CIRIA proposal 3137

February 2018

Making B£ST better – improving approaches to value benefits from SuDS and NFM

Summary

CIRIA's B£ST tool and guidance has been used to assess the benefits of SuDS for over two years, both in the UK and internationally. Feedback on B£ST's quality and functionality has been very positive, with benchmarking suggesting it is the most robust tool freely available to assess the benefits of surface water management, particularly SuDS. However, evidence and approaches to the valuation of SuDS and blue and green infrastructure have evolved and it would now be beneficial to update B£ST with this information, include other natural flood management measures (NFM) and make it more useable. The update will be split into three distinct but related phases of work.

1. *Assessing and including new evidence related to the outcomes and monetary benefits of SuDS and natural flood management.*
2. *Including additional functionality around Natural Capital accounting and reporting (in line with water industry processes and Defra's 25 year Environment Plan).*
3. *Accounting for spatial variation in benefits with an integrated GIS user interface, and improving the overall user interface of B£ST.*

Background

With B£ST the industry is now able to financially quantify 19 benefits from SuDS (see figure1). With the growing requirement to explore opportunities for collaboration and partnership funding it is important to understand, evaluate and fund multiple benefits from SuDS and NFM. B£ST has begun to underpin this work with close to 5000 downloads of the tool. At the moment, the majority of B£ST usage is coming from sewerage undertakers and those delivering strategic SuDS. Our aspiration is that B£ST will support all stakeholders in the delivery of SuDS and now NFM, particularly in retrofit situations at all scales.

During the development of B£ST we recognised that the tool would become dated quickly, and that it would require updating to include new evidence and approaches ensuring that its reliability, relevance and usefulness was maintained and enhanced. This proposal provides a mechanism to update B£ST and expand it to include a number of NFM measures as well as make it more contemporary.

During the last two years we have received encouraging independent feedback about the robustness and comprehensiveness of B£ST with a number of international benchmarking comparisons highlighting its usefulness and robustness, however B£ST requires some familiarisation with the tool. We now wish to build on this to expand the number of measures considered, consider the benefits evaluated, improve its functionality and usability. As well as the existing SuDS components we will look to include those NFM measures that are used in urban, semi-urban environments. These typically include:

- River restoration
- Offline storage areas
- Floodplain woodland
- Headwater management
- Floodplain restoration
- Catchment woodland
- Riparian woodland
- Runoff management
- Leaky barriers
- Cross-slope woodland
- Soil and land management

Justification

Nature based approaches that include SuDS and NFM can deliver multiple benefits and it is essential that the benefits are understood, communicated to stakeholders and included in investment/funding decisions. B£ST has helped to assess whether SuDS provide value for money, either in themselves or when compared with more traditional drainage approaches. However, it is important that this approach evolves and considers other nature based approaches including NFM.

Reflecting the current economic climate and the need for value, improvements in economic appraisal of infrastructure interventions are continuously required. To ensure that B£ST remains credible and useful, it is imperative that it is based on the best available international good practice on valuation methods for surface water management and NFM. It is also crucial that B£ST's valuations are based on the most recent and robust UK evidence. These activities will ensure that B£ST aligns with the evolving policy, regulatory and environmental economics assessment processes, the latest information on benefits as well as improve its functionality. The project will update the existing literature and benefits value database (underpinned by more than 500 sources of information) and develop an eye-catching infographic to assist with awareness raising around the benefits of SuDS and NFM delivery.

At the time of developing B£ST, ecosystem services and triple bottom line assessments were commonly used in economic appraisal. Since then natural capital has become more prevalent and is supporting water industry investment decisions, infrastructure planning and central government policy including Defra's 25 Environment Plan.

Feedback on B£ST has highlighted the robustness and the quality of the evidence and the methodology used. With advances in software and platforms for the online graphical presentation and assessment of information we will also look into opportunities to improve the presentation and ease of use (ie user interface) of B£ST.

The development of an improved (graphical) user interface (GUI) in B£ST will be augmented by work on presenting spatial variation of benefits. This will be based on the EPSRC's Blue Green Cities Project, the Local Action Toolkit and proprietary commercial initiatives. B£ST will incorporate good practice from these approaches to help identify the spatial extent of benefits and to identify potential beneficiaries. This will assist in aligning SuDS and NFM interventions with potential impacts, benefits and a broad base of beneficiaries over longer term periods and different spatial scales, whether these be development, neighbourhood, catchment or citywide.

These enhancements to improve B£ST provide an opportunity to contribute to better integrated water management and catchment management where collaboration and partnership funding is likely to be integral to obtain meaningful and sustainable environmental outcomes.

Updating B£ST provides the opportunity to build on an established well regarded tool to create a free to use tool designed for all stakeholders interested in delivering blue/green infrastructure to manage flood risk. These changes have the potential to support catchment management, local flood risk strategies, SuDS delivery, Drainage and Wastewater Management Planning and drive the delivery of high quality flood risk management schemes.

Outcomes and benefits

A diverse group of stakeholders will benefit from updating B£ST. The key target audience and beneficiaries are likely to be those managing or living with local flooding and water quality challenges, and those delivering redevelopment or regeneration projects with green/blue infrastructure (ie regulators, local authorities, sewerage undertakers, clients and increasingly community and third sector organisations).

The expected outcomes and benefits of this project are to:

- **Help enable SuDS and NFM delivery** – The provision of an evidence base and a consistent approach to assess benefits to a wide variety of stakeholders and beneficiaries should drive the delivery of SuDS and NFM.

- **Improve and raise awareness of evidence –** Further develop a compelling evidence base on the benefits and business case for SuDS and NFM, particularly retrofit projects.
- **Support collaboration** – Enhance a valuation framework that facilitates partnerships and partnership funded SuDS and NFM schemes. This will support the development of business cases and applications for a variety of funding routes, including partnership funding, catchment restoration fund, WaSC investment (AMPs and PR19/24).
- **Mainstream the use of B£ST** – This project will maintain and enhance the credibility of B£ST as the leading tool to assess the benefits of SuDS and now NFM.
- **Free access to good practice** – It will continue to provide free and therefore greater accessibility to B£ST by a wide range of stakeholders involved in the delivery of SuDS and NFM. Supporting the consistent approaches to valuation and collaboration.
- **Improve awareness of B£ST –** Ensure at all phases of the project we work with the target audience and potential users to raise of awareness of B£ST and how it can contribute to decision making and flood risk management.
- **Underpin policy delivery** – Position B£ST as a key tool to underpin government and regulator policy initiatives that includes
    - Defra's 25 year Environment Plan
    - Natural capital accounting (on assets and liabilities)
    - Resilience and climate change adaptation
    - Partnership Funding – particularly for surface water and NFM projects
    - Water industry business planning cycles (potentially PR19/24)
    - Drainage and Wastewater Management Planning
    - The Catchment Based Approach
    - National and local flood risk management strategies in the UK
    - Initiatives to promote the delivery of NFM
    - National initiatives to manage water quality
    - Green infrastructure delivery

Aims and objectives

The overall aim remains the collation and presentation of evidence and the sharing of an approach to assess and value the multiple benefits of SuDS and NFM. The specific objectives of the project are to:

1. Engage with the wide range of organisations with an interest in understanding the benefits associated with SuDS and NFM to determine their needs and desired outcomes.
2. Ensure B£ST is based on the latest and best available evidence related to the outcomes and monetary benefits of SuDS and NFM.
3. Provide additional functionality to B£ST to ensure it links to natural capital accounting and reporting.
4. Ensure B£ST takes account of the spatial variation in benefits through an integrated GIS user interface.
5. Improve the overall user interface of B£ST to improve its appeal and usage amongst a broader base of stakeholders.
6. Disseminate the tool and guidance to encourage the delivery of SuDS and NFM by having dissemination and practical workshops. CIRIA's existing projects and links with other initiatives and organisations will be fully utilised.

The outputs of this project will include guidance and a tool (the exact platform will depend on user requirements and availability of funds) and will be freely available via susdrain. A suite of case studies will also be developed to demonstrate approaches, outcomes and lessons learned.

The guidance will support the (consensus based) framework and agreed process for assessing the benefits of SuDS and NFM delivery, looking at the roles of different stakeholders, their drivers and approaches to funding and delivery. The specific deliverables include:

1. Scoping report – presenting information on the current approach to benefits assessment and recommendations for improving B£ST
2. An updated literature review on approaches and UK benefit assessments
3. An infographic imaginatively presenting evidence on SuDS and NFM benefits
4. Updated (or new) tools to assess and compare the benefits of SuDS and NFM
5. Guidance document on how to assess the costs and benefits related to SuDS and NFM
6. Suite of case studies applying the developed approach for presentation on www.susdrain.org
7. PowerPoint presentation (with notes) providing summary of generic guidance

Project team

The proposed project team is mainly based on those involved already in B£ST development, it has been augmented with the inclusion of Cambridge University who has also been researching and developing tools on the assessment of blue green infrastructure benefits, particularly their spatial context. The team includes:

CIRIA

CIRIA will manage the collaboration, quality, objectivity and relevance of the document. It will co-ordinate the production of the proposed guidance outputs and liaise with relevant organisations and initiatives. CIRIA will also manage the consultation, engagement and dissemination throughout the project.

The overall project will be managed by one of CIRIA's experienced Project Managers, who will be guided by an independently chaired Project Steering Group.

CIRIA has a strong reputation for the production of collaborative and consensus based guidance on urban drainage, sustainable drainage and green infrastructure and also has extensive links with government, practitioners and the wider industry. Their guidance documents have a high standing and reflect the opinion of a broad cross-section of stakeholders.

Project technical team

Stantec (previously MWH) has an extensive track record of retrofitting surface water management in urban areas in the UK and abroad, including surface water separation schemes and SuDS. They have also been engaged in some NFM projects and innovative thinking for retrofitting surface water management, economic assessment and delivered B£ST. **Stantec will lead the project team** that includes an economist familiar with economic appraisal and approaches to assess the range of SuDS benefits.

Academic support will be provided by Richard Ashley, Emeritus Professor of Urban Water at the **University of Sheffield** and Director of EcoFutures and Professor Richard Fenner from the **University of Cambridge.** They will assist with the literature review, collation of case studies develop synergies with relevant international initiatives and provide an internal review of processes and outputs. Cambridge University will also assist with developing the approach to assess spatial variation in benefits.

The team will also be augmented with specialist input from organisations undertaking similar work, particularly experts from the West Country Rivers Trust.

Approach and methodology

The extensive contacts of CIRIA, the project team and partners have will be used to exploit synergies with other initiatives and organisations to produce consensus based guidance, tools and champion outputs. The project will be managed to foster collaboration and consensus as well as utilise extensive links and momentum with related initiatives and others in the industry.

The project will involve the following three phases of work:

1. **PHASE 1 - Initial engagement and review of evidence**

   This phase will initiate engagement on revisions to B£ST and start the review process to incorporate new evidence related to the outcomes and monetary benefits and outcomes of SuDS and NFM into B£ST. A number of tasks are envisaged.

   a. **Engagement and initial scoping** – this will include interviews (10) and a workshop to engage with the industry and particularly end users to understand user experiences, their desired outcomes and explore potential improvements to B£ST in terms of data and usability. This will be useful to further clarify our understanding of the stakeholders' requirements with regards to investment decision making processes, revisions to the tool, spatial assessment and approaches to presentation. An initial scoping report will be produced to inform the methodology and budget for phase 3.

   b. **Review new and updated evidence and assessment approaches** – this will undertake a focused review of literature and initiatives in the UK and overseas. It is likely that benefits related to physical and mental health and wellbeing will be emphasised since a significant amount of research has been completed recently. A number of other benefits worth exploring could include noise reduction, amenity benefits for commercial properties, further information on recreation, economic growth and tourism.

      Evidence on greenhouse gas conversion factors, energy costs and inflation data may need updating. The changing policy context for SuDS and NFM (like investment and guidance on NFM, partnership funding and business planning, eg PR19 guidance) will also need consideration.

      A number of resources for understanding and assessing SuDS and NFM performance and their benefits have been developed in recent years. These will also be part of the review, as there may be scope to link these to B£ST. These include:

      - Academic outputs and toolkits (UK) – this includes work from the Green Blue Cities project and Local Action Toolkit as well as work to support GI delivery.
      - The Environment Agency's Working with Natural Processes research framework and evidence directory.
      - Social impact analysis – this encompasses approaches to assessing the distributional and social impacts of SuDS on the well-being of different groups of the population, particularly on the poor and most vulnerable. Tools such as the Social Value Portal are available to support such analysis;
      - Tools from the USA – like SUSTAIN and those used by the Environment Protection Agency used to assists stormwater management professionals with developing and implementing plans for flow and pollution control measures;
      - E^2STORMED TEEB (European)- a decision support tool and assessment tool that can be used to compare financial, energy and environmental criteria to improve urban stormwater management;
      - Water UK/EA (UK) - Benefits assessment framework for high spilling CSOs (part of the industry's 21st century drainage programme of work); and

   c. **Assess evidence** – the evidence will be reviewed in terms of robustness and applicability to SuDS and NFM in the UK context (consistent with the existing B£ST tool).

d. **Integrate evidence –** B£ST will be updated to ensure the new evidence is appropriately incorporated and existing functionality is maintained. It is anticipated that, of the suite of B£ST outputs, only the tool and guidance will need a major revision.

e. **Reporting and dissemination –** this will include the development of an updated literature review, tool and guidance as well as a new infographic that will be based on new evidence. This will be supported by webinars and a workshop if necessary. There may also be improvements to visualization of the outputs for a wider audience.

2. **PHASE 2 - Natural capital reporting**

This phase will ensure that B£ST is linked to natural capital approaches. This phase will run in parallel with phase 1. Two main tasks are envisaged:

a. **Review** – a focussed review of recent work (eg Natural Capital Protocol, UKWIR (2017) Ecosystem service and natural and social capital accounting tool) to establish feasibility of integrating natural capital approaches into B£ST ensuring they remain complementary to the B£ST methodology and presentation of triple bottom line and ecosystem services.

b. **Update B£ST** – it is likely that only the tool and guidance will need a major revision. The tool could be restructured to ensure an output is reported in a way consistent with natural capital accounting (ie assets and liabilities) and the Defra 25 year plan.

3. **PHASE 3 – User interface and spatial variation**

This phase will adapt B£ST to improve the user interface and present the spatial variation in benefits through an integrated GIS platform. A number of tasks are envisaged.

a. **Understanding stakeholder needs and scoping** – this will follow on from the engagement activities in phase 1 where we will engage with stakeholders and potential funders to better understand how the spatial assessment and presentation of SuDS and NFM benefits would help them understand and calculate the impact of SuDS and NFM. This would determine stakeholder needs, tool functionality and platform requirements (eg online/offline), user interface requirements and based on this understanding a methodology and confirmed cost. A number of specific tasks are envisaged:

   i. A half day workshop to explore requirements
   ii. Further scoping of the tool specification based upon user and stakeholder needs
   iii. Confirm progression of the spatial development element

b. **Assess spatial variation of SuDS and NFM benefits** – identify where possible, evidence to indicate how quantified estimates of impact and monetary values for benefits included in B£ST may vary across space (e.g. values generally diminish the further away you get from the intervention).

c. **Review of tools –** a focused review of other SuDS and NFM assessment tools and spatial-based benefit tools/approaches (including Local Action Toolkit, academic research and practitioner tools (eg Atkins SuDS Studio), Impact and UrbanBEATS) to identify synergies and approaches to presenting information.

d. **Develop B£ST and user testing** - develop an easy to use GIS-based tool with user interface, with automatic routines that enable users to easily complete the assessment.

e. **B£ST update** - update the tool, guidance and associated B£ST outputs. It could also include a simplified and practical approach to undertaking scenario analysis.

f. **Dissemination** – this will include broad engagement and integration with other CIRIA activities to disseminate and promote the use of B£ST to industry and wider stakeholders.

The programme has been designed to maximise engagement, consultation and dissemination of information from the project through a variety of communication channels, including www.susdrain.org and other partners.

Project information

The total project cost is circa £220,000. The final cost of the project will depend on options for phase 3

Phase 1:	£73,000	(draft tool April 2018 completed tool and updated guidance ~~June~~ May 2018)
Phase 2:	£22,000	(subject to funding)
Phase 3:	£125,000 - £170,000	(subject to scoping, budget and funding)

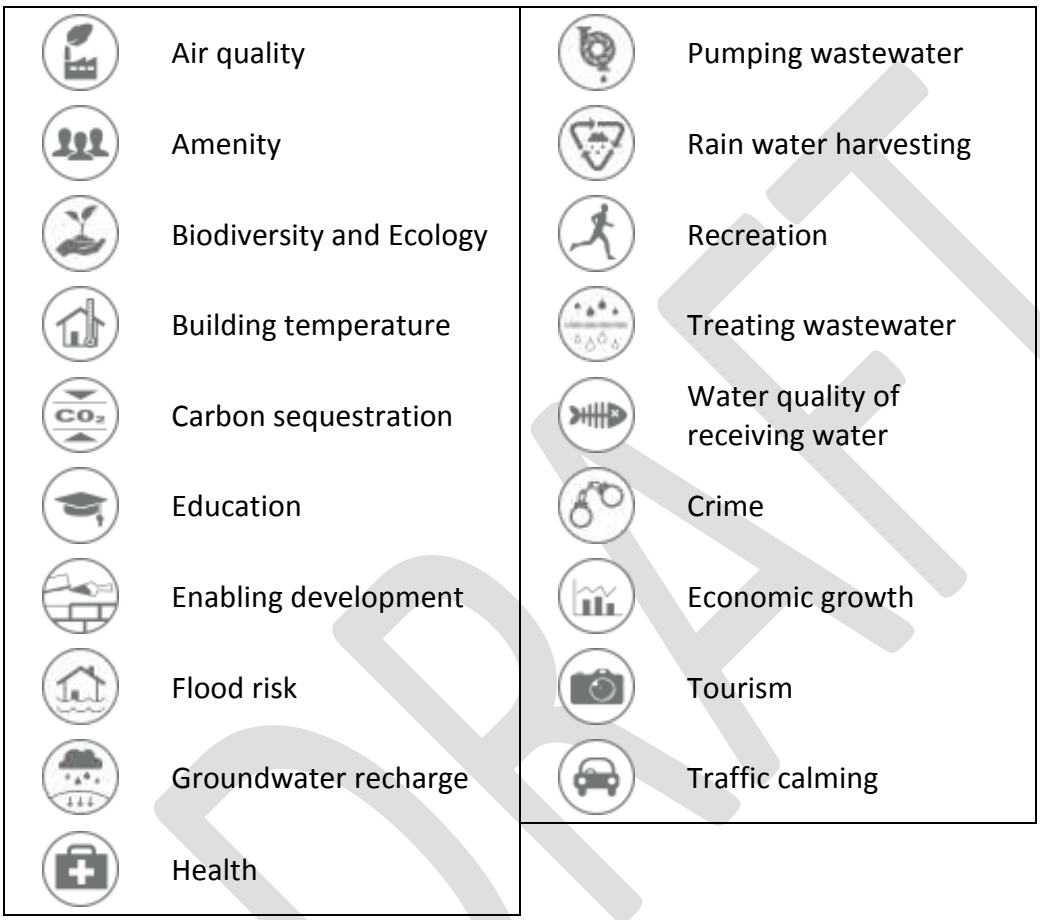

Figure 1 : Benefits in B£ST

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