

## Valuing and funding green infrastructure:

### Non-planning related projects



**January 2016**

Preparation of this guidance note on the viability of green infrastructure (GI) has been led by Worcestershire County Council's Strategic Planning and Environmental Policy Team. The paper has been endorsed by the **Worcestershire Green Infrastructure Partnership** (GI Partnership). The GI Partnership includes the DEFRA statutory agencies (Environment Agency, Natural England, Forestry Commission), English Heritage, local authorities, and voluntary sector organisations including Worcestershire Wildlife Trust.

## What is green infrastructure?

**1.1** Green infrastructure (GI) is the planned and managed network of green spaces and natural elements (including rivers, streams, canals, woodlands, street trees, parks, rock exposures and semi-natural greenspaces) that intersperse and connect our cities, towns and villages. GI comprises many different elements including biodiversity, the landscape, the historic environment, the water environment (also known as blue infrastructure) and publicly accessible green spaces and informal recreation sites<sup>1</sup>.

## Why is green infrastructure important?

**1.2** Green infrastructure provides multiple benefits. It delivers environmental gains including landscape and habitat protection and enhancements, preservation of the historic environment, water quality improvements, and flood risk reduction. It also delivers benefits directly to local residents, such as new cycle paths, informal recreation areas and welcoming green surroundings.

**1.3** The importance of GI is recognised through national planning policy and guidance. The National Planning Policy Framework (2011) states that Local Plans should address climate change, biodiversity and landscape issues through *"planning positively for the creation, protection, and*

**Neighbourhood or local GI:** These are small-scale GI enhancements which would typically be included within a development site.

- 1.7 The GI delivery process will differ depending on the type and scale of projects, and will impact viability and funding considerations. As such, two broad categories of GI initiatives can be identified:

**New development sites:** Over the next 20 years a large number of new small scale and strategic developments are expected to come forward in Worcestershire through Local Plan and, where adopted, Neighbourhood Plan allocations. The allocation and delivery of these sites is strictly regulated through the planning process under national (NPPF) and local planning policy. GI requirements, alongside other 'asks', will impact the viability and deliverability of these sites. These GI projects will predominantly be delivered directly by developers, or through third parties using developer contributions.

**Non-planning GI initiatives:** This category covers a wide range of different schemes such as retrofitting GI on existing sites or wider strategic and rural GI projects. The common theme for these schemes is that they will be less affected by the planning process, with a wider range of funding mechanisms being required to secure delivery.

## Purpose and scope of this guidance note

- 1.8 This document aims to provide guidance on valuing and costing green infrastructure to support implementation and delivery of non-planning GI projects such as creation of parks, flood management, sustainable transport, etc. GI considerations that should be taken into account for new development sites are described in a separate paper "*Viability, valuation and funding of green infrastructure on new development sites*".
- 1.9 This paper consists of two parts which should be read together: the main document, and a spreadsheet of green infrastructure costs. The main document contains information on:

Valuation of green infrastructure  
Funding of green infrastructure  
Green infrastructure costs

- 1.10 The indicative costs of different elements of green infrastructure are summarised in the Indicative GI Costs Spreadsheet. This information has been collated from a number of sources, including the GI Partnership organisations. Nationwide studies have also informed this summary.

## Introduction

**2.1** This section explores various approaches to calculating the value of green infrastructure. Extensive methodologies on valuing green infrastructure are available at the national and regional level. This paper aims to direct readers to these calculation methods, rather than describing each of them in detail<sup>2</sup>. The valuation methods included in this paper are a selection of various techniques across different elements of green infrastructure. There may be additional methods which are not covered by this paper.

## Context

**2.2** The valuation of green infrastructure provides an understanding of the quantitative – and, where that's not possible, the qualitative - benefits of services and functions provided by different elements of green infrastructure to society, the economy, and the environment.

**2.3** The valuation tools described in more detail in this section enable assessment of the value of existing green infrastructure (*baseline benefits*) as well as the value associated with greater use of that asset in the future (*marginal benefits*). A recent study by the Mersey Forest and BE Group<sup>3</sup> (described in more detail further in this document) proved that the effects of green infrastructure could be quantified and demonstrated how these could be used in viability calculations.

**2.4** The assessment of both current and future benefits could be of assistance when planning and delivering green infrastructure.

## Valuation techniques

**2.5** There is a wide range of valuation methods which relate to different types of green infrastructure. In 2013, Natural England (NE) commissioned a report<sup>4</sup> which assessed various valuations available nationally and internationally. Following this, NE issued a report on

## TOTAL ECONOMIC VALUE OF GREEN INFRASTRUCTURE

There is no single method for assessing the value of green infrastructure; different methods may be appropriate depending on the type of GI and what we are trying to achieve. The complex nature of GI relationships means that specialist techniques are needed. One starting point is to assess the *total economic value*\* (TEV) of the green investment. Total economic value can include:

*Use value* - relating to current or future uses of a good or service.

Direct use values such as timber (consumptive value<sup>5</sup>) or recreational activities (*nonconsumptive value*<sup>6</sup>)

Indirect use values such as flood protection.

*Option value* - associated with retaining the option to use a resource in the future.

*Non-use values derive from:*

Existence value - the knowledge that environmental resources continue to exist

Altruistic value – are available to others to use now

Bequest value – are available for use in the future.

Costs and benefits related to market goods and services are estimated using market prices. For wider social and environmental costs and benefits for which no market price is available, specialised non-market valuation techniques should be applied.

### **Green Infrastructure Valuation Toolkit (GIVT)**

**2.6** The Green Infrastructure Valuation Toolkit (GIVT) has been developed by a consortium of organisations with remits for economic development, place-making and natural environment protection, led by Natural Economy Northwest. The toolkit provides step-by-step guidance on valuation, including preparation, assessment and reporting. The guidance is supported by a software calculator which guides users through the valuation process. The spreadsheet can be accessed on the Natural Economy Northwest website: [www.bit.ly/givaluationtoolkit](http://www.bit.ly/givaluationtoolkit).

**2.7** The principle of this valuation technique is '*an ecosystem services approach*'. The ecosystem approach means recognising that, regardless of its current main use, any area of land has the potential to deliver a very wide range of services (such as flood management, biodiversity, or recreation) and it is important that the diversity of these services is recognised in policy and decision making. There may, however, be a limit to the extent to which multifunctionality can be pursued without impairing the delivery of one or more of the services involved. For example, there may be trade-offs to be made between archaeology and diversity of wildlife or flood management.

**2.8** The toolkit contains useful guidance on the assessment of green infrastructure benefits including quantifying and monetising of the services it provides. This is spread across different GI elements and the functions they perform:

Climate change mitigation and adaptation  
Flood alleviation and water management

---

<sup>5</sup> Consumptive value refers to non-market value of resources such as firewood, game meat, etc. Such resources are consumed directly, without passing through a market.

<sup>6</sup> Non-consumptive value - refers to all of the "functions" or "services" of natural systems.

Place and communities  
Health and wellbeing  
Land and property values  
Labour productivity  
Tourism  
Recreation and leisure  
Biodiversity, and  
Land management.

**2.9** Below is an example of how GIVT works in practice:

## LANDSCAPE AND VISUAL AMENITY:

### **QUANTIFYING**

Landscape and visual amenity value is generally expressed as a willingness to pay\* for a view, and varies according to landscape type. The values provided include a basket of benefits, including recreation. It does not take account of local context - including green space nearby, the quality of the asset, the accessibility of the asset and so on. It can, however, provide an estimate of the level of benefits.

A 2003 study for the Forestry Commission<sup>1</sup> focused on the number of urban fringe households with a woodland view, which was found using 1991 Census classification of wards. It estimated the value of woodland views from properties to generate the willingness to pay figures. These numbers can be used together with the number of households within 450 metres of the green asset.

### **MONETISING**

Work by Eftec<sup>2</sup> for the Department for Communities and Local Government brought together 47 studies on the externalities

woodland view. This approach provides values significantly higher than the Eftec work.

\***Willingness to pay** is the maximum amount an individual is willing to sacrifice to procure a good or avoid something undesirable.

<sup>1</sup> Willis, Garrod et al, The social and environmental benefits of forests in Great Britain, 2003

<sup>2</sup> Eftec, Valuing the external benefits of undeveloped land, 2005

**2.10** *Please note that for meaningful results this toolkit should only be used with the assistance of an expert economist.*

## **Health Economic Assessment Tools (HEAT) for walking and cycling**

## Highways Agency green infrastructure valuation

The Highways England (formerly Highways Agency) network nationwide is split into a number of 'Areas'. Area 1 consists of the A30 and A38 trunk roads to the west of Junction 31 on the M5 near Exeter, and in total contains 289km of trunk road. Within this network, there are 972 ha of "soft estate" such as verges, grasslands, shrubs and trees.



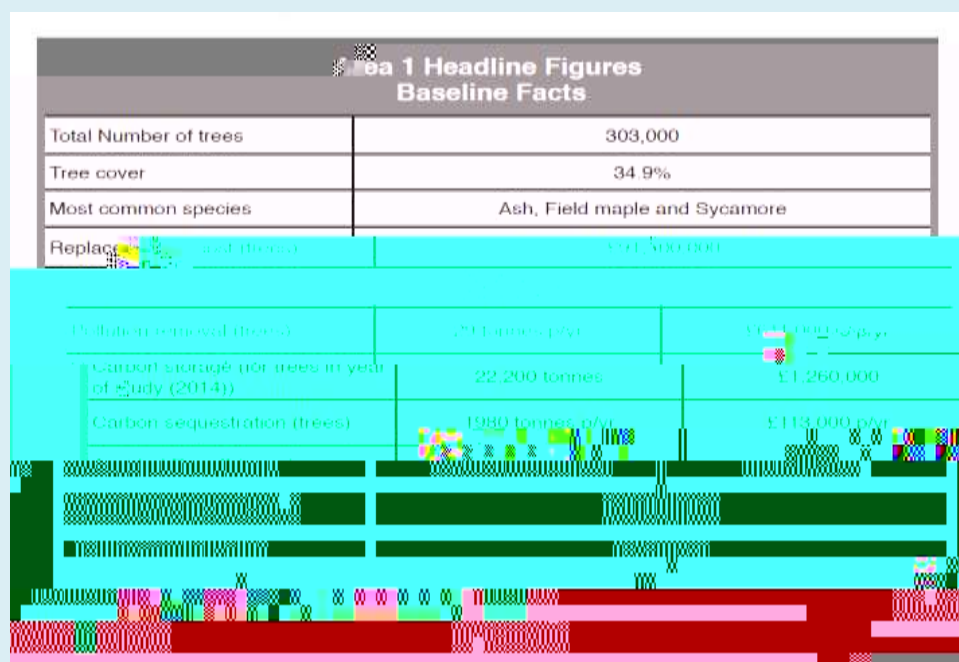
In 2014 the Highways Agency commissioned a study to assess the scale of benefits provided by the natural capital and the economic value of the green infrastructure of "Area 1" using the existing and new field data and the i-Tree Eco model.

The data collected from 72 randomly selected field plots across the network were analysed. The field survey data included:

**Plot information:** Land use type; percent tree cover; percent shrub cover; percent plantable space; percent ground cover type,

**Tree information:** species; stem diameter; total height; height to crown base; crown width; percent foliage missing, percent dieback; crown light exposure.

This assessment was supplemented by a desktop study to evaluate the major benefits of grassland. The findings of the study are available in the table below:



More detail about the calculation method and outputs of this study can be found in the pilot study.

Source: Highways Agency (2014) Valuing the Natural Capital of Area 1. A pilot study, [https://www.itreetools.org/resources/reports/Valuing\\_the\\_Natural\\_Capital\\_of\\_Area1\\_UK\\_Pilot\\_Report.pdf](https://www.itreetools.org/resources/reports/Valuing_the_Natural_Capital_of_Area1_UK_Pilot_Report.pdf)





and investors. This is because the attraction and retention of businesses is an important consideration for developers and property investors when assessing the investment value of a property. The elements that play role here include:

- Reduction of the initial period from completion of speculative development to signing a tenant;
- Minimising the level of incentive required for a new tenant to take the lease; and
- Increasing the desirability of the property and area and as a result increasing rental income.

**2.24** In this case, the potential purchaser of this speculative commercial development would have a high level of confidence that new or replacement tenants would be secured for their investment property. For that reason, the investor would be prepared to pay a higher price to purchase the property. The study suggests that the quality of the environment - including green infrastructure - can reduce investment risk.

**2.25** The viability calculation method suggested by Mersey Forest and BE Group is portrayed in the case study below:

## MERSEY FOREST AND BE GROUP METHOD

### **Assumptions:**

- An office development of 85,000 sqft
- A market rent of £16.00/sqft, with uplift to £17.00/sqft with green infrastructure – this represents a 5-6% increase in value with green infrastructure investment
- A rent free period of either 12 months or 6 months
- An initial void of either 18 months or 12 months
- An additional cost of £200,000 to pay for the green infrastructure



## Introduction

4.1 Different green infrastructure proposals will require different funding mechanisms. Green infrastructure not only needs capital investment to successfully deliver schemes, but also long-lasting funding streams to finance ongoing management and maintenance of the assets. Both the revenue and capital funding opportunities are explored in this section.

4.2 Please note that the funding sources described here are not exhaustive and there might be other ways of financing green infrastructure.

4.3 The approach to delivery, funding and operation of green infrastructure will depend on the type, scale and location of the project. Green infrastructure projects delivered outside the planning system can include:

### Community projects

4.4 Where there are no strategic projects in place, green infrastructure improvements can be undertaken by local communities.

specific criteria for qualifying projects. This money would predominantly be for capital investment in assets and would not include future maintenance.

**4.6** Community groups could maintain green spaces on a volunteer basis. On a small scale, they could also develop innovative solutions to secure long-term management of GI assets or even generate revenue for future activities. Revenue from green infrastructure assets could arise from, for example:

Orchards – fruit or products produced from fruit could be sold;

Biomass energy from woodfuel, coppic

should be noted, however, that due to the high level of competition for this funding, there is no guarantee that any particular application for GI project funding will be successful.

**4.13** The RDPE 2014-2020, through the **LEADER** programme, offers £138 million to farmers, foresters, land managers and communities to undertake actions leading to job creation and economic growth in rural areas. This funding is not directly related to improving green infrastructure functionality, however there are opportunities for indirect contributions to green infrastructure priorities through increasing farm and forestry productivity, farm diversification or cultural and heritage activity linked to this programme.

#### **Infrastructure projects**

**4.14** GI can be delivered through various

restoration GI assets within Local Plans could provide some certainty and control over these uses.

## Further reading

Town & Country Planning Association and The Wildlife Trusts (2012) Planning for a healthy environment – good practice guidance for green infrastructure  
[http://www.tcpa.org.uk/data/files/TCPA\\_TWT\\_GI-Biodiversity-Guide.pdf](http://www.tcpa.org.uk/data/files/TCPA_TWT_GI-Biodiversity-Guide.pdf)

DEFRA (2015) The new Common Agricultural Policy schemes in England: February 2015 update  
[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/406212/CAPLF005v10\\_WEB.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/406212/CAPLF005v10_WEB.pdf)

United Utilities website [http://www.unitedutilities.com/documents/Non-household\\_charges\\_2013-2014 - at a glance.pdf](http://www.unitedutilities.com/documents/Non-household_charges_2013-2014_-_at_a_glance.pdf)

## 5. Green infrastructure costs

- 5.1** As identified in the above sections, green infrastructure will differ from site to site according to the type and size of schemes and their cost. For the purpose of this paper, the costs of various green infrastructure solutions have been collated through a literature review and from real-world information provided by our partners and other stakeholders. However, it needs to be noted that these costs are only indicative and the actual green infrastructure costs of various developments should be considered and valued on a site-by-site basis.
- 5.2** This information has been collated in a spreadsheet which can be found on the Worcestershire County Council website [www.worcestershire.gov.uk/GI](http://www.worcestershire.gov.uk/GI). The extent of this information is limited due to its availability. Once more robust information becomes available, the spreadsheet will be updated.