South Gloucestershire Council

Delivering for you

Green infrastructure

Guidance for new development

Supplementary Planning Document | Adopted April 2021

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Contents

1. Executive Summary

This Supplementary Planning Document (SPD) provides information to support existing Local Plan policies which seek to ensure that green and blue infrastructure (GI) is adequately conserved and enhanced throughout the development process. It is targeted on supporting Core Strategy policies CS1, CS2 and CS24 and PSP policies PSP1, PSP2 and PSP3. **Throughout the document GI also includes Blue Infrastructure** (hydrological considerations).

The principal objectives of this SPD are to:

- Champion the significance of GI as critical infrastructure to create bigger, better, and more joined-up functioning green spaces and ecological networks at the regional and local level

- Ensure an integrated and collaborative approach to the planning for GI in new developments across South Gloucestershire by setting clear objectives that reflect industry good practice; thereby contributing to the Council's commitment to achieving sustainable communities and quality of life for all

- Provide a single reference source for the main principles set out in the NPPF/national guidance, our existing Core Strategy policy CS2, and the West of England Joint Green Infrastructure Strategy (JGIS), which was published June 2020

- Introduce the Council's commitment, as set out in Policy CS2 of the Core Strategy to develop a South Gloucestershire GI Strategy and work to achieve a South Gloucestershire GI and Local Nature Recovery Strategy by working with our partners through the statutory planning policy, development management and Council's asset management processes

- Make developers aware of the Council's Climate Emergency declaration and leadership commitment for South Gloucestershire to be carbon neutral by 2030; and the desire to prioritise design, implementation and operational considerations to assist in delivering this goal

- Encompass access and public rights of way requirements, to reinforce PSP10 regarding active travel and access to footpath/cycleway networks, contributing to GI delivery

- Provide guidance by way of a Check List for developers and others on how GI should be mainstreamed in planning and land use decisions, capitalising on a site's existing landscape features and attributes to maximise biodiversity and the creation of healthy, sustainable places that respond to the needs of people and the environment at all scales and contexts

- Explain how to maximise GI opportunities on a site and how to integrate GI into all stages of the planning, design and development process. Details will include how to achieve a well-designed scheme, compliant with biodiversity net gain requirements, which contributes to the local nature recovery network and wider GI strategic objectives, with a step by step guide for ease of reference in sections 6-8

- Include best practice examples and case studies of exemplar schemes, where GI benefits have been achieved including reference to current papers and research by other bodies such as Natural England and the Landscape Institute

The SPD is primarily for use by planning applicants, developers and landowners, as well as decision makers such as planning officers.

The GI SPD encompasses access and public rights of way requirements and forms one part of a suite of SPDs developed to accord with our Climate Change Emergency Action Plan; https://www.southglos.gov.uk/environment/climate-change/climate-change-strategy/

The GI SPD should be read together with:

- Trees on Development Sites SPD
- Biodiversity and Planning SPD (being developed to coincide with the Environment Bill)
- SuDS SPD
- Landscape Character Assessment SPD (revised and adopted November 2014)[1] and
- Current Core Strategy and PSP policies relating to GI, biodiversity and good design

Appropriate weight should be given to the advice set out in this SPD which supports the interpretation and delivery of the Council's adopted Local Plan policies.

[1] Landscape Character Assessment SPD- https://www.southglos.gov.uk/environment-and-planning/countryside/planning-landscape-character-assessment/

2. Introduction- what is GI?

Green Infrastructure is the term used to encompass all the natural environment assets of a site and to maximise their benefits through integrated site planning, with good design being the key to this integrated approach to land use. At its heart, the aim of GI is to manage the many, often conflicting, pressures for housing, industry, transport, energy, agriculture, nature conservation, recreation and aesthetics.

GI definition; Green and blue infrastructure (GI/BI) is a strategically planned and managed network of natural and semi natural features, green spaces, rivers and lakes that intersperse and connect villages, towns and cities. Individually, these elements are GI assets, and the roles that these assets play are GI functions. When appropriately planned, designed and managed, these assets and functions have the potential to deliver a wide range of benefits – from providing sustainable transport links to mitigating and adapting the effects of climate change. The planning, management and investment in GI is fundamental and is required at all levels of planning, from strategic, to local, to site specific plans.

The National Planning Policy Framework (NPPF) defines GI as: '*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'.*

National Planning Policy Guidance (NPPG - Par 27) explains – '*Green infrastructure is not simply an alternative description for conventional open space. As a network it includes parks, open spaces, playing fields, woodlands, but also street trees, allotments and private gardens. It can also include streams, canals and other water bodies and features such as green roofs and walls,'* and recommends embedding GI into the development process at an early stage linking it explicitly to ecosystem services: '*Green Infrastructure provides multiple benefits, notably ecosystem services, at a range of scales, derived from natural systems and processes, for the individual, for society, the economy and the environment. To ensure that these benefits are delivered, green infrastructure must be well planned, designed and maintained'.*

The Government's 25 Year Environment Plan, due to be enacted in 2021, provides a legal framework for environmental governance once the UK leaves the EU and makes provision for specific improvement of the environment. It focuses on enhancing natural capital, defined as: "*The elements of nature that directly or indirectly produce value for people, including ecosystems, species, freshwater, land, minerals, air and oceans, as well as natural processes and functions*". GI consists of these natural capital assets, which underpin the provision of ecosystem services, providing benefits to our health, wealth and well-being.

2.1 Components of GI

What unites these definitions is the idea that green infrastructure planning adds value through the concept of a **managed multifunctional network, which can operate at multiple scales.** This is why in South Gloucestershire we consider genuinely sustainable development depends on a holistic approach to site design and

development and appropriate long-term management and maintenance to achieve effective multifunctional GI. GI encompasses the following multifunctional benefits:

- **Adaption to climate change-** green infrastructure can contribute to carbon storage, cooling and shading, opportunities for species migration to more suitable habitats and the protection of water quality and other natural resources. It can also be an integral part of multifunctional sustainable drainage and natural flood risk management
- **Biodiversity/Environmental protection-** high-quality networks of multifunctional green infrastructure contribute a range of benefits, including ecological connectivity, facilitating biodiversity net gain and nature recovery networks and opportunities for communities to undertake conservation work
- **Access, recreation, play, movement and leisure-** Green infrastructure can improve the wellbeing of a neighbourhood with opportunities for recreation, exercise, social interaction, experiencing and caring for nature, community food-growing and gardening, all of which can bring mental and physical health benefits
- **Habitat provision and access to nature**
- **Landscape setting and context-** GI can reinforce and enhance local landscape character, contributing to a sense of place and natural beauty
- **Promoting healthy and safe communities-** and reducing inequalities through access to high quality green spaces and public realm
- **Energy production and conservation**
- **Increasing the sustainability of food production, soil health and productive landscapes**
- **Flood attenuation and protection**
- **Cultural heritage**
- **Healthy lifestyles-** improving mental and physical health, and the cohesion of local communities
- **Promoting economic growth, employment and skills improvement-** Green infrastructure can drive economic growth and regeneration, helping to create high quality environments which are attractive to businesses and investors
- **Connectivity-** physical, functional and visual links and relationships –visual and perceived connectivity e.g. linking into visually important hillsides and strategic viewing corridors important to preserve

2.2 GI Functions

We want to ensure that GI is fully recognised for its potential to respond to a range of current and future challenges. GI is multifunctional; it can help to mitigate and adapt to climate change, improve health and wellbeing, decrease soil erosion, manage water resources and flooding and enhance biodiversity.

Landscape scale connectivity is required for the healthy functioning of ecological and recreational networks and critical links identified in the Nature Recovery Network for the West of England

GI Functions for Communities

- Exercise & recreation
- Wellbeing and social interaction
- Enhanced accessibility
- Contact with nature
- Landscape protection and sense of place
- Food production
- Urban cooling and shade
- Management of flood risk
- Natural beauty
- Reduced air pollution
- Informal play
- Gardening

GI Functions for the Earth

- Carbon storage
- Protection of water quality
- Maintenance of groundwater
- Protection of soils and their micro-organism systems
- Ecological connectivity- allowing for migration of species
- Protection of geomorphology of the landscape
- Protection of landscape features of both natural and social value e.g. ridge and furrow, hedgerows
- Protection of complex biodiversity systems
- Natural river and wetland features e.g. marshland

GI applies to all scales and forms of development, from regional and sub-regional, to district scale, neighbourhood scale and down to local, site specific scale. **The same GI principles apply to all**. At the **regional scale** Green Infrastructure creates a connected network of green spaces which respond sensitively to landscape character and conserve natural ecosystem values and functions. **At the local scale** it creates green space between and around built areas. It connects communities with nature and retains the important scenic and cultural landscapes that make a community unique. **In built areas** it connects public spaces like parks, streets and waterfront with surrounding landscapes. It also includes the tree canopy that keeps cities cooler in summer, adds natural beauty, helps clean the air, and reduces storm water run-off.

2.3 Elements of Green Infrastructure

The range of appropriate options depends on the scale and context of the site, rural sites offering more opportunities for large scale initiatives.

Larger scale or rural elements	Smaller scale and urban elements
▪ Parks ▪ Communal gardens ▪ Woodland ▪ Sustainable drainage features such as ponds, swales and reed beds ▪ Streams ▪ Canals ▪ Marshland ▪ Scrub ▪ Species rich grassland ▪ Orchards and food growing opportunities ▪ Hedgerow network ▪ Green active travel routes	▪ Green roofs ▪ Private gardens ▪ Green walls ▪ Street trees ▪ Rain gardens ▪ Hedges ▪ Permeable paving ▪ Wildflower verges ▪ Habitat enhancements such as nest boxes ▪ Allotments and food growing opportunities ▪ Natural play ▪ Footpath and cycle ways

2.4 The different GI concepts explained - natural capital, ecosystem services and net gain

The terms natural capital, ecosystem services, green infrastructure and net gain now form an integral part of a complex and ever-growing environmental vocabulary in England. They all feature in key national guidance and strategies, such as the Government's 25 year Environment Plan[2], and the connections between the concepts are explained as follows:

- The environment provides a finite stock (natural capital) of multifunctional assets such as geology, soil, water, plants and animals
- This natural capital provides us with ecosystem services such as food, fuel, climate regulation, crop pollination, natural flood management
- Different people value different ecosystem services for different reasons; thus policy and decision making often require trade-offs to be made

GI provides both an approach and delivery mechanism to secure multiple benefits through a connected network of green space and features (West of England).

[2] The Governments 25 year Environment Plan; A Green Future; https://www.gov.uk/government/publications/25-year-environment-plan

2.5 GI updated 2020

Since the adoption of our Core Strategy GI policy in 2013, GI has taken on enhanced significance due to the climate change emergency and mitigation and adaptation required. Our adopted PSP policies PSP1-PSP6 provide current policy guidance on climate change mitigation. However, as explained above, in July 2019 all five West of England authorities declared climate emergencies, committing to area wide carbon neutrality by 2030. Our adopted Local Plan policies continue to be the starting point for how we want to deliver effective GI through new development in South Gloucestershire, but we also now recognise the value of other strategies as described above, to help support our GI objectives. These act as other material considerations in the overall planning balance.

The ambitions set out in the Government's 25 year Environment Plan are now due to be translated into the Environment Bill, which will include a requirement to develop Local Nature Recovery Strategies and a duty on public authorities to actively carry out strategic assessments of the actions they can take to enhance and conserve biodiversity. This includes a mandatory approach to Biodiversity Net Gain (10%). Biodiversity Net Gain (BNG) is the achievement of measurable gains for biodiversity through new development and occurs when a development leaves biodiversity in a better state than before development. A Biodiversity and Planning SPD is being developed to accord with the Environment Bill timetable and this document will add further clarity and explain how South Gloucestershire will support biodiversity through the determination of planning applications and provide clear guidance for developers regarding what will be required.

2.6 West of England Joint Green Infrastructure Strategy (JGIS) (June 2020)

The JGIS was approved and endorsed by the WECA Joint Committee in June 2020 and sets out the West of England (WoE) goals and objectives to enhance and optimise GI across the West of England. The strategy has been produced to set out key concepts and tools to enable a consistent approach to GI across the West of England and promote the development and use of a GI shared evidence base for Local Plan development. Recognising that connectivity between different GI assets can help maximise the benefits they generate, four key GI strategic ecosystem networks as set out below, match with the Building with Nature site based themes of Wildlife, Water and Wellbeing.

The Joint Green Infrastructure Strategy further reinforces our current Core Strategy and PSP policies and starts to bring forward the elements set out in CS2.

The JGIS can be viewed on the West of England Combined Authority's (WECA) website:

https://www.westofengland-ca.gov.uk/west-of-england-joint-green-infrastructure-strategy/

The key natural and semi natural assets in the West of England will be enhanced by creating bigger, better, more and joined-up habitats. Within South Gloucestershire these include;

- Water/wetlands; including the Severn Estuary, with the second highest tidal range in the world and the River Avon
- Grasslands; including waterside permanent pasture and wet grassland, calcareous and neutral grasslands, including those of the Cotswolds AONB
- Trees, woodland and parkland; South Gloucestershire has in the region of 11% tree canopy cover, including ecologically important ancient woodland such as Lower Woods
- Field boundaries; hedges and drystone walls

The West of England Joint GI Strategy sets out targets consistent with the Defra 25 Year Environment Plan indicators and WENP Nature Recovery ambitions. Defra have set out an indicator framework for the Government's 25 year Environment Plan (May 2019) setting out commitment to deliver a comprehensive set of indicators which collectively describes environment change as it relates to the 10 goals in the 25 Year Plan. The Framework of indicators is developed on the concept of natural capital. There are 66 indicators under 10 broad themes. Defra will, where possible, make data available to allow analysis at local scales including local authority or catchment. As part of the monitoring of delivery of the JGIS, the Defra Indicators are to be used and analysed for the West of England when available. Delivery of the West of England Nature Recovery Network ambitions will be monitored through the work of WENP working with the unitary authorities, WECA, Government agencies and key partners.

West of England Targets are set to;

- Create 5,108 hectares of wildlife-rich habitat outside the protected site network by 2043
- Double our woodland by 2060
- Close the connectivity gaps with 580 hectares of new native woodland and 660 hectares of new species-rich grassland by 2050
- All water catchments to be in good ecological status and all SSSIs in favourable condition by 2027
- Double the amount of land managed for environmental gain from 2018 levels by 2050
- Ensure that all new developments achieve well connected and appropriate biodiversity net gains that contribute to these ambitions
- Double the abundance of wildlife from 2018 levels by 2050
- Develop a strong and living evidence base to hold the above ambitions to account and help us make the smartest decisions for nature's recovery

2.7 West of England Joint Green Infrastructure Strategic Programmes

The JGIS includes an Action Plan which will include training for planners as well as producing GI planning guidance that will tie in the BNG work currently being undertaken. A number of programmes and projects have been identified which will aid nature recovery network enhancement across the West of England and contribute to achieving these targets, with strategic projects reflecting the following 4 identified categories: wetland, grassland, woodland and field boundaries. The JGIS identifies 8 key outcomes, which state what is to be achieved and how these outcomes will be delivered across the West of England. The action plan identifies West of England priority activities to achieve the outcomes. Some are joint activities or projects and others will be delivered by individual partners, e.g. unitary authorities as they progress their local plans and climate emergency action plans. The 8 nature based outcomes sought as part of an integrated approach to GI in the West of England are:

- Improved and better-connected ecological networks
- Greater resilience to climate change
- Sustainable water management
- Health and wellbeing for all
- Create and maintain sustainable places
- Create and maintain valued healthy landscape
- Support sustainable and local food production
- Build a resilient economy

It is recognised that good mapping and analysis of GI assets, as well as understanding issues affecting communities, is key to GI planning and at the heart of the JGIS is the evidence base, building on the latest WENP mapping data. The Nature Recovery Network (NRN) mapping enables the identification of the links that are vital for effective GI, and also the opportunities that can deliver multiple benefits. Geographic Information System (GIS) and geospatial technologies are therefore incredibly useful to plan, deliver, and monitor green infrastructure. The JGIS action plan recognises the need to develop and manage a shared interactive environment and ecological map/data resource that is kept updated.

In addition, the JGIS divides the West of England into 22 GI areas to assist GI delivery by facilitating a focus on specific landscape areas and the development of local partnerships, as well as operating across groups of areas or the whole West of England area and beyond. Of these 22 GI areas, 7 are within South Gloucestershire and this information will be used in conjunction with our adopted Landscape Character Assessment (Adopted and Revised 2014), which provides a further level of detail within our district. The JGIS also includes details of the Building with Nature initiative, which is a voluntary approach developed by practitioners, policy-makers and academic experts, and tested with the people who will use and benefit from the framework. It enables developers to integrate green infrastructure to create places in which people and nature can flourish. It sets out standards to provide a benchmark and is to be used as well as the Biodiversity Net Gain matrices, in site assessment, in order to provide a qualitative assessment of the site. The Building with Nature (BwN) three key themes

are Wildlife, Water and Wellbeing; and there are three levels of award that can be applied for; Candidate, Achieved and Excellent. On major sites, developers will be encouraged to use this benchmarking scheme. Major development is defined as 10 dwellings or more, or a site area of 0.5 hectares or more, or for non-residential development it means additional floor space of 1,000m2 or more, or a site of 1 hectare or more. There may also be smaller sites where the Building with Nature scheme may be appropriate, in order to demonstrate the highest standard of design regarding wildlife, water and wellbeing. Further information can be accessed via the website:

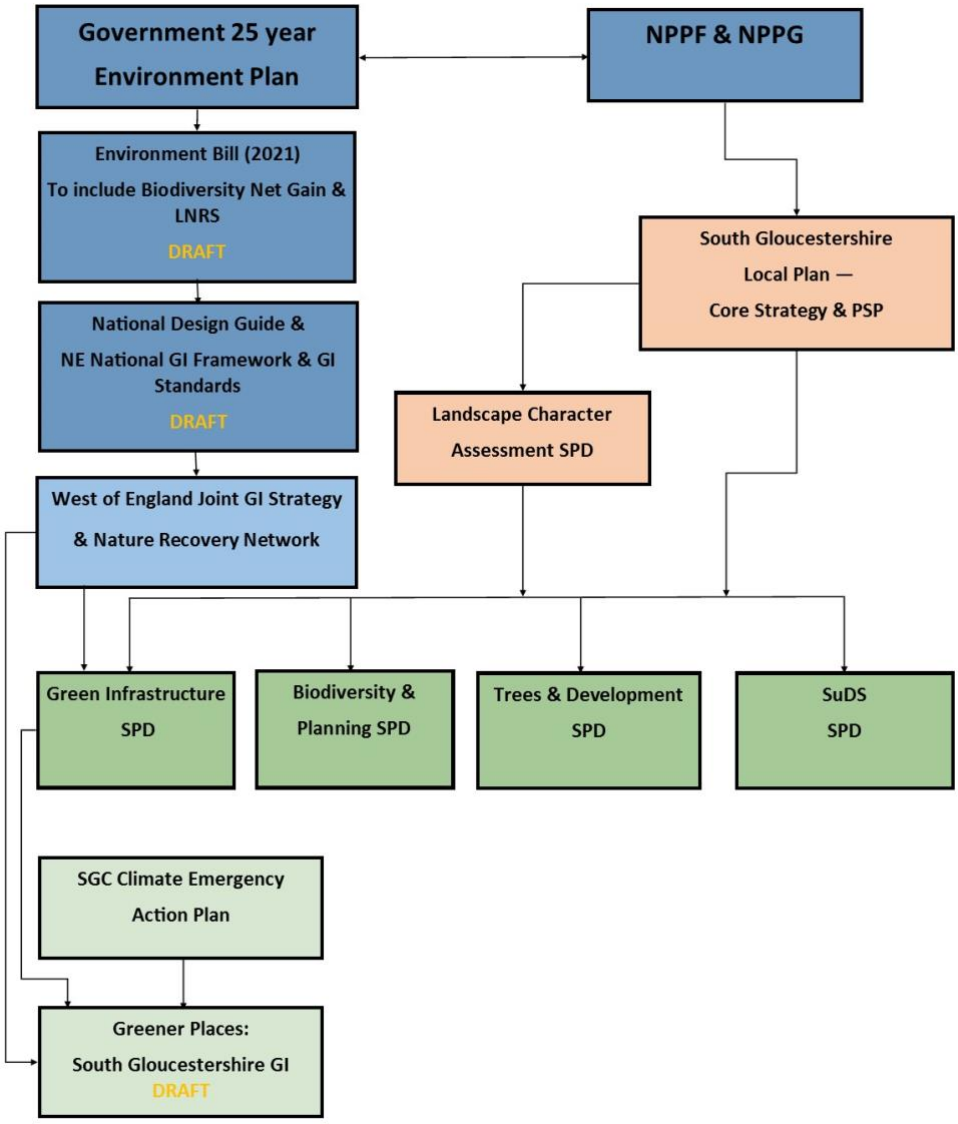
https://www.buildingwithnature.org.uk

The West of England JGIS approach is also a pilot for the National Framework of Green Infrastructure Standards Project, being developed by Natural England. The West of England pilot proposal is to test the framework, its suitability, usability and effectiveness, and will bring together the GI Policy Matrix and Building with Nature (BwN) standards to test the Natural England GI Standards Framework.

3. Planning Policy, Legislation & Standards

3.1 Policy hierarchy

The flow diagram below illustrates the range of policy and guidance regarding GI and the interdependences between them.



3.2 How is GI included in national Government policy?

The NPPF (February 2019), NPPG (October 2019) and National Design Guide (September 2019) all recognise the importance of integrating GI into development and the duties and obligations regarding GI are set out in European conventions, national legislation and national, sub-regional and local policy. These give substantive weight to the need for plan making, policy development and economic development to be sustainable through the integration, development and maintenance of Green Infrastructure. The key components for the requirement for GI are further embedded in the National Design Guide.

3.3 The National Design Guide

This design guide is based on the objectives for design set out in NPPF chapter 12, and requires new development to incorporate GI, including e.g. street trees to soften the impact of car parking, and states that it should be well-designed and landscaped and sensitively integrated into the built form so that it does not dominate the development or the street scene. It incorporates green infrastructure, including trees, to soften the visual impact of cars, help improve air quality and contribute to biodiversity.

The National Design Guide also recognises that nature contributes to the quality of a place, and to people's quality of life, and it is a critical component of well-designed places. Natural features are integrated into well-designed development. They include natural and designed landscapes, high quality public open spaces, street trees, and other trees, grass, planting and water.

National design guide diagram

The National Design Guide requires development to be well designed and:

- Integrate existing and incorporate new natural features into a multifunctional network that supports quality of place, biodiversity and water management
- Prioritise nature so that diverse ecosystems can flourish

- Provide high quality attractive open spaces in locations that are easy to access, with activities for all to enjoy, such as play, food production, recreation and sport. They should be robust and adaptable over time so that they remain fit for purpose and are managed and maintained for continual use

- Include well-integrated drainage, ecology, shading, recreation and food production that achieve a biodiversity net gain as required by the 25-year Environment Plan

- Achieve new water features that manage drainage and also existing watercourses. This should include green and brown roofs, swales, rain gardens, rain capture and other drainage, to create multifunctional 'green' sustainable drainage systems. They also enhance the attractiveness of open spaces and provide opportunities for play, interaction and relaxation

- Include site-specific enhancements to achieve biodiversity net gains at neighbourhood, street and household level. Green corridors can be used to extend and enhance existing ecosystems. Existing areas of valuable biodiversity are protected and enhanced. Priority is given to rare or critical habitats and species

3.4 Draft National Framework of Green Infrastructure Standards

Although GI is embedded in both national and local policy, often GI outcomes are not maximised within new development or seen as a critical component of the infrastructure of a place, despite GI led solutions providing multiple values and benefits, which are also usually more cost effective. As a result, Natural England, in coordination with Defra and other partners, is currently developing a national GI framework of standards and guidelines, which aim to provide clarity and help local authorities, developers and communities plan and design GI to provide environmental and quality of life benefits for communities.

The National GI Standards Framework will set out principles, attributes and guidance which can be applied to drive a partnership approach to the development and delivery of good multifunctional GI that responds to the needs of people and the environment at all scales and contexts.

These National GI Standards are currently being tested as a West of England GI pilot study which will test the framework, its suitability, usability and effectiveness and taking account of existing tools including the GI Policy Matrix and Building with Nature standards.

The recently published Nature Networks document, is a summary for practitioners which aims to provide a quick reference guide to support the development of Nature Networks. It is based on the extensive review of evidence presented in the Nature

Networks Evidence Handbook by Natural England[3]. The GI Standards Framework will build on this evidence.

3.5 How is GI included in local policy?

Core Strategy (adopted Dec 2013)

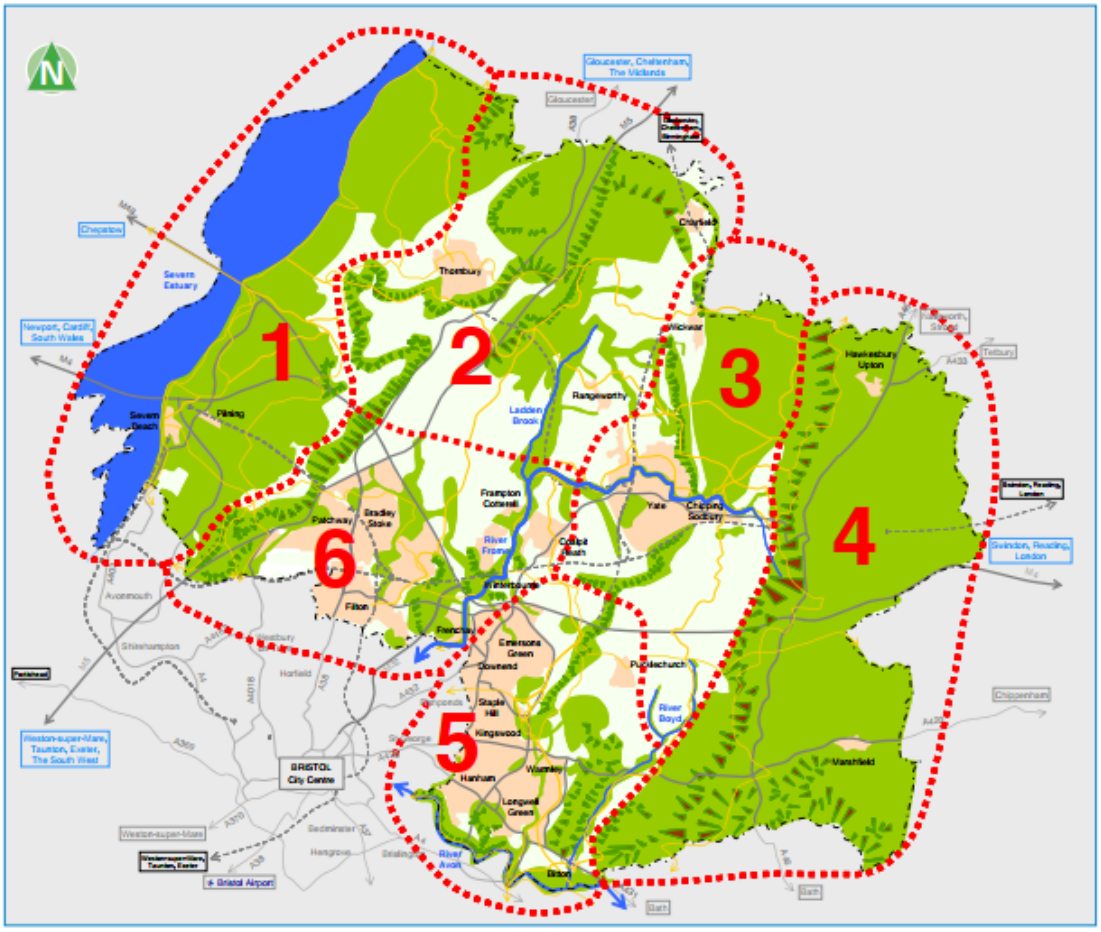
Policy CS2 – Green Infrastructure policy states:

The Council and its partners will ensure that existing and new Green Infrastructure is planned, delivered and managed as an integral part of creating sustainable communities and enhancing quality of life, considering the following GI objectives:

1. Realising the potential of Green Infrastructure to assist with mitigation of, and adaption to, climate change
2. Delivering high quality multi-functional and connected open spaces (including Green and Blue Infrastructure)
3. Protecting, creating and improving recreational, play, access and local food cultivation opportunities
4. Protecting and enhancing species and habitats, and creating new habitats and wildlife linkages between them
5. Conserving and enhancing landscape character, historical, natural, built and cultural heritage features
6. Securing ongoing management and maintenance and creation of GI assets
7. Joint working with partners, including neighbouring local authorities.

[3] http://publications.naturalengland.org.uk/publication/5144804831002624

Key - Strategic Green Infrastructure Network (Figure 1)



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- South Gloucestershire Council Boundary
- Strategic Green Infrastructure
- Visually Important Hillsides
- Strategic Recreation & Cycle Routes
- Main Water Courses
- Railways
- Main Roads

ZONES

ZONE 1
Severn Estuary; SPA/SAC/RAMSAR; Floodzones 2&3; Strategic Nature Areas; Severn Way, Monarch's Way & Jubilee Way; Landscape Character Areas 19,20,21

ZONE 2
Strategic Nature Areas; SNCIs; Open Access Areas; Ladden Brook; Floodzones 2&3; Visually Important Hillsides; Historic Parks & Gardens; Strategic Paths & Cycleways; Landscape Character Areas 7,8,9,10,17,18

ZONE 3
Commons; Local Nature Reserves; Strategic Nature Area; SSSI; Lower Woods Nature Reserve; Frome Valley; Floodzones 2&3, Strategic Paths & Cycleway; Visually Important Hillsides; Historic Parks & Gardens; Landscape Character Areas 5,6,8,12

ZONE 4
Cotswold AONB; Strategic Nature Area; Historic Parks & Gardens; Visually Important Hillsides; National Trail; SSSIs; Open Access Lane; Landscape Character Areas 1,2,3,4

ZONE 5
Visually Important Hillsides; Strategic Paths & Cycleways; Local Nature Reserves; Commons; Overscourt Wood; Warmley Forest; Hanham Hills; River Boyd; Avon Valley, Floodzones 2&3; Landscape Character Areas 6,11,12,14,16

ZONE 6
Visually Important Hillsides & Landscape; Commons, Frome Valley; Strategic Paths; Local Nature Reserve; M32 Corridor; Haw Wood; Stoke Park; Historic Parks & Gardens; Landscape Character Areas 13,15,18

To support Policy CS2, the Strategic Green Infrastructure Network (Figure 1) displays those current and potential GI assets which are important at a strategic scale. Some of these assets are protected by existing development plan policies, whilst other areas provide opportunities to extend (through the creation of new assets) and introducing enhancements to the network.

Policy CS24 - Green Infrastructure, Sport and Recreation Standards

Policy CS24 requires that where existing facilities are inadequate for the needs of new occupiers of a development, new provision will be required. It states that GI is an integral to a development and provision for GI, outdoor space, sport and recreation facilities will be sought according to 3 principles:

1) New developments must comply with local standards
2) Should be delivered on site unless it is demonstrated that provision off-site creates a more acceptable proposal; and
3) The functionality and usability of spaces and facilities must be suitable for their intended purposes.

This is further developed in our Playing Pitch and Sports Strategy:

https://beta.southglos.gov.uk/playing-pitch-and-sports-facilities-strategy/

Policy CS1 requires the highest possible standard of design and site planning demonstrating that the proposal will connect to the wider network of foot, cycle and public transport links and enhance or develop the public realm including the needs of pedestrians, cyclists and disabled and older people. Whilst **Policy CS8** seeks to improve accessibility supporting sustainable travel links by the integration of walking and cycling into the local network. South Gloucestershire Core Strategy GI policies can be accessed via our website:

https://beta.southglos.gov.uk/wp-content/uploads/South-Gloucestershire-Core-Strategy-2006-2027.pdf

The Policies Site and Places DPD

Policy PSP10 protects all active travel routes from development that will reduce, sever or adversely affect the utility, amenity safety and delivery of all existing or proposed ATRs. All development proposals are expected to link to existing or proposed ATR and new or enhanced routes must address local circumstance, character recognising user requirements, safety and local community aspirations. This policy recognises the importance of links to the GI network as well as removal of barriers to accessibility links to the countryside maximised to encourage healthy lifestyles. In **PSP30** bridleways as GI are protected from over intensive use as a result of horse related development.

Our landscape policy **PSP2** requires a high standard of landscape design for all amenity space, hard and soft landscape works and open space provision, appropriate to the use and character of the development and its location; and designed as an integral part of the development, incorporating existing landscape features where appropriate, for the benefit of the development proposal.

Policy PSP3 - **Trees and Woodland** requires development proposals to minimise the loss of existing vegetation on a site that is of importance in terms of ecological, recreational, historical or landscape value. Our Designated Local Green Spaces Policy **PSP4** protects valued local designated areas from development and are identified on the policies map. Other relevant PSP policies to GI are **PSP7**; Development within the Green Belt and **PSP44**; Open space, sport and recreation. **PSP19** requires every effort to be made to maximise biodiversity net gain on a site, retaining and enhancing those habitats identified though the site survey work and incorporating them within the scheme.

Our PSP policies relating to GI can be found on our website:

https://beta.southglos.gov.uk/wp-content/uploads/PSP-Plan-Nov2017.pdf

4. Green Infrastructure in South Gloucestershire

South Gloucestershire has a diverse and varied landscape, from the distinct landscape of the Cotswolds Area of Outstanding Natural Beauty within the eastern portion of the district to the Severn Estuary and the low lying landscape of the Severn Vale marking the western boundary. More than half of South Gloucestershire is covered by Green Belt which surrounds and separates Bristol and Bath.

This rich landscape is characterised in detail within our Landscape Character Assessment, adopted as an SPD, which provides a useful resource in assessing planning applications and informing policy.

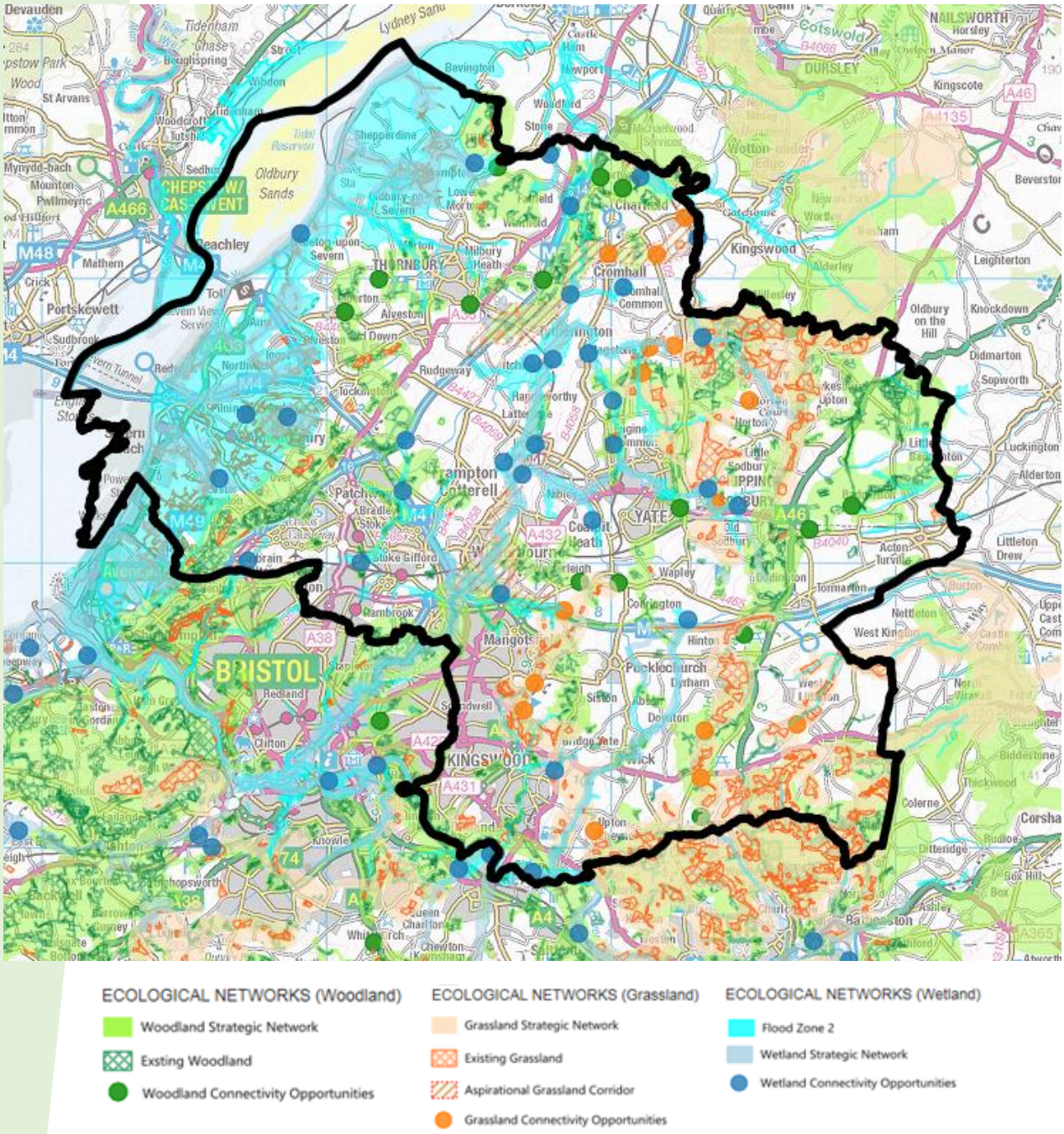
The district is divided into 21 landscape character areas (LCA), and the document provides a landscape strategy for each character area, which provides guidance for GI and landscape proposals on new development. The key point being that site design and landscape mitigation should be appropriate to the host landscape and character setting, as set out in the Landscape Strategies for each LCA (and list of GI assets given in Appendix 3.0). This has latterly been further reinforced by the use of a GI area approach within the JGIS, relating to the wider landscape character within the West of England. The Landscape Character Assessment can be accessed via our website:

https://www.southglos.gov.uk/environment-and-planning/countryside/planning-landscape-character-assessment/

4.1 Our Local Nature Recovery Network

Using the WENP mapping data as a base, work is now progressing towards a South Gloucestershire GI and Local Nature Recovery Strategy, to be produced in line with our new Local Plan and revised GI policy. Although at an early stage, the 'gaps' identified in the nature recovery network are being analysed and projects developed to enhance connectivity and biodiversity.

The WENP mapping illustrates the importance of connectivity in order to reduce fragmentation and severance. Fragmented green and blue space results in poorly functioning landscapes with highly negative impacts on the ecosystem services we depend on. This in turn can have significant impacts on flood and drought risk, which can cause more far reaching repercussions on existing and proposed development. Well designed and high quality GI can protect and enhance as well as improve connectivity for access and sense of place (WoE). A link to the WENP mapping can be found here: www.wenp.org.uk



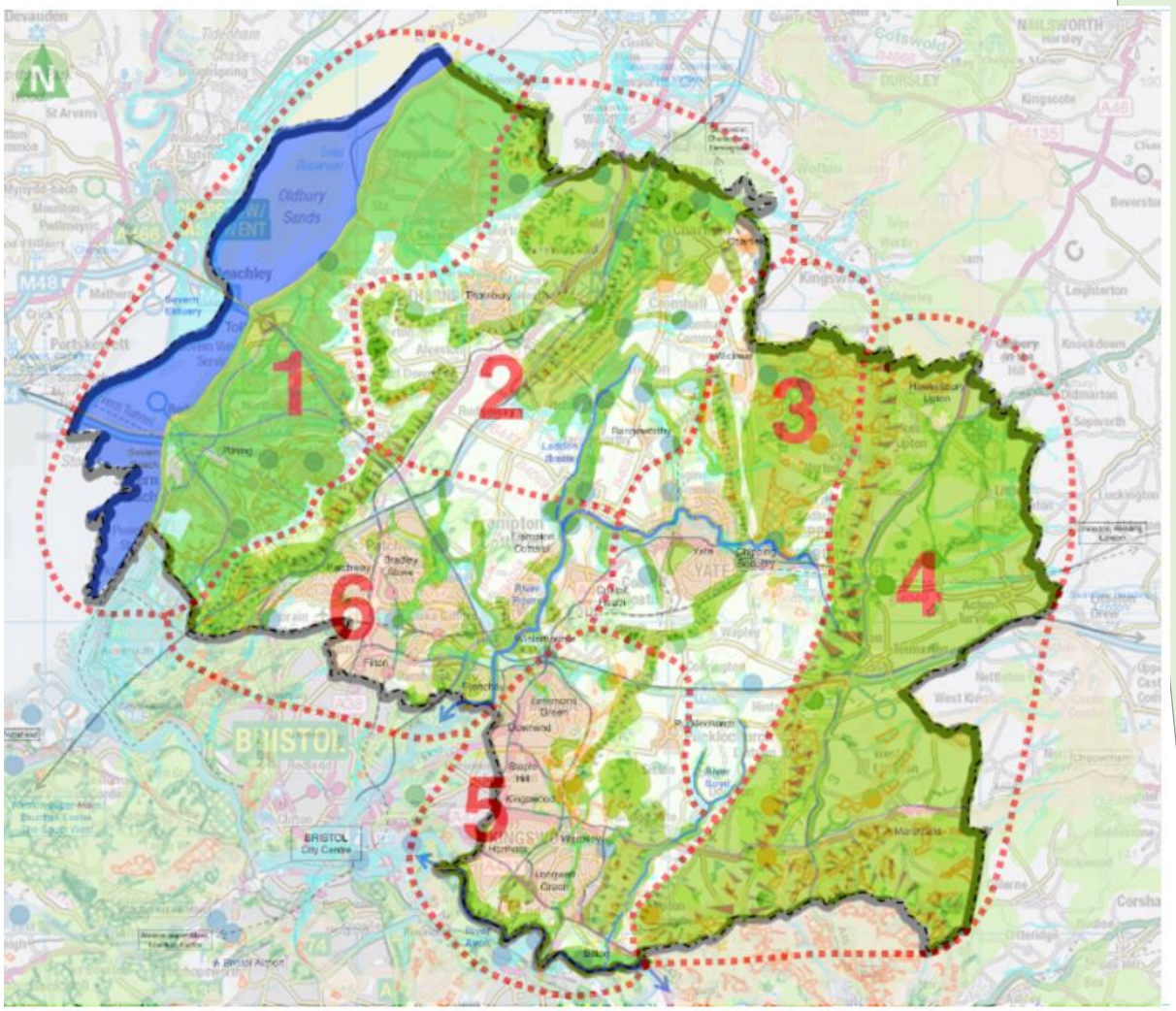
The South Gloucestershire Nature Recovery Network based on WENP Map 2020

This mapping identifies the areas of core habitat, the best connections between them and existing gaps in ecological connectivity for woodland, grassland and wetland within South Gloucestershire. This forms only **part** of the wider GI and will form the basis of the forthcoming GI and Local Nature Recovery Strategy. It provides technical evidence for how applications need to show how they have addressed the 7 GI objectives set out in CS2, as reiterated above in Section 3.5 and illustrated by the Case Studies in Section 8. Policy CS2 commits the Council to developing a South Gloucestershire GI Strategy and this is now being produced and will show GI improvements proposed on Council owned land, outlined in our Greener Places document; see 4.3 below. All emerging

development proposals and applications are assessed on an individual basis, where finer grain and more technical assessment may be available to consider their acceptability.

4.2 Green Infrastructure Mapping – Progression of CS2 policy diagram to include our Nature Recovery Network and the development of Strategic GI Corridors

Our CS2 diagram is being developed, using the Nature Recovery Network data to incorporate the other elements of GI. This forms the evidence base for further work and helps to identify priority areas for the creation and enhancement of habitat and has identified strategic networks or 'corridors', with the aim of creating a robust and dynamic ecological network within and beyond South Gloucestershire. The overlapping information can be seen in the diagram below. There is a strong interrelationship; however, the nature recovery network and GI corridors, although linked, are separate entities, therefore sometimes the corridors diverge as well as overlap.



The South Gloucestershire Nature Recovery Network overlaid with CS2 diagram

The mapping can be shown in these respective 6 main GI Strategic elements.

Our overall vision and targets are currently being developed and will take the WoE targets set out in the JGIS and distil them to suit our local requirements within South Gloucestershire. This will then form the basis of our forthcoming GI and Nature Recovery Strategy. It is intended that an interactive GI and Local Nature Recovery map will be developed for inclusion in our new Local Plan.

The mapping needs to include the WoE GI Area profiles and historic landscape character and individual features and sites. This includes designed landscapes and their settings such as formal historic parks and gardens, and/or the setting of individual historic settlements and heritage assets such as Conservation Areas, important Listed Buildings, critical views and vistas etc. which will provide historical, social, economic, cultural and environmental context. Understanding the origins and history of the semi-natural and designed landscapes can provide information on how these areas could be managed, conserved and protected. It is crucial that a holistic approach is taken towards the management of green spaces that incorporates an understanding of their intrinsic heritage values (WoE).

Other data layers to be overlaid will be the agricultural land classification information to indicate our best soils with potential for food production, active travel routes and new strategic routes planned as part of the JLTP4. This evidence base will be developed into an interactive map, which will support a revised GI policy within the new Local Plan and provide technical evidence to inform planning applications. Refer to JGIS Appendix 1 for the full list of WoE mapping data included.

4.3 Greener Places- South Gloucestershire Green Infrastructure Strategy

A South Gloucestershire GI Strategy is being prepared which is a non-statutory 'corporate' document that brings together the Council and our partner's commitments regarding GI alongside setting out the standards, priorities and approach we will take to managing Council owned and or maintained green space assets. As part of this it introduces and sign posts to the Council's statutory Development Plan and supporting SPDs to optimise the role, creation and management of GI for people, place and nature. The Council's GI Strategy will also help provide the technical evidence base to establish the new GI standards being prepared as part of the new Local Plan.

4.4 South Gloucestershire Tree Asset Management Plan

Adopted in 2018, this document was developed as a tool to describe the policies and strategies used by the Council in making management decisions on their tree resource. It sets out how the Council will maximize the value of our tree assets, and aim to increase the existing tree cover in South Gloucestershire to achieve trees on public and private land across the district. Canopy cover was assessed using our GIS mapping data. Sample areas were interrogated in detail and the figures were extrapolated across the district to obtain the overall % canopy cover.

Due to the declaration of a climate change emergency, combined with the requirement to replace trees lost to current diseases, most notably Ash Dieback, occurring throughout the district, the tree planting targets will need to be significantly increased. Recent assessment estimates canopy cover will need to be increased to 22%, rather than 15%, in order to aid climate change mitigation. This represents establishing a further 5900 hectares of tree canopy cover.

5. Access & PROW Requirements

The Joint Local Transport Plan (JLTP4) supports delivery of transport schemes set out in local transport strategies across the region, including the Bath and Bristol Transport Strategies, and those covering cycling, walking, public transport, parking and the main road network. Its vision is 'Connecting people and places for a vibrant and inclusive West of England'. The JLTP4 has regard for the JGIS and shares many of the GI outcomes and will take both existing and potential GI into account and seek to avoid severance of GI and ecological networks by delivering appropriate mitigation where issues are identified. The West of England's Local Cycling and Walking Infrastructure Plan (LCWIP) identifies a series of walking and cycling routes which have been prioritised for future investment and will include consideration of GI opportunities.

The PSP10 diagram map showing active travel and cycle routes is kept updated and can be accessed via out interactive map on our website;

http://map.n-somerset.gov.uk/southglos.html

The network of Public rights of way (PROW) and long distance routes often includes the GI within an area and is key in its provision of safe and accessible access through new developments as well as linking to important wider transport links. Its importance is recognised in law being a material consideration in the planning process as well as national and local planning policy. National Guidance requires that PROW within developments should be provided via made up estate paths through landscaped or open space areas away from vehicular traffic.

The NPPF, Core Strategy, Local Plan Policy as well as the Joint Rights of way Improvement Plan seek to achieve healthy active lifestyles through the provision of safe and accessible path network including paths that provide links to the wider network beyond. The British Standard requires that the least restrictive access must be provided with removal of inaccessible barriers. Any development proposals should set out how the active travel routes are safeguarded, enhanced and will contribute towards the green infrastructure and healthy lifestyles aspirations in national and regional policy.

Any proposals for change to the PROW network have to be through the legal process and comply with the South Gloucestershire Public path order policy to include the same or betterment principle and taking into account the GI aspirations. New routes must recognise the PSP 10 principle that active travel routes must accommodate multi-user i.e. cycle, pedestrian and horse rider and their design to match accordingly with width, surface, protection from traffic and crossings, accessibility and utility taken into account. PROW may not be obstructed by development without the required legal order in place either for temporary or permanent changes.

6. Guiding Principles for Developers & Landowners – Building GI into Development and Land Use Change

This section covers the steps that developers should take at the planning and design stages to ensure that GI assets within development sites are suitably retained, maintained and enhanced so that any new development is an asset to the landscape and complies with Policy CS2.

6.1 Emerging Government guidance on the integration of biodiversity and GI within site design and planning

It is recommended that the latest best practice tools are used for site assessment and design, proportionate to the scale of development proposed. It is expected that the Environment Bill will require **all** development (except householder applications and permitted development) to achieve a minimum of 10% biodiversity net gain and sufficient information to demonstrate this will be required to be submitted as part of the planning application. Biodiversity Net Gain is still a developing area and we are bringing forward guidance on this as a Biodiversity and Planning SPD, to coincide with the enactment of the Environment Bill.

Biodiversity Net Gain will require developers to ensure habitats for wildlife are enhanced. It requires a demonstrable increase in habitat value compared to the pre-development baseline. By measuring the value of existing habitats in Biodiversity Units the Net Gain approach firstly encourages habitats of high biodiversity value to be avoided or preserved, given the difficulty and cost in compensating for them. It also leads to new developments integrating wildlife-enhancing features into plans in order to boost their score of biodiversity units. Such enhancing features might include: trees, hedges, wildflowers, ponds and other habitats. Net Gain follows the principle of the mitigation hierarchy which seeks to: enhance habitat, avoid habitat loss, minimise habitat loss, restore habitat loss, compensate for habitat loss, or as a final option if on-site mitigation cannot be achieved, offset Habitat loss. High-quality networks of multifunctional green infrastructure contribute a range of benefits, including ecological connectivity and, facilitating biodiversity net gain.

6.2 GI in Site Design and the Development Control Process

South Gloucestershire believes that new development should champion GI as a shared vision that is planned, delivered and managed effectively from the start. The natural elements that define a site's special character should be integrated into practical, resilient and deliverable design proposals. We take this approach as it results in cost-effective and sustainable solutions to the many challenges associated with new development, including visual impact and the management of flood risk.

To ensure this commitment is realised through new development we have identified the following check list points which will help meet the requirements of Policy CS2:

GI Checklist

- GI should be well considered and site design should be appropriate to the requirements of end users and the location/scale of development
- Different solutions will be required according to whether the site is urban, suburban or rural edge and dependent on future use , taking into account connectivity and maintaining or creating green corridors
- Green Infrastructure should be prioritised in all development, using every opportunity to contribute to biodiversity net gain (due to be mandatory 10% minimum) and retrofitting GI where appropriate
- Ensure the Council's suggested 8 stage process is followed which is set out below

6.3 Site Design and the Development Control Process

The Site design and Development Control Process can be divided into 8 key stages;

- **Stage 1: Pre planning;** surveys and site assessment, including landscape and visual impact assessment where appropriate
- **Stage 2: Initial scheme design, informed by survey analysis and assessment of impact** and net gain (Mitigation hierarchy), along with drawing on showcasing examples of GI (see Section 7)
- **Stage 3: Pre-application advice**; and initial discussions with Council
- **Stage 4: Refine Design;** revised to accord with Council comments
- **Stage 5: Submission of planning application;** in accordance with our planning validation checklist www.southglos.gov.uk/what-you-need-to-submit-with-your-planning-application
- **Stage 6: planning approval, DOC Planning conditions, planning obligations**
- **Stage 7: Start on site / Construction** – all activities relating to site clearance and building phases. Tree and hedgerow protection to be in place PRIOR to any site clearance works
- **Stage 8: Monitoring, management and enforcement**; what is expected from a LEMP and Section 106 requirements

Major development will be encouraged to use the Building with Nature standards, to run concurrently with the planning application process, including future management and maintenance of the site.

6.4 Stage 1: Site Assessment, pre-planning and design.

The following assessments are likely to be relevant to the provision of GI and, where applicable, should give consideration to existing GI and future GI constraints and opportunities:

- Tree and hedgerow survey to BS5837:2012 and Arboricultural impact assessment; refer to Trees and Development SPD for more information
- Topographical survey
- Landscape assessment; and possible requirement for a landscape and visual impact assessment (LVIA)
- Ecological survey. The applicant is also encouraged to submit a BNG assessment, where appropriate, to demonstrate biodiversity net gain, in accordance with Policy PSP19. All ecological surveys should be carried out at the correct time of year to provide an accurate assessment.
- Location of GI, accessibility, connectivity, context and integration into surrounding landscape and existing development
- Drainage assessment and flood modelling
- Assessment of links and paths throughout and links beyond the development including accessibility, utility and recreation BS5709:2018

6.5 Stage 2: Initial scheme design, informed by analysis of all survey information and assessment of impact.

Site design is an iterative process, which should respond positively to the site context. The information resulting from the survey work in stage 1 should be brought together so that opportunities for biodiversity and GI enhancement can be developed. A landscape led approach should be followed, employing suitably qualified landscape professionals and making reference to the Landscape Institute's Guidance for Landscape & Visual Impact Assessment (GLVIA3) that sets out best practice assessment guidance for identifying the importance and inter-relationship/connectivity of landscape and visual features. Landscape architects, urban designers and ecologists, are best placed to fully maximise the sites potential to reach a well-designed scheme which is not only policy compliant, but provides biodiversity net gain. LVIA guidance can be found via the Landscape Institute website:

https://www.landscapeinstitute.org/technical/glvia3-panel/

Landscape assessments need to be appropriate and proportionate to the type and scale of the proposed development and the sensitivity of the location.

Often there are competing requirements to accommodate within the green and blue spaces within a site; for example balancing CS24 policy requirements and surface water attenuation. Good design has the ability to accommodate all these elements within a multi-functional space without compromising the quality of the scheme design, and at the same time will successfully integrate the development into the surrounding landscape, or

townscape. Good design at any scale will achieve a balance between functionality, durability and being aesthetically pleasing.

6.6 Stage 3: Pre-application advice and initial discussions with Council.

Pre-application discussion is encouraged in order to achieve a well-designed and policy compliant scheme. Early engagement with the local authority, partners and other stakeholders can potentially avoid abortive work and facilitate a more straightforward route through the planning application process to achieve a positive outcome. In order to enable the Council to provide officer comment, the applicant should provide a sufficient level of information to inform discussion e.g. site analysis – constraints and opportunities, sketch scheme and BNG assessment.

6.7 Stage 4: Design refinement/revision.

Design refinement/revision in response to feedback from LPA and comments received. This may need to be repeated after stage 5 until an acceptable scheme is achieved.

6.8 Stage 5: Submission of planning application.

The level and type of information to be submitted with the application should include those listed on our validation checklist and should be proportionate to the size of development proposed. Application drawings, including those regarding GI provision, should include an indication of the site's context and the application red line boundary should be clearly shown on all plans.

Plans should be coordinated across disciplines and be at a consistent scale to allow them to be easily assessed by the LPA. They should include a vegetation retention and removal plan and a design and access statement or design code as required, depending on the scale of development. It is recommended that a composite plan is also submitted, indicating existing and proposed planting, lighting, drainage and levels information, to demonstrate that there are no conflicts.

- **Outline application**: To assist with demonstrating compliance with Policy CS2, applicants are advised to submit a GI plan and landscape strategy drawing with outline applications. This should include access and connections, proposed palette of planting and hard landscape materials. A detailed planting plan will be requested as part of a following Reserved Matters application.

- **Full application**: all as set out above for an Outline application, plus a fully detailed landscape plan. Also a composite plan to show service runs (and associated easements), drainage and SuDS features (including associated easements) and lighting, together with proposed tree positions is required to be submitted as part of the application. Details of all tree planting will be required, to include detailed tree pit designs and target soil volumes for tree pits.

Details of the future management and maintenance of the site should be agreed and whether the public open space is to be maintained by the Council or a private management entity, to be secured under a Section 106 agreement. Provisions to

ensure suitable and secure in-perpetuity arrangements for operation, management and maintenance of all the public open spaces and surface water infrastructure need to be incorporated into the Section 106 agreement and the Council are required to inspect the open spaces to ensure their compliance with the approved plans prior to transfer to the private management entity.

6.9 Stage 6: Planning approval and discharge of planning conditions

Tree protection secured by condition.

Public Path order if required, to ensure this is planned in within the required timescale.

When revised plans are submitted, all amendments should be clearly highlighted to aid Council assessment within the required timescale.

Detailed planting plans submitted to discharge a landscape condition, should include full plant schedules detailing quantity, size, type and specification of all planting, including grass specification.

Specialist maintenance and management plans for key habitat, particularly for protected sites, should be embedded within the landscape design and management proposals for the site. A landscape and ecological management plan (LEMP) and construction environmental management plan (CEMP) should be submitted as required, in accordance with the list of requirements set out in BS 42020:2013.

6.10 Stage 7: Start on site / Construction

All activities relating to site clearance and building phases; existing vegetation – trees and hedgerows should be protected during development. All tree protection fencing is to be erected in accordance with BS5837:2012 PRIOR to start on site or any site clearance works. The developer is required to notify SGC Tree Officers, when fencing is in place, so it can be inspected and approved. Refer to our Trees and Development SPD for further detail.

Ensure that there is no obstruction of the public rights of way unless a legal order has been put in place that provides a suitable alternative route for temporary diversions and complies with legal tests and Path order policy for permanent diversions.

6.11 Stage 8: Monitoring, management and enforcement

Landscape plans should include details of required post-planting maintenance for a minimum of 3 years to ensure successful establishment. Where a site is covered by a Section 106 agreement, replacement planting is required in perpetuity to ensure successful landscape establishment. The overall success of the scheme in the long term is dependant of securing suitable management and maintenance prescription through the planning process and correct implementation and monitoring on site.

Once the scheme is complete the Council should be notified in order to inspect the open spaces and ensure their compliance with the approved plans and requirements of the Section 106 agreement, prior to transfer to the Council or private management entity.

7. What does good GI look like?

The best designed and most successful schemes are designed with respect for the sites landform and topography, existing ecology, vegetation and drainage. A GI 'landscape led' approach to site design acknowledges all aspects of the site and adapts and incorporates these elements into the development requirements, creating a strong landscape framework for the built development. Working with the existing levels allows the amount of site vegetation retained to be maximised, which in turn minimises biodiversity loss and reduces the landscape and visual impact of the scheme.

A well-designed scheme coordinates all disciplines, avoiding conflict between existing and proposed vegetation, service routes and drainage requirements

Direction is given within this SPD regarding GI application according to the various types and scales of development in order to achieve the 7 objectives set out in CS2. It is envisaged that case studies will be investigated by working with stakeholders and partners etc. to explore how GI strategies are realised on the ground with a review and feedback process to inform the development of our forthcoming GI and LNR strategy, to coincide with our new Local plan programme and the Environment Bill. Our current Design Checklist (Adopted August 2007) provides design guidance and can be viewed here; www.southglos.gov.uk/wp-content/uploads/Design-checklist-design-and-landscape-SPD

Good GI principles apply to all scales of development; common elements which apply to all scales of development and should be incorporated into development, in order to maximise GI benefits, include the following:

7.1 Retention of existing vegetation

Every effort should be made to retain existing trees and hedgerows within a layout as they form vital biodiversity and GI connectivity and constitute an intrinsic characteristic of the landscape.

Trees

Refer to Trees and Development SPD. The retention of existing trees on a site provides a level of instant mitigation and helps to integrate the development into the surrounding landscape. Mature trees provide the biggest element of total canopy cover (important for carbon absorption and habitat) and therefore the retention and management of existing trees should be prioritised. Existing trees should be protected during construction works, with fencing in accordance with BS5837:2012, which also prevents storage of materials and change of levels within the root protection area.

Tree planting should be accommodated on site as part of a comprehensive landscape scheme, providing full mitigation for the development. However where this cannot be

achieved, the Council will require a tree planting contribution for off-site tree planting. Please refer to the Trees and Development SPD, which sets out the obligations for replacement tree planting.

- As set out in our Trees and Development SPD, where deemed necessary the Council will use Tree Preservation Orders as prescribed by Central Government as a tool for tree protection and retention

Hedgerows

The Hedgerow Regulations (1997) provide some protection for those hedges deemed to be 'ancient and/or species rich hedges' i.e. those that contain five or more woody species in a 30 metre length or support a Priority Species. The regulations exclude those hedgerows forming a domestic curtilage. For all applications it is vital to evaluate the condition and significance of the hedgerow in accordance with landscape, historic environment and nature conservation policy, and whether the layout appropriately accommodates significant hedgerows and allows for their future maintenance and management, to ensure that the hedge is in good condition on completion, protected during construction and managed into the future.

It is preferable to incorporate existing hedgerows within the open space network on a site, with adequate space along both sides for maintenance. Planned properly, these hedgerows can become a real asset to pathways, cycle routes, development frontage and open amenity spaces.

Standard trees should be included at irregular intervals within the hedgerow, to be allowed to develop to maturity as hedgerow trees. The translocation of existing hedgerows should also be considered in order to preserve a hedgerow appropriately within a development which would otherwise be lost. Translocation should only take place when the plants are dormant between November and February and tops should be pruned to balance the root loss suffered.

Where appropriate to the scheme, consider the inclusion of ditches, to be dug alongside new hedges where they can be integrated within the overall SuDS proposal for the site.

Try to avoid hedges forming the boundary between open space and private landowners, or between private landowners, as this leads to problems in terms of appropriate maintenance access to both sides of the hedge, for example. It is necessary that the application shows the hedgerow will be left in a suitable condition which may include proposals for additional planting to fill gaps, laying the hedge to form a secure boundary, and/or flailing to trim to shape. Proposals must also be secured to ensure the long term viability and value of the hedge secured through a management and maintenance programme. (Refer to Management & Maintenance section below)

New and supplementary hedgerow planting should accord with the common hedgerow species within South Gloucestershire. Predominant species are: Blackthorn, Hawthorn and Hazel. Common species are; (Ash; currently not available to buy or plant), Crab-apple, Dogwood, Elder, English Oak, Field maple, Guelder Rose, Holly, Spindle, Wayfaring tree, Wild privet, Willow species and Wych Elm. Avoid planting Blackthorn beside garden boundaries, due to its highly suckering nature.

Ecological habitats

Core Strategy Policy CS9 seeks to conserve and enhance the natural environment, avoiding or minimising impacts on biodiversity and geodiversity. Every effort should be made to maximise biodiversity net gain on a site, retaining and enhancing those habitats identified though the site survey work and incorporating them within the scheme, as set out in Policy PSP19. Habitat connectivity should be sought within and through the site linking to the wider ecological network of the area, to create new green corridors and provide an uninterrupted network of natural features within an urban area that acts as a linkage for wildlife, and potentially people.

7.2 New development

Proposals should build on the sites existing landscape and biodiversity features and provide enhancement with new trees, hedgerows and grassland, appropriate to the location. Native species should be chosen wherever possible. The following best practice examples should be incorporated within new development, where appropriate:

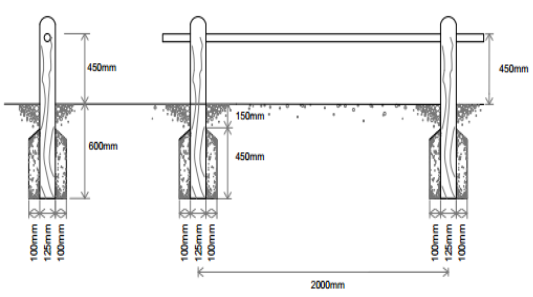
Fencing; fencing should be appropriate to use and location. Consider using timber panelled fencing with trellis for garden boundaries, which provides detail and enhanced amenity value. Boundary fencing should be wildlife friendly incorporating gaps for hedgehogs to move between gardens.

The use of natural stone or brick/rendered walls or estate railings should be considered according to location and overriding landscape character.

Emerson's Green Phase 1 development Mangotsfield

Emerson's Green East development

Where knee rail is required to protect areas of open space, it is preferable to use timber post and metal rail, which provides a robust and durable solution



Naturally designed attenuation ponds and basins; refer to our SuDS SPD for details of sustainable drainage requirements for new development. With regard to GI and public open space provision, although SuDS contributes to good GI it does not normally count towards CS24 policy provision.

Bath Riversgate development

Green bridges to provide connectivity; opportunity should be taken within a development to enhance the GI and nature recovery network by the incorporation of green bridges to provide habitat connectivity and improve footpath/cycleway connections.

A556 Link road Knutsford

Private gardens and small green space; even these small areas have the ability to contribute to the wider GI and biodiversity connections and are important to retain as natural spaces. They allow for regular contact with nature and allow for rest, reflection and social interaction. Policy PSP43 sets the required private amenity space standards with a minimum ranging from 5sq.m. for a 1 bedroom flat, to 70sq.m. for a 4+ bedroom house.

Cumulatively gardens and small green spaces represent a significant percentage of open space within the urban area, however whilst potentially of visual amenity and

biological value, small unconnected incidental spaces are not counted in the POS database for the purposes of calculating the need for additional provision to meet the requirements of CS24. In order for an area to contribute to the POS quantum on a site, it has to be publicly accessible and function as useable space.

Rain gardens to front gardens and swales; refer to SuDS SPD. Even at a small scale, changes can be made to enhance GI and biodiversity. Where possible front gardens should be self-draining; simple actions, such as creating a rain garden within the front garden, linked to a water butt to take rain water runoff from the roof of the property, can bring huge benefits. Avoid paving over front gardens, however if off-street parking is needed, look at using gravel strips with rain garden to the centre. The RHS also provides guidance on how to improve your front garden for the benefit of nature;

https://www.rhs.org.uk/advice/how-to-green-your-grey-front-garden

Include wildlife ponds and a fruit tree for example into your garden to encourage wildlife and connection to neighbouring gardens. Reduce grass mowing to develop wildflower areas etc.

Food production; opportunities for food production such as allotments can form an important part of the urban landscape and incorporated into new development, provide a focus for the community and can contribute to the wider GI network. Benefits include ecosystem services such as local climate modification, pollination, and providing a pleasant location for socialising.

Allotments at Hanham Hall development

Use of green walls; in urban areas where space is at a premium, there are opportunities to incorporate green walls. These high maintenance techniques are best suited where a high quality environment is required in a constrained site or where air quality is a concern, but they are a useful solution where opportunities for street tree planting for example, are limited.

7.3 Careful choice of materials; hard landscape elements

Paving should be appropriate to use and location. Within areas of POS the use of mown grass pathways and Breedon gravel surfacing may be appropriate in some circumstances, through semi-natural and informal areas, but should be restricted to additional routes, rather than for primary use. A suitable surface, which is durable and accessible to all, should form the primary access route through an area, using e.g. tarmac, resin bound gravel, or tinted asphalt. Appropriate edging should also be used that is sufficiently durable and suitable for the situation.

Hanham Hall POS; footpath/cycleway in coloured asphalt, right, provides a durable surface suitable for all users, connecting to the Bristol-Bath cycletrack. Bound gravel surfaced path to the left, used as a secondary route through the wildflower meadow area.

Use of setts and smaller paving units add interest and help to define the public realm.

Careful choice of planting species; soft landscape; plant species should be chosen to provide 'year-round' colour and interest, low maintenance and appropriate for the situation and required result. Avoid the use of thorny, vigorous shrubs adjacent to walkways and parking spaces and ensure where possible all planting is UK sourced and grown. Climbers should be included to boundary fencing to enhance amenity. Avoid the use of poisonous or sharp species in or adjacent to children's play areas.

Private garden Hanham Hall

Thornbury hospital site

Tree planting; new tree species should be selected so that their canopies are seen on the skyline above new developments as they mature in height, to contribute to the wooded and treed skylines of the district. Tree planting should include a variety of native species of local provenance. Ornamental species should be UK grown and a variety of species and cultivars should be used. The number of clonal varieties should be limited in order to ensure resilience against disease and climate change. Proposals should avoid using a large number of the same species or species such as Leyland Cypress to achieve screening. However, where a uniform avenue forms part of the landscape design, specimens should be chosen for like species, size and form. Ensure native species predominate adjoining rural areas and natural green spaces.

- Street trees should be incorporated into all main access roads where possible and where required, a structural soil system, such as the Stockholm tree pit is advised, to maximise potential rooting area for new planting, whilst minimising the negative impacts associated with tree root systems on the urban setting. https://stockholmtreepits.co.uk

Emerson's Green Phase 1 development

Wallscourt Farm development

- Design adequate rooting environments following up to date guidance to support the long term health of new trees. Trees should be carefully sited to avoid conflict with underground services and should be planted a minimum of 6m from buildings and to include root protection where required. Group services into defined corridors under roads or pavements to allow space for tree planting and SuDS features outside of wayleaves and provide adequate foundation design to new buildings to allow for the inclusion of forest scale trees within developments

- New hedgerow trees will be an important part of achieving increased tree cover in South Gloucestershire. This can be from new planting or the selection of suitable specimens being allowed to develop from within the hedge as part of the hedgerow management

Car-parks; new car-parks should be designed to include SuDS drainage, with the use of swales and rain gardens, permeable paving and sufficient canopy cover developed to reduce heat island effect. Where appropriate, 1 tree should be planted per 6 parking spaces, using suitable tree pit design, to achieve the optimum soil volumes for successful tree establishment. Ensure trees planted within car-parks are protected against vehicle damage.

Road verges; new road verge management is currently being developed as part of our Greener Places GI Strategy, in order to enhance biodiversity. Where appropriate, road verges on new development should be consistent with our South Gloucestershire verge


specification. *Meadow mix to road verge Yate May 2020*

7.4 Retrofitting GI

Every opportunity should be taken to incorporate GI into existing development, to improve natural drainage solutions, by the use of e.g. rain gardens within road verges and gardens and the addition of trees within streets, gardens and car-parks to reduce heat island effect. Refer to SuDS SPD for further details on rain gardens.


Rain gardens and existing street trees incorporated as part of highway improvements, Greener Grangetown, Cardiff

7.5 Management & Maintenance

General; if a developer chooses Council adoption, a maintenance contribution is required, based on a 15yr multiplier. The use of a management entity is the alternative option. The S106 definition: "Management Entity" shall mean a company (including a residents management company) trust or other body established by the Owner and approved in writing by the Council whose stated objectives are restricted to managing and maintaining

the Open Spaces in perpetuity; or an established company trust or other body, approved in writing by the Council whose objectives are restricted to managing and maintaining areas of land which may include areas of land used for Open Spaces. Both options are secured via a Section 106 agreement and details of management and maintenance are required. There is no objection in principle to town or parish councils (T&PCS) taking ownership of open spaces subject to these bodies having the necessary financial provisions, experience and infrastructure in place. T&PCs would also usually require a substantial lump sum maintenance contribution to be able to do so. This would need to be secured via s106 on their behalf.

Trees; street tree planting may be managed by the Council or a management company. If the land has highway status rather than POS, either adoption under a Section 38 will be required or it will need to be included within the POS schedule in the Section 106 agreement.

Hedges; if a hedge encloses a domestic garden it should be the responsibility of the domestic owner, to avoid residents on the entire development paying for garden boundary upkeep by the management company via the Management and Maintenance Scheme. A covenant will be required to ensure the hedge is maintained correctly in the future.

Native hedgerows within a development should receive ongoing management comprising either cutting (trimming in an A shape, above 1.5m), laying (aesthetically pleasing and will improve an overgrown hedge and encourage dense, bushy new growth), or coppicing if needed to regenerate an overgrown hedge (this looks drastic, but plants normally grow back strong and dense and allows new hedging, used to gap up, to establish). Maintaining hedges where appropriate as wider and taller features is an important way of increasing biodiversity, total canopy cover, carbon absorption and is particularly important as bat and bird habitat.

Grass verges; if appropriate to the scheme, a mechanism can be incorporated in the Section 106, for planted verges to be managed and maintained by the management entity or other approved body, however they do not count toward spatial POS policy compliance.

8. Case Studies – showing best practice

The following case studies are considered to fulfil the objectives set out in CS2 and are illustrated below, identifying the GI elements of each scheme.

8.1 Case study 1 - large scale housing development: Hanham Hall

This was a landscape and heritage led scheme design, which encompassed latest best practice regarding water attenuation and natural solutions. It was one of the flagship Carbon Challenge schemes promoted by the Homes and Communities Agency to develop a zero carbon development and was completed in 2015. The development comprises 186 dwellings on a 9ha site.

The concept for the site was the creation of a new sustainable community around the grade II listed Hanham Hall. The scheme was developed to exploit the strengths and opportunities of the site and the historic context of the Hall. Three different character areas were identified, the Hall with its immediate surroundings, the walled garden which once surrounded the Hall (remnants of the wall are retained and enhanced) and the surrounding fields which are characterised by their network of hedgerows. The development includes a generous proportion of POS with wildflower meadows and attenuation ponds, which meant that the scheme achieved BREEAM excellent rating for the development.

Case Study 1; Hanham Hall development

Landscape masterplan

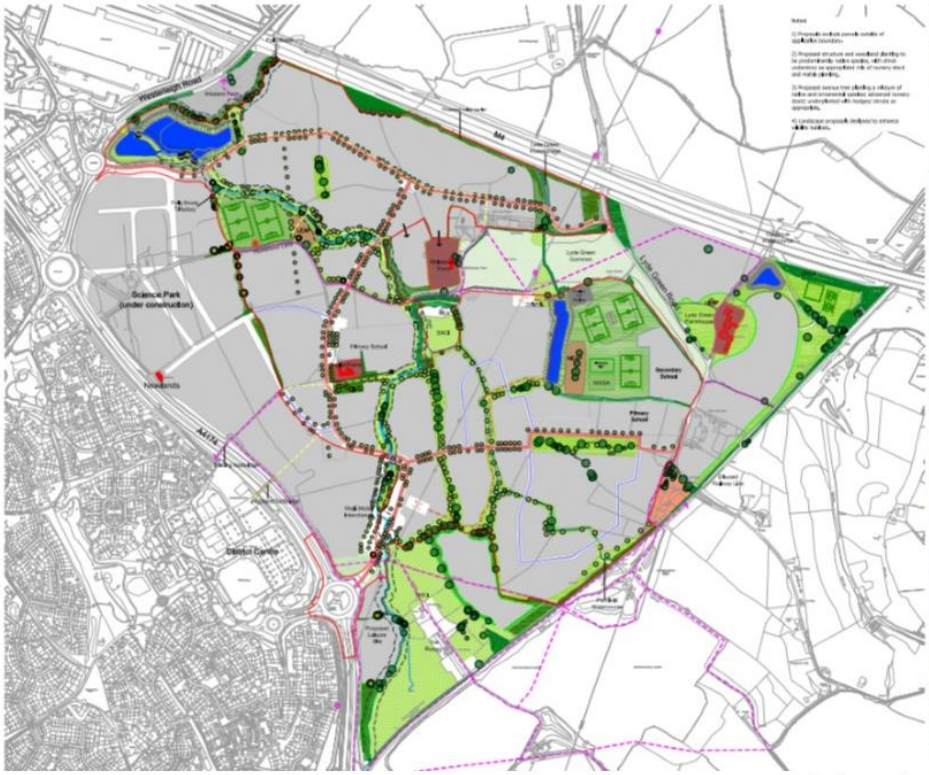
Green Infrastructure elements of the scheme

- Retention of statuesque parkland trees and features remaining from the original formal gardens
- Informal paths through wildflower meadows
- Renovation of formal gardens to front of Hanham Hall, including herbaceous planting beds and formal lawn, connecting to open space within the adjacent housing development to the south
- Allotments and grow patches, with greenhouses and growing areas at the heart of the development, using the existing stone boundary wall as a backdrop
- Natural attenuation pond, linked by a swale through the centre of the development
- Equipped children's play area and play trail
- Wildflower meadows with apiary and community orchard
- Footpath/cycleway connecting to Bristol-Bath cycle path, which runs along the eastern boundary of the site and good active travel routes within the site, linking into the wider network
- Refurbishment of the historic Hanham Hall building, a former hospital, to provide small business units, crèche and café as a centre for the new community, including outdoor courtyard spaces and visitor car-park

8.2 Case study 2; new neighbourhood scale strategic housing development; Emerson's Green East

This is a new neighbourhood south of the M4, adjacent to the ring road on the east side of Bristol and is in the final stages of completion. The mixed use scheme comprises 2550 dwellings, with links to the science park employment area and district centre opposite the site and forms part of the 400ha Emerson's Green sustainable urban extension set out in the Local Plan. The scheme incorporates a linear GI corridor through the site as a footpath/cycleway, retention of existing landscape features within a network of public open space and community and education facilities to supplement those at Emerson's Green West.

Case Study 2; Emerson's Green East development



Landscape plan

Green Infrastructure elements of the scheme

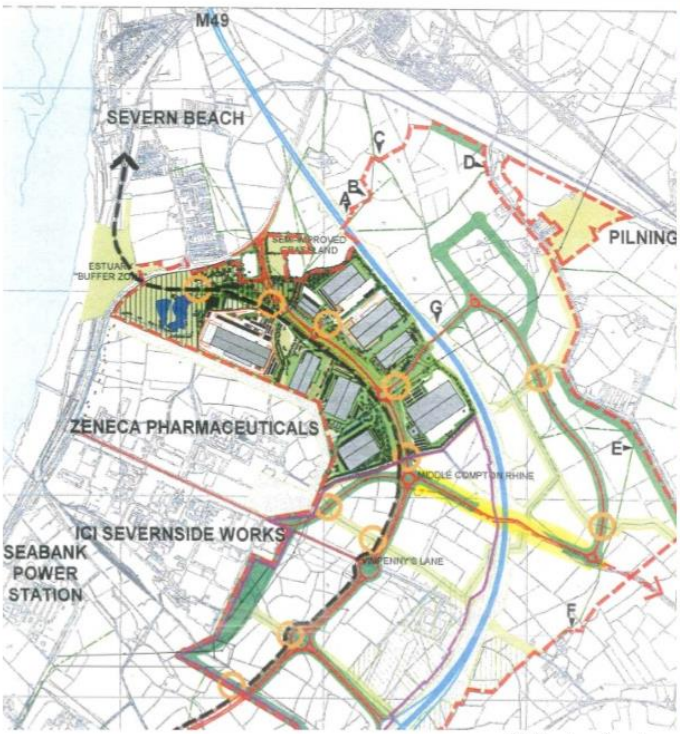
- Pedestrian bridge over ring-road to access district centre shops
- Retention of extensive hedgerow network and mature Oak trees, incorporated within the POS and access routes throughout the site
- Generous open space provision structured around existing landscape features, including cricket pitch and playing fields at the centre of the site
- Provision of comprehensive movement network prioritising public transport, cyclists and pedestrians, focused within a 'greenway link' linear open space, through the development
- The incorporation of SuDS throughout the site, with swales associated with existing hedgerow corridors and naturalistic attenuation basins
- Allotments and equipped children's play area and smaller play spaces throughout the development
- Footpath/cycleway connecting to Bristol-Bath cycle path which runs along the eastern boundary of the site, linking into the wider network
- Park and ride car-park alongside main access road, providing a regular bus link into Bristol city centre

8.3 Case study 3; large scale commercial development; Western Approach Phase 1 development

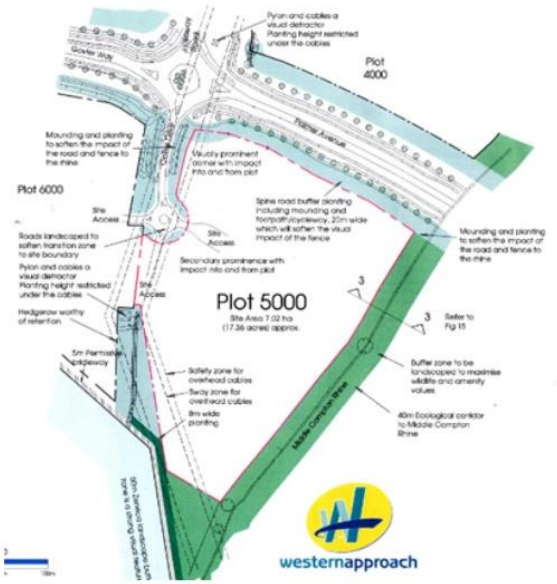
This scheme forms phase 1 of the Western Approach Distribution Park, within the designated Severnside Enterprise Area. The original Western Approach Masterplan provided a generous landscaped infrastructure, incorporating attenuation ponds and swales linking to the existing rhine system. The masterplan and landscape strategy for the Western Approach required proposed landscaping to be proportionate to the scale of the buildings, which can be seen in the illustrations and photos below and creates a 'campus style' layout, with the large industrial buildings set sufficiently back from the distributor road, to afford a robust landscape infrastructure. These buffers also accommodate swales and ecologically rich areas, managed for wildlife as part of the long-term management proposals for the site to enhance biodiversity.

In recent years however this has been eroded in more recent applications, especially in plots away from the main central avenue, which did not form part of the original detailed masterplan area and in some cases landscape buffers have reduced significantly in size, increasing the visual impact of the more recent development parcels.

Case Study 3; Western Approach Phase 1, Severnside



Original masterplan



Example of individual plot masterplan

Extract from original landscape strategy

Green Infrastructure elements of the scheme

- Retention and enhancement of existing hedgerow and rhine network, incorporating existing landscape features within the layout including a natural attenuation pond
- Extensive landscape buffers proportionate to the scale of development, provide screening of the industrial units and allows incorporation of swales and boulevard tree planting
- Native planting and ecological management to enhance biodiversity
- Informal network of footpaths and cycleways through the development, incorporating amenity areas with seating and picnic tables
- Improvements to existing footpath and bridleway network through development and improved links beyond the site

8.4 Case study 4; large scale recreational development; The Wave, Easter Compton

The development provides an inland surfing lake, set within extensive naturalistic gardens and ecological areas for public use, covering 29ha of former agricultural land within the Green Belt at Easter Compton. Access and car-parking is at Washingpool Farm to the west of the site with a shuttle bus to take people to the site itself. The surfing lake was opened in 2019 and the scheme included the retention of the existing hedgerow network and trees throughout the site, supplemented by new hedge and tree planting, woodland blocks and the creation of water meadows and a network of informal paths, natural play areas and ponds. The existing footpath network was incorporated and new links provided.

Case Study 4; The Wave, Easter Compton

Landscape masterplan

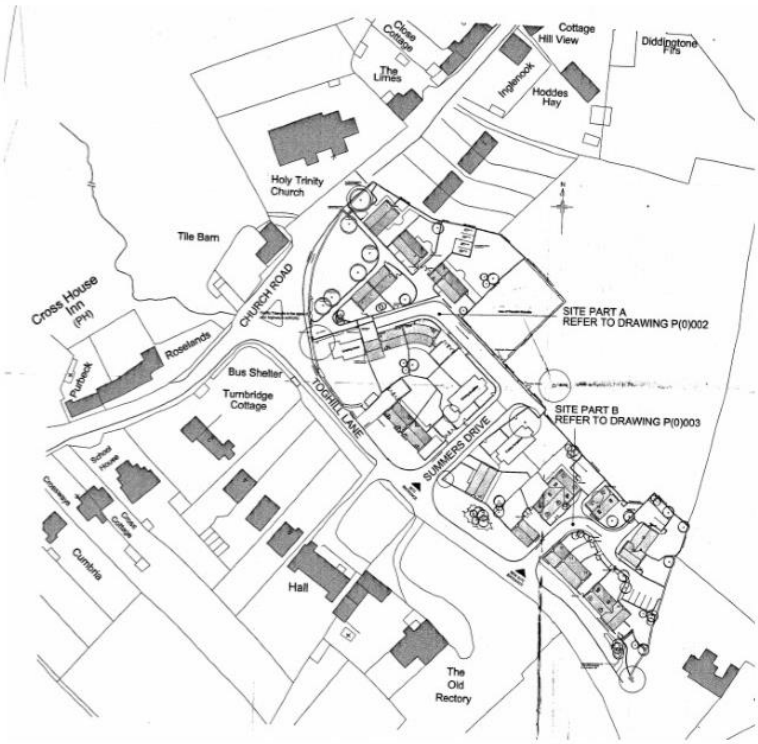
Green Infrastructure elements of the scheme

- Retention of extensive hedgerow network and mature Oak trees throughout the site and incorporation into green links and areas of open space
- Ecological enhancements including the creation of new woodland blocks, linking to and extending the existing blocks of woodland adjacent to the site
- Formal and informal gardens, including the creation of water meadows and wildflower meadows
- The incorporation of SuDS throughout the site, linking to the existing rhine system
- Natural children's play areas and play trail
- Exiting footpath network incorporated and enhanced and new links to the footpath network provided

8.5 Case study 5; small scale housing development; Doynton

This is a development of 21 dwellings on a previously developed site (17 Council houses were demolished to accommodate the development), consented in 2004. 11 houses are Housing Association affordable housing and 10 are open market houses. The site lies within the Doynton Conservation Area so the scheme design, construction materials, boundary treatments and landscape mitigation needed careful consideration. Footpath links were incorporated and a large allotment area was also included within the layout, abutting the northern site boundary with open space focused around an existing mature Lime tree, a prominent landscape feature within the area.

Case Study 5; Housing development, Doynton



Original site plan

Green Infrastructure elements of the scheme

- Retention and enhancement of existing hedgerow and boundaries, incorporating existing landscape features within the layout including a mature Lime tree retained as a focal point within the open space along the northern boundary
- Careful choice of materials, including natural stone facades and garden boundary walls, consistent with the local vernacular and appropriate within the Doynton Conservation Area
- Native planting and ecological management to enhance biodiversity
- Informal network of footpaths incorporating amenity areas
- Creation of 'village green' at junction of Church Road with tree planting
- Allotment site adjacent to the development with community orchard

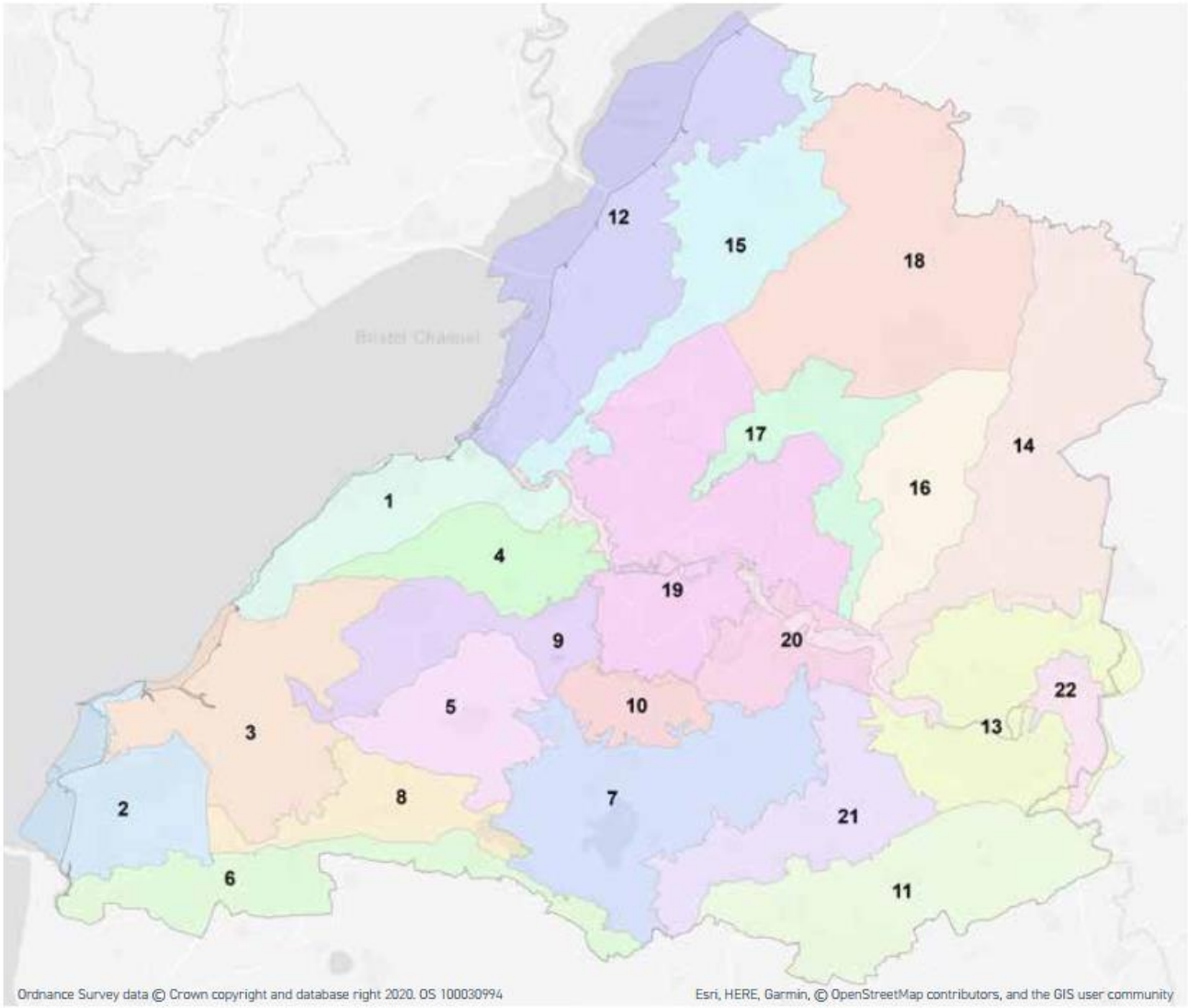
Appendix 1: Policy CS2 Appendix 3: GI Assets

Green Infrastructure Assets (Including blue infrastructure assets)

Local focus (Non-Strategic)		Strategic focus (Strategic GI Network)	
Local/Site Scale	**Neighbourhood Scale**	**District Scale**	**Regional & Sub-Regional Scale**
Private gardens Green roofs and walls. SuDS (Sustainable Drainage Systems) Watercourses and ponds Hedgerows Footpath and cycleway network Landscape features and screens Trees Amenity greenspace. Childrens' and Young Peoples' play space	Allotments and orchards Footpath and cycleway network Parks, play areas, playing fields, village greens and amenity green spaces Sites of archaeology and cultural heritage Woodlands and nature reserves Cemeteries and Churchyards Watercourses, floodplains, ponds, rhines and flood attenuation areas Countryside under agri-environmental stewardship	Local Nature Reserves (LNRs) River corridors & their floodplains (Boyd and Ladden Brook) Locally Designated sites, SNCIs and RIGS Larger parks and amenity greenspace Strategic Footpath and cycleway network Historic Parks and Gardens Visually important landscapes and features (such as hillsides and ridgelines), historic landscapes Open access land The commons Nature Reserves (Lower Wood Nature Reserve) Ancient Woodland Landscape Character Areas (not displayed on the diagram)	Internationally & Nationally designated sites (e.g. Cotswolds AONB, SPA/ SAC – The Severn Estuary, SSSIs South West Nature Map (Strategic Nature Areas) National Trail (Cotswold Way) and long distance footpaths (The Dramway, Community Forest Path, Frome Valley Walkway, Jubilee Way, Rive Avon Trail, Monarch's Ways, Severn Way & Thornbury Link). National Cycle Network & Avon Cycleway (including the Bristol & Bath Railway Path) Major River Corridors/ Estuary (Avon, Frome and Severn Estuary) & their floodplains

Appendix 2: West of England GI Areas

West of England Green Infrastructure Areas



West of England GI Areas:

1 Clevedon Portishead and Gordano
2 Weston-super-Mare and Environs
3 North Somerset shoreline and Moors
4 Wooded uplands, Abbots Leigh, Tickenham, Failand
5 North Somerset Open Plateau and wooded slopes
6 Mendip Slopes and outliers
7 Chew Valley
8 Yeo Valley and Spring line villages
9 Nailsea, Backwell, Long Ashton and Environs
10 Dundry Hill
11 Cam, Wellow and Somer Valley around Norton Radstock
12 Severn Estuary Shoreline and levels
13 Bath and Environs – Bathscape
14 Cotswold Scarp and Dip Slope
15 Ridges, Shirehampton to Tytherington
16 Pucklechurch Ridge, Boyd and Golden Valleys
17 Frome Valley – Westerleigh Vale – Oldland Ridge
18 The South Gloucestershire Vales
19 Greater Bristol
20 Keynsham and Environs
21 Undulating plateau Newton St Loe to Hinton Blewett
22 River Avon Valley

Appendix 3: Important Hillsides and Key Landscape Features within South Gloucestershire

KEY LANDSCAPE FEATURES WITHIN SOUTH GLOUCESTERSHIRE

LANDSCAPE FEATURE	CONTRIBUTION TO GI NETWORK	SOUTH GLOUCESTERSHIRE LANDSCAPE CHARACTER AREA
Within Cotswold AONB		
Plateau landform and associated features	Nationally important	1 Badminton Plateau
Plateau landform and associated features (incl. Broadmead Brook valley)	Nationally important	2 Marshfield Plateau
Ashwicke Ridges (incl. 2No. Henley Hills, Nimley Hill, Freezing Hill and Hanging Hill)	Nationally important	3 Ashwicke Ridges
Valleys of Doncombe Brook, Catherine's Brook, Lam Brook and Pipley Bottom		
Cotswold Scarp (incl. Hawkesbury Knoll, Broad Hill, Birch Hill, wooded slopes of Doddington Park and Dyrham Park, Tog Hill and Freezing Hill Beeches)	Nationally important	4 Cotswold Scarp
Valleys of Little Avon River and River Frome		
Outside Cotswold AONB		
Wickwar Ridge (incl. Bury Hill at south)	Visually Important Hillside (1)	5 Wickwar Ridge and Vale
Churchend Ridge		
River Frome valley	Main water course (1)	5 Wickwar Ridge and Vale
Little Avon River valley	Local feature (2)	5 Wickwar Ridge and Vale
Bishops Hill Brook valley		
Pucklechurch Ridge (incl. Claypit Hill and Westerleigh Hill in north, and Coxgrove Hill)	Visually Important Hillside (1)	6 Pucklechurch Ridge & Boyd Valley
Naishcombe Hill- Ketcheshill		
Holbrook Common		
River Frome valley	Main water course (1)	6 Pucklechurch Ridge & Boyd Valley
River Boyd valley		

LANDSCAPE FEATURE	CONTRIBUTION TO GI NETWORK	SOUTH GLOUCESTERSHIRE LANDSCAPE CHARACTER AREA
Severn Ridge 's-shaped' incl. Milbury Heath at west end, Abbotside Hill in centre, and Charfield Hill in eat before merging with Wickwar Ridge)	Visually Important Hillside (1)	7 Falfield Vale
Wick's/Butcher's Hill (outlier to Severn Ridge)		
Eastwood Park spur		
Falfield bowl landform	Local feature (2)	7 Falfield Vale
Moorslade outlier hill		
Tortworh Court Park and Aboretum valley		
Little Avon River valley		
River Frome valley	Main water course (1)	8 Yate Vale
The Marle Hills (east)	Local feature (2)	8 Yate Vale
Laddon Brook valley	Main water course (1)	9 Tytherington Plain
The Marle Hills (west)	Local feature (2)	10 Earthcott Vale
Latteridge Hill		
Dockham Ditch		
Hortham Brook		
Bradley Brook		
Laddon Brook valley	Main water course (1)	10 Earthcott Vale
Mill Hill	Visually Important Hillside (1)	11 Golden Valley
Mount Pleasant		
River Boyd/Golden Valley (south part)	Main water course (1)	11 Golden Valley
Oldland Ridge (incl. Bitton Hill at south, Beech Hill and Cann Brake in centre, and Barrow Hill in north)	Visually Important Hillside (1)	12 Westerleigh Vale & Oldland Ridge
Ram Hill		
Westerleigh Ridge (incl. Shortwood Hill in north and Siston Hill in south)		
Rodway Hill	Local feature (2)	12 Westerleigh Vale & Oldland Ridge
Siston Brook valley		
Warmley Brook valley		
Folly Brook valley		
Bury Hill		13 Frome Valley

LANDSCAPE FEATURE	CONTRIBUTION TO GI NETWORK	SOUTH GLOUCESTERSHIRE LANDSCAPE CHARACTER AREA
Sims HIll	Visually Important Hillside (1)	
River Frome (steeper valley sides)		
River Frome	Main water course (1)	13 Frome Valley
Mount Hill (wooded scarp)	Local feature (2)	14 Kingswood
Warmley Brook valley		
Siston Brook valley		
A4174 Ring Road (open corridor beneath Cock Road ridge)		
Patchway Brook	Local feature (2)	15 Patchway & Filton and the Stokes
Stoke Brook		
Bradley Brook		
Henbury Trym		
Hanham Hills	Visually Important Hillside (1)	16 Avon Valley
River Avon valley (steep northern side)		
River Avon	Main water course (1)	16 Avon Valley
Siston Brook valley	Local feature (2)	16 Avon Valley
Rudgeway & Tytherington Ridge Tyrherington/Baden Hill at north end)	Visually Important Hillside (1)	17 Rudgeway & Tytherington Ridge
Hortham Brook	Local feature (2)	17 Rudgeway & Tytherington Ridge
Severn Ridge NE-SW Scarp	Visually Important Hillside (1)	18 Severn Ridges
Upper Hill	Visually Important Hillside (1)	18 Severn Ridges
Eastwood Park Spur		
Red Hill		
Cow Hill		
Titters Hill		
Fowler's Hill		
Henley Hill		
Catherine's Hill		
Eastcombe Hill		

LANDSCAPE FEATURE	CONTRIBUTION TO GI NETWORK	SOUTH GLOUCESTERSHIRE LANDSCAPE CHARACTER AREA
Spaniorium Hill		
Thornbury bowl landform	Local feature (2)	18 Severn Ridges
Pool Brook		
Pickedmoor Rhine		
Tockington Mill Rhine		
OverBrook		
Rockhampton Rhine	Local feature (2)	19 Oldbury Levels
Aust outlier hill	Local feature (2)	20 Pilning Levels
Ingst outlier hill		
Littleton Pill		
River Severn and shoreline	Main water course (1)	21 Severn Shoreline & Estuary

Note 1: Important landform feature or main watercourse shown on Policy CS2: Green infrastructure, supporting Figure 1: Key-Strategic Green Infrastructure Network, and identified in more detail within South Gloucestershire Landscape Character Assessment SPD, Adopted November 2014.

Note 2: Smaller scale landform features or watercourse identified within South Gloucestershire Landscape Character Assessment SPD.

Note 3: Locational hillside names relating to the main ridgelines within South Gloucestershire taken from OS Explorer Maps 155 and 167; list is not exhaustive.

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