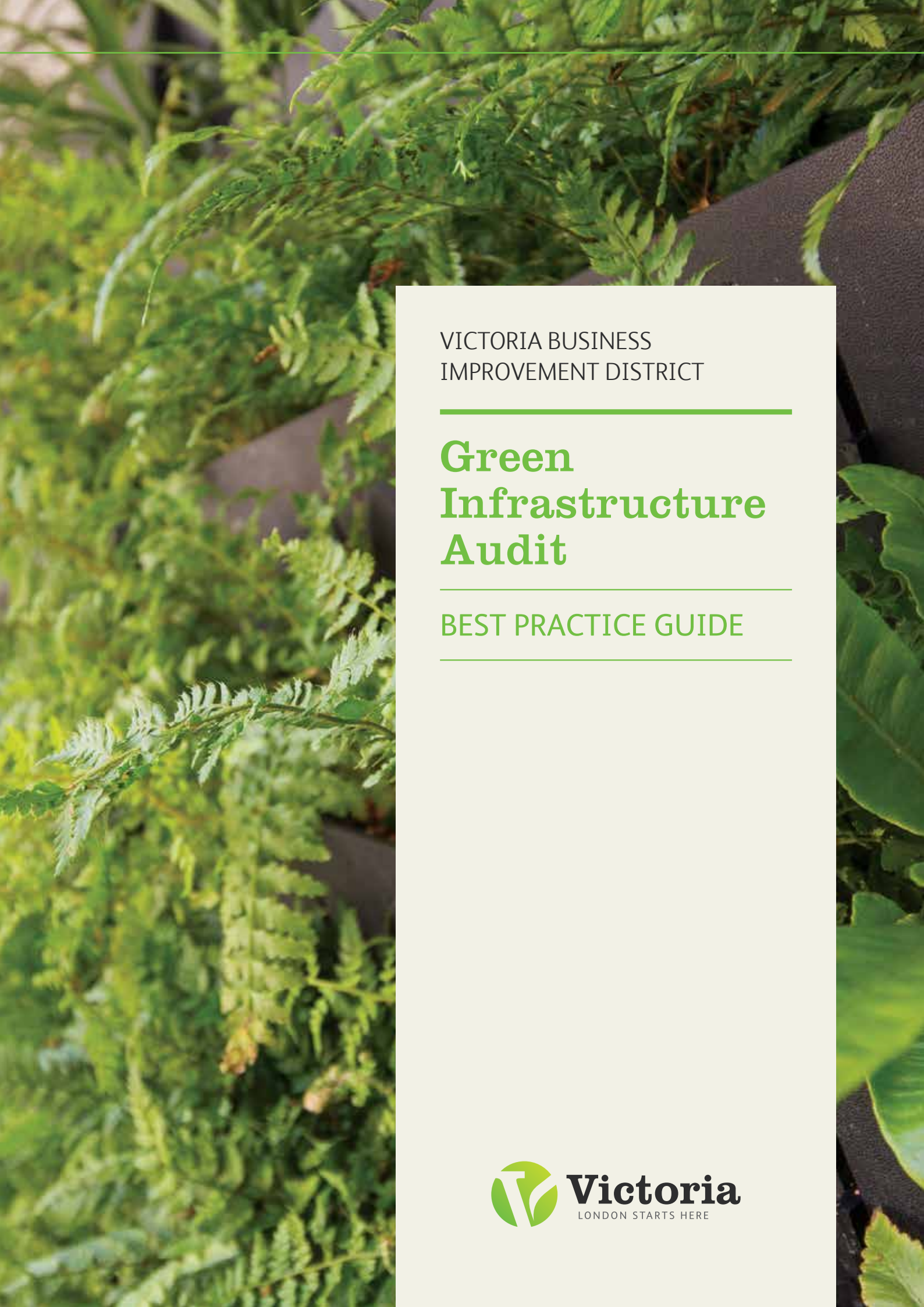

VICTORIA BUSINESS
IMPROVEMENT DISTRICT

Green Infrastructure Audit

BEST PRACTICE GUIDE

Victoria
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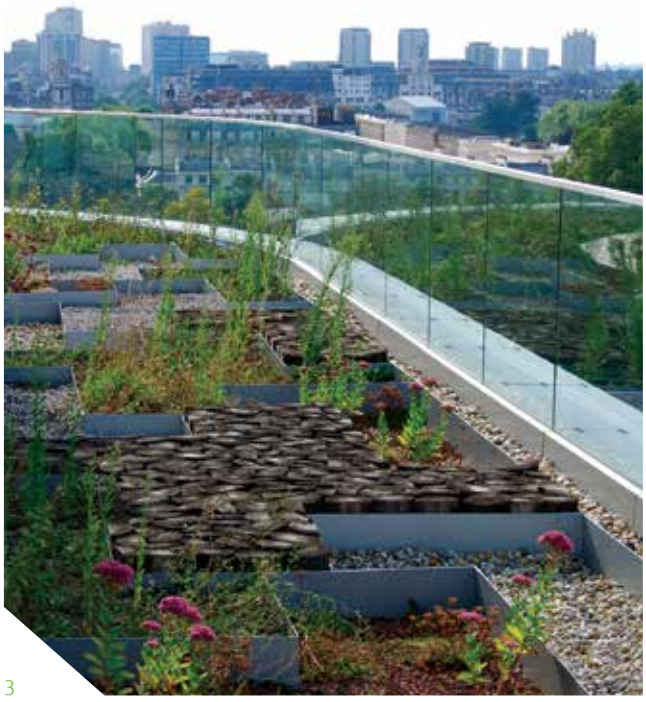

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IN PICTURES

Front cover. The vertical rain garden in Team London Bridge BID. Credit: Mickey Lee and Associates.

1. The Diamond Garden, adjacent to The Queen's Gallery, Buckingham Palace. Credit: Victoria BID/Mickey Lee.

2. The Market Hall in Borough Market, London. Credit: Better Bankside/Mickey Lee.

3. An accessible green roof with views over the surrounding area. Credit: Arup.

CONTENTS

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Foreword

In 2010, the Victoria Business Improvement District (Victoria BID) undertook a ground breaking Green Infrastructure Audit. At the time our intentions were simple: to work towards installing more green space in a part of London largely characterised by hard surfaces and to tackle surface water flooding. As the project got underway, we quickly came to realise the level of interest being generated by the audit process and the range of opportunities that were being identified for new green infrastructure assets, often in previously overlooked locations.

Since 2010, several other BIDs and business partnerships in London have emulated our innovative GI auditing model with valuable support from the Greater London Authority via the regeneration agency, Cross River Partnership. Like us, this has enabled them to pinpoint locations for new green infrastructure in their own areas, be it living walls, roof gardens, pocket parks, community food growing spaces or street trees, and to access external funding to help develop and install them.

As more and more greening schemes are developed and installed as a result of the GI Audit process, the cumulative impact of all these individual schemes will have a positive impact on the local streetscape, the environment – and contribute to growth.

With Arup, thanks to support from Natural England, we have captured the lessons that those who have implemented GI Audits so far have learnt so you can repeat the process. Wherever you are in the UK, a GI Audit will be relevant to you and your local area. The best part is that a GI Audit can be adapted and shaped to fit your space so that it is locally relevant, fits with your wider aims and objectives, and is ultimately more meaningful.

A large part of the GI Audit process is about speaking with people. The sheer volume of positive collaborations that have arisen as a result of our GI Audit has been hugely rewarding. From property developers to landlords, and from facilities managers to estate teams, all have been involved in one way or another – and continue to be involved – in planning, installing, and maintaining new green space in Victoria. In the process we have witnessed a positive shift in the way green infrastructure is perceived among these groups. Other BIDs that have completed their own audits have reported the same.

If you want to learn how to map your area for new green spaces such as green living roofs, trees, and living walls (among other schemes), give underused and forgotten spaces a welcome facelift, and be part of a wider effort that benefits everyone whilst enhancing your local area, read on.

Martin Kelly
Chair, Victoria BID Clean & Green Steering Group
Deputy Vice Chair, Victoria BID
Land Planning Director, Capita
Founder and Chair of the Trees and Design Action Group (TDAG)

1. Introduction

OVERVIEW

This document provides guidance for undertaking a Green Infrastructure Audit (GI Audit). It will help readers to determine:

- Whether your organisation would benefit from a GI Audit
- How a GI Audit should be completed, drawing on lessons learned from recent projects
- How the findings of a GI Audit can be used to catalyse improvements in the local environment

A GI Audit is the accurate mapping, description and analysis of all existing green infrastructure (GI) features within a defined study area. It outlines the functional benefits of GI, and identifies opportunities for improving existing GI and for creating new GI. The improvement and increase of GI within an area will provide multi-functional benefits to people, the economy and the environment.

A GI Audit provides a focus for organisations such as Business Improvement Districts (BIDs), and can identify partnership opportunities that lead to the targeted implementation of the most relevant and beneficial schemes. It highlights the potential that GI offers to business, through a structured and evidence-based process that initiates action. Indeed, BIDs have reported that a GI Audit has assisted them in the delivery of a range of their business plan objectives that include the improved appearance of the BID area, increased biodiversity and improved air quality.

WHO IS THE GUIDE FOR?

This Guide is written primarily for BIDs, but will be relevant to anyone interested in undertaking a GI Audit for their local area or in delivering the opportunities identified through the GI Audit process.

The wider audience therefore includes those working in partnership with BIDs, or others with a remit for a defined geographic area such as neighbourhood organisations, local authorities, registered social landlords, estate managers, Community Improvement Districts, Local Enterprise Partnerships or Local Nature Partnerships.

SCOPE OF THE GUIDE

The Guide is focused on the following topics:

- The drivers for, and benefits of, undertaking a GI Audit
- Moving from opportunity to delivery – the impact of GI Audits upon achieving urban greening
- The governance and project management approaches that can be used to complete a GI Audit
- An overview of available resources and data that can be used to inform the GI Audit process
- Determining how the GI Audit process assists BIDs with delivering their wider business plans

METHODOLOGY

The Guide has been informed through a two-stage process of evidence gathering:

1. A literature review; a wide range of literature and analysis is already available in relation to urban greening, BIDs and business partnerships. A recommended reading list detailing relevant sources of information can be found in Appendix D.
2. Semi-structured interviews with 50 people from 45 organisations that were spread across four separate stakeholder groups: BIDs that have undertaken GI Audits; BID levy paying businesses and other businesses located within the BID area; local authorities connected to BIDs that have undertaken a GI Audit, and; other organisations whose work involves GI. A list of organisations interviewed is provided in Appendix E.

More detail on the methodology can be found in Appendix A.

1. BUSINESS IMPROVEMENT DISTRICTS

Business Improvement Districts are "business-led partnerships focused on improving and enhancing commercial areas including town and city centres, commercial locations and industrial estates."[1] Since the BID concept emerged in North America in the 1960s, it has been adopted in many countries across the world. Today, there are more than 1,500 BIDs across the world, including over 150 formal BIDs in the UK and Republic of Ireland.

BIDs focus on a range of issues, depending on what is important to their local area and business members. Issues often incorporated in business plans include safety, marketing and promotion, the public realm, business engagement and the environment.

1. As described by British BIDs, www.britishbids.info

2. Green Infrastructure Audits

WHAT IS GREEN INFRASTRUCTURE?

People working in different sectors have a different understanding of the term green infrastructure. The definition used by Natural England, the public body responsible for protecting and improving England's natural environment, is shown in Box 2.

2. NATURAL ENGLAND'S GI DEFINITION

"A strategically planned and delivered network of high quality green spaces and other environmental features. It should be designed and managed as a multifunctional resource capable of delivering a wide range of environmental and quality of life benefits for local communities."[2]

BIDs are often based in urban areas and hence the following definition of GI, taken from the London Plan[3], is more specific to the urban environments in which BIDs operate: "[Green infrastructure is] the multifunctional, interdependent network of open and green spaces and green features (e.g. green roofs). It includes the Blue Ribbon Network [watercourses] but excludes the hard-surfaced public realm. This network lies within the urban environment and the urban fringe, connecting to the surrounding countryside. It provides multiple benefits for people and wildlife including: flood management; urban cooling; improving physical and mental health; green transport links (walking and cycling routes); ecological connectivity; and food growing. Green and open spaces of all sizes can be part of green infrastructure provided they contribute to the functioning of the network as a whole."

In relation to BIDs and urban areas, the most common types of GI are:

- Parks
- Open spaces
- Trees and woodland
- Green (living) roofs
- Green (living) walls
- Rain gardens
- Swales
- Planted landscaping, including shrubs, wildflowers, etc.
- Private gardens and squares
- Allotments

These elements can also be described as GI 'assets', and will be referred to as such throughout the rest of the Guide. A glossary of terms is provided in Appendix B.

BENEFITS OF GREEN INFRASTRUCTURE: WHY INVEST?

GI provides multi-functional benefits. In urban areas, the key benefits for people, the economy and the environment include:

Economic benefits: There are an increasing number of studies that identify economic benefits as a result of GI. Well planned improvements to public spaces encompassing green infrastructure within town centres can boost commercial trading by up to 40%[4]. An example of the economic benefits is provided by the soft landscaping and security improvements undertaken at Langthwaite Grange Industrial Estate, Wakefield. Since starting in 2005, 16 new businesses have moved in bringing over £12m investment and creating 200 new jobs. Crime has also fallen by 70% in 12 months[5]. Another example is the High Line project in New York, a large project that demonstrates the scalable nature of GI and that transformed 1.6km of abandoned railway line into an elevated public park costing $70m. As a result of this investment in GI, there has been an estimated $2bn of new economic activity along the route and an anticipated increase in local tax revenue of $900m over a 20-year period[6].

Amenity value and access to nature: GI can create an attractive setting that encourages inward investment and incorporates sustainable approaches. It enhances local identity, creating distinctive workplaces and contributing to a vibrant local economy. Employers in Cumbria have reported that an improved environment and the involvement of staff in activities to benefit biodiversity have boosted morale. This has led to better staff retention with the knock-on benefits of lower recruitment costs, retaining experienced staff and reducing the disruption of staff changes – leading to higher productivity[7]. Trees are associated with a higher perception rating of amenity and visual quality

2. *Green Infrastructure Guidance*, Natural England, 2009. **3.** *The London Plan: Spatial Development Strategy for Greater London*, Greater London Authority, July 2011. **4.** *The economic benefits of Green Infrastructure: The public and business case for investing in Green Infrastructure and a review of the underpinning evidence*, Natural Economy North West, 2008. **5.** *Benefits of green infrastructure: Report to Defra and CLG*, Forest Research, 2010. **6.** http://www.bbc.co.uk/news/magazine-19872874 **7.** *Natural Benefits for Business – Case Studies*, Natural Economy North West, 2009.

and people are likely to spend more time, visit more frequently and travel further distances to places with trees compared to places with no trees[8]. Other benefits include opportunities for food growing on allotments, community gardens and roof gardens, increasing community involvement through planting and maintenance, and providing attractive and sustainable places to live and work.

Improved air quality: "Estimates indicate that air pollution reduces life expectancy in the UK by seven to eight months."[9] "Poor air quality combined with high temperatures also increases the risks of cardiovascular and respiratory disease, especially in the elderly and vulnerable."[10] Vegetation can help by removing pollutants such as ozone, nitrogen dioxide and particulates from the air.

Flood attenuation and water resource management: GI can reduce peak water flows (which tend to be increased in urban environments), improve water quality by removing pollutants and replicate natural drainage patterns so that base groundwater flows are maintained.[11]

Habitat provision: The ecological benefits of urban GI are largely related to the provision of habitat, which in turn increases resources for wildlife. Well-designed GI can create targeted habitat and contribute to national habitats of principal importance (for example, those published in England as a list under Section 41 of the Natural Environment and Rural Communities (NERC) Act), as well as local habitat objectives, thus conserving biodiversity.

Cooling effects to increase thermal comfort: "Informed selection and strategic placement of vegetation can reduce the UHI [Urban Heat Island] effect and cool the air by between 2°C and 8°C."[12] "Heat islands can develop in 'pockets' around single buildings and temperature differences of 4°C have been reported along a single street." GI achieves these results through evaporative cooling and evapotranspiration, reflectance of radiation and shading to reduce the direct gain of energy.[13]

Reduced energy consumption: Trees can reduce the energy consumption of buildings by sheltering them from cooling winds in the winter and shading them from direct sunlight in the summer. "This will prove increasingly beneficial with the anticipated effects of climate change[14]" and deciduous trees will also allow sunlight through in winter. Appropriately designed green roofs and walls can provide an insulating effect that reduces the transfer of heat between the external and internal environment or vice versa. As a result, building temperatures can be 4.5°C warmer in the winter and nearly 15°C cooler in the summer; this reduces the internal heating and cooling costs[15].

> An increasing number of studies identify economic benefits as a result of GI
>
> 

8. *The Environmental Psychology of Shopping: Assessing the Value of Trees*, Kathleen L. Wolf, 2007. **9.** *Urban Air Quality*, Woodland Trust, 2012. **10.** *Trees in our towns: The role of trees and woodland in managing urban water quality and quantity*, Woodland Trust, 2012. **11.** *Interim Code of Practice for Sustainable Drainage Systems*, National SUDS Working Group, 2004. **12.** *Air Temperature Regulation by Urban Trees and Green Infrastructure*, Forestry Commission Research Note, 2013. **13.** *Air Temperature Regulation by Urban Trees and Green Infrastructure*, Forestry Commission Research Note, 2013. **14.** *Trees in the Townscape: A Guide for Decision Makers*, Trees and Design Action Group, 2012. **15.** *Building Greener: Guidance on the use of green roofs, green walls and complementary features on buildings* (C644), CIRIA, 2007.

MULTI-FUNCTIONALITY

GI assets not only provide local benefits *in situ*, but should contribute a wider function as part of other infrastructure planning. For example, to segregate cycle and traffic lanes or providing barriers to vehicular access. Integrated GI that is intelligently designed and managed provides multi-functional benefits, as described above, across streets, neighbourhoods, towns and beyond.

For example, a single tree or green roof within a BID area will provide some localised benefits at and around its physical location (such as shade and local habitat). A cluster of trees and green roofs located within a BID provide greater cumulative net benefit to the wider area (including water retention and improved air quality). Well-connected GI assets help to create places that are adaptive and resilient to changes in climate, and the more extreme weather events that we can expect as a result, and are especially important in urban areas due to the limited amount of available space.[16]

The benefits that GI delivers fall into many categories contributing to aesthetic, environmental, social and economic objectives. Feedback from our interviews with BIDs and businesses has suggested that the aesthetic and economic benefits of GI is of particular interest to many BIDs, in terms of not only increasing resilience to future change, but also for attracting investment and acting as a catalyst for growth.

Research conducted for Natural Economy North West (NENW)[17] identified that the economic benefits of GI fall into 11 distinct areas:

- Economic growth and investment
- Land and property values
- Labour productivity
- Tourism
- Products from the land
- Health and wellbeing
- Recreation and leisure
- Quality of place
- Land and biodiversity
- Flood alleviation and water management
- Climate change adaptation and mitigation

As this list highlights, many of the economic benefits will bring related environmental and social advantages for the local area. Whilst the original NENW list was derived following a regional scale study, these GI benefits are still applicable and can be achieved within BIDs, but at a smaller scale.

> The benefits that GI delivers contribute to aesthetic, environmental, social and economic objectives

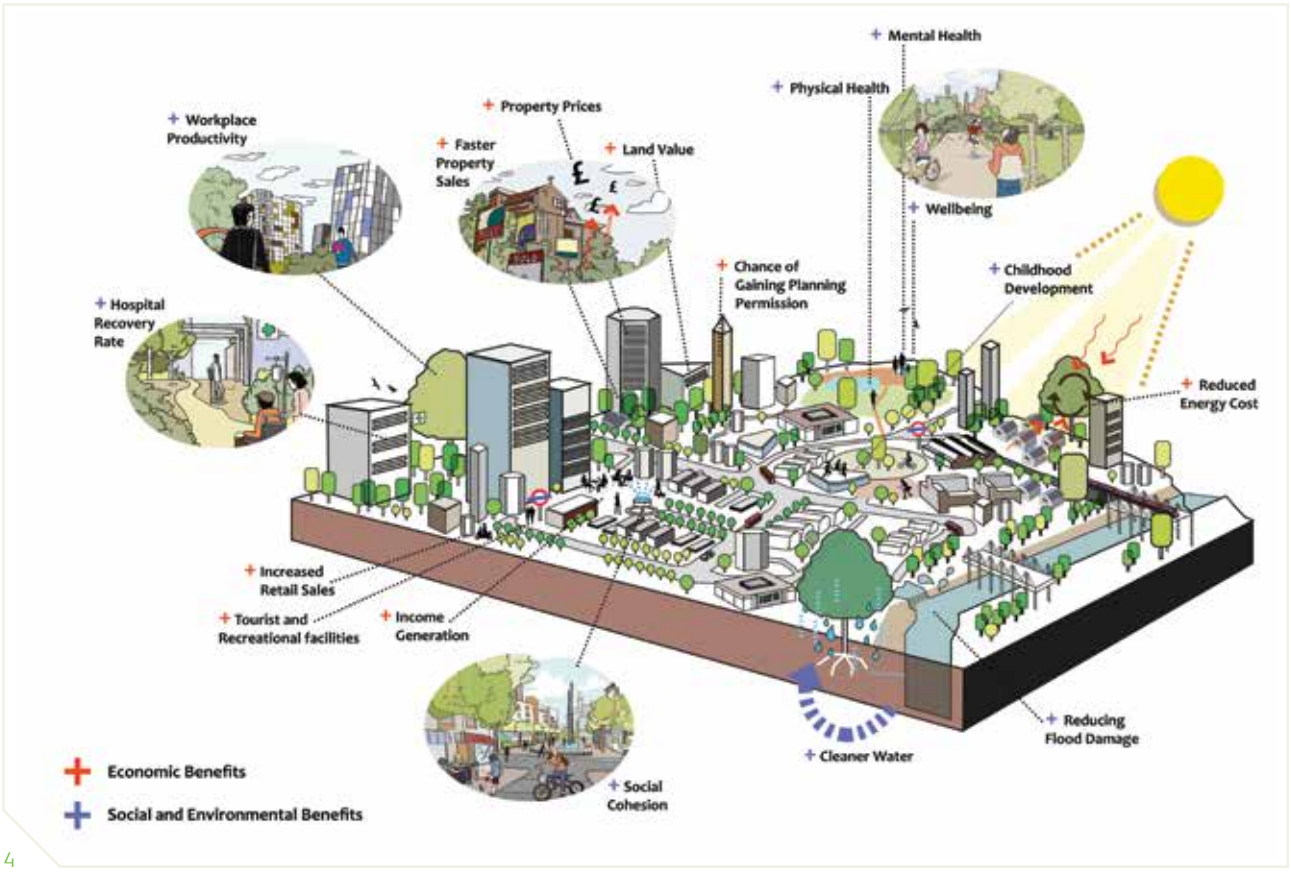
IN PICTURES

4. Illustration from CIRIA document C712, *The Benefits of Large Species Trees in Urban Landscapes*, that highlights some of the GI benefits in urban areas. Credit: CIRIA/Arup.

5. Green infrastructure can create attractive settings, increase local identity and create distinctive work places. Credit: Victoria BID/Chris Loades.

6. Trees can cool urban areas through shading and dispersal of heat and improve air quality. Credit: Victoria BID/Chris Loades.

16. *Green Infrastructure: An integrated approach to land use*, Landscape Institute, 2013. **17.** *Research Summary 1: Green Infrastructure*, Natural Economy North West, undated.


+ Mental Health
+ Physical Health
+ Property Prices
+ Workplace Productivity
+ Faster Property Sales
+ Land Value
+ Wellbeing
+ Chance of Gaining Planning Permission
+ Childhood Development
+ Hospital Recovery Rate
+ Reduced Energy Cost
+ Increased Retail Sales
+ Tourist and Recreational facilities
+ Income Generation
+ Reducing Flood Damage
+ Cleaner Water
+ Social Cohesion
+ Economic Benefits
+ Social and Environmental Benefits

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WHAT IS A GREEN INFRASTRUCTURE AUDIT?

In the simplest terms, a GI Audit can be defined as:

- The accurate mapping and description of all existing GI features within a defined area
- An evaluation of the functional benefits of those features
- Identifying targeted opportunities for improving the existing GI within a study area and providing new GI

Victoria BID was the first BID to undertake a GI Audit in 2010, as part of its Clean and Green programme. The drivers for Victoria BID included reducing surface water flooding and improving amenity in the local area.

Several other BIDs and business partnerships in London have subsequently completed their own GI Audits. In London, 13 have completed, or are in the process of completing, GI Audits at the time of writing this report. These are[18]:

- Baker Street Quarter
- Better Bankside
- Camden Town Unlimited
- Cheapside Initiative
- Hammersmith BID
- inmidtown
- King's Cross Business Partnership
- New West End Company
- South Bank Employers Group
- Team London Bridge
- Vauxhall One
- Victoria BID
- Waterloo Quarter

The GI Audits have all been carried out with guidance and/or financial assistance from the Greater London Authority (GLA)'s Greening the BIDs and Drain London programmes, supported by Cross River Partnership, demonstrating how GI Audits have the potential to attract external support.

Whilst this assistance has encouraged BIDs to undertake GI Audits in London, a GI Audit is just as applicable elsewhere, and would provide the same value to any BID.

DRIVERS FOR UNDERTAKING A GREEN INFRASTRUCTURE AUDIT

The GI Audit process is relatively new and reflects a recent increase in political interest and policy around GI. The government's National Planning Policy Framework, the Natural Environment White Paper and individual local authority policies are encouraging action in this field. This increasing importance is developing in response to a growing understanding of the quantifiable benefits of GI across the wide range of topic areas described above.

GI is being used strategically to address wider issues, for example, the London Plan includes a policy to increase the amount of surface area that is 'green' by at least 5% by 2030, and a further 5% by 2050, whilst Birmingham City Council's Draft Green Living Spaces Plan will prioritise policies and interventions that both reduce health inequalities and mitigate climate change.

A driver is defined as 'something that provides impetus or motivation'. In the GI Audit context, this helps to focus attention towards achieving a specific outcome.

The drivers for a BID undertaking a GI Audit will vary depending on the BID business plan, location, the types of businesses within the area, the natural microclimate and the quality, type and extent of existing GI. Depending on the drivers identified by the BID, the focus and content of the GI Audit will change.

The most common BID drivers to date have been aesthetics, improving the look and feel of business areas for visitors, workers and residents, and attracting investment. Other drivers included improving the BID area through the reduction of flood risk, improving air quality, increasing biodiversity and understanding existing assets. A lot of these drivers are themes that are already present in the objectives and priorities of BIDs and the GI Audit can directly contribute to a number of these.

18. Completed GI Audits can be downloaded from: http://www.london.gov.uk/priorities/environment/greening-london/urban-greening/greening-bids

The list below sets out a number of potential drivers for BIDs to undertake a GI Audit:

Increasing footfall: This is an important driver for BIDs, particularly those containing a high proportion of retail business. Research from the US shows that in retail areas, trees both positively affect judgments of visual quality and also appear to influence consumer responses and behaviours. People reported willingness to travel further, stay longer and spend more in business districts with trees as compared to those without[19].

Improving air quality: This provides a more pleasant environment for the BID area, including health benefits to workers and visitors. Urban vegetation influences air quality; in particular, trees can absorb significant quantities of gaseous pollutants such as sulphur dioxide (SO_2), nitrogen oxides (NOx) and ozone.

Reduced flood risk: Flooding can have a large impact on an area, with rapid flash flooding in particular causing damage to business property in urban areas. Measures to reduce flood risk, such as the implementation of sustainable drainage systems (SuDS – which include types of GI), can improve business resilience and potentially reduce insurance premiums. The Audits can help identify areas in which investment in GI should be prioritised to manage flood risk.

Developing partnerships: Partnerships can be used to leverage support and funding for BID activities, help to promote the BID and secure expert knowledge that the BID does not have in-house.

Improved aesthetics: The appearance of an area is important to deliver a good first impression, develop a sense of place and increase the dwell time of visitors. It can also improve the area's attractiveness for investment.

Additional income: The GI Audit can generate additional income for the BID by providing opportunities to obtain funding from external parties, for example Natural England or the local authority, linked to the implementation of GI projects. Any income over and above the BID levy will help the BID to provide a greater benefit to businesses within the area.

Climate change adaptation: The effects of climate change could result in a negative impact on business, for example, through higher risk of flooding due to wetter winters and through increased temperatures requiring additional air conditioning. Adapting the BID area to respond to this will improve resilience, reduce potential future costs and create a more sustainable BID. Informed selection and strategic placement of GI can reduce the impact of increased rainfall as well as the UHI effect.

Increasing biodiversity: "Biodiversity is a useful means of engaging communities… and helping to strike a balance between the social, economic and environmental needs of sustainable development."[20] Increasing biodiversity ensures improved access to nature, something that people value and that brings health, recreational and community benefits. Improved biodiversity also has an intrinsic value – moves to support and improve flora and fauna in an urban setting are important in their own right.

Understanding existing assets: Knowing and understanding what assets exist within a BID will result in more informed decisions based on the value provided and management required. It also helps to prioritise investment in areas that will have the greatest benefit.

If a BID identifies improved aesthetics and reduced flood risk as their main drivers, for example, the GI Audit should then be focused towards achieving this outcome. In that instance, focusing on opportunities for SuDS would respond directly to one of the BID's drivers, whereas focusing on increasing biodiversity would not. Whilst they are not necessarily mutually exclusive outcomes, the GI Audit will provide a greater benefit if targeted to the drivers of the BID. GI can be designed to deliver multiple benefits and high quality, sustainable design should seek to achieve this wherever possible.

> The GI Audit can generate additional income for the BID
>
> 

19. *The Environmental Psychology of Shopping: Assessing the Value of Trees*, Kathleen L. Wolf, 2007. **20.** *Delivering biodiversity benefits through green infrastructure* (C711), CIRIA, 2011.

BENEFITS OF UNDERTAKING A GREEN INFRASTRUCTURE AUDIT

BIDs that were interviewed identified a wide range of benefits that the process of undertaking a GI Audit has provided. These have been interpreted into 10 benefits listed below. It is worth noting that not all of them are linked solely to GI, demonstrating how the GI Audit process assists BIDs, levy payers and other businesses in delivering their wider aspirations and business plans[21].

1. Developing an evidence-based action plan to reap the multi-functional benefits of GI, not least as a catalyst for growth and improving the appearance of the BID area.
2. Enhancing the BID's reputation, through demonstrating action on green issues, developing positive relationships and demonstrating that business can lead the way in GI initiatives, bringing public and third sector partners with them.
3. Responding to policy, such as the National Planning Policy Framework (NPPF) which requires local planning authorities to plan positively for strategic networks of GI and take account of the benefits of GI. At a local level too, GI is increasingly recognised as part of the solution in planning policies, biodiversity strategies and climate change strategies. A GI Audit shows how the BID, levy payers and businesses within the area, are responding to this.
4. Improved knowledge of the BID area by clearly mapping all existing assets, understanding the functions they provide and having a recorded GI baseline against which the BID can measure change throughout its term.
5. Generating opportunities to bring in additional income over and above the BID levy through partnership funding and grants, focusing investment where most impact will be made, and identifying and inspiring the implementation of 'quick-win' projects alongside longer-term regeneration and improvement.
6. Increased engagement with levy payers, other businesses and the local authority facilitated by discussions throughout the development of the GI Audit. Similar benefits include developing relationships with new partners to explore opportunities for funding and delivery, and collaboration on GI and other projects.
7. To use as part of the evidence during the BID renewal process by demonstrating achievements and noticeable improvements to the BID area.
8. Assisting levy payers and other businesses with their Corporate Social Responsibility (CSR) activities by providing a document and initiative that they can reference in their own reporting and show their support of within the business.
9. Allowing businesses to feel that they are contributing to the larger initiative by making their own small scale changes that otherwise could seem insignificant.
10. Reduced crime levels as a result of improved public perception of the BID area and increased sense of ownership by levy payers, businesses and employees.

> The GI Audit can be used during the BID renewal process to demonstrate achievements

21. These benefits are also illustrated further in the sections that follow.

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IN PICTURES

7. The Market Hall in Borough Market, London, was conceived as a community garden within the historic market setting. It will be used for growing hops, fruits, flowers, herbs, olives and salad leaves. Vertical planters run up the pillars and benches and planting spaces at either end have been installed. Credit: Better Bankside/Mickey Lee.

8. The Diamond Garden at The Queen's Gallery. A formerly turfed over area identified during Victoria BID's GI Audit and redesigned for the benefit of people and wildlife. Credit: Victoria BID/Mickey Lee.

9. The Verdant Viaduct in Borough Market uses green infrastructure to clad an access staircase to the new Thameslink viaduct. Credit: Better Bankside/Mickey Lee.

3. Successes of Completed Green Infrastructure Audits

This section provides a summary of the successes identified by BIDs and businesses that have been involved in the GI Audits completed to date.

INCREASED KNOWLEDGE

Feedback from BIDs showed that there was generally an understanding of aesthetic benefits of GI within the BID team and smaller businesses, but not how particular features could provide functional services such as flood management, temperature regulation or air quality improvements. Larger businesses that had worked with consultants on development projects were more likely to already understand the role of GI.

GI Audits have provided BIDs with a greater understanding of opportunities for GI, in both identifying potential projects and opportunities for funding. One BID reported that the GI Audit has led to more follow-on projects than any other initiative. They have also increased businesses' understanding of GI and allowed businesses to report the outcomes of the GI Audit as part of their CSR agendas.

The biggest benefit identified by one BID was that the GI Audit greatly accelerated the evolution of BID thinking and put them instantly at a higher level of understanding the business case for GI. This has resulted in them making a shift from responsive activities to being proactive and making the area more competitive.

ASSISTING BUSINESS PLAN DELIVERY

A number of BIDs reported that the GI Audit has assisted them in the delivery of a range of their business plan objectives, including: improving the appearance of the BID area; increasing biodiversity; improving air quality; increasing employee engagement; reducing carbon emissions; cleanliness, and; recycling. This will assist BIDs in reporting the benefits of the GI Audit to businesses and levy payers in their Annual Reviews and Renewal Ballots. Reporting on these improvements to the BID area will help to retain existing businesses and attract new ones.

The New West End Company is the BID for the retail hub of Oxford Street, Bond Street and Regent Street. In this dense urban area they now understand the importance of greening and recognise the role GI can play in increasing footfall, extending visitors' trip durations and even serving as tourist destinations for the area.

A number of BIDs have reported strengthened relationships with levy payers and other businesses as a result of engagement through and following the GI Audit. The process has resulted in BIDs engaging with levy payers and businesses which they previously have had little contact with. In some instances, the GI Audit has led to excellent collaboration with the local authority and other key partners who can assist the BID with their GI agenda and other BID objectives through additional expertise and funding, both in the short and long-term. For some, this has been seen as the biggest benefit of the GI Audit.

These relationships have already led to positive outcomes with one BID working with the local authority in developing their neighbourhood plan and another's GI Audit being put in front of their local authority's planning committee. This helps the BID to influence local policy for the long-term benefit of the BID area and may lead to the implementation of projects that would not have happened otherwise.

INCREASED INVESTMENT

GI Audits provide an evidence base and rationale to help secure funding to implement GI projects. In London, funding to date has been obtained from the GLA and Natural England, via the regeneration agency Cross River Partnership.

The GLA has provided funding of £100,000 to seed fund and catalyse the implementation of projects identified in the GI Audits. The GI Audits can continue to be used to help raise future funding, increasingly from the private sector in times of cuts to public sector spend. Box 3 shows how the Cheapside GI Audit results are influencing future investment in GI.

> GI Audits provide an evidence base and rationale to help secure funding
>
> “

3. CHEAPSIDE INITIATIVE: SECTION 106 FUNDING

Cheapside Initiative is a business partnership within the City of London. It has a particular focus on making the area more attractive as a tourist and leisure destination.

Early in the GI Audit process the Cheapside Initiative identified that the local authority in their area had Section 106 funding allocated for GI projects. The partnership and the local authority worked together to produce the GI Audit and to ensure that the evidence base developed would provide them with the detail that they needed to deliver schemes that the funding identified. The final GI Audit was presented to Council members at committee to highlight potential projects to them. It is hoped that this will help to retain existing investment and direct new Council funding to the area.

Section 106 agreements are to be phased out by mid-2014 (although they may still be used in some site-specific cases) and replaced by the Community Infrastructure Levy (CIL). The UK Government sees CILs as a means of raising an additional £1bn for local infrastructure development by 2016, and it also emphasises role of CILs in developing a practical investment framework for large-scale investment in both grey and green infrastructure.

Team London Bridge has obtained funding from Natural England to undertake eight small GI projects, including bug hotels, bird boxes, trees and climbing green walls to improve the quality of the public realm and the appearance of the BID area, whilst at the same time increasing opportunities for wildlife.

There is evidence, as outlined in the GI projects listed below, that the GI Audit has inspired private businesses to look into investment in GI which they had not considered previously. This investment will lead to positive outcomes for the BID as a whole and encourage other businesses to do the same.

REALISING URBAN GREENING

A number of BIDs have started to set out delivery plans for GI in order to take advantage of the opportunities identified by the GI Audit. This has been achieved in some BIDs as a result of buy-in from their board members following presentations, visualisations and walks around the BID area. Team London Bridge's 12 Point Plan (see page 31) is a good example of breaking down the findings of a GI Audit into targeted actions focused on delivery. Some have also started to use their increased knowledge of GI and the BID area to inform new planning developments within the BID thereby strengthening their role within their area, for example, by promoting the inclusion of environmental professionals on project design teams (see Box 4).

4. USING THE GI AUDIT TO INFLUENCE NEW DEVELOPMENT

The GI Audits have increased BID knowledge of GI which is allowing them to have more informed discussions with a variety of stakeholders in the area, including developers and local planning departments.

Following the GI Audits, BIDs have been able to push their local authority for increased GI policy and provision. One BID is now involved in developing a neighbourhood plan with the council, which will help future developers and land owners to have a better understanding of what locally is considered to be acceptable development.

Design briefs being prepared by councils and developers have had input from BIDs as a result of the GI Audit and subsequent increased engagement between BIDs and councils.

Due to the relative infancy of the GLA-led Greening the BIDs programme in London, it is too early to evaluate how well GI Audits support the delivery of urban greening initiatives within BIDs. Some GI Audits are on-going, and few BIDs have had sufficient time to go beyond implementing demonstration or pilot projects (some London BIDs have benefited from funding from the GLA, Cross River Partnership and Natural England for these projects). It is hoped that pilot projects will act as catalysts and encourage more private investment in GI.

There are a number of GI projects on course for delivery that are in the process of design and approval as a direct result of a GI Audit. At the time of publishing this Guide, the following projects were completed or underway as part of the Greening the BIDs programme in London:

Streetscape improvements: The Camden Town Unlimited GI Audit recognised that the Mornington Crescent area had scope for GI enhancement. As a result, they are undertaking a streetscape project that aims to provide economic regeneration to the area that includes a tree planting scheme.

Green roofs: The following green roof projects are currently in progress:

- Five green roofs are being implemented by inmidtown, providing rooftop food growing, wildflowers for invertebrates and rainwater harvesting
- A 'Planted Canopy' green roof demonstration has been completed in Better Bankside
- Two potential green roofs have been proposed for the Lyric theatre and Novotel in Hammersmith, neither of which would have considered green roofs without the GI Audit
- Concept designs have been completed for two exemplar green roofs in Victoria BID
- The Baker Street Quarter GI Audit identified up to 176 roofs which could be fitted with green infrastructure. They are now in discussions with hotels in their area to explore the opportunity of privately funded greening projects, including herb gardens which can be seen through windows by hotel guests, resulting in the potential to bring in additional income

Green walls: A modular green wall has been installed in Better Bankside and a vertical rain garden has been installed in Team London Bridge. A 350m^2 living wall has been installed by the owners of The Rubens at the Palace Hotel in Victoria BID.

Rain gardens: John Lewis are installing a rain garden with Victoria BID. Potential locations for rain gardens have been identified on housing estates within Better Bankside.

Tree planting: Over 30 trees have been planted in Victoria BID, following a tree strategy and more are planned. There is a strategy for partnership planting in Better Bankside. A plan for more planting has been developed by Team London Bridge.

Bug hotels, bird boxes and bee hives: Forty bird boxes and bug hotels and seven planters have been installed to increase habitat for wildlife in Waterloo Quarter. Beehives have been installed and beekeeping courses set up in Victoria BID. This has generated wider interest in GI across the BID, with a number of businesses considering planting their open spaces with plants that are good for pollinators. A number of small-scale funded projects are taking place in Team London Bridge.

Pocket plazas: Four pocket plazas (small open spaces with a mix of paving and planting) are planned in Team London Bridge.

> BIDs have reported strengthened relationships with businesses following the GI Audit
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IN PICTURES

10. The Union Street Urban Orchard demonstrates the potential vacant development sites have for creative and green interim uses. Credit: Better Bankside/Mickey Lee.

11. One of inmidtown's rooftop food growing spaces. Credit: inmidtown.

12 and 13. The vertical rain garden implemented by Team London Bridge. Credit: Mickey Lee and Associates.

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IN PICTURES

14. The entrance to the John Lewis Partnership Head Office in Victoria, soon to be converted to a rain garden with support from the Greater London Authority's Drain London fund and Natural England, via the regeneration agency Cross River Partnership. Credit: Victoria BID.

15. Bird boxes for buildings. Credit: inmidtown.

16 and 17. The 350m² living wall on the side of The Rubens at the Palace hotel on Buckingham Palace Road was identified in Victoria BID's GI Audit and taken forward by the hotel's owners, the Red Carnation Hotel Collection. Credit: Red Carnation Hotels.

4. Green Infrastructure Audits – A Five Step Approach

OVERVIEW

A GI Audit can be developed using a five step approach. The production of a GI Audit is one of the steps. It is important to undertake all the steps to ensure that the GI Audit is as effective as it can be.

The approach has been adapted from the Landscape Institute's seven steps for developing a strategic approach to GI[22], which encourages the development of an integrated and strategic approach. This means that initiatives at different scales all contribute to a shared wider objective and reflect lessons learned from BIDs who have already undertaken a GI Audit.

The process provides a strategic 'cradle-to-grave' methodology, which aims to maximise the benefits that GI can provide for the widest possible audience. As set out by the Landscape Institute, a strategic approach to integrated GI provides "a focus for multiple initiatives operating at various scales"[23].

STEP 1 outlines the approach to the context, timing, potential partners, information required, resources, funding and the setting up of a steering group before commencing the GI Audit. This will set a robust starting point to provide direction and allow the GI Audit to be as successful as it can be.

STEP 2 details the approach to undertaking the GI Audit itself from the point of selecting a consultant through to the time, cost and content of a GI Audit and planning for delivery.

STEP 3 describes how to take the findings of the GI Audit and move towards design and implementation of GI assets. It identifies the benefits of 'quick-win' projects, options for funding and what to consider in terms of planning and consenting issues.

STEP 4 sets out the importance of management and maintenance, and options for involving partners who can adopt the management and maintenance of GI assets.

STEP 5 outlines the importance of monitoring and evaluation in reporting the benefits of GI to the BID and also encouraging investment in GI by levy payers and businesses.

The thought process throughout the five steps should not be linear, but has been shown as such here for illustrative purposes. There will be feedback loops between the different steps such as:

- Planning for the management and maintenance of an intervention during the design and implementation step
- Refining design solutions or the monitoring and maintenance approach, as required following the results of monitoring and evaluation

18. The five step approach

- Re-visiting the vision at key points in time, for example, following BID renewal, as a result of a changing business environment or as a result of achievement of the initial vision
- Updating the GI Audit maps and data following implementation of GI projects

> There will be feedback loops between the different steps

22. *Green Infrastructure: An integrated approach to land use*, Landscape Institute, March 2013. **23.** ibid.

STEP 1: VISION AND PARTNERING

Developing an overview

Before starting a GI Audit, it is important to understand the local area and the local context in relation to GI initiatives, aspirations and policy. Understanding the key drivers of local stakeholders will help to ensure that the process of defining the opportunities will be easier and more realistic. This will involve understanding how GI might be able to contribute to some of the wider aims and objectives of the BID itself, and of the businesses within it. For example, businesses suggested that it could be a useful way in which BIDs could assist levy payers with their CSR targets. Local drivers of institutions add context to local GI Audits and increase the likelihood of political support and investment. Bringing together existing and new local partners from across the public, private and third sectors will help develop a shared vision for what the BID aims to achieve as a result of the GI Audit.

5. ENGAGING STAKEHOLDERS

A recent GI Audit by consultants in Vauxhall included early engagement with a wide range of stakeholders, including community groups and the local authority, providing the BID with a clear vision of how the GI Audit will fit into the wider plans for the area and how potential GI interventions can be delivered. Vauxhall One BID is located on London's South Bank and believes the area has lagged behind the success of the wider area. Engaging with a range of stakeholders will lead to a more complete view of their future aspirations and thus the opportunities available, as well as developing a consensus on the importance of GI. It is hoped that the move from GI Audit to implementation and beyond is more likely to be successful as a result.

Out of the interviews undertaken with BIDs, those that felt the GI Audits provided good value for money were those who had well targeted briefs, clear goals, good engagement with levy payers, other businesses and stakeholders, and a vision for implementation.

Context

There are many examples of how BIDs have incorporated the planning policy, local initiatives and priorities, and the environmental context of the local area into their GI Audit reports. Better Bankside's GI Audit includes a specific chapter considering these issues. However, there is less evidence of how BIDs have explored ways in which a GI Audit and the benefits of GI could help them to achieve their Business Plan objectives. Many BID managers were able to articulate the links between the vision for GI delivery and the BIDs objectives though it was not always clear that this had formed a clear driver for the contents of the GI Audit or the prioritisation of opportunities identified. A clear link between the benefits of GI and a BID's business plan will be helpful in assisting others to understand the role that GI can play for the BID area.

Timing

Some BIDs have suggested that a GI Audit is something that is best undertaken within the second term of a BID. The first term is often focused on immediate issues identified within the BID ballot such as recycling, security and cleanliness. By the second term (or possibly the third year of the first term – before the BID renewal process begins) a lot of these activities have been put in place, giving the BID more time to look at new initiatives. However, acknowledging that GI Audits can facilitate the delivery of other BID projects, it is reasonable to expect that as the positive link between GI and business plans become more widely known, GI Audits will be carried out earlier. Whilst there may not be a 'one size fits all' approach to the most appropriate timing for a GI Audit, it may be an important consideration in ensuring that it fits with other initiatives underway.

> Referencing the local drivers of institutions adds context to GI Audits
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Partners

Effective strategic relationships will help to underpin and inform a GI Audit and its resultant strategies. As set out above, working with a wide range of stakeholders will help to generate support. Creating a shared vision will help to maximise the quality of input from partners throughout the process (see Box 5). BIDs have taken different approaches to working with partners, some examples include: undertaking the GI Audit as an internal BID exercise with little or no external engagement; requesting specific information from partners; setting up steering groups to involve businesses and wider experts, and; running wide-reaching and inclusive workshops.

Early involvement of a wide range of stakeholders can be expected to have the following benefits:

- Buy-in to the concept and vision, ensuring that everyone is working towards the same goal
- Increased information about the potential deliverability of new GI assets and an understanding of the wider context
- The creation of an interdisciplinary 'team' with a wider range of relevant skills and networks
- Increase in the number of potential partners to help deliver and manage GI assets in the longer-term
- Access to a wider range of funding and other resource opportunities; this could be directly through monies from stakeholders or the knowledge of funding that is available
- Improved relationships between the BIDs and partners (beyond GI), for example, with a local authority or with particular levy payers
- Reduction in any possible duplication of effort by partners, by combining resources and funding to deliver outcomes that are beneficial to all

Partners have included organisations such as:

- Local authorities (including planning, green space, highways and economic development departments)
- Businesses and developers within the BID area (see Box 6 and Box 7)
- Neighbourhood organisations
- Wildlife Trusts and other Non-Governmental Organisations (NGOs)
- Relevant community groups
- Regional/national organisations with specific expertise (e.g. Natural England, Environment Agency, Greater London Authority)

In particular, involving the local authority as soon as possible means that they can advise the BID on deliverability through planning, and the local priorities that are more likely to receive support. They can also provide information on land use and major planned developments. This will help to target opportunities and understand what consents may be required for any proposals.

BIDs may want to consider how they can proactively work with emerging groups with an interest in a green economy, such as Local Nature Partnerships (LNPs) and Local Enterprise Partnerships (LEPs). This could involve including them on a GI Audit steering group (see Box 8). Joining up with other BIDs to work across BID boundaries could also be a useful way to pool resources. It is clear that spatially and functionally, GI does not start and finish at the boundaries of a BID, therefore a more imaginative approach to partnerships could create a joined up network providing greater benefits to the individual BID.

BIDs may want to consider how they can proactively work with emerging groups with an interest in a green economy

6. WORKING WITH BUSINESSES

BIDs are working for the benefit of the businesses located within their area. It is critical that their views and needs are incorporated into the GI Audit process. This does not necessarily mean hours of consultation; BIDs should make it easy for businesses to do positive things for their local area. Businesses and BIDs can have a really positive impact; challenging other partners to go further and follow their lead on delivering GI.

BIDs that have already undertaken GI Audits have learned through the development of their pilot projects that they need to work directly with businesses and levy payers in the first instance to encourage implementation.

It will be important to work with the early adopters first; some businesses will have already thought about the GI agenda and the benefits of GI. Working with these businesses early on will generate momentum. For example, a news bulletin regarding the upcoming GI Audit could ask for businesses to provide a relevant point of contact for liaison. Having a very motivated or passionate individual within a company, who feels strongly about sound environmental practices, will be useful to encourage their wider business to get the most out of the GI Audit. This, combined with engagement and buy in from a decision maker within the company, can make a real difference.

Understanding the stakeholders within a business, rather than treat businesses as homogenous organisations, is also important. This may mean there is a need to develop information that can be shared within businesses, for example, where they need agreement to secure financial contributions or deliver projects.

Providing information

One of the key ways in which partners can collaborate early in the process is by providing information to the BID for the GI Audit. This may be through businesses granting access to private land to carry out detailed elements of the GI Audit; local authorities providing access to information regarding local priorities, land ownership and proposed development; utility companies providing information about services; or community groups highlighting projects that could contribute to the wider vision.

7. WORKING WITH DEVELOPERS

Some BIDs are currently undergoing significant development. Working with partners prior to the GI Audit to understand what development is in the pipeline is an important first step.

The Landscape Institute carried out research, looking at the case for developers to invest in GI. They concluded that investment in the landscape makes sound economic sense. "When landscape is placed at the heart of the development process a range of economic benefits are delivered for developers, local businesses and communities. Working with the landscape can reduce development costs, optimise development potential and increase the saleability of housing and commercial property." [24]

Where significant development is taking place within the BID area, working with developers to ensure that they understand these benefits and the aspiration of the existing business community, will help to deliver effective GI.

24. *Why Invest in Landscape?*, Landscape Institute, 2011.

Resources and funding

Another key area in which partners might be able to assist is in providing resources, financial or otherwise. Those BIDs that have undertaken GI Audits in London have all received financial support and/or guidance from the GLA. Outside London, BIDs can develop creative partnerships to secure funding or allocate resources from the levy based on the relevance of a GI Audit to the BID's objectives.

External funding from grant giving bodies, partners, businesses, levy payers or other agencies will be essential to the delivery of GI. Therefore the benefits of GI to the BID area, individual businesses, levy payers and the wider area need to be communicated clearly.

The partners mentioned above may all be in a position to provide funding, at some point in the process, particularly where they see direct benefits. A range of potential funding models for GI have been identified by Natural England and include:

- Multi-agency public sector grant funding
- Tax initiatives
- Planning and development opportunities
- Bonds and commercial finance

Further details of each funding opportunity that falls under each of these headings can be found in Natural England's *Green Infrastructure Guidance*[25].

Steering group

A steering group is a useful way to give focus to a partnership arrangement and ensure that input into the GI Audit is continuous and consistent. It should ensure that there is input from a wide range of viewpoints, but with consistency and a pre-agreed vision for what the project is seeking to achieve. This can be made more formal by developing a project brief that sets out the requirements and process for the delivery of the GI Audit itself.

8. LONDON CROSS-BID STEERING GROUP

In London, Cross River Partnership (CRP) set up and facilitated a Cross-BID steering group to provide guidance to the GLA's Greening the BIDs programme. The BIDs have found the group invaluable in terms of sharing approaches to the GI Audit process and best practice.

A similar approach could be used by BIDs elsewhere, for example, by setting up a regional group, to develop momentum and share ideas.

> A steering group is a useful way to ensure that input into the GI Audit is continuous and consistent
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25. *Green Infrastructure Guidance NE176*, Natural England, 2009, Appendix 3.

STEP 2: THE GREEN INFRASTRUCTURE AUDIT

Selecting a consultant

The GI Audit process itself is likely to be delivered by an external consultant (with appropriate skills in GI and Geographic Information Systems (GIS)). The feedback from BIDs has been that professionals with strategic and local knowledge have provided a useful, relevant and informative service.

To appoint a consultant, a project brief needs to be written outlining the BID's requirement. The brief should provide details of any existing information and data sources, as provided by partners, and define the level of consultation required with them. In some instances, their professional knowledge has been used to work with the BID to refine the scope of the brief once they have been appointed. An example of a brief that can be used by BIDs as a basis for their own and that has been developed from the GLA's brief for London BIDs, is available in Appendix C.

The first stage in selecting a consultant will be to invite companies or professionals to tender for the work using the brief. The type of professionals who have been appointed to date have been teams that comprise landscape architects, ecologists and green roof experts, with experience in GIS mapping and data analysis.

Landscape architecture companies can be found on the Landscape Institute website[26] and ecologists on the Chartered Institute of Ecology and Environmental Management website[27] or in the ENDs Directory[28]. Local partners may also be able to provide some advice on this process. Inviting up to five companies to tender for the work should provide a range of price and quality against which to judge.

Criteria for judging submissions should be balanced against quality and price. This balance should be decided by the BID in advance of the tender. Feedback from BIDs that have undertaken GI Audits to date suggests that having the GI Audit completed to the best quality possible provides the better value to the BID than any short-term cost savings. This would suggest that greater weighting should be placed on quality.

For ease of management, the consultants should liaise with one identified point of contact within the BID who has an interest in the study and who has the time to engage with the consultant as required throughout the GI Audit.

Time and cost

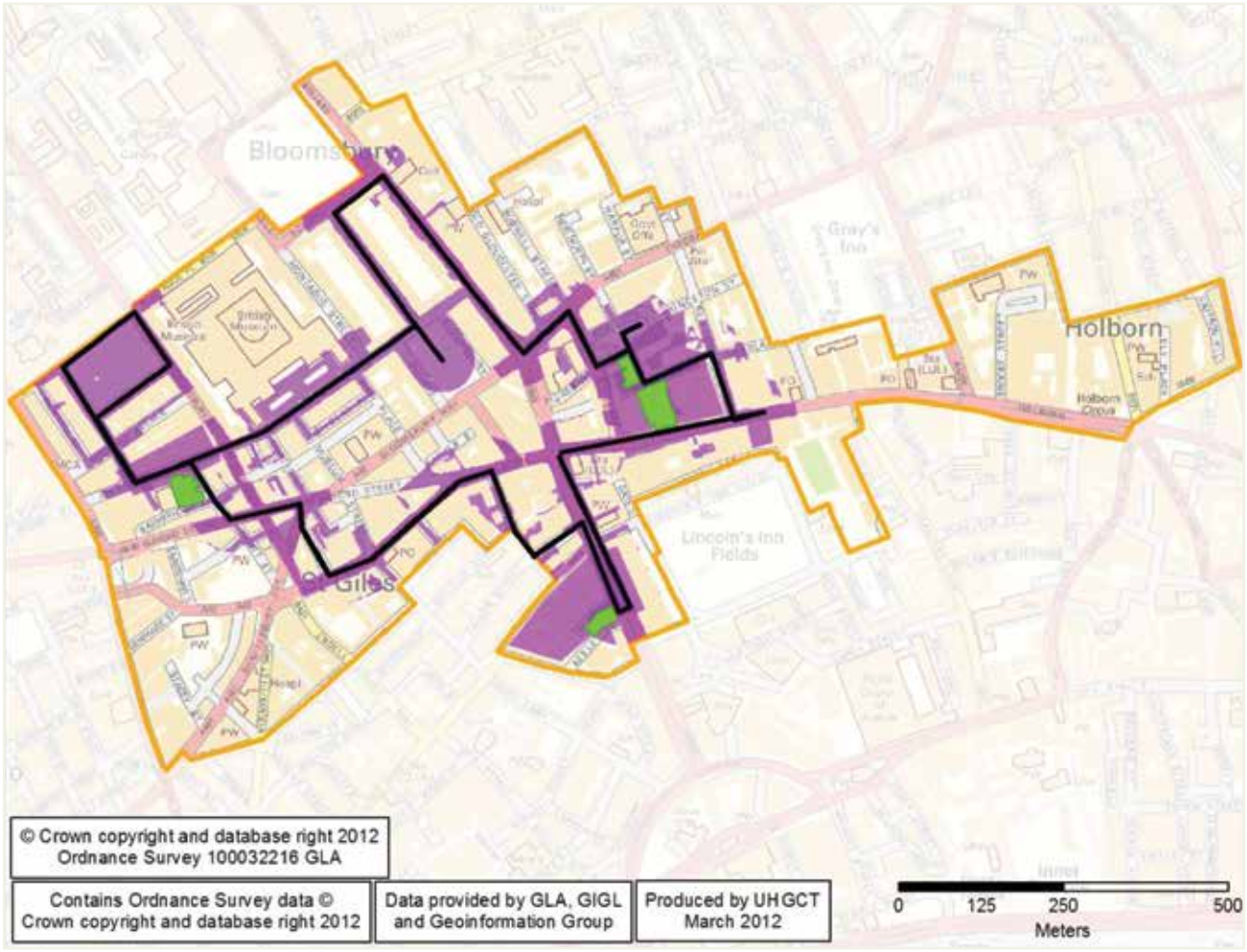
Experience suggests that a GI Audit will take three months from appointment of the consultants to completion. This period could be increased or reduced depending on the scope of the GI Audit, the availability and format of information and stakeholders, and the method used to present the GI Audit results. However, many BIDs believe that the GI Audit should not be a rushed process as this could have a negative influence on the quality of the document and limit its impact within the BID.

The cost of the completed GI Audits to date has been around £15,000 each. This cost is scalable depending on the size of the study area (it may not necessarily be the full BID area, or could be a larger area), scope of the brief, availability of spatial mapping information and the amount of ground-truthing undertaken (see Box 9). For example, one way to reduce costs could be to scope out particular aspects of GI that may be more suited to the context and drivers of the BID area. There may be opportunities for efficiency savings if BIDs within a particular locality (and with similar drivers) were to commission a joint GI Audit.

9. GROUND-TRUTHING IN inmidtown

inmidtown represents 570 businesses in Bloomsbury, Holborn and St Giles in London. They carried out a GI Audit in 2012, with a particular focus on biodiversity, carbon reduction, corporate food production and composting. Their ground-truthing exercise was confined to privately-owned land and BID priority areas, as demonstrated on their survey plan below.

26. www.landscapeinstitute.org **27.** www.cieem.net **28.** www.endsdirectory.com



IN PICTURES

19. The inmidtown GI Audit survey area and BID boundary. Credit: inmidtown and University of Hertfordshire.

Content and presentation

The content of a GI Audit should be structured around five specific parts, outlined below, that derive from a review of the GI Audits to date, the GLA London BIDs brief (see Appendix C) and feedback from interviews. Ultimately, the output of the GI Audit, be it a report or presentation, should be clearly organised and engaging.

There has been little variation in the methodologies followed within GI Audits undertaken so far. This is largely due to the relative embryonic stage of the GI Audit process, the inexperience of BIDs in this area of work and the lack of feedback to date on the success (or not) of completed GI Audits. Where content has differed it has been due to the drivers of a specific BID, and the variation in focus on green roofs being a notable example of where differing levels of detail and analysis has taken place.

GI Audits typically present information in maps produced using GIS (such as those shown in this Guide). Some reports also include pie charts and tables to demonstrate opportunities (through tick boxes) and quantitative analysis (tree species, % coverage, water attenuation provided, etc.). A mixture of these approaches is recommended within the main report to allow for a full understanding of the GI resource, opportunities and for the report to be relevant for a wide audience.

Part 1: Understanding the key issues, drivers and local planning/development context. The start of the document should set the scene in terms of the boundaries of the study area and contain a broad description of the existing environment. The identification of key issues and drivers should have been developed during Step 1 (Vision and Partnership) and should be clearly stated. Identifying and linking to the local planning and development context was highlighted by interviewees as an important aspect in engaging the local authority and businesses undertaking planning applications for development. This positions the GI Audit within the local framework and identifies how interventions proposed within the report will assist in the implementation of specific policies. For example, demonstrating the link to surface water management plans could help to secure support for GI interventions with a flood management benefit.

Part 2: An overview of the benefits of GI and GI assets. The initial description should be written in the simplest terms to provide BID members, as well as other businesses, with a clear understanding of GI assets and potential. Some may have never heard the term 'GI' before (whilst they understand the individual assets such as parks, trees, etc.), so it is important to ensure all readers share the same understanding.

It is important to express quantitative information on the benefits of GI so that businesses have the information they require to make investment decisions. For example, if they invest £1,000 in tree planting, what will be the benefits to the business or the local area? There are now an increasing number of studies and documents that contain this type of quantitative information, some of which are referenced in Appendix D (Recommended Reading) and can be considered alongside qualitative information such as testimonials.

Part 3: Accurate mapping and description of the current GI resource. This part of the GI Audit is partly reliant on the availability and accuracy of relevant spatial data sets. Data sets that have been used for GI Audits include:

- Base Mapping (e.g. OS MasterMap, aerial photography and topography)
- Open Spaces (type, size and quality)
- Trees (including species and size)
- Species records
- Habitat data
- Designated nature conservation sites
- Areas of deficiency in access to nature
- Flooding (fluvial and surface water)
- Air quality
- Temperature
- Flat roof mapping
- Services and utilities

This information is likely to be held by local authorities who may have already undertaken broader open space audits. The data may be held by a GIS team.

Local Environmental Records Centres will be able to provide BIDs with a lot of the information listed above. They can be identified throughout the UK using the Association of Local Environmental Record Centres website[29]. Some information can be obtained for free from Natural England[30] (such as details of Local Nature Reserves, Sites of Specific Scientific Interest, woodland and some habitat types outside designated areas) and Ordnance Survey Open Data[31] which may be useful for some types of base mapping.

Other sources of information may include utility companies and the Environment Agency. Agreements to use this data may be required and some may charge; however, they may be interested in developing a working relationship with the BID and

29. www.alerc.org.uk **30.** www.gis.naturalengland.org.uk **31.** www.ordnancesurvey.co.uk/oswebsite/opendata/discover.html

also receiving the findings of the GI Audit for their own use in return for providing baseline information. If relevant information is not available, data can be purchased from companies who provide data and mapping products. A further option could be to commission a tree survey and/or a topographic survey for the GI Audit study area.

Access to some private property may need to be arranged for surveys of private trees and roof space. This is best arranged directly by the BID and increases engagement and understanding with levy payers, other businesses within the BID and other stakeholders.

Part 4: Overarching functional and quantifiable benefits of existing GI. This section of the report is very technical in some GI Audits and provides information on the percentage of the area covered by green space, tree canopy cover, number of trees by species, number of trees in private and public ownership, a histogram of tree age, number of flat roofs, and/or flat roof area. This provides useful baseline information against which change can be monitored and benefits analysed. There are also broad descriptions of the functions that are provided by the existing GI.

Information should be summarised using data obtained from the digital datasets and survey proformas that have been completed on site during a ground-truthing exercise. Proformas allow a check to be carried out on the digital data and record additional pertinent details – an example proforma is included in Appendix F. They could be used for each type of space / feature and record:

- Name and location with a photograph and plan
- Any details relating to its location or designation
- Details of the type of space (park, tree, pavement, building plot, etc.)
- The condition of the space, management, features or habitats present and GI functions provided
- The date the record was made and by whom

The information should then be spatially mapped to show locations of existing GI along with areas of relative quality, functionality and deficiency.

Feedback from BIDs demonstrates that this process is important to raise awareness of the existing assets in their area. BIDs can then use this mapping, quantitative and qualitative information as a baseline against which to report in Annual Reports and monitor change over time, allowing them to report demonstrable achievements to levy payers and businesses. This quantifiable information has also been well received by local authorities in which BIDs are located.

Feedback from interviews suggests that individual businesses feel that there is less benefit provided by this BID-wide information, as it does not relate specifically to them and their properties. However, they will benefit from information relating to their own land or property, as it informs their business decisions and generates an understanding of the value of GI. Information relating to the BID as a whole can be used to identify areas of deficiency and provide a baseline for annual monitoring and reporting.

Part 5: Identification, mapping and prioritisation. This part of the GI Audit should be aspirational, but differentiate opportunities that are possible now, taking into account existing constraints, to those that would be desirable if current constraints could be overcome (for example, through new developments). Feedback from BIDs and businesses has shown that in some cases the aspiration has been great, but in reality some elements are not always deliverable. This might have been due to existing underground services, costs or structural/physical constraints. Often, these issues could be resolved through engagement with the right individuals and organisations from the outset.

Quantifiable benefits of the potential opportunities should be provided where possible as this will allow businesses to see what benefits would be provided to the local area and the BID as a whole if investments in GI were made. For example, in the Victoria BID GI Audit quantitative information was provided on m^3 of rainfall that could be attenuated and the potential energy (kWh) savings per year as a result of implementing different types of green roof. The kWh data allows businesses to undertake a cost-benefit analysis of the proposed interventions, and the attenuation data can be linked back to the BID's original GI Audit driver to reduce surface water flooding.

In addition to the quantifiable benefits, qualitative information should be included to help prioritise the actions that follow. This may include referencing and prioritising local priority species and local character, for example. This information will also help to target and obtain funding as a result of being able to demonstrate specific benefits and targets from the outset, that are linked to wider objectives.

Planning for delivery and promoting opportunities

A delivery plan, such as Team London Bridge's 12 Point Plan (see page 31), prioritising potential projects should be produced. This allows the BID and other stakeholders to prioritise activities and focus energy. Within the delivery plan, a number of quick-win projects should be identified that can be delivered to demonstrate that change is underway. This should help to encourage other levy payers and businesses to get involved. The introduction of one or two large, iconic projects has also been suggested as a way to raise the profile of GI within an area. The delivery plan helps to ensure that the findings of the GI Audit and opportunities for greening are being taken forward. It could be distributed to partners as a short glossy brochure that invites conversation and presented to them at a launch event.

10. TEAM LONDON BRIDGE: GREEN INFRASTRUCTURE 12 POINT PLAN

Team London Bridge, a BID formed in 2005 in the London Bridge-Tower Bridge area, developed a 12 point plan following the completion of their GI Audit. This document provided a short summary of the 12 key opportunities that the GI Audit identified. It provided a visualisation of each scheme, information about the key partners, main benefits and a rough cost estimate for the installation of each. Examples included:

- Preliminary structural surveys of roofs with green roof potential – £300 per survey
- Landscape planting scheme on a derelict site with help from volunteers – £1,000
- The creation of a high profile rain garden combined with tree planting – £20,000

Visualisations of potential improvements help stakeholders to understand what future changes may look like. This reflects feedback from levy payers and businesses that the aesthetic driver is most important for many. Some examples of quick-win projects include increasing the range of GI functions provided by parks through meadow creation, tree planting or swales; demonstration projects such as a green roof on a building visible from overlooking properties; and the installation of bee hives and 'bug hotels'. The effectiveness and type of quick-win projects will vary from BID to BID, depending on the drivers that were identified at the outset.

11. PROMOTION OF THE GI AUDIT

Promotion of the GI Audit and its findings is perhaps the most important part of the process. A number of interviews with businesses and local authorities found that many had not seen the final GI Audit document. By seeing the findings of the GI Audit (be it the report, executive summary, a presentation or a delivery plan based on the findings of the GI Audit) stakeholders and businesses remain involved in the process, informed of a BIDs plan and more able to assist in its delivery. The GI Audit will need to be promoted in a number of ways to different audiences, for example:

A presentation or launch event: This allows a wide range of people to attend, provides the opportunity to ask questions and encourages dialogue, debate and enthusiasm. One BID reported that, at their GI Audit launch, they met a number of businesses they had previously had difficulty engaging with. A separate presentation for partners would also be beneficial to allow discussion around funding opportunities and constraints that may need to be resolved.

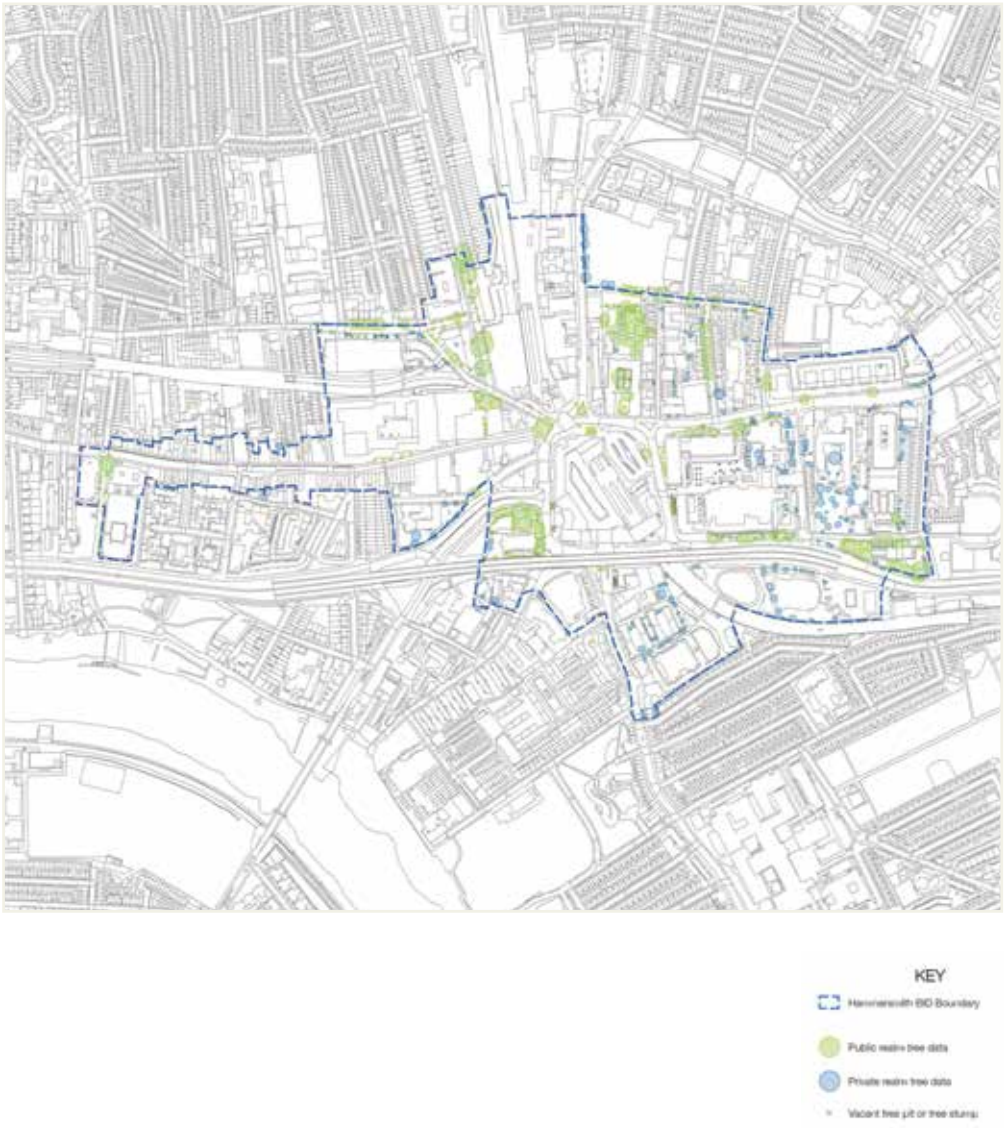
Direct email or phone call: This is beneficial for those who have been involved in the process or for businesses/landowners at locations where specific opportunities have been identified. It will enable a discussion about each proposal and starts the dialogue with regards to design and implementation.

A newsletter or flyer: A specific newsletter regarding the GI Audit raises awareness across the BID and provides detail to those unable to attend a launch event. It should provide a link to allow people to download the GI Audit, executive summary and delivery plan.

On the website: Upload the GI Audit documents to the BID website to allow those who are interested to be able to view the report and any progress updates.

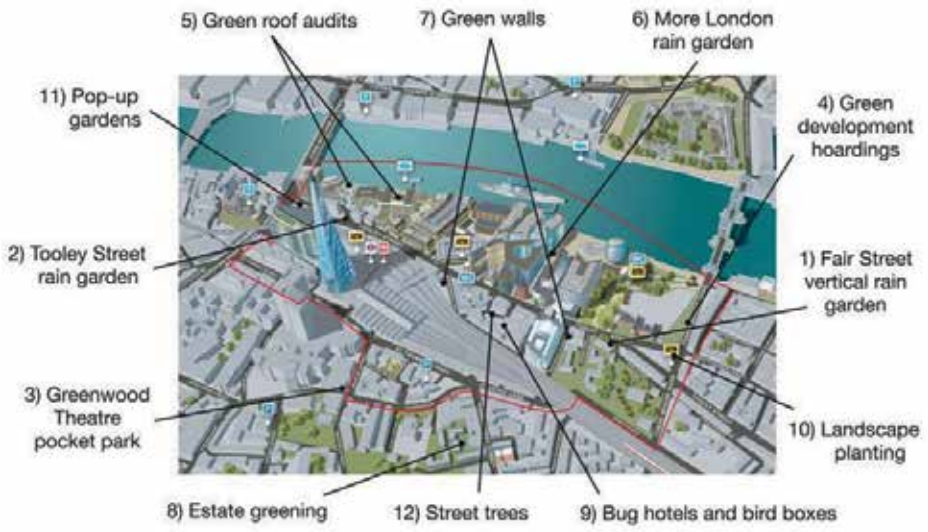
IN PICTURES

20. A map from the Victoria BID GI Audit indicating current land use. Credit: Victoria BID and Land Use Consultants.



IN PICTURES

21. A map from the Hammersmith London BID GI Audit indicating public and private tree locations.
Credit: Hammersmith London and The Ecology Consultancy.



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IN PICTURES

22. Team London Bridge: A location plan indicating their 12 target opportunities. Credit: Team London Bridge.

23. A community garden near London Bridge. Credit: Micket Lee and Associates.

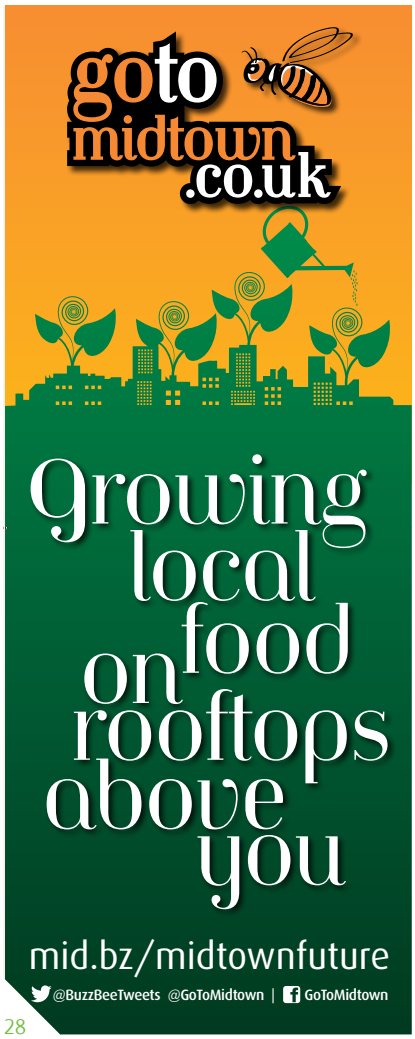
24. Meadow planting in Potters Fields Park, London Bridge. Credit: Mickey Lee and Associates.

IN PICTURES

25. A map from the Better Bankside GI Audit indicating functions of existing assets. Credit: Better Bankside and The Ecology Consultancy.

26

27



28

IN PICTURES

26. Tree champions: local businesses signing up for free watering cans to take care of the trees outside their premises. Credit: Victoria BID/Chris Loades.

27. A design concept for the John Lewis rain garden. Illustrations such as this can help to communicate to businesses the impact that completed schemes will have. Credit: Nigel Dunnett at The Landscape Agency.

28. A street banner designed by inmidtown to inform passers-by of new, productive green space. Credit: inmidtown.

STEP 3: DESIGN AND IMPLEMENTATION OF GI ASSETS

This is likely to be the most significant step in terms of resources required (time and cost), physical change within the BID and in enthusiasm from those involved. Whilst some visualisation may have been undertaken as part of the GI Audit itself, this will now need to be developed into detailed designs for specific GI assets. It is likely that consultants will need to be appointed to assist with this work.

Quick-wins: Interventions may vary in scale; from a single green roof, to the redesign of the public realm across the whole BID area. Many BIDs are finding that it is useful to move quickly to design and implement some 'quick-win' projects, which will then act as demonstration projects and catalysts. Defining what constitutes a 'quick-win' will depend on a range of factors, including funding, enthusiasm of partners and likely programme for implementation. Such projects usually build on existing initiatives and delivery mechanisms, an example is outlined in Box 12.

Funding: Detailed designs will enable better estimation of costs associated with implementation. However, unless funding for implementation is secured prior to development of the detailed design, the design should be flexible enough to be adapted to the needs of a range of potential funding sources. Working partnerships that have a range of priorities may lead to more imaginative funding solutions, perhaps with a combination of public and private funding sources for any one scheme. A funding approach adopted by Victoria BID for one of its schemes involves approximately one third of costs funded by the BID, one third by grants and one third by the business primarily benefitting from the scheme. Section 106 opportunities and Community Infrastructure Levy (CIL) are other potential funding sources (although Section 106 schemes will be phased out as detailed in Box 3).

Consents: It is important to understand the planning and consenting issues that may be associated with delivery of any potential new GI assets. These will be specific to the planned scheme, but may include:

- Planning permission
- Highways consent
- Listed Building or Conservation Area consent
- Environmental permits

Early engagement with local authorities and other statutory undertakers in the GI Audit process could help to identify which consents would be necessary, thus reducing delay and potentially abortive work (as reported by local authority interviewees).

12. BETTER BANKSIDE: GROWING THE URBAN FOREST INITIATIVE

Better Bankside is a BID in London, in between London Bridge and Southwark, with a membership of over 480 companies. They were able to move quickly to implement a number of initiatives following their GI Audit, partly as they already had the delivery mechanism set up as part of the Bankside Urban Forest programme. The examples below also demonstrate the importance of partnerships in delivery:

- One of the actions that followed on directly from the GI Audit was the development of the 'Planted Canopy' – a demonstration green roof. A green oak canopy structure has been built and planted with a range of plant species which will show how green roofs contribute positively to the urban environment. This 'quick-win' will be used to encourage others to get involved in similar projects.
- Working with partners Network Rail and Skanska, Better Bankside has installed a modular green wall. Over 25m^2 of vertical planting has transformed a wire mesh fence into a living garden.
- Better Bankside are also partnering with Southwark Council, the Mayor of London and Groundwork London to plant street trees in the area.

> Many BIDs are finding that it is useful to move quickly to design and implement some 'quick-win' projects

STEP 4: MANAGEMENT AND MAINTENANCE

At the time of publishing this guide only a few of the BIDs had begun the management and maintenance of new assets or taken early steps to plan for post-implementation. The BID itself is unlikely to be well placed to manage assets in the long-term, as it only has a five year term, which may not be renewed.

There are a number of partners who could be interested in adopting the management and maintenance of GI assets. These include:

- Local authorities, for assets within the public realm (e.g. public parks)
- Highways authorities, for assets within the highway (e.g. roadside trees)
- SuDS Approving Body/water authorities[32], for assets that have a drainage or water storage function (e.g. SuDS) – see Box 13
- Local wildlife groups, for assets with an ecological/ biodiversity function (e.g. trees, wildflower planting and community gardens, etc.)
- Private landowners and businesses, in particular for assets on their private land (e.g. green roofs)
- Community groups, for assets with a particular amenity value (e.g. food growing space)

Again, gaining consensus from partners early in the process may mean that they are more likely to be prepared to adopt the assets following installation because they contribute to their objectives. For example, the John Lewis rain garden in Victoria BID will benefit from one year of maintenance provided by the contractor after which John Lewis will maintain the garden.

13. WATER COMPANIES – SuDS AND WATER SENSITIVE URBAN DESIGN

SuDS is an approach to surface water management that combines a sequence of management practices and control structures designed to drain surface water in a more sustainable fashion than some conventional techniques.

SuDS can provide additional habitats for wildlife as well as improved visual amenity and can comprise streetscape assets such as permeable paving or rain gardens, as well as soft landscape assets such as swales.

Increasingly, there are examples of water companies recognising the benefits of adopting SuDS and Water Sensitive Urban Design. Reducing surface water run-off into combined sewers has financial and wider benefits for water companies, meaning they may be willing to invest in BID SuDS projects.

Dŵr Cymru Welsh Water has recently been involved in a feasibility study to implement a Water Sensitive Urban Design project in Grangetown in Cardiff, and other utility companies (including Thames Water and Yorkshire Water) are often willing to adopt SuDS if there is a demonstrable benefit in reducing run-off.

For more information on SuDS, see Appendix D or visit www.susdrain.org.

32. *Flood and Water Management Act*, 2010.

STEP 5: MONITORING AND EVALUATION

Evaluating the success of projects is always important to ensure continuous improvement. It is also a key part of increasing the evidence base on the value of GI to encourage more partners to get involved. The BIDs that have completed GI Audits in London have adopted different approaches to this. For example, one BID has recruited a full-time member of staff focused on GI implementation and another BID has created an internal GI sub-group. In some cases the GI Audit has not yet been used to its full potential by BIDs following its completion. It is thought that this is due to the lack of a specific vision being developed from the outset and limited engagement with potential partners. However, these BIDs still feel that the GI Audit was a useful process and will use it to target GI opportunities when funding becomes available.

It is useful to monitor the full range of potential benefits as described in Chapter 2. BIDs could set up a range of social, environmental and economic monitoring systems to review the impact of GI interventions that could include:

- Footfall, visitor numbers and dwell time
- Annual perception surveys of businesses, employees and visitors
- Number of sick days taken by staff
- Ecological monitoring of species present (see Box 14)
- Air quality monitoring
- Number of flood events/damage or lost earnings caused by flood events
- Increased income from the BID levy
- Updating quantitative data set out in the GI Audit
- Modelling of carbon sequestrated, water attenuated or cooling provided

Wherever possible, it is suggested that existing data sets are used to monitor the impact of interventions. For example, if the local authority already monitors the area's air quality, it is not suggested that the BID set up an alternative system. Worcester BID, as part of their Annual Report[33] has undertaken a survey with local residents to understand their perception of impact that GI interventions have had. Setting a clear vision and objectives at the outset will make it easier to set relevant Key Performance Indicators (KPIs) for measurement.

14. BAT MONITORING AND WELLBEING SURVEYS IN VICTORIA

Victoria BID is in the third year of its bat monitoring project, which aims to determine whether GI can improve urban biodiversity. The project is supported by the Bat Conservation Trust, Natural England and several businesses in the BID that are allowing access to rooftops on which bat detectors are placed. Bats are an important indicator of environmental quality in urban areas. By monitoring bat numbers and species over time, and before and after the installation of new GI the BID aims to gather data in regard to the changes in environmental quality and biodiversity in the area.

Defra have commissioned research in Victoria BID that will investigate what impacts greening improvements have for businesses, workers, visitors and residents by looking at these different groups' knowledge and behaviour before planting occurs and after the improvements have happened. The research is being carried out by the Cities Institute at the London Metropolitan University and the Stockholm Environmental Institute at the University of York. The first stage of the research was run between June and October 2012 and will be run again in 2014.

It is often difficult to isolate the impact of one particular intervention. For example, it could be difficult to define whether an increase in dwell time or footfall in an area was due to an increase in GI or wider initiatives carried out by the BID, or other development that had happened contemporaneously in the area. Consideration therefore needs to be given to this and attempts made to isolate the 'additionality' of the GI interventions over and above other external influences. However, whilst it is not always possible to attribute trends to the GI initiatives alone, it is useful to monitor any positive and negative trends. If the benefits of GI interventions can be well communicated to levy payers and businesses it will help to encourage them to invest in GI, resulting in a greater benefit to the BID as a whole.

33. *Worcester BID: Annual Report*, 2010-2011.

5. Conclusion

Green Infrastructure Audits have been found to provide a wide range of benefits to BIDs. These have included bringing in additional income, developing relationships with new partners, targeting investment to projects with the greatest benefit, and improved knowledge of the BID area and the range of functions that GI provides.

GI has many potential benefits for BID areas and for businesses and levy payers. To date, the benefits that have been most widely recognised have been in relation to the aesthetic value of GI. There is much wider value that can be exploited, for example, through delivering wider BID and business objectives whilst also increasing biodiversity, responding to climate change, improving air quality and providing water attenuation.

Developing strategic partnerships with local stakeholders helps to realise some of this wider value. Working with partners allows for a more creative and holistic approach to providing greater opportunities for funding and long-term management of GI assets. In addition, partners across the public, private and third sectors can provide access to information to inform a GI Audit.

Spending time early on generating support across a range of agendas and organisations will help to reduce delay at a later date and provide momentum to the project. A vision for GI in an area should link back to the wider aims and objectives of a BID, and to the priorities of the wider partnership.

A GI Audit itself will contain an overview of the context for the study, including the key drivers for the BID and details of the benefits of GI to the BID, levy payers and businesses. It will also identify the current GI resource within the BID area and its functional benefits, and will begin to identify the opportunities to enhance existing GI or increase the GI provision of the area.

However, a GI Audit alone will not lead to greening interventions. BIDs need to achieve support and buy-in from the outset. A GI Audit is a live document that helps the BID to improve the local area for the range of benefits that it brings. As set out in this guide, the GI Audit should form part of a wider approach process that includes:

- Vision and partnering: Providing direction and allowing the GI Audit to be as successful as it can be
- Design and implementation of GI assets: Taking the findings of the GI Audit and using them to inform real change
- Management and maintenance: Ensuring the long-term success of GI assets
- Monitoring and evaluation: Reviewing the success of interventions against the initial vision and design aspirations

By undertaking a GI Audit, the BID will acquire useful knowledge both of the baseline situation and of the opportunities in the local area to quickly move to the development of an action plan. Delivery against this action plan helps the BID to achieve its wider BID plans.

With appropriate partnerships, such as the Greening the BIDs steering group (see Box 8) and a structured vision and process, BIDs everywhere can play an important role in facilitating the successful delivery of GI that benefits the BID area, the wider environment and businesses within it. By demonstrating the importance that the business community places on this agenda, BIDs can meet priorities for themselves and other partners, and bring additional funding into the area.

Appendix A – Research Methodology

APPROACH TO THE STUDY

Two separate methods have been used to obtain information for the study: A literature review and targeted stakeholder interviews. The literature review focused on the process of undertaking GI Audits, the findings of existing GI Audits and documentation around the benefits and understanding of GI. The interviews have been divided into four stakeholder groups:

- BIDs that have undertaken GI Audits
- BID levy paying businesses, other businesses located within the BID, property developers, landowners and tenants
- Local authorities
- Other organisations with an interest in GI

The breadth of this research has ensured that a rounded view was obtained from stakeholders with differing agendas, but with an interest in urban greening. This knowledge has been used to understand which approaches appear to have been successful and why, informing the content of the Guide.

LITERATURE REVIEW

A wide range of literature and analysis is available in relation to GI, urban greening and BIDs. We identified key documents and literature, including:

- Green Infrastructure Audits
- BID Proposals and Annual Reports
- Key documents from the Landscape Institute, Natural England and other organisations

The literature was reviewed and key points that were relevant to this study and its relationship to BIDs were noted. The review highlighted contexts, insights and lessons learned that were relevant to any type of organisation undertaking a GI Audit. It also assisted in the production of a Recommended Reading list as part of the Guide.

INTERVIEWS

The research was underpinned by interviews with representatives from different groups that have provided direct insight, experience and knowledge in relation to:

- Drivers for undertaking a GI Audit
- Governance and project management approaches
- Key documents, data sets and organisations
- Linking GI Audits to wider business plans
- The extent that GI Audits have been successful in delivering real interventions

Different sets of interview questions were produced targeted to each of the groups identified above. The sets of questions were strongly linked, but worded differently to reflect the interview audience. The questions sought to gather both qualitative and quantitative information from our interviewees.

Where possible, the questions were sent to the interviewee, prior to a telephone interview taking place. This allowed them the opportunity to consider or research their answers fully, resulting in more reliable and detailed information being gathered from the process. The telephone interview process allowed the interviewer to explore particular areas in more detail and obtain a greater understanding than could be obtained through written responses.

Appendix B – Glossary of Terms

BIODIVERSITY

Biodiversity is a term used to describe the variety of life on Earth. It includes plants, animals, even micro-organisms invisible to the naked eye and bacteria which, together, interact in complex ways with the inanimate environment to create living ecosystems.

BUG HOTEL

A bug hotel provides invertebrates such as bumblebees, beetles and spiders a place to shelter and hibernate over the winter period.

BUSINESS IMPROVEMENT DISTRICT

A BID is a business-led and business funded body formed to improve a defined commercial area. A BID is funded through the BID levy, which is a small percentage of a businesses' rateable value. The majority of BIDs charge 1 % of rateable value; however, there are good reasons why some have opted for higher levies, particularly in locations with lower rateable values such as industrial areas.

CROSS RIVER PARTNERSHIP

Cross River Partnership is a public-private partnership that has been delivering regeneration projects in London since 1994. Originally formed to deliver cross-river infrastructure projects such as the Millennium Bridge and the Golden Jubilee Footbridges, Cross River Partnership has since diversified to deliver a wide range of cross-borough, multi-partner regeneration projects.

www.crossriverpartnership.org

GEOGRAPHIC INFORMATION SYSTEM (GIS)

GIS is a spatially referenced database, or 'a system to collect, store, manipulate, analyse and present spatially referenced data'.

THE GREATER LONDON AUTHORITY

The Greater London Authority (GLA) was established by the GLA Act 1999. Its staff are appointed by the Head of Paid Service, the GLA's most senior official, and serve both the Mayor and the London Assembly.

GREEN INFRASTRUCTURE (GI)

A strategically planned and delivered network of high quality green spaces and other environmental features. It should be designed and managed as a multifunctional resource capable of delivering a wide range of environmental and quality of life benefits for local communities. GI includes parks, open spaces, playing fields, roof gardens and private gardens.

GREEN INFRASTRUCTURE ASSET

A green infrastructure asset is an individual GI feature that is part of the wider GI network, such as a tree or a green roof.

GREEN INFRASTRUCTURE FUNCTION

GI functions are the roles that assets can play if planned, designed and managed in a way that is sensitive to, and includes provision for, natural features and ecosystem services. They may have obvious primary functions, but each asset can perform different functions simultaneously – a concept known as multi-functionality. For example, street trees add aesthetic quality to an urban area, but will also reduce airborne pollution, provide shade, reduce urban heat island effects, mitigate wind chill and turbulence, and increase biodiversity.

GREEN ROOF

A roof with plants growing on its surface, which if designed accordingly can contribute to local biodiversity. The vegetated surface provides a degree of retention, attenuation and treatment of rainwater, and promotes evapotranspiration.

GREEN WALL

A wall with plants growing on its surface without the need to root in ground level soil. A green facade is an alternative approach where climbing plants are rooted in the ground and trained to grow on a support system attached to the wall.

HABITATS OF PRINCIPAL IMPORTANCE

Fifty-six habitats of principal importance are included on the S41 list of the NERC Act. These are all the habitats in England that were identified as requiring action in the UK Biodiversity Action Plan (UK BAP) and continue to be regarded as conservation priorities in the subsequent UK Post-2010 Biodiversity Framework.

LOCAL ENTERPRISE PARTNERSHIP (LEP)

LEPs are partnerships between local authorities and businesses. They decide what the priorities should be for investment in infrastructure, buildings and facilities in the area. LEPs can apply for an area to become an Enterprise Zone. These zones can take advantage of tax incentives and simplified local planning regulations. So far 39 LEPs have been created, their locations can be found at: www.gov.uk/government/policies/supporting-economic-growth-through-local-enterprise-partnerships-and-enterprise-zones/supporting-pages/local-enterprise-partnerships

LOCAL NATURE PARTNERSHIP (LNP)

Local Nature Partnerships are located where partners in local areas wish to establish them. These partnerships will work at a strategic scale to improve the range of benefits and services we get from a healthy natural environment. They will aim to improve the multiple benefits we receive from the good management of the land. Part of their purpose is to become local champions influencing decision-making relating to the natural environment and its value to social and economic outcomes, in particular, through working closely with local authorities, LEPs and Health and Wellbeing Boards. More detail can be found at: www.defra.gov.uk/environment/natural/whitepaper/local-nature-partnerships/

NATURAL ENVIRONMENT AND RURAL COMMUNITIES (NERC) ACT

The Natural Environment and Rural Communities (NERC) Act came into force on 1st Oct 2006. Section 41 (S41) of the Act requires the Secretary of State to publish a list of habitats and species which are of principal importance for the conservation of biodiversity in England. The list has been drawn up in consultation with Natural England, as required by the Act.

The S41 list is used to guide decision-makers such as public bodies, including local and regional authorities, in implementing their duty under section 40 of the Natural Environment and Rural Communities Act 2006, to have regard to the conservation of biodiversity in England, when carrying out their normal functions.

RAIN GARDEN

In its simplest form, a rain garden is a shallow depression, with absorbent, yet free draining soil and planted with vegetation that can withstand occasional temporary flooding. Rain gardens help to deal more effectively with heavy rain, but they also filter and clean runoff.

SPECIES OF PRINCIPAL IMPORTANCE

There are 943 species of principal importance included on the S41 list of the NERC Act. These are the species found in England, which were identified as requiring action under the UK BAP and which continue to be regarded as conservation priorities under the UK Post-2010 Biodiversity Framework.

SUSTAINABLE DRAINAGE SYSTEMS (SuDS)

An approach to surface water management that combines a sequence of management practices and control structures designed to drain surface water in a more sustainable fashion than some conventional techniques.

SuDS can provide additional habitats for wildlife as well as improved visual amenity. SuDS can comprise streetscape assets such as permeable paving or rain gardens, as well as soft landscape assets such as swales.

SWALE

Swales are linear vegetated drainage features in which surface water can be stored and conveyed. They can be designed to allow infiltration, where appropriate. They should promote low flow velocities to allow much of the suspended particulate load in the stormwater runoff to settle out, thus providing effective pollutant removal.

URBAN HEAT ISLAND (UHI)

The increased temperature of urban air compared to its rural surroundings. The term 'heat island' is used because warmer city air lies in a 'sea' of cooler rural air.

Appendix C – Example Green Infrastructure Audit Brief

INTRODUCTION

This brief has been developed from an example provided by the Greater London Authority. Its inclusion within this Guide provides BIDs with an idea of what to include in their own brief to consultants.

Any brief written by a BID for their GI Audit should be specific to their BID area and identify specific drivers and desired outcomes. The brief below includes sections that commissioning organisations should complete to tailor the brief to their area.

BRIEF

The BID invites tenders to quote for completing a Green Infrastructure Audit (GI Audit) of the BID area. The project will present detailed findings of existing green infrastructure (GI) and identify opportunities to increase green cover.

Introduction to the BID

[TEXT TO DESCRIBE THE BID]

A map of the BID area (and the proposed GI Audit area if different) is enclosed.

The existing data and mapping that will be provided to the selected consultant is outlined below. Other mapping required to complete the GI Audit should be obtained by the selected consultant and reimbursed by the BID. Please provide an indication of datasets and associated costs as part of your submission.

[OUTLINE AVAILABLE DATA AND EXAMPLES OF INFORMATION THAT THE CONSULTANT MAY NEED TO OBTAIN]

Green Infrastructure: Good for Business

Greening is good for business. Increasing GI such as trees, parks, gardens and living roofs not only makes areas more attractive to visit and work in, but also helps urban areas to be more resilient to extreme weather events – thus helping to preserve economic sustainability.

Turning grey areas to green ones increases storage of rainfall, reducing the risk of surface water flooding and its impacts upon buildings and transport infrastructure. It also helps cool urban areas by increasing shade and evapotransporative cooling. Both will become increasingly important in light of projected increases in the severity and frequency of downpours and heatwaves. Furthermore, additional green spaces increase biodiversity by providing new habitat.

[TEXT INCLUDING CURRENT ENVIRONMENTAL CONCERNS AND ANTICIPATED BENEFITS OF INCREASING GI WITHIN THE BID]

[AMEND AS APPROPRIATE FOR SPECIFIC BID SCOPE]

For the purpose of this project, GI is taken to include parks, open spaces and green features in both the public and private realm, including trees, ground level and raised beds, green roofs, green walls, gardens and squares, allotments, parks and other areas of amenity or semi-natural greenspace. We therefore expect all of these features to be considered during the GI Audit work.

SCOPE OF THE GI AUDIT

[THIS SECTION SHOULD BE TAILORED TO THE BID's SPECIFIC NEEDS AND ISSUES UPON WHICH THEY WOULD LIKE TO FOCUS]

The key requirements of the successful consultant are to:

Use available data sources and a ground-truthing to map and describe the current GI resource in the BID area.

Provide a brief evaluation of the overarching functional benefits of the existing suite of GI.

Identify the key strategic and thematic opportunities to enhance or increase the GI provision of the area. **[THE FOCUS FOR THIS IS TO BE DECIDED BY THE BID]**

Produce a targeted delivery plan focusing on quick-win and projects with the greatest cost/benefit ratio.

The results of the GI Audit will be presented in a report, digitised in a GIS programme and summarised in a concise non-technical glossy document and PowerPoint presentation.

A lump sum fee quote should be provided for undertaking all elements of this work.

Approach

Required desk based analysis: An accuracy assessment of the digital data.

Determine qualitative information relating to the private realm and public realm so that these figures can be compared.

Required ground-truthing exercise: Location of private realm trees – we do not expect a comprehensive survey, but a ground-truthing exercise to judge the accuracy of GIS data sources. We expect consultants to devise a simple and efficient sampling strategy.

Mapping of vacant tree pits – we do not expect a comprehensive survey, simply the identification of these features as an incidental result of the ground-truthing exercise for trees in the private realm.

Audit of existing terrestrial GI resource and GI opportunities: The following information shall be recorded for each individual GI resource during the ground-truthing work:

- Description
- Primary function
- Brief evaluation of the benefits provided
- Scope to enhance

Each individual GI resource should be digitised as a separate polygon in a GIS programme, if not displayed in the base mapping. The above information should be linked to each polygon mapped in a GIS table.

It is likely that flat roofs will provide a large opportunity (in terms of area) for increasing green cover in the BID. The consultant is required to undertake a green roof and flat roof GI Audit to identify existing green roofs using digital aerial photography, knowledge from the BID contacts, etc. For any accessible green roofs record the type of green roof and primary function (i.e. roof garden; biodiversity).

Each roof should be digitised as a separate polygon in a GIS programme. The above information should be linked to each polygon mapped in a GIS database.

The consultant will use various data sources (such as aerial photography) to identify flat roofs that could potentially be greened.

Green roof feasibility survey: The consultant will undertake structural surveys of the flat roofs deemed to have the highest potential for greening. At least **[TO BE DECIDED BY THE BID]** roofs will be surveyed and a chartered structural engineer or surveyor must undertake this. These roofs should be concentrated on roofs with highest potential or in areas estimated to be at high risk of surface water flooding.

Outputs

The findings of the GI Audit will be presented in a report. **[TO BE DECIDED BY THE BID]** hard copies and a PDF file of the report are required. All GI features are to be digitised with required information attached in a corresponding GIS table.

Report style and content: The report will be used for two purposes: firstly a baseline and to inform GI interventions in the study area and secondly to explain and promote the benefits of GI to the wider BID partnership. Consequently, the report must be accessible to those with little or no previous understanding of the concept or benefits of GI. It should include:

- A summary of GI and its benefits
- Maps and figures detailing the results of the GI Audit and analysis
- A brief evaluation of the overarching functional benefits (if any) of the existing GI
- Identification of the key strategic and thematic opportunities to enhance or increase the GI provision in the BID area (NB based on the initial findings of the GI Audit) and estimation of the potential to increase green cover area
- Indicative scoring of the cost of installing and maintaining the key GI opportunities to aid prioritisation of future GI interventions by the BID
- A delivery plan

GIS outputs: Each type of existing GI should be mapped as a separate layer under the following groupings **[ADDITIONS OR REMOVALS TO BE DECIDED BY THE BID]:**

- Street trees
- Green open space in the public realm
- Private gardens
- Groups of trees (NB may overlap with green open space and private gardens)
- Green roofs
- Green walls
- Planters and raised beds

Each mapped layer must be linked to a GIS table, including details and the feature's precise location (8 figure grid reference).

TENDER PROCESS

Project management

Any questions regarding the content of the brief or the tendering process should be directed to:

[BID CONTACT]

It is expected that there will be one meeting at the inception of the project and a presentation to the BID at the end of the project. Please identify any additional proposed meetings with your submission.

Timetable and reporting

The project must be completed by **[INSERT DATE].** A timetable of milestones is set out below.

Milestone	Date
Tenders received	
Appoint consultant	
Initial meeting with consultants	
Draft report + presentation submitted	
Final report + presentation submitted	

Tender submission

Tenders must be received by **[XX/XX/XXXX]** and addressed to:

[BID CONTACT]

You should send your Proposal in a plain package, marked "CONFIDENTIAL – TENDER DOCUMENTS" in the top left hand corner.

Proposals will be received up to the time and date stated. Those received before that date will be retained unopened until then, please ensure your Proposal is delivered not later than the appointed time.

Fee Proposal

Please note that this assignment will be awarded on a fixed fee basis. Your Fee Proposal should provide fully inclusive costs (including an indication of any additional expenses). A Pricing Schedule should form part of your proposal.

Evaluation of tenders

The **[BID]** anticipates that the project will be undertaken by a suitable consultancy team that are:

- Highly skilled at using GIS to analyse and present data, including undertaking accuracy assessments;
- Experienced in the mapping and assessment of greenspace and the identification of enhancement opportunities; and
- Familiar with the principles of GI and have a working knowledge of landscaping options that can contribute to a GI network.
- Green roof experts

Evaluation Criteria

[INSERT BID SPECIFIC CRITERIA – E.G. 40% COST, 60% QUALITY AND EXPERIENCE]

Appendix D – Recommended Reading

GREEN INFRASTRUCTURE

Natural England – Green Infrastructure Guidance (NE176), 2011. Natural England's Green Infrastructure Guidance articulates Natural England's position in relation to green infrastructure planning and delivery, which is increasingly recognised as an essential part of sustainable spatial planning. This is due in no small part to the role of green infrastructure as a 'life support system', able to deliver multiple environmental functions and to play a key part in climate change mitigation and adaptation.

http://publications.naturalengland.org.uk/publication/35033?-category=49002

Landscape Institute – Green Infrastructure Position Statement, 2013. The aim of the document is to give public and private sector bodies, clients, and natural and built environment professionals fresh insights into the benefits GI can bring by creating multifunctional landscapes and show how people can collaborate to deliver it. It is also a chance to take stock of significant planning reform across the UK and shows how the landscape profession can lead in this area by the integrated use of GI in a way that will provide effective solutions.

www.landscapeinstitute.org/policy/GreenInfrastructure.php

Landscape Institute – Why Invest in Landscape?, 2011 The document features examples from across the UK where councils, house builders and private developers are reaping the rewards of putting the landscape at the heart of their thinking.

www.landscapeinstitute.org/invest/index.php

Victoria BID – Green Benefits in Victoria Business Improvement District, 2012. This report presents a baseline quantitative assessment of the air pollution, amenity, carbon storage and sequestration benefits of trees as well as the storm water and surface temperature benefits of existing green infrastructure in the Victoria BID.

www.victoriabid.co.uk/downloads/

CIRIA – Delivering biodiversity benefits through green infrastructure (C711), 2011. This guide aims to give clear messages about the goals and objectives of GI for the construction industry. It also seeks to serve as a tool to enable construction professionals to work together with other disciplines to maximise the opportunities presented by civil engineering and building projects, to enhance biodiversity and ecosystem services through GI, while minimising any negative effects on the environment.

www.ciria.org/SERVICE/Home/core/orders/product.aspx?-catid=2&prodid=1830

TREES

CIRIA – The benefits of large species trees in urban landscapes: A costing, design and management guide (C712), 2012. This document encourages the use of large species trees within the urban landscape, dispelling assumptions and myths regarding the whole life costs of planting and maintenance. It highlights social and environmental aspects and offers technical guidance covering planning, design, management and maintenance.

www.ciria.org/SERVICE/Home/core/orders/product.aspx?-catid=2&prodid=2005

Forestry Commission – Air temperature regulation by urban trees and green infrastructure, 2013. This review examines how the type of tree, its planting location, together with the mix of vegetation and paved surfaces in green space all contribute to countering the effects of urban heat islands.

www.forestry.gov.uk/fr/INFD-95REN7

Trees and Design Action Group – Trees in the Townscape: A Guide for Decision Makers, 2012. As well as playing a role in climate proofing our neighbourhoods and supporting human health and environmental well-being, trees can also help to create conditions for economic success. This guide takes a 21st century approach to urban trees, providing decision makers with the principles and references they need to fully realise this potential.

www.tdag.org.uk/trees-in-the-townscape.html

Woodland Trust – Trees in our Towns: The role of trees and woodland in managing urban water quality and quantity, 2013. While Government and public bodies have an important role in managing urban green space, businesses, communities and individuals can also help make our towns and cities better and safer places to live. The report looks at how planting trees in urban areas can help address surface water flooding and improve river health.

www.woodlandtrust.org.uk/en/planting-woodland/making-the-most-of-land/Trees-and-water/Pages/default.aspx

SuDS (INCLUDING RAIN GARDENS)

CIRIA – Model agreements for sustainable drainage systems (C626), 2004. This guide provides basic advice on the use and development of model operation and maintenance agreements for rainwater and greywater use systems together with simple guidance on their incorporation into developments. The guide identifies maintenance considerations and provides an outline of ways in which the long-term responsibilities for the maintenance of the rainwater and greywater use systems can be allocated.

www.ciria.org/SERVICE/Home/core/orders/product.aspx?-catid=2&prodid=115

CIRIA – Retrofitting to manage surface water (C713), 2012. This guidance sets out a process to achieve the retrofitting of surface water management measures. It integrates the principles of urban design with surface water management.

www.ciria.org/SERVICE/Home/core/orders/product.aspx?-catid=5&prodid=1909

CIRIA – The SuDS Manual (C697), 2007. Provides guidance on the planning, design, construction and maintenance of Sustainable Drainage Systems (SuDS) to assist with their effective implementation within developments. It addresses landscaping, biodiversity issues, public perception and community involvement as well as water quality treatment and flood risk management.

www.ciria.org/service/AM/ContentManagerNet/MembersOnly.aspx?NavMenuID=845&ContentID=12339&DirectListComboInd=D

CIRIA – Water Sensitive Urban Design in the UK (C723), 2013. The document brings together a number of key strands and has identified the benefits and opportunities of Water Sensitive Urban Design (WSUD) in a UK context. It is a journey that no one organisation can take on their own and it will require collaboration to embrace the organisations, disciplines and individuals to deliver a radical change in how water is perceived and managed in the UK.

www.ciria.org/service/free_publications/AM/ContentManagerNet/ContentDisplay.aspx?Section=free_publications&ContentID=25333

ODPM – Interim Code of Practice for SuDS, 2004. The document aims to facilitate the implementation of sustainable drainage in developments in England and Wales by providing model maintenance agreements and advice on their use. It provides a set of agreements between those public organisations with statutory or regulatory responsibilities relating to SuDS. It aims to make the adoption and allocation of maintenance for SuDS more straightforward.

www.environment-agency.gov.uk/static/documents/Business/icop_final_0704_872183.pdf

UK Rain Garden Guide, 2012. Sponsored by Thames Water and supported by CIRIA and the Environment Agency, this document provides information on the benefits and design of rain gardens including planning, construction and maintenance advice.

http://raingardens.info/

RSPB / WWT – Sustainable drainage systems: Maximising the potential for people and wildlife. A guide for local authorities and developers, 2012. This guide is aimed at local authorities (and eventual SuDS Approving Bodies (SABs)), landscape architects, developers, engineers, masterplanners and anyone wishing to deliver benefits for people and wildlife through SuDS. It describes how to maximise the biodiversity potential of SuDS and identifies a set of design criteria and the design features required to deliver these benefits as well as their long-term management.

www.rspb.org.uk/Images/SuDS_report_final_tcm9-338064.pdf

GREEN ROOFS AND WALLS

CIRIA – Building Greener: Guidance on the use of green roofs, green walls and complementary features on buildings (C644), 2007. This guidance results from a detailed assessment of published information on green roof and walls; it provides guidance on their design, construction and operation. The guidance also describes how quick-wins for biodiversity can be achieved in the built environment by incorporating nesting and roosting boxes for birds, bats and other animals.

www.ciria.org/SERVICE/Home/core/orders/product.aspx?-catid=2&prodid=130

Greater London Authority – Living Roofs and Walls, 2008. The document investigates the practical benefits of living roofs and explores the different barriers to their implementation. It helps support the delivery of the new London Plan policy, build a greener London and in turn makes our roofs places for life.

www.london.gov.uk/priorities/environment/greening-london/urban-greening/greening-roofs-and-walls

Buglife – Creating Green Roofs for Invertebrates: A Best Practice Guide, 2012. This guidance is aimed at anyone who is considering installing or planning to install a biodiverse green roof. It outlines how green roofs can support invertebrates, particularly those associated with wildlife-rich brownfield sites.

www.buglife.org.uk/Resources/Buglife/GreenRoofGuide_P5.pdf

Green Roof Guide An interactive online guide detailing how to design and install good quality green roofs in the UK.

www.greenroofguide.co.uk

Living Roofs. An independent portal supported and sponsored by the leading green roof companies in the UK. On the site is the latest information on research into the benefits of green roofs and green walls, definitions of extensive, intensive and biodiverse green roofs and case studies of seminal green roof projects throughout the UK.

www.livingroofs.org

PARKS, GARDENS AND SQUARES

CABE – Making Contracts Work for Wildlife: How to encourage biodiversity in urban parks, 2006. Making contracts work for wildlife advises green space professionals on how to make the most of the potential for biodiversity in our urban parks. It shows how the commitment of individuals and employers can make the difference between failure and inspiring success.

www.designcouncil.org.uk/our-work/CABE/Publications-resources/CABE-publications/Making-contracts-work-for-wildlife/

CABE – The Value of Public Space: How high quality parks and public spaces create economic, social and environmental value, 2004. A report showing how cities in the UK and around the world have used their public spaces to deliver economic, health and social benefits.

www.designcouncil.org.uk/our-work/CABE/Publications-resources/CABE-publications/The-value-of-public-space/

CABE – Urban Green Nation: Building the evidence base, 2010. No one knows exactly how many green spaces there are in our urban areas, where they are, who owns them or what condition they are in. This report starts to fill the information gap. It is of interest to policymakers and decision makers in central and local government and anyone interested in understanding more about England's urban green spaces.

www.designcouncil.org.uk/our-work/CABE/Publications-resources/CABE-publications/Urban-Green-Nation/

London Parks and Greenspaces Forum – London's Small Parks and Squares – A Place for Nature? The report emphasises the importance of green spaces as wildlife habitats and, secondly, it provides evidence and information, which will facilitate the publication of good practice guidelines for managers of both public and private green spaces to consider.

www.lbp.org.uk/downloads/Publications/HabitatInfo/05 small parks&squares final report.pdf

ECOLOGICAL DESIGN

Bat Conservation Trust – Landscape and Urban Design for Bats and Biodiversity. The document presents effective measures that designers, consultants, developers and planners can use to enhance biodiversity on sites of all sizes with a focus on bats. The content covers landscape design features such as urban woodlands, trees, urban wetlands, green roofs, walls, linear features, eco-passages and lighting from a bat ecology perspective. It also includes a useful plant species list categorised by features such as rain gardens, green roofs, living walls, and bed and borders based on plants that provide benefit to bats.

www.bats.org.uk/publications_download.php/1180/Landscape_and_urban_design_for_bats_and_biodiversityweb.pdf

Olympic Learning Legacy – Habitats for birds and bats on the Olympic Park. Habitats have been provided on bridges for house sparrows, swifts, starlings, black redstarts and bats. To enable the highest possible use of the habitats, the naturally preferred living arrangements have been taken into account for each species and each approach is described within the document.

http://learninglegacy.independent.gov.uk/documents/pdfs/design-and-engineering-innovation/7-bird-bat-boxes-dei.pdf

Appendix E – Acknowledgements

This Guide was commissioned by the Victoria Business Improvement District and prepared by Arup. It has been undertaken with valuable funding support from Natural England, administered via the regeneration agency, Cross River Partnership.

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Interviews were carried out with representatives from the organisations listed below.

BUSINESS IMPROVEMENT DISTRICTS

- Baker Street Quarter
- Bath BID
- Better Bankside
- Camden Town Unlimited
- Cheapside Initiative
- Hammersmith BID
- inmidtown
- New West End Company
- Newcastle NE1 Ltd
- Northampton BID
- Team London Bridge
- Victoria BID
- Waterloo Quarter

BID LEVY PAYING BUSINESSES, OTHER BUSINESSES LOCATED WITHIN THE BID, PROPERTY DEVELOPERS, LAND-OWNERS AND TENANTS

- The Department for Business, Innovation & Skills British Land
- Capita
- The Crown Estate
- DP World
- Grosvenor
- John Lewis
- Land Securities
- Lyric Hammersmith
- Novotel London West
- Portman Estate
- Tate Modern

LOCAL AUTHORITIES

- City of London
- Islington Council
- London Borough of Hammersmith and Fulham
- London Borough of Lambeth
- Southwark Council
- Westminster City Council

OTHER ORGANISATIONS

- British BIDs
- CIRIA
- Cross River Partnership
- Defra
- The Ecology Consultancy
- Greater London Authority
- Greenspace Information for London (GiGL)
- The Green Roof Consultancy
- Land Securities
- Land Use Consultants
- Landscape Institute
- Natural England
- Treecomomics
- Thames Water
- Trees and Design Action Group

Appendix F – Example Proforma[34]

Vauxhall One Green Infrastructure Audit - terrestrial

Site ID:

Site name/location:

Site size: sq m E N

Survey date: Surveyor:

Site photograph

Site plan

Desk-based information

Are there any heritage features in or adjacent to the site:

Is the site within a GLA Area of Wildlife Deficiency:

Is the site a SINC

Site category (tick box)

Existing Potential

Local park	Wetland/ standing water	Grass verge
Pocket park	Derelict building plot	Hedge
Garden or square	Highway infrastructure e.g. traffic island	Planter/ raised bed
Community garden/ Allotment	Street tree in pit	
Shrub plantings	Pavement or other hard surface	

Condition of GI (tick box)

Good (signs of active management)	Moderate (signs of limited management)	Poor (few signs of management)

Current management

Mowing/grass cutting (please specify)

Specify here:

Pruning or other tree maintenance

No obvious signs of management

Appears unmanaged/overgrown

Productive use for food

April 2013 LUC

34. Land Use Consultants, April 2013.

Vauxhall One Green Infrastructure Audit - terrestrial

Landcover/habitat types present (tick box)

Amenity grassland ☐
Semi-natural grassland ☐
Woodland ☐
Scrub/shrubs (please indicate wildlife value) ☐
Value
Other (please specify):

Building ☐
Pavement/paved area ☐
Highway ☐
Traffic island ☐
Roof ☐
Green space ☐

Function

Primary function (insert "1" in box) / Secondary function (insert "2" as appropriate)

Public use: informal recreation:
Public use: formal recreation:
Visual/amenity:
Wildlife:

Food growing/productive use:
Flood management/water storage:
Not in active use but managed:
Not in use/derelict:

Scope for enhancement

Enhance existing function (please specify opportunities e.g. biodiversity, flood storage, visual appearance etc):

Create new function / feature tick box):

Wildflower meadow/semi-natural grassland ☐
Tree-planting: woodland ☐
Wetland features/rain gardens ☐
Water storage feature ☐

Green wall/climbing plants ☐
Substantial window box ☐
Floristic annual planting ☐
Food growing: fruit trees/vegetables ☐

Street tree ☐
Shrub ☐
Planters ☐

Additional comments:

Ease of delivery

Easy/quick win ☐ Moderate ☐ Challenging ☐

Barriers to delivery (tick box)

Isolated/ poor visibility ☐
Current uses , e.g. active use, transport infrastructure ☐
Listed buildings or other building constraints ☐

Underground services - water mains , gas, telecoms, sewers ☐
Wayleaves (strip of land that allows access to underground service) ☐

Approximate cost (tick box)

Less than £5k ☐ £5-15k ☐ £15-30k ☐ More than £30k ☐

Any other notes/ observations:

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The Green Infrastructure Audit Best Practice Guide pioneered by Victoria BID is a superb innovation to the BID toolbox and demonstrates the ability of Business Improvement Districts to engage local businesses at many different levels

Dr Julie Grail, Chief Executive, British BIDs

NATURAL ENGLAND

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