



Green and blue infrastructure:

A transport sector perspective



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Supporters

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Executive summary

This document is intended for use by all the countries within the UK, but we appreciate that some phrasing is specific to the context in England. We ask that you interpret the terminology as appropriate for your country.

It is widely recognised that green and blue infrastructure (GBI), which encompasses natural and semi-natural features, interventions, and structures, can bring many social, environmental, and economic benefits to a local area. However, a recent CIHT survey suggests that these benefits are not fully acknowledged by the transport sector, even though the UK’s great heritage of street trees was largely created by local authority highway departments.

Despite there being a wide range of general policy and guidance relating to GBI, we have found that there is comparatively little resource given to street- and road-specific GBI, which is disappointing as streets and roads have the potential to play a vital role in delivering GBI. This lack of guidance is a crucial part of why local authorities (including the planning, development, highways operations, and maintenance functions) struggle to fully engage in the GBI process.

Our survey findings reveal a disconnect between authority departments as GBI proposals in planning applications move through from the policy team to the development management team, and are subsequently deployed by highways and sustainable drainage systems (SuDS) engineers. Again, this appears to stem from a lack of guidance and support available that would provide necessary information to support formalised systems within the highway network.

On this basis, we have made several recommendations to our members, central government agencies, and local authorities, which broadly cover three main tasks we believe are necessary to help improve and encourage GBI on our roads.

Our Recommendations

1. Greater promotion of GBI

As a professional transport body we believe we have a great responsibility in this area, so the CIHT has set out to:

- ✔ work with government bodies such as the Department for Transport (DfT), Department for Environment, Food and Rural Affairs (DEFRA), and Department for Levelling Up, Housing and Communities (DLUHC) and local authorities to raise the profile of GBI and jointly promote the associated benefits
- ✔ provide a CIHT Learn course on GBI in the transport sector
- ✔ call for evidence on GBI within our transport network.

We ask our members to:

- ✔ make the most of resources provided
- ✔ actively get involved in discussions about GBI
- ✔ seek to implement GBI into future projects.

We recommend that local authorities:

- ✔ promote the benefits of GBI to your employees and those you work with
- ✔ undertake the necessary skills training to better understand how GBI can be implemented and maintained effectively.

2. Improved GBI guidance for local authorities

To help support local authorities, the CIHT will:

- ✔ work with the UK Roads Leadership Group (UKRLG) to develop a set of national GBI standards and specifications
- ✔ provide a CIHT Learn course on best practice on the end-to-end GBI process and guidance on what GBI suppliers should be providing.

We recommend that the DfT:

- ✔ sets GBI guidelines for local authorities to follow
- ✔ includes GBI criteria within the DfT incentive fund self-assessment.

3. Empowered local authorities

We recommend that central government bodies:

- ✔ review current funding available to encourage GBI
- ✔ create a nationally agreed framework for commuted sums.

We recommend that local authorities:

- ✔ establish formalised systems to include GBI within the highway network and planned improvements
- ✔ create a performance framework for GBI to measure success and assign responsibility for targets.

In this piece, we provide the relevant context for implementing GBI, from international reports, such as the Dasgupta Review, to local council strategies. We then discuss the findings from a CIHT survey that gathered the opinions of those working in the transport sector on GBI, which found that there is a lack of awareness in the sector on what GBI is and that this knowledge-gap is slowing planning and implementation progress. Finally, we detail how we see our recommendations being implemented.

It is our belief that if all players involved in the GBI process understand what is required to succeed at each stage (planning, design and delivery, adoption, and maintenance) we will see more innovative and successful GBI projects.

Contents

1. Introduction.....	6
2. Context and support for GBI.....	8
2.1 Government strategies.....	8
2.2 Summary of GBI-related policy and guidance.....	10
2.3 The importance of streets and roads for GBI.....	12
2.4 Case studies: the benefits of GBI.....	13
2.4.1 Connectivity and accessibility – green linkages.....	13
2.4.2 Economic value – garden villages.....	13
2.4.3 Air quality management – green roofs and walls.....	14
2.4.4 Flood management – rain gardens.....	14
2.4.5 Creating beautiful places – value of trees toolkit.....	15
3. GBI stakeholder survey results.....	16
3.1 Background of survey respondents.....	16
3.2 Opinions from those who are currently implementing GBI projects.....	17
3.3 Opinions from those who are not currently implementing GBI projects.....	18
3.4 What more needs to be done to encourage GBI development?.....	19
4. Going forward.....	21
4.1 Why the UK needs GBI.....	21
4.2 CIHT actions and resources.....	21
4.3 Our recommendations.....	22
4.3.1 Recommendations for CIHT members.....	22
4.3.2 Recommendations for DfT, DLUHC, and DEFRA.....	22
4.3.3 Recommendations for highway and roads authorities.....	22

1. Introduction

GBI encompasses natural and semi-natural features, interventions, and structures that provide functions and benefits for an area.

The “green” component refers to a wide range of green features including street trees, natural and

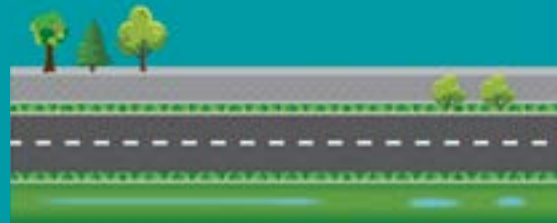
semi-natural vegetation, green roofs and green walls, woodlands, grasslands, and parks. The “blue” component includes rivers, canals, ponds, rain gardens, swales, filter strips, which are all integrated into the management train of Sustainable Drainage Systems (SuDS).



Buildings

GBI - Buildings assets include:

- Green roofs
- Green walls
- Gardens or grounds
- Rainwater collection systems
- Driveways (permeable)
- Trellises/pergolas



Streets

GBI - Streets assets include:

- Boundary features (hedges)
- Street trees
- Grass verges
- Sustainable Drainage Systems (e.g. swales)
- Porous paving



Neighbourhoods and Countryside

GBI - Neighbourhood assets include:

- Amenity greenspaces
- Pubic parks & gardens
- Play areas
- Allotments
- Community growing spaces
- Playing fields, sports pitches
- Cemeteries
- Churchyards
- Swales, reeds
- Urban woodlands
- Ponds
- Water courses
- Urban nature reserves
- Conservation areas

GBI - Countryside assets include:

- Historic parks and gardens
- Country parks
- Forests, woodlands & nature reserves
- Downland, grasslands & heathland
- AONBs
- World Heritage sites
- Farmland

Effective GBI has many benefits to an area for road users, local residents, visitors, vendors and local authorities.

These benefits can broadly be grouped into four key areas:



Environmental

GBI can provide:

- Climate resilience for drought and flooding
- Street cooling
- Carbon sequestration and storage
- Wildlife enhancement and nature recovery
- Create new areas for biodiversity



Economic

GBI can increase:

- Property values
- Footfall to shopping streets



Social

GBI can:

- Provide beautiful places for people to meet and socialise
- Create a sense of place and community
- Increase local engagement in planning and conservation



Health

GBI can:

- Reduce air pollution
- Reduce noise pollution
- Increase exercise and active travel
- Positively impact people's mental health

Traditionally, when it comes to investment, there has been a focus on grey infrastructure such as rail, roads, bridges, pipes, and cables. A recent [IPPC report](#) urged for a focus on climate-resilient development and highlighted that grey infrastructure misses the opportunity to provide services while also enhancing eco-systems.

Implementing GBI within the highway network is an opportunity to tackle the climate emergency, an identified policy priority in most local authority areas

in the UK. It is also a way to take action to support the delivery of green, resilient, accessible places and healthier sustainable transport options. [CIHT's Improving Local Highways document](#) highlights that the government should work with the sector to develop a new focus for the local highway network that supports the delivery of a carbon-neutral system, creates sustainable, green, resilient, and accessible places, makes transport healthier, and helps the economy grow.

2. Context and support for GBI

2.1 Government strategies

In 2021, an independent global report into [The Economics of Biodiversity](#) was published. Written by Professor Sir Partha Dasgupta (also referred to as the Dasgupta Review) and commissioned by the Treasury, this report emphasised the importance of nature, claiming it is our most important asset both now and for future generations. It focused on the relationship between nature and the economy, criticising the global population for creating demands on nature that far outweigh what it can supply. It also claimed that there has been an institutional failure, exacerbated by governments who “pay people more to exploit nature than to protect it”, and called for them to invest in nature.

The 2021 [Nature for people, climate and wildlife](#) policy recognised this call for investment by the Dasgupta Review. Published by DEFRA, it also acknowledged the role COVID-19 has played in increasing people’s awareness of the importance of outdoor space. The piece included an announcement that DEFRA will be updating the Environment Bill to set a legal target for species abundance by 2030. The department stated it hoped this will be the “net zero equivalent for nature”. To help achieve this goal two action plans have been put in place, supported by £640 million from the Nature for Climate Fund: one for restoring, managing, and protecting peatlands, the [England Peat Action Plan](#), and one for increasing and protecting our woodlands, the [England Trees Action Plan](#).

The England Trees Action Plan set out a vision for the future, where:

- ✔ 12% of England’s land will be woodland by 2050
- ✔ the value of nature is better understood by everyone
- ✔ a skilled workforce is in place to plant and manage trees.

To help with this, £6 million was given to the [Urban Tree Challenge Fund](#) to support the planting and establishment of standard trees in urban and peri-urban areas, and the [Local Authority Treescape Fund](#) (£2.7 million) was created to help plant trees outside of woodlands. The action plan also committed to plant three new community forests and 6,000 hectares of new woodland around towns and cities. This action came as a

response to the [England Tree Strategy](#) – a consultation piece based on the opinions of 20,400 responses. The majority of respondents were members or supporters of Friends of the Earth, the Woodland Trust, or Rewilding Britain, but the consultation also included opinions from members of the public, landowners, and managers, farmers, foresters, and local authorities.

The England Tree Strategy consultation noted that community engagement in nature is crucial for planting new trees, and if the public were more educated on the benefits of nature this would help to boost engagement. It also noted that [community forest](#) schemes can be a great way to get the public interested in planting and preserving trees, and are effective in getting public opinion on green-infrastructure decision-making.

When asked where the responsibility for implementing GBI lies, the majority of respondents stated that it falls to:

- ✔ local authorities to deliver green infrastructure
- ✔ central government to provide technical and financial support
- ✔ national parks and areas of outstanding natural beauty (AONB) to provide coordination and leadership.

The DLUHC expressly highlighted the importance of green infrastructure in its 2016 (updated in 2019) [Natural Environment Guidance](#), and how it can help to achieve planning goals, such as:

- ✔ competitive economies
- ✔ well-designed places
- ✔ healthy and safe communities
- ✔ mitigating climate change, flooding, and coastal erosion
- ✔ conserving and enhancing the natural environment.

It called for district-wide policies and strategies that are evidence-based, assess the quality of current GBI, and identify gaps in the current provision. It also recommended that GBI should be considered at the earliest stages of development proposals, and national/local strategies and standards be consulted to inform decisions.

In terms of using GBI for flood management, the [National flood and coastal erosion risk management strategy](#) specifically called for a use of “nature-based solutions to slow the flow of or store flood waters”, and the [Environment Agency published guidance](#) on how to do this. This included advice to plant trees and hedges, which will absorb excess water (thereby reducing water pollution and run-off), as well as advice to divert high water flows and create more areas to store water.

Where a natural solution to flood management is not suitable, [SuDS](#), such as permeable pavements, swales, rain gardens, detention and retention ponds, and underground storage, can be an appropriate GBI

alternative as they aim to mimic natural drainage systems. The [National Planning Policy Framework](#) set out that SuDS should be incorporated in all major developments and any developments in areas at risk of flooding. DEFRA recently published an assessment of [how strategic surface water management informs SuDS](#). This looked at how current surface water management plans can be made more effective for defining requirements for SuDS. It made 30 recommendations for the government to consider, one of which called for guidance to “describe the role of highways authorities in strategic surface water management so that they can be more consistently engaged”.

2.2 Summary of GBI-related policy and guidance

Clearly the policy and guidance provided on GBI is vast and calls for more engagement from the transport sector in terms of planning and delivery. To help inform those seeking specific information on GBI we have put together a summary of the resources available on planning, delivering, and maintaining GBI, at various levels, seen below.

The law, policy and guidance referenced can be accessed by clicking on the document names in the table.

Table 1: List of the policy and guidance documents available at an EU, national, and local level.

Level	Law and Policy	Guidance
Global		The Economics of Biodiversity Global Biodiversity Framework
EU	Green Infrastructure Strategy 2013 EU Biodiversity Strategy for 2030	
National	Environment Act 2021 Flood and Water Management Act 2010 HM Government, A Green Future: Our 25 Year Plan to Improve the Environment Natural Environment and Rural Communities Act 2006 National Planning Policy Framework National policy statement for national networks The Ten Point Plan for a Green Industrial Revolution	National Model Design Code National Design Guide Building with Nature Green Infrastructure Standards Framework Planning Practice Guidance – Natural Environment Biodiversity Net Gain Code of practice for the sustainable use of soils on construction sites Trees, Planning and Development Trees in Hard Landscapes Trees in the Townscape Use nature-based solutions to reduce flooding in your area Greenspace establishment practices The SuDS Manual Achieving Sustainable Drainage How Strategic Surface Water Management Informs Sustainable Drainage Systems (SuDS) Delivery in Developed Areas Through Spatial Planning and Development Management BS 3998:2010 Tree work BS 5837:2012 Trees in relation to design, demolition and construction BS 42020:2013 Biodiversity. Code of practice for planning and development BS 8545:2014 Trees: from nursery to independence in the landscape BS 8683:2021 Process for designing and implementing Biodiversity Net Gain
England	Nature for people, climate and wildlife National flood and coastal erosion risk management strategy	Natural England's Green Infrastructure Guidance Natural England's Green Infrastructure Framework Environmental Improvement Plan 2023
Scotland	The Draft Fourth National Planning Framework Roads Scotland Act 1984 Nature Conservation (Scotland) Act 2004 Water Environment and Water Services (Scotland) Act 2003 Flood Risk Management (Scotland) Act 2009 Creating Places: A policy statement on architecture and place for Scotland Designing Streets: A Policy Statement for Scotland	Green Infrastructure: Design and Placemaking Water-resilient places – surface water management and blue-green infrastructure
Wales	Planning Policy Wales Natural Resources Policy SuDS Statutory Guidance	Welsh Government's Green Infrastructure Guidance National Roads Development Guide
Northern Ireland	Strategic Planning Policy Statement Planning Policy Statement 15 – Planning and Flood Risk Water and Sewerage Services Act (Northern Ireland) 2016	A Green Recovery for Northern Ireland The Biodiversity Duty
Local	Localism Act 2011 Local Nature Recovery	London Environment Strategy SuDS in London Creating health-promoting environments Sustainable drainage systems – maximising the potential for people and wildlife

2.3 The importance of streets and roads for GBI

While there are various forms of GBI that occupy large areas such as woodlands, grasslands, parks, and lakes, a great majority of GBI is found on our streets.

Some examples of this are:

- ✔ street trees
- ✔ green verges
- ✔ green walls
- ✔ hedgerows
- ✔ verges
- ✔ parklets and pocket parks
- ✔ ditches
- ✔ planters
- ✔ private gardens
- ✔ pervious pavements
- ✔ canals
- ✔ rain gardens
- ✔ swales
- ✔ surface and subsurface drainage networks
- ✔ balancing ponds
- ✔ ponds

Streets are a logical place to implement GBI as the improved air quality and sound attenuation they bring will naturally help to decrease the air and noise pollution caused by road traffic vehicles.

Roads also serve a purpose as linear green linkages, whereby the strips of trees and plants that run alongside roads provide a means for connecting green spaces and [reversing the effects of fragmentation on biodiversity](#).

Additionally, as more road space is allocated to GBI, walking and cycling can become more attractive modes of transport, helping to increase active travel.

As so much GBI is placed on our streets, much of the responsibility for implementing and maintaining GBI falls onto local authorities. Despite this, there is relatively little street-specific policy and guidance available to those looking to implement, manage, and maintain GBI on our streets and roads. This lack of whole-life guidance is a crucial part of why local authorities struggle to fully engage in the GBI process. The guidance that is available is summarised in the table below. CIHT is currently working with the DfT and DLUHC on a revised version of the government's Manual for Streets, which will cover several of the issues developed in this document. Publication is anticipated in 2023.

Document name	Summary
Design Manual for Roads and Bridges LA 108 - Biodiversity	Requirements for assessing and reporting the effects of highway projects on biodiversity
Guidance Notes: Highways Statutory Duties and Vested Powers	Highway authority responsibilities in terms of Highway drainage infrastructure
Highway Tree Management	Examples of good practice tree and highway management with respect to trees growing within the curtilage of the highway
Plantlife – The good verge guide	Recommendations on what to plant to encourage diverse road verges
National Roads Development Guide	Scottish guidance on developing roads that includes street planting considerations

Table 2: Policy and guidance documents available that focus on GBI within the transport sector.

Further guidance for local authorities is needed to establish formalised systems within the highway network and for planned improvements that set a framework for users to measure success and assign responsibility for targets. This is discussed further in our recommendations section.

2.4 Case studies: the benefits of GBI

We believe that if there was a greater acknowledgement of the benefits that GBI can provide, this would relieve a lot of the hurdles currently slowing down the progress of GBI roll-out on our highways. With this in mind, we have collated a series of case studies that provide examples of how GBI can improve connectivity and accessibility, increase economic value, and provide both air quality management and flood management.

2.4.1 Connectivity and accessibility – green linkages

Manchester's Green Trail

Task: [Manchester City Council set out](#) to improve connectivity and accessibility to GBI, ensuring that “all communities can have access to high-quality GI, both within their local area, and out to other areas of the city and wider conurbation”.

GBI solution: Green linkages – paths, streets, or roads that connect green areas together, increasing accessibility to open spaces for health and recreational activities, while also encouraging biodiverse networks.

Implementation: In 2012 Manchester's Green Trail was established, creating a 63-mile circuit that connects eight of the city's parks and other green areas. The walking route was established by Manchester City Council, City of Trees, the Ramblers Association, Living Streets, and Transport for Greater Manchester. Later in 2018 the routes were updated to make them more accessible from public transport.

Benefits: Creating these green links allows those who live in areas where new green spaces cannot be created to still be able to access parks and recreational facilities. Making these green and open spaces more accessible increases footfall, which in turn creates a safer and more inviting atmosphere. Additionally, greater access and more attractive walking routes promote active travel, thus encouraging healthier lifestyles.

2.4.2 Economic value – garden villages

St Cuthbert's Garden Village

Task: Carlisle City Council wanted to focus on using green infrastructure as a tool for economic recovery. In a bold statement made by the council in its [Green Infrastructure Strategy](#), it claimed: “Some people will question this strategy, and imply that the 'environment' is effectively a luxury item fundable in the good times but a luxury when the going gets tough. This view is mistaken. There has never been a better time to take stock of realities and look to the future with a clear vision of progressive change.”

GBI solution: Garden village – a settlement of approximately 1,500 to 10,000 homes that enhances the natural environment and offers high-quality affordable housing and locally accessible work in beautiful, healthy, and sociable communities. (Sources: [UK Government](#), [Town and Country Planning Association](#))

Implementation: In partnership with [Arup](#), the [creation of the village](#) will provide 10,325 new homes and approximately 225 ha of open green space including natural and semi-natural green space, parks and gardens, amenity green space, playgrounds, and sports fields.

Benefits: When complete, the village will be a means of attracting new revenue streams through investment and tourism, while also contributing to a 10% increase in biodiversity in the area.

2.4.3 Air quality management – green roofs and walls

Skainos Building, Belfast

Task: Increase green infrastructure on congested roads despite there being considerable space constraints.

GBI solution: Green roofs and walls – a [green roof](#) is a roof of a building that is covered with a small layer of vegetation, which provides many benefits such as rain water capture, carbon capture, and building insulation, and improves aesthetics. Similarly, green walls or “living walls” are external structures fitted to walls that allow plants to grow up them. Like green roofs, [green walls](#) provide insulation and improved aesthetics, while also acting as noise protection.

Implementation: The [Skainos Building](#) in Belfast is covered in a large green roof and a 500 m² green wall [containing over 6,500 plants](#).

Benefits: According to Belfast City Council, the building “was specifically designed to be an example of a sustainable and environmentally conscious building to be replicated elsewhere in Belfast. The site was constrained by space availability and is located near to a main road so required any greenery to be integrated into the building design.”

2.4.4 Flood management – rain gardens

Greener Grangetown, Cardiff

Task: The City of Cardiff Council needed to decrease the amount of rainwater entering Cardiff’s sewerage system, to prevent flooding and to protect the sewer’s long-term resilience.

GBI solution: Rain gardens

RHS says: “Put simply, a rain garden is a shallow area of ground or dip which receives run-off from roofs and other hard surfaces. It is planted with plants that can stand waterlogging for up to 48 hours at a time. More drought-tolerant plants are used towards the edges. Storm water fills the depression and then drains.”

Implementation: In collaboration with Arup, water utility Dŵr Cymru Welsh Water, and environmental authority Natural Resources Wales, 108 rain gardens were created and 130 trees were planted.

According to Arup: “When it rains, water flows into the rain gardens where hardy plants and trees soak it up and filter it, capturing and breaking down some pollutants along the way. During heavy storms, water that cannot be absorbed by soil and vegetation travels through pipes at the base of each rain garden and is conveyed to the nearby River Taff.”

Benefits: The presence of rain gardens and trees has added beauty to the area and also means that 40,000 m³ of surface water has been removed from the sewer system annually. The redesigning of the streets in Greener Grangetown to retrofit the rain gardens also allowed road space to be reallocated, creating the first ever bicycle street in Wales, along Taff Embankment. The new street design allows cyclists to be more visible and take priority in the road.

2.4.5 Creating beautiful places – Value of Trees Toolkit

Leicester City Council's Value of Trees Toolkit

Task: Leicester City Council (LCC) was asked by the Association of Directors of Environment, Economy, Planning and Transport (ADEPT) in 2021 to develop an approach that would help local authorities to re-establish trees as an important feature along the highway network. For LCC, the project was particularly timely, in part due to work that the authority had undertaken to develop an action plan for ash dieback but also because of the changing national policy context, including the new National Planning Policy Framework and National Design Code and Guide, which emphasised that developments should create “beautiful places” where street trees should be a prominent feature.

GBI solution: A toolkit that will help with the implementation and management of street trees within the county.

As the name suggests, street trees are trees that line streets, with many [associated benefits](#) such as reducing flooding and air toxicity, improving mental health, and reducing crime rates.

Implementation: The toolkit designed by LCC will include four components:

- ✔ A species selection guide: containing 350 species for developers and designers to work with for different locations.
- ✔ A valuation matrix: species from the selection guide are characterised by specific parameters such as ecosystem services, biodiversity value, environmental tolerances, hardiness, climate zones, and an ecosystem monetary value.
- ✔ A design guide: best practice in terms of stock selection, planting matrices and density, and post-planting care.
- ✔ Life-cycle costing: a full costing from design to aftercare, including ancillary costs such as traffic management. Understanding the full life-cycle cost will provide a robust basis for calculating commuted sums.

Benefits: Delivery of the toolkit will ensure the right tree is in the right place, so that they thrive in their chosen location. It will provide a blueprint for tree planting and management that can be applied by third parties as well as in-house designers and will give a sound understanding of the costs and benefits of trees, giving a robust argument for the continued funding of their planting and maintenance.

3. GBI stakeholder survey results

The CIHT designed a survey to gather the opinions of those in public bodies and the industry. The survey focused on their current knowledge and awareness of GBI, how they currently employ GBI, and what is needed to increase implementation.

3.1 Background of survey respondents

The survey received 77 responses from a range of organisations. Just under half of the respondents worked for consultancy organisations and roughly a third worked for public bodies or government departments. Other professions such as academics, contractors, highway engineers, transport planners, and charity workers were also represented. In terms of experience, roughly a third of the respondents' jobs focused on GBI, while more than

a third (38%) stated that while they did not currently focus on GBI it would be a part of their role in the future.

When asked to rate their knowledge of GBI on a scale of 1 (unfamiliar) to 10 (extremely familiar) there was a slight trend towards unfamiliarity, but most respondents ranked themselves between 2 and 7, showing that the majority of respondents had some idea of what GBI is (Figure 1).

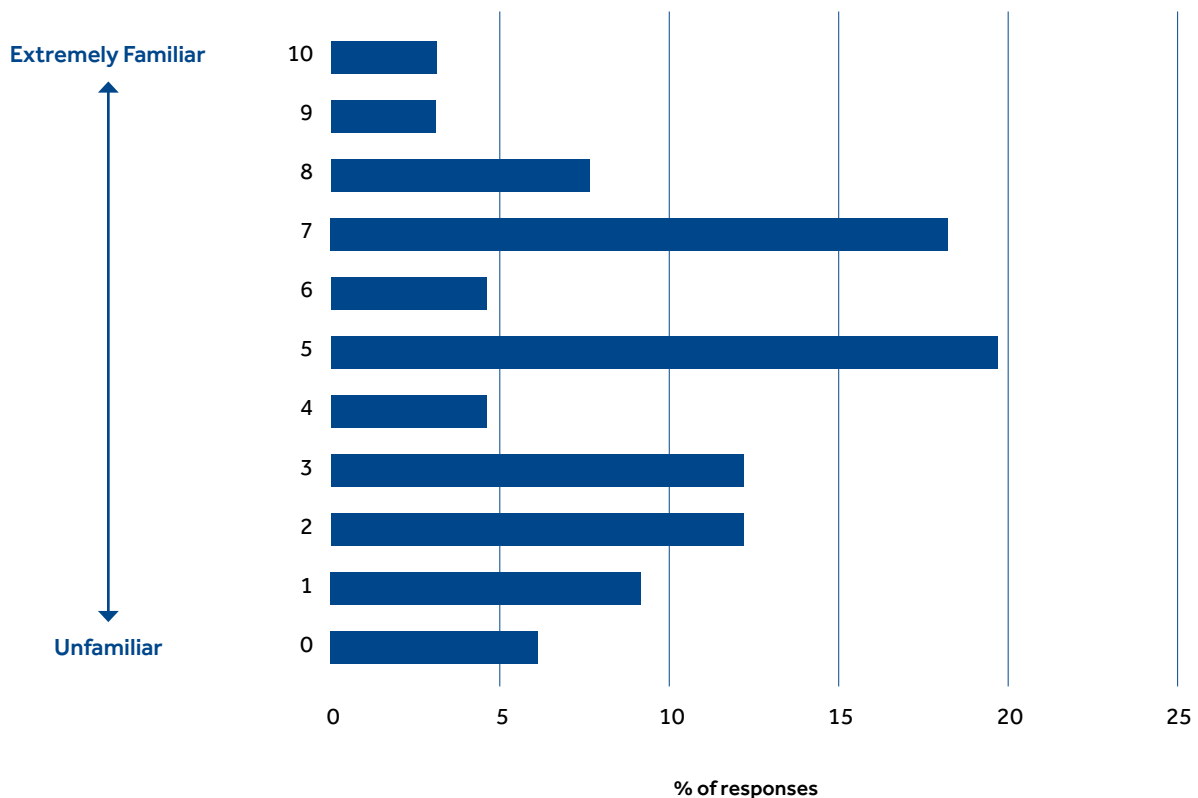


Figure 1: "How would you rate your knowledge of GBI from 1 (unfamiliar) to 10 (extremely familiar)?"

3.2 Opinions from those who are currently implementing GBI projects

Just over half (52.5%) of respondents stated that they were currently implementing GBI components within projects, with the planting of trees and greenery (edible plants, wildflowers, green roofs) being the most popular form of GBI (Figure 2). The answers to this question were given via an open text format where respondents freely

wrote their answers. An interesting point that has come out of this is the misinterpretation of what GBI means, with some respondents giving traffic reduction and the promotion of public transport as forms of GBI. While these schemes are good for the environment, they are not necessarily forms of GBI. This shows the need for a greater awareness and understanding of what constitutes GBI among those working in the transport infrastructure sector.

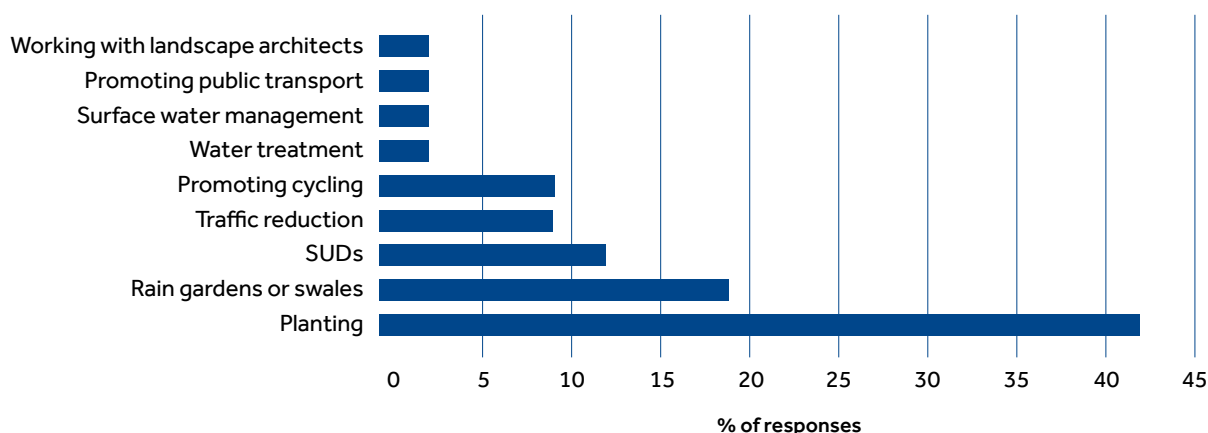


Figure 2: “Please tell us what GBI components you are currently implementing” – open text responses gathered and categorised into the answers seen here.

Through an open text question the respondents were asked what they thought were the main barriers to maintaining or increasing levels of GBI. Their responses were summarised into categories, with the most common responses falling under industry mindset, project management, and inexperience. Under industry mindset, the answers were mainly barriers set by clients, such as perceptions that GBI is too expensive, a refusal to adopt SuDS or street trees, unrealistic perceptions or expectations, and a lack of variety allowed. Issues

categorised as project management included only being involved in supporting roles and not initial planning stages, projects being dictated by clients’ budgets, and the unpredictable nature of workloads being last-minute and inconsistent. Finally, answers categorised as inexperience ranged from a lack of high-level knowledge, such as the optimal species of trees, through to a lack of general knowledge needed for planning and implementing GBI.

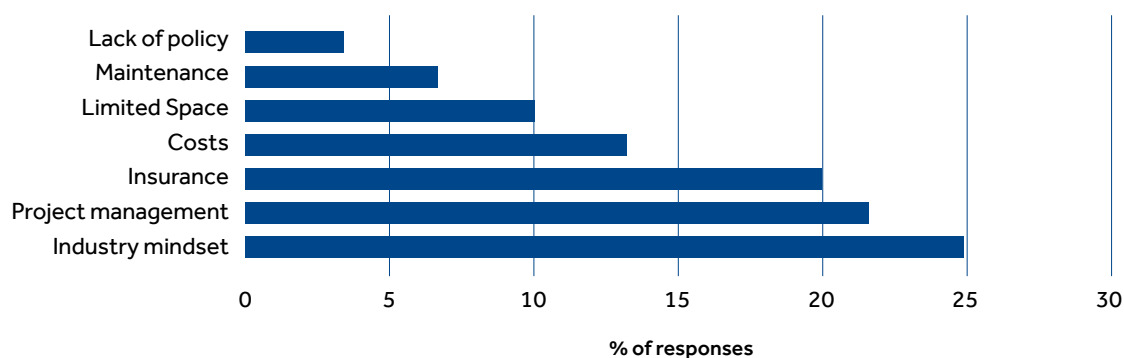


Figure 3: “What do you see as the main barriers for you or your organisation in maintaining or increasing levels of GBI?” – open text responses gathered and categorised into the answers seen here.

3.3 Opinions from those not currently implementing GBI projects

For those not currently implementing GBI, the main reason given for not doing so was a lack of knowledge and awareness of what GBI is. Examples included lack of knowledge at individual level and company level; for

example, their company could be implementing it, but they were not aware of this. Another common reason was not having the authority to enforce whether projects they work on include GBI implementation, or it not being within the project brief or scope for them to do this.

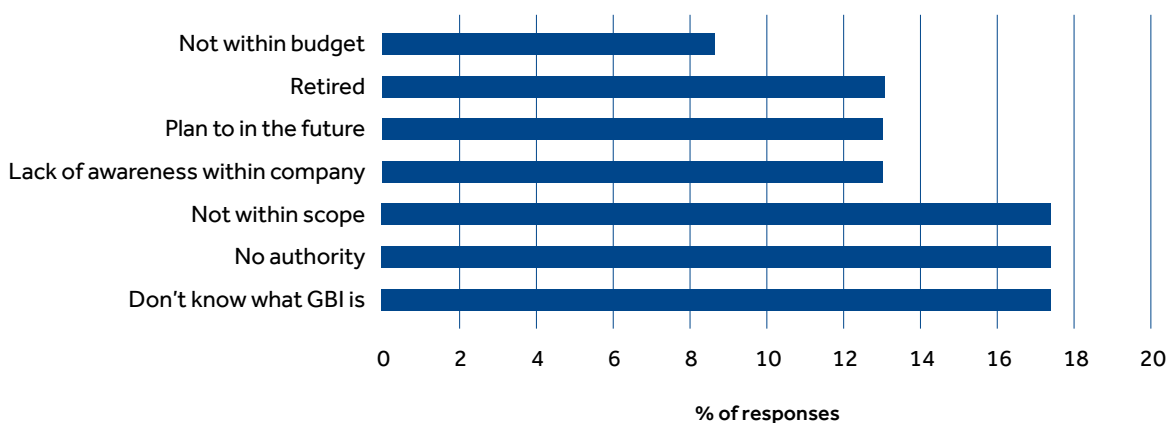


Figure 4: "Are you or your organisation currently implementing any GBI components within your projects? If no, is there a reason why?" – open text responses gathered and categorised into the answers seen here.

It therefore made sense that when asked what more is needed to encourage GBI in their projects, most people stated a need for awareness and promotion. We found that most people wanted the benefits of GBI to be better highlighted, which would hopefully make it easier to implement. Some respondents also requested better education in effective ways to implement GBI. This links to a need for updated and more extensive policies,

which was also requested by respondents. Overall, a common theme that arose through the responses was that if those in the sector felt more knowledgeable about what GBI is and how to implement it they would be able to share this in wider discussions throughout their work, thus further promoting, and engaging people in, GBI.

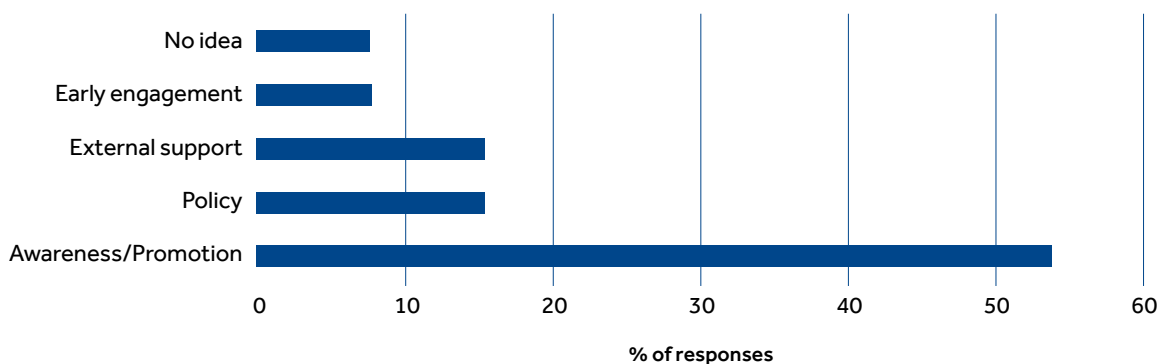


Figure 5: "What support/measurements would be needed for GBI to be incorporated in your organisation's projects?" – open text responses gathered and categorised into the answers seen here.

3.4 What more needs to be done to encourage GBI development?

When polled, the majority of respondents did not feel that it is too expensive or difficult to implement GBI. When asked what they felt the benefits of GBI are, most answers were what we would expect – covering both the environmental advantages (climate change mitigation, flood reduction, improved air and water quality) and social advantages (better public spaces, noise reduction, encouragement of active travel, improved mental health and sense of well-being) associated with GBI. However, comparatively fewer responses mentioned the economic benefits that GBI can bring, such as increased property values, investment, and tourism. This suggests these benefits are not widely recognised by, or presumed applicable to, the transport sector.

When considering the disadvantages of GBI, by far the most common answer given by respondents was the maintenance required. While most did not feel it was too difficult to maintain GBI, many did state that associated costs were an issue. Another point made by many

respondents was that, if the green infrastructure was neglected, the money invested could be wasted (if the trees or plants die) or safety issues could arise (overgrown trees or fallen branches blocking roads). It was felt that the safety of the maintenance workers must also be considered (if more people are sent to work on roads to maintain GBI, this could lead to an increase in health and safety incidents). Some other perceived disadvantages of GBI included negative feedback, such as claims made against the highway authority if an accident occurred related to GBI, or if GBI became detrimental to the local community. On a similar note, the negative perception of the public (those who would rather see investment in something else) was also seen as a potential disadvantage.

These responses provide a useful insight into the possible implications of GBI, especially from a roads and highways perspective. However, while it is important to acknowledge the potentially negative impact of GBI, it should be noted that the second-highest answer given was that there is no disadvantage, which is promising to see.

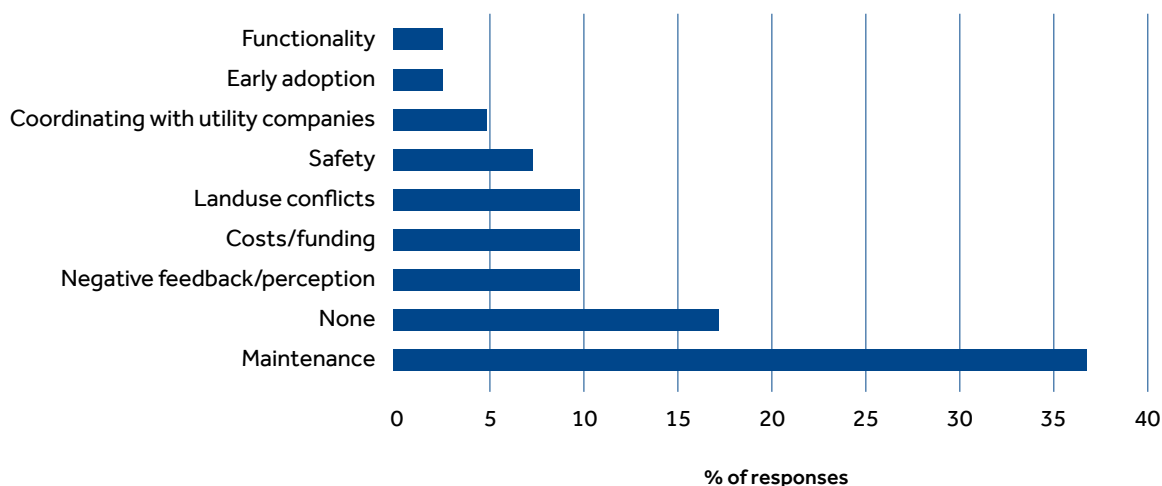


Figure 6: “What do you think are the principal disadvantages of GBI on our highways?” – open text responses gathered and categorised into the answers seen here.

In terms of policy and support, when polled most respondents agreed that there is a lack of framework and guidance for the sector. They also agreed the sector lacks the skills and knowledge necessary to deliver GBI. When

asked who the key stakeholders are in enabling GBI, many respondents thought this responsibility lies with highway authorities and local authorities (Figure 7).

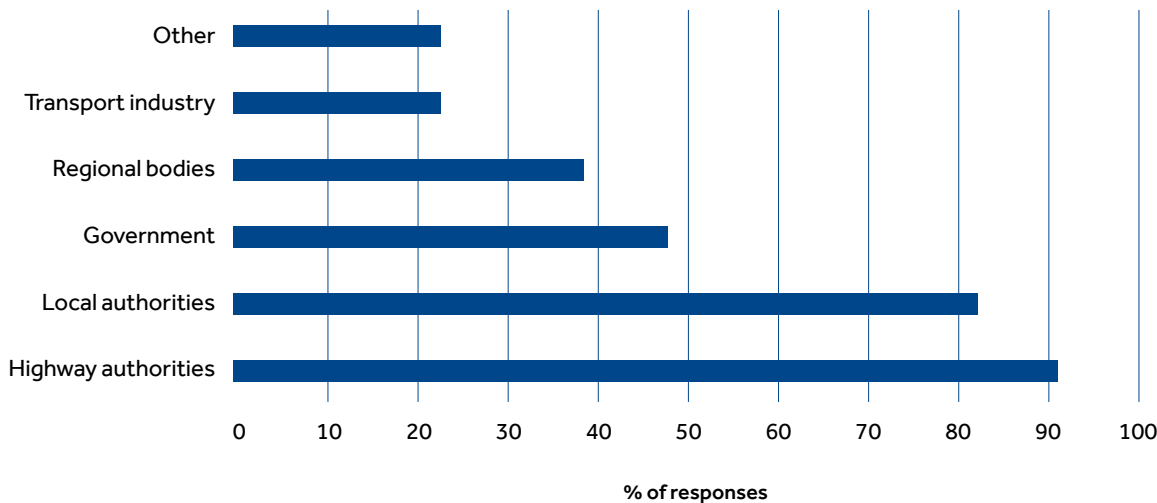


Figure 7: “Who do you see as the key stakeholders in enabling the greening of highway infrastructure?”

When asked to justify why they selected specific stakeholders as the responsible parties, the answers given by respondents were that highway authorities control approvals and so it will fall to them to deliver and maintain GBI, hence why they should enable it. For local authorities, specifically as the planning authority, respondents said that because they are able to dictate what is built on council-owned land, they should make sure that GBI aligns with what is needed and will integrate with local areas. Reasons given for selecting the government were that it sets the policy framework and so has a responsibility to contribute resources and select scheme sponsors. Finally, some said that regional bodies are responsible for allocating funding, without which GBI will not be possible.

In short, it was the opinion of the survey respondents that:

- ✔ highway authorities should have the authority and responsibility to oversee GBI implementation and maintenance
- ✔ local authorities should help and ensure that GBI schemes are carried out

- ✔ the government should set the policy and framework that is currently needed
- ✔ regional bodies should be responsible for ensuring that funding is appropriately allocated.

The examples given of other stakeholders responsible for GBI implementation were water and utility companies (they can incentivise blue-infrastructure developments such as SuDS), the public (as they will be the primary beneficiaries of GBI, their opinion should be consulted), academia, local flood authorities, and national park authorities.

Finally, the majority of the survey respondents either agreed or strongly agreed that there needs to be more:

- ✔ guidance for stakeholders
- ✔ holistic approaches to GBI
- ✔ cooperation between central and local government
- ✔ integrated approaches to maintenance alongside other highway assets
- ✔ design standards within the sector.

4. Going forward

4.1 Why the UK needs GBI

GBI plays an important role in promoting healthy and safe communities, as well as helping to deliver net zero targets, adapting to climate change, and conserving and enhancing the natural environment. However, [Natural England's Beta Green Infrastructure Mapping tool](#) shows that around a third of people in England do not live within 15 minutes' walk of a natural green space.

Presently, the mixed understanding and awareness of what GBI is and the benefits it can bring is, from our evidence, holding back the transport sector from successfully implementing more GBI. This problem stems from a lack of specific highway and transport guidance and support. As a result, many local authorities do not have the budgets, skills, or tools needed to properly include GBI in planning decisions or adequately maintain GBI assets. The lack of knowledge surrounding GBI also means it is often wrongly seen as an expensive, decorative add-on that is nice to include. Instead, if more authorities recognised it as a key long-term investment tool that would save them money, we could see a greater roll-out of GBI along our roads and highways.

Ultimately, this change in mindset can only be brought about by proper education, support, and promotion of GBI. Below we outline recommendations we believe are necessary for bringing about these changes, and what we plan to do to support their implementation.

4.2 CIHT actions and resources

The CIHT acknowledges that we must play an active role in promoting the benefits of GBI on our streets and roads and increasing the sector's knowledge and awareness of GBI. We will therefore do the following.

- ✔ Work with government agencies such as the DfT, DLUHC, and DEFRA to both raise the profile of GBI and jointly promote the associated benefits.
- ✔ Encourage and support the transport sector to adopt the guidance provided in the *Manual for Streets 2*, which covers several of the issues developed in this document.
- ✔ Provide a series of CIHT Learn courses that cover:
 - GBI in the transport sector – what it is and the benefits it provides
 - best practice on the end-to-end GBI process
 - guidance on what GBI suppliers should be providing.
- ✔ Work with the UKRLG to provide a national set of GBI standards and specifications, such as:
 - all streets having SuDS requirements in the same way as they now have tree requirements
 - including specific guidance for the design, operation, and maintenance of GBI assets.
- ✔ Call for evidence – the CIHT will encourage those in the transport industry and beyond to submit examples of GBI projects to create a knowledge-sharing platform that promotes best practice.

4.3 Our recommendations

The CIHT also acknowledges the important role that our members, government agencies, and local authorities play in creating successful GBI. Therefore, we have set out a list of recommendations for each of these groups that we believe are necessary to help the transport sector promote, deliver, and maintain better GBI.

4.3.1 Recommendations for CIHT members

- ✔ Make the most of resources provided to educate yourself on what GBI is and the benefits it can bring
- ✔ Actively get involved in discussions about GBI
- ✔ Seek to implement GBI into future projects.

4.3.2 Recommendations for DfT, DLUHC, and DEFRA

The government has already acknowledged the importance of GBI and the benefits it can bring. However, to help increase understanding, adoption, implementation, and maintenance of GBI we are calling upon central government agencies to do the following.

- ✔ Set GBI guidelines for local authorities to follow, such as:
 - model street design and adoption standards
 - national underground design code
 - guidelines on risk and liability
 - how to effectively maintain GBI.
- ✔ Include GBI criteria within the DfT incentive fund self-assessment, such as evidence of:
 - adopted tree and woodland strategies
 - green infrastructure strategies
 - SuDS or water management strategies
 - GBI performance frameworks and targets.

- ✔ Review current funding available for GBI and ensure funds are available for:
 - investment to encourage GBI
 - funding for GBI total system solutions
 - maintenance of GBI (including both public and private sources).
- ✔ Create a nationally agreed framework for commuted sums to remedy the problem of these acting as a disincentive to tree planting.
- ✔ Work with the CIHT to raise the profile of GBI.

4.3.3 Recommendations for highway and roads authorities

- ✔ Establish formalised systems to include GBI within existing highway networks and planned improvements, especially at the crucial stages of:
 - planning
 - design and delivery
 - adoption
 - maintenance.
- ✔ Create a performance framework for GBI to measure success and assign responsibility for targets.
- ✔ Promote the benefits of GBI to your employees and those you work with.
- ✔ Undertake the necessary skills training to better understand how GBI can be implemented and maintained effectively.

About CIHT

The Chartered Institution of Highways & Transportation (CIHT) provides strategic leadership and support to help our members develop, deliver, and maintain sustainable solutions for highways, transport infrastructure, and services that:

- ✔ **Address the challenges of climate change**
- ✔ **Support the economy**
- ✔ **Help address societal inequalities**
- ✔ **Reduce environmental degradation**
- ✔ **Respond to a changing world.**

We bring members together to share, learn, and feel confident about addressing these challenges through the application of good practice, by embracing innovation and by acting with integrity. It is through this and the values that CIHT can demonstrate and deliver on thought leadership and shaping the highways and transportation sector for the public benefit.

Find out more at www.ciht.org.uk