Investing in Sustainable Drainage Systems (SuDS): A guide for investors and project developers

Introduction

The IGNITION project, funded by the European Union's Urban Innovative Actions (UIA) fund, brought together twelve partners to accelerate investment in urban nature-based solutions across Greater Manchester. Since 2019, IGNITION has complied evidence, researched finance solutions, developed business cases and identified priority areas for investment.

To accelerate investment in nature, IGNITION explored the potential of different urban greening interventions across Greater Manchester and created pilots that help inform the business case for investment.

IGNITION developed a multi-partner finance model for SuDS retrofit. The approach incorporates grant funding from multiple beneficiaries and repayable finance based on the annual drainage charge savings available to non-domestic site owners across Greater Manchester that install SuDS on their premises.

SuDS at the Living Lab, University of Salford

This work also features in this webinar: **Collaborative approaches to tackling urban flooding sustainably.**

Nature-based solutions

In relation to the water environment, nature-based solutions can be defined as interventions that preserve, enhance or restore elements of a natural system to help secure clean and reliable water supplies, while generating wider benefits for people and nature.

The case for SuDS

SuDS are nature-based water management systems designed to reduce surface water flood risk by capturing and retaining water where it falls, while delivering a range of additional benefits for the environment and local communities.

They offer a creative approach to tackle the growing impacts of climate change, which include increasingly frequent and severe rainfall events. Combined with continuing urbanisation trends, this increases the volume and intensity of surface water run-off and with that the risk of surface water flooding and Combined Sewer Overflows ("CSOs"), which can directly pollute waterways.

The Government's Green Infrastructure Framework set out in the 25 Year Environment Plan recognises the importance of nature-based solutions such as SuDS and encourages public, private and community organisations to develop opportunities for expanding these approaches.

SuDS at Moorlands Junior School, Sale, Cheshire

SuDS deliver two key water management benefits:		
Flood Risk	**3m+**	**The number of properties in England currently at risk from surface water flooding – more than any other type of flooding.** Additional warming is likely to increase risk exposure, with those in socially deprived areas expected to be disproportionately affected. Under a 2-4°C warming scenario, damages associated with increased surface water flood risk in the UK are expected to cost between £60-200 million/year.
Water Quality	**0**	**The number of rivers or streams in England in good overall health.** Surface water run-off during heavy rainfall can cause river pollution through both CSOs and direct transfer of pollutants from land into water courses. The loss of green and blue spaces, especially in urban areas with development pressures, has exacerbated this problem.

SuDS approaches and types

Many different types of SuDS are available, and identifying the most appropriate and cost-effective solution for a site is vital to a successful SuDS programme.

Bioretention Zone / Raingarden

An area of vegetation underlain with sand and gravel layers designed to channel and filter surface water run-off.

Typical cost: £250-550/m^2

Swale

Shallow vegetated drainage channels (~2-3m wide) that provide temporary storage for surface water run-off.

Typical cost: £15-20/m^2

Permeable Paving

Paving allowing water to soak into a gravel sub-base, holding the water before it drains into the ground or passes to an outfall.

Typical cost: £50-75/m^2

Green Roof

A multi-layered vegetated roofing system designed to intercept and retain precipitation.

Typical cost: £125-150/m^2

Soakaway

A subsurface structure, filled with gravel or rubble, into which surface water is conveyed

Typical cost: >£150/m^3 volume

Tree Pit

Installations which attenuate surface water run-off through the inherent void in a tree's roots

Typical cost: £2,000-3,000/tree

CASE STUDY: RainScapes, Wales

Welsh Water has invested £115 million since 2012 in retrofitting SuDS and other innovative solutions across South Wales to mitigate surface water and sewer flood risk. The RainScapes project was the largest retrofit SuDS scheme in the UK and has been successful in delivering an array of environmental and social benefits:

- c.1.5 million m^3/year reduction in water entering the sewer network in Llanelli, equating to 20% of surface water run-off;
- 95% reduction in CSO events;
- Opportunities to educate pupils about water resource management; and
- A more attractive local environment, supporting community wellbeing.

The adoption of RainScape, smart sewers and Peak Flow Equivalent Treatment (PFET) technology, has saved Welsh Water over £200 million, compared to the traditional alternative grey infrastructure approaches.

To date, few SuDS have been retrofitted in the UK. A key reason is the relatively high cost of most SuDS projects (although often still cheaper than the traditional hard engineering alternatives): specialist design and construction costs mean SuDS installations typically cost £80,000+, which is often in excess of revenues that can be generated through the most readily monetisable benefits. These relatively high up-front capital costs, coupled with the long-term nature of benefits that SuDS provide, result in a major need and opportunity for financing solutions for SuDS programmes.

**Cost estimates are high level estimates, based on data from Environment Agency, Greening Streets and Old Kent Road Integrated Water Management Strategy, and updated to approximate 2022 prices.*

Key benefits / beneficiaries of SuDS and funding opportunities

SuDS have the potential to deliver a range of benefits for multiple beneficiaries. To support the valuation of these benefits, the Construction Industry Research and Information Association (CIRIA) has developed the Benefits Estimation Tool (B£ST), a site specific, structured approach that can be used to assess the economic value of environmental and social benefits provided by SuDS. These assessments can be useful in identifying likely beneficiaries and potential funders.

To attract private finance, SuDS projects must be able to access reliable revenue streams. Despite progress in the valuation of benefits provided by SuDS, there is a lack of established markets for these benefits. This uncertainty in income generation often makes it difficult to attract investors seeking reliable financial returns.

Benefit	Description	Key Beneficiaries	Illustrative funding and revenue opportunities
Flood risk reduction 	**Improved water retention** reduces local surface water and sewer flooding risks **Reduced pressures on wastewater network and treatment systems**, with operating costs savings	**Site owners** **Water utilities** **Regional Flood and Coastal Committees (RFCCs)** **Local communities** **Department for Education**	**Reduction in site owner drainage bills** (offered by only 4 out of the 11 water utilities in England and Wales currently, for sites that install SuDS of sufficient size). **Outcome payments from water utilities** for evidenced reductions in surface water run-off and/or flood risk, subject to negotiation and agreement with the relevant utility. **RFCCs may pay for surface water flood risk reduction benefits**, sourced from a DEFRA flood defence grant or local levy. **The Department for Education has recently provided grants (via an open application process) to fund up to 50% of construction costs** for SuDS at schools it has assessed to be at risk of flooding.
Improved water quality 	**Reduced risk of CSOs** and therefore of untreated wastewater entering rivers **Reduced risk of pollutants** entering water bodies from surface run-off	**Water utilities** **Local communities**	**Outcome payments from water utilities** for evidenced reductions in surface water run-off in sub-catchments at risk of CSO events and/or the load of pollutants entering a water body, subject to negotiation and agreement with the relevant utility. **Nutrient trading:** Through evidenced uptake of nitrates and phosphates, a series of targeted SuDS in a given area may collectively generate nutrient credits which could be sold to developers as offsets to meet nutrient neutrality requirements where allowed.
Amenity benefits 	**Improvements in local natural environment Outdoor lesson delivery and enhanced playground and extra-curricular activities**, for SuDS in schools	**Site owners** **Local communities** **Department for Education**	**Philanthropic funding from a charitable Trust or Foundation** in support of the positive social benefits, especially if situated in socially deprived areas with public access. **Education-related funders** supporting the dissemination of knowledge and understanding of climate change risks and nature-based solutions (e.g. charitable foundations, Department for Education, Local Authorities).
Other benefits 	**Supporting wildlife** and habitat connectivity in urban areas, while also improving local air quality and storing carbon	**Site owners** **Local communities** **Developers**	While valuable features of SuDS, the relatively small scale of most SuDS means that these other benefits are unlikely to generate significant levels of revenue for the foreseeable future on an individual basis. However, developers may still be interested in supporting such multi-benefit projects in communities they work in; for example, to meet compensatory obligations if eligible, or for corporate social responsibility purposes.

Repayable finance

The most reliable revenue stream currently available for SuDS in some areas of England and Wales is based on drainage bill savings accrued by site owners, although this is currently only offered by some water utilities and is relatively small in most cases. Additional revenue streams may be created via any of the beneficiaries outlined above. In some instances, this revenue may be made available after SuDS installation, contingent on the project achieving intended environmental outcomes (such as reductions in surface water run-off or the amount of nutrients entering local water bodies), and in these cases the project could be structured as an Environmental Impact Bond (EIB). EIBs have the advantage of transferring risk related to the effectiveness of an intervention onto impact investors, who are only repaid for outcomes which are successfully achieved.

Drainage bill charging band mechanism

Four of the nine water utilities in England (United Utilities, Northumbrian Water, Severn Trent and Yorkshire Water) use "charging bands" to set non-domestic customers surface water drainage bills, with bills based on the area of a site which drains into the public sewer network. Ofwat is responsible for setting specific charging band rules for water wholesalers and retailers, led by Defra's guidance.

Installation of a SuDS can reduce the area of a site that drains into the public sewer network and can therefore result in bill savings if the reduction is sufficient to move the site to a lower charging band. This can form the basis of a revenue stream to support repayable finance. Key requirements to unlock this revenue opportunity include:

- **Charging band mechanism in place:** only 4 water utilities currently operate this incentive system.
- **Securing charging band charges with the water utility:** The utility will need to commit to retaining the charging band changes from SuDS installation for an agreed period (e.g., 10-15 years) that is sufficiently long enough to provide confidence to investors in this revenue stream.
- **Contract with the site owner:** Site owners will need to agree to transfer drainage bill savings to the project developer over an agreed period (aligned with the water utility's commitment, above) so that finance can be repaid, after which the site owner can retain all savings.

Environmental Impact Bonds (EIBs)

Impact bonds have emerged from the UK's social investment sector over the past 10-15 years. Targeted at nascent markets, they allow a project funder to transfer performance risk to investors. In an EIB model, bond investors are repaid by beneficiaries or "outcome payers" based on the level of success of the project. Where outcomes exceed expectations, beneficiaries pay more to acknowledge the greater benefits and the investor(s) receive a premium; conversely, if the project falls short of targeted outcomes, lower outcome payments are due and investor returns and potentially even capital are at risk depending on the design.

A pilot $25 million EIB to improve water management through the use of nature-based solutions was implemented successfully in 2016 in Washington, DC, with outcome payments linked to reductions in surface water run-off volumes. Work is currently underway to explore similar approaches in the UK.

Adopting a blended finance approach

As revenue streams for the benefits generated by SuDS become more established, investor confidence in SuDS projects will increase. However, the relatively low value of the charging band revenue stream compared to typical SuDS delivery costs means that a blended approach combining repayable and grant funding is likely be required in the meantime. An optimised structure may include tranches of grant funding, concessionary investment and more mainstream investment which together can meet full project funding requirements.

Tranche A: Grant funding	Tranche B: Concessionary investment	Tranche C: Financially motivated investment
Limited / no revenue streams	Uncertain / untested revenue streams	Reliable revenue streams
No expectation of repayment	'First-loss' concessionary finance from philanthropic investor, repaid if project achieves targeted outcomes	Expectation of full capital repayment, plus return
Up-front funding provided in anticipation of benefits (non-financial returns) received over time		

The SuDS investment journey: from concept to delivery

1. **Site identification**: Establish appropriate sites as early as possible, based on a systematic approach that reflects targeted outcomes and considers:
   a. Collective catchment-scale impact of multiple small-scale SuDS
   b. Priority areas identified by local water utility or RFCC based on flood risks
   c. Site access and site owner support
   d. Site characteristics / feasibility and potential drainage bill savings
   e. Options for different SuDS types and estimated costs

   Key risks and mitigations:
   - *Lack of site owner or key stakeholder support: Seek early engagement with site owners and key beneficiaries, desk-based pre-feasibility assessments*

2. **Develop technical case**: Establish optimal SuDS type/specification for each site

   Key risks and mitigations:
   - *Lack of technical standards can make it difficult to prove technical case: Use online resources and enlist analysis from hydrology and drainage experts where resource allows*

3. **Cost estimation and refinement**: Desktop research followed by outline design work on most promising sites, in collaboration with site owners.

   Key risks and mitigations:
   - *Lack of funding for outline design work: Seek early-stage development funding for design work focused on the most promising sites*

4. **Revenue development**: Identify beneficiaries; gain buy-in and identify funding streams; seek indicative commitments to support investor engagement.

   Key risks and mitigations:
   - *Lack of standards for quantifying benefits: Make use of CIRIA tool (above)*
   - *Lack of funding: Identify full range of beneficiaries early; establish their priorities and tailor engagement approach to ensure strategic alignment*

5. **Financial planning:** Establish financing requirements and develop proposals for tranches of repayable and non-repayable finance if needed, bringing together public, philanthropic and private funders.

   Key risks and mitigations:
   - *Ongoing uncertainties in costs and revenues: Use ranges where necessary; incorporate contingencies; explore EIBs as risk transfer mechanisms*

6. **Governance, management and transaction structuring:** Consider a Special Purpose Vehicle (SPV) to pool funding and hold contracts.

   Key risks and mitigations:
   - *Lack of resource for project management: Factor in from early stage; consider options incl. hiring staff, secondments or commissioning advisors*

7. **Fundraising:** Engage potential investors; may require corporate finance advice.

   Key risks and mitigations:
   - *Uncertainties in financial returns: Gain indicative commitments from key funders where possible; highlight ongoing work to refine cost estimates, such as outline design and market testing*

8. **Contracting:** Contracts required with funders, investors, design / construction contractors, site owners and any technical / financial advisors. Legal support may be necessary. Templates suitable for SuDS design and construction contracts are available (e.g., JTC Minor Works, JCLI Landscape Works).

   Key risks and mitigations:
   - *Lack of standardised transaction structures and contractual arrangements: Allow time / resource in process for bespoke documentation preparation*

9. **Construction:** Procurement and management of design/build contractors.

   Key risks and mitigations:
   - *Limited pool of expertise in SuDS construction, contractors difficult / costly to secure: Arrange competitive procurement processes well in advance, and plan early for scheduled on-site work, especially if the site(s) has certain accessibility windows (e.g. school holidays)*

10. **Monitoring and maintenance:** Monitoring and attributing the benefits of SuDS on both water management and broader outcomes is vital for building technical standards and increasing investor confidence; consider making data available in real time via an online platform. Maintenance requirements are likely to be relatively light touch for most SuDS.

    Key risks and mitigations:
    - *Monitoring equipment costs: Ensure funding for monitoring is built into project costs, and consider seeking separate funding for this if necessary*

Unlocking SuDS investment: planning for success

The following considerations may be important in preparing business cases for SuDS and maximising chances of successfully raising investment.

Engage early with site owners: Site owners play an integral role throughout the SuDS journey – as ultimate custodians of the SuDS infrastructure, it is vital that the design, construction and long-term management of SuDS reflects site owners' needs and priorities. Consider running workshop sessions and webinars to provide opportunities for engagement and gain support.

Understand water utility regulatory drivers and strengthen where possible: Water utilities can be key beneficiaries in SuDS programmes, and while regulators Ofwat and the Environment Agency are encouraging utilities to consider nature-based solutions such as SuDS, there remains scope for regulatory regimes to be strengthened to further incentivise water utilities to provide funding and support for SuDS.

Seek early-stage development funding: Securing full funding for a pipeline of SuDS is likely to be contingent on commitment from site owners and robust cost estimates. Both are likely to require at least outline design work to have been undertaken at each site, which is likely to necessitate early-stage development funding. This can be difficult to source due to the diffuse spectrum of beneficiaries and the risk of sites later being deemed unviable, but projects may wish to consider ways to incentivise and reward early development funders.

Adopt partnership approach to share benefits, costs and risks: The range of benefits generated by SuDS, together with the relatively high cost of design and delivery in the current early stage of market development, means that a SuDS portfolio is likely to require a blended financing approach. Explore ways to embed a partnership approach from an early stage, bringing together public, private and philanthropic funders.

Work towards replicable and scalable approaches by harnessing learnings: Despite the bespoke nature of individual SuDS design, there is great potential for shared learnings and replicability in the approach taken across a SuDS pipeline; for example, in transaction structures and contracting. Consider opportunities to standardise aspects of a SuDS programme, to drive efficiencies and reduce transaction costs.

Explore innovative financing solutions such as outcome-payment mechanisms: While the evidence base for SuDS is growing, uncertainty in technical performance, especially vs. "grey" alternatives, can prevent beneficiaries from investing. Consider an EIB approach to overcome these concerns by transferring performance risk to impact investors.

More information

IGNITION has looked at financing options for other NBS and many of the learnings from SuDS can be applied in other areas. To find out more and access further insight, tools and resources, visit the project website: www.IGNITIONgm.com.