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Making the Case for Green Infrastructure: Lessons from Best Practice

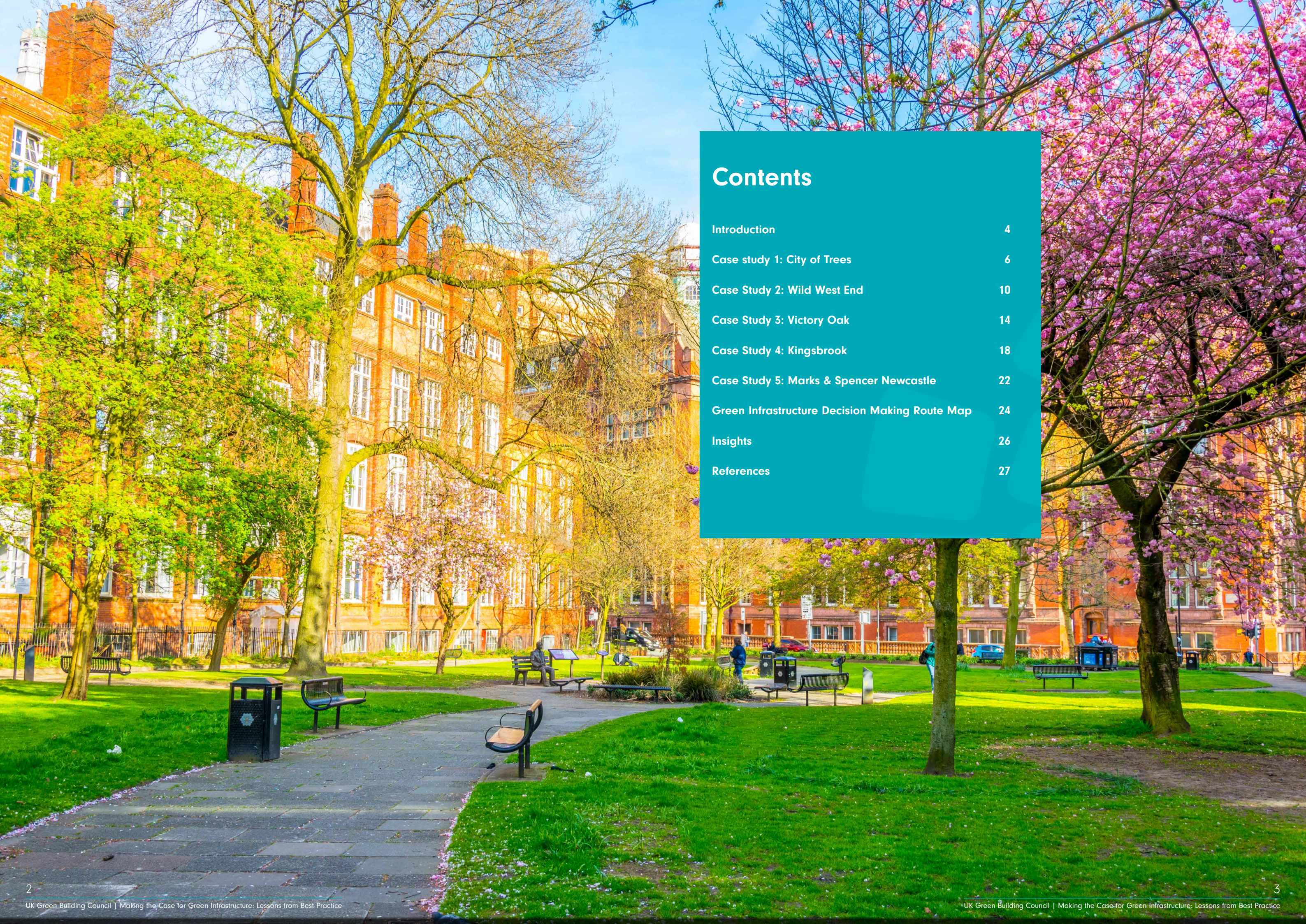
FEBRUARY 2020

Project partners:



The
University
Of
Sheffield.





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Introduction



Green Infrastructure (GI) can make a number of positive contributions to the urban environment. These can include environmental performance improvements such as enhanced climate change adaptation and resilience, to the delivery of socio-economic benefits such as improved societal well-being and economic return. Integrating GI within the development process is a challenging prospect. As well as the need to integrate GI within other development needs, it requires, amongst other things, working with a wide array of stakeholder interests, complex regulatory procedures and the ability to work within the constraints presented by location.

This report aims to provide built environment professionals with case study insights into the nature of GI decision making. Insights are shared from the project teams and stakeholders involved. These cover the GI benefits attained, the decision making process followed and the barriers, solutions and lessons learned.

This report explores five Green Infrastructure case studies;

- City of Trees
- Wild West End
- Victory Oak
- Kingsbrook
- Marks & Spencer Newcastle

This report was funded as part the Natural Environment Research Council (NERC) 'Green Growth Project' (NE/N01748/1). It was prepared by the UK Green Building Council (UKGBC) along with the University of Manchester and the University of Sheffield. The report compliments other outputs produced as part of the project. These include:

- [Practical How-to Guide: Developing and Implementing a Green Infrastructure Strategy](#)
- [Understanding Green Infrastructure at Different Scales](#)

This report also features a '[Green Infrastructure Decision Making Route Map](#)'. This provides a synthesis of the current GI best practice which applies to different decision making stages in the development life cycle.

This was created based on interview centred research conducted for the NERC 'Green Growth Project' and follows the key steps set out in the Practical How-to-Guide.

We hope this report acts as a resource which informs how projects are approached and enables the creation of more and better quality green and blue space for wildlife, people and business.

KEY

Scale



Micro: an individual or average sized site or development and its immediate surroundings.



Meso: typically spans multiple micro locations. Spatially, this may be a neighbourhood or settlement.



Macro: is the regional level and typically spans multiple meso locations. Spatially, this may include a city, region, or combined authority area.

Project types



City

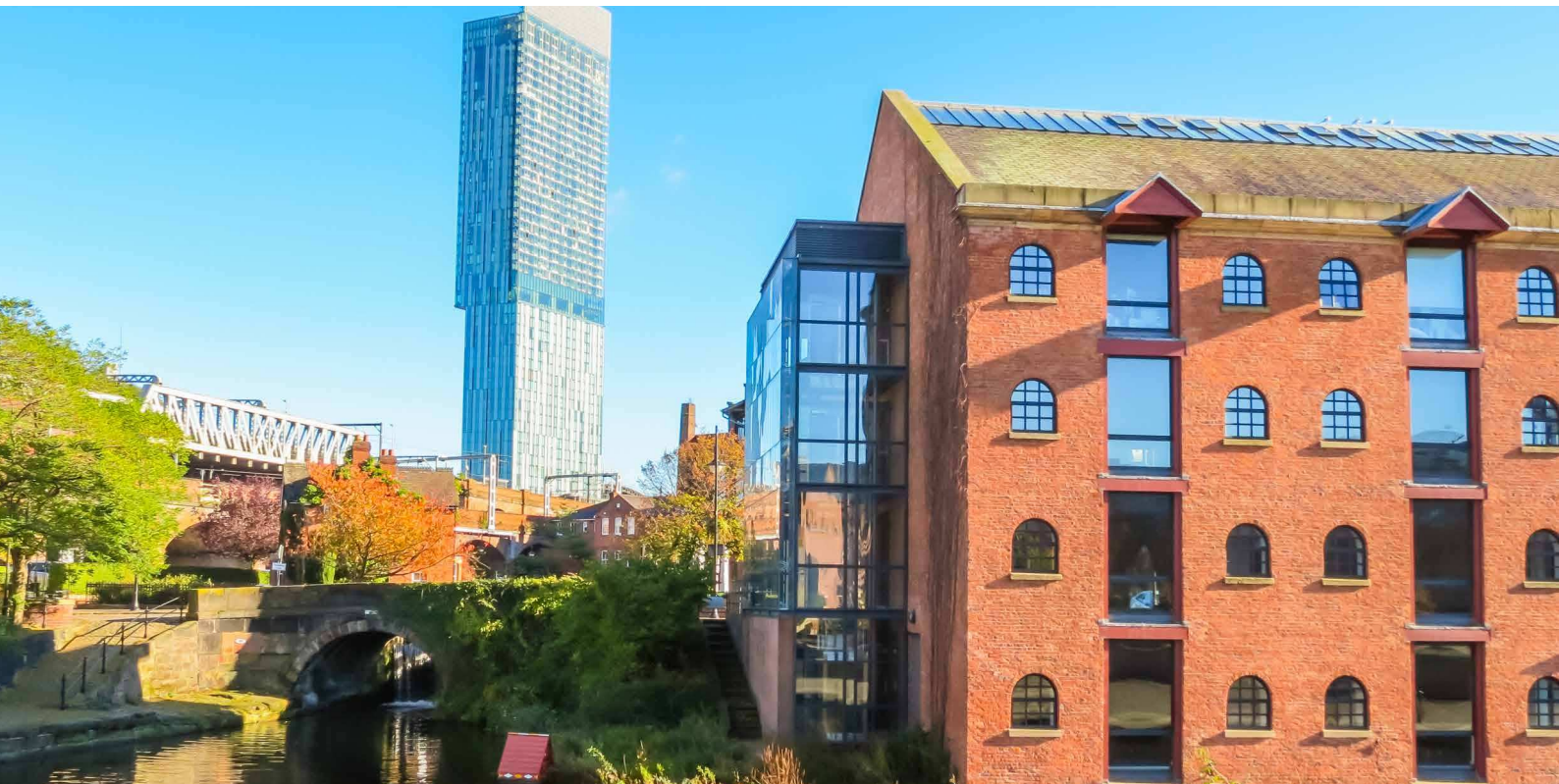


Residential



Retail

Case study 1: City of Trees



Location:	Completion Date:
Manchester	Ongoing

Key actors:

- Bury City Council (strategic partner)
- City of Trees (delivery initiative)
- Environment Agency (advisor)
- Greater Manchester Combined Authority (strategic partner)
- Heritage Trees (strategic partner)
- Natural Course (funder)
- United Utilities (strategic partner)
- Urban Vision (contractor)
- Rivers Trust (strategic partner)
- Salford City Council (strategic partner)
- The University of Manchester (strategic partner)

More information:

- [About City of Trees](#)
- [Cleavleys Wet Woodland](#)
- [A Wet Woodland Case Study – Catchment Based Approach](#)
- [Pioneering street tree research project could hold answer to urban flooding](#)
- [New street trees unveiled along A56 as part of regeneration scheme](#)

PROJECT DESCRIPTION

City of Trees is an initiative aiming to introduce GI solutions into Greater Manchester. It does this by creating and diverting water courses, managing existing woodland, and tree planting. The initiative seeks to create new ecosystem services and better connect people with nature.

Project objectives include:

- Plant 3 million trees, one for every person in Greater Manchester (450,000 trees planted to date)
- Bring 2,000 hectares of unmanaged woodland back into community use (260 hectares managed to date)
- Better connect people to trees and woodland (over 12,500 people connected to date)

This case study is split across two City of Trees projects; Cleavleys Wet Woodland and Prestwich High Street.

CLEAVLEYS WET WOODLAND, SALFORD

City of Trees and partners created a wet woodland by a tributary of Worsley Brook in Salford. The aims of the scheme were to improve water quality, reduce water volumes, enhance biodiversity and enrich recreational space for local people.



The site is located within a former council tree nursery, known as Cleavleys Nursery. The Environment Agency conducted monitoring of the tributary in early 2014 and found it was contaminated with ammonia. The discharge from the tributary had been contributing to water quality failures within Worsley Brook under the Water Framework Directive. The finished scheme allows for mixed leisure use whilst also acting to attenuate highway runoff and capture contaminants before they enter Worsley Brook downstream.

The woodlands and wetlands have an abundance of lichens, mosses, sedges, rushes and ferns, creating habitats for large numbers of invertebrates, amphibians, mammals and birds. The dead wood provides a specialised habitat not found in dry woodland types which supports crane flies and other insects. These insects, in turn, make ideal food for bats and other priority species like the willow tit.¹

The scheme has served to reconnect local people to nature, through volunteering and enjoyment of the woodlands.



PRESTWICH HIGH STREET, BURY AND HOWARD STREET, SALFORD

Street trees planted across Greater Manchester have used specially designed tree pits to channel rainwater; irrigating the trees, providing water filtration and draining excess water to reduce the need to pump and treat surface flooding. London Plane trees were planted in Howard Street, Salford, using an innovative modular system called Silva Cell; a 3-layer system filled with bioretention soil provided by British Sugar. The Soil Cell system uses crates installed under the pavement which are high load bearing structures that can accommodate uncompacted soil, allowing water and oxygen to the tree roots. At Prestwich High Street in Bury, the planting was part of a planned road regeneration scheme.²

GI BENEFITS:

Wet woodlands:

- Provides mixed leisure area for local people
- Attenuation of highway runoff
- Contaminant capture and filtration through aquatic plants
- Urban flood prevention through use of bunds routing water to original channels
- Air quality improvement
- Urban cooling
- Habitat creation for priority species

Street trees:

- Access to clean water and efficient processing of waste water
- Reduction in surface water flood risk (average delay of storm water peak flow 68 minutes)³
- Air quality improvement, reducing air pollution by filtration (NO₂ reduced by 9%, PM10 reduced by +21%)⁴
- Urban cooling⁵
- Improvement in aesthetic appeal of the high street
- 15% increase in revenue for businesses⁶



DECISION MAKING PROCESS:

- In the Cleavleys project, a design process based on natural principles was adopted. By diverting the straight or modified water courses into meandering, or holding areas, the deposition of chemical components could slow down and allow aquatic plants to colonise and further help to remove pollutants. This would have been difficult to achieve if a straight water course had been designed.
- The design at Cleavleys was based on audit results, iterative flow path analysis and flood risk assessment. Material excavated from the existing channel embankment was used to create a bund, ensuring that water re-entered the original channel and did not extend beyond the proposed wet woodland area. The river system now meets "Good" waterbody status as outlined under the area-wide River Basin Management Plan and Water Framework Directive objectives.
- In the Prestwich High Street and Howard Street projects, it was decided that although investment in the Soil Cell system would prove more expensive in the short term, it would give longer term payback in ecosystem services returns.

BARRIERS, SOLUTIONS AND LESSONS LEARNT:

- Implementing GI projects in isolation from existing development can be expensive and disruptive. The Prestwich High Street project in Bury sought to integrate GI interventions with development activities already being undertaken as part of a major regeneration scheme. To achieve this, the project partners, including United Utilities, Environment Agency and Salford City Council, provided match funding to enable value to be added to wider capital project activities.
- It can often be difficult to negotiate for development solutions which recognise GI as an integral component of future development proposals. However, the rising profile of the climate crisis along with the commitments enshrined in the 25 Year Environment Plan and the Greater Manchester Spatial Framework, have provided opportunities to explore GI-led investment.

Contributor:

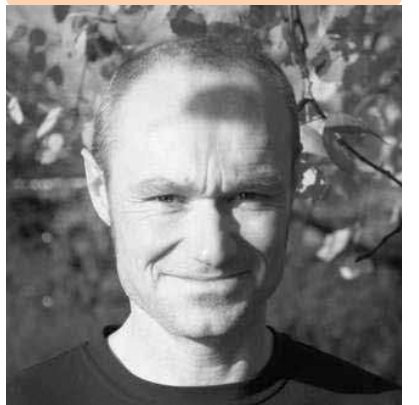
Pete Stringer
Special Projects Manager, City of Trees

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- 1 Catchment Based Approach (2019). Wet Woodland Creation – Case Study. [online] Available at: <https://catchmentbasedapproach.org/learn/wet-woodland-creation-case-study/> [Accessed: 25/10/19].
- 2 Manchester City of Trees (2016). Pioneering street tree research project could hold answer to urban flooding. [online] Available at: <https://www.cityoftrees.org.uk/news/pioneering-street-tree-research-project-could-hold-answer-urban-flooding> [Accessed: 25/10/19].
- 3 Stringer, P. (2018). GI – A Focused and Evidence Based Approach for Delivery. [online] Available at: http://www.cityoftrees.org.uk/sites/default/files/Pete%20Stringer%20-%20City%20of%20Trees_0.pdf [Accessed: 25/10/19].
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- 5 Armson, D. (2012). The Effect of Trees and Grass on the Thermal and Hydrological Performance of an Urban Area. [online] Available at: [https://www.research.manchester.ac.uk/portal/en/theses/the-effect-of-trees-and-grass-on-the-thermal-and-hydrological-performance-of-an-urban-area\(c203be98-7c4e-4445-83cb-32d8d98796bc\).html](https://www.research.manchester.ac.uk/portal/en/theses/the-effect-of-trees-and-grass-on-the-thermal-and-hydrological-performance-of-an-urban-area(c203be98-7c4e-4445-83cb-32d8d98796bc).html) [Accessed: 25/10/19].
- 6 Manchester City of Trees (2018). New street trees unveiled along A56 as part of regeneration Scheme. [online] Available at: <https://www.cityoftrees.org.uk/news/new-street-trees-unveiled-along-a56-part-regeneration-scheme> [Accessed: 25/10/19].

"Including GI solutions on an existing capital project was a really good opportunity to take advantage of the economies of scale. Providing the complementary works avoided any retrofit costs, saving time and money and avoided further disruption and inconvenience. My advice would be to get in early when local authorities can integrate SuDS schemes into existing projects and can fund-match other sponsors. It can be more difficult to make the business case with smaller retrofit projects."

Pete Stringer, Special Projects Manager at City of Trees



Case Study 2: Wild West End



Location:	Completion Date:
London, UK	Ongoing

Developers:

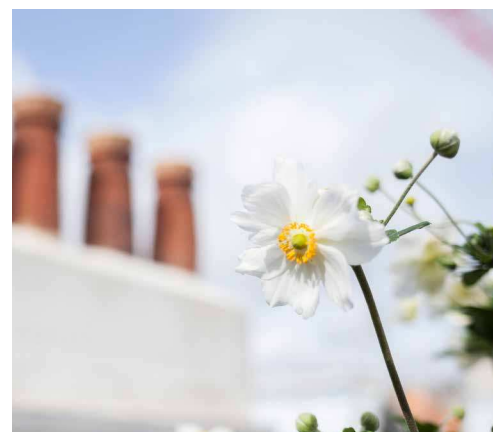
- Great Portland Estates
- Grosvenor
- The Crown Estate
- The Howard de Walden Estate
- Shaftesbury
- The Portman Estate

Key actors:

- Arup (technical partner)
- Greater London Authority (strategic partner)
- London Wildlife Trust (strategic partner)
- Westminster City Council (advisor)

More information:

- [Wild West End Website](#)



PROJECT DESCRIPTION:

The West End's largest property owners are currently working together to improve GI within this iconic area of London. The partnership is adopting a long-term shared vision which aims to:

- Enhance biodiversity (particularly bees, bats and birds) and ecological connectivity
- Improve the wellbeing of residents, workers and visitors by increasing connections to green space and nature, and contributing to improvements in local air quality
- Raise awareness and promote the benefits of green infrastructure to inspire others to participate and create similar initiatives

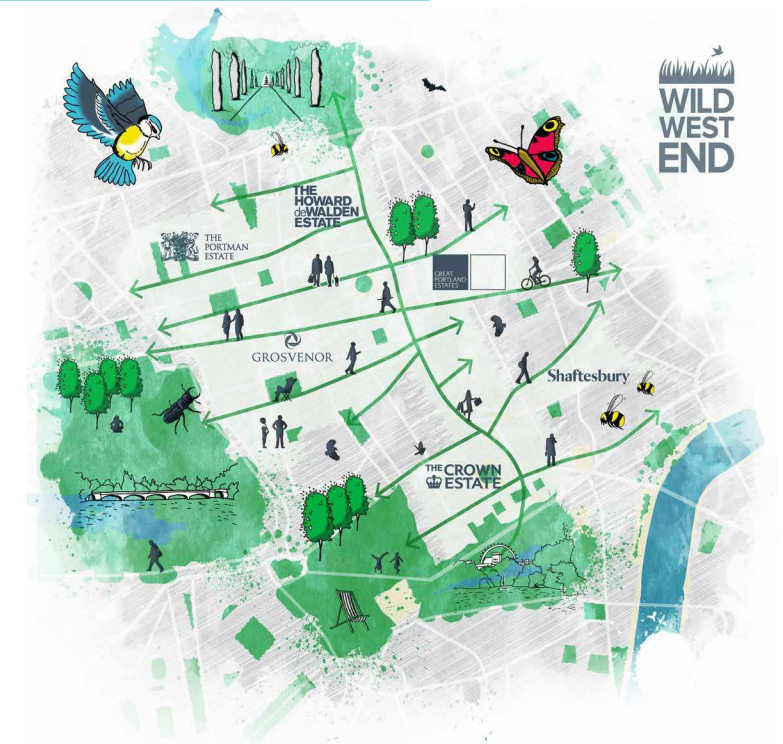
A key component of the scheme is the creation of green 'stepping stones' between the existing areas of surrounding parkland. This is being achieved through the combined provision of green roofs, green walls, planters, street trees, flower boxes and pop-up spaces. As a priority, the partnership is looking to re-attract species once common in London such as the Black Redstart and the House Sparrow.

The project is being supported by a programme of monitoring, target setting, specification guidance, engagement events and sharing of good practice. The project has the opportunity to demonstrate the positive impact of urban green infrastructure whilst also offering vital research insights into the contribution that GI can make in urban areas.

GI BENEFITS:

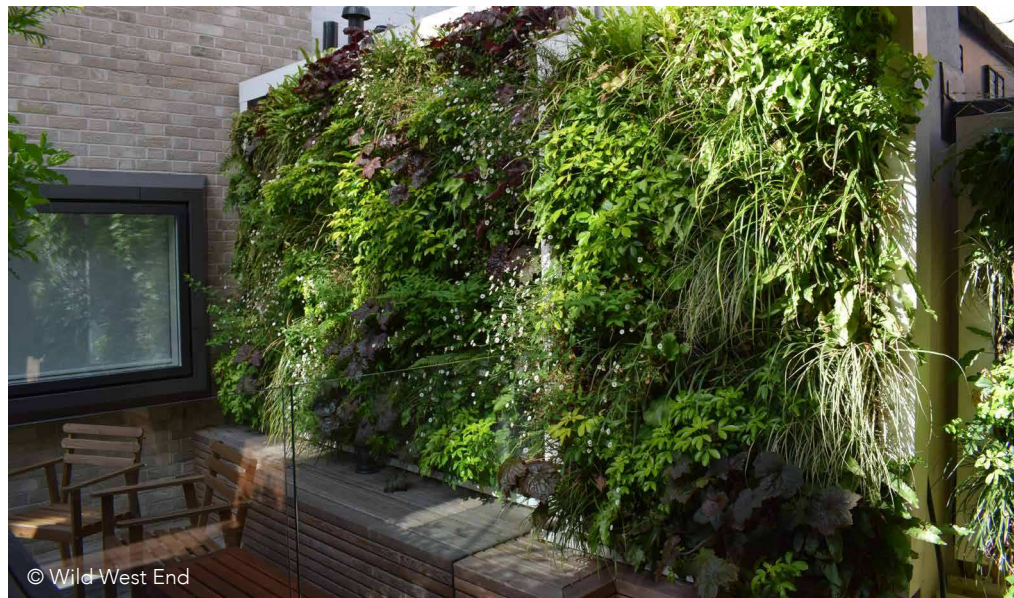
In addition to increasing the total area of green space, Wild West End seeks to increase the multi-functional value of each of the green spaces across the partnership. As part of the project, newly created green spaces must target, as a minimum, at least two of the following:

- Increased biodiversity through habitat provision and ecological connectivity
- Climate resilience through rain water management, sustainable energy or carbon sequestration
- Enhanced microclimatic conditions through localised air quality improvements and improved temperature regulation
- Improved wellbeing through the provision of sensory and active green space
- Better social cohesion through increased opportunities for social engagement and interaction



DECISION MAKING PROCESS:

- Establishing the vision for the partnership was an important first step in the decision-making process, enabling the partners to work together towards the same goals.
- Regular communication between the partners enabled the sharing of good practice, collaboration on projects and strategic thinking. Engagement with the wider public, through the partnership's social media, website and events, aimed to inspire and encourage others to create similar initiatives.
- At the early stages of the partnership, Wild West End identified the opportunity to collaborate with London Wildlife Trust, who as a strategic partner seek to raise awareness of the city's wildlife, help create a vibrant living landscape, and support the initiative's partners in becoming ambassadors for wildlife.
- Wild West End also identified the opportunity to collaborate with the Greater London Authority in order to demonstrate how the Mayor's policy framework can be translated into innovative ways to further green the city. The technical partner, Arup, supported the development of a framework which defined the processes for partnership working and set clear targets for Wild West End. Arup continues to provide expertise not just on ecology but also on landscape architecture, digital communications and wellbeing evaluation.
- Arup developed a [Functional Value Matrix](#) for Wild West End to assist in the delivery of GI which is multifunctional with considerations for climate resilience, wellbeing and social value. The matrix provides a way to value green space and monitor progress against the targets set.
- To measure the changes in species distributions and green space value against the targets over time, the Wild West End partners committed to engage in [active monitoring](#) of the green spaces within their combined portfolios.
- The process has been iterative, particularly to get businesses to uptake GI implementation as part of the process.



BARRIERS, SOLUTIONS AND LESSONS LEARNT:

- Some of the Wild West End project teams have had concerns that fire regulations unnecessarily impact the ability to implement GI when retrofitting heritage buildings. The lesson here has been to bring multiple stakeholders along the journey in order to deliver GI. By looking at what other stakeholders are doing, they have been able to push each other to achieve more.
- It is not always possible to deliver GI onsite due to space limitations but this can be overcome by implementing enhancements in other nearby locations as an offset. This can, in some scenarios, offer greater benefits for nature.
- GI is viewed by some people as a "nice to have" but something which increases costs without creating value for built assets. The project has shown that whilst the value derived may not always take the form of direct monetary benefits, value accrued can include a range of social, environmental and health benefits.
- Consideration for the long term integrity of green space is needed. When it is first installed it can be of high quality, but it is important to ensure consistency across the whole life span of the asset and assess how this will be paid for. Ideally, there should be a habitat management plan in place, which is regularly reviewed every five years. The contractors should be encouraged to carry out maintenance, particularly during the first years as this is when GI is most likely to fail. This is most effective when built in to the contract at the outset.
- Limitations of space can lead to trade offs with other sustainability initiatives. For instance, should a roof be a green roof, photo voltaic (PV) or both? One method employed by the Wild West End has been to create a green roof with raised PV as a means of combining two approaches.
- Working in partnership provides the opportunity for more successful outcomes. For Wild West End it created a broader base for engagement and generated cumulative benefits. It also created a network to share lessons learnt and to build from experience.

Contributors:

Emily Hamilton
Senior Sustainability Manager, Grosvenor

Emily Woodason
Associate Landscape Architect, Arup

Matt Smith
Interim Head of Sustainability – Real Estate, The Crown Estate

"84% of people live in cities. We are in the midst of an ecological and climate crisis. Now more than ever it is fundamental to make space for nature. One of our challenges has been that although greening projects exist across London, a project of this scale is still unusual. With London now a National Park City we need to break free of creating pockets of green space, and innovate to deliver transformational purposeful greening at scale across this city. The Wild West End is a blueprint for how development and the real estate sector can make space for nature and people and make our cities greener, healthier and wilder for current and future generations."

Emily Hamilton, Senior Sustainability Manager at Grosvenor



"As Technical Partner to Wild West End, ensuring that the partners did not work in isolation posed a key challenge at the onset of the project. To overcome this, a framework for regular sharing of lessons learned between partners was established, helping them to tackle issues such as establishing good practice in design specification, balancing competing space demands, and resourcing for planned maintenance and monitoring. Progress on net gain and functional value is tracked at quarterly meetings, facilitating discussion on strategic opportunities, collaborative projects and overcoming challenges."

Emily Woodason, Associate Landscape Architect at Arup



Case Study 3: Victory Oak



Location:	Completion Date:
Dorset, UK	2021

Developer

- Sovereign Housing Association

Key actors:

- Alaska (translocation specialists)
- Dorset Wildlife Trust (strategic partner)
- Drew Smith (contractor),
- East Dorset District Council (local authority partner)
- Forestry Commission (strategic partner)
- Highways England (strategic partner)
- Homes England (land owner)
- Johns Associates (ecologists)
- Kendal Kingscott (architects)
- Natural England (advisor)
- Spectrum Premier Homes (client)
- Tetlow King (planners)

More information:

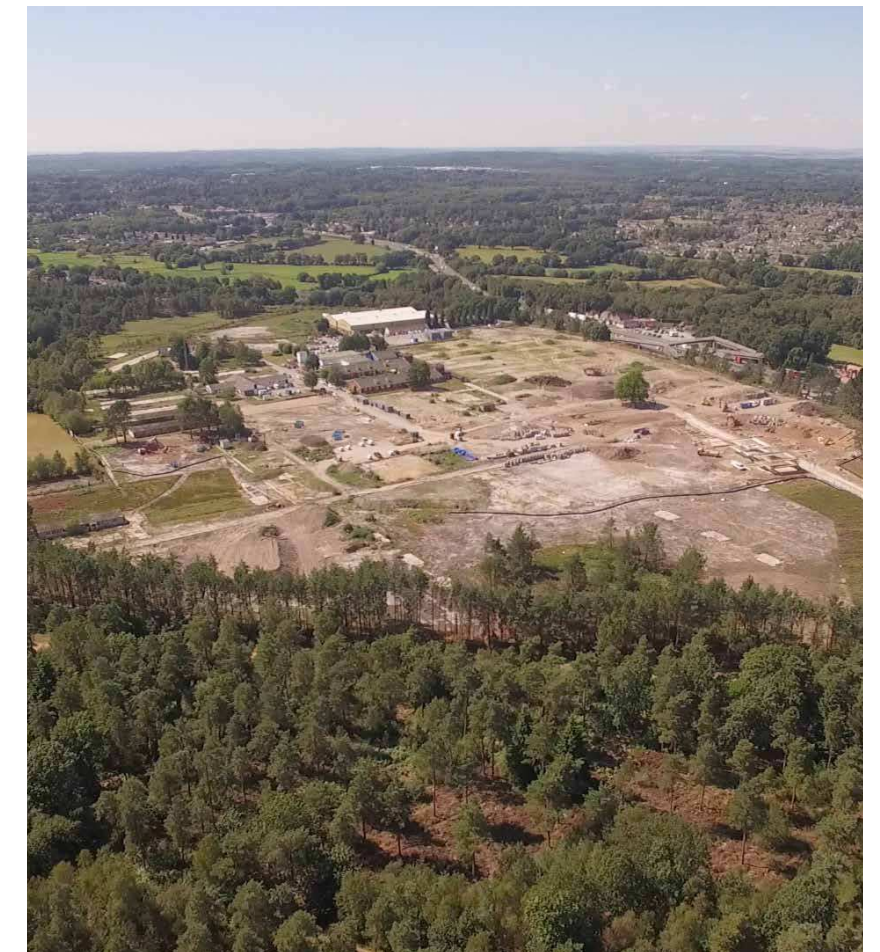
- [Dorset Local Nature Partnership case study](#)
- [Victory Oak Website](#)



PROJECT DESCRIPTION:

Victory Oak housing estate has been developed on the site of St Leonard's, a former American military hospital, to create 210 new properties. The project has led to the restoration and enhancement of an existing 18-hectare nature reserve and the provision of ongoing management support. The site is particularly notable for the sensitivity of a number of key ecological features. These include acid grassland/heathland communities, a population of sand lizards and other reptiles, rare plants (such as green winged orchids, autumn ladies' tresses and mossy stonecrop).⁷

The project is notable for the use of a partnership approach between public, private and third- sector organisations to deliver green infrastructure benefits through residential housing. Key stakeholders involved in the process included the developer, the local wildlife trust, the local authority, statutory consultees, and environmental consultancies. The project has recently won a Highly Commended Certificate from the Royal Town Planning Institute (RTPI) for 'excellence in spatial planning'. This was in recognition of outstanding collaboration.⁸



GI BENEFITS:

- Habitat restoration and enhancement
- Resident enjoyment
- Health and wellbeing improvements
- Specific provisions for valued bird and insect populations
- Improved aesthetic appeal and increased market value



DECISION MAKING PROCESS:

- To ensure a consistent decision-making approach, a Landscape and Ecology Management Plan (LEMP) steering group was formed. This met regularly to ensure the continued involvement of all stakeholders and alignment with project objectives.
- A significant development issue was that habitat areas had become established in between the former hospital buildings and any change to the existing footprint could potentially have an impact. In order to comply with Local Plan provisions, mitigation measures were established to protect existing habitats.
- The heathlands were known to be visited by night jars from the nearby Dorset Heathland Special Protection Area. As there was evidence that recreational access would increase species risk, a Supplementary Planning Document required suitable habitats to be provided off-site and the attractiveness of the green-belt to be maintained.
- Many of the developer's key decisions were driven by advice from Natural England. This enabled them to make informed judgments on options for habitat alteration and species introduction. Further specialist ecological expertise was provided by Johns Associates (particularly on the balance between the built and natural environment) and Alaska. The latter proved essential in advising on maintenance of soil conditions as part of grassland translocation.



BARRIERS, SOLUTIONS AND LESSONS LEARNT:

- Joint decision making enabled aspects of the process to be streamlined. To avoid the need for a separate felling license, tree and scrub clearance was authorised through the planning process. This led to efficiency gains and cost savings.
- Although, the LEMP steering group was resource intensive, it enabled the developer to receive ongoing support. This in turn promoted flexibility and enabled them to resolve problems as they arose.
- Management of the reserve hadn't previously included a maintenance regime. Any agreed measures would therefore need to account for management post-construction. The solution was to secure a management arrangement. Funding has been secured for the next 50 years and Dorset Wildlife Trust has taken ownership of the reserve. The project was able to protect 2ha of sensitive grassland through translocation. To ensure that soil conditions were maintained, early planning and expert involvement proved fundamental.
- Partnership working with a cross-section of stakeholder interests revealed ways in which environmental improvements could lead to increased market value and enhanced community benefits. This resulted in property types which have features uncharacteristic of new build developments. The homes at Victory Oak not only have large gardens but are located in easily accessible and high quality natural surroundings.
- The project enhanced an understanding of how existing GI could be improved. By felling the non-native trees in existence on the site, the original heathland could be restored. Horses and cattle were also deliberately introduced to keep the scrub down through natural grazing. This in turn helps reduce maintenance costs. Sovereign Housing Association and Dorset Wildlife Trust split the cost of the animals 50/50 in recognition of the joint benefits.
- A flexible design approach was key to the site. Street lighting in new housing developments can often impact bat flight paths. Lighting at Victory Oak was deliberately positioned away from flight paths and the roosts were positioned within the flight paths to minimise the negative impact on the bat population.

Contributors:

Mary Miller
Commercial Development Manager, Sovereign Housing Association

Annette Cattle
Project Manager, Land, New Business & Delivery, Sovereign Housing Association

Imogen Davenport
Director of Conservation, Dorset Wildlife Trust

References

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- 8 Dorset Council (2017). Victory Oak development is Highly Commended. [online] Available at: <https://news.dorsetforyou.gov.uk/2017/06/08/victory-oak-development-highly-commended/#targetText=Sovereign's%20Victory%20Oak%20development%20in,Excellence%20in%20Spatial%20Planning%20category.&targetText=Victory%20Oak%20is%20a%20great,to%20take%20from%20this%20project.> [Accessed: 25/10/19].

"My advice to those undertaking GI projects is not to underestimate the complexities and restrictions of ecological



cycles on the project timescale. Interactions with bat nesting seasons or transposing acid grassland for example will mean adjustments and extensions to phases and budgets, and these changes to the programme need to be understood and communicated. Larger developers may need to reconsider their forecast sales programme. It's better to get the timespan right from the ecologist and recognise you can't short-cut it".

Mary Miller, Commercial Development Manager at Sovereign Housing Association

"My advice to developers undertaking GI projects is to involve stakeholders right from the beginning. We had over 20 years



of interaction prior to planning permission going ahead. I would also recommend establishing a focus group to look at ongoing management and help advise on set up"

Imogen Davenport, Director of Conservation at Dorset Wildlife Trust

Case Study 4: Kingsbrook



PROJECT DESCRIPTION:

Kingsbrook is a new community development of 2,450 homes to the east of Aylesbury. The project is being led by Barratt Developments along with the RSPB and Aylesbury Vale District Council. It seeks to set a new standard for wildlife friendly housing on a large-scale conventional development site. As the project seeks to secure both nature-based and community benefits, a key part of the process has been to engage with the local community to identify the benefits that they can receive from GI interventions. Central to the ambition of the project is an attempt to use a GI approach which can be replicated in other development scenarios.

At Kingsbrook, 60% of land excluding gardens will be established as greenspace for the benefit of both people and wildlife. This will include ponds, parks, meadows, orchards, allotments and a 100ha nature reserve. In order to help species move around the site, habitat corridors are being created using hedges, wildflower strips and gaps under fences. Sustainable Drainage Systems (SuDS) are also being established to manage rainwater on the site and to provide refuge areas for wildlife. Approaches include the use of rills, swales and ponds. New habitats will also be created making use of swift and sparrow boxes, a barn owl box, bat boxes, a logger (for the collection of logs), dragonfly perches, wildlife tunnels, bat hop-over points and a wildlife friendly garden in each show home.



Location:	Completion Date:
Buckinghamshire, UK	2026 - 2031

Developer:

- Barratt Development

Key actors:

- Aylesbury Vale District Council (strategic partner)
- RSPB (strategic partner)

More information:

- [Barratt Developments Website](#)
- [RSPB Website](#)



GI BENEFITS:

- Health and wellbeing uplift for residents and the wider community
- Habitat provision for wildlife
- Improved development aesthetics
- Reduced flood risk through the use of Sustainable Drainage Systems (SuDS)

DECISION MAKING PROCESS:

- Barratt sought expert advice from the RSPB and Aylesbury Vale District Council to inform their decision making process and approach.
- Baseline habitat surveys were undertaken using standard ecological survey techniques to understand the existing ecology on and surrounding the site.
- The ecological survey findings were then used to aid the selection of GI types and species composition.
- A variety of GI interventions were used with a view to raising development standards, driving inspiration and demonstrating what can be achieved. Importantly, the GI approach adopted recognised both local and national needs.



BARRIERS, SOLUTIONS AND LESSONS LEARNT:

- The Kingsbrook development initially struggled to obtain development consent from Aylesbury Vale District Council. Ecologists from the council however, suggested that if Barratt were to partner with the RSPB to create a development which was mindful of wildlife, they would potentially look more favourably towards any revised planning application. The three parties discussed how this might work before Barratt put forward a new planning application. Through this early collaboration and joint vision, Barratt were able to successfully navigate the planning process.
- The partners found that mutual respect was essential for the successful delivery of each other's objectives. For instance, whilst the RSPB needed to respect that profitability is a strong motivating factor for Barratt, Barratt also needed to understand that only certain development options are likely to be sensitive to the needs of wildlife. Understanding and building this collaboration early on saved time and money as well as leading to better business and wildlife outcomes. The approach also revealed that inter-partner connectivity and an awareness of the knowledge resources held by each partner was fundamental to success.
- Creating a new ethos and culture was found to be paramount in achieving such a significant change in day to day practice. The partners recognised that this was something that needed to be present throughout the development team. Regular tool box talks with contractors (not just the management team) for example, and the ability to ask for help when needed (i.e. from the RSPB) were found to be helpful.
- A common perception of GI is that it is often unattractive. It can indeed look messy and bare for long periods, particularly in the early phases of intervention. To overcome this, communities and customers at Kingsbrook are being engaged on what is being done and why. This process has influenced standard business practice within Barratt Developments.
- The housing industry typically works on a restricted palette of plant species, based on favourable tree root types, look and plant availability. For this development a more bespoke biodiversity perspective was required in order to meet different wildlife needs.
- Conservation bodies often have limited awareness of the working practices of housing developers. Typically, much of project delivery is carried out by contractors and sub-contractors. Kingsbrook provided an opportunity for the RSPB to engage with new working practices, processes, skill sets and information flows.

Contributors:

Adrian Thomas
Senior Project Manager, RSPB

Jeremy Alden
Technical Director, Barratt Developments – North Thames Division

Helen Nyul
Group Biodiversity Manager, Barratt Developments

"Kingsbrook is working hard to raise the bar for what can be achieved on a large-scale development, for the benefit of wildlife but also how new communities are inspired and engaged to play their part and reap the rewards. Much of the challenge in delivering a wildlife-rich built environment is to do with adjusting ways of working, but we also need to help translate what can be quite complex ecological ideas into something that is seen as easy, achievable and desirable on any development."

Adrian Thomas
Senior Project Manager at RSPB



"Green infrastructure should not just be seen as an attractive space between housing within a development but should encompass every part of a development. Houses, gardens and even road frontages can play a vital role in creating diverse and attractive habitats. Working in partnership with experts and having faith to rely on that expertise is crucial. Establishing a common goal within a framework of what each party requires is the starting point to building ideas and success. From ideas comes practice and from practice comes culture. There are challenges in translating these ideas into the built form but early engagement and solid communication with contractors and suppliers can ease these challenges. Continuity also plays a key role in creating a positive environment where green infrastructure developments can succeed"

Jeremy Alden
Technical Director at Barratt Developments – North Thames Division



Case Study 5: Marks & Spencer Newcastle



Location:	Completion Date:
Newcastle-Upon-Tyne, UK	2015

Developer:

- Marks & Spencer

Key actors:

- ANS Global (product supplier)

More information:

- [ANS Website](#)



PROJECT DESCRIPTION:

As part of a wider sustainable refit, Marks & Spencer installed a 167m² living wall on the exterior of its Newcastle store. This wall was designed and installed by ANS Global. It is made up of 16,000 native species including thyme, wild strawberries and cranesbill all of which provide habitat for insects and birds. The ANS System is a compost-based system specifically designed for vertical walls and is irrigated using rainwater harvesting.⁹

Improvements to Marks & Spencer Newcastle follow on from the refit of four Simply Food sites, which included the installation of living walls. The main aim of the living wall at Newcastle was to provide an uplift in biodiversity to the high street, whilst also providing a striking vista.

GI BENEFITS:

- Urban cooling
- Health and wellbeing improvements
- Provision of bird and insect habitat and food
- Improved aesthetic appeal of the high street

DECISION MAKING PROCESS:

- The living wall was a clear visual representation to customers of the sustainable credentials of the wider refit.
- The size of the living wall was determined by the cost and design process.
- The species of plants used were chosen by ANS in conjunction with store design and the consistency of the M&S brand.

BARRIERS, SOLUTIONS AND LESSONS LEARNT:

- In some cases, acquiring planning permission for new development work can be a challenge. However, GI often falls within local council priorities and in this instance Newcastle City Council have an ambition to regenerate the high-street, something the living wall contributes to. This made it easier to get planning approval.
- The set-up cost of the wall was significant, particularly when considering the structural design factors. Additionally, maintenance cost is an ongoing challenge for the site and wider industry. To overcome this, GI solutions with low maintenance costs need to be identified and considered upfront.
- In some instances, it can be difficult to decide what sustainable feature to use. This green wall was in part chosen for the added value to customer experience.

Contributors:

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Marks & Spencer

Zoe Mountford
Lead Sustainability Manager, Marks & Spencer

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⁹ ANS Global (2019). Marks & Spencer Newcastle. [online] Available at: <https://www.ansgroupglobal.com/living-wall/case-studies/marks-spencer-newcastle> [Accessed: 25/10/2019].

"The refurbishment at M&S Newcastle signalled our intent to regenerate and invest into Northumberland Street, improving not only customer experience, but also providing a striking vista on the high street which aims to help encourage biodiversity. The living wall was one of a number of initiatives to improve the sustainable performance of the store, including intelligent door sensors, LED fridge lighting and a new heat reclaim system".

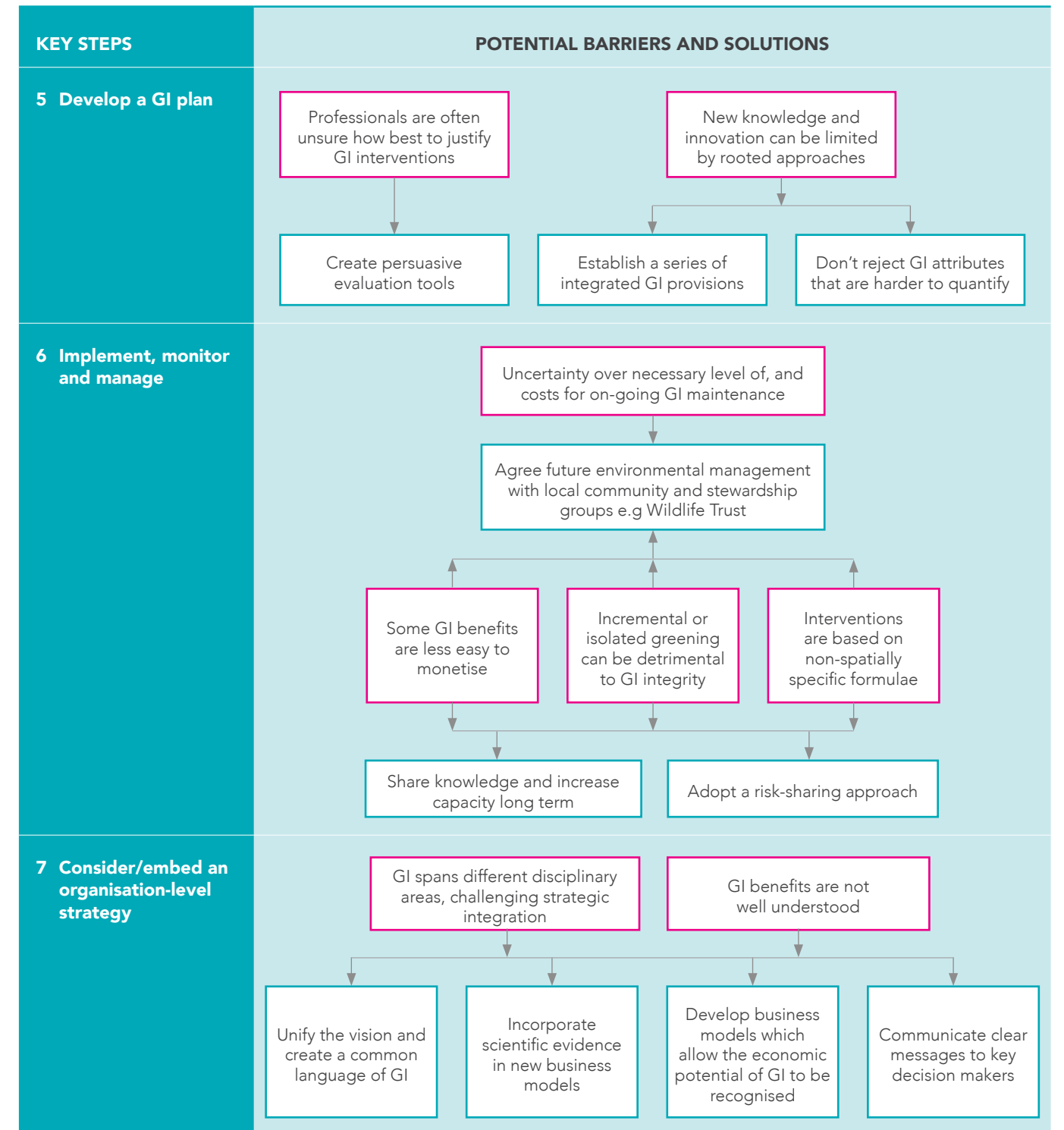
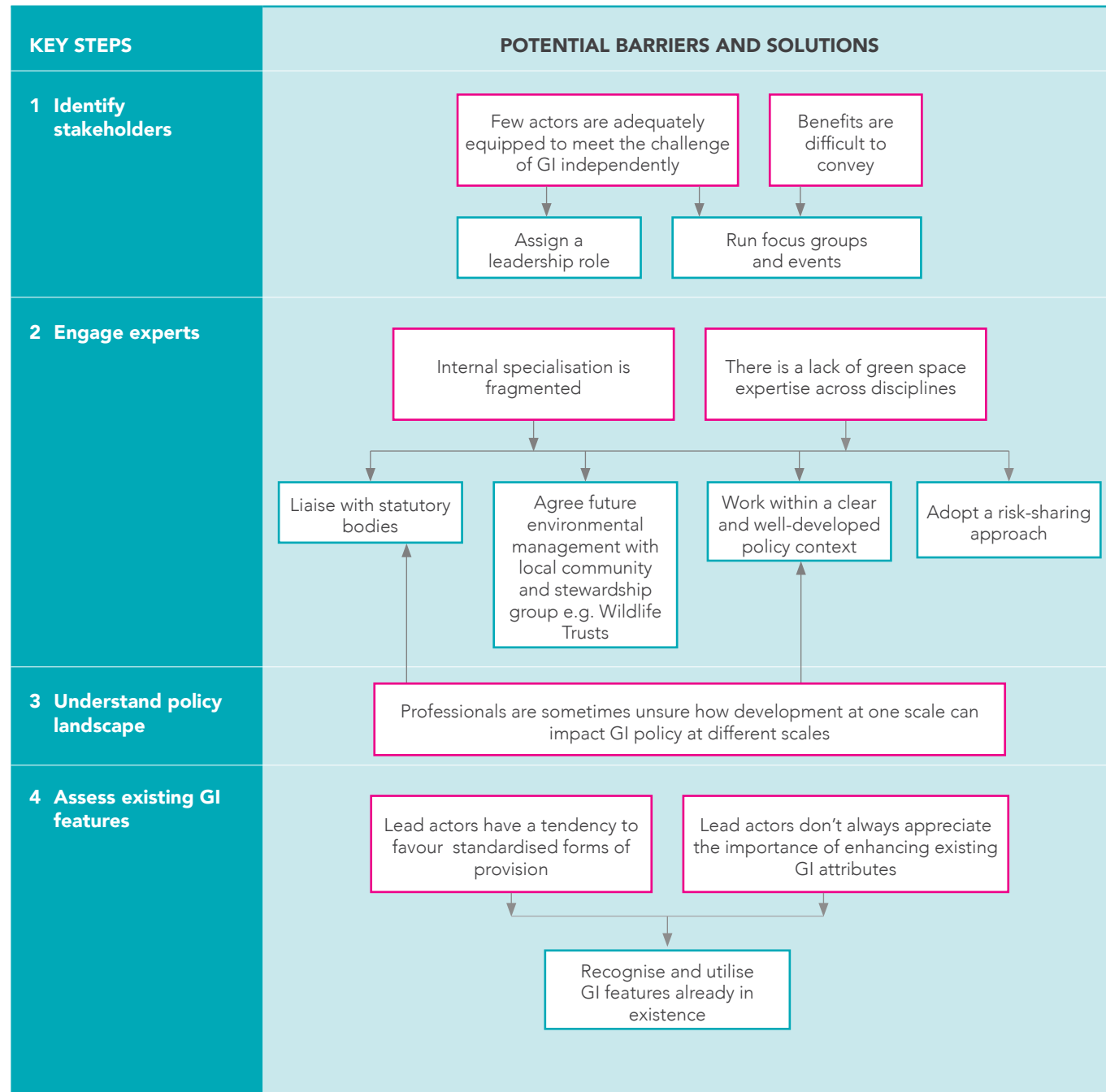


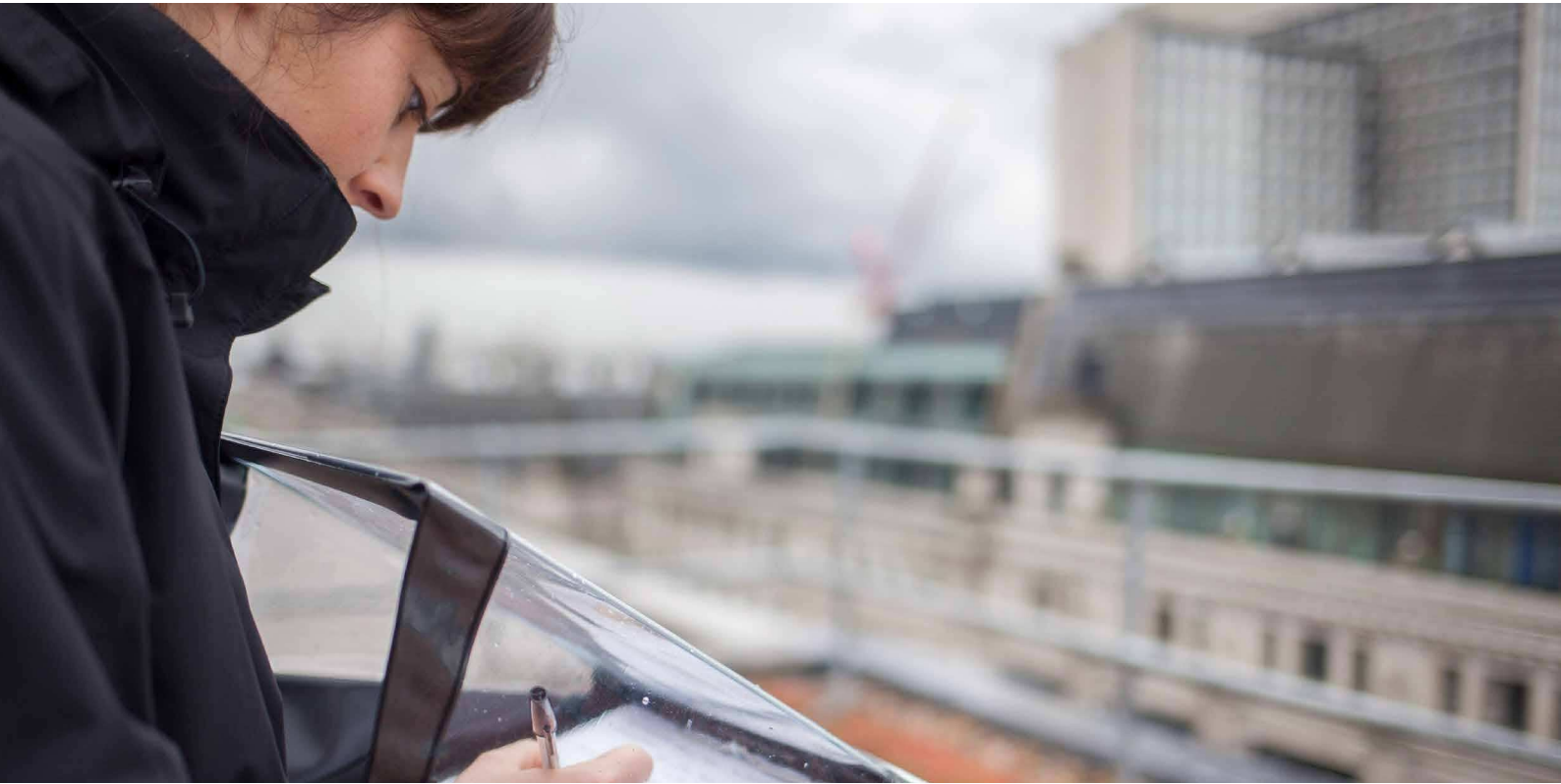
Zoe Mountford
Lead Sustainability Manager
at Marks & Spencer

Green Infrastructure Decision Making Route Map

This decision route map represents a synthesis of the common barriers and recommended solutions identified during research conducted for the Green Growth project. It is designed to follow the key steps in the Practical How-to Guide, and offers a reference tool for project leads, designers, developers and beyond, to support decision making when planning new developments.

Key:
 Barriers Solutions





This report highlights five case studies which show how the multiple challenges of successfully integrating GI into built environment proposals were overcome. The insights and learnings from these are intended to aid the successful implementation of GI in future development projects.

GI is typically perceived to lack a return on investment, resulting in low levels of implementation. However, as shown in these case studies, GI can generate a multitude of benefits for businesses, the environment and society. For instance, through GI built assets can adapt to the impacts of future climatic changes including the increased risk of flooding and overheating. This resilience will generate financial returns through the avoidance of flood damage repair and air conditioning system upgrades. It was also shown in some of the case studies that implementing GI into the design of the project increases the speed and likelihood of acquiring

planning permission, saving both time and money. In some cases, GI may not offer direct or immediate financial returns, but can still provide long term value in other forms including better environmental outcomes, improved health and wellbeing of building occupants and greater customer experience.

Another common thread that ran throughout the case studies was the success of a collaborative approach. Typically, this was shown to involve working closely with a number of stakeholders, some of which are not traditionally involved in development, such as environmental NGOs. By working together developers and external partners can exchange knowledge, share learnings and collaborate to generate better outcomes for nature and people.

It is hoped that the learnings shared in this report can support future project teams in achieving similar or greater gains in GI for their own projects.

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