



Delivering better water management through the planning system



Catchment
Based Approach

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Water and Environmental
Management

RTPI Royal Town Planning Institute





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Delivering better water management through the planning system

Part A: Main guidance

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Summary

Water management is vital for good town planning. Planning for water enables our towns and cities to be greener, healthier, wealthier, more attractive and more resilient to climate change. Integrating water management brings multiple benefits, including:

- ◆ increased resilience
- ◆ delivering housing and a strong local economy
- ◆ enhancing environment and greenspace.

Development can have significant impacts on water availability and its quality, and if left unchecked we risk water shortages, flooding and environmental damage.

This guidance supports planning for water through the delivery of Integrated Water Management (IWM). This concept combines a range of approaches to make the most of opportunities to improve people's lives, while also avoiding and mitigating the risks from too little or too much water, as well as risks related to water pollution.

Box 1 Positive outcomes from an IWM approach

- 1 Reduced risk from flooding.
- 2 Increased water efficiency and reduced water stress.
- 3 Clean and good quality water environment.
- 4 Enabling new housing.
- 5 Facilitating economic growth and regeneration.
- 6 Enhanced biodiversity.
- 7 Better blue-green infrastructure.
- 8 Improved accessible public spaces and places, and well-being.
- 9 Mitigating and adapting to climate change.
- 10 Using resources more sustainably and effectively.

A planning approach based on IWM delivers multiple benefits and ecosystem services that contribute to natural capital while mitigating and removing risks, to create more liveable and sustainable places. THE positive outcomes from taking an IWM approach in local planning are in **Box 1**.

The guidance explains the role of effective strategies and local plan policies that should be underpinned by effective engagement and evidence. This improves approaches to managing and using all available water resources, eg rainwater, greywater, wastewater, recycled water and groundwater, in addition to mains water.

The 'golden thread' can be a useful concept to support effective delivery of IWM, this involves:

- ◆ identifying the water-related opportunities and challenges
- ◆ determining the appropriate IWM response
- ◆ putting in place policies to enable IWM, and facilitate the partnerships to achieve the outcomes.

The guidance shows how, through the application of critical success factors (CSFs) the golden thread can be achieved (see **Box 2**). The guidance explains these CSFs and how they work to achieve better water management outcomes.

Box 2 CSFs – achieving better water management outcomes

- a Understanding IWM.
- b Enabling local policy.
- c Early engagement.
- d Partnerships.
- e Good management.

Engagement and effective partnerships are the key to delivering multiple benefits, as resources can be pooled to deliver outcomes that would have been beyond the scope of the individual stakeholders working independently. The guidance sets out the benefits of early engagement and partnership formation, how partnerships work, and how opportunities can be delivered and challenges overcome by local authorities (local planning authorities [LPAs] and lead local flood authorities [LLFAs]), regulators, developers and water and sewerage companies engaging early and working together.

Good local plan policies for IWM need to be sensitive to local circumstances. Clear technical requirements or ‘asks’ of a policy are important in creating certainty for developers, the LPA, regulators and the public. The guidance sets out the key characteristics of good local policy for delivering IWM and how this fits within the planning policy framework, particularly the National Planning Policy Framework (NPPF) in England (MHCLG, 2019a) and Planning Policy Wales (PPW) (Welsh Government, 2018).

Advice on making good local plan policy is illustrated by examples of good local policy contained in **Part C**, and **Part B** provides case studies demonstrating what good integrated water management looks like. The case studies and examples show how the CSFs apply to the development of good local plan policy and developments on the ground to deliver IWM outcomes.

This guidance provides advice to planners on good practice when preparing plans and policies, and for other stakeholders on what they should be asking for when plans and policies are under preparation or the subject of consultation.

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1 Introduction



Creekside (courtesy Bill Green Photography)

1 Introduction

1.1 PURPOSE OF THE GUIDE

Managing water in the way shown in this guide will help save money, deliver housing targets and improve places for communities. Planning is integral to the effective management of water on developments. This guidance supports the delivery of integrated water management (IWM), ie better water management for new development and regeneration projects. Some key definitions used in the guidance (and associated parts) are presented in **Box 1.1**.

This guidance provides local government, particularly local planning authorities (LPAs) with support and resources to enable them to develop policies and appropriately engage with stakeholders to ensure that high-quality developments with good water management are cost effectively delivered.

1.2 HOW TO USE THE GUIDE

This guidance is split into five parts (A to E) and 10 sections:

Part A Main guidance	Section 1	Gives an outline of IWM and how to use this guidance.
	Section 2	Explains why IWM is important, including the outcomes it can deliver. Against each outcome described in Table 2.1 is a list of the case studies that demonstrate how IWM can deliver that outcome.
	Section 3	Sets out the critical success factors (CSFs) that facilitate the delivery of good IWM through the planning system. Below each CSF is a list of the case studies and examples of good local plan policies that illustrate its application.
	Section 4	Highlights the key characteristics of good local plan policy that can deliver IWM.
	Section 5	Lists all the case studies and examples of good local plan policies, and shows how they relate to the outcomes and CSFs.
Part B Physical case studies	Section 6	Contains case studies of projects on the ground that demonstrate how IWM can deliver the full range of good outcomes. These case studies also provide examples of how the CSFs have been applied to deliver IWM. Links are made to local plan policies relevant to each project.
Part C Good local policy case studies	Section 7	Contains examples of good local plan policy. Each example has a summary of the issues the policy addresses and lists the outcomes the policy is intended to deliver.
	Section 8	Shows the CSFs that were applied to develop the policy, and provides links to projects on the ground that have adopted it

Box 1.1 Key definitions

IWM is a collaborative approach to managing land and water that delivers co-ordinated management of water storage, supply, demand, wastewater, flood risk, water quality and the wider environment. See **Figure 2.1**.

In this guidance, the 'planning system' means the English and Welsh land-use planning systems following national policy set out in the National Planning Policy Framework (NPPF) and Planning Policy Wales (PPW) and its implementation through local plans (including strategic and joint plans) and neighbourhood plans in England, and through local development plans and place plans in Wales. The definition includes documents associated with these plans, ie supplementary planning documents, supplementary planning guidance, and associated documents, eg infrastructure delivery plans, master plans and IWM strategies.

In this guidance, 'water company' means a water and sewerage company, a 'water only' company or a new appointments and variations company (a limited company that provides a water and/or sewerage service to customers in an area which was previously provided by the incumbent monopoly provider, or a site that is currently unserved by any water or wastewater infrastructure).

Part D National policy review	Section 9	Contains a review of English and Welsh national planning policy and guidance relevant to IWM. It highlights the 'hooks' that LPAs can use to support and justify IWM policies in local plans (as at 31 July 2019).
Part E Characteristics of good local policy	Section 10	Provides detail on the way in which relevant local policies demonstrate good practice based on the guidance in Section 4 .

Links are given in **Part A** to case studies (**Part B**) and examples of good local plan policy (**Part C**). Each case study includes a list of the outcomes that the scheme delivers, and the CSFs that were applied to deliver it. The examples of good local policy also lists the outcomes it delivers and the CSFs that helped its development.

Part A
Main guide

Part B
Physical case studies

Part C
Local case studies

Part D
National policy review

Part E
Characteristics of local policy

2 The importance of integrated water management



Creekside (courtesy Bill Green Photography)

2 The importance of integrated water management

2.1 WHY DOES PLANNING FOR WATER MATTER?

Water management is a vital aspect of good town planning. Planning for water provides opportunities to design towns and cities to be greener, wealthier, healthier, more attractive and biodiverse, and more resilient to climate change. Development can have significant impacts on water use and water network capacity affecting water resources, wastewater disposal and flood risk.

Although water is only one of many factors planners need to take into account, if it is considered early in the planning process it can help deliver other requirements (see [Table 2.1](#)). Early consideration of water can also help prevent costly and hazardous unintended consequences of development.

For the most part, historically the UK has had sufficient water supply so this has not been an issue for planners. However, this is likely to change and the planning system will have to cope with a changing climate with more extreme weather conditions, within the context of an increasing population and an increasing demand for water and wastewater services.

The current UK water supply surplus of 12 per cent is due to change by the 2050s to a water deficit of 8 to 22 per cent of total water demand (Defra, 2017). In 2018, the National Infrastructure Commission (NIC) calculated that an extra four billion litres will be needed every day by 2050 to ensure the UK water network is resilient, with one billion litres per day shortfall under current plans (NIC, 2018). Extreme water shortages could cost the economy £1.3 billion per day (Clark *et al*, 2018).

Flood risk is a major focus for the planning system. Extended periods of extreme rainfall are already seven times more likely than in pre-industrial times. More than 5.2 million people in the UK live and work in 2.7 million properties that are at risk of flooding from rivers or the sea, three million are also at risk of surface water flooding, and 200 000 are at risk of groundwater flooding. The UK's annual flood damage costs are around £1.1 billion. These could rise to as much as £27 billion per annum by 2080 (Environment Agency, 2018a).

Maintaining an adequate supply of water together with ensuring adequate drainage capacity, especially during extreme rainfall events, is getting much more difficult. It requires careful and integrated planning, with LPAs working closely with water companies, Lead Local Flood Authorities (LLFAs), the Environment Agency, Natural Resources Wales, Internal Drainage Boards and highways authorities.

Urbanisation and agricultural development have shaped the landscape. Natural landscapes such as wetlands, grassland and woodland have been reduced by such an extent that only 10 per cent of floodplains in England continue to provide their natural flood attenuation function. In England and Wales, 42 per cent of floodplains are separated from their rivers, largely by engineering. Part of this problem arises from granting of planning permission for housebuilding – residential development of floodplains has grown by 1.2 per cent since 2011, 0.5 per cent faster than other areas (Clark *et al*, 2018).

2.2 WHAT IS IWM AND HOW DOES IT HELP?

IWM is a concept that brings together a range of approaches to improve people's lives while also avoiding and mitigating the risks from too little or too much water, as well as risks related to water pollution (see [Figure 2.1](#)). IWM is defined as a collaborative approach to managing land and water that delivers co-

ordinated management of water storage, supply, demand, wastewater, flood risk, water quality and the wider environment (**Box 1.1**). IWM should deliver better management of land and water.

A planning approach based on IWM can provide multiple benefits and ecosystem services that contribute to natural capital while mitigating and removing risks, to create more liveable and sustainable places. Multiple benefits are achieved when different stakeholders work in partnership to achieve a range of outcomes that meet their individual and collective ambitions. The positive outcomes from taking an IWM approach in local planning are set out in **Table 2.1**. These outcomes align and are mutually supporting. They can be achieved together (as multiple benefits) through IWM.

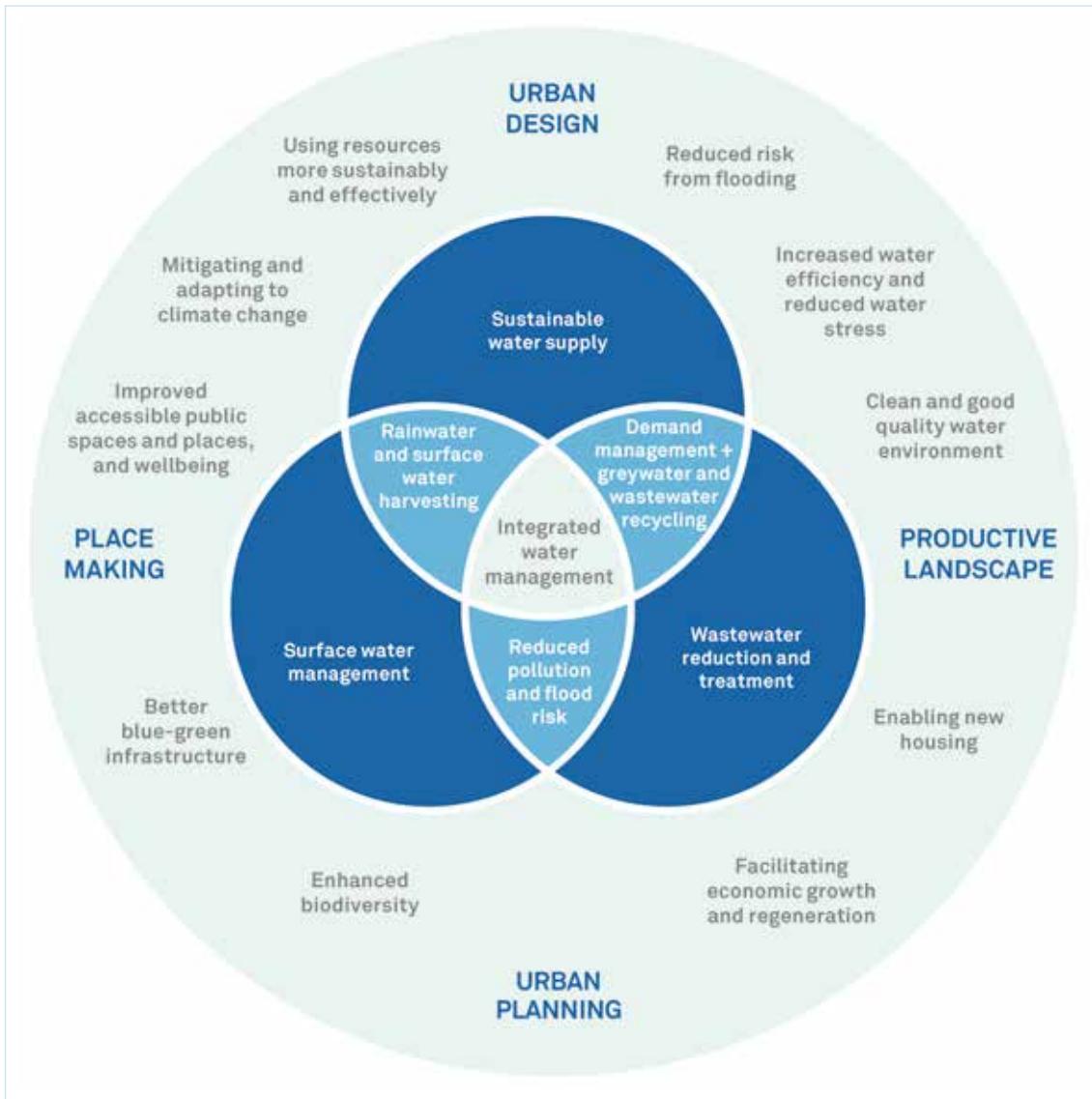


Figure 2.1 Process of delivering IWM

Table 2.1 IWM outcomes

Outcome	How IWM contributes to multiple benefits	Case studies	Local plan policy	
	Reduced risk from flooding	Reducing risk of flooding from a range of sources and scales (Figure 2.3), from landscape scale (through natural flood risk management) reducing the risk of river flooding to sustainable drainage systems (SuDS) reducing and attenuating runoff to reduce the risk of local flooding.	All	LP1, LP2, LP3, LP4, LP5, LP6, LP7, LP8, LP9; LP10, LP12, LP13, LP14, LP15
	Increased water efficiency and reduced water stress	Reducing potable water use including rainwater harvesting and use, greywater and wastewater recycling/reuse can reduce demand on the public water supply. If this is linked to water-efficiency measures in buildings, the savings can be significant.	P1, P3, P6, P10, P11, P12	LP1, LP2, LP3, LP4, LP5, LP6, LP7, LP8, LP10, LP12, LP12, LP14
	Clean and good quality water environment	Reducing or removing pollution from surface water and groundwater, and providing a more natural and biodiverse water environment.	P1, P2, P3, P4, P5, P6, P7, P8, P9, P10, P11, P12	LP1, LP3, LP4, LP5, LP6, LP7, LP8, LP10, LP12, LP13, LP14, LP15
	Enabling new housing	Providing water management and improvements to overcome challenges such as flood risk, availability of water, lack of drainage capacity and poor urban environment.	P1, P2, P3, P4, P5, P6, P7, P8, P10	LP1, LP3, LP4, LP5, LP6, LP11, LP12, LP14
	Facilitating economic growth and regeneration	Improving urban economies and environments and enabling sustainable redevelopment. Enhanced value of development with better greenspace and water views.	P1, P2, P3, P4, P5, P6, P7, P10, P11, P12	LP2, LP4, LP6, LP9, LP14, LP15
	Enhanced biodiversity	Providing a vibrant, more natural environment, introducing a range of habitats and species. Providing ecosystem services and enhancing natural capital, contributing to net environmental gain.	P1, P2, P3, P4, P5, P6, P7, P8, P9, P10, P11, P12	LP1, LP4, LP5, LP6, LP7, LP8, LP9, LP10, LP12, LP13, LP15
	Better blue-green infrastructure	Providing functional and connected blue and green spaces which deliver multiple benefits and connect urban places for water, wildlife and people.	P1, P2, P3, P4, P5, P6, P7, P8, P9, P10, P11, P12	LP1, LP2, LP3, LP4, LP5, LP6, LP8, LP9, LP10, LP11, LP13, LP14, LP15
	Improved accessible public spaces and places, and improving well-being	Providing good quality open space which, as well as managing water, is accessible, creates more liveable places and promotes health and well-being. Connecting places and people to water.	P1, P2, P3, P4, P5, P6, P7, P8, P9, P10, P11, P12	LP1, LP2, LP3, LP4, LP5, LP6, LP8, LP10, LP14
	Mitigating and adapting to climate change	Providing sustainable urban greenspace at a range of scales makes urban areas more resilient by reducing the urban heat island effect, reducing energy consumption, making better use of water, and enabling our towns and cities to better cope with more extreme weather events.	P1, P2, P3, P4, P5, P6, P7, P8, P9, P10, P11, P12	LP1, LP3, LP5, LP6, LP7, LP8, LP9, LP10, LP11, LP13, LP14
	Using resources more sustainably and effectively	Cost savings and efficiencies, particularly through partnership working delivering multiple benefits, makes schemes affordable, and more can be done for less.	P1, P2, P3, P4, P5, P6, P7, P8, P9, P10, P11, P12	LP3, LP5, LP6, LP7, LP8, LP10, LP14

2.3 DELIVERING POLICY IN ENGLAND AND WALES

IWM has an important role in delivering the UK Government's 25 year environment plan (HM Government, 2018) (see [Part D, Section 6.1](#)). IWM supports the overall objectives of the plan, and directly supports key parts of it in terms of delivering natural capital and multi-beneficial blue-green infrastructure, providing net environmental gain, and mitigating and adapting to climate change.

IWM supports the goals of cleaner water and a cleaner, greener country for everyone, including creating new habitats, improving biodiversity, and improving rivers.

IWM directly supports the Secretary of State for Environment, Food and Rural Affairs' ambitions for greening urban environments, and ensuring development should result in net environmental gain and, crucially, to "*work with nature to protect communities from flooding, slowing rivers and creating and sustaining more wetlands to reduce flood risk and offer valuable habitats*" (HM Government, 2018). IWM can help

contribute to the urban aspect of a nature recovery network through the creation of multi-beneficial connected blue and green spaces. IWM contributes to all of the 25-year goals set out in the plan.

IWM also directly contributes to health and well-being (POST, 2016). In Wales, the Well-being of Future Generations Act (Wales) 2015 requires public bodies to ensure that when making their decisions they take into account the effect they could have on peoples' lives in the future, including their health and well-being.

IWM is also supported by the catchment-based approach, a policy framework that encourages taking a whole catchment approach to water management which also involves local communities in decision making.

The 'Circular Economy' is a concept that has been used in relation to resource management which is also very relevant to IWM. The principles of circular economy are at the heart of IWM. They include:

- 1 Efficient use of water, use of rainwater harvesting and SuDS 'design out waste and pollution', the first principle of the Circular Economy.
- 2 Reusing greywater or other wastewater to 'keep the product and materials in use', the second principle of the Circular Economy.
- 3 SuDS and Green infrastructure not only manage rain and flooding in a more sustainable manner but also 'regenerate natural systems', which is the third principle of Circular Economy.

IWM schemes also have a wider impact on urban water and natural systems. Reduced demand and usage not only requires less infrastructure thus lowering the material use, it also requires less water abstracted from the environment that can enhance the ecosystem and its ability to respond to shocks such as droughts. In this regard, IWM will be fundamental in adapting to climate change.

2.4 THE GOLDEN THREAD

There is often a golden thread running through successful approaches to achieving the outcomes that IWM can deliver.

The principle of the golden thread is very simple:

- ◆ identify the water-related opportunities and challenges for the community (eg environmental quality, water supply/quality, flood risk)
- ◆ identify the appropriate IWM response
- ◆ put in place policies to enable IWM
- ◆ facilitate the partnerships to achieve the outcomes.

Box 2.1
Natural capital – ecosystem services and net environmental gain

Natural capital is "*the sum of our ecosystems, species, freshwater, land, soils, minerals, our air and our seas. These are all elements of nature that either directly or indirectly bring value to people and the country at large. They do this in many ways but chiefly by providing us with food, clean air and water, wildlife, energy, wood, recreation and protection from hazards*" (HM Government, 2018). Recognising and quantifying the natural capital of the natural environment is intended to improve decision making by making costs, benefits and trade-offs more transparent.

Ecosystem services are the "*benefits people obtain from ecosystems*" (JNCC, 2019). Ecosystems are dynamic systems with interactions and connections evolving over time and space and can be expressed in terms of goods and services. These goods and services contribute to 'natural capital'.

Net environmental gain is an objective underlying the 25 year environment plan (HM Government, 2018) and other government policy such as the NPPF. The NPPF uses the concept of net gains across economic, social and environmental objectives as a way of encouraging sustainable development. A challenge of achieving net environmental gain is being able to measure it so that it can be compared with economic measures such as gross value added. In this way, it is related to a natural capital approach. Planning Practice Guidance (MHCLG, 2019b) contains guidance for planners on delivering net biodiversity gain and Defra is developing metrics for other aspects of natural capital, including the water environment.

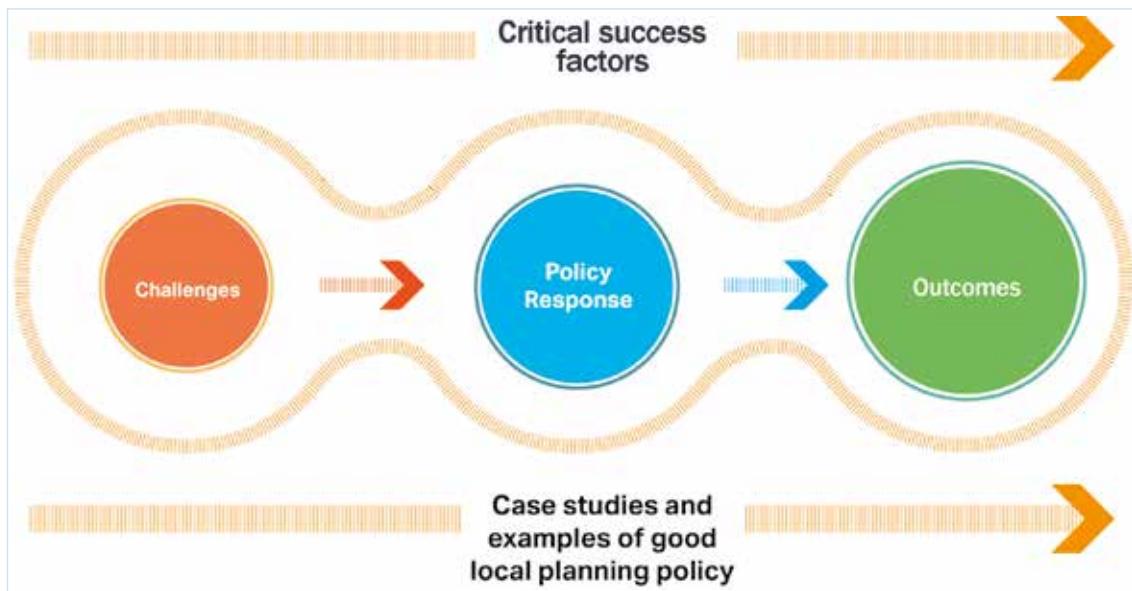


Figure 2.2 *The golden thread*

Table 5.2 demonstrates how policies and CSFs come together to help respond to the opportunities and challenges in delivering IWM outcomes. The case studies in **Part B** show how it works in practice and there are examples of the policies that make it work in **Part C**.

The local plan policies and outcomes in Uxbridge (P10), Lewisham (P2), Clay Farm (P1) and North West Cambridge (P6) demonstrate this golden thread well. In all, nine of the case studies in **Part B** demonstrate a direct golden thread between local plan policy and good IWM outcomes. In two others, New South Quarter and Wandle Park (P5) and Manor Fields Park (P7), the engagement of the LPAs with an innovative IWM project has led to the development of good water policies. These two, and Mount Oswald (P8), demonstrate that, with early engagement and good partnership working, a developer can work with a LPA and LLFA to secure good IWM outcomes, even when there is no supporting planning policy. In these cases there was a shorter golden thread. In collaboration, the partners identified the challenges and opportunities and were able to apply the CSFs to directly achieve good outcomes.

2.5 OPPORTUNITIES, CHALLENGES AND SOLUTIONS: HOW IWM WORKS

The first element of developing the golden thread is identifying the opportunities and challenges in achieving IWM outcomes (see **Sections 2.6 and 3.2.1**). Planners need to identify local issues and priorities. This can involve undertaking opportunity mapping, and mapping local plan development priorities with land availability and land allocation, green space, flood risk, water stress, deprivation etc to highlight the potential for multiple benefits to be maximised. Planners then need to understand what IWM approaches are available to achieve the right outcomes and how they work together throughout a catchment. Water management challenges and potential IWM approaches are illustrated in **Figures 2.3 and 2.4** respectively.



Figure 2.3 Bad water management



Figure 2.4 Good water management

In a catchment without IWM, rain runs quickly off poorly-managed land upstream of the town with insufficient opportunity to soak into the ground and recharge groundwater, or be captured for irrigation and other agricultural uses. This water reaches the town very quickly, via canalised waterways, as a rapidly rising surge.

The surge is increased by runoff from rain falling onto impermeable surfaces in the town. This becomes a flash flood which overwhelms piped drainage systems and causes sewer overflows and property flooding (often with sewage). When this now heavily-polluted water drains away into the canalised waterways it continues to the next community downstream, causing the same problems there. The volumes of water are often too great for wastewater treatment works to accommodate resulting in permitted outfalls of untreated sewage into rivers and coasts. In this example, blue-green infrastructure (the corridors and networks of green space and water that permeate and connect the urban fabric) is not being used to improve biodiversity, or public amenity, or to adapt to climate change. Opportunities to capture rainwater to supplement the public water supply and improve water quality, including how rivers look and behave, are being missed.

These problems can be rectified, and many other benefits realised, by adopting an IWM approach as demonstrated in [Figure 2.4](#).

Managing water higher up the catchment through good agricultural and land management practice including the use of natural flood management has several benefits. It helps to control runoff, reduce agricultural pollution and soil loss and reduce peak flows, while also providing farmers with a more even and reliable water supply and resilient landscape.

Providing flood storage areas further down the catchment retains water during times of high rainfall, helping to manage downstream flooding. These flood storage areas help even out discharge to maintain river flow in times of drought, while also providing a range of habitats to improve biodiversity and provide the components for nature improvement areas.

Blue-green infrastructure in the town provides interconnectivity and flow paths (through green corridors), and water storage to manage flow and reduce the risk of flooding, while also providing greater resilience to other aspects of climate change, improved urban access and other benefits.

SuDS in the town, including green roofs, rain gardens, swales, detention basins and permeable surfaces, reduce runoff from rain falling directly on the town. Diffuse pollution is reduced and the drainage and sewerage systems in the town can cope better with storms, which decreases the risk of homes and businesses being flooded. Rainwater is captured for non-potable use, reducing demand on the public water supply.

The design of open space and layout of developments provides opportunities for wastewater reuse (eg reedbeds to treat runoff/greywater) and localised treatment and distribution of water. Good water management should include buildings designed to minimise water use (see [Box 2.1](#) and [Case study P6](#)).

SuDS allow runoff to be used locally, enabling groundwater to recharge. The water that does leave the town is released back to the river slowly and is cleaner, causing fewer challenges for communities downstream. The IWM measures also provide recreational space and a more pleasant and healthy urban environment, incorporating wetlands and other habitats to improve biodiversity.

2.6 FACTORS CRITICAL FOR THE DELIVERY OF IWM

When the opportunities or challenges for IWM have been determined, local plan policies need to be put in place to provide a framework for the outcomes to be achieved. There are a range of factors that are critical to the effective and efficient delivery of better water management. The five key CSFs are:

- 1 Understanding IWM.
- 2 Enabling local policy.

- 3 Early engagement.
- 4 Partnerships.
- 5 Good management.

These CSFs are described in detail in [Section 3](#).

There are, however, three significant constraints to the golden thread process. These are:

- ◆ LPAs may not have sufficient resources to prioritise IWM over competing demands.
- ◆ National policy (planning and other sectors) which is not coherent, is not applied consistently and does not promote IWM, and a lack of appropriate statutory technical requirements.
- ◆ A lack of up to date local plans.

These constraints, referred to as 'blockers' in [Section 3](#), can be addressed by applying the CSFs, and through partnership working.

2.7 RESPONSIBILITIES

Another important part of making the CSFs work to achieve the golden thread is understanding who is responsible for different aspects of water policy and regulation, and how they interact with local planning (see [Sections 3.2.2 and 3.2.3](#)).

Planning policy and guidance for England are set out in the NPPF and planning practice guidance, and for Wales is set out in PPW and technical advice notes (see [Part D](#)). This national policy is applied through local plans, made by LPAs (mainly district and unitary councils in England and unitary councils in Wales) and associated neighbourhood plans (local development plans and place plans in Wales), and through assessment of planning applications.

The Flood and Water Management Act 2010 introduced duties in England and Wales for local surface water management which are co-ordinated by LLFAs (county and unitary councils). LLFAs establish the surface water management strategy for a given location. However Schedule 3 of the Act, dealing with the approval and management of SuDS, and connection to public sewers has not been implemented in England, although some parts have been implemented in Wales.

The Water Framework Directive (Directive 2000/60EC) sets out the requirements for river basin management plans, which are produced by the Environment Agency and Natural Resources Wales. River basin management plans identify the current state of the water environment, the pressures it faces, and what needs to be done about it. The Drinking Water Directive (Directive 98/83/EC) aims to protect drinking water supplies from pollution and the Environment Agency and Natural Resources Wales have adopted common position statements that developers and local planning authorities should refer to (Environment Agency (2018b)).

Water legislation gives water companies a statutory duty to prepare and maintain water resource management plans, which look ahead 25 years and describe how each water company aims to secure a sustainable supply of water. It places a resilience duty on water companies, which includes the requirement to protect the natural environment, now and in the future. There are also initiatives within the water industry to look more strategically and produce drainage and wastewater management plans to improve wastewater and surface water management. Water companies are also statutory flood risk management authorities.

This inter-relationship of policy and legislation is illustrated in [Figure 2.5](#).

The LPA and LLFA (in unitary authorities both are in the same local authority), would need to join up with the environmental regulator (Environment Agency in England and Natural Resources Wales in Wales) and water companies to put policies in plans that deliver IWM.



Figure 2.5 How policy and regulation joins up

Figure 2.6 shows the links between local plans and neighbourhood plans and the plans of water companies, the Environment Agency and Natural Resources Wales, the LLFA, and national planning policy. It also illustrates how important it is to establish good links between LPAs, LLFAs and water companies at a very early stage in any of their plan making.

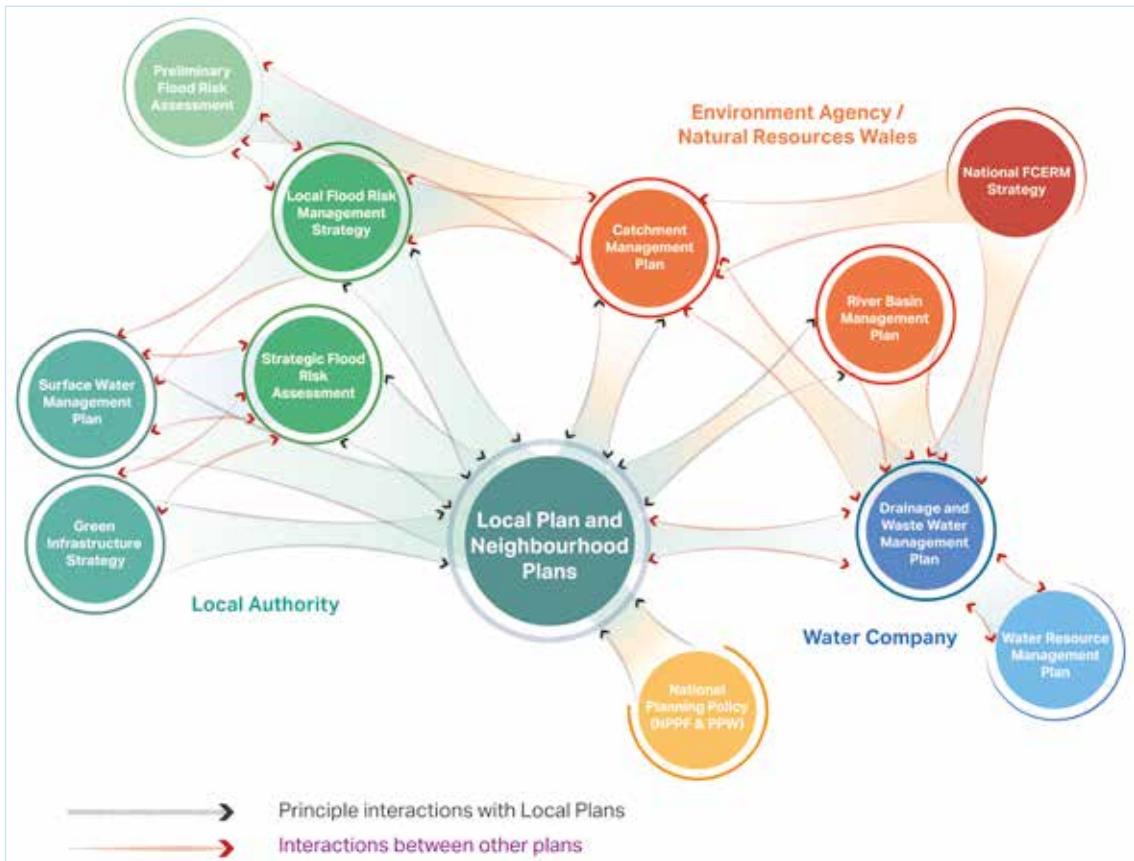


Figure 2.6 Interactions in the land-use planning process

LPAs and LLFAs have a mutual duty to co-operate enshrined in law (the Localism Act 2011 and the Flood and Water Management Act 2010). This underlines how crucial close working between them is to ensure that local plans and local flood risk management strategies are properly integrated and mutually supporting.

2.8 THE RELATIONSHIP BETWEEN LOCAL AUTHORITIES AND WATER COMPANIES

Opportunities can be realised and challenges overcome by collaboration between local authorities (LPAs and LLFAs) and water companies. These include:

- ◆ supporting 'good growth' by managing potential constraints on new development due to scarce water resources and wastewater infrastructure capacity, particularly the absolute constraint of inadequate sewage treatment capacity
- ◆ misalignment of the geographic boundaries of LPAs, LLFAs, and water companies
- ◆ reducing flood risk and pollution from combined sewer overflows and sewer flooding.

There are particular benefits to water companies, local authorities and developers from working together. These are presented in **Table 2.2**.

Table 2.2 Benefits of good stakeholder relationships

Action	Benefit to LPA/LLFA	Benefit to water company	Benefit to developer
Early and strategic engagement	<ul style="list-style-type: none"> ◆ being able to make deliverable and sustainable land allocations for development 	<ul style="list-style-type: none"> ◆ being able to plan strategically and more innovatively for water supply and wastewater treatment infrastructure 	<ul style="list-style-type: none"> ◆ better strategic business planning and masterplanning ◆ working with new appointments and variations/water companies (see Box 2.3) to use IWM on large and phased sites
Close engagement during plan preparation	<ul style="list-style-type: none"> ◆ provision of evidence base for policy development ◆ planning for achievable and sustainable delivery of housing targets ◆ awareness of where IWM is needed early in the planning process ◆ planning for climate change adaptation/mitigation 	<ul style="list-style-type: none"> ◆ ensuring that land allocations in local plans make provision for IWM ◆ managing capacity of sewerage and drainage system ◆ allowing headroom for development – more flexibility and more customers 	<ul style="list-style-type: none"> ◆ certainty in applying for and receiving planning permission for developments ◆ efficiencies in development layout to enable cost effective IWM ◆ increased awareness of the range of means of compliance
Integrated surface water management	<ul style="list-style-type: none"> ◆ reduction of surface water and sewer flooding ◆ facilitating delivery of multiple benefits as well as better places and spaces 	<ul style="list-style-type: none"> ◆ reduction of surface water in sewer networks ◆ reduction of volumes of wastewater ◆ saving on wastewater treatment and energy costs 	<ul style="list-style-type: none"> ◆ improved quality of place and lower flood risk – increasing the value and resilience of developments ◆ increased developable area ◆ enhanced reputational value, ie 'green' credentials
Water efficiency and water reuse/rainwater harvesting	<ul style="list-style-type: none"> ◆ enabling more development with less impact on existing water resources and infrastructure in water-stressed areas 	<ul style="list-style-type: none"> ◆ reducing water supply requirements ◆ augmenting supplies with harvested rainwater and other alternative sources of water 	<ul style="list-style-type: none"> ◆ overcomes constraints on sewer capacity and water supply ◆ potential savings for building users

It is vital that water companies provide LPAs and LLFAs with sufficient support and evidence to inform IWM policies and identify where IWM is needed early in the planning process. Water resource management plans and drainage and wastewater management plans support this by giving greater external visibility to long-term strategic needs for a catchment. This collaboration can be further underpinned by partnership working with other stakeholders, such as developers, businesses and landowners, to ensure that water is managed sustainably.

It is equally important that LPAs include policies in their local plans to reflect the IWM objectives of the water company. Anglian Water works with LPAs to help deliver better water management and has published guidance to help planners include effective local plan policies that are mutually beneficial (see **Box 2.2a**) and support 'good growth' (Anglian Water, 2018).

Competition in the water industry (through the new appointments and variations process – see **Box 2.2b**) can also provide opportunities for innovations in IWM and provide clarity on how stakeholders can benefit.

The drainage and wastewater management plan (DWMP) framework (see **Box 2.2c**) specifically encourages water companies to invite proposals from stakeholders for alternative, innovative or more efficient ways to manage future risks (eg where risks are identified as arising from new mixed or domestic developments on greenfield or brownfield sites).

Water companies should work with LPAs to deliver their resilience duty (see **Box 2.2d**), which includes the requirement to protect the natural environment, now and in the future. IWM is a key route to delivering the requirements of the resilience duty.

Box 2.2 Local plans (a), NAVs (b), drainage and wastewater management plan framework (c) and water companies' resilience duty (d)

a Local plans

Anglian Water (2018) provides guidance for planners explaining why it needs their support and how they can help achieve relevant IWM outcomes. It suggests appropriate local plan policy wording for their region covering most aspects of IWM including:

- ◆ water efficiency
- ◆ water resource assets
- ◆ water supply and foul sewerage networks
- ◆ SuDS.

It sets out the assistance Anglian Water can provide to LPAs in its region, including site allocation criteria, plan preparation, data requirements, neighbourhood planning, and commenting on planning applications.

b The new appointments and variations process

New appointments and variations (NAVs) are limited companies providing a water and/or sewerage service to customers in an area that was previously provided by the incumbent monopoly provider, or a site that is currently unserved by any water or wastewater infrastructure.

A new appointment is made when a company is appointed by Ofwat to provide water and/or sewerage services for a specific geographic area.

A variation is where an existing company asks Ofwat to vary its appointment so it can extend the areas it provides services to.

NAVs involve one company replacing another as the appointee for a specific geographic area. They can provide innovative solutions for specific areas. Working with developers on large sites, they may be able to provide more cost-effective and sustainable water services.

For more information go to: www.ofwat.gov.uk/regulated-companies/markets/nav-market

c The drainage and wastewater management plan framework

Drainage and wastewater management plans provide a framework for the long-term (25 years) planning of drainage and wastewater services, using similar timeframes as the water resource planning process.

This framework provides the basis for more collaborative working between water companies, LPAs, LLFAs and other organisations that have responsibilities relating to drainage, flooding and protection of the environment, to support integrated long-term planning. It enables water companies to target investments more effectively and share information about drainage and wastewater services with LPAs, LLFAs and other relevant stakeholders.

Water companies in England and Wales will produce drainage and wastewater management plans using this framework by the end of 2022, to support their business plans for the 2024 price review.

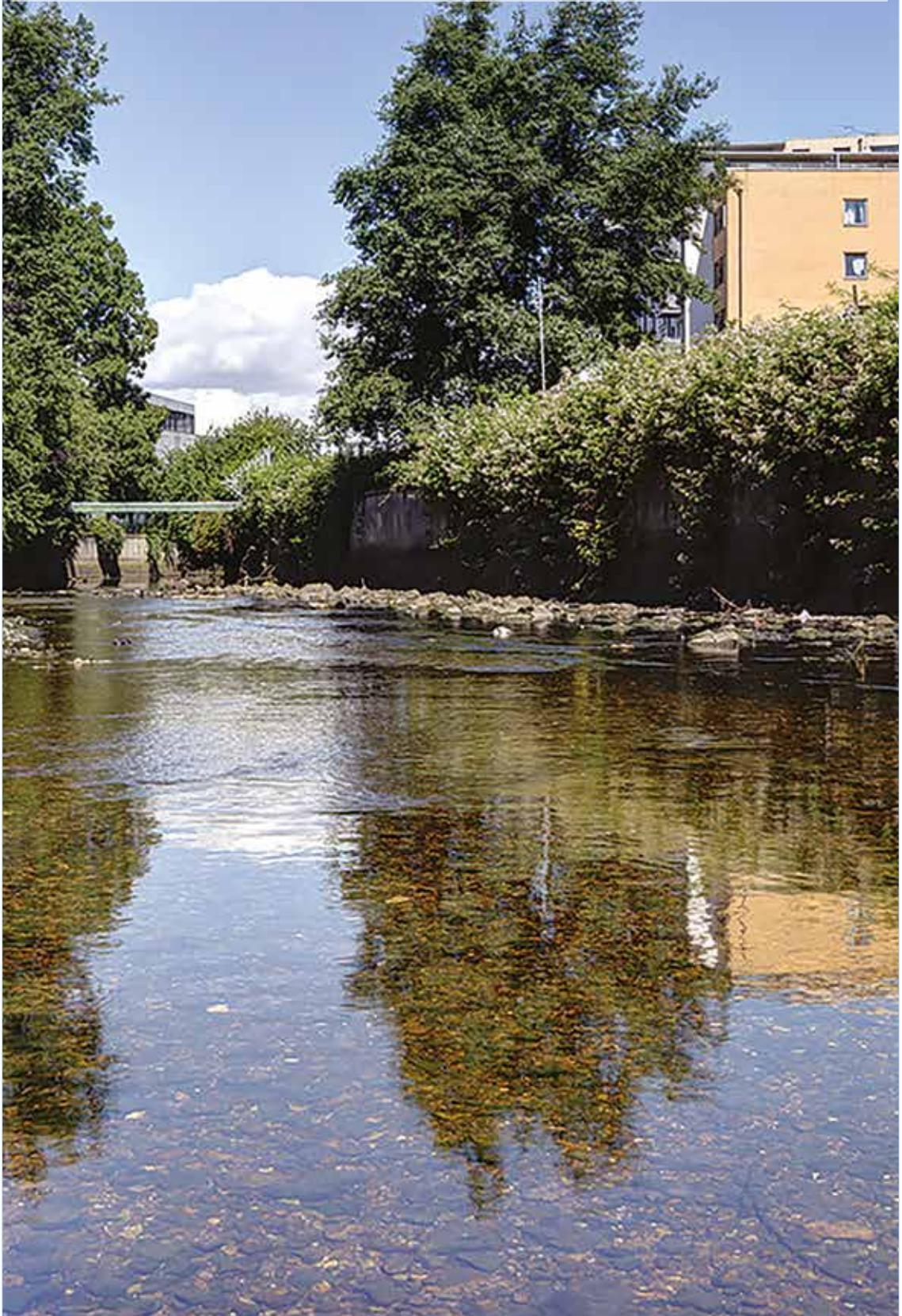
d Water companies' resilience duty

The Water Act 2014 added a new duty to water companies to support resilience in England and Wales. It focuses on the need for long-term resilience of water and wastewater systems and service provision when faced with increasing external stresses, such as environmental pressures, population growth and changes in consumer behaviour. It highlights the need to:

- ◆ promote long-term planning and investment, and the use of a range of measures to manage water resources in sustainable ways
- ◆ increase efficiency in water use and reduce demand for water to minimise pressure on water resources.

For more information go to: <https://www.ofwat.gov.uk/regulated-companies/resilience-2>

3 Critical success factors



Brookmill Park (courtesy Bill Green Photography)

3 Critical success factors

3.1 BLOCKERS TO CHANGE

There are three fundamental blocks to improving the delivery of IWM through the planning process and achieving the desired outcomes set out in [Section 2.1](#). These are:

- ◆ LPAs (and other agencies and organisations) not having sufficient resources (budget, skills and people) to develop plans and policies and engage with developers, LLFAs, water companies and other stakeholders ([Section 3.1.1](#))
- ◆ national policy (planning and other sectors) which is not coherent, is not applied consistently and does not promote IWM, and a lack of appropriate statutory technical requirements ([Section 3.1.2](#))
- ◆ lack of up-to-date local plans ([Section 3.1.3](#)).

The first two of these challenges can only be removed by action from central government. However there are some factors that are of critical importance in helping the delivery of IWM through the planning process despite these issues. There may be best described as critical success factors (CSFs).

3.1.1 LPA resources

Lack of resources within LPAs is a critical hindrance to IWM. LPAs need to have sufficient resources (budget and people) to engage with developers, LLFAs, water companies and other stakeholders on an early and continuous basis. They also need to be adequately staffed, and officers should have appropriate knowledge and expertise, to be able to develop plans and policies, and understand and make effective decisions around planning applications, while also carrying out their development management responsibilities. Staffing for development planning and management needs to enable speedy, consistent and thorough processing of planning applications and ensuring compliance with planning conditions.

3.1.2 National policy and technical requirements

Coherent and consistently interpreted and applied national policy (both within the NPPF, PPW and their supporting policy guidance and across policy responsibilities of other government departments) is vital to support delivery of IWM. Statutory technical requirements also provide critical support to implementing IWM through the planning system.

3.1.3 Lack of up-to-date local plans

Local plans without IWM policies may take several years to be updated and during that time opportunities to adopt IWM and secure multiple benefits are missed. This factor is exacerbated by the lack of LPA resources. The requirement in England for local plans to be reviewed every five years may help to ensure that IWM policies are included in future.

3.2 THE CSFS

CSFs are the circumstances and actions that enable the achievement of the outcomes of IWM set out in [Table 2.1](#). There is not a single factor for each outcome. Rather, there are a range of CSFs that, in combination, contribute to the achievement of all of the outcomes. The CSFs range from technical knowledge, effective policy and processes, and productive engagement between stakeholders (see [Figure 3.1](#)).

A Understanding IWM	<ul style="list-style-type: none"> ◆ A robust and accessible evidence base. ◆ Knowing which IWM approaches are appropriate. ◆ Identifying IWM possibilities at an early stage. ◆ Showing that IWM is effective and efficient. ◆ Breaking down institutional barriers and changing mind-sets.
B Enabling local policy	<ul style="list-style-type: none"> ◆ Clear and understandable local plan policies. ◆ Clear, supportive plans and strategies from LLFA and water company.
C Early engagement	<ul style="list-style-type: none"> ◆ With the water company, developers, LLFA and other areas of local government. ◆ With the local community. ◆ With the catchment partnership and other stakeholders.
D Partnerships	<ul style="list-style-type: none"> ◆ Good links with (and between) LPAs, LLFAs and water companies. ◆ Catchment partnerships. ◆ An engaged and supportive local community. ◆ Understanding partners' interests and drivers
E Good management	<ul style="list-style-type: none"> ◆ A strong champion. ◆ Early and clear identification of long-term management arrangements. ◆ Co-ordination of budgets and funding. ◆ Enforcement conditions.

Figure 3.1 CSFs

All these success factors are critical to the successful implementation of IWM and the development of good planning policy. An explanation of what these CSFs mean, in terms of developing effective local plans and policies and delivering schemes and developments, is set out in [Sections 3.2.1 to 3.2.5](#). The table at the start of each section cross references to the case studies (see [Section 6](#)) and the examples of good local plan policies (see [Section 7](#)), relating to, and illustrating, the application of the CSFs. See also [Tables 5.3 and 5.4](#).

3.2.1 CSF A: understanding IWM

A robust and accessible evidence base

A robust and accessible evidence base underpins all the CSFs. It supports and promotes the understanding of IWM, and:

- ◆ is essential to the development and adoption of enabling local policy
- ◆ provides the evidence and justification for early engagement and partnerships
- ◆ provides the baseline information and data to support good management.

It is questionable whether the CSFs can be established, and IWM can be put in place, without access to a robust evidence base.

Establishing and maintaining a robust evidence base is expensive. However, costs can be significantly reduced if LPAs pool resources and/or work with other stakeholders such as environmental regulators, water companies, catchment partnerships and universities. 'Citizen science', where local volunteers collect evidence and data, is a valuable means of inexpensive data capture, provided it is done within a robust framework and those collecting the data understand what they are doing and are adequately trained. It has the added benefit of promoting community engagement through understanding and buy-in. Catchment partnerships have been pioneering the successful use of citizen science.

Shared databases have the additional advantage that more experts are around the table, so the database is more robust and balanced, with greater buy-in. Shared databases also encourage and facilitate partnership working on policy development across local authority boundaries.

Bodies with a strategic remit such as the English Regional Flood and Coastal Committees, the Wales Flood and Coastal Erosion Committee and catchment partnerships have an important role in inspiring, bringing together and even funding LPAs to work on a bigger scale and pool expertise and funding.

Water cycle studies and IWM strategies are an important part of the underpinning evidence and database to support IWM.

The Environment Agency produced guidance on the development of water cycle studies (Environment Agency, 2009). Water cycle studies were intended to determine the timing, location and requirement of sustainable water infrastructure to integrate it within the local planning framework. A water cycle study generally covers an area wider than the local plan, and often highlights the requirement for IWM, rather than provide guidance on delivery. However, combining water cycle studies with development masterplans can offer a strong evidence base and framework for delivery.

In designated parts of London, this approach to strategic delivery of IWM has been taken a stage further by the introduction of IWM strategies. An IWM strategy is an evidence-based approach to managing and using all available water resources, eg rainwater, wastewater, recycled water and groundwater, in addition to mains potable water.

The IWM strategy is useful for a defined area of growth and regeneration, to support the water management objectives set out, for example, in area action plan policies. It considers how water management measures can be delivered in an integrated way that allows them to be planned within development masterplan proposals and to provide a robust evidence base for the development of planning policy relating to water management.

An IWM strategy provides a platform for collaboration with partners and stakeholders to ensure early and strategic engagement so that planning policy and masterplannings identify IWM opportunities, making water an integral part of the new development. It makes specific recommendations for plans, guidance and projects that can be used by planners and designers. It can also be used to help demonstrate that the Localism Act 2011 duty to co-operate is being met, as part of statements of common ground and an infrastructure funding statement.

IWM strategy objectives

An IWM strategy should develop a framework to sustainably manage water supply, wastewater and flood risk in an integrated way. This framework should:

- ◆ identify the optimal mix of measures to develop effective IWM
- ◆ offer guidance on how the required infrastructure should be planned, provided and managed
- ◆ be flexible and adaptable to support phasing and delivery
- ◆ provide clarity for developers and stakeholders to help them meet the requirements of the strategy.

The strategy should cover strategic policy requirements and delivery elements, and should also include specific water management objectives to:

- ◆ minimise the volume of water that is discharged to the sewer network
- ◆ manage surface water runoff to replicate the pre-development conditions
- ◆ reduce the demand for centralised water supply.

It should deliver these objectives in a way that maximises wider benefits while ensuring the viability of development and the deliverability of the strategy.

The IWM strategy should establish performance criteria to measure the relative success of the options proposed in meeting the framework requirements and water management objectives. The general sequential process for developing a strategy is presented in **Table 3.1**.

Table 3.1 Stages of IWM strategy delivery

Stages	Description
Baseline	Define the water management baseline conditions, including opportunities and challenges related to physical situations, existing infrastructure, and environmental constraints. This should include: <ul style="list-style-type: none"> ❖ environmental context and constraints ❖ constraints of existing water and wastewater infrastructure ❖ flood risk parameters ❖ opportunities created by regeneration ❖ a review of proposed housing and employment numbers.
Water balance	Based on the extent of the expected development, the water balance (or water cycle) for baseline (current) and future conditions (post development) is determined, to show how water flows in and out of the area will change with time, and how different inflows and outflows of water can be used and managed efficiently within the development. Components of the water cycle flows include: <ul style="list-style-type: none"> ❖ rainfall ❖ surface water runoff from roofs and other impermeable surfaces ❖ evapotranspiration ❖ infiltration ❖ potable and non-potable water consumption ❖ greywater (wastewater from hand basins, baths and showers) ❖ black water (wastewater from toilets, kitchen and laundry use – generally with a higher level of contamination).
Options appraisal and strategy development	This stage of the IWMS integrates the outputs of the baseline assessment with the calculated water balance to identify the IWMS objectives and develop a range of effective measures that can be applied across the area covered by the IWMS. These are: <ul style="list-style-type: none"> ❖ establish options through a review of a range of water management and flood risk measures that could be implemented in combination to meet the IWMS objectives ❖ develop a preferred strategy for water and flood risk management through analysis of a range of option scenarios or combination of measures.
Strategy delivery and testing	This final stage sets out a high-level delivery plan and approach for delivering the preferred option. It provides recommendations on infrastructure delivery, funding mechanisms, and roles and responsibilities of key stakeholders in implementing the IWMS. <p>The plan identifies how the options identified for the IWMS area could be effectively procured, constructed and maintained, and which parties might be best placed to deliver these. It should show how the benefits for the IWMS area are derived in terms of:</p> <ul style="list-style-type: none"> ❖ satisfying planning and regulatory requirements ❖ optimising costs for the works ❖ certainty of delivery of required works to meet the overall programme ❖ placing risk and associated responsibility with the party that is best placed to manage this effectively.

Knowing which IWM approaches are appropriate

Knowing which IWM approaches are appropriate is an essential starting point for all those involved in implementing IWM. Understanding these approaches in light of water management issues in local catchments is particularly important for officers in local authorities, whether in planning, or in other departments with an interest in or influence on IWM. Land-use planners and transport planners need a good appreciation of the different elements of IWM, where and when they should be applied, and how they can be linked. They also need a good awareness of what is possible and achievable on different sites, and the opportunities to realise multiple benefits. They need to be able to communicate this to colleagues in other local government functions such as highways, Building Regulations, parks and environment and public health, to achieve joined-up multiple benefits.

However, there is a limit to the knowledge that local authority officers can be expected to have on IWM and multiple benefits. It is important that these officers can act as intelligent clients and have access to further information and expertise on the technical aspects of IWM and how multiple benefits can be maximised within a development. Relevant local expertise and enthusiasm, including water companies, catchment and coastal partnerships, universities, local wildlife trusts, and technical specialists can be used to provide such information.

Identifying IWM possibilities at an early stage

The earlier that the possibilities for IWM are identified in both plan making and scheme/site planning and design, the more likely they are to be cost effectively and successfully implemented. For major new developments, this should be no later than the master planning stage. Once the process of obtaining planning permission and designing has begun, it becomes increasingly difficult to introduce IWM measures. This is critical for realising strategic-scale IWM on large schemes with multiple developers.

The location of areas for strategic development in local plans should take account of the requirements for catchment and sub-catchment-scale IWM (ie natural flood management, provision of flood storage areas, potential for communal rainwater harvesting and water reuse, blue-green corridors) and the availability of water resources and wastewater treatment. Adopting an IWM approach can increase the multifunctionality and natural capital of an area.

Understanding IWM requirements from catchment/sub-catchment to local scale enables planners to ensure that allocation of all sites, regardless of their size, support IWM.

Planners and developers need to have access to relevant IWM expertise and technical advice from the start. IWM measures can then be designed into any scheme to work with the topography of the site and the existing drainage. The best locations for IWM measures, such as SuDS and rainwater harvesting, can be identified and integrated to shape the rest of the development. Mapping factors such as existing development, infrastructure, green space, watercourses, flood risk, water quality and supply, and protected habitats and potential nature improvement areas, can all help to identify locations that would provide the greatest return in terms of multiple benefits and improve cost effectiveness. Early engagement with environmental consultees and regulators will help to identify the need to design developments to protect and enhance surface water and groundwater, biodiversity and landscape quality.

If IWM is considered early, it should be cheaper and more beneficial than conventional drainage, and certainly no more expensive (this is particularly the case with SuDS). However amending plans, development layouts and designs to retrofit SuDS and other IWM measures at a late stage in the process adds costs and is likely to result in poor water management, if it is even taken forward. For example, dual purpose rainwater harvesting can be designed and installed as part of a SuDS scheme to provide rainwater for flushing toilets while controlling surface water discharges. Early identification of such solutions can enable multiple stakeholders to support their deployment from different funding pots.

Showing that IWM is effective and efficient

Showing that IWM is effective, efficient, and viable in both economic and technical terms is universally important and crucial for developers. It is important that developers and engineers as well as planners understand what IWM is and its benefits, and are not deterred by misconceptions about performance, difficulty and cost. There are a variety of resources available to help with this (see **Box 3.1**).

Doubt about viability, whether real or perceived, is a significant constraint on incorporating IWM measures into new developments. Planners need to be able to show that including IWM policies in local plans will have a positive effect on sustainable development and realise multiple benefits. Appreciating the cost benefits of IWM from the start is key to writing implementable planning policies and delivering better water management. Partners need to see a clear benefit before they will engage with a scheme, and developers will be reluctant to consider incorporating IWM, particularly SuDS, if they perceive them to be more expensive or offer a lower return than traditional drainage. This was overcome in the Manor Fields Park development in Sheffield (see **Box 3.2**).

Box 3.1 Sources of information on IWM

Anglian Water (2018): <https://tinyurl.com/y43o95l3>

Catchment-based approach (CABA):
<https://www.catchmentbasedapproach.org>

Natural Capital Leaders Platform:
<https://tinyurl.com/yyf4sny>

susdrain: www.susdrain.org

Water Sensitive Urban Design (WSUD): www.wsud.co.uk

Waterwise: <http://www.waterwise.org.uk>

The usual development model in the UK places more emphasis on short-term investment and returns. However, the revised NPPF (MHCLG, 2019a) echoes the UK Government's 25 year environment plan (HM Government, 2018) by referring to the concepts of net environmental (including biodiversity), social and economic gains. The 25 year plan focuses on the environmental net gain principle for development, including housing and infrastructure (MHCLG, 2019b). It specifically expands the biodiversity net gain approaches to include wider natural capital benefits, such as flood protection, recreation and improved water and air quality.

Taking an IWM approach to development can deliver this required 'environmental net gain' while also delivering financially viable developments, both initially and for its lifetime. Incorporating SuDS reduces costs for draining the site and providing water for consumptive use, whilst also increasing the value (and return to the developer) of the units on the site by increased open space quality. Providing these desired multiple benefits attracts contributions from other stakeholders to reduce costs further.

The NPPF and supporting section of the planning practice guidance (MHCLG, 2019b) place more emphasis on considering viability at plan level and there is an expectation that developments which are compliant with plans will be financially viable. This makes it more important for any potential costs of promoting IWM (such as increased water efficiency, SuDS and blue-green infrastructure) to be factored in at plan-level and for site promoters to be involved in plan making. More research is needed about the costs of building the infrastructure needed to help achieve IWM, but it is notable that several viability assessments place the cost of delivering SuDS and increased water efficiency to optional Building Regulations and the Building Research Establishment Environmental Assessment Method (BREEAM) standards at £0 (eg Lee, 2018 and Adams Integra, 2016).

For more information on construction costs see RICS (2019) and susdrain.org (2019).

In Wales, SuDS became mandatory from January 2019, so this strengthens SuDS delivery and paragraph 165 of the NPPF provides more certainty by requiring SuDS in major developments to:

- ◆ have appropriate proposed minimum operational standards
- ◆ have maintenance arrangements in place to ensure an acceptable standard of operation for the lifetime of the development
- ◆ provide multifunctional benefits, where possible.

Breaking down institutional barriers and changing mind-sets

IWM take-up often requires breaking down institutional barriers and changing mind-sets. These barriers are experienced in both the organisational structures and cultures of different organisations (eg between district LPA and county LLFA, and LPA and water companies) and the different parts of the same organisation, and the preconceptions and prejudices of those who work in them. Examples include:

- ◆ misalignment of funding cycles between organisations

Box 3.2 *Understanding IWM, Manor Fields Park*

The Manor Fields Park development overcame challenges of viability and high costs of traditional drainage by delivering a more IWM system. It used the regeneration of a city park to manage the runoff from new housing development at considerably lower cost than the traditional piped drainage alternative.

This example shows that by understanding the possibilities for IWM, innovative thinking and working in partnerships, institutional barriers can be overcome and apparently conflicting objectives reconciled to provide multiple benefits and substantial cost savings.

See Part B Case study P7.



- perceived differences in remit and objectives
- local authorities that have separate departments with different priorities
- planners (and developers and engineers) who perceive IWM to be hard, expensive and difficult to do.

Organisations that have a well-established way of doing things (eg highway authorities, developers) may be particularly reluctant to accommodate new approaches. Demonstration projects and case studies can help address this.

Establishing a common language is an important precursor to overcoming these preconceptions. Once the different parties understand each other, then barriers can be broken down and mind-sets changed by demonstrating that there is an advantage, in terms of cost effectiveness and better outcomes, over traditional approaches. Case studies such as those in **Part B Section 6** can be used to demonstrate this and show what IWM can deliver.

CSF A: understanding IWM	
Supporting physical case studies	Supporting local policy examples
All	LP1, LP3, LP4, LP5, LP6, LP7, LP10, LP13, LP14, LP15

3.2.2 CSF B: enabling local policy

Clear and understandable local plan policies

Clear and understandable local plan policies are much more likely to succeed. They will be understandable to the public, councillors and planning inspectors as the plan is progressed, and developers are far more likely to take them into account when designing schemes. However, they need to be carefully worded to avoid ambiguity and wilful misinterpretation. Local plan policies should also provide enough detail to deliver on key opportunities for IWM, such as the provision of multiple benefits, long-term adoption and maintenance of assets and retrofitting IWM into existing development.

Section 4 provides a comprehensive guide to developing clear, understandable and implementable local plan policies. **Table 5.3** lists examples of good policy for delivering IWM described in detail in **Part C**. **Box 3.3** shows how effective clear and enabling local policy has been in Cambridge.

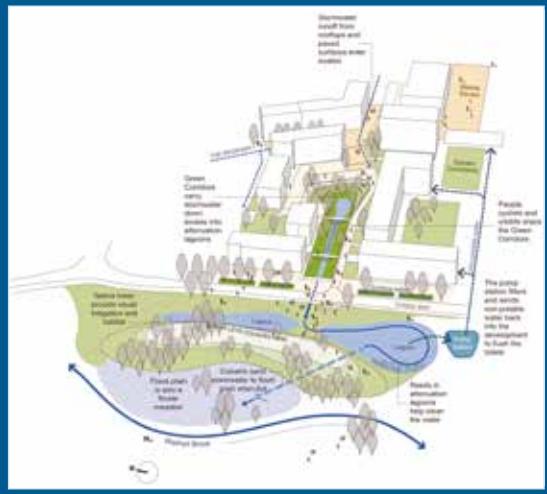
IWM policies should be co-ordinated and integrated across local plans, linking climate change, green infrastructure, biodiversity, water and flood risk management, housing provision, economic development, creating places and spaces, and well-being.

Box 3.3 Enabling local policy, North West Cambridge

North West Cambridge is a mixed-use new development in a water-stressed area with a high risk of surface water flooding. These challenges are being overcome by taking a Water Sensitive Urban Design approach, which looks at the entire water cycle and was integrated into the design from the start.

This case study demonstrates the power of supportive local policy from the LPA as well as the value of a strong evidence base. It also highlights the importance of clear, supportive plans and strategies from the LLFA and water company. This coupled with vision from the developer and early engagement with stakeholders helped the development achieve outstanding IWM.

See **Part B Case study P6**.



To be successful, policies also need to be evidence based. A robust evidence base, including evidence from other partners, particularly LLFAs and water companies, is important to get the policy supported and justify it through the consultation and adoption of the plan. Early, positive engagement with partners is very important to identify and gather the evidence.

Clear policies, supported by evidence of viability can also help prevent the need for viability assessments for individual planning applications and challenges on the grounds of viability.

Clear, enabling plans and strategies from the LLFA and water company are important to support the local plan policies and their implementation. LLFA's surface water management plans and local flood risk management strategies, and water companies drainage and wastewater management plans and water resource management plans, as well as river basin management plans and shoreline management plans should join up ([Figure 2.5](#)) and provide 'hooks' for local plan policies to deliver IWM at a range of scales from catchment/sub-catchment to individual developments. This level of policy integration should ensure that individual new developments under the local plan contribute cumulatively to catchment-scale water management.

CSF B: enabling local policy	
Supporting physical case studies	Supporting local policy examples
P1, P2, P3, P4, P6, P9, P10, P11, P12	LP2, LP4, LP5, LP6, LP8, LP10, LP12, LP13, LP15

3.2.3 CSF C: early engagement

Early engagement in planning policy development

Early engagement with the water company, developers, LLFA and other areas of local government (eg highways, parks, Building Regulations, environment and public health) enables the plans of the various partners to evolve in parallel with a sympathetic mutual understanding of objectives. This allows the policies that are developed to be complementary and stronger. Conversely, developing policies in isolation, only involving other bodies at a late consultation stage, will result in weak and conflicting policies that can be easily worked around by developers (who have not bought into them) and may be impossible to implement.

The local community

Early engagement with the local community to gain support from local people and local councillors is important, to ensure that the policy wording properly represents their concerns and needs, and that communities understand the policy and support it. Writing a neighbourhood plan can be a powerful means of engagement and empowerment, focusing the attention of the community on water issues and the IWM measures to address them.

Catchment partnerships and other stakeholders

Early engagement with the catchment partnership and other stakeholders during plan preparation should identify which IWM approaches will work best. It should provide the basis for establishing a robust evidence base for policies. It should also facilitate land acquisition to implement the plan, both in informing planners whether land allocations are realistic, and in giving developers' and other stakeholders' sufficient lead time to acquire or retain the necessary land.

Early engagement in developing specific sites

Similarly, for individual schemes, partners should be identified and engaged at the earliest opportunity so they can contribute from the start to the planning and design of the scheme. This will help to

achieve an optimum outcome and to realise the full potential of their contribution, as was achieved in the Greenwich Peninsula development (see **Box 3.4 and P12**).

Consideration to IWM should be given when the LA allocates land for development and developers consider purchasing it. Some IWM approaches may influence the layout of buildings, land take and potential profitability of the development. Pre-application discussions are key to early engagement and should lead to high quality and appropriate development schemes being granted planning permission more quickly while avoiding expensive abortive work. These discussions should not be limited to a two-way exchange between the developer and the LPA, but involve the full range of appropriate stakeholders, particularly the LLFA. Early, collaborative discussions between developers, water companies, other stakeholders and the communities affected by a new development can help to shape better quality, more accepted schemes and ensure improved outcomes for the community. These discussions also avoid wasted effort and costs.

Box 3.4 Early engagement, Greenwich Peninsula

Greenwich Peninsula is a large former industrial inner urban site that is being transformed into a liveable new business district focused on ecology and high quality open spaces, providing multiple benefits through a broad range of IWM approaches.

The master plan has evolved in parallel with the London Plan and the Royal Borough of Greenwich Local Plan. This case study shows the importance of early engagement and partnership working between a wide range of stakeholders, including the local community, in successful master planning for a very large and challenging phased site.

See **Part B Case study P12**.



CSF C: early engagement	
<i>Supporting physical case studies</i>	<i>Supporting local policy examples</i>
All	LP2, LP3, LP4, LP5, LP6, LP8, LP9, LP10, LP11, LP12, LP13, LP14

3.2.4 CSF D: partnerships

If the different stakeholders with a range of interests (eg water supply, flood risk management, the environment, health and well-being, housing provision and economic development) can be brought together and agree strategic priorities, they can realise opportunities to deliver multiple benefits in a collaborative way (see also **Section 3.2.3**).

LPAs and LLFAs should take a leading role in developing and leading partnerships. Partnerships take a long time to develop, and the challenges in building and maintaining successful partnerships should not be underestimated. LPAs and LLFAs can provide long-term continuity and stability, along with the long-term strategic vision to develop strong and effective partnerships.

Figure 3.2 shows how, by working together, the different stakeholders in a catchment can appreciate each other's drivers and objectives to build a mutual understanding of the issues affecting their area. This shared understanding helps collaboration to identify shared objectives and opportunities, and builds capacity to deliver multiple benefits and sustainable development.

Delivering multiple benefits through IWM approaches supports successful and effective partnerships. Stakeholders often engage in partnerships to gain a benefit for themselves. If the different stakeholders understand each other's aspirations, they can collectively identify benefits of IWM approaches that will be of value to them. They can co-operate to devise ways of funding and delivering these multiple benefits. By working together and pooling resources, the different bodies in a partnership can create the opportunities to achieve their individual aspirations in cost-effective and mutually-supporting ways for the benefit of the whole community.

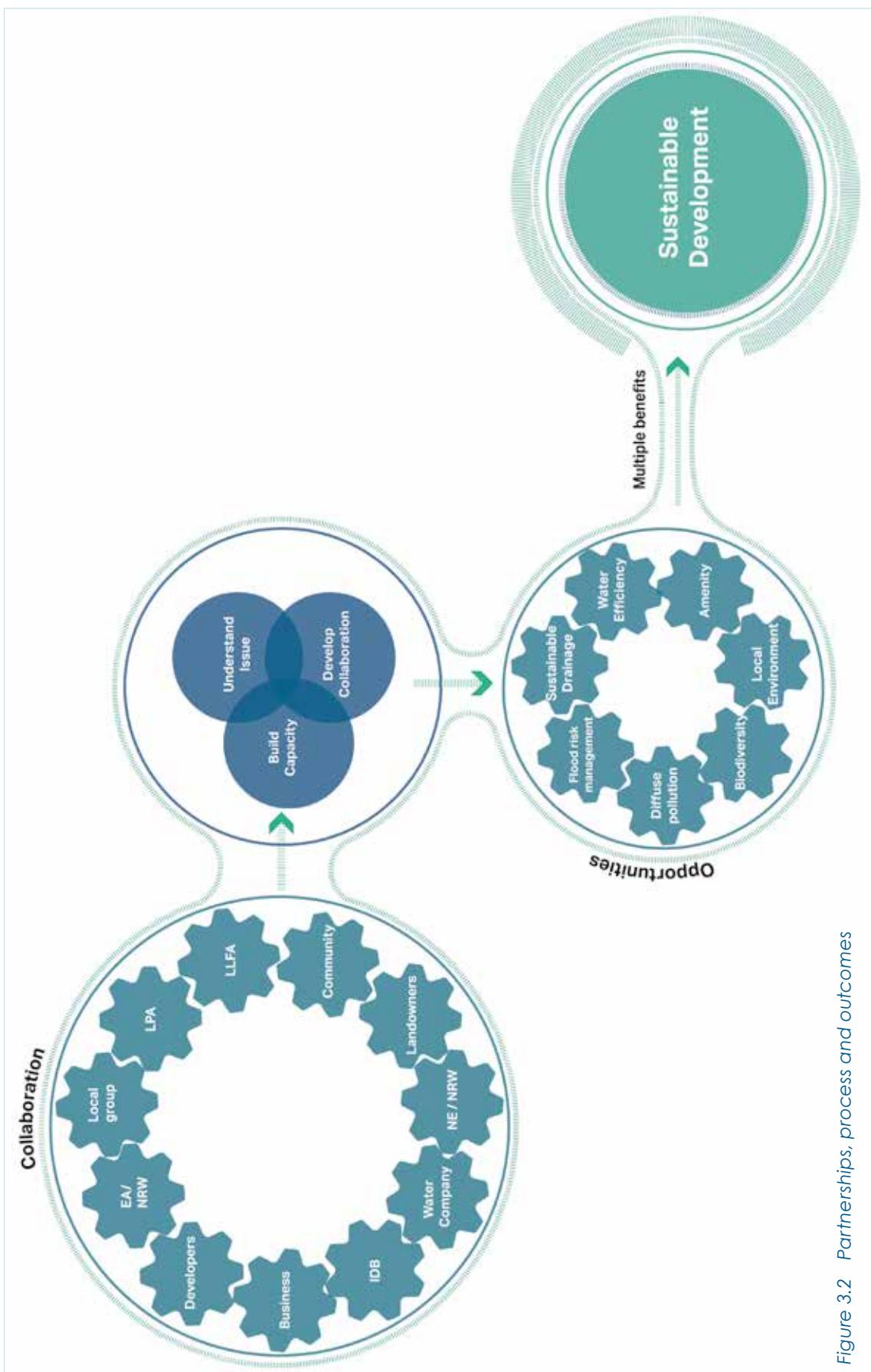
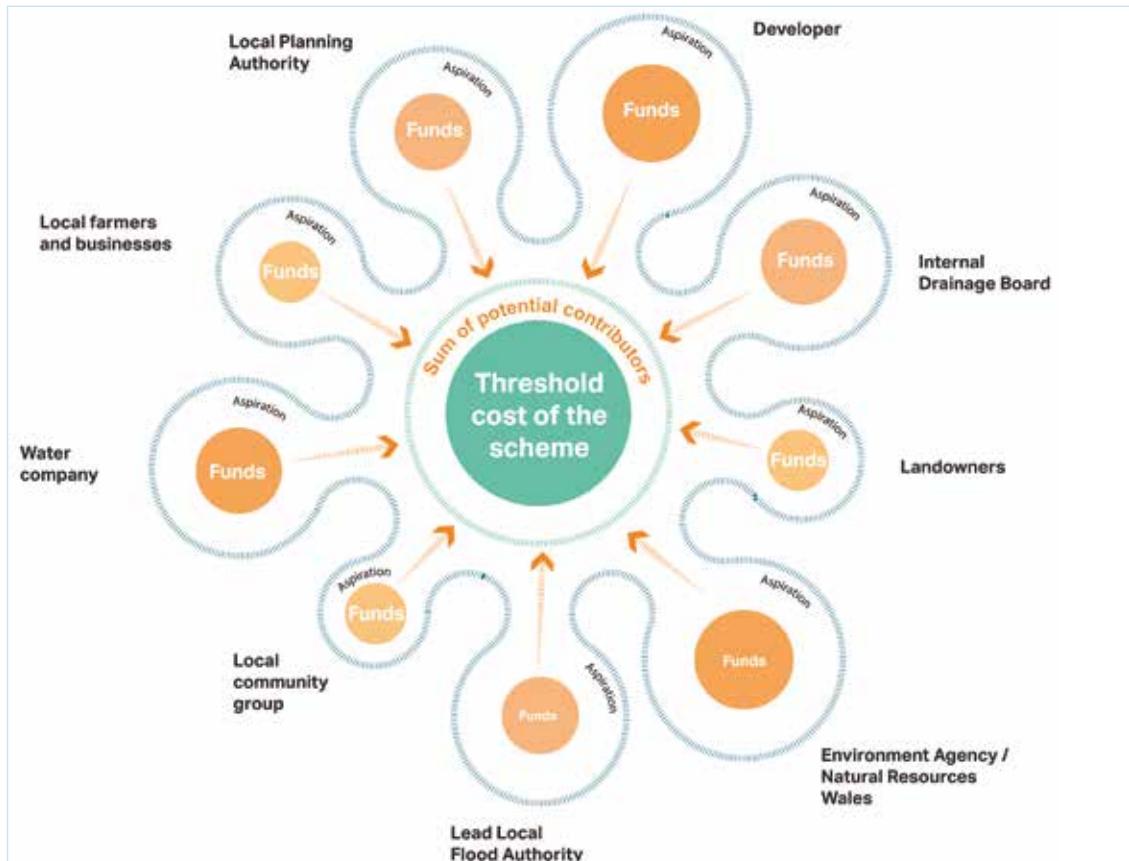


Figure 3.2 Partnerships, process and outcomes

Partnerships are the key to delivering multiple benefits, as resources can be pooled to deliver outcomes that would have been beyond the scope of the individual stakeholders working alone. Also, the sum of the pooled resources can be greater than the threshold cost of the scheme, allowing more to be achieved for the money, or for savings to be made by the partners (Figure 3.3). Either way, this is getting more for less. The New South Quarter development in Croydon shows how partnerships can provide substantial benefits for all the partners, considerably beyond their initial expectations (see Box 3.5).



Note

The green circle represents the minimum amount of funding needed to take the basic scheme forward, ie the threshold cost of the scheme. The orange circles represent the funds available to each separate body, and the surrounding area within the dashed line represents their aspirations, which they cannot afford from their own funds. Looking at the size of the orange circles, in relation to the green circle, it is clear that no single body has sufficient funds available to meet the threshold cost of the scheme by themselves.

Figure 3.3 Partnerships: getting more for less

Links with LLFAs, water companies, highways authorities and the environmental regulator

Good links with (and between) LPAs, LLFAs and water companies and the environmental regulator (Environment Agency/Natural England or Natural Resources Wales) are vital. Local plan policies and land allocations should reflect the LPAs strategic flood risk assessments, surface water management plans and local flood risk management strategies, water companies' drainage and wastewater management plans and water resource management plans and the Environment Agency's river basin management plans (and, for coastal authorities, shoreline management plans). Good links to highway authorities are also important so that highway specifications and adoption requirements are compatible with IWM policy. Using IWM measures, particularly SuDS and blue-green infrastructure, in highways schemes should help highways authorities meet their obligations under the requirement of the Public Services (Social Value) Act 2012 to

"have regard to environmental well-being in connection with public services contracts". Surface water management plans, local flood risk management strategies and plans should then provide 'hooks' for IWM that planners can use to justify and support the policies in the local plan.

Box 3.5

Partnerships, New South Quarter, Wandle Park

This major housing development next to Wandle Park, Croydon provided the opportunity to de-culvert the River Wandle. This helped to improve the local quality of life and the surface water environment, and restore a poor quality, but popular public open space, while providing over 900 high-quality homes in an attractive and sought after riverside setting.

This case study shows that although partnership working is not always easy or smooth, it can produce substantial benefits for all the partners, considerably beyond their initial expectations.

See Part B Case study P5.



The local plan and its supporting planning documents should be the blueprint for delivering IWM at both the community and individual site scales. It should bring together the aspirations of all key stakeholders and integrate them with environmental improvements and safeguards, as well as with the economic and social needs of the community. It is the only platform to do this. IWM should be regarded as a strategic issue that should be included in local plans and also in statements of common ground (The Planning Inspectorate, 2015) that are required to support the Localism Act's duty to co-operate. Local plans should ideally also set out local policies for IWM, or where neighbourhood plans should include IWM policies.

Close partnership between the LPA, LLFA and water company will simplify the implementation of IWM in other ways, including identifying appropriate adoption arrangements for SuDS and other IWM infrastructure.

Catchment partnerships

Catchment partnerships facilitate more strategic partnerships (Clark *et al*, 2018). They can bring together the different LPAs and LLFAs with other bodies that have an interest in catchment management to tackle challenges in a collaborative way. Catchment partnerships can also identify opportunities, and agree and deliver the strategic priorities for the catchment.

The LPA, working through a catchment partnership, can influence what happens in other parts of the catchment that would have a direct effect on development and growth in their local area. Catchment partnerships can co-ordinate catchment restoration with LLFAs. By joining-up with neighbouring authorities, LPAs and LLFAs can shape how land and water is managed at a landscape scale. Catchment partnerships are also an important source of evidence to support LPAs' local plans.

The catchment partnership, working with LPAs and LLFAs across the catchment, could develop an 'adaptation framework' for water to make the catchment more resilient to climate change challenges such as flooding and drought, with common goals and clear expectations on stakeholders.

An engaged and supportive local community

Local politicians can be influenced to embrace IWM by an engaged and supportive local community. Local planners, working with communities, can influence local councillors to support the introduction

of IWM policies in local plans, and the support of those same communities is crucial in getting the plan to adoption. Community campaign groups have been notably successful advocates of IWM, and in some cases have used IWM challenges as a basis to oppose unsustainable development.

Understanding partners' interests and drivers

Understanding and appreciating partners' interests and drivers is a vital part of developing a realistic and achievable local plan. Planners need to understand the remit and drivers of the other bodies they need to engage with. For IWM this will include other areas of LA responsibility (eg climate change, green infrastructure, housing, regeneration, environment and health and well-being), LLFAs, the environmental regulators, water companies, developers and businesses, and local communities. LPAs, LLFAs and water companies should ensure that their plans are mutually reinforcing and supporting.

Planners need to understand:

- ◆ how IWM fits with delivery of strategies for responding to climate change and delivery of blue-green infrastructure
- ◆ how IWM contributes to high-quality development and sense of place
- ◆ what LLFAs are trying to achieve in their surface water management plans
- ◆ what the constraints and opportunities are for water companies, developers and business interests
- ◆ funding cycles
- ◆ the regulatory framework administered by the environmental regulators
- ◆ the aspirations of communities.

To 'sell' a scheme to prospective partners it is vital that those promoting the scheme understand what the remit of potential partners is, what their drivers are, and also what the benefits are, ie 'what's in it for them'. When the remit and aspirations of the possible partners are understood, what they might get in return for making a contribution can be identified (see [Figure 3.3](#)). Potential partners need be shown what the scheme will achieve for them so that they can realise their objectives at a lower cost. By contributing to the scheme and sharing the costs, they have a real incentive to participate.

CSF D: partnerships	
Supporting physical case studies	Supporting local policy examples
All	All

3.2.5 CSF E: good management

A strong champion

A strong champion providing leadership is a common factor in getting good policies on IWM into local plans and successful schemes to deliver IWM on the ground.

For policies in local plans the champion is usually an officer in the LPA, although elected councillors may also be champions. A champion with a strong vision and/or evidence has the ability to generate enthusiasm for IWM across the LA and with the bodies the LPA works with (see [Box 3.6](#)). Champions in LLFAs may also encourage LPAs to embrace IWM.

Champions for the delivery of IWM can come from any one of the partners (eg local authority, environmental regulator, water company, developer, business and community). Community campaign groups have been notably successful advocates of IWM. Wherever the champion comes from, they should have the ability to enthuse the other partners, build a team and create a momentum in the project. They need to provide strong and consistent leadership and should also be knowledgeable, and respected by the other stakeholders.

The champion should also be given a degree of freedom by their organisation to carry out the role of champion (ie the organisation needs to take account of long-term benefits as well as short-term needs and allow the champion time away from daily activities).

Early and clear identification of long-term management arrangements

Long-term management arrangements need to be clear and early identification of who is responsible for management is crucial for realistic provision of IWM. Like most development infrastructure, any IWM infrastructure, regardless of scale, will require management and maintenance after it has been created.

For large-scale IWM approaches (eg sub-catchment natural flood management, flood storage areas, community rainwater harvesting and reuse, and parks providing multi-use space) this will be agreed between the landowners and land managers, usually local authorities, businesses and water companies. LPAs will need to consider funding through Community Infrastructure Levy or planning obligations.

For individual developments in England, it is more difficult to find a suitable entity to adopt the scheme, traditionally a common challenge associated with SuDS. There are various possibilities, including the local authority, water company, a community group, or a private management company. New appointment and variations can provide an alternative adoption route because individual developments are their primary focus. However identifying and negotiating suitable adoption arrangements for IWM measures is key to their implementation, and one of the main reasons given (along with viability) for why measures such as SuDS are not used. The revised NPPF refers to the need for SuDS for major developments to have maintenance arrangements in place to ensure an acceptable standard of operation for the lifetime of the development. The revised planning practice guidance on viability (MHCLG, 2019b) refers to the need to take into account the long-term infrastructure needs of sites. Local plans should include a process for deciding on maintenance arrangements.

In Wales, parts of Schedule 3 of the Flood and Water Management Act 2010 have been implemented and a SuDS Approving Body (SAB) has been set up within LLFAs. The Act requires SAB approval of all new drainage systems for new and redeveloped sites and highways to be obtained before construction can begin. It also requires that the proposed drainage system meets national standards for SuDS. These national standards are concerned with the design, construction, operation and maintenance of SuDS. If the national standards for SuDS are met, then the SAB will be required to adopt and maintain the approved SuDS that serve more than one property.

Co-ordination of budgets and funding

Delivery of IWM is improved with the co-ordination of budgets and funding. Once partners have been identified and convinced of the benefits to them of contributing to a project, the timing and management of funding should be established. Each partner will have their own time constraints on when funding is available and what justifications are required for its release and accounting. These are likely to be different for different partners. This should be phased in from the start, with a realistic and achievable work programme which includes timed stages and deliverables that are tailored to the budgeting and

Box 3.6
Good management, Mount Oswald, Durham

The Mount Oswald development is a large mixed-use property scheme on the outskirts of Durham. It has a cost-effective SuDS regime which manages runoff so that discharges are lower volume and cleaner than before the development and flow rates are managed.

This case study shows that a strong champion (in this case the developer), working closely with the LPA and LLFA, with management arrangements identified and agreed at an early stage, can deliver SuDS cost effectively on a large and challenging site.

See Part B Case study P8.



accounting requirements of the individual partners. LPAs need to consider the long-term funding needs of IWM infrastructure when they are developing infrastructure delivery plans and considering the need for Community Infrastructure Levy and S106 obligations (Town and Country Planning Act 1990).

Planning conditions

Requirement and enforcement of planning conditions is important to ensure that the IWM approach is embraced and necessary infrastructure is built and functions as designed, and the management arrangements are properly and effectively monitored and maintained. If developers know that enforcement is weak or lacking they may be tempted to cut corners and leave critical IWM infrastructure and connections out, rendering the water management ineffective and giving IWM approaches a bad name.

CSF E: good management	
<i>Supporting physical case studies</i>	<i>Supporting local policy examples</i>
P1, P2, P3, P4, P5, P6, P7, P8, P9, P10, P11, P12	LP1, LP4, LP6, LP8, LP9, LP10, LP11, LP12, LP13, LP14

4 Key characteristics of good local policy for IWM



Volunteers planting, River Wandle (courtesy South East Rivers Trust)

4 Key characteristics of good local policy for IWM

4.1 INTRODUCTION

This section sets out the generic key characteristics of good local policy to deliver IWM, based on the NPPF, PPW and the examples of local policy (see [Table 5.3 and Part C](#)). Policies need to be sensitive to local circumstances, challenges and opportunities, but the key characteristics are applicable across both England and Wales. In addition, clear technical requirements or ‘asks’ of a policy are important in creating certainty for developers, the LPA, regulators and the public.

4.2 NATIONAL POLICY AND GUIDANCE IN ENGLAND AND IN WALES

The NPPF and planning practice guidance are not prescriptive about what constitutes good local policy. The minimum requirement in England is that local plans should contain strategic policies, but can also contain local policies. Local policies can also be in separate plans produced by LPAs or in neighbourhood plans produced by neighbourhood planning bodies.

Paragraph 20 of the NPPF defines what strategic policies should cover, with requirements relevant to IWM highlighted in **bold**:

“Strategic policies should set out an overall strategy for the pattern, scale and quality of development, and make sufficient provision for:

- ◆ *housing (including affordable housing), employment, retail, leisure and other commercial development*
- ◆ *infrastructure for transport, telecommunications, security, waste management, water supply, wastewater, flood risk and coastal change management, and the provision of minerals and energy (including heat)*
- ◆ *community facilities (such as health, education and cultural infrastructure)*
- ◆ *conservation and enhancement of the natural, built and historic environment, including landscapes and green infrastructure, and planning measures to address climate change mitigation and adaptation.”*

Local and neighbourhood plans can also include non-strategic policies which can incorporate locally-specific requirements for managing local sources of flooding, and both green infrastructure and biodiversity improvements.

Local plans have to pass a test of ‘soundness’ before they can be adopted. LPAs will need to prepare statements of common ground that set out how objectively assessed needs will be delivered with neighbouring authorities. The precise form and content of this is yet to be set out in guidance, but failing to consider IWM could undermine the ability of a LPA to develop a sound strategy.

Paragraph 35 of the NPPF sets out the tests and the contribution of IWM is shown in [Table 4.1](#).

In Wales, there are three soundness tests (does the plan ‘fit’, is it ‘appropriate’ and ‘will it deliver?’) for local development plans (Welsh Government, 2018, Paragraph 2.7.2), which are encompassed in [Table 4.1](#).

In this guidance, the term ‘local plans’ is used generically to include local plans in England and local

development plans in Wales. In both countries, local plans are prepared in accordance with the primary legislation, the Planning and Compulsory Purchase Act 2004, although secondary legislation, policy and practice has evolved differently because of planning being a devolved matter in Wales.

Table 4.1 How IWM contributes to the test of soundness

Test	Requirement	IWM contribution
Positively prepared	A strategy that, as a minimum, seeks to meet the area's objectively assessed needs. It is informed by agreements with other authorities so that the needs of neighbouring areas are accommodated where practical to do so and are consistent with achieving sustainable development.	<ul style="list-style-type: none"> ◆ Sufficient water and wastewater infrastructure, water-efficiency standards to serve future needs. ◆ River basin management plan objectives and net biodiversity gains are achieved. ◆ Flood risk is managed. ◆ IWM is used to help adapt to the predicted effects of climate change. ◆ Blue-green infrastructure is protected and improved. ◆ IWM is considered as part of the duty to co-operate and included in statements of common ground.
Justified	An appropriate strategy, taking into account the reasonable alternatives, and based on proportionate evidence.	Strategic flood risk assessments, surface water management studies, water resource management plans, drainage and wastewater management plans, green infrastructure strategies etc should all inform the local plan (directly or via water cycle studies, IWM strategies, the sustainability appraisal, viability assessment or infrastructure delivery plan).
Effective	Deliverable over the plan period and based on effective joint working on cross-boundary strategic matters that have been dealt with rather than deferred, and included in statements of common ground.	The IWM infrastructure and requirements can be included in statements of common ground, should be considered in carrying out viability assessments of the plan's policies to justify being included in Community Infrastructure Levy, s106 obligations, planning conditions and infrastructure delivery plans.
Consistent with national policy	Enabling the delivery of sustainable development in accordance with the policies in the NPPF framework.	Objectives relevant to IWM should be included in the sustainability appraisal that informs the local plan.

Paragraph 002 of the 'plan-making' section of the planning practice guidance (MHCLG, 2019b) does not contain any detailed advice about how to write policy but states that 'all plans need to be as focused, concise, and accessible as possible.'

Welsh Government (2018) contains policy and guidance on the content of local development plans (LDPs), but not on how to write policy. This is contained in Welsh Government (2015), particularly checklists at 7.2.2 and 7.2.3.

4.2.1 Other generic advice on good local policies

Guidance that helps communities produce neighbourhood plans could also be used by LPAs when drafting local plan policies (see **Table 4.2**). Other sources of information are provided in **Table 4.3**.

Table 4.2 Top tips for writing planning policies (after Burton, 2014)

Write in everyday English	Try to avoid jargon and stick to common sense language.
Avoid duplication	There is little point in addressing issues that are already covered by the policies in the local plan.
Be clear	Avoid ambiguity and be precise about the intention of the policy.
Vision and objectives	Each planning policy should stem from a clear vision for the neighbourhood and help deliver at least one of the plan's objectives.
Stand out	The policies are the centrepiece of the neighbourhood plan – make them stand out by putting them in a box in clear bold text.

Evidence	Policies should not be included 'on a whim', they need to be supported by robust evidence and rooted in the feedback from public engagement.
Keep it local	Planning policies cannot conflict with central government policy, challenge the strategic elements of the local authority's planning policies, or deal with topics such as minerals or waste or nationally-significant infrastructure.
Be positive	Word policies to welcome development that meet expectations instead of turning development away.
Targets	Use policies to set targets or provide indicators that can be used to monitor success.
Delivery	Policies need be capable of being delivered within the timeframe.

Table 4.3 Other guidance on writing IWM policy

Source	Description
The Green Infrastructure Partnership (GIP)	A network of people and organisations that support the creation, enhancement and promotion of green infrastructure in the UK. It has identified good and bad practice in drafting local plan policy and an 'exemplar' local plan policy (Scott, 2018). The guide (Table 4.4) to strong policy wording, and weak wording to avoid, applies equally to IWM policy.
The Mainstreaming Green Infrastructure project	A package of advice, to help 'mainstream' green infrastructure into planning policy, practice and decision-making processes, has been produced. In particular, the A-Z of designing and writing good practice green infrastructure policies with a case study of England's NPPF includes 26 assessment criteria that can be used by policy planners to produce better policies, incorporating five assessment criteria related to the water environment. https://mainstreaminggreeninfrastructure.com/
RTPI and TCPA (2018)	The Royal Town Planning Institute and Town and Country Planning Association produced joint guidance for local authorities on planning for climate change. This contains useful advice on the law, policy and guidance on climate change, tips for developing an evidence base and 'model' policies for mitigation and adaptation. Some of the model approaches for adaptation incorporate many elements of IWM.

Table 4.4 Phrasing of local policy (from Scott, 2018)

Strong phrases	Weak phrases
"all new developments will provide"	"should incorporate"
"meet the needs of"	"when appropriate"
"must be designed to meet ____ needs"	"where appropriate"
"the Council will not accept"	"the Council will negotiate provision"
"proposals must demonstrate"	"should be well designed"
"any new development must protect"	"the Council will encourage"
"proposals will be expected to demonstrate compatibility with"	"the Council will expect development proposals to have regard to"
"planning conditions will be applied and, where necessary, legal agreements sought"	"the Council does not favour the use of"
"all new development must comply with the Council's standards"	"development that helps ____ will be supported"
"the Council will expect"	"the Council will seek to develop"
"the Council expects that all development proposals shall be"	

4.2.2 Characterising local policies

The local policies used as examples in this guidance have been chosen because they demonstrate the CSFs, outcomes and, in some cases, the full golden thread linking them to projects on the ground (see [Part C](#)). Key characteristics of good local policy for IWM are suggested in [Table 4.5](#).

Table 4.5 Characteristics for IWM policies

Characteristic	Recommendations
Evidence based	<p>Clearly justify policies by linking to and referencing:</p> <ul style="list-style-type: none"> ◆ strategic flood risk assessments ◆ local flood risk management strategies ◆ surface water management plans ◆ river basin management plans ◆ water resource management plans ◆ drainage and wastewater management plans ◆ catchment management plans ◆ green infrastructure strategies ◆ infrastructure delivery plans/infrastructure funding statements ◆ water cycle studies and/or IWM strategies ◆ viability assessments and other relevant evidence.
Visionary	IWM policies should help deliver a vision for sustainable development, or a theme such as ecosystems services or climate change adaptation.
Strategic	Local plans should include a strategic policy that integrates managing flood risk, water quality, water efficiency and blue-green networks, and should set the framework for any non-strategic local plan or neighbourhood plan policies.
Avoid duplication	Do not reproduce national policy, but translate it into locally-specific policy.
Clear and positive	<p>Use opportunities to introduce appropriate water consumption standards flexible enough to allow for future improvements in national standards.</p> <p>Use strong language that emphasises the requirements for new development to deliver positive benefits, preferably identified as targets (eg what constitutes reduced water demand or better water quality).</p>
Co-operative	Develop policies with strategic partners and neighbouring LPAs. Include IWM issues in statements of common ground to help pass the soundness test.
Deliverable	<p>Include IWM in infrastructure delivery plans/infrastructure funding statements and longer term masterplans, including identifying long-term management arrangements and partners.</p> <p>Ensure that LPA development management staff understand the IWM policies by having ease of access to a clear and simple evidence base, and produce a developer guide, or supplementary planning guidance to produce the detail to show others how it works.</p>

Table 4.6 presents the local policies that have been analysed for this guidance and the extent to which they present the key characteristics of good local planning policy identified in **Table 4.5**. Key characteristics from the examples are outlined in **Tables 7.1 to 7.8 in Part E**.

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Table 4.6 Analysis of where examples exhibit strong characteristics of good local policies

Example		Evidence based	Vision	Strategic	Avoid duplication	Clear and positive	Co-operative	Deliverable
LP1	Cambridge	✓	✓	✓	✓	✓	✓	✓
LP2	London Borough of Lewisham	✓				✓	✓	
LP3	Greater London	✓	✓	✓	✓	✓	✓	✓
LP4	Peterborough	✓	✓	✓		✓		✓
LP5	London Borough of Croydon	✓	✓	✓		✓	✓	
LP6	North Northants		✓			✓	✓	✓
LP7	Warwick	✓				✓	✓	
LP8	South Downs	✓	✓			✓		
LP9	Leicester	✓	✓		✓	✓		
LP10	London Borough of Hillingdon	✓			✓	✓	✓	✓
LP11	Brighton and Hove	✓	✓	✓				✓
LP12	Ashford	✓	✓	✓			✓	
LP13	Hull	✓		✓			✓	✓
LP14	Arun	✓	✓	✓	✓	✓	✓	✓
LP15	St Helens	✓	✓	✓			✓	

Key

✓ Indicates where local policy is particularly strong.

4.3 TECHNICAL REQUIREMENTS OR 'ASKS' IN LOCAL POLICIES

Local policies used for this guidance were reviewed to understand their technical requirements, or 'asks'. There were some common themes that exemplify good practice shown in [Tables 4.7 to 4.11](#) to help influence the development of strong policy. However, there are no examples of technical requirements for all of the outcomes.

Table 4.7 Reduced risk from flooding

Example	Policy and technical ask	Comment
LP7	<p>Warwick District Local Plan, FW2 (Warwick District Council, 2017)</p> <p>"All new major developments must incorporate SuDS that provide biodiversity, water quality and amenity benefits and be in accordance with the Warwickshire SWMP. There will be a presumption against underground storage of water, and it should support the delivery of green infrastructure.</p> <p>All new development sites will discharge at the QBAR (see Glossary) greenfield runoff rate, including an allowance for climate change; for sites with a life expectancy of less than 60 years, a 20% allowance must be applied; for sites with a greater than 60-year life expectancy, the allowance must be 30%.</p> <p>SuDS schemes must be located outside the floodplain; ideally this should be within the development site or close to the site as part of a masterplanned drainage scheme. Priority should be given to SuDS that incorporate green infrastructure, including green roofs, walls and rain gardens.</p> <p>For development sites that are suspected to be contaminated, the SuDS scheme will be designed to prevent the mobilisation of contaminants to waterbodies. The Environment Agency must be consulted in relation to sites suspected to be contaminated and will provide advice and guidance to the Council and developers on how best to implement SuDS on a site-specific basis."</p>	<p>The policy has clear, positive, strong wording and has detailed and strict requirements for SuDS.</p> <p>It helps to implement a multi-agency management plan.</p> <p>It clearly stresses the multiple benefits of SuDS.</p>
LP10	<p>Draft Hillingdon Local Plan Part 2 Development Management Policies Revised Proposed Submission Version, Policy DME10 (London Borough of Hillingdon, 2015)</p> <ul style="list-style-type: none"> ◆ Applications for all new build developments (not conversions, change of use, or refurbishment) are required to include a drainage assessment demonstrating that appropriate SuDS have been incorporated in accordance with the London Plan hierarchy (GLA, 2016a). ◆ All major new build developments, as well as minor developments in critical drainage areas or an area identified at risk from surface water flooding must be designed to reduce surface water runoff rates to no higher than the pre-development greenfield runoff rate in a 1:100-year storm scenario, plus 30 per cent allowance for climate change for the worst storm duration. The assessment is required regardless of the changes in impermeable areas and the fact that a site has an existing high runoff rate will not constitute justification. ◆ Rain gardens and non-householder development should be designed to reduce surface water runoff rates to greenfield runoff rates. ◆ Schemes for the use of SuDS must be accompanied by adequate arrangements for the management and maintenance of the measures used, with appropriate contributions made to the Council where necessary. ◆ Proposals that would fail to make adequate provision for the control and reduction of surface water runoff rates will be refused. ◆ Developments should be drained by SuDS and must include appropriate methods to avoid pollution of the water environment. Preference should be given to using drainage options in the SuDS hierarchy which remove the key pollutants that hinder improving water quality in Hillingdon. Major development should adopt a 'treatment train' approach where water flows through different SuDS to ensure resilience in the system. 	<p>The policy has clear, strong wording and has detailed and strict requirements for SuDS that address long-term management, water quality and climate change.</p>

Table 4.8 Increased water efficiency and reduced water stress

Example	Policy and technical ask	Comment
LP3	<p>New draft London Plan, Policy SI5 Water infrastructure (GLA, 2016c)</p> <ul style="list-style-type: none"> a “In order to minimise the use of mains water, water supplies and resources should be protected and conserved in a sustainable manner. b Development Plans should promote improvements to water supply infrastructure to ensure security of supply. This should be done in a timely, efficient and sustainable manner taking energy consumption into account. c Development proposals should: <ul style="list-style-type: none"> 1 minimise the use of mains water in line with the Optional Requirement of the Building Regulations (residential development), achieving mains water consumption of 105 litres or less per head per day (excluding allowance of up to five litres for external water consumption) 2 achieve at least the BREEAM Excellent standard for the ‘Wat 01’ water category124A or equivalent (commercial development) 3 be encouraged to incorporate measures such as smart metering, water saving and recycling measures, including retrofitting, to help to achieve lower water consumption rates and to maximise future-proofing. d In terms of water quality, Development Plans should: <ul style="list-style-type: none"> 1 promote the protection and improvement of the water environment in-line with the Thames River Basin Management, and should take account of Catchment Plans. 2 support strategic wastewater treatment infrastructure investment to accommodate London’s growth and climate change impacts. Such infrastructure should be constructed in a timely and sustainable manner taking account of new, smart technologies, intensification opportunities on existing sites, and energy implications. Boroughs should work with Thames Water in relation to local wastewater infrastructure requirements. e Development proposals should: <ul style="list-style-type: none"> 1 seek to improve the water environment and ensure that adequate wastewater infrastructure capacity is provided 2 be designed to ensure that misconnections between foul and surface water networks are eliminated and not easily created through future building alterations.” 3 EA Development Plans and proposals for strategically or locally defined growth locations with particular flood risk constraints or where there is insufficient water infrastructure capacity should be informed by Integrated Water Management Strategies at an early stage.” 	<p>The policy includes the higher national optional standard for residential development, BREEAM Excellent standard for other developments and makes clear suggestions about how to reduce water consumption further. It also includes water quality expectations and the need for integrated water strategies for significant development.</p>
LP6	<p>North Northants Joint Core Strategy, Policy 9 (Corby Borough Council, 2016)</p> <p>“All residential development should incorporate measures to limit use to no more than 105 litres/person/day and external water use of no more than five litres/person/day or alternative national standard applying to areas of water stress.”</p>	<p>The policy applies highest water efficiency standards under Building Regulations and contains flexibility in case of increased national standards.</p>
LP11	<p>Brighton and Hove Local Plan, Policy CP8 (Brighton and Hove City Council, 2016)</p> <p>“Unless it can be demonstrated that doing so is not technically feasible and/or would make the scheme unviable:</p> <ul style="list-style-type: none"> 1 All development will be required to achieve the minimum standards as set out below unless superseded by national policy or legislation: <ul style="list-style-type: none"> residential (new build): water efficiency ‘optional’ standard non – residential: BREEAM Very Good non-major: BREEAM Very Good major and greenfield: BREEAM Excellent. 2 All development proposals including conversions, extensions and changes of use will be expected to demonstrate how the development: <ul style="list-style-type: none"> addresses climate change mitigation and adaptation; aspire towards water neutrality by meeting high water efficiency; meets standards and incorporates facilities to recycle, harvest and conserve water resources; reduces ‘heat island effect’ and surface water runoff.” 	<p>The policy applies highest water-efficiency standards under Building Regulations and contains flexibility in case of increased national standards if the optional standard is altered.</p> <p>The policy exceeds national policy by referring to BREEAM standards for conversions, extensions and changes of use, and by requiring water neutrality to be investigated.</p>

Table 4.9 Clean and good quality water environment

Example	Policy and technical ask	Comment
LP1	LP1 Cambridge Local Plan, Policy 31 (Cambridge City Council, 2018a) Development will be permitted provided that... <i>"development adjacent to a water body actively seeks to enhance the water body in terms of its hydromorphology, biodiversity potential and setting."</i>	The policy has clear, strong, positive wording that aims for net gains.
LP7	Warwick District Local Plan, policy FW1 (Warwick District Council, 2017) <i>"Where development lies adjacent to a watercourse, the supporting planning application will include a Water Framework Directive assessment to demonstrate how the waterbody will not deteriorate in status and will be enhanced, and:</i>	The policy has clear, strong wording that refers to the need for extra assessments, increasing certainty for the developer over information requirements.
	<ul style="list-style-type: none"> ◆ there will be no impact upon priority habitat or designated sites of nature conservation; ◆ modified watercourses will be restored in line with the recommendations of the Severn River Basin Management Plan; ◆ culverting open watercourses will not be allowed." 	

Table 4.10 Enhanced biodiversity

Example	Policy and technical ask	Comment
LP8	<p>South Downs Local Plan, Core Policy SD2 Ecosystem services (South Downs National Park, 2019)</p> <p><i>"Development proposals will be permitted where they have an overall positive impact on the ability of the natural environment to contribute goods and services.</i></p> <p><i>This will be achieved through the use of high-quality design, and by delivering all opportunities to:</i></p> <ul style="list-style-type: none"> a sustainably manage land and water environments; b protect and provide more, better and joined-up natural habitats; c conserve water resources and improve water quality; d manage and mitigate the risk of flooding; e improve the national park's resilience to, and mitigation of, climate change; f increase the ability to store carbon through new planting or other means; g conserve and enhance soils; h support the sustainable production and use of food, forestry and raw materials; i reduce levels of pollution; j improve opportunities for peoples' health and well-being; and k provide opportunities for access to the natural and cultural resources which contribute to the special qualities <p><i>Development proposals must be supported by a statement that sets out how the development proposal impacts, both positively and negatively, on ecosystem services."</i></p>	The policy is strongly worded and contains a clear requirement for development to take an ecosystems service approach. It explains what this means for development proposals, including signalling information requirements for developers.

Box 4.1
Enabling water efficiency

To address water supply challenges highlighted in **Section 2.1**, an efficient approach is needed to manage how water is used, harvested and recycled within buildings and developments. Innovative approaches involving rainwater harvesting and greywater recycling can significantly reduce the volumes of both treated water supplied to a site, and wastewater entering the sewerage system.

Examples of what can be achieved are highlighted in case studies in **Part B**, particularly **Case studies P1, P3, P6 and P11**. In North West Cambridge (P6) rainwater harvesting reduces potable water consumption by over 45 per cent and in Southbank Place (P11) a combination of rainwater harvesting and greywater recycling will save 40 000 m³ of mains water per year, and reduce input to the sewer system by the same amount.

A partnership between developers, water companies and planners is needed to achieve these levels of water efficiency. Planners can facilitate water efficiency through planning policy to support long-term ambition on reducing demand for water.

Approved Document G of the Building Regulations (2015) encourages water efficiency. It includes an optional requirement of 110 l/p/d that can be implemented through the planning permission for the property and local policy where there is clear evidence of need (ie in water-stressed areas). A water fittings approach can be used where less than 110 l/p/d is required. LPAs could specify a lower level of per capita water consumption for new developments that fall within the supply area of a water company that offers incentives for water efficiency in new homes. For commercial development, rainwater harvesting and greywater recycling can count towards BREEAM scoring.

LPAs can introduce ambitious policies for water efficiency. Examples in **LP3, LP6 and LP11** are particularly ambitious, including water-efficiency standards for non-residential and conversions, encouraging developers to go beyond the optional standard and flexibility if national standards are tightened.

Rainwater harvesting and greywater recycling may appear to be more expensive than conventional water supply/disposal but there are many different systems available ranging in scale from units for individual homes up to systems for entire developments. Rainwater harvesting systems can also be fitted with smart technology to enable them to manage the harvesting of rain and potential discharges to the environment or sewer in-line with demand and rainfall, thereby improving their contribution to IWM. Larger scale, multi-dwelling systems appear to provide economies of scale but further monitoring and data collection is needed to establish their true costs and benefits. Water companies are developing the evidence base, particularly in water-stressed areas.

For water-efficiency measures to be successful, a degree of behavioural change is required. Acceptance of water-efficient technology is likely to require broader awareness and education, re-connecting people with where water comes from, and where it goes.

Table 4.11 Improved blue-green infrastructure

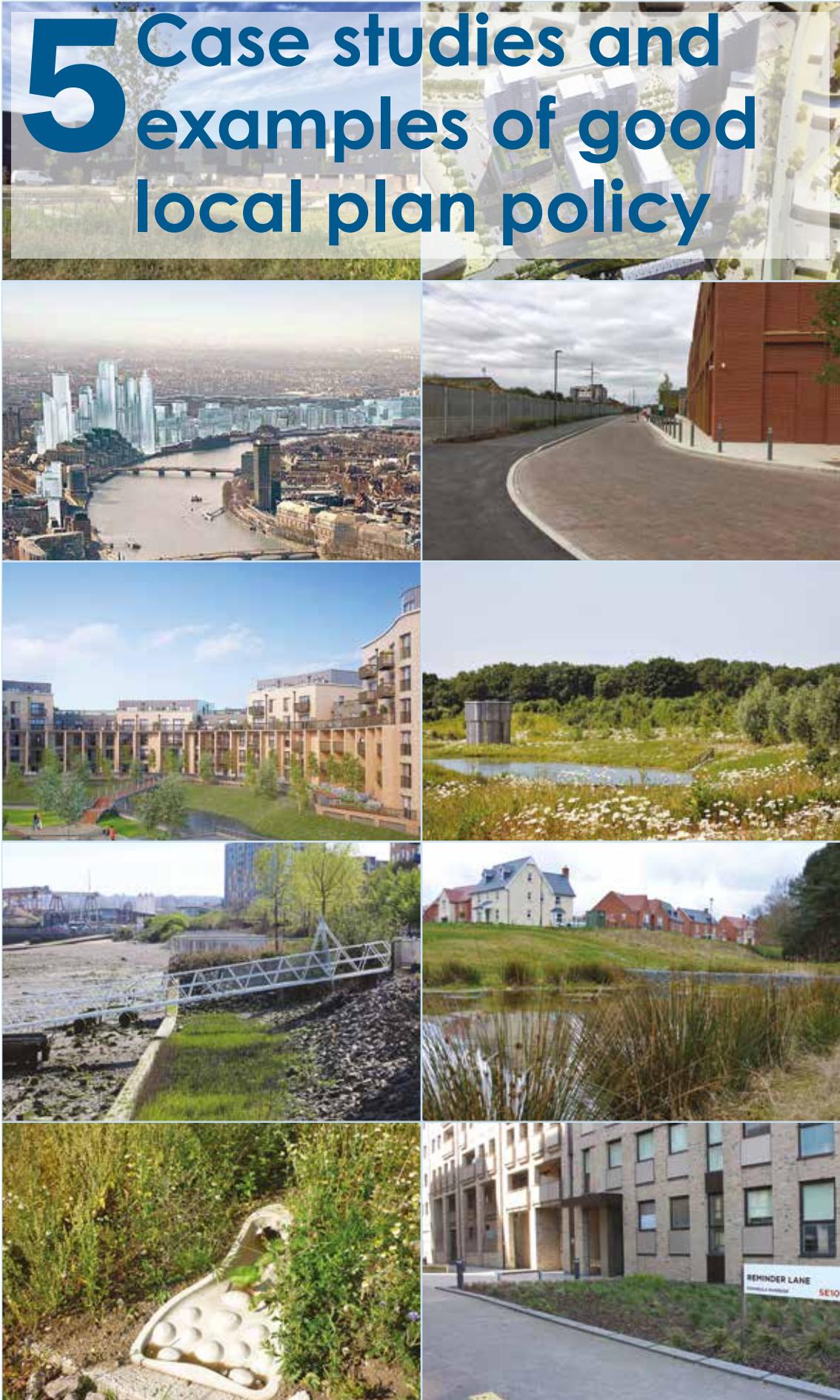
Example	Policy and technical ask	Comment
LP3	<p>Draft New London Plan, Policy G5 (GLA, 2016d)</p> <p>"a A major development proposals should contribute to the greening of London by including urban greening as a fundamental element of site and building design, and by incorporating measures such as high-quality landscaping (including trees), green roofs, green walls and nature-based sustainable drainage.</p> <p>b Boroughs should develop an urban greening factor (UGF) to identify the appropriate amount of urban greening required in new developments. The UGF should be based on the factors set out in Table 8.2, but tailored to local circumstances. In the interim, the Mayor recommends a target score of 0.4 for developments that are predominately residential, and a target score of 0.3 for predominately commercial development.</p> <p>b Existing green cover retained on-site should count towards developments meeting the interim target scores set out in (B) based on the factors set out in Table 8.2."</p>	The policy includes an innovative approach to recognising and quantifying the benefits of blue-green infrastructure.
LP5	<p>London Borough of Croydon Local Plan, Policy SP6.5</p> <p>"The Council and its partners will promote the implementation of 'urban blue corridors', enabling a network of multifunctional spaces and corridors that provide safe routes and storage for flood water within the urban environment. This will be achieved by:</p> <p>Supporting schemes that make space for water in flood events;</p> <p>Supporting schemes to de-culvert sections of the River Wandle, Norbury Brook and Caterham Bourne;</p> <p>Preserving and enhancing landscape, heritage and culture through protection and access improvements to the Borough's ponds, open water and water heritage sites; and</p> <p>Maximising opportunities to establish overland flow paths, surface water ponding areas, urban watercourse buffer areas and multi-use flood storage areas in locations of high surface water flood risk and critical drainage areas."</p>	The policy promotes the multiple benefits of protecting and enhancing blue-green infrastructure

4.4 CONCLUSIONS AND RECOMMENDATIONS

Few of the examples of local policies exhibit all the key characteristics of good local policy. However, between them, they show that local policies can help achieve IWM. They are generally supported by a good range of evidence and demonstrated that they had widespread involvement and support from a range of stakeholders and infrastructure providers. Taking account of the review of local policy and recent changes in English and Welsh planning policy, some recommendations for local policies are that they should be:

- ◆ based on a wide range of evidence from several sources, preferably packaged together as an IWM strategy
- ◆ founded on an overarching vision of sustainable development (including IWM) that supports the plan
- ◆ linked to established good practice guidance
- ◆ strategic so they are included in local plans
- ◆ consulted on and agreed by neighbours and partners, so that they can meet the tests of soundness and can form part of statements of common ground
- ◆ complementary to national planning policy, and strategies (eg the UK Government's 25 year environment plan [HM Government, 2018])
- ◆ locally specific, rather than duplicating national policy
- ◆ use positive, stronger wording
- ◆ identify specific targets or objectives
- ◆ clearly linked to an infrastructure delivery plan that has the support of other delivery partners.

5 Case studies and examples of good local plan policy



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5 Case studies and examples of good local plan policy

Part B provides case studies of IWM delivery and **Part C** provides examples of good local planning policy. **Table 5.1** lists the case studies, which show how IWM outcomes have been delivered, and the CSFs that have helped deliver them. **Table 5.2** gives further details of the case studies. **Table 5.3** lists the examples of good local plan policy. The local plan policy example numbers can be used to identify the examples of good local plan policy illustrating the CSFs in **Section 3**.

Part B contains **Case studies P1 to P12**.

Part C contains examples of good local plan policy (**LP1 to LP15**).

Table 5.1 Key for CSFs and outcomes

Code	Details	Icons
CSFs		
A	Understanding IWM	
B	Enabling local policy	
C	Early engagement	
D	Partnerships	
E	Good management	
Outcomes		
1	Reduced risk from flooding	
2	Increased water efficiency and reduced water stress	
3	Clean and good quality water environment	
4	Enabling new housing	
5	Facilitating economic growth and regeneration	
6	Enhanced biodiversity	
7	Better blue-green infrastructure	
8	More accessible public spaces and places, and improving well-being	
9	Mitigating and adapting to climate change	
10	Using resources more sustainably and effectively	

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Table 5.2 Case studies showing IWM outcomes and CSFs

Case study	Category	Golden thread?	CSFs involved	Physical output?	Outcomes achieved	Planning involvement	Comment
P1 Clay Farm, Cambridge	Large	Yes		Partially complete, development, ongoing.		Cambridge local plan (Policy 9/3) (2006) Cambridge sustainable drainage design and adoption guide.	Large-scale IWM incorporating rainwater harvesting.
P2 Lewisham Gateway	Large	Yes		Partially complete, development, ongoing.		Lewisham Core Strategy Policies 7, 8, 10 and 11 River Corridors Improvement Plan SPD planning conditions.	Urban regeneration centred on river restoration. Contributes to all IWM outcomes except water efficiency and reduced water stress.
P3 Nine Elms, South Bank, London	Large	Yes		In construction		London Plan policy, particularly the drainage hierarchy Vauxhall Nine Elms Battersea opportunity area planning framework.	A district-scale IWM system to drain the South Bank at Vauxhall led by Thames Water.
P4 Fletton Quays, Peterborough	Large	Yes		In construction		Peterborough City Council core strategy policies: CS21 Biodiversity and geological conservation CS22 Flood risk.	A large-scale integrated SuDS scheme providing district surface water management, enabling regeneration and housing provision.
P5 New South Quarter and Wandle Park, Croydon	Large	No		Completed		Croydon planners involved, but no clear supporting policy in the local plan at the time. The Wandle Park improvements were through a S106 agreement. A reverse 'golden thread' as policy was developed as a result of the schemes.	Large-scale brownfield regeneration with IWM centred on de-culverting the River Wandle, and enabling restoration of Wandle Park. Demonstrates all aspects of IWM except water efficiency and reduced water stress.
P6 North West Cambridge	Large	Yes		In construction		NW Cambridge AAP.	Major development designed round a large-scale IWM system, incorporating measures to reduce water consumption including rainwater harvesting.

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Case study	Category	Golden thread?	CSFs involved	Physical output?	Outcomes achieved	Planning involvement	Comment
P7 Manor Fields Park, Sheffield	Large	No		Completed		<ul style="list-style-type: none"> Developed before Sheffield had policies on water management. A 'reverse' golden thread as policy was later developed. 	Proven very effective large-scale integrated SuDS scheme that was significantly cheaper than conventional drainage, enabling housing that would otherwise not have been economically buildable.
P8 Mount Oswald, Durham	Large	No		Completed		<ul style="list-style-type: none"> Implemented with LLFA despite no supporting planning policy. 	Large SuDS scheme for a major development. No planning policy support, rather, a very good example of collaborative working with the LLFA to put in comprehensive SuDS without supporting planning policy.
P9 Asda supermarket, Leicester	Medium	Yes		Completed		<ul style="list-style-type: none"> Leicester City Council planning policies: CS2 Climate change and flood risk CS17 Biodiversity CS 13 Green network. 	An integrated SuDS scheme draining and removing pollution from a large brownfield industrial site.
P10 St Andrews Park, Uxbridge	Large	Yes		Completed		<ul style="list-style-type: none"> London Borough of Hillingdon local plan (Port 1 2012) Uxbridge SPD. 	Policy-driven large brownfield regeneration incorporating a wide range of IWM measures.
P11 Southbank Place, Lambeth	Large	Yes		In construction		<ul style="list-style-type: none"> London Plan policy (particularly the drainage hierarchy). 	Major inner-city redevelopment incorporating measures to reduce water consumption including rainwater harvesting and greywater recycling.
P12 Greenwich Peninsula	Large	Yes		Later phases in construction, earlier phases complete		<ul style="list-style-type: none"> London Plan policy (particularly the Drainage Hierarchy). Royal Borough of Greenwich local plan, which has developed in parallel with masterplanning for the site. 	Very large scheme to regenerate a former industrial landscape into a liveable new business district focused on ecology and high-quality open spaces providing multiple benefits.

Table 5.3 Examples of good local plan policy

Local policy example	Policy documents	Category	Golden thread?	CSFs involved	Adopted?	Outcomes	Examples of developments it has influenced (including reference to case studies)	Comment
LP1 Cambridge	Local plan policy Policy 31		Yes		Yes	 	P6 North West Cambridge P1 Clay Farm	Shows value of partnership working and technical knowledge of IWM.
LP2 London Borough of Lewisham	Local plan policy Core strategy policies 7, 10, 11	Urban	Yes	 	Yes	 	P2 Lewisham Gateway	Value of partnership working.
LP3 London Plan policy	Policies GG6, SD2, D1, D2, D7, G1, G5, SI5, SI12, SI13, SI14	Urban	Yes	 	Draft	 	P2 Lewisham Gateway P5 New South Quarter, Croydon P10 St Andrews Park	This may be the best example in England of a strategic, regional scale set of policies that tackle the full range of IWM challenges.
LP4 Peterborough	Local plan policy Policies LP22 LP24, LP32 Flood and water management SPD	Urban	Yes	 	Yes	 	P4 Fletton Quays	The plan includes a wide-ranging sustainable water policy.
LP5 London Borough of Croydon	Local plan policy Policy SP6	Urban	Yes	 	Yes	 	P5 New South Quarter and Wandle Park, Croydon	Value of a good evidence base, partnership working and learning from projects – a ‘reverse’ golden thread.
LP6 North Northamptonshire Joint Planning Unit	Local plan policy Policies 1, 4, 5, 8, 9, 10, 19	Urban/rural	No	 	Yes	 	Potentially Rushden Lakes Urban Extension, Wellingborough, influenced neighbourhood plans, eg Raunds	Value of partnership working, close links between agencies and strong emphasis on overarching sustainable development policy.
LP7 Warwick	Local plan policy Policies FW1, FW2, FW3, FW4	Urban/rural	No	 	Yes	 	Potentially land on the east side of Warwick Road, Kenilworth or land on the north side of Birmingham Road, Hatton	Value of sound knowledge of IWM, partnership working and close links between agencies.

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Local policy example	Policy documents	Category	Golden thread?	CSFs involved	Adapted?	Outcomes	Examples of developments it has influenced (including reference to case studies)	Comment
LP8 South Downs	Local plan policy (schedule of changes April 2018) Policies SD2, SD17, SD45, SD48, SD49, SD50 Technical advice notes on ecosystems services Ecosystems services background paper	Rural	No		Yes	 	Value of policy being embedded into an overarching ecosystems approach.	
LP9 Leicester	Local plan policy Policies CS 2, CS 13, CS 17 Sustainable drainage guide, climate change SPD, green space SPD, SWMP	Urban	Yes (Asda)	 	Yes	 	P9 Asda supermarket, Leicester	Value of building on cross-departmental teamwork following a previous project (Environment City).
LP10 Hillingdon	Draft Local Plan Part 2 Development management policies revised submission version Policies DMEI 7, 8, 9, 10, 11	Urban	Yes (St Andrews Park)	 	Draft†	 	P10 St Andrews Park	How projects can drive policy development, value of expert knowledge embedded in LPA, trying to break down silo thinking.
LP11 Brighton & Hove City	Local plan policy (part one), Policies CP8, CP11	Urban	No	 	Yes	 	The Keep Toads Hole Valley SPD	Value of a strong champion and partnership working.

Local policy example	Policy documents	Category	Golden thread?	CSFs involved	Adapted?	Outcomes	Examples of developments it has influenced (including reference to case studies)	Comment
LP12 Ashford	Local plan policy Integrated water strategy, 2007, Ashford core strategy, 2008, adopted sustainable drainage SPD, 2010 Adopted public green space and water environment SPD, 2012 Ashford water cycle strategy (2016), local plan to 2030 including Policies ENV5, ENV6, ENV7, ENV8, ENV9 and ENV11	Urban/ rural	No	☒ ☐ ☒ ☐	Yes	☒ ☐ ☒ ☐ ☒ ☐ ☒ ☐ ☒ ☐	None specific – used to influence development throughout Ashford	Shows how a strong local partnership can work together to find innovative solutions to growth challenges.
LP13 Hull	Local plan policy Policies 37, 38, 39, 40, 41, 43, 44	Urban	Yes	☒ ☐ ☒ ☐ ☒ ☐	Yes	☒ ☐ ☒ ☐ ☒ ☐ ☒ ☐ ☒ ☐	Hull Kingston Rovers RLFC SuDS scheme	Value of multi-agency approach and strategy.
LP14 Arun	District local plan Policies GISPI, WSPI, WDM1, WDM3, HSP2c	Urban/ rural	No	☒ ☐ ☒ ☐ ☒ ☐	Yes	☒ ☐ ☒ ☐ ☒ ☐ ☒ ☐ ☒ ☐	Potentially Salt Box development, Bognor Regis	Value of partnership working including considering long- term management.
LP15 St Helens	Local plan policy Preferred options 2018 Policies LPA09, LPC12	Urban/ rural	No	☒ ☐ ☒ ☐	No	☒ ☐ ☒ ☐ ☒ ☐ ☒ ☐	Recent adoption of policies means that there are no examples yet	Understanding the multifunctional benefits of green infrastructure. Benefits of partnership working.

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Part A
Main guide

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Introduction

This part of the *Delivering better integrated water management through planning* guidance contains case studies of projects (see **Table 1**) that show how integrated water management (IWM) outcomes are being delivered, and the critical success factors (CSFs) that have helped deliver them. The case study numbers can be used to identify the case studies listed against outcomes in **Table 2** and described in **Part A Table 2.1**, and the CSFs they illustrate in **Section 3**. The case studies are:

Table 1 Case studies

P1	Clay Farm, Cambridge
P2	Lewisham Gateway
P3	Nine Elms, South Bank, London
P4	Fletton Quays, Peterborough
P5	New South Quarter and Wandle Park, Croydon
P6	North West Cambridge
P7	Manor Fields Park, Sheffield
P8	Mount Oswald, Durham
P9	Asda supermarket, Leicester
P10	St Andrews Park, Uxbridge
P11	Southbank Place, Lambeth
P12	Greenwich Peninsula, Greenwich

Each case study contains a table showing which outcomes it delivers and the CSFs that were instrumental in its implementation. The key to the codes for the CSFs and outcomes is given in **Table 2**.

Table 2 Key for CSFs and outcomes

Code	Details	Icons
CSFs		
A	Understanding IWM	
B	Enabling local policy	
C	Early engagement	
D	Partnerships	
E	Good management	
Outcomes		
1	Reduced risk from flooding	
2	Increased water efficiency and reduced water stress	
3	Clean and good quality water environment	
4	Enabling new housing	
5	Facilitating economic growth and regeneration	
6	Enhanced biodiversity	
7	Better blue-green infrastructure	
8	More accessible public spaces and places, and improving well-being	
9	Mitigating and adapting to climate change	
10	Using resources more sustainably and effectively	

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Summary

Clay Farm is a mixed-use development (predominantly housing) on 109 acres of land removed from the green belt immediately to the south of Cambridge. It features a site-scale IWM system including rainwater harvesting and low water use fixtures and fittings. The IWM system for the whole site was designed at the project start, following Cambridge City Council planning policy (Cambridge City Council, 2018a, b, 2019 and Scott Wilson, 2011). The sustainable drainage system (SuDS) will be adopted by Cambridge City Council.



Site plan

CSFs involved and outcomes delivered

CSFs										
Outcomes										

The opportunity/challenge

To mimic, as far as possible, the existing natural runoff of the site, while also managing peak flows and reducing the impact on the wider drainage system, and to reduce the water footprint of the site and demand on the public water supply.



Virado central quad

Description

The overall site is 109 acres and to the east of Trumpington village. The Clay Farm and showground development will total 2300 homes, with the overall development being carried out by Countryside Properties. Clay Farm will also include a park, secondary school (Trumpington Community College), a primary school (Trumpington Park Primary School) and a local centre with a square, shops and a community centre (Clay Farm Centre). See Trumpington Residents Association (2011).

SuDS are being used where practicable throughout the site to provide source control, to re-introduce water into the subsoil, to improve water quality, to reduce flood risk and support biodiversity. The surface water drainage strategy aims to mimic, as far as possible, the existing natural runoff. To prevent increased flows off-site, surface water control features and storage facilities will be installed before any discharge to Hobson Brook (Cambridge City Council, 2013).

The drainage strategy for the Clay Farm site is based on 60 per cent of the developable area being impermeable, with the piped network designed to accommodate flows with no flooding from a 1 in 30-year rainfall event. The drainage has been divided into four catchment areas, each with a piped network that discharges into Hobson's Brook via its own attenuation pond. Each network will include a hydrodynamic separator located upstream of the attenuation pond to remove sediment, floatables and associated pollutants from the surface water discharge. For any rainfall event, discharge into the brook is controlled to reduce the risk of flooding. Any excess flows are contained within the ponds, which are primarily required for attenuation purposes, but also provide opportunities for biodiversity, ecology and wildlife habitat. Three of the four ponds include areas of permanent water with shallow margins that flood to provide the storage volume. One pond is dry in normal conditions, with water contained following periods of heavy rainfall.

For the individual development plots within the site, the following SuDS components are being used:

- ◆ green roofs
- ◆ harvesting rainwater using water butts
- ◆ attenuation at source using underground storage systems/geocellular systems
- ◆ permeable surfacing with infiltration/ storage blankets to driveways, private roads and parking areas. Overflow will be to the piped network
- ◆ filter strips such as 'French drains'
- ◆ shallow vegetated swales to be used as a conveyance and storage mechanism where adequate space is available such as verges and open spaces
- ◆ existing ditches as flood protection and water quality facility
- ◆ dry detention basins/wet ponds as final flood protection and water quality facility
- ◆ canals/rills.

Part of the site is being developed to Level 5 of the *Code for Sustainable Homes* (DCLG, 2006) which requires water consumption to be no more than 80 litres/person/day) and contains communal rainwater harvesting.

Outcomes

The attenuation ponds that have been constructed in the green corridor area east of Hobson's Brook have been designed to accommodate surface water flows in excess of the 2 l/s per hectare runoff rate for the site area. The ponds have been designed to accommodate excess flows from a 1 in 100-year rainfall event plus 30 per cent allowance for climate change.

The pipe networks within the development will be designed to accommodate the surface water runoff for a 1 in 30-year rainfall event, and calculations indicate that flows from a 1 in 100-year rainfall event plus 30 per cent allowance for climate change are accommodated without flooding.

The site has seen extensive use of permeable paving. The new urban extensions in Cambridge have 30 per cent permeable paving compared to the national average of 10 to 15 per cent as well as other SuDS components including rain gardens, swales and ponds.

Housing is being built with water-saving measures. Communal rainwater harvesting on part of the site along with measures to re-introduce water into topsoil to reduce the need for watering will decrease demand on the public water supply.

How this relates to planning policy

The surface water drainage strategy for the site was in response to policy contained within the Cambridge Local Plan (Cambridge City Council, 2018a), which required new urban extensions to the city to use sustainable drainage. It also responds to *Sustainable drainage. Cambridge design and adoption guide* (Wilson *et al*, 2009), with swales in green corridors or open spaces due to be adopted and maintained by Cambridge City Council as part of the public open spaces.

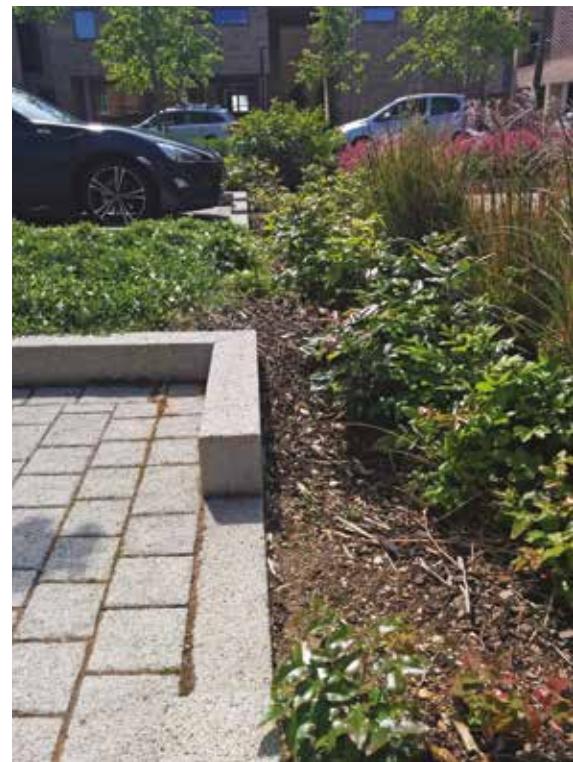
See [Part C Case study LP1](#).

Partners

Clay Farm is a collaboration between Countryside Properties, Cambridge City Council, Skanska, Bovis Homes, Crest Nicholson, Hill Residential, Cala Homes, Cambridgeshire County Council and the Parkside Federation. The Trumpington Residents Association (2011) has been actively engaged in the development of the site.



Permeable paving



Rain garden

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Summary

Lewisham Gateway is one of the largest regeneration projects in south-east London (Lewisham Council, 2019). It will provide a new heart for Lewisham town centre with high-quality buildings and major new public realm that benefit from IWM. The project is the result of innovative planning policies developed by Lewisham Council following the success of the Ladywell Fields project, and implemented through innovative design by the developer, Muse Developments T/A Lewisham Gateway Developments Ltd (Muse Developments, 2006).



Lewisham town centre before the Gateway project

CSFs involved and outcomes delivered

CSFs					
Outcomes					

The opportunity/challenge

Lewisham town centre had suffered years of decline and lacked a sense of identity. The town centre site comprised a bus layover built over the confluence of two culverted rivers and a large and widely unpopular roundabout that cut off the town centre from Lewisham Docklands Light Railway and railway stations. Pedestrian connectivity between the transport hub and the town centre was extremely difficult and unclear. Pressure to redevelop the town centre grew as public perception of Lewisham improved following the successful Ladywell Fields project and business confidence returned.

Description

The Council and the Environment Agency worked with the developers, using Lewisham's planning policy for river restoration (Lewisham Council, 2015), to focus the redevelopment on the rivers as an asset, and de-culvert their confluence to form a town centre pocket park.

The scheme involves 'daylighting' (removing from concrete culverts) and providing public access to the confluence of the rivers Ravensbourne and Quaggy to make a waterside park (Confluence Place) at the heart of the development. The roundabout opposite Lewisham's railway and DLR stations has been removed and replaced by a new road layout, which will make it easier for pedestrians to travel from the stations to the town centre. As part of this, the bus layover was relocated. When complete, Lewisham Gateway will include:

- ◆ shops, restaurants and cafes
- ◆ a multi-screen cinema
- ◆ around 900 new homes and co-living accommodation
- ◆ new work space
- ◆ Confluence Place
- ◆ a town square opposite St Stephen's Church
- ◆ much improved bus, taxi and cycling facilities.

Construction of the first phase, comprising 362 apartments in four blocks along with ground floor retail, is nearing completion. Construction of the second phase of four landmark buildings providing 530 new homes with ground floor retail and restaurants, cinema, 110 co-living units, workspace and retail and restaurants has been submitted for planning permission. Phase 2 construction will start in 2019 with a three-year construction period.



CGI of phase 1 proposals



Deculverting the River Quaggy



Artist's impression of Confluence Place

Outcomes

- ◆ improved connectivity
- ◆ improved public highways
- ◆ river realignment and opening up to provide access
- ◆ public park
- ◆ retail and leisure amenities
- ◆ new homes and workspace
- ◆ extension to the town centre
- ◆ a multiplex cinema for Lewisham.

How this relates to planning policy

The regeneration was guided by Policy 7, 8, 10 and 11 of Lewisham's core strategy (Lewisham Council, 2011) and river corridors improvement plan supplementary planning document (Lewisham Council, 2015). These policies provided clarity for developers on what would be required and gave Lewisham Council the power to require the IWM elements.

See [Part C Case study LP2](#).

Partners

Lewisham Gateway is a collaboration between the London Borough of Lewisham, the Greater London Authority, Transport for London and London Bus Services, and developer Lewisham Gateway Developments Limited and Muse Developments.

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Summary

A major brownfield redevelopment on London's South Bank has an IWM strategy designed into the project to minimise the effect on the sewer system and reduce demand on the public water supply (Brockett, 2016).



The Nine Elms site

CSFs involved and outcomes delivered

CSFs										
Outcomes										

The opportunity/challenge

Managing the water impact of a major new mixed-use brownfield development across the Vauxhall Nine Elms Battersea Opportunity Area in central London. This development will provide 20 000 homes and create 25 000 new jobs, but without IWM would increase demand on existing water infrastructure by 800 per cent in an area of existing water stress, where sewers are running at or close to capacity.

Description

An IWM strategy was developed for the whole site to address the effect of the developments on the water and wastewater networks and their ability to cope. The strategy development had a strong partnership element with all the key stakeholders, which included the developers for more than 60 sites, VNEB partnership, local authority planners, Greater London Authority, and Thames Water (Nine Elms Partnership, 2010).

The strategy balances water supply and demand by using measures such as water efficiency and rainwater, stormwater and recycled greywater for non-potable uses (such as toilet flushing, washing

machines and landscape irrigation). It integrates suggested solutions with a variety of measures proposed by developers to capture, slow and use rainwater through measures such as green roofs, and swales and rain gardens in pedestrianised areas.

An IWM system, a key part of the strategy and London's most ambitious sustainable drainage network, is being delivered. It involves a surface water management train that captures water falling on buildings and other surfaces to be reused as far as possible. Excess water from the developments flows along surface water green corridors that form the public open space network, including a linear park. The design of the public realm will include swales as part of this new green infrastructure.

The system will capture and redirect excess surface water runoff from nine development sites across the Nine Elms development, with scope to extend it in future, into the Thames via an upgrade to a pumping station on Ponton Road. The implementation of the strategy will result in rainfall landing on an area of 13 hectares draining into the Thames instead of entering the local combined sewer.

Once the strategy is adopted in full, peak mains water demand and foul water discharges will be 32 per cent lower than expected, reducing the need for immediate capacity upgrades to the water and wastewater infrastructure. Also, the diversion of surface water to the Thames and the reduced foul water discharges will reduce the likelihood and effect of pluvial and sewer flooding in the downstream network.



The Thames path towards Battersea Power Station



CGI of the completed development

Outcomes

The IWM system will:

- ◆ reduce demand on the public water supply
- ◆ minimise discharge into combined sewers and reduce the effect on the wider drainage system
- ◆ reduce local flood risk
- ◆ provide multiple use high-quality open space
- ◆ improve biodiversity in an inner-city location through multi-use GI and associated tree planting
- ◆ help the project achieve higher environmental standards.

During development the IWM approach has:

- ◆ reduced infrastructure reinforcement requirements
- ◆ made the build-out easier and reduced disruption
- ◆ cut costs.

How this relates to planning policy

The water management solutions for the project are driven by London Plan policy (GLA, 2016a), particularly the drainage hierarchy which only permits discharge of surface water into a drain or combined sewer if no other more sustainable storage, infiltration, or attenuation measures are possible. The site should comply with the Vauxhall Nine Elms Battersea Opportunity Area Planning Framework (Wilson *et al*, 2012), which sets out requirements for managing flood risk and water conservation and management at strategic, site wide and building level.

See [Part C Case study LP3](#).

Partners

The framework (Wilson *et al*, 2012) is being delivered by the VNEB Partnership (Wandsworth Council, Lambeth Council, the local authority, TfL and local developers). The Nine Elms IWM strategy was developed by the VNEB Partnership, Thames Water and Arup (Arup, 2016).

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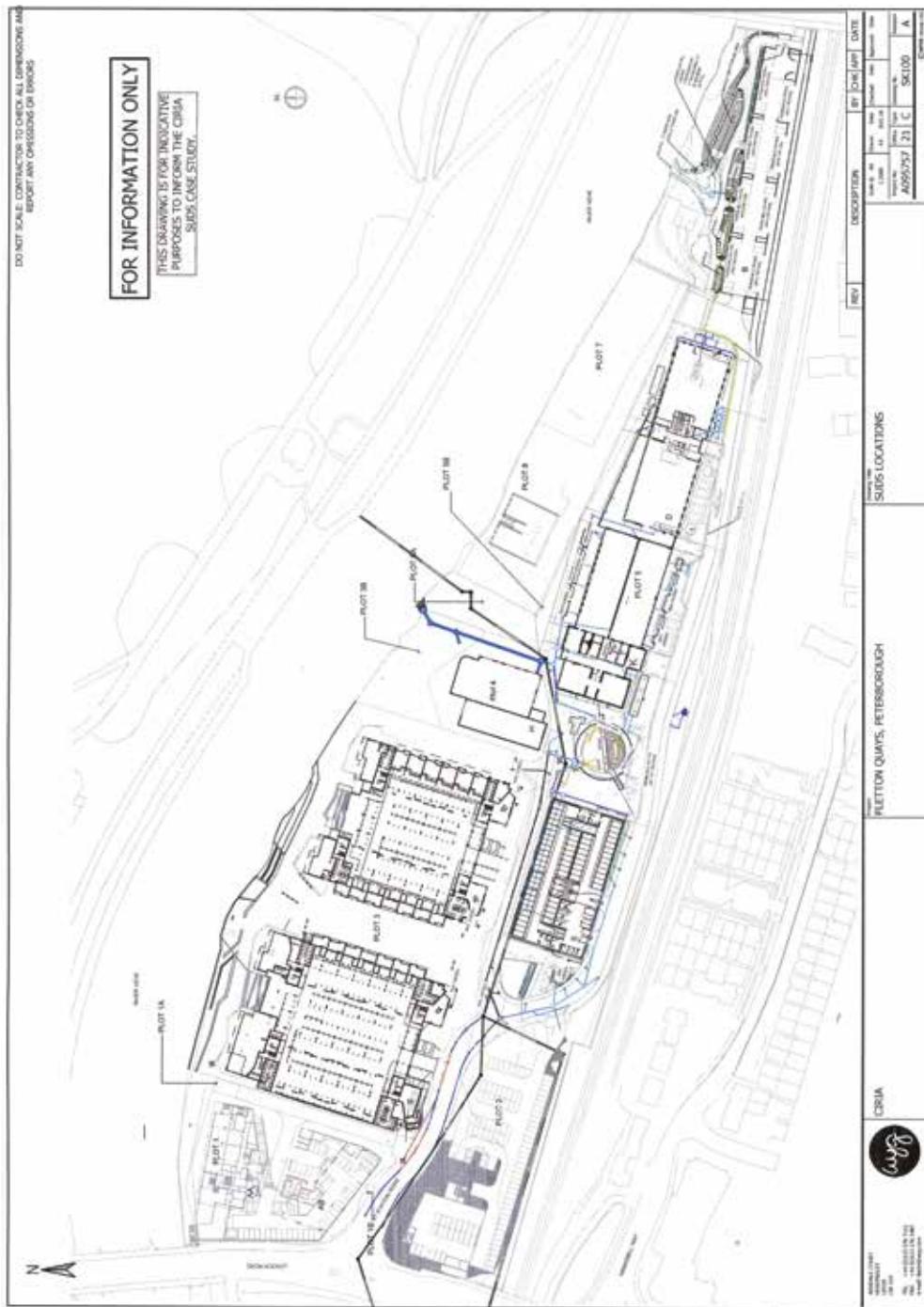
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Landscaping at Nine Elms

Summary

A significant former industrial site by the River Nene close to Peterborough city centre is being redeveloped to provide housing and other uses (PIP, 2015). The IWM strategy for the whole site co-ordinates the separate surface water management systems for each of the five plots. These SuDS components incorporate high-quality open spaces, which also mitigate diffuse pollution and the effects of climate change.



SuDS train for Plot 5

CSFs involved and outcomes delivered

CSFs									
Outcomes									

The opportunity/challenge

To redevelop a large brownfield site to meet the requirements of Peterborough City Council's planning policy on water management, heritage, contaminated land, and biodiversity.



Permeable pavement

Description

The Fletton Quays development comprises 6.4 hectares of prime river front development land located to the south of the city centre between the River Nene and the Peterborough to March railway line. The site comprises derelict land and vacant buildings.

The development involves the remediation of a former industrial site and the construction of new residential and commercial spaces. It incorporates a SuDS scheme designed in from the start in consultation with the LLFA and LPA, and Peterborough City Council. The scheme includes permeable pavements, rain gardens, dry swales and a regional soakaway.

Outline planning permission for the proposed development was granted in 2015 (Peterborough City Council, 2015). Following the outline permission, the site has been split into several plots, which have been subject to detailed applications for the following developments:

- ◆ Plot 1: hotel and residential (17/01766/FUL)
- ◆ Plot 3: residential (16/02385/FUL)
- ◆ Plot 4: commercial uses (16/00653/LBC)
- ◆ Plot 5: residential and multi-storey car park (16/01314/REM).

So that the development can proceed in phases whilst delivering the site-wide IWM strategy, each plot has been provided with its own individual surface water system. It was agreed with PCC that runoff from each plot would go through a SuDS management train before being discharged to the river. Due to the nature of the River Nene, a ‘rapid release’ system was agreed with Peterborough City Council (PCC) as LLFA and the Environment Agency. Surface water runoff from each plot is discharged to the River Nene at unrestricted rates.

The provision of the SuDS management train has been feasible as the Council agreed to adopt the drainage system. Rain gardens, permeable pavements and swales have been introduced in the plots' drainage systems to satisfy the requirements of the Council's policy. These SuDS components provide treatment to surface water runoff from the access road and the pedestrian areas and biodiversity/ landscaping benefits.



Rain garden

Outcomes

The £120M regeneration of Fletton Quays will deliver much needed homes, offices, leisure facilities and public space in the centre of Peterborough. It will include:

- ◆ over 350 high-quality riverside apartments
- ◆ cycle and pedestrian links along the south bank
- ◆ new public spaces offering views across the river towards the cathedral
- ◆ a dedicated wildlife area
- ◆ the refurbishment of the listed rail sheds
- ◆ a public ‘urban beach’ riverside park
- ◆ up to 160 bed hotel – with Hilton putting in planning permission for a Hilton Garden Inn brand
- ◆ restaurant, leisure and retail opportunities
- ◆ creation of hundreds of jobs during and post construction

The site's previous uses comprised different industrial activities, and surface water was discharged directly to the River Nene. The provision of a SuDS management train ensures that the water discharged into the Nene is now clean. Also, the introduction of swales and rain gardens provides small environmental and biodiversity benefits.

How this relates to planning policy

As LLFA and LPA, Peterborough City Council promotes and requires sustainable development. Peterborough's local plan development plan document contains the following policies:

- ◆ PP16 *Landscaping and biodiversity*
- ◆ PP17 *Heritage assets*
- ◆ PP20 *Development on land affected by contamination.*

The core strategy contains the following policies:

- ◆ CS17 *Historic environment*
- ◆ CS21 *Biodiversity and geological conservation*
- ◆ CS22 *Flood risk.*

The draft local plan policies:

- ◆ LP22 *GI network*
- ◆ LP24 *Nene Valley*
- ◆ LP32 *Flood and water management support IWM.*

See [Part C Case study LP4](#).

Partners

Fletton Quays is a collaboration between Peterborough Investment Partnership, Peterborough City Council, WYG, ELG Planning and ArchialNorr.

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Summary

A major housing development in Croydon provided the opportunity to de-culvert the River Wandle and improve the surface water environment, and restore a popular public open space. This increased biodiversity, reduced flood risk and improved public amenity and quality of life while providing over 900 high-quality homes with a riverside setting.



Gasworks site and Wandle Park before restoration



Aerial view of Wandle Park and New South Quarter development

CSFs involved and outcomes delivered

CSFs								
Outcomes								

The opportunity/challenge

The old gas works site in Croydon was available for regeneration. The River Wandle flowed beneath it in a culvert. Next to the gas works, on the other side of the railway line, is Wandle Park, which was a popular Victorian park centred on the River Wandle and a boating lake. However as the 19th century progressed the river became so polluted that the river was culverted for all its length through Croydon, causing local flooding when it overflowed. The park fell into decline, but was supported by a vociferous local community group. The River Wandle was cleaned up, but there were no funds to daylight the river and restore the park.

Description

Barratt Developments acquired the large derelict gasworks site over the railway line from Wandle Park, with the intention to build over 900 homes. Working with the London Borough of Croydon and local community groups, it was realised that by de-culverting the river through their site and through Wandle



Daylighted and re-naturalised River Wandle in the restored Wandle Park

Park, and contributing to the restoration of the park, the value of this local amenity could be increased. Barratt Developments provided £1M towards the restoration of the park. A further £2.8M was provided by other sources. The daylighted and restored River Wandle influenced the design of the development, particularly the landscaping around the river, which manages runoff and reduces flood risk as well as increasing the ecological value of the river corridor.

Outcomes

The restoration of Wandle Park reinstated the River Wandle through the park, with wetland areas that also provide flood storage, and natural banks and waterside planting to increase biodiversity and amenity. Other improvements to the park included a bandstand, children's playground, formal gardens, a pond and a pavilion as well as retaining the existing skate park.



CGI of New South Quarter with daylighted River Wandle



Completed New South Quarter with daylighted River Wandle

The River Wandle was de-culverted through the New South Quarter development, linking it to the park. The New South Quarter development has delivered 923 new homes, many of which have river views, as well as on-site facilities such as commercial units and a nursery. Surface water runoff rates have been lowered to the levels of a greenfield site. A new pedestrian bridge has been built on the site to improve access and provide views along the river corridor. The works to the river open up walking and cycling links between the main road, Purley Way, and Wandle Park via Wandle Park tramlink station.

How this relates to planning policy

Benefits of the scheme have been realised through the conditions associated with the granting of permission, which were developed because of a partnership approach between the housebuilder (Barratt Developments), the LPA (London Borough of Croydon) and the Environment Agency. Following challenges and ideas generated by the scheme Croydon Council developed policies for IWM (a 'reverse' golden thread).

See [Part C Case study LP5](#).

Partners

New South Quarter and the Wandle Park restoration is a collaboration between Barratt Developments, the London Borough of Croydon, the Friends of Wandle Park and the Environment Agency.

References

The River Restoration Centre:

https://www.therrc.co.uk/sites/default/files/files/Conference/2015/Outputs/presentations/6.1.3_ian_dennis.pdf

Restoring Europe's Rivers: https://restorerivers.eu/wiki/index.php?title=Case_study%3ARestoration_of_Wandle_Park

Summary

The North West Cambridge development is 150 hectares and led by the client's vision for sustainable construction, with a comprehensive IWM system reducing off-site flows to below greenfield runoff rates (Eddington Cambridge, 2011). It includes the largest water recycling system in the country, capturing up to 45 per cent of rainwater to reduce potable water demand.



The site

CSFs involved and outcomes delivered

CSFs									
Outcomes									

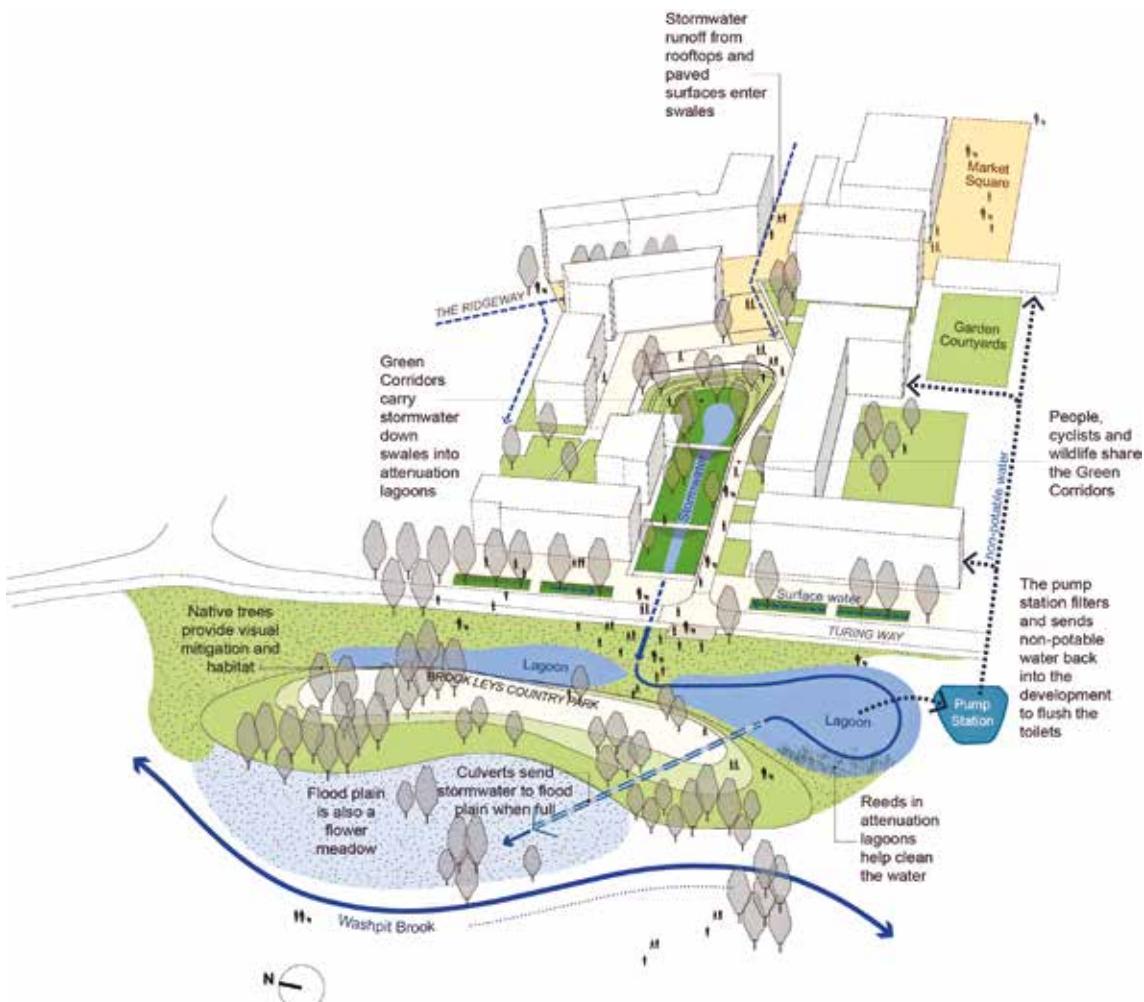
The opportunity/challenge

Cambridge is located within an area of water stress (East Anglia has the lowest rainfall in the country and is described officially as semi-arid) and is also at high risk of surface water flooding. The local communities downstream regularly suffered flooding from two different brooks so there was no capacity within existing watercourses to accommodate additional surface water from new development. Cambridge planning policy requires sustainable drainage and sets stringent standards for water use.

Description

North West Cambridge is a development of 3000 homes and 100 000 m² of other uses (laboratories, offices, retail etc) managed by the University of Cambridge. The surface water drainage strategy for the site (Aecom, 2013 and North West Cambridge, 2013) was integrated into the design at the start, and taking a Water Sensitive Urban Design (WSUD) approach to enable opportunities to reduce flood risk and enable water harvesting and reuse to be maximised. The scheme incorporates the following:

- ◆ The new houses are being built to Level 5/6 of the *Code for Sustainable Homes* (DCLG, 2006). The Code requires water consumption to be no more than 80 litres per person per day, as set out in the North West Cambridge area action plan (policies NW24, NW25 and NW27), and incorporates two sources of water:
 - a potable water supply used for drinking, preparing food, washing and bathing from the water company's mains supply
 - a recycled (non-potable) water supply used for washing clothes, flushing the toilet and watering the garden.
- ◆ A site-wide IWM system across the development is landscaped to enable water recycling and manage flood risk.
- ◆ A hard and soft landscaping environment (swales, blue and brown roofs and green corridors) manages the water through the development site into man-made lagoons (which hold six million litres of water for Phase 1 of the development alone). If the capacity of the lagoons is exceeded flow is absorbed on large purpose-designed floodplains.
- ◆ The IWM system is designed to ensure that the flow and volume of water that is discharged into Washpit Brook does not exceed greenfield runoff rates for events up to and including a one in 100-year storm (with an additional 30 per cent allowance for climate change).



The IWM system for the site



A strategic swale with crossings, part of the water management train



Lagoon and pumping station

- ◆ Rainwater stored in the specially designed ‘green landscape’ areas is treated by reed bed filters and ultraviolet light and chlorinated before it is pumped back into the homes for non-potable water uses.
- ◆ North West Cambridge will be the largest rainwater harvesting system in the country, and will be operated and maintained by Cambridge Water.
- ◆ The SuDS will be managed by the University of Cambridge.

Outcomes

The IWM system will capture 25 to 45 per cent of rainwater for recycling. Properties on the North West Cambridge development will be among the most water efficient in the UK. The non-potable water recycling scheme will cut water consumption to 80 litres per person per day (compared to the Cambridge average of 150 litres per person per day). The rainwater harvesting system will reduce daily consumption of potable water across the site by over 45 per cent, through rainwater recycling and water efficiency. When the development reaches full capacity, this will represent a daily saving of about 595 000 litres (the equivalent of 8500 baths of water) and enable a discount on customer bills by charging different tariffs for potable and non-potable sources.

The scheme was the most cost-effective solution to meeting the potable water reductions – cost benefit analysis identified it was 40 per cent cheaper with plot based options (which also considered black water, grey water, and plot based rainwater harvesting).

The development reduces the risk of downstream flooding in the neighbouring communities, and cleaner discharged water also reduced the risk of contaminating sensitive watercourses.

How this relates to planning policy

Cambridge City Council has a strong, evidenced-based policy that demonstrated the need to address scarcity, along with strong policy on the use of SuDS. The North West Cambridge area action plan set policy requirements for the site including policy related to the use of SuDS and a policy requiring all the homes (3000) to meet Level 5 of the Code (DCLG, 2006), which includes a requirement for water consumption of no more than 80 litres per person per day.

- ◆ NW24 Code 5 requirement
- ◆ NW25 Surface water drainage
- ◆ NW27 Management and maintenance of surface water drainage

See Part C Case study LP1.

Partners

North West Cambridge is a close collaboration between Cambridge University and AECOM (responsible for the masterplan) and the Innovate UK project that helped build the business case for the non-potable network. Other partners were Anglian Water and a collaboration of contractors including Skanska, BAM, Farrans, Graham, RG Carter, Wates and Willmott Dixon.



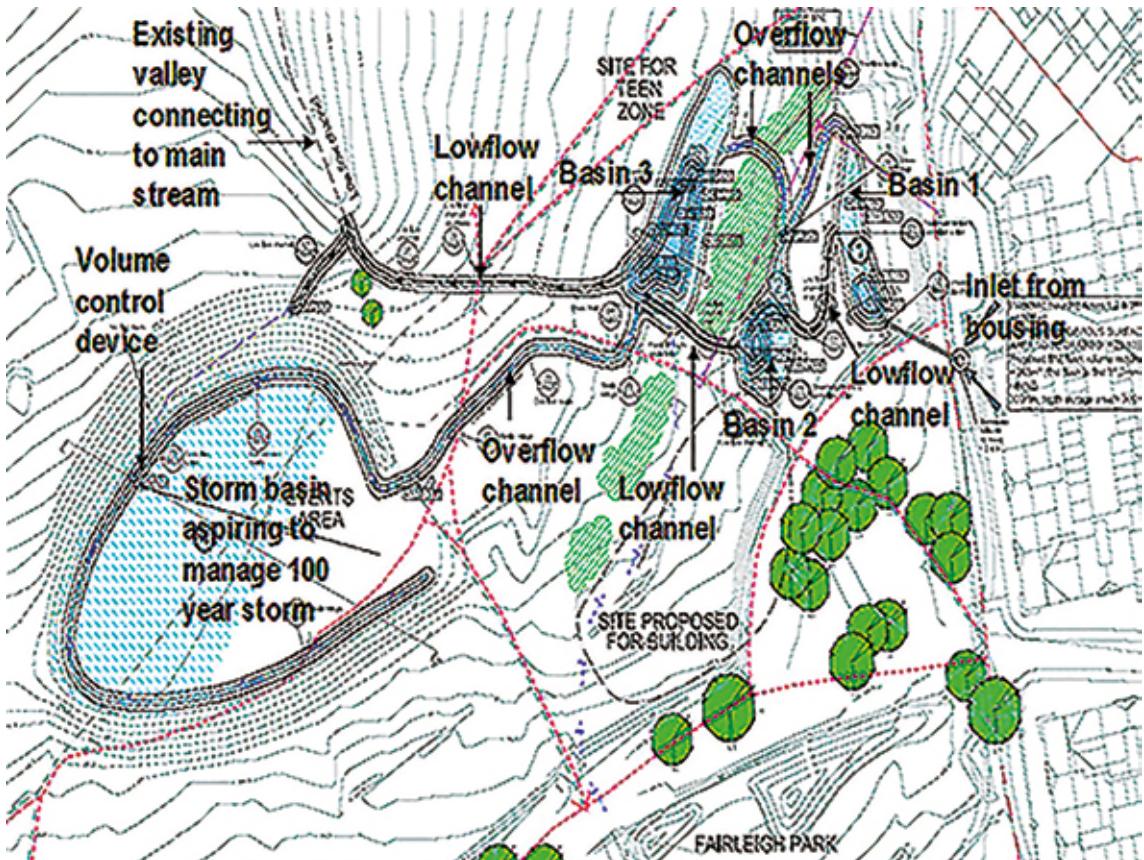
A minor swale with crossings, part of the water management train

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http://www.nwcambridge.co.uk/sites/www.nwcambridge.co.uk/files/sws_condition_26_surface_water_drainage_strategy.pdf

Summary

An IWM system that regenerated a district park for the Manor and Castle area of Sheffield manages the runoff from a 300 dwelling new housing development and was considerably cheaper than conventional piped drainage (CABE, 2011).



Site plan

CSFs involved and outcomes delivered

CSFs								
Outcomes								

The opportunity/challenge

Providing affordable drainage for a large social housing development on a site that was challenging for conventional piped drainage; and regeneration of a run-down inner-city park.



During construction



Parts of the SuDS train

Description

Sheffield City Council had two problems to resolve:

- ◆ promoting the redevelopment of ex-council housing areas where there were considerable problems of viability, some aspects of which included the high costs of conventional drainage into the sewer system
- ◆ finding sufficient funding to regenerate and manage a derelict city park.

The use of SuDS built into the park to drain the nearby housing development on the Manor Fields Park site (Landscape Institute, 2016) was put forward initially by Sheffield Wildlife Trust. Subsequently the Council Parks Development team and the Green Estate company (a social enterprise formed by the Trust and Manor and Castle Development Trust) developed the scheme with Bellway Homes. By combining both projects and making a considerable saving on the drainage of the development both schemes were realised, with additional benefits.

The resultant development of the scheme design was managed by the park's team with expertise from Robert Bray Associates. Delivery was by Bellway Homes' appointed contractors.

The scheme consists of a series of basins positioned at different levels down the sloping topography of the park, each managing an increasing size of storm event and improving water quality down the system. At the end of the system there is a dry grass basin doubling as a recreational space, which is designed to manage a 1 in 100-year storm event. Discharge is below greenfield runoff rate for the area.

Management arrangements were through a commuted sum from the developer with the Council adopting. Delivery of management is through an agreement with Green Estate. See Green Estates (2016) and Nesta (2019).

Outcomes

The regeneration of this deprived area of Sheffield has replaced a lot of inadequate housing and improved the poor open space network of the area.

Combining the park restoration with draining the housing development made both schemes economically viable.

The scheme has many additional benefits:

- ◆ reclamation of land into improved landscape
- ◆ recreational/amenity space built in a challenging topography
- ◆ enhancing the wetland ecosystem
- ◆ generating finance for the management of the park
- ◆ educational opportunity, leading to ownership

- ◆ improving the profile of the park
- ◆ promoting SuDS – demonstrating that it works.

The scheme performed effectively during the June 2007 storms. The large recreational space was covered with water, but there was no increase in runoff from the site.

How this relates to planning policy

The Manor Fields Park scheme showed what was possible, and championed IWM in Sheffield and, more widely, raised its political profile and highlighting its contribution to mitigating climate change. It also pioneered arrangements for adoption. In planning in Sheffield, the scheme influenced both policy development and practice. It led to a focus on brownfield housing, development of a supplementary planning document and design guides for SuDS, a SWMP, and setting up working groups to drive/support developers through the process. There are now three other SuDS schemes in development in the Manor area using open space while improving the viability of the housing development and achieving multiple benefits.

Partners

Manor Fields park is a collaboration between Sheffield City Council, Sheffield Wildlife Trust, The Green Estate company, Manor and Castle Development Trust, Yorkshire Water, Robert Bray Associates, and Bellway Homes.

References

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- Manor Fields Park facebook community: <https://en-gb.facebook.com/manorfelldspark>
- Manor Fields Park scheme: <https://www.manorfelldspark.org>
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<https://www.nesta.org.uk/project/rethinking-parks/manor-fields-park-and-green-estate-sheffield>

Summary

The Mount Oswald development is located on the outskirts of Durham and is a large mixed-use development, promoted by the Banks Group (2019). The drainage strategy was established and agreed at the start of the project. This facilitated flexibility in the detailed design and build of the development while delivering a cost-effective sustainable drainage regime that manages water on site. This means that discharges to the River Wear are lower, have a more even flow rate and are cleaner than pre-development.



Site plan

CSFs involved and outcomes delivered



The opportunity/challenge

Creating an IWM system on a large site with varied topography and some challenging ground conditions, in an area with no established SuDS policy, and setting up an appropriate management regime.

Description

The Mount Oswald development site is located on the outskirts of Durham city and comprises 2000 bed space student accommodation, 297 residential properties, retail, office and a listed building conversion in a low density parkland setting covering some 100 acres in total.

The site, a former golf course, has a varied topography that is part natural and part man-made. It has fairly typical ground conditions for the area consisting of significant thickness of stiff boulder clay at shallow depth, underlain by sandstone and middle coal measures. No formal drainage infrastructure was present on the site, but there was an extensive land drainage network associated with the former use. A listed manor house is located centrally within the site surrounded by significant swathes of protected trees. The development was proposed at the same time the Flood and Water Management Act 2010 was introduced, with outline planning permission received in early 2012.

The site has two distinct catchment areas separated by a natural ridgeline running east to west through the centre of the site. The southern part of the site, including the manor house, is more natural in form with an existing watercourse discharging to a tributary of the River Wear. The northern part of the site has a more uniform topography. All surface water flows from the northern area discharge into another tributary of the River Wear.

Development of the surface water scheme proposals started in the southern area, with early and extensive consultation with Durham County Council (LLFA), the Banks Group agreed on the need for a strategic SuDS. The chosen solution was to use an existing low-lying area, next to the watercourse, to create a shallow basin, attenuating flows and offering a level of pre-treatment.



Southern SuDS

Following closely behind the introduction of the Flood and Water Management Act 2010 and with the lack of an established SuDS policy (at the time), adoption mechanisms and design standards, a 'collaborative working' approach was fostered between the Banks Group and the LLFA with the southern SuDS component acting as test case to help establish acceptable baseline parameters. This collaborative approach allowed a sensible cost recovery mechanism to be developed based on a strict management regime which was acceptable to both parties. An area contribution calculation was used based on the annual maintenance charge split pro rata per m² of contributing development area. Once the precise development layout was fixed (through a detailed planning permission), the overall area apportionment

was further sub-divided based on the curtilage area of each property (ie larger properties paid proportionally more than small ones). This mechanism allowed for further flexibility of proposed use and scale within the development parcels.

The southern SuDS component was the first formal developer led SuDS scheme to be delivered on a development site in Durham. It was constructed in early 2014 and has been in operation since.

The northern part of the site extended further the collaborative working with a different approach to surface water management. The Banks Group and the LLFA agreed to create a linear park SuDS feature comprising shallow basins, swales, filter strips and interconnecting piped sections woven throughout a proposed parkland area between two development parcels. This approach allowed design standards and management arrangements to be further tested and refined.

Due to site levels, only the development on the western side of the linear park contributes flows to the SuDS and so will pay an annual contribution to its upkeep. Given the extensive landscaping within the site and the need to sensitively manage areas associated with the grounds of the listed manor house, a formal management company was established, into which all on-site occupiers would contribute. This approach was supported by the Council as well as the drainage authority, Northumbrian Water.

The linear park SuDS was constructed in the spring of 2017 with surface water flows entering the facility during early 2018.

Outcomes

Proactive and collaborative working with the LLFA allowed an aspirational development to be produced without significant delay despite a lack of established planning policy. Successful use of natural landform to deliver a cost-effective method of surface water attenuation with other benefits associated with water quality and public amenity including creation of 25 acres of public open space throughout the site.

The well-developed and IWM strategy allowed maximum flexibility both in terms of changes of proposed use and responsibility of delivery.

Understanding the aims and requirements of all parties involved facilitating an acceptable contractual structure and charging mechanism that allowed a cost-effective delivery of the development alongside the security of future high-quality management.



Southern SuDS

A sensible approach to access and safety allowed wider integration of water management techniques into the development.



Southern SuDS

How this relates to planning policy

The scheme demonstrates that even where there is no established water management policy, partnership working between the developer, LPA and LLFA from the start can deliver effective IWM, while also building capacity in the LPA and LLFA.

Partners

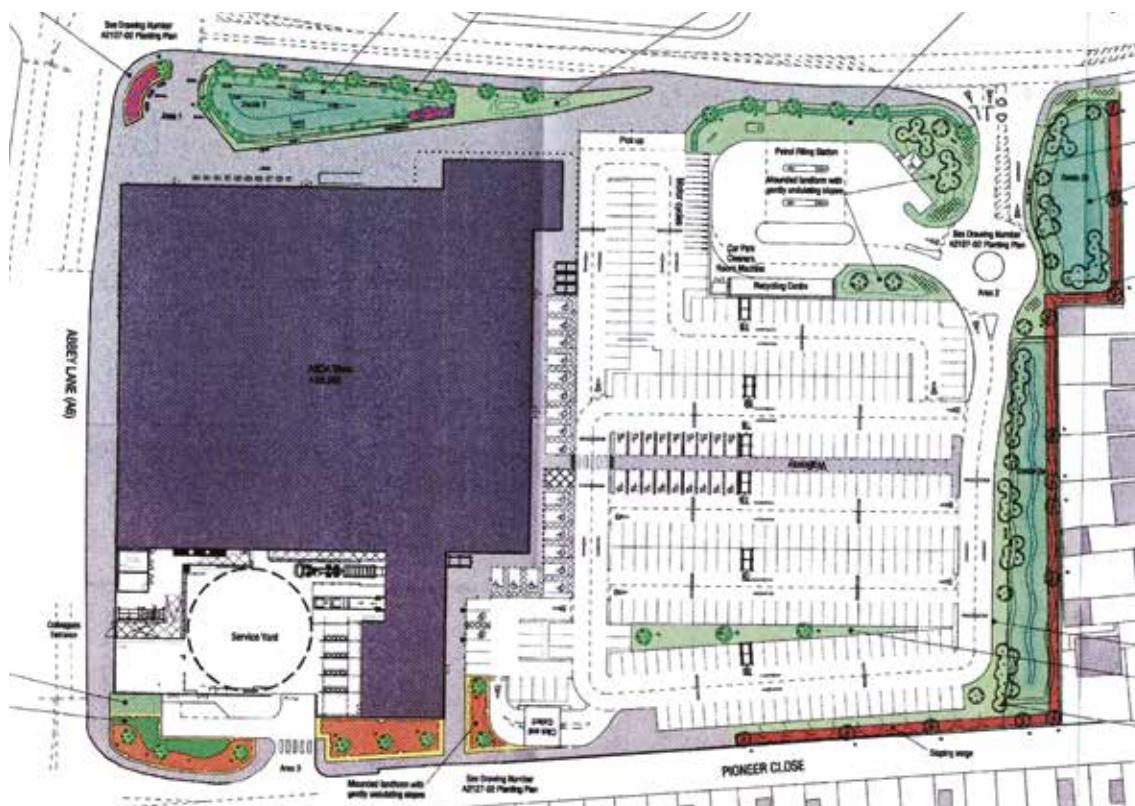
Mount Oswald is a collaboration between The Banks Group and Durham County Council (LLFA and LPA).

References

BANKS PROPERTY (2019) Mount Oswald project, Durham City, Banks Property, Durham, UK
<https://www.banksgroup.co.uk/projects/property/mount-oswald>

Summary

The Leicester Asda included SuDS within a supermarket development (External Works Index, 2019). The solution is an integrated SuDS scheme that combines proprietary and vegetative systems to achieve effective surface water management, while introducing a level of biodiversity never attained before on a retail development in Leicester.



Site plan showing swales

CSFs involved and outcomes delivered

CSFs					
Outcomes					

The opportunity/challenge

To drain and treat pollution from a large supermarket site so no surface water goes into the sewage system and discharge to the River Soar is clean.

Description

A combination of proprietary and natural systems provides three stages of treatment for surface water from a 4000 m² former brownfield site, with the new development comprising a large supermarket and car park, and petrol station.

Rainwater is managed on or near the surface, in an area that would have typically been highly impermeable. The scheme design exploits fully the drainage gradient on site so the three stage treatment process ensures that water quality is improved through filtration, biodegradation, separation and exposure to sunlight before being discharged into the river.

The SuDS scheme collects runoff from the roof of the supermarket and car park in slot drains and passes through filters comprising particulate filters installed in outlet chambers, designed to filter particulates over 0.5 mm, and polystyrene filled sacks in the gully, with adsorbent properties that remove particulates as well as chemicals and dissolved metals.

Any excess flow in extreme events runs directly off the car park over the side slopes into the swale.

The petrol filling station is drained via a conventional oil separator and to further treat the potentially high pollution load, a high performance surface water treatment plant was installed. The filtering system effectively removes the majority of sediments including smaller fractions of less than 100 µm, and also treats dissolved metals such as copper and zinc. The filtering system uses proprietary filters to remove and contain pollutants providing a point source for maintenance.

The treated water from these proprietary systems is transmitted to the swale using specially designed swale inlet units that dissipate flow energy and aerate the water.

The ‘wobbly’ swale is designed to look attractive while maximising opportunities for infiltration, evaporation and evapotranspiration through the planting regime, which also provides a visual amenity and enhanced biodiversity. Water that passes from the swale discharges into the River Soar.



Meadow flowers in the detention area and swale



Signs around the site

Outcomes

- ◆ cost effective, requiring minimal ground works and maintenance
- ◆ all surface water treated on site, with peak flow attenuation
- ◆ discharge less than greenfield runoff rate
- ◆ pollution removed, so discharge into the River Soar is clean
- ◆ increased biodiversity
- ◆ improved visual amenity and well-being
- ◆ exemplar for similar developments
- ◆ monitoring and evaluation has shown that it works
- ◆ increased public awareness of SuDS.



Swale outlet



Gully guard and filter elements

How this relates to planning policy

The scheme was driven by Leicester City Council (2019) planning policies:

- ◆ CS2 *Climate change and flood risk*
- ◆ CS17 *Biodiversity*
- ◆ CS13 *Green network; sustainable drainage*
- ◆ SPD *Green infrastructure supplementary planning document*
- ◆ SPD *Climate change*
- ◆ *Surface Water Management Plan.*

Responding to significant surface water flood risk and building on being the first environment city, helped to develop the policy approach.

See [Part C Case study LP9](#).

Partners

The supermarket IWM is a collaboration between Asda, Leicester City Council, ISG and ACO Water Management.



The swale

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LEICESTER CITY COUNCIL (2019) Adopted planning policy, Leicester City Council, UK
<https://www.leicester.gov.uk/your-council/policies-plans-and-strategies/planning-and-development/adopted-planning-policy/>

Summary

The redevelopment of a large urban brownfield site incorporates IWM that increases water efficiency, and improves the quality and reduces the volume of water discharged from the site, to improve the environment and reduce flood risk to the wider community (Peracha, 2018).

CSFs involved and outcomes delivered

CSFs									
Outcomes									

The opportunity/challenge

To redevelop a large urban brownfield site while reducing runoff, improving water quality, and increasing water efficiency.

Description

The 44 ha St Andrews Park site to the west of central London is being redeveloped into a 1500 unit mixed-use residential development with retail, business premises and leisure amenities. It includes a 16 ha urban park (Dowding Park). VSM Estates Limited is the developer of the site and is providing the strategic drainage and highway infrastructure across the site.

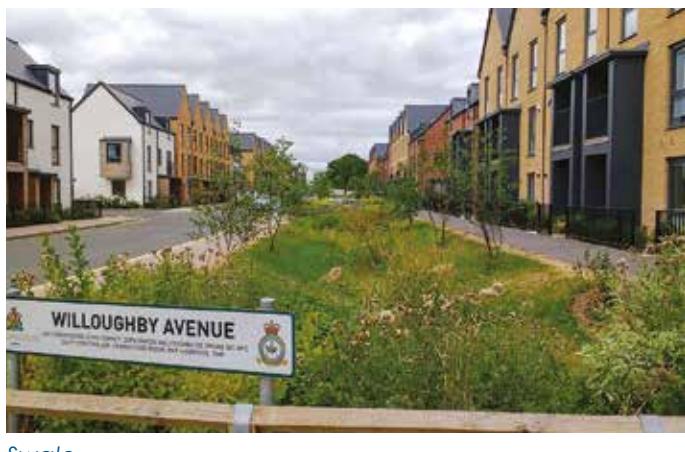
A combination of source control, site, and regional SuDS components ensures that the overall agreed discharge rate from the strategic network to the River Pinn is not exceeded.

The IWM system features a SuDS management train:

- ◆ Source control – various measures including rainwater harvesting (water butts).
- ◆ Swales located along the spine road through the site to receive surface water runoff from roads and



Permeable paving and waterbutts on the rear of each house



Swale

pavements, designed to maximise water quality treatment by ensuring water flows over vegetated surfaces as long as possible.

- ◆ Filter drains, strips and pervious pavements allow rainwater runoff to infiltrate and provide storage if needed. The water is temporarily stored before infiltration into the ground or discharge to a watercourse or other drainage system. Pervious paving combined with perforated carrier pipes and positive storage facilities (eg geocellular storage) provide at least three levels of filtration treatment.
- ◆ Retention basins hold excess water and allow controlled discharge to minimise flood risk. They will normally be dry and only hold 'open' water for short periods during and following rainfall events but they will incorporate ephemeral wetland features to enhance appearance, encourage biodiversity and provide a level of final treatment before water is discharged to the River Pinn.

Long-term management is through a private management company, operating in accordance with the SuDS management and maintenance plan developed for the site.

Residential development on the site is being built to achieve BREEAM 'very good' standards for water efficiency (105 litres per person per day).



Retention basin in Dowding Park

Outcomes

- ◆ An improved environment for residents alongside the main spine road.
- ◆ New quality public green/blue space.
- ◆ Improved biodiversity.
- ◆ Reduction in flood risk: a reduction in runoff rate from free discharge to greenfield runoff rate of 12.27 l/s/ha as required in the flood risk appraisal.
- ◆ Reduced demand on the public water supply.

How this relates to planning policy

The scheme was developed to meet the requirements of the London Borough of Hillingdon planning policy, specifically:

- ◆ Local plan part 1 (2012)
- ◆ Uxbridge SPD

Specific local plan policies are:

- ◆ Policy EM6: *Flood risk management: flood risk management.*

- Sustainable drainage
- ◆ Policy EM7: Biodiversity and geological conservation: Green infrastructure
- ◆ Policy EM8: Land, water, air and noise: water efficiency

See **Part C Case study LP10**.

Partners

St Andrews Park is a collaboration between VSM Estates Limited, the London Borough of Hillingdon, and Atkins and Allen Pyke.



Swale

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<https://www.mylondon.news/news/west-london-news/st-andrews-park-largest-new-14402959>

Summary

This scheme involves a large (2.13 ha) development of eight tower blocks (two commercial and six residential) on a dense inner-London brownfield site with drainage issues (Akturan, 2018). The development incorporates the largest non-potable water system in London.



Site plan

CSFs involved and outcomes delivered

CSFs									
Outcomes									

The opportunity/challenge

To reduce the water footprint of a large commercial and residential development in a constrained urban space, where water supply and wastewater disposal infrastructure is critically overloaded.

Description

The masterplan by Squire and Partners creates new connections through the site which visually and physically link the River Thames to Waterloo Station (Buildington, 2019 and Braeburn Estates, 2019). A mix of offices, private and affordable homes and retail space will link to new public open spaces, with the existing 1960s Shell Centre Tower at its heart. Construction began in April 2016 and is expected to be complete in 2019.

The development incorporates cutting-edge technologies including:

- ◆ greywater recycling
- ◆ rainwater harvesting
- ◆ cooling tower bleed-off recycling
- ◆ low flow devices
- ◆ a highly-efficient energy centre and district heating system that will recycle heat which would otherwise be lost.

Rainwater is being collected in five combined rainwater harvesting/attenuation tanks. This water is used in three sets of cooling towers on three buildings (part of the district heating/cooling system).

The greywater recycling comprises six interconnected systems (two in commercial towers and four in residential towers). The total capacity is about 100 m³/d.

Residential buildings produce excess greywater, but offices do not produce enough. To allow for this and maximise the water efficiency, the greywater recycling systems in the residential buildings are larger to treat the excess greywater. The excess water is transferred on demand to the commercial buildings when they run out of treated greywater. This way the available non-potable water collected is used in the most efficient way across the whole development.



Aerial view



Public space with planting and water features

Outcomes

The greywater systems have a total capacity of >100 m³/d saving ~33 000 m³ of mains water per year and also reducing the input to the sewer system by the same amount.

The rainwater harvesting system will potentially save about 7000 m³ of mains water per year, at the same time preventing this volume of water entering the combined sewer.

The energy centre and district heating system will use recycled rainwater for cooling. Heat is retained in the main fresh air handling units.

Public realm and connectivity improvements improve urban amenity and community well-being.

How this relates to planning policy

The development of strategically important schemes like Southbank Place is guided by the London Plan's policies (GLA, 2016) such as:

- ◆ D2 Delivering good design
- ◆ D7 Public realm
- ◆ G1 Green infrastructure and natural environment
- ◆ G5 Urban greening
- ◆ SI5 Water infrastructure
- ◆ SI12 Flooding
- ◆ SI13 Sustainable drainage.

Partners

Southbank Place is being developed by Braeburn Estates, a joint venture between Canary Wharf Group plc and Qatari Diar Real Estate Investment Company.

References

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GLA (2016) *London Plan*, Greater London Authority, London, UK
<https://www.london.gov.uk/what-we-do/planning/london-plan>

Summary

A very large former industrial inner urban site is being transformed into a liveable new business district focused on ecology and high-quality open spaces providing multiple benefits (Environment Agency, 1996 and 2017).





An impression of the completed development at Greenwich Peninsula

CSFs involved and outcomes delivered

CSFs									
Outcomes									

The challenge

To redevelop a heavily-contaminated post-industrial site surrounded on three sides by the River Thames, with poor and failing tidal flood defences.

Description

- ◆ Before 2000, to make the area safe for redevelopment, 1.7 km of flood defences were replaced and refurbished on the eastern side of the Greenwich Peninsula (Biodiversity by Design, 2019). A further 700 m is proposed on the western frontage.
- ◆ Greenwich Peninsula is a 190-acre development site and is London's largest regeneration scheme.
- ◆ The mixed-use development consists of 15 000 new homes, 3.5 million square feet of office space – a new business district for London, with over 150 shops and restaurants, and the O2 Arena (Popper, 2009).
- ◆ The site is being developed in phases/plots with final completion in 20 years, in-line with the overall masterplan (WSP, 2015).
- ◆ The ecologically-led masterplan combines high density housing for people with high levels of biodiversity.
- ◆ Linked green infrastructure provides water management, biodiversity, climate change mitigation and well-being benefits.
- ◆ The flood defences incorporate foreshore terraces providing a range of habitats.
- ◆ The site includes the award-winning Greenwich Peninsula Ecology Park.
- ◆ Buildings are water efficient. The first to be completed, 4 Pier Walk, is rated BREEAM 'excellent' for its energy efficiency, water and waste management. It uses rainwater harvesting for flushing toilets and irrigation.
- ◆ The SuDS train includes extensive green roofs, greenspace, roadside SuDS and tree pits for surface water control and attenuation. The central park area and the ecology centre pond provide additional storage in extreme events.



The tidal terrace looking downstream



The tidal terrace looking upstream

Outcomes

- ◆ The intertidal terraces provide valuable habitat for fish and other animals and birds, as well as creating a new landscape feature for people to enjoy.
- ◆ Flood defences designed to protect from tidal flooding with an allowance made for the future effects of climate change.
- ◆ Surface water flood risk reduction on each plot is being provided in line with the London Plan policies using a SuDS train that also provides green infrastructure and enhances biodiversity.
- ◆ The IWM/Green infrastructure components are cost-neutral.
- ◆ Many of the features incorporated at this site are being adopted as good practice by other developers across London.
- ◆ The site is considered to be a European exemplar of eco-urbanism.
- ◆ Water efficiency measures meet the Royal Borough of Greenwich local plan policy requirement limiting water use to 110 l/d pp.

How this relates to planning policy

The masterplan for the Greenwich Peninsula has evolved in parallel with the London Plan and RBG's local plan. The site is identified in the adopted RBG core strategy (2014) and London Plan (2011–2013) as an opportunity area. The masterplan has evolved since originally consented in 2004 to the current 2015 masterplan in response to emerging design and environmental considerations and feedback from meetings and public consultation events. This has been achieved through partnership working. The development of strategically important schemes like Greenwich Peninsula is guided by the London Plan's policies such as:

- ◆ D2 Delivering good design
- ◆ D7 Public realm
- ◆ G1 Green infrastructure and natural environment
- ◆ G5 Urban greening
- ◆ SI5 Water infrastructure
- ◆ SI12 Flooding
- ◆ SI13 Sustainable drainage
- ◆ SI14 Waterways.



Green roofs



Rain garden with inflow slots



Tree pit and permeable paving



Tree pit showing inflow slots

Partners

Greenwich Peninsula is a collaboration between Greenwich Peninsula Regeneration Ltd, the Royal Borough of Greenwich, the Greater London Authority and the Environment Agency. Other partners include The Port of London Authority, Transport for London, Thames Water, English Heritage, and the Greater London Archaeological Advisory Service.

References

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Part C

Examples of good local policy

Part A
Main guide

Part B
Physical case
studies

Part C
Local case studies

Part D
National policy
review

Part E
Characteristics
of local policy

Introduction

The examples in this part of the *Delivering better water management through the planning system* guidance show good local policy, and illustrate the critical success factors (CSFs) given in **Part A Section 3**. Each case study sets out the integrated water management (IWM) outcomes it delivers and which CSFs were instrumental in its implementation. The case studies are listed in **Table 1**, while the key to the codes for the CSFs and outcomes is given in **Table 2**.

Table 1 Examples of good local policy

LP1	Cambridge local plan policy
LP2	London Borough of Lewisham local plan policy
LP3	London Plan policy
LP4	Peterborough local plan policy
LP5	London Borough of Croydon local plan policy
LP6	North Northamptonshire Joint Planning Unit local plan policies
LP7	Warwick local plan policy
LP8	South Downs local plan policy
LP9	Leicester local plan policy
LP10	London Borough of Hillingdon local plan policy
LP11	Brighton and Hove local plan policy
LP12	Ashford local plan policies and IWM strategy
LP13	Hull local plan policy
LP14	Arun emerging local plan policy
LP15	St Helens local plan policy

The final section identifies other plans and policies that exhibit elements of IWM, but where it has not been possible to identify CSFs.

Table 2 Key for CSFs and outcomes

Code	Details	Icons
CSFs		
A	Understanding IWM	
B	Enabling local policy	
C	Early engagement	
D	Partnerships	
E	Good management	
Outcomes		
1	Reduced risk from flooding	
2	Increased water efficiency and reduced water stress	
3	Clean and good quality water environment	
4	Enabling new housing	
5	Facilitating economic growth and regeneration	
6	Enhanced biodiversity	
7	Better blue-green infrastructure	
8	More accessible public spaces and places, and improving well-being	
9	Mitigating and adapting to climate change	
10	Using resources more sustainably and effectively	

Part A
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Golden thread link to physical case studies
■ P1 Clay Farm
■ P6 North West Cambridge

Policies/plans

Adopted Cambridge Local Plan (Cambridge City Council, 2018):

- ♦ Policy 31 *IWM and the water cycle.*

Summary

The policy seeks to ensure that all new development in Cambridge takes a Water Sensitive Urban Design approach to surface water drainage.

Challenges/opportunities

The policy was developed in response to evidence in the city's surface water management plan and strategic flood risk assessment that showed that there is no capacity in Cambridge's watercourses to cope with additional surface water runoff from new development. As such, it is vital that all new developments use SuDS to manage surface water.

CSFs involved and outcomes delivered

CSFs						
Outcomes						

Outcomes

- 1 **Reduced risk from flooding.** There is little or no spare capacity in Cambridge's rivers so surface water runoff needs to be adequately managed so that flood risk is not increased elsewhere. The policy aims to implement good practice in SuDS.
- 2 **Increased water efficiency and reduced water stress.** The policy encourages the storage and use of rainwater to help counter water stress.
- 3 **Clean and good quality water environment.** The policy aims to help achieve Water Framework Directive 'good' status and to ensure all surface water that is discharged to ground or into rivers, watercourses and sewers has an appropriate level of treatment to reduce the risk of diffuse pollution. The policy also recognises that development adjacent to a water body provides an opportunity for both the development and the water body, and that they should complement and enhance each other.
- 4 **Enabling new housing.** The policy is crucial to Cambridge's need to accommodate high density housing, as it is tightly constrained by green belt. Diagrams illustrate the way in which IWM can be achieved in new developments.
- 6 **Enhanced biodiversity.** The policy aims to enhance biodiversity by encouraging green roofs and enhancements around water bodies.
- 7 **Better blue-green infrastructure.** The policy seeks multifunctional surface water features.

- 8 **Improved accessible public spaces and places, and well-being.** The policy seeks to ensure that new features to manage water make an active contribution to making places for people.
- 9 **Mitigating and adapting to climate change.** The policy aims both to control the risk of increased flooding and also to store water to counter greater water stress due to climate change.

CSFs

- A **Understanding IWM.** The technical expertise available was crucial in the development of a policy that would support new development in an area at risk of surface water flooding. The policy ensures that the approach to drainage was integrated into the overall design of new developments to maximise benefits. The available expertise also helped being able to robustly defend the policy against objections raised during consultation on the local plan.
- D **Partnerships.** Good links were in place between LPA, LLFAs and water companies). In general, there was a high degree of support for the policy, particularly from partners such as the LLFA, Environment Agency and the local community.
- E **Good management.** A council's sustainable drainage engineer working in collaboration with the planning policy team.

Further information

Policy 31 is also supported by additional guidance that is contained in the Cambridgeshire flood and water supplementary planning document (Cambridge City Council, 2016).

References

CAMBRIDGE CITY COUNCIL (2016) *Cambridgeshire flood and water supplementary planning document*, Cambridge City Council, Cambridge, UK
<https://www.cambridge.gov.uk/media/7107/cambridgeshire-flood-and-water-spd.pdf>

CAMBRIDGE CITY COUNCIL (2018) *Local plan*, Cambridge City Council, Cambridge, UK
<https://www.cambridge.gov.uk/local-plan-2018>

Golden thread link to physical case studies

- P2 Lewisham Gateway

Policies/plans

Adopted Lewisham Core Strategy (Lewisham Council, 2011a and b) and River corridors improvement plan (Lewisham Council, 2015):

- ◆ Policy 7 *Climate change and adapting to the effects*
- ◆ Policy 8 *Sustainable design and construction and energy efficiency*
- ◆ Policy 10 *Managing and reducing the risk of flooding*
- ◆ Policy 11 *River and waterways network*

Summary

The policies seek to contribute to the Borough adapting to existing flood risk, future climate change and to improve local green infrastructure.

Challenges/opportunities

The policies were developed in response to the risk of climate change increasing existing flood risks and a desire to improve blue-green infrastructure to help regeneration of parts of the Borough.

CSFs involved and outcomes delivered

CSFs			
Outcomes			

Outcomes

- 1 **Reduced risk from flooding.** The policies aim to manage fluvial and surface water flooding and provide guidance on flood alleviation and ecological improvements.
- 2 **Increased water efficiency and reduced water stress.** Core strategy policy 8 refers to BREEAM 'excellent' standards for minor and major non-residential developments and encourages retrofitting of sustainable design standards especially in existing housing especially estate renewals.
- 5 **Facilitating economic growth and regeneration.** The river corridor improvement plan aims to provide co-ordinated guidance for development adjacent to the London Borough of Lewisham's rivers, promoting regeneration and ensuring design is responsive to and makes the most of opportunities to enhance the river environment. It also aims to help promote social inclusion and tackle deprivation and discrimination, ensuring that the river corridor is accessible to everyone as part of the Blue Ribbon Network.
- 7 **Better blue-green infrastructure.** The policies aim to safeguard and increase the role of the river corridors in the public realm, contributing to the open space network in the Borough, and to promote opportunities for sport, leisure, education, investment and employment. One of the objectives of the river corridor improvement plan is to promote the sustainable and efficient use of

space by protecting and enhancing the multifunctional nature of the Ravensbourne, Quaggy and Pool Rivers, Deptford Creek and the River Thames.

- 8 **Improved accessible public spaces and places, and well-being.** The river corridor improvement plan promotes opportunities for walking and cycling by ensuring existing routes, such as the Waterlink Way and Route 21, are maintained and where possible enhanced, and by promoting opportunities to overcome barriers to the public rights of way network.

CSFs

- B **Enabling local policy.** Developed from the Ravensbourne river corridor improvement plan (Lewisham Council, 2010) that led to river corridors improvement plan supplementary planning document and local flood risk management strategy.
- C **Early engagement.** The Council held meetings with the Environment Agency about their likely response to the emerging local plan.
- D **Partnerships.** Good links with the Greater London Authority, neighbouring London Boroughs through the Drain London Forum and the LLFA officer helped lead to the development of Policy 10. A 'better working together' agreement with the Environment Agency helped to establish regular and ongoing liaison on planning applications and emerging local policy, including on water quality.

Further information

The policies are also supported by the River corridors improvement plan (Lewisham Council, 2015) and Development near rivers, guidance for planners (Gray, 2015).

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- LEWISHAM COUNCIL (2010) *Ravensbourne river corridor improvement plan*, London Borough of Lewisham, Lewisham, London, UK
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- LEWISHAM COUNCIL (2011a) *Core strategy. Development plan document*, London Borough of Lewisham, London, UK
<https://www.lewisham.gov.uk/myservices/planning/policy/Documents/CoreStrategyAdoptedVersion.pdf>
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<https://lewisham.gov.uk/myservices/planning/policy/ldf/core-strategy/about-our-core-strategy-for-the-local-development-framework>
- LEWISHAM COUNCIL (2015) *River corridor improvement plan*, London Borough of Lewisham, London, UK
<https://lewisham.gov.uk/myservices/planning/policy/ldf/spds/river-corridors-improvement-plan-spd>

Golden thread link to physical case studies

- P2 Lewisham Gateway
- P3 Nine Elms London South Bank
- P5 New South Quarter Wandle Park Croydon
- P10 St Andrew's Park, Uxbridge.

Policies/plans

Draft New London Plan (GLA, 2018):

- ◆ GG6 *Increasing efficiency and resilience*
- ◆ SD2 *Collaboration in the wider south east*
- ◆ D1 *London's form and characteristics*
- ◆ D2 *Delivering good design*
- ◆ D7 *Public realm*
- ◆ G1 *Green infrastructure and natural environment*
- ◆ G5 *Urban greening*
- ◆ SI5 *Water infrastructure*
- ◆ SI12 *Flooding*
- ◆ SI13 *Sustainable drainage*
- ◆ SI14 *Waterways – strategic role*

Summary

The policies are driven by a need to make London a more resilient city and better adapted to climate change. They seek to manage flood risk from a number of sources, ensure water supply, protect and enhance biodiversity, and promote water efficiency and improve water quality in the face of climate change where water and flood risk is a strategic issue for the capital. The policies seek to ensure collaboration between regulators, local authorities and water companies across boundaries. The policies promote the concept of a Blue Ribbon Network, which influences and is given in more detail in the Boroughs' local plans.

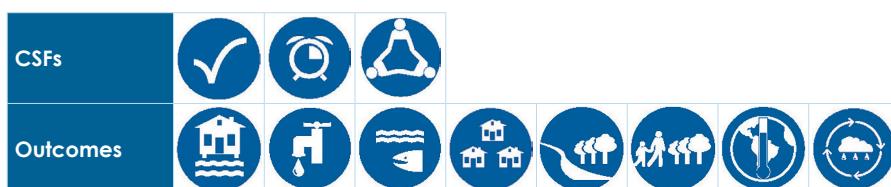
- ◆ **GG6 Increasing efficiency and resilience** is one of several 'good growth' policies. It takes an innovative approach by promoting resilience to climate change (aiming to be zero carbon by 2050), and requires development to deliver a variety of strategic and local infrastructure.
- ◆ **SD2 Collaboration in the wider south east** commits the Mayor to working with partners (Councils and other agencies and stakeholders) outside London, to help tackle climate change (including water management and flood risk) and to improve the environment.
- ◆ **D1 London's form and characteristics** sets out the key characteristics that should be delivered through the design of London's buildings and spaces in terms of their form and layout, quality and character. It requires developers to aim for high sustainability, provide spaces and buildings that maximise opportunities for urban greening, in order to create attractive resilient places that can also help the management of surface water.
- ◆ **D2 Delivering good design** requires Boroughs to consider open space networks, green infrastructure, and water bodies when considering growth potential and setting out design policies in their local plans and area-wide strategies.
- ◆ **D7 Public realm** requires green infrastructure to be included in the public realm to help rainwater management through sustainable drainage, reduce exposure to air pollution, moderate surface and air temperature, manage heat and increase biodiversity.
- ◆ **G1 Green infrastructure and natural environment** recognises the value of London's green infrastructure, requires Boroughs to protect it, and to identify opportunities to enhance its social and environmental value in plans and area-wide frameworks.

- ◆ **G5 Urban greening** is an innovative policy requiring major developments to include urban greening such as street trees, green roofs, green walls and rain gardens to help manage flood risk, boost biodiversity and improve water quality. It also sets out a methodology (urban greening factor) that should be used by Boroughs to set targets for new development.
- ◆ **SI5 Water infrastructure** combines requirements to help secure water supply including the higher optional requirement for new residential development, and the water element of BREEAM Excellent for commercial developments. It also includes measures such as smart metering, water saving and recycling measures, including retrofitting, to help to achieve lower water consumption rates and to maximise future-proofing.
- ◆ **SI12 Flood risk management** aims to minimise and manage flood risk, enable new flood risk management infrastructure and promotes natural flood risk management.
- ◆ **SI13 Sustainable drainage** includes a preference for green over grey features and specifically recognises their multifunctional benefits for water efficiency, river water quality, biodiversity, urban greening, amenity and recreation. It also includes a strong presumption against impermeable paving. The policy aims to get as close to greenfield runoff rates as possible.
- ◆ **SI14 Waterways'** strategic role requires development plans and development proposals to take account of marine spatial plans and to maximise the multifunctional benefits that waterways – the Blue Ribbon Network – can provide.

Challenges/opportunities

The policies were developed in response to London's significant housing and economic pressures, while needing to keep the city running in the face of water stress and flood risk and water infrastructure constraints (both wastewater and water supply). They seek to maximise the opportunities to work with Boroughs, agencies and bodies outside London in a strategic way, but also to set the framework for development at local level.

CSFs involved and outcomes delivered



Outcomes

- 1 **Reduced risk from flooding.** London's homes, businesses and infrastructure are especially vulnerable to surface water flooding and the Plan contains strong clearly worded policies to address this risk.
- 2 **Increased water efficiency and reduced water stress.** London is located in an area of severe water stress and the policies aim to enable its continued growth and resilience, particularly as climate change will increase these stresses.
- 3 **Clean and good quality water environment.** The urban greening, flooding and sustainable drainage policies in particular will help to improve London's heavily modified water features. The 'roll out' of the Blue Ribbon Network through the Boroughs will help this.
- 4 **Enabling new housing.** The suite of policies will help to deliver the 66 000 new homes needed every year for the next 20 years.
- 7 **Better blue-green infrastructure.** The strategic waterways policy, in particular, is helping to deliver better blue infrastructure networks in the boroughs.
- 8 **Improved accessible public spaces and places, and well-being.** The design policies D1, D2 and D7 all incorporate a strong recognition of the importance of blue-green infrastructure and the multiple benefits it brings.

- 9 **Mitigating and adapting to climate change.** Climate change will worsen London's risk from flooding, water stress and the urban heat island effect. The policies will help to increase resilience to these impacts.
- 10 **Using resources more sustainably and effectively.** The policies will help to delay the need for new strategic water infrastructure for London.

CSFs

- A **Understanding IWM.** The policies demonstrate a strong knowledge of the potential of IWM to deliver multiple benefits while recognising that IWM strategies need to reflect local opportunities and constraints.
- C **Early engagement.** The policies have been developed partly through a longstanding and persistent engagement between the Greater London Authority and partners over several iterations of the London Plan.
- D **Partnerships.** Strategic partners such as Thames Water, the Environment Agency and London Boroughs have pushed the Greater London Authority to develop and strengthen the policies as at the development scale. They will help to overcome water supply deficit and reduce, or delay the need for new strategic water infrastructure while continuing improvements in water quality. However, the Mayor is clear that there is a need for a new reservoir to serve London.

Further information

The London Plan has been the starting point for developing IWM strategies for development areas in London, eg Old Oak Common, Southwark, Nine Elms and Charlton to Crayford. See Aecom (2017) and Mayor of London (2018a).

Policies such as the London Borough of Croydon (LP7), London Borough of Hillingdon (LP10) also show the 'cascade' effect of the London Plan's strong policies.

References

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<https://www.london.gov.uk/what-we-do/planning/london-plan>
- MAYOR OF LONDON (2018a) *Draft London Plan*, Greater London Authority, London, UK
<https://www.london.gov.uk/what-we-do/planning/london-plan/new-london-plan/draft-london-plan-consultation-and-minor-suggested-changes>
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<https://www.london.gov.uk/about-us/organisations-we-work/old-oak-and-park-royal-development-corporation-opdc/get-involved-opdc/opdc-local-plan/submission-and-examination/opdc-local-plan-submission-key-documents>

Golden thread link to physical case studies

- P4 Fletton Quays

Policies/plans

Peterborough Local Plan 2019:

- ◆ LP22 Green infrastructure network
- ◆ LP24 Nene Valley
- ◆ LP32 Flood and water management
- ◆ Flood and water management supplementary planning document

Summary

The local plan and supplementary planning document seek to protect and enhance biodiversity, manage flood risk from a number of sources and promote water efficiency and improve water quality. The core strategy was adopted and the flood and water management supplementary planning document updated afterwards to reflect the revised NPPF. The policies help to deliver 10 overarching objectives, which include sustainable water, land use and wildlife.

Challenges/opportunities

The policies and supplementary planning document were developed in response to the evidence base of a water cycle study and strategic flood risk assessment. Peterborough lies just a few metres above sea level and much of the district lies below sea-level, making the area particularly vulnerable to the effects of climate change. Peterborough seeks to promote development that can adapt to climate change, protect the water environment and promotes flood risk reduction. It also seeks net gains in biodiversity. In particular, policy LP32 integrates flood risk and water quality issues in one policy.

CSFs involved and outcomes delivered



Outcomes

- 1 **Reduced risk from flooding.** LP32 seeks to manage flood risk from rivers (including tidal rivers) and surface water.
- 2 **Increased water efficiency and reduced water stress.** LP32 requires new housing development to comply with the higher Building Regulations optional standard.
- 3 **Clean and good quality water environment.** LP32 requires new development contributes positively to the water environment and its ecology where possible and to separate surface and wastewater.
- 4 **Enabling new housing.** Some high-profile mixed-use projects (including Fletton Quays) demonstrate IWM.
- 5 **Facilitating economic growth and regeneration.** Mixed use developments include employment, leisure and retail uses.

- 6 **Enhanced biodiversity.** Policies LP22 and LP24 are strong and comprehensive green infrastructure and biodiversity policies, seeking net gains in biodiversity and improvements to the green infrastructure network. More guidance is given in a green infrastructure and biodiversity SPD.
- 7 **Better blue-green infrastructure.** Policy LP22 seeks the enhancement of the green infrastructure network which includes 'blue' infrastructure, and the importance of the Nene Valley is particularly recognised in policy LP24.
- 8 **Improved accessible public spaces and places, and well-being.** The natural environment and landscape is recognised as an important part of the public realm in policy LP16.

CSFs

- A **Understanding IWM.** With the support of partners and a water cycle study, Peterborough understood the concept and opportunities for IWM.
- B **Enabling local policy.** The previous adopted local plan had enabling policies and the strong evidence base helped to justify policies in the new draft plan, which are more ambitious than national policy.
- C **Early engagement.** There was early engagement on the creation of the evidence base and the development of a shared approach.
- D **Partnerships.** The City Council is the LLFA and is responsible for co-ordinating local flood risk issues. The Council has worked with the Environment Agency, Anglian Water, a number of IDBs and local community groups to prepare a local flood risk management strategy including an action plan for managing flood risk.
- E **Good management.** A strong champion within the Council has helped to drive the policies and some key projects on the ground. Environmental infrastructure is included in the infrastructure delivery schedule of the local plan.

References

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PETERBOROUGH CITY COUNCIL (2019b) *Peterborough draft flood and water management supplementary planning document (SPD)*, Peterborough City Council, UK
https://drive.google.com/file/d/1lc_Ep4j1CxzsLfHaAg36CM50IfMYmY56/view

Golden thread link to physical case studies

- P5 New South Quarter and Wandle Park, Croydon

Policies/plans

Croydon local plan 2018 (London Borough of Croydon, 2018)

- ◆ Policy SP6:
 - Policy SP6.3 Sustainable design and construction
 - Policy SP6.4 Flooding, urban blue corridors and water management

Summary

Croydon's policies that help to deliver IWM are grouped together in the local plan. They respond to the particular local environmental challenges of the Borough within the wider context of climate change (London Borough of Croydon, 2018a and b).

Policy SP6 is a high-level policy, linked to strategic objectives of the plan. It is split into elements including:

- ◆ **Policy SP6.3.** This details requirements for major new residential development to meet the higher optional water-efficiency standard of 110 litres/person/day. It also requires the BREEAM 'very good' and 'excellent' standards to be achieved for some non-residential and residential conversion developments. The policy also requires development to improve water quality.
- ◆ **Policy SP6.4.** Requires all development to implement SuDS, protects groundwater and enhancements to urban blue corridors including landscape, amenity, heritage and biodiversity.

Challenges/opportunities

Even though it does not have many rivers or streams, Croydon has the fourth largest number of people at risk of surface flooding of any LPA in England. It also sits on the edge of the chalk North Downs and contains important groundwater source protection zones. Croydon Council has recognised the multiple benefits of enhancing its water features, ie the positive effect on amenity, biodiversity, landscape and water quality, as well as managing flood risk better. It has learnt from private and public sector-led projects that have de-culverted streams, improved river corridors and improved greenspaces and residential environments. As a result, the Council has introduced 'joined up' IWM policies in an example of a 'reverse golden thread'.

CSFs involved and outcomes delivered



Outcomes

- 1 **Reduced risk from flooding.** The policies have been developed with the LLFA, partly to overcome surface and groundwater flooding problems experience in recent history.
- 2 **Increased water efficiency and reduced water stress.** The policy requirements go beyond minimum national policy standards, in applying to converted buildings and non-residential developments.

- 3 **Clean and good quality water environment.** The policy specifically protects groundwater, and will reduce urban diffuse pollution and improve the physical attributes of surface water bodies such as ponds, lakes and streams.
- 4 **Enabling new housing.** The approach has already been designed into the development of South Quarter to improve the amenity of a new housing development.
- 6 **Enhanced biodiversity.** The policy has the potential to improve the biodiversity of several rivers and streams and other areas that are important for local biodiversity.
- 7 **Better blue-green infrastructure.** The policy integrates improvements to blue infrastructure into existing and new areas of green infrastructure, including parks.
- 8 **Improved accessible public spaces and places, and well-being.** The policy recognises and promotes the multifunctional attributes of blue-green infrastructure.
- 9 **Mitigating and adapting to climate change.** The policy helps to contribute to Croydon's adaptation strategy.
- 10 **Using resources more sustainably and effectively.** In referring to BREEAM standards, the policy goes further than national Building Regulations, recognising that many developments in Croydon are conversions and changes of use.

CSFs

- A **Understanding IWM.** Learning from successfully implemented projects that included some IWM techniques. Croydon based its policy partly on a Defra research report (Defra, 2011).
- B **Enabling local policy.** The surface water management plan influenced the development of the policy, which draws on the London Plan's requirements for sustainable design and construction (GLA, 2014).
- C **Early engagement.** The policies are partly driven by earlier work the Council did to identify urban blue corridors.
- D **Partnerships.** The Council, as LPA and LLFA, works in partnership with the Environment Agency, community groups, water and highways infrastructure providers, developers and other LLFAs. It learnt from a strategic flood risk assessment carried out with three other boroughs.

References

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Policies/plans

Adopted North Northants Joint core strategy 2011–2031 (Corby Borough Council, 2016)

- ◆ Policy 1 Presumption in favour of sustainable development
- ◆ Policy 4 Biodiversity and geodiversity
- ◆ Policy 5 Water environment, resources and flood risk management
- ◆ Policy 8 North Northamptonshire place shaping principles
- ◆ Policy 9 Sustainable buildings
- ◆ Policy 10 Provision of infrastructure
- ◆ Policy 19 Green infrastructure

Summary

The policies together seek to manage flood risk and water resources as key elements of sustainable development, and to promote green infrastructure. The North Northants Joint Planning Unit brings together Corby, East Northamptonshire, Kettering and Wellingborough.

Challenges/opportunities

The area faces particular flooding issues in the Nene Valley, which has implications for existing settlements and future development. Anglian Water, which has been actively involved in developing the policies, faces waste treatment capacity challenges.

- ◆ **Policy 1** includes a commitment to be flexible and explore alternative approaches to achieving policy outcomes when viability is an issue.
- ◆ **Policy 4** seeks net gains in biodiversity, including requiring developments to provide or contribute to alternative green infrastructure.
- ◆ **Policy 5** includes designing sustainable drainage into schemes from the start and achieving the Water Framework Directive objectives set out in the river basin management plan.
- ◆ **Policy 8** sets out design principles for new development, including requiring green infrastructure and enhancing biodiversity.
- ◆ **Policy 9** includes a requirement that helps address water stress, by requiring the 'optional' higher Building Regulations standard that all residential development should incorporate measures to limit use to no more than 105 litres/person/day, and external water use of no more than five litres/person/day.
- ◆ **Policy 10** seeks to ensure infrastructure, including green and blue infrastructure, is provided and funded through the planning system using Community Infrastructure Levy and by several agencies and service providers.
- ◆ **Policy 19** seeks to maintain and improve the green infrastructure network, including the River Nene and Ise Valleys.

CSFs involved and outcomes delivered

CSFs									
Outcomes									

Outcomes

- 1 **Reduced risk from flooding.** Including surface water and groundwater in areas that have experienced flooding before.
- 2 **Increased water efficiency and reduced water stress.** In an area defined as being at water stress.
- 3 **Clean and good quality water environment.** Driven by the river basin management plan and the requirements for detailed assessments as new developments are brought forward.
- 4 **Enabling new housing.** The focus of the local plan is promoting sustainable growth.
- 5 **Facilitating economic growth and regeneration.** The focus of the local plan is promoting sustainable growth.
- 6 **Enhanced biodiversity.** Is a major theme of Policy 1 of the plan.
- 7 **Better blue-green infrastructure.** Seeking a net gain in green (and blue) infrastructure.
- 8 **Improved accessible public spaces and places, and well-being.** One of the key factors in the Nene and Rushden Lakes proposals.
- 9 **Mitigating and adapting to climate change.** A theme of Policy 1.
- 10 **Using resources more sustainably and effectively.** The North Northants Joint Planning Unit has considered an 'allowable solutions' approach to reduce water use further.

CSFs

- A **Understanding IWM.** Showing that IWM is effective and efficient – using external consultancy help on viability assessments:
 - i identifying IWM possibilities at a very early stage, the wording of policy 5 is particularly important
 - ii breaking down institutional barriers and changing mind-sets – the Flood Risk Operational Group has been very helpful in breaking down barriers (see point C).
- B **Enabling local policy.** Clear and understandable local plan policies supporting/enabling delivery – a lot of effort was put into developing clear policies, from 2012 onwards.
- C **Early engagement.** A multi-agency Flood Risk Operational Group comprising the County Council, Anglian Water, Network Rail and other stakeholders has been instrumental.
- D **Partnerships.** Good links between LPAs, LLFAs and water companies. The local plan integrates with, and refers to, Environment Agency and Anglian Water plans. Also understanding partners' interests and aims, with the help of the Flood Risk Operational Group.
- E **Good management.** A strong champion, particularly the flood manager at the county LLFA and an Anglian Water employee. Early and clear identification of long-term management has been important and also co-ordination of budgets and funding – an external partnerships manager within the North Northants Joint Planning Unit co-ordinates funding and looks for new sources of funding.

Further information

Rushden Sustainable Urban Extension – a proposed major mixed use urban extension to the east of Rushden and Higham Ferrers:

https://www.east-northamptonshire.gov.uk/info/200153/planning_and_buildings/1791/major_planning_developments_in_the_district/2

Part A
Main guide

Part B
Physical case studies

Part C
Local case studies

Part D
National policy review

Part E
Characteristics of local policy

References

CORBY BOROUGH COUNCIL (2016) *North Northamptonshire joint core strategy 2011–2031*, Corby Borough Council, Northants, UK
http://www.nnjpu.org.uk/docs/Joint%20Core%20Strategy%202011-2031_Jan3_Main-Minor_v5.pdf

Policies/plans

Adopted Warwick District local plan 2011–2019 (Warwick District Council, 2017):

- ◆ Policy FW1 Reducing flood risk
- ◆ Policy FW2 Sustainable drainage
- ◆ Policy FW3 Water efficiency
- ◆ Policy FW4 Water supply

Summary

The policies seek to reduce flood risk, ensure that SuDS schemes are incorporated into new developments and that the right flood risk management authorities are contacted, increase water efficiency, and provide an adequate water supply for new developments.

Challenges/opportunities

Warwick has a long history of flooding from surface water flows and from many watercourses across the district. In the last 30 years, parts of the district have experienced flooding, especially in 1998, 2007 and 2012 when district-wide flooding was experienced. These events highlighted the many issues associated with development and with modern farming, including channel capacity issues, the diverting and culverting of watercourses, building within the floodplain, and removing natural woodlands and habitat areas. Climate change will increase the district's vulnerability to such events. It is important therefore to appraise, manage and reduce the risk of flooding, directing development away from areas at risk of flooding, and to encourage developments to harmonise with the natural environment and surroundings.

- ◆ **Policy FW1** seeks to reduce flood risk by ensuring that development only takes place where there is no or minimum risk for flooding and where this is unlikely to have a detrimental effect elsewhere on the system. It also requires planning applications next to watercourses to include an assessment of their impact on water body status.
- ◆ **Policy FW2** ensures that SuDS schemes are incorporated into new developments, and that the relevant authorities are contacted to gain guidance and information on how to achieve this.
- ◆ **Policy FW3** increases water efficiency by minimising the use of water at a domestic use level.
- ◆ **Policy FW4** ensures that there is an adequate water supply for new developments.

CSFs involved and outcomes delivered

CSFs						
Outcomes						

Outcomes

- 1 **Reduced risk from flooding.** Policy FW1 will help implement a multi-agency approach to reducing flood risk to 5000 homes, businesses and infrastructure, with less emphasis on raised flood defences. Policy FW2 will help reduce risk from local sources of flooding by requiring developments to reach a 'greenfield' runoff rate.
- 2 **Increased water efficiency and reduced water stress.** Policy FW3 directs new development to areas of the District where water availability is less stressed and requires a higher level of water efficiency, and is in-line with the supporting water cycle study and with Severn Trent's water resources management plan.
- 3 **Clean and good quality water environment.** Policy FW1's requirement for water quality assessments for development near to watercourses will help to achieve 'good' status for water bodies (especially where they have already been heavily modified by physical alterations) and Policy FW2 contains safeguards to prevent SuDS mobilising pollutants.
- 6 **Enhanced biodiversity.** Policy FW2 is partly aimed at improving biodiversity and local amenity and expanding habitat and green routes for biodiversity movement.
- 9 **Mitigating and adapting to climate change.** Policy FW2 ensures that future flood risk is taken into account by requiring runoff rates to be calculated using a climate change allowance.
- 10 **Using resources more sustainably and effectively.** Policy FW3 helps to direct development to areas with greater water resources available.

CSFs

- A **Understanding IWM.** Technical understanding and appreciation of what is possible and achievable – motivated by a long history of flooding.
- D **Partnerships.** Good links between LPAs and LLFAs and water companies – local plan policies that reflect the Joint Warwickshire Partnership water cycle study (2016) as well as the Severn river basin management plan and Severn Trent Water's water resources management plan. Understanding partners' interests and aims. A good relationship with the Environment Agency and inclusion of district-specific recommendations in the Severn river basin management plan.

Further information

Planning application documents:

- ◆ Land on the east side of, Warwick Road, Kenilworth: https://planningdocuments.warwickdc.gov.uk/online-applications/applicationDetails.do?activeTab=documents&keyVal=_WARWI_DCAPR_79884
- ◆ Land on the north side of Birmingham Road, Hatton: https://planningdocuments.warwickdc.gov.uk/online-applications/applicationDetails.do?activeTab=documents&keyVal=_WARWI_DCAPR_80190

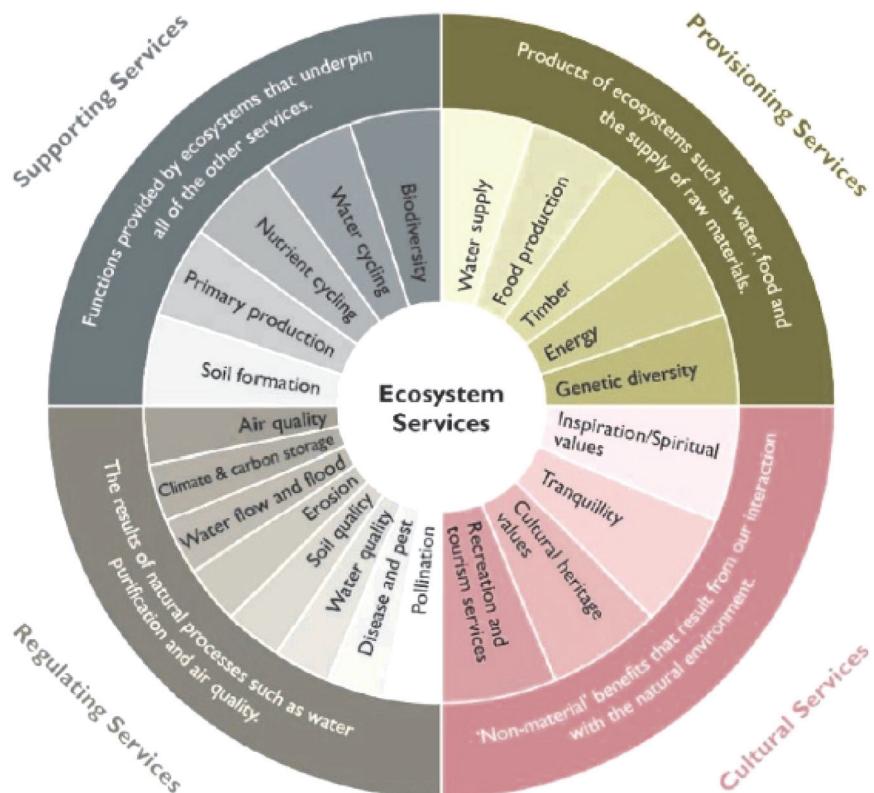
References

WARWICK DISTRICT COUNCIL (2017) *Warwick District local plan, 2011–2029*, Warwick District Council, Leamington Spa, UK
https://www.warwickdc.gov.uk/downloads/file/4623/new_local_plan

Policies/plans

South Downs local plan (South Downs National Park, 2019):

- ◆ September 2017 and Schedule of Changes April 2018
- ◆ SD2 *Ecosystem services*
- ◆ SD17 *Protection of the water environment*
- ◆ SD45 *Green infrastructure*
- ◆ SD48 *Climate change and sustainable use of resources*
- ◆ SD49 *Flood risk management*
- ◆ SD50 *Sustainable drainage systems*
- ◆ Technical advice notes on ecosystems services
- ◆ Ecosystems services background paper



Ecosystem services in the South Downs National Park

Summary

The whole plan is based on an ecosystems services approach. It has its roots in the landscape-led approach of the partnership management plan and the statutory purposes of the national park. The ecosystems services approach (shown in the figure above) is explained in a background paper and summarised in the main body of the local plan (SD2). This approach runs throughout the local plan. The plan was informed by a water cycle study. South Downs National Park have also produced

practical technical advice notes for householder and non-householder developers, about how to promote ecosystems services into their proposals. See South Downs National Park (2018a, b, c, d).

Challenges/opportunities

The policies were developed in-line with Paragraph 109 of the NPPF, that the planning system should contribute to and enhance the natural and local environment by recognising the wider benefits of ecosystem services. The approach is also in-line with the South Downs National Park's biodiversity strategy 2020 and the Government's 25 year environment plan (HM Government, 2018). However, using the ecosystems services approach as the basis of a whole local plan is an innovative approach and was considered at the examination of the local plan in November 2018. The approach emphasises how the multifunctional benefits of development should be sought. It has also been embedded into development management.

CSFs involved and outcomes delivered



Outcomes

- 1 **Reduced risk from flooding.** The policies seek to address flood risks from all sources across a large rural area and in settlements within it.
- 2 **Increased water efficiency and reduced water stress.** The local plan includes a policy (SD48) requiring water efficiency in new homes to be the higher optional standard, and requiring BREEAM excellent standards for major non- and multi-residential developments.
- 3 **Clean and good quality water environment.** The policies seek to protect a diverse range of groundwater and surface water features, including 11 rivers.
- 6 **Enhanced biodiversity.** Developments affecting the water environment, particularly surface water, should protect and improve biodiversity.
- 7 **Better blue-green infrastructure.** The local plan aims to protect and improve multifunctional blue-green infrastructure in a policy (SD45) that is grouped with 'grey' infrastructure policies.
- 8 **Improved accessible public spaces and places, and well-being.** The importance of public access to and recreational opportunities in river corridors is recognised in Policy SD17.
- 9 **Mitigating and adapting to climate change.** Several policies reflect the need to plan for climate change and the role of blue-green infrastructure in adapting.
- 10 **Using resources more sustainably and effectively.** Policy SD48, in particular, aims to secure efficient use of water resources.

CSFs

- B **Enabling local policy.** Clear and understandable local plan policies – the policy wording is robust. Good enabling plans and strategies from the LLFA and water company. These are among the partners in projects such as the Brighton Chalk Management Partnership Project (ChaMP), which aims to protect and improve the quality of groundwater in the Brighton Chalk block.
- C **Early engagement.** With the LPA, LLFA and water company and other areas of local government and with other partners and stakeholders. Many of the agencies are represented on the South Downs Partnership which helped shape the local plan. This includes representatives of the Environment Agency, local authorities and the water company.

- D **Partnerships.** Good links with (and between) LPAs, LLFAs and water companies, and understanding partners' interests and drivers, are all achieved through formal consultations and through the South Downs Partnership.
- E **Good management.** Strong champion – the ecosystem services approach has been championed by both South Downs National Park members and officers.

Further information

The policies are supported by:

- ◆ Brighton CHaMP for Water: <https://www.southdowns.gov.uk/care-for/water/brighton-champ-for-water/about-the-champ-project>
- ◆ South Downs Partnership: <https://www.southdowns.gov.uk/national-park-authority/committees-meetings/south-downs-partnership/>

References

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https://www.southdowns.gov.uk/wp-content/uploads/2018/04/SDLP-01-Pre-Submission_South_Downs_Local_Plan.pdf
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<https://www.southdowns.gov.uk/wp-content/uploads/2018/04/SDLP-01.1-Schedule-of-Changes-to-the-SDLP.pdf>
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https://www.southdowns.gov.uk/planning/south-downs-local-plan_2019/local-plan/

Golden thread link to physical case studies

- P9 Asda supermarket, Leicester

Policies/plans

Leicester City core strategy (Leicester City Council, 2014 and 2015):

- ◆ CS 2 Climate change and flood risk
- ◆ CS 13 Green network
- ◆ CS 17 Biodiversity
- ◆ Sustainable drainage guide
- ◆ Climate change supplementary planning document
- ◆ Green space supplementary planning document
- ◆ Surface water management plan

Summary

Policy CS2 incorporates climate change mitigation and adaptation aims as well as promoting green infrastructure and SuDS. Policies CS13 and CS17 help to address 'shortages' in green infrastructure and to enhance biodiversity. A comprehensive set of SDPs provide more detail for developers and the public.

Challenges/opportunities

The policies were developed in response to the need to help the regeneration of the city and provide housing, while contributing to climate change mitigation and adaptation needs while protecting and enhancing the natural environment.

CSFs involved and outcomes delivered



Outcomes

- 1 **Reduced risk from flooding.** Particularly surface water flooding
- 5 **Facilitating economic growth and regeneration.** The policies have been implemented in large-scale regeneration projects.
- 6 **Enhanced biodiversity.** Policy CS17 includes a strong expectation for new development to enhance biodiversity.
- 7 **Better blue-green infrastructure.** A blue-green infrastructure network is identified and Policy CS13 and a SPD provides advice about the Council's expectations.
- 9 **Mitigating and adapting to climate change.** Policy CS2 reduces the impact of development on climate change and the impacts of climate change on development, spelt out in more detail in a SPD.

CSFs

- C **Early engagement.** The policies were developed through working groups and workshops with key stakeholders while taking into account national policy. Leicester is nationally significant in terms of surface water risk. This was a key aim for the development of the policies. The Level 2 strategic flood risk assessment also provided further evidence. National policy was also a key aim and comments from the Environment Agency and Natural England helped further develop the policies.
- D **Partnerships.** Good links with (and between) LPAs, and the Environment Agency, Natural England, Severn Trent Water Plc, Trent Rivers Trust, Soar catchment partnership. The LPA with the water company, Environment Agency and Natural England and other city council departments (highways, parks, environment team etc). Policy CS2 and the climate change SPD were also developed by close working with the Council's environment team building on the city's history as the first environment city. Policy CS17 on biodiversity was developed in consultation with the city councils nature conservation officers, as was policy CS13, along with the parks and green spaces service.
- E **Good management.** More clear guidance and expertise from the LPA and LLFA to ensure projects are delivered and perform as expected.

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Golden thread link to physical case studies

- P10 St Andrews Park, Uxbridge.

Policies/plans

Hillingdon draft Local Plan: Part 2 Development Management Policies Revised Submission Version (London Borough of Hillingdon, 2015):

- ◆ DMEI 7 *Biodiversity protection and enhancement*
- ◆ DMEI 8 *Waterside development*
- ◆ DMEI 9 *Management of flood risk*
- ◆ DMEI 10 *Water management, efficiency and quality*
- ◆ DMEI 11 *Protection of ground water resources*

Summary

The policies seek to manage surface water and other flooding, protect and enhance biodiversity, enhance green infrastructure and improve the public realm. They stem from the London Plan policies on climate change adaptation and the Blue Ribbon Network (GLA, 2016a, b).

Challenges/opportunities

The policies were developed in response to surface and groundwater flood risk (eg Pinn Meadows, Ruislip 2013–2014). Their purpose is to enhance public open space and biodiversity and improve water quality. The policies were developed partly because of learning from successful projects like St Andrews Park, Uxbridge – which won a 2018 susdrain SuDS Award.

CSFs involved and outcomes delivered

CSFs					
Outcomes					

Outcomes

- 1 **Reduced risk from flooding.** Policy DMEI 9 translates the strategic flood risk assessments and preliminary flood risk assessments into planning policy, particularly to reduce surface water flood risk, which is the key flood risk for Hillingdon.
- 2 **Increased water efficiency and reduced water stress.** Policy DMEI 10 includes stringent policy requirements for new development that will help to reduce water stress.
- 3 **Clean and good quality water environment.** Policy DMEI 10 requires developers to demonstrate that there is sufficient capacity in the wastewater system and – if in doubt – to produce a drainage strategy to show how it will be addressed. This will help achieve better quality surface water and reduce pressure on the infrastructure network.
- 6 **Enhanced biodiversity.** Policy DMEI 7 will enhance biodiversity in developments alongside main rivers and the Grand Union Canal.

- 7 **Better blue-green infrastructure.** Policy DMEI 8 in particular, will help to deliver the aims of a catchment partnership and enhance London's Blue Ribbon Network.
- 8 **Improved accessible public spaces and places, and well-being.** Policy DMEI 8 will help deliver better waterside public spaces – including by seeking financial contributions for improvements elsewhere in Hillingdon if it is not technically feasible to do so on site.
- 9 **Mitigating and adapting to climate change.** Policies DMEI 9 and 10 are particularly aimed at ensuring that new development is able to adapt to climate change's impacts on flooding and water availability.
- 10 **Using resources more sustainably and effectively.** Policy DMEI 10 should ensure that water resources are available for the Borough in future.

CSFs

- A **Understanding IWM.** Knowing which IWM actions are appropriate, ie the LLFA officer has been able to translate technical aspects of IWM into practical approaches. Identifying IWM possibilities at an early stage (masterplanning). Breaking down institutional barriers and changing mind-sets.
- B **Enabling local policy.** Clear and understandable local plan policies that support London's Blue Ribbon Network. Involvement in Pinn Meadows and St Andrew's schemes has led to better understanding of what can be achieved, and has led to better policy.
- C **Early engagement.** Early engagement with the Environment Agency and the LLFA has helped to develop the policies.
- D **Partnerships.** Good links with (and between) LPA, LLFAs and water companies. An engaged and enabling local community that is active in managing flood risk and have reproduced the Royal Horticultural Society's permeable paving guidance in a resident's association newsletters. Understanding partners' interests and aims.
- E **Good management.** A strong champion embedded in the Council's planning department helps to break down 'silo' approaches between policy planners and development management planners. Early and clear identification of long-term management arrangements. Co-ordination of budgets and funding through the Hillingdon strategic infrastructure fund.

Further information

The policies is also supported by a website on SuDS requirements for planning applications, the London Borough of Hillingdon (McCloy *et al*, 2018) SuDS design and evaluation guide and the Royal Horticultural Society supplementary planning guidance on front gardens.

References

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- ROYAL HORTICULTURAL SOCIETY: *Front gardens: designing*
<https://www.rhs.org.uk/advice/profile?pid=738>

Policies/plans

Adopted Brighton and Hove City Plan, Part One (Brighton and Hove City Council, 2016):

- ◆ CP8 Sustainable buildings
- ◆ CP11 Managing flood risk

Summary

Policy CP8 is more ambitious than national policy as it requires developers to provide evidence on how they are trying to achieve water neutrality and also applies water-efficiency standards to a wider range of development than many local policies.

Policy CP11 aims to manage flood risk from a variety of sources, but mainly 'local' ones, and to adapt to climate change.

Challenges/opportunities

Brighton and Hove City Council intends that, by 2030, the city will have made significant progress towards becoming a resource-efficient, 'one planet, zero carbon city' (Bioregional, 2017), and a city that is adapting well to climate change.

Brighton and Hove's position on the coast, and the potential for flooding and coastal erosion, means that existing and new homes, buildings and infrastructure require protection, and that the city effectively adapts to climate change. Brighton and Hove has the eighth largest number of people at risk of flooding of any LPA in England. To help appraise, manage and reduce flood risk in relation to the location of new development, the Council commissioned a strategic flood risk assessment. The strategic flood risk assessment found that surface and groundwater flooding are particular risks. The highly urbanised nature, geology and topography of the city means that surface water runs off the agricultural land on the South Downs and from the built-up area, soaks into the highly permeable underlying South Downs chalk and causes sewer flooding if infrastructure becomes inundated with groundwater. Development management policies on protecting the water environment and sustainable urban drainage to support the implementation of policy CP11 are being developed as part of the city plan (part two). A supplementary planning document on SuDS is currently being developed.

CSFs involved and outcomes delivered

CSFs				
Outcomes				

Outcomes

- 4 **Enabling new housing.** The policies will be used to shape the significant housing proposals coming forward over the next decades.
- 7 **Better blue-green infrastructure.** Increase the multifunctional use of the limited blue-green infrastructure in the city.

- 9 **Mitigating and adapting to climate change.** The policies will particularly help to deal with increased water stress and the increased likelihood of surface water flooding due to climate change.

CSFs

- A **Understanding IWM.** The development of policy CP11 with the partners has helped to break down institutional barriers and change mind-sets, which has been taken further through the Scalable Preservation Environments (SCAPE) project.
- C **Early engagement.** Early engagement with partners including the water company has helped particularly because polluting groundwater and sewer flooding are both issues.
- D **Partnerships.** Local plan policies that reflect the surface water management plan, local flood risk management strategies, drainage strategies and One Planet and Biosphere initiatives (as described in the city's sustainability action plan).
- E **Good management.** A strong champion, ie a flood risk manager working closely with applicants and planning staff.

Further information

Toad's Hole Valley

Proposals for this large mixed-use (primarily housing) site are expected to include an integrated approach to the provision of blue, green and transport infrastructure for buildings as well as the network of paths and roads.

An outline planning application (BH2018/03633) was submitted in late 2018.

For up-to-date information, please visit the Council's planning register:

<https://planningapps.brighton-hove.gov.uk/online-applications/>

Toad's Hole Valley SPD: www.brighton-hove.gov.uk

(search for 'supplementary planning documents', Toad's Hole Valley supplementary planning document).

Shaping Climate Adaptive Places

INTERREG 2 Seas Shaping Climate Adaptive Places (SCAPE) is a European Union project which is developing innovative methods and pilot projects for adapting to climate change through landscape-led design. It seeks, among other things, to break the silo thinking that often guides the delivery of projects and hampers greater stakeholder input and buy-in. The SCAPE project aims to 'build bridges' and improve collaboration across council teams (from planning and property and design, to transport and public health) as well as with external partners. These include project partners, Southern Water, Brighton Chalk Management Partnership and the University of Brighton, and the local community (residents, businesses, elected members and local action groups).

The SCAPE project illustrates how IWM approaches can successfully address a range of city plan part one policy objectives, by delivering spaces that are inviting, functional and affordable, and which could help improve local pride while reducing water runoff and contamination. It highlights the benefits and challenges of incorporating into project development early stakeholder engagement and training and monitoring outcomes. A one-day 'climate test' brings together multi-disciplinary experts from several council departments and outside agencies to analyse data, share ideas and propose potential solutions to flooding issues.

Pilot projects in Brighton and Hove will demonstrate how surface and groundwater flood risk can be managed, groundwater quality protected, and amenity and biodiversity enhanced.

SCAPE Brighton & Hove City Council: www.brighton-hove.gov.uk/scape (includes two pilot projects that will deliver lower flood risk now and into the future)

INTERREG 2 Seas SCAPE: <http://scape.oostende.be/>

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<https://www.brighton-hove.gov.uk/sites/brighton-hove.gov.uk/files/FINAL%20SUDS%20SPD%20NOV18.pdf>

Golden thread link to physical case studies

- P10 St Andrews Park, Uxbridge.

Policies/plans

Ashford integrated water strategy (Environment Agency, 2007):

- ◆ Ashford core strategy (Ashford Borough Council, 2008)
- ◆ Adopted sustainable drainage supplementary planning document (Ashford Borough Council, 2010)
- ◆ Adopted public green space and water environment supplementary planning document (Ashford Borough Council, 2012)
- ◆ Ashford water cycle strategy (Ashford Borough Council, 2016)
- ◆ Ashford Local Plan 2030 (Ashford Borough Council, 2019) including policies:
 - ENV5 *Protecting important rural features*
 - ENV6 *Flood risk*
 - ENV7 *Water efficiency*
 - ENV8 *Water quality, supply and treatment*
 - ENV9 *Sustainable drainage*
 - ENV11 *Sustainable design and construction*

Summary

When Ashford was identified by the Government as a growth area in 2003, it was proposed that the urban area had the capacity to accommodate an additional 31 000 homes by 2031. Concern was raised over the ability of the water infrastructure and environment to accommodate this level of growth. Central government funded the commissioning of the Ashford IWM study.

The study assessed the:

- ◆ constraints to growth that might arise in relation to meeting the demand for potable water
- ◆ provision of wastewater services and the impact of treated effluent on the receiving waters
- ◆ management of flood risk.

It identified significant concerns with the capacity of the water infrastructure to support the level of growth proposed.

The Ashford integrated water strategy was published in 2007. This is now reviewed and updated through the Ashford water cycle study (2016), which also advocates an integrated approach to water management. The strategy informed policies in the Ashford core strategy 2008, and the water cycle study has informed policies in the Ashford Local Plan 2030. The draft plan contains a comprehensive set of policies that address the challenges outlined in the water cycle study.

The Ashford Water Group meets quarterly and brings together key partners for the benefit of the natural water environment. The group was originally set up to oversee the delivery of actions within the IWM study action plan, but now the emphasis is on Water Framework Directive requirements and key elements of the water cycle.

Challenges/opportunities

- ◆ Aquifers have been over-abSTRACTed and over-licensed, leading to reduced base flows and problems in associated water features. In dry years, there may not be enough water to supply both public demand

and the ecological needs of the River Stour. This would be worsened by an increasing population using more water year on year, making water-efficiency measures increasingly important.

- ◆ Downstream of Ashford, the Great Stour becomes an important lowland chalk river, which is a scarce habitat. In recent years, the water quality of the Great Stour has failed the Water Framework Directive targets set by the Environment Agency. The health of the River Stour is one of the main indicators of the success or failure of Ashford's 'sustainable development'.
- ◆ Post-development runoff rates would need to be over-attenuated, to reduce rates to below pre-development rates. The study suggested physical measures to manage flood risk resulting from development in Ashford, and identifies the large-scale incorporation of SuDS throughout new development areas as the most efficient option of flood risk management.
- ◆ Projected peak wastewater loads could not be accommodated. There was insufficient conveyance capacity within the existing Ashford sewer system to accommodate flows from new development, and insufficient treatment capacity at Bybrook wastewater treatment works.

CSFs involved and outcomes delivered

CSFs					
Outcomes					

Outcomes

- 1 **Reduced risk from flooding.** Policy ENV9 is a locally specific and comprehensive SuDS policy that is linked to the Ashford IWM study and a discharge rates assessment and aims to reduce flood risk. The Policy includes a requirement that the first 5 mm of any rainfall event can be accommodated and disposed of on site and that SuDS should provide multifunctional benefits.
- 2 **Increased water efficiency and reduced water stress.** In a context of regional population growth, the Ashford Water Group recognised the importance of a twin-track approach to supply, which involves increasing supply while reducing demand, achieving a sustained supply-demand balance. In the late 2000's Kent County Council led water-efficiency projects that delivered 110 litres per person per day in new homes and piloted the retrofitting of water and energy efficiency measures in existing homes. In its water resources management plan, South East Water set an aspirational target to reduce per capita consumption of water across their supply area of 149 litres per person per day (l/p/d) by 2040, which is a reduction against the current baseline of 166 l/p/d. However, the average per capita consumption in the Ashford Borough is already below this at 142 l/p/d. Part of the South East Water strategy includes water education and awareness to try and change customer behaviour with regards to water use. Alongside the educational measures, South East Water provides free or subsidised water-efficiency devices to customers. They also have a programme to have 90 per cent of all domestic customers metered by 2020, which is now mostly complete in Ashford. Leakage control targets (10 per cent by 2020) and water efficiency of South East Water's sites also form part of their long-term strategy. Policy ENV 7 requires new residential development to achieve a minimum water-efficiency use of no more than 110 litres per person per day (the optional requirement set through Building Regulations).
- 3 **Clean and good quality water environment.** Policy ENV8 contains a strong policy requirement to protect and enhance groundwater.
- 4 **Enabling new housing.** The Ashford IWM study was originally prepared to facilitate growth and the WCS has continued its approach.
- 6 **Enhanced biodiversity.** Policy ENV9 specifically refers to SuDS improving biodiversity.

CSFs

- A **Understanding IWM.** The Ashford IWM study and the subsequent strategy provided an early, strong, shared understanding of local water issues within Ashford Borough Council and across the partner organisations. It played a key part in the policy successes and allowed partner organisations to identify where they were well placed to lead on specific issues.
- B **Enabling local policy.** Clear and understandable policies are in place within the local plan and the policy wording is generally clear and strong. Other plans and strategies from the LLFA and water company are clear and enabling and the Ashford Water Group brings the different parties together to help 'dovetail' strategies.
- C **Early engagement.** Right from the start, water issues have been recognised as a potential constraint to growth at Ashford. This was key to the early successes, and it established a strong and ongoing understanding of the water issues within the local authority, partners and communities.
- D **Partnerships.** Ashford Water Group was originally set up to oversee the delivery of actions within the Ashford integrated water strategy action plan, but now the emphasis is on Water Framework Directive requirements and key elements of the water cycle. Key representatives include Ashford Borough Council, the Environment Agency, Kent County Council, South East Water and Southern Water Services.

The Ashford Water Group brings these organisations together and provides an ongoing forum for addressing water management issues. It meets quarterly and has recently facilitated a co-operative approach to drafting the local plan. The Environment Agency has also been instrumental in building strong relationships with the Stour catchment partnership and linking urban development issues with the management of the wider catchment. Notable outputs from the group and its partners have been:

 - i countryside funding to improve land-use management for the water environment
 - ii development and adoption of a SuDS supplementary planning document to establish acceptable runoff rates for new developments without prejudice to overall water environment quality
 - iii upgrading the Bybrook wastewater treatment works to provide more than enough capacity for Ashford's expansion
 - iv a joint approach to water efficiency.

Excellent links between the LPA and LLFA have been in place for many years. The quality of the links with the two water companies has been generally good, but the separation of water supply and wastewater responsibilities has been a challenge to greater integration.
- E **Good management.** The Environment Agency has provided a consistent leadership role throughout the process, starting with the project management of the AIWMS in 2003 and the formation of the Ashford Water Group. The Environment Agency's role has continued to the present day. A local growth delivery body (Ashford's Future) was formed in 2003 and provided strong leadership on sustainable development, integration and programme management, but this organisation was closed following the financial crisis. Since then, members of staff and councillors at Ashford Borough Council have been involved and other organisations have led on some of the issues. The co-ordination of budgets and funding worked well under Ashford's Future. The strategic partners were contributing to shared budgets and jointly bidding for funding from central government. However, this was mostly lost with the closure of that organisation and the pressures on public sector budgets.

Further information

Ashford best placed in Britain website: <http://www.ashfordbestplaced.co.uk>

Part A
Main guide

Part B
Physical case studies

Part C
Local case studies

Part D
National policy review

Part E
Characteristics of local policy

References

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- ASHFORD BOROUGH COUNCIL (2019) *Adopted Local Plan 2030*, Ashford Borough Council, Ashford, UK
<https://www.ashford.gov.uk/planning-and-building-control/planning-policy/adopted-development-plan-documents/adopted-local-plan-to-2030/>
- ENVIRONMENT AGENCY (2007) *Ashford integrated water strategy 2006–2031*, Environment Agency, West Malling, UK
https://www.ashford.gov.uk/media/4915/ashford_integrated_water_strategy.pdf

Policies/plans

Adopted Hull Local Plan 2016–2032 (Hull City Council, 2017):

- ◆ Policy 37 *Flood defences*
- ◆ Policy 38 *Surface water storage and drainage*
- ◆ Policy 39 *Sustainable drainage*
- ◆ Policy 40 *Addressing flood risk in planning applications*
- ◆ Policy 41 *Groundwater protection*
- ◆ Policy 43 *Green infrastructure and green network*
- ◆ Policy 44 *Biodiversity and wildlife*

Summary

The policies seek to manage flood risk, particularly from flooding from a variety of sources, to protect groundwater, and to enhance the network of green infrastructure and biodiversity.

Challenges/opportunities

The policies were first developed because much of the city is at risk of river, tidal and surface water flooding, and is heavily reliant on flood defences. It is important that the Council's planning policies support the work that the Council and colleagues in the East Riding of Yorkshire Council, the Environment Agency and Yorkshire Water are doing to increase flood resilience across the city. The city also lies in a groundwater source protection zone. Co-operation around dealing with the risk of flooding has helped lead to a collaborative approach to wider water management issues.

Developers should refer to the Hull City Council (2015) drainage impact assessment for all major planning applications. Before the adoption of both the local plan and the drainage impact assessment, the Council held workshops with local developers, builders and others likely to be involved in the planning process to explain both what they would be expecting and why.

CSFs involved and outcomes delivered

CSFs					
Outcomes					

Outcomes

- 1 **Reduced risk from flooding.** Policies 37 to 40 should together help to manage the significant current and future flood risks from the sea, rivers and surface water.
- 3 **Clean and good quality water environment.** Policy 41 will help protect the important groundwater source protection zones in the city.

- 6 **Enhanced biodiversity.** Policy 44 aims to protect and enhance a network of sites including internationally significant wetland sites and to help deliver the Hull Biodiversity Action Plan.
- 7 **Better blue-green infrastructure.** Policies 39, 43 and 44 will help to deliver more enriched biodiversity and blue-green infrastructure, including aqua greens and a green/blue corridor along the River Hull.
- 9 **Mitigating and adapting to climate change.** The SuDS policy 39 includes the need for new developments to adapt to climate change using a +30 per cent allowance.

CSFs

- A **Understanding IWM.** The Council were seeking a positive effect on the city's environment and water systems. It established some principles for water management, and then provided the science to support the funding and the delivery of interventions on the ground to improve flood risk. Previous studies and the strategic flood risk assessment helped identify IWM possibilities at an early stage, as it includes citywide surface water modelling. Breaking down institutional barriers and changing mind-sets were key to shifting organisational thinking. The primary partners in this are the Council, the Environment Agency and Yorkshire Water. The Living with Water partnership is a collaborative initiative to improve water management comprising Environment Agency, Hull City Council, the East Riding of Yorkshire Council and Yorkshire Water. It removes institutional barriers and ensures there is a senior officer and member commitment to doing the right thing for the city, with a shared organisational responsibility to deliver.
- B **Enabling local policy.** The water policies are all grouped into Chapter 11 of the local plan. Rivers and drains are incorporated into the green network (Policy 43) and biodiversity gains in the green network are encouraged through Policy 44. Clear, enabling plans and strategies from the LLFA and water company. The Living with Water partnership is signed up to the strategic flood risk assessment. Yorkshire Water have a detailed sewer model and Hull City Council has a local flood risk strategy and preliminary flood risk assessment.
- C **Early engagement.** With the LPA, LLFA and water company, this has been critical. It occurs frequently and has done since 2007. It is more difficult to get this level of commitment with the local community, but the community wide aqua greens (see Paragraph 12.6) are driving more interest in water management, and the Living with Water partnership will drive further local community commitment. The partnership is heavily engaged and is also reaching out to the wider business and residential communities to embed the Living with Water thinking into everyday decisions.
- D **Partnerships.** Good links with (and between) LPAs, LLFAs and water companies are essential and are a real strength in the decision making to ensure the full IWM options are understood, explored and implemented. A weak partnership would make the Council's objectives undeliverable. The Council understands partners' interests and motivations, and challenges interests through the partnership where necessary.
- E **Good management.** A strong champion is important and the director of property and assets at Yorkshire Water, the deputy chief executive of East Riding Council, area managers at the Environment Agency and the director of regeneration at Hull are all Living with Water partnership board members. Early and clear identification of long-term management arrangements is still an issue that Hull City Council is addressing. The Council is starting to explore co-ordination of budgets and funding and it is open about capital commitments to schemes.

Further information

Developers should refer to Hull City Council's (2015) Guide to drainage impact strategies and drainage impact assessments for all major planning applications. Before the adoption of both the local plan and the guide, the City Council held workshops with local developers, builders and others likely to be involved in the planning process to explain both what they would be expecting and why.

At the Hull Kingston Rovers Craven Park Rugby League ground, a SuDS scheme was created for the surface water runoff when a new stand and car park was being constructed.

Aqua greens are relatively small-scale flood alleviation schemes, designed to address particular problems and improve water quality, eg de-culverting watercourses and creating temporary flood storage areas at Willerby Carr, Sutton, Bellfield Avenue and Bristol Road.

References

HULL CITY COUNCIL (2015) Guide to drainage impact strategies and drainage impact assessments, Hull City Council, Hull, UK
<http://www.hull.gov.uk/sites/hull/files/media/Editor%20-%20Planning/Drainage%20impact%20assessment%20guide.pdf>

LWW partnership Living with Water: <https://livingwithwater.co.uk/>

Policies/plans

Arun Local Plan 2011–2031 (Arun District Council, 2018)

- ◆ GI SP1 *Green infrastructure and development* (Section 7)
- ◆ W SP1 *Water* (Section 18)
- ◆ W DM1 *Water supply and quality* (Section 18)
- ◆ W DM3 *Sustainable urban drainage systems* (Section 18)
- ◆ H SP2c *Inland Arun* (Section 12)

Summary

The policies aim to protect and improve green infrastructure, manage flood risk from a variety of sources (Arun District Council, 2016 and LUC, 2012), including ‘local’ sources, adapt to climate change, help to address water quality issues and manage water stress in part of the district.

Challenges/opportunities

Several factors led to the revision of the strategic flood risk assessment. These included flooding in 2012 and 2014, previous work on critical drainage areas in the Lidsey catchment, water quality issues downstream of the Tangmere wastewater treatment works, water stress, and revised climate change allowances. These factors also led to the development of the Arun strategic surface water strategy (Mott MacDonald, 2016), and the development of policies to help deliver housing numbers and better IWM. Arun’s local plan strategic objective for water is “*To plan for climate change and work in harmony with the environment to conserve natural resources and increase biodiversity.*”

- ◆ **Policy W SP1** includes a number of elements:
 - it encourages water-efficiency measures to protect the District’s water resources
 - it seeks to improve the quality of the water environment which supports a range of habitats and ecosystems
 - it encourages development that makes active use of surface water as a design feature
 - it seeks to improves waterbodies or provide additional flood relief.
- ◆ **Policy W DM1** requires a maximum water consumption standard of 110 litres/person/day in new residential developments. It also requires that major developments have to meet the South East river basin management plan (Environment Agency, 2015) objectives and introduces more stringent assessment requirements for developments that materially increase foul or surface water discharges.
- ◆ **Policy W DM3** requires all developments to increase the levels of water capture and storage and improve water quality, using SuDS. Proposals for major development should also integrate SuDS within public open spaces and roads, accommodate and enhance biodiversity by making connections to existing green infrastructure, and provide amenity for local people while retaining the existing drainage network of the site and the wider area.
- ◆ **Policy H SP2c** for major development in inland Arun includes a requirement for a comprehensive strategy for surface water management to be developed in-line with the Arun strategic surface water management study (Mott Macdonald, 2016).

CSFs involved and outcomes delivered

CSFs								
Outcomes								

Outcomes

- 1 **Reduced risk from flooding.** Arun faces multiple, complicated flood risks.
- 2 **Increased water efficiency and reduced water stress.** Across the whole district.
- 3 **Clean and good quality water environment.** Meeting Water Framework Directive objectives.
- 4 **Enabling new housing.** Incorporating better water management into the large greenfield development sites.
- 5 **Facilitating economic growth and regeneration.** Particularly Bognor Regis and at an ex-airfield.
- 7 **Better blue-green infrastructure.** Promoting a linear park in Policy H SP2c.
- 8 **Improved accessible public places and spaces, and well-being.** Linking in with the green infrastructure strategy.
- 9 **Mitigating and adapting to climate change.** Policy H SP2c will particularly help Arun adapt to increased impacts of flooding which are already a significant risk.
- 10 **Using resources more sustainably and effectively.** Policies W SP1 and W DM1 will help to conserve water and use it close to source.

CSFs

- A **Understanding IWM.** The partners learnt from each other as the draft plan developed.
- C **Early engagement.** Particularly the LPA, county LLFA and Environment Agency.
- D **Partnerships.** Workshops hosted by the County LLFA but involving LPAs, the Environment Agency, the water company helped develop and build on the Arun strategic surface water study and develop potential solutions.
- E **Good management.** Early and clear identification of long-term management arrangements – for example the involvement of Arun District Council engineers enabled alternative management solutions based on local knowledge of drainage infrastructure.

Further information

Proposals at Salt Box Field for a 12 ha mixed-use development off Rowan Way, Bersted, Bognor Regis includes surface water management measures and a package wastewater treatment plant (Arun District Council, 2017).

References

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- ARUN DISTRICT COUNCIL (2017) *Bersted development*, BE/102/17/OUT, Minutes of the Development Control Committee, Arun District Council, Littlehampton, UK
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<https://www.arun.gov.uk/download.cfm?doc=docm93jijm4n10223.pdf&ver=10144Strategic%20Flood%20Risk%20Assessment>

Policies/plans

Draft submission St Helens Borough Local Plan 2020–2035 (St Helens Council, 2019)

- ◆ LPA09 *Green infrastructure*
- ◆ LPC05 *Open space and outdoor sports facilities*
- ◆ LPC06 *Biodiversity and geodiversity*
- ◆ LPC07 *Greenways*
- ◆ LPC08 *Ecological network*
- ◆ LPC09 *Landscape protection and enhancement*
- ◆ LPC10 *Trees and woodlands*
- ◆ LPC12 *Flood risk and water management*

Summary

Policy LPA09 is an overarching green infrastructure policy that encourages the protection and enhancement of green infrastructure, including watercourses. It links with policies LPC05 to LPC10 that are more detailed and encompasses several multi-authority and multi-agency strategies such as the hydrology action plan and the Mersey Forest.

Policy LPC12 seeks to manage river and surface water flooding while improving water quality and providing ecological benefits, based on a holistic approach derived from a whole catchment approach (Sankey Catchment Partnership, 2017).

Challenges/opportunities

- ◆ Policy LPA09 was based on the recognised range of recreation, ecology, public access, health, water management, climate change mitigation, landscape enhancement, regeneration benefits that green infrastructure brings. This particularly applies to the St Helens Greenway Network and the Liverpool City Region Ecological Network.
- ◆ Policy LPC12 was developed in response to complex flooding issues from main rivers, ordinary watercourses and surface water, while improving both water quality and the wider urban environment.

CSFs involved and outcomes delivered

CSFs			
Outcomes			

Outcomes

- 1 **Reduced risk from flooding.** Policy LPC12 is helping to implement the multi-agency Sankey catchment action plan, by requiring applicants for major development to incorporate riparian development to temporarily attenuate floodwater and reduce downstream flood risk.

- 3 **Clean and good quality water environment.** Policy LPC12 contains strong requirements to protect and enhance water quality.
- 5 **Facilitating economic growth and regeneration.** Policy LPC09 regards improving the natural environment as a crucial aspect of facilitating economic regeneration in St Helens.
- 6 **Enhanced biodiversity.** Policies LPC06 and LPC07 together aim to protect and enhance biodiversity interest, including greenways that are often along rivers and streams.
- 7 **Better blue-green infrastructure.** Policy LPA09 is an overarching policy that knits together the aspects of green infrastructure to help deliver better open space, landscape, trees and biodiversity.

CSFs

- A **Understanding IWM.** An essential starting point to developing effective policies that link together in order to usher new development towards an integrated approach from the initial design stage onwards, making best use of the water resource and often-limited space on a development site.
- B **Enabling local policy.** LPA09 indicates the Council's recognition of the multifunctional benefits of green infrastructure, and its commitment to safeguarding and enhancing the Borough's green infrastructure assets, including water management. The key driver for the policy was to ensure that new development contributes to the green infrastructure resource in a way that addresses issues such as (natural) flood management, habitat creation and healthy lifestyles.
The policy was designed to provide an environmental policy backdrop that allows a range of policy themes including water management, working effectively together, strengthening policy weight and linking broad principles with detailed policy requirements.
Policy LPC12, the flood risk and water management policy. The key driver was to ensure the Council had enough policy leverage to require new developments to address water management, to provide maximum benefits such as habitat provision and water quality improvement, both on site and off site. The policy seeks to ensure that sites are not developed in isolation to the surrounding landscape and river catchment.
- D **Partnerships.** The policies were scoped with the LLFA and through discussions with neighbouring LPAs in the catchment and the wider catchment partnership, to seek the widest policy linkages. Wider consultation including with United Utilities and the Environment Agency shaped policy content, particularly of the flood risk and water management policy. The key driver was to try to get an effective and consistent policy approach LPAs across the Sankey catchment.

Further information

Policy LPC12 is also supported in the Sankey Catchment Partnership action plan (2017).

References

SANKEY CATCHMENT PARTNERSHIP (2017) *Sankey Catchment action plan*, St Helens Council, Environment Agency, Mersey Rivers Trust, Warrington, UK
<http://moderngov.sthelens.gov.uk/documents/s75485/Sankey%20Catchment%20Action%20Plan%20Final%20Version.pdf>

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Other examples of local policies promoting IWM

The following sections provide details of local policies that have the capability of promoting IWM, but where there is insufficient information to identify the CSFs.

LONDON BOROUGH OF BEXLEY

The Bexley local plan preferred approaches to planning policies and land-use designations (February 2019) and the accompanying integrated impact assessment (IIA) scoping report refer to IWM in name.

IWM is an integral part of the preferred strategic policy approach to mitigating and adapting to climate change along with promoting green infrastructure and managing flood risk. The multiple benefits of IWM are identified and it forms part of proposed policy DP35 Mitigating climate change: *"All major development proposals must demonstrate how Integrated Water Management (IWM) has been considered within the scheme. Development that would give rise to water pollution is unacceptable."*

IWM is included in the IIA scoping report as a topic and also an objective against which the draft plan's policies are measured.

<https://www.bexley.gov.uk/services/planning-and-building-control/planning-policy/local-plan-review>

MILTON KEYNES COUNCIL AND OTHER COUNCILS IN THE ANGLIAN WATER REGION

Plan: Milton Keynes (MK) was adopted in March 2019. Policy SC1: *Sustainable construction of plan MK* is ambitious on water efficiency and includes the following:

"C. Water

- 1 *All newly constructed dwellings will be required to achieve an estimated water consumption of no more than 110 litres/person/day.*
- 2 *Water reuse and recycling and rainwater harvesting should also be incorporated wherever feasible to reduce demand on mains water supply, subject to viability. Proposals will be expected to maximise the use of the above measures subject to the outcome of the viability assessment."*

The planning inspector recommended the inclusion of a reference to financial viability but accepted Anglian Water's argument that such measures should be maximised (para 191 of the report). This suggests that it is currently possible to include local plan policies that refer to water reuse/recycling and rainwater harvesting etc. as well as the standard itself.

Go to: <https://www.milton-keynes.gov.uk/planning-and-building/plan-mk>

There are also other emerging plans which contain examples of similar policies that refer to water reuse/recycling and rainwater harvesting in the Anglian Water region, including:

- ◆ Central Bedfordshire Council Local Plan pre-submission (January 2018) Policy CC1: *Climate change and sustainability*

https://www.centralbedfordshire.gov.uk/info/45/planning_policy/468/local_plan_-_overview/2

- ◆ Harborough District Council's Local Plan (main modifications) (January 2019) Policy IN4 *Water resources and services* states that *"Major developments, and high or intense water use developments, should*

include a grey water and rainwater harvesting system, unless demonstrated to the Council's satisfaction that such a system is not viable feasible or practical."

<https://www.harborough.gov.uk/local-plan-examination>

- South Kesteven District Council's proposed submission local plan to 2036 Policy SB1 *Sustainable building* seeks to achieve water neutrality and an innovative requirement for water-efficiency promotion and community education for major development sites.

<http://www.southkesteven.gov.uk/index.aspx?articleid=14390>

SOUTH WORCESTERSHIRE COUNCILS

Worcester City Council, Malvern Hills District Council and Wychavon District Council have jointly published a draft flooding and water management supplementary planning document. The SPD relates to policies in the adopted South Worcestershire development plan SWDP 28 *Management of flood risk*, SWDP 29 *Sustainable Drainage Systems* and SWDP 30 *Water resources, efficiency and treatment*. They seek to minimise the risk of flooding and to direct development to the areas of lowest flood risk, promote effective water management and maintain water quality. They are a good example of jointly-prepared policies and guidance.

<https://www.swdevelopmentplan.org/>

PARTNERSHIP FOR URBAN SOUTH HAMPSHIRE (PUSH)

PUSH is a partnership of Hampshire County Council, three unitary councils and eight district councils. Together, they are planning for the need for 100 000 homes between 2018 and 2036. Building on the experience of an IWM study published in 2008, a new version has been prepared for the councils to use as part of their evidence base for revising their local plans and to take account of changes in environmental laws. The study identifies improvements needed to upgrade wastewater treatment and to phase development to allow it to proceed while maintaining environmental quality. The study is reflected in the Havant Borough pre-submission local plan 2036 Policy IN1 *Effective provision of infrastructure*.

<https://www.havant.gov.uk/sites/default/files/documents/PUSH%20integrated%20water%20management%20study.pdf>

<https://www.havant.gov.uk/sites/default/files/documents/Pre-Submission%20HBLP2036%20for%20Full%20Council%20-%20FINAL%20POST%20COUNCIL%20%28clean%20for%20use%29%20-%20Copy.pdf>

Part D

National policy review



6 Introduction

This part of the *Delivering better water management through the planning system* guidance summarises significant planning policy and guidance about Integrated Water Management (IWM), which is primarily aimed at planners in England and Wales. These documents provide the overarching framework that guides planners when drafting and reviewing their local plans and are ‘material planning considerations’ in development management decisions.

The critical success factors (CSFs) and case studies **Parts B and C** illustrate how national policy and guidance is being adopted by local planning authorities (LPAs), lead local flood authorities (LLFAs), flood risk management bodies, water companies and other agencies ‘on the ground’.

This section also briefly describes the National Policy Statements (The Planning Inspectorate, 2012) that guide decisions on nationally significant infrastructure projects, and the potential developments in policy and guidance that may affect planning decisions about IWM in the future.

The section addresses the following:

- ◆ 25 year environment plan
- ◆ National infrastructure delivery plan and national infrastructure assessment
- ◆ UK climate projections
- ◆ The National Planning Policy Framework (NPPF) (MHCLG, 2018) and planning practice guidance (England)
- ◆ Planning Policy Wales (PPW) (Welsh Government, 2018) and technical advice notes (Wales)
- ◆ Future developments in policy.

The policy review is based on current national policy at the time of writing (July 2019).

6.1 25 YEAR ENVIRONMENT PLAN

In December 2018, the UK Government published *A green future: our 25 year plan to improve the environment* (HM Government, 2018). The 25 year plan provides a significant opportunity to promote IWM. The plan adopts a ‘natural capital’ approach that emphasises the role of air, water, soil and ecosystems that support all forms of life, and are an essential basis for economic growth and productivity over the long term. As a high-level statement of government policy, the plan is a material consideration in planning decisions, although its approach will need to be translated into planning policy and guidance before it has maximum effect ‘on the ground’. Although published by the UK Government, many of its actions will be dependent on implementation by governments in Wales, Scotland and Northern Ireland where environmental and planning issues are devolved.

The fresh natural capital approach of the plan is mutually compatible with IWM. Promoting IWM can contribute to many of the plan’s aims and actions. LPAs can use it to justify including IWM policies in their plans and developers can use it to support including IWM in their developments.

In particular, IWM:

- ◆ Supports the Prime Minister’s goals of “*cleaner water and a cleaner, greener country for us all, including creating new habitats; improving biodiversity; and improving rivers.*” (p4 of the plan)
- ◆ Supports the ambitions of the Secretary of State for the Environment, Food and Rural Affairs for “*greening our urban environments; ensuring development should result in net environmental gain; and crucially, working with nature to protect communities from flooding, slowing rivers and creating and sustaining more wetlands to reduce flood risk and offer valuable habitats.*” (p6–7)

- Contributes to the 25-year goals – directly to seven and indirectly to the remaining three (see **Table 6.1**).

Table 6.1 Contribution of IWM to the goals of HM Government (2018)

Goal		IWM contribution
1	Clean air	Indirect
2	Clean and plentiful water	Direct
3	Thriving plants and wildlife	Direct
4	Reduced risk of harm from flooding and drought	Direct
5	Using resources from nature more sustainably and effectively	Direct
6	Enhanced beauty, heritage and engagement with the natural environment	Direct
7	Mitigating and adapting to climate change	Direct
8	Minimising waste	Indirect
9	Managing exposure to chemicals	Direct (attenuation of diffuse pollution by SuDS)
10	Enhancing biosecurity	Indirect (enhancing ecosystems that favour indigenous species)

Of the direct measures to achieve the 10 goals, IWM contributes specifically to:

- Clean and plentiful water. Improving at least three quarters of the England's water to be close to their natural state as soon as is practicable (p25).
- Thriving plants and wildlife. Creating or restoring 500 000 ha of wildlife-rich habitat outside the protected site network (p26).
- Reducing the risks of harm from environmental hazards. Bringing the public, private and third sectors together to work with communities and individuals to reduce the risk of harm (p27).
- Using resources from nature more sustainably and efficiently. Maximising the value and benefits from the England's resources (p.27).
- Enhancing beauty, heritage and engagement with the natural environment. Making sure that there are high quality, accessible, natural spaces close to where people live and work, particularly in urban areas, and encouraging more people to spend time in them to benefit their health and well-being.
- Mitigating and adapting to climate change. [Contributing to] implementing a sustainable and effective second national adaptation programme.
- Managing exposure to chemicals. Significantly reducing the levels of harmful chemicals entering the environment (including through agriculture) – using a wider interpretation of 'entering the environment' as diffuse pollution (the plan focuses on tackling point sources).

IWM makes direct contributions to many of the actions in the plan. The most significant are set out in **Sections 6.1.1 to 6.1.4**.

6.1.1 Using and managing land sustainably

- Embed an 'environmental net gain' principle for development, including housing and infrastructure (p.32), specifically:
 - expand the net gain approaches to include wider natural capital benefits, such as flood protection, recreation and improved water and air quality (p34)
 - explore ways in which design can contribute to environmental improvements (p34)
 - produce stronger new standards for green infrastructure (p34)
- New homes will be built in a way that improves flood resilience.
- Incentivise and reward land managers to restore and improve the England's natural capital.
- Invest in technical advice to support farmers and land managers in delivering the outcomes, and to

- help them work together to achieve benefits at landscape and catchment level (p37).
- ◆ Realise a wide range of environmental benefits from productive forestry planting by planning and developing investment zones at a landscape scale, consistent with catchment-based approaches to flood risk management (p49).
 - ◆ Take action to reduce the risk of harm from flooding including greater use of natural flood management solutions (p32).
 - ◆ Looking to strengthen joint delivery across organisations to support the updated national flood and coastal erosion risk management strategy (p51).
 - ◆ Increasing the uptake of SuDS, especially in new developments (p52).
 - ◆ Learning from the £15M natural flood management funding to develop knowledge, identifying and promoting practical solutions for local implementation (p52).
 - ◆ Improving partnership working (p54).
 - ◆ Amending planning practice guidance to clarify construction and ongoing maintenance arrangements for SuDS in new developments, tightening links with planning guidance for water quality and biodiversity (p54).
 - ◆ Considering changes to the NPPF and Building Regulations in the longer term to encourage SuDS (p54).
 - ◆ Improving existing arrangements for managing surface water flooding, and the outcomes delivered by LLFAs and other risk management authorities, including water companies (p54).

6.1.2 Recovering nature and enhancing the beauty of landscapes

- ◆ Protecting and recovering nature (p57).
- ◆ Restore and create areas of wetland (p57).
- ◆ Opportunities for nature recovery through natural flood management (p59).
- ◆ New and existing green infrastructure to extend wildlife corridors into towns and cities (p59).
- ◆ Local communities and businesses more involved (p59).
- ◆ Landscape-scale restoration (analogous to catchment scale) with benefits extending to water management (p60).

6.1.3 Connecting people with the environment to improve health and well-being

- ◆ Help people improve their health and well-being by using green spaces (p.71).
- ◆ Greening towns and cities:
 - green and blue spaces in the built environment are important to health and happiness (p76).
 - explaining what ‘good’ green infrastructure actually looks like by defining a set of standards in close consultation with stakeholders (p76).
 - ensuring that new developments include accessible green spaces, and that any area with little or no green space can be improved for the benefit of the community (p77).
- ◆ Supporting the Year of Green Action (John Muir Trust) by:
 - combining targeted activities to make it easier for people to get involved in improving the natural world and spread the word about environmental issues (p82)
 - scoping out an evidence-based behaviour change strategy to enable further actions by individuals, communities, businesses and government beyond 2019 (p82)
 - working with partners from the business and voluntary sectors to make these activities happen.

<https://www.johnmuirtrust.org/initiatives/youngpeople/year-of-green-action-2019>

6.1.4 Increasing resource efficiency and reducing pollution and waste

Chapter 4 of HM Government (2018) currently omits the contribution that local greywater and wastewater recycling/treatment as part of the contribution IWM can make to reduce the impact of wastewater. It also omits the contribution that SuDS can make to minimising the risk of chemical contamination in water by treating diffuse pollution.

6.1.5 Putting the plan into practice

A key aspect of putting the plan into practice is working closely with a large range of stakeholders over the year to identify their contribution to the goals set out in the plan (p128). The plan recognises the benefits of better evidence for decision making and aims to improve understanding and valuation of the benefits of natural capital (p133). It also outlines how the larger environmental delivery bodies have aligned around a common geography of 14 areas, so each now has its own area integrated plan (ie a joint statement of intent between the Environment Agency, Natural England and the Forestry Commission). Defra proposes to develop these area integrated plans into natural capital plans, which will also have input from a range of organisations including local enterprise partnerships, businesses and utility companies, local nature partnerships, catchment partnerships, local authorities, national park authorities and water companies (p140). These natural capital plans will be aligned with the plan.

The section on financing in the 25 year plan (p141–150) includes a summary of innovative water company schemes such as Upstream Thinking, EnTrade and SCaMP.

6.2 NATIONAL INFRASTRUCTURE DELIVERY PLAN, NATIONAL INFRASTRUCTURE ASSESSMENT

The National Infrastructure Delivery Plan 2016–2021 (IPA, 2016) brings together the UK Government’s plans for economic infrastructure in England (and across the UK for non-devolved matters), with those to support delivery of housing and social infrastructure. Chapters 8 and 9 refer to managing flood risk and water management, although they are primarily about large capital infrastructure projects. IWM can complement these approaches.

The UK National Infrastructure Assessment (NIC, 2018) sets out infrastructure needs including the need to tackle droughts and flooding. It recommends that the Environment Agency completes catchment and coastal cell management plans for flooding by 2023, that water companies and local authorities should work together to publish joint plans to manage surface water flood risk by 2022, and that a stronger twin-track approach to water supply and management is taken. IWM can contribute significantly to these aims by reducing flood risk at the same time as increasing water efficiency.

Welsh Government (2012) sets out Wales’ capital investment needs and plans for spending, including flood management and private sector water company spending. There was a mid-point review in 2018 which included commitments to deliver 20,000 affordable homes various transport, internet and flood management projects.

6.3 UK CLIMATE PROJECTIONS

In November 2018, the Met Office published revised estimates of climate change for the UK (Met Office, 2018). These could significantly change the ways that LPAs, regulators and water companies plan for future flood risk, water demand/supply and water quality. It is expected that governments in London and Cardiff and regulators will update their current policies, assumptions and allowances to help this happen.

6.4 NATIONAL PLANNING POLICY FRAMEWORK (NPPF) (ENGLAND)

The NPPF is the main source of planning policy for England. It was originally published in March 2012 and updated in July 2018, February 2019 and June 2019. The NPPF contains policy on a wide range of planning issues, and on the different processes in the planning system such as preparing local plans, which set out policy for a local area for a defined period, and development management. Some of the key policies from the NPPF that can support and promote better IWM through planning policy and projects include:

- ◆ The 'net gain' principle, which is included throughout the NPPF;
- ◆ providing green and public spaces are cited as aspects of good design, green infrastructure delivery and healthy communities.
- ◆ Local green space can offer opportunities to protect land important for IWM.
- ◆ Local plans should help areas to be resilient to current and future risks from the climate, including by using green infrastructure, and should consider strategic issues including water supply, climate resilience and the natural environment:
 - climate change adaptation, flooding, the natural environment, water quality and infrastructure are all strategic issues that local plans should address
 - flooding from 'local' sources should be assessed and planned for through local plans and in development management, including by promoting SuDS, particularly for major developments, and the involvement of LLFAs
 - promoting well-being, and
 - contributing to natural capital through health, well-being and cultural infrastructure.

The concept of IWM is not referred to in the NPPF. However, Paragraph 7 states that the "*the purpose of the planning system is to contribute to the achievement of sustainable development*".

The sustainable development theme is expanded on in a fundamental section of the NPPF (achieving sustainable development). Paragraph 8 states that:

'Achieving sustainable development means that the planning system has three overarching objectives, which are interdependent and need to be pursued in mutually supportive ways (so that opportunities can be taken to secure net gains across each of the different objectives)'.

Paragraph 8 of the NPPF defines the environmental objective of sustainable development as: "*to contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy*".

The net gain principle is also emphasised in Paragraph 32 about creating local plans.

Paragraph 11, the NPPF contains a 'presumption in favour of sustainable development' which is the decision-making guiding principle that runs through the document. This is an important principle and is reproduced here:

"For plan making this means that:

- ◆ *plans should positively seek opportunities to meet the development needs of their area, and be sufficiently flexible to adapt to rapid change;*
- ◆ *strategic policies should, as a minimum, provide for objectively assessed needs for housing and other uses, as well as any needs that cannot be met within neighbouring areas, unless:*
 - *the application of policies in this Framework that protect areas or assets of particular importance provides a strong reason for restricting the overall scale, type or distribution of development in the plan area; or*
 - *any adverse impacts of doing so would significantly and demonstrably outweigh the benefits, when assessed against the policies in this Framework taken as a whole.*

For decision-taking this means:

- ◆ *approving development proposals that accord with an up-to-date development plan without delay; or*

- ◆ where there are no relevant development plan policies, or the policies which are most important for determining the application are out-of-date, granting permission unless:
 - the application of policies in this Framework that protect areas or assets of particular importance provides a clear reason for refusing the development proposed; or
 - any adverse impacts of doing so would significantly and demonstrably outweigh the benefits, when assessed against the policies in this Framework taken as a whole.”

The presumption in favour of sustainable development is relevant to the delivery of better water management because:

- ◆ it is often interpreted as ‘tipping the balance’ in favour of new development (especially housing), at the expense of achieving high environmental quality – including IWM
- ◆ it increases the need for evidence of environmental harm and benefit that can be used by planning decision makers
- ◆ it refers to NPPF policies that are relevant to IWM that can outweigh the normal presumption in favour of new development. These include sites protected under the Birds Directive (Directive 2009/147/EC) and the Habitats Directive (Council Directive 92/43/EEC), local green space and locations at risk of flooding.

Paragraph 20b contains a requirement for strategic policies in local plans, including infrastructure for “*water supply, wastewater, flood risk and coastal change management*” and “*conservation and enhancement of the natural, built and historic environment, including landscapes and green infrastructure, and planning measures to address climate change mitigation and adaptation.*”

This means that policies that will help IWM such as minimum requirements for water efficiency, preferred SuDS approaches, identification of green infrastructure networks and improvements to them, and measures to improve biodiversity and public access can be identified as strategic priorities and included in local plans.

Paragraph 28 states that non-strategic, detailed policies that “*set out more detailed policies for specific areas, neighbourhoods or types of development*” can go into local plans or neighbourhood plans created by parishes and other neighbourhood planning bodies. These could include detailed or location-specific requirements for IWM.

The NPPF contains a greater emphasis on the ‘deliverability’ of plans. This is manifested in Paragraph 34: “*Plans should set out the contributions expected from development. This should include setting out the levels and types of affordable housing provision required, along with other infrastructure (such as that needed for education, health, transport, flood and water management, green and digital infrastructure). Such policies should not undermine the deliverability of the plan.*”

This information is useful for IWM as it makes it clear that flood and water management and green infrastructure requirements should be considered along with affordable housing and ‘hard’ or grey infrastructure needs. The challenges that deliverability poses can be overcome if it can be demonstrated that IWM provides multiple benefits and cheaper or similar cost solutions compared with traditional drainage and provides additional benefits.

The NPPF contains policy on many planning topics relevant to local plans and development management. While the relevance of these may not be immediately apparent, some contain ‘hooks’ that planners can use to justify promoting IWM.

Paragraphs 59 to 79 are about ‘delivering a sufficient supply of homes’. The NPPF and Ministerial Statements, legislation and incentives/penalties have been aimed at increasing the amount of land designated for housing and the amount of planning permissions for new housing. Planners may give more weight in their decisions on local plans and development management to increasing housing supply. However, it does not mean that housing should be provided regardless of other planning objectives.

Paragraphs 91 to 101 are about ‘promoting healthy communities’. In Paragraph 91c, one of the aims is to achieve places which “*enable and support healthy lifestyles, especially where this would address identified local*

health and well-being needs – for example through the provision of safe and accessible , sports facilities, local shops, access to healthier food, allotments and layouts that encourage walking and cycling.”

In addition to delivering social, recreational and cultural services, planning policies and decisions should “ensure an integrated approach to considering the location of housing, economic uses and community facilities and services.” (Paragraph 92e).

Planning policies for open space should be based on “robust and up-to-date assessments of the needs for open space” (Paragraph 96). A powerful tool (with protection equal to green belt) is local green space (Paragraphs 96-101):

- “a in reasonably close proximity to the community it serves;*
- b demonstrably special to a local community and holds a particular local significance, for example because of its beauty, historic significance, recreational value (including as a playing field), tranquillity or richness of its wildlife; and*
- c local in character and is not an extensive tract of land. (para 100).”*

Local green space designation can be used to protect green infrastructure which performs a valuable IWM function, such as parks, linear open spaces around watercourses, ponds and other water bodies.

Paragraphs 124 to 132 are about ‘achieving well-designed places’. One of the key messages is that “*good design is a key aspect of sustainable development; it creates better places in which to live and work and helps make development acceptable to communities*” and that plans should set out a design vision for the future.

Paragraph 127 includes some key principles for good design that complement and support delivering IWM and green infrastructure. These include principles to encourage blue-green infrastructure interventions that:

- “a will function well and add to the overall quality of the area, not just for the short term but over the lifetime of the development;*
- b are visually attractive as a result of good architecture, layout and appropriate and effective landscaping;*
- c are sympathetic to local character and history, including the surrounding built environment and landscape setting, while not preventing or discouraging appropriate innovation or change (such as increased densities);*
- d optimise the potential of the site to accommodate and sustain an appropriate amount and mix of development (including green and other public space) and support local facilities and transport networks; and*
- e create places that are safe, inclusive and accessible and which promote health and well-being, with a high standard of amenity for existing and future users; and where crime and disorder, and the fear of crime, do not undermine the quality of life or community cohesion and resilience.”*

The NPPF section on ‘meeting the challenge of climate change, flooding and coastal change’ (Paragraphs 148 to 169) is key to implementation of effective IWM policies. IWM can improve resilience to climate change by providing flood storage, slowing the flow of floodwater, increasing infiltration to groundwater, promoting water efficiency and enhancing biodiversity.

LPAs must adopt proactive strategies to mitigate and adapt to climate change (Paragraph 149) which is a legal requirement introduced by the Climate Change Act 2008. RTPI and TCPA (2018) provides advice on the kind of policies that LPAs should include to achieve this.

Paragraph 149 advises local plans to: “*... take a proactive approach to mitigating and adapting to climate change, taking into account the long-term implications for flood risk, coastal change, water supply, biodiversity and landscapes, and the risk of overheating from rising temperatures*”⁴⁸. Policies should support appropriate measures to ensure the future resilience of communities and infrastructure to climate change impacts, such as providing space for physical protection measures, or making provision for the possible future relocation of vulnerable development and infrastructure.”

It is important to note that ‘flood risk’ includes all sources of flood risk and has been defined as: “*...a combination of the probability and the potential consequences of flooding from all sources – including from rivers and the sea, directly from rainfall on the ground surface and rising groundwater, overwhelmed sewers and drainage systems, and from reservoirs, canals and lakes and other artificial sources.*” (MHCLG, 2019b Flood risk and Coastal change section, Paragraph 002).

A key aim is that new developments: “*avoid increased vulnerability to the range of impacts arising from climate change. When new development is brought forward in areas which are vulnerable, care should be taken to ensure that risks can be managed through suitable adaptation measures, including through the planning of green infrastructure.*” (Paragraph 150).

Furthermore, local plans “*should be supported by strategic flood risk assessment and develop policies to manage flood risk from all sources, taking account of advice from the Environment Agency and other relevant flood risk management bodies, such as LLFAs and internal drainage boards..*” (Paragraph 100).

Part of the NPPF’s general approach to flood risk is: “*..using opportunities provided by new development to reduce the causes and impacts of flooding (where appropriate through the use of natural flood management techniques).*” (Paragraph 157c)

Good IWM policies and projects will often include extensive use of natural flood risk management techniques as they offer greater opportunity for maximising the multiple benefits than ‘hard’, grey infrastructure.

Two important policy tests related to flooding are the sequential test and the exception test. The sequential test (Paragraph 158) is primarily aimed at directing new development away from areas at risk of flooding from all sources. Previously this was mainly applied to areas at risk of flooding from the sea or rivers, so this is potentially a significant policy shift which will have to be reflected in revised planning practice guidance.

The exception test (Paragraphs 159 to 160) requires decision makers to be satisfied that a development in an area at risk of flooding: “*provides wider sustainability benefits to the community that outweigh flood risk, and a site-specific flood risk assessment must demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.*” (Paragraph 160).

All developments should not increase flood risk elsewhere and in areas at risk of flooding. One of the NPPF’s policy tests is that development should only be approved if “*it incorporates sustainable drainage systems, unless there is clear evidence that this would be inappropriate.*” (Paragraph 163c).

Paragraph 165 includes the crucial policy hook that gives priority to the use of SuDS in major new developments, which “*should incorporate SuDS unless there is clear evidence that this would be inappropriate. The systems used should:*

- a take account of advice from the LLFA;*
- b have appropriate proposed minimum operational standards;*
- c have maintenance arrangements in place to ensure an acceptable standard of operation for the lifetime of the development; and*
- d where possible, provide multifunctional benefits.”*

A good IWM approach can contribute to meeting NPPF requirements by reducing flood risk and managing it through SuDS, and by incorporating natural flood management (flood storage and vegetative or GI SuDS, rather than grey infrastructure and attenuation tanks underground).

The section of the NPPF about ‘conserving and enhancing the natural environment’ (Paragraphs 170-187) reflects some of the guidance in HM Government (2018) and states that the:

“planning system should contribute to and enhance the natural and local environment by:

- a ... the wider benefits from natural capital and ecosystem services ...;*
- b maintaining the character of the undeveloped coast, while improving public access to it where appropriate;*
- c minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;*
- d preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water... pollution.... Development should, wherever possible, help to improve local environmental conditions such as ... water quality, taking into account relevant information such as river basin management plans.”*

Paragraph 170 is a crucial paragraph that supports the concept of IWM, which contributes to several ecosystem services, and should contribute to net gains in current and future biodiversity and water quality.

The NPPF contains several references (paragraphs 24 to 27) to the need for planners and other professions, and bodies such as utility providers, to work together on producing local plans, including across administrative boundaries. This is partly due to the legal requirement in the Localism Act 2011 known as the ‘duty to co-operate’. It applies to ‘cross-border’ issues such as flooding, biodiversity and water supply and should be used to encourage IWM. In the future, statements of common ground will be prepared, and these could provide a useful way of embedding an IWM approach across administrative boundaries. The planning practice guidance contains advice on how to prepare these (MHCLG, 2019b, plan-making section, paragraphs 9 to 17).

6.5 PLANNING PRACTICE GUIDANCE

The planning practice guidance for England was first published in March 2014, replacing many thousands of pages of detailed guidance contained in previous statements, guidance notes and circulars. This section reviews the most relevant sections and paragraphs published up to the end of July 2019.

Planning practice guidance:

- ◆ provides numerous ‘hooks’ and encouragement for planners to take into account water quality and supply, local sources of flooding and green infrastructure in plan making and in deciding applications
- ◆ encourages assessment of current and future risks, positive improvements and taking a wider-than-local approach – specifically encouraging a catchment approach
- ◆ does not, however, specifically encourage an integrated approach to formulation of policies about water, even if they are informed by a document such as a water cycle study that may encourage just such an approach.

6.5.1 Water supply, wastewater and water quality

The introduction includes the key advice that: “*Multiple benefits for people and the environment can be achievable through good design and mitigation.*” (MHCLG 2019b, water supply, wastewater and water quality section, Paragraph 019).

It also advises consideration of local issues, and the contribution that can be made to Defra’s preferred ‘catchment-based approach’. It encourages early discussions with water companies, particularly where two levels of local authorities are responsible for the water environment (county councils and unitary authorities are responsible for planning for waste, including wastewater), so that the water companies can take account of planned development in their business planning, such as water resource management plans.

The PPG refers to the legal requirement derived from the WFD for local authorities to ‘have regard’ to river basin management plans. These plans set out the actions needed for water bodies to achieve ‘good’ status. They include actions for planning authorities and for developers.

The broad considerations for local plans are:

- ◆ infrastructure
- ◆ water quality
- ◆ wastewater
- ◆ cross-boundary concerns
- ◆ strategic environmental assessment and sustainability appraisal
- ◆ habitats regulations assessments , and
- ◆ “*need to consider the objectives in the government’s 25 Year Environment Plan to reduce the damaging abstraction of water from rivers and groundwater, and to reach or exceed objectives for rivers, lakes, coastal and ground waters that are specially protected.*” (MHCLG, 2019b, water supply, wastewater and water quality section, Paragraph 002).

The PPG encourages LPAs to take water quality into account in plan making. Examples given include: “*How to help protect and enhance local surface water and groundwater in ways that allow new development to proceed and avoid costly assessment at the planning application stage.*” and “*whether measures to improve water quality, for example sustainable drainage schemes, can be used to address impacts on water quality in addition to mitigating flood risk.*” (MHCLG, 2019b, water supply, wastewater and water quality section, Paragraph 006).

Parts A and B of this guidance provide examples of where IWM can achieve these multiple outcomes.

The need for co-operation between the Environment Agency, water companies, catchment partnerships and LPAs to address water quality and supply issues is emphasised, with a reminder that the ‘duty to co-operate’ in the Localism Act 2011 applies to cross-boundary issues such as water and should be included in a Statement of Common Ground (MHCLG, 2019b, water supply, wastewater and water quality section, Paragraph 008).

The PPG emphasises that water supply and quality should be included in the key planning tools of sustainability appraisal and Strategic Environmental Assessment, in the ‘baseline’ studies, and in setting objectives – suggested as: “*preventing deterioration of current water body status, taking climate change into account and seeking opportunities to improve water bodies.*” (MHCLG, 2019b, water supply, wastewater and water quality section, Paragraph 009).

The PPG provides many potential sources of information for planners to use to obtain information about the water environment, including water cycle studies, water company drainage strategies and various Environment Agency published information (MHCLG, 2019b, Water supply, wastewater and water quality section, Paragraph 010).

The pre-application role of the Environment Agency in identifying water quality issues and possible permit requirements is outlined in Paragraph 14 (MHCLG, 2019b, water supply, wastewater and water quality section).

Neighbourhood plans and development orders may also help in protecting and improving water bodies (MHCLG, 2019b, Water supply, wastewater and water quality section, Paragraph 015).

The section on deciding planning applications is dominated by the issue of how to take a proportionate approach to assessing impacts on water quality of applications (MHCLG, 2019b, water supply, wastewater and water quality section, Paragraphs 016–020 008).

6.5.2 Flood risk

The PPG provides a lot of technical guidance on flood risk. The majority of this relates to flooding from rivers or the sea, but a significant element also relates to ‘local’ flooding from surface water, groundwater and ordinary watercourses. The three core principles that planners should follow are:

- ◆ assess flood risk
- ◆ avoid flood risk
- ◆ manage and mitigate flood risk.

In reflecting these principles, the PPG says:

- ◆ LPAs and developers should seek flood risk management opportunities (eg safeguarding land), and should seek to reduce the causes and impacts of flooding (eg by using SuDS in developments)
- ◆ LLFAs (unitary authorities or County Councils) are responsible for managing local flood risk ... and for preparing local flood risk management strategies. LPAs should work with LLFAs to secure local plan policies compatible with the local flood risk management strategy Strategic Flood Risk Assessments (SFRAs) which are needed to inform local plans and planning applications should take account of all sources of flooding, and flooding in a catchment context (MHCLG, 2019b, flood risk and coastal change section, Paragraph 001).

This is reiterated in Defra/Environment Agency guidance on preparing SFRAs, which requires all sources of flooding to be included in both ‘Level 1’ and more detailed ‘Level 2’ SFRAs (Defra, 2019).

Pursuing the potential multiple benefits of SuDS is recognised in Paragraph 51 (MHCLG, 2019b, flood risk and coastal change section):

"Sustainable drainage systems are designed to control surface water runoff close to where it falls and mimic natural drainage as closely as possible. They provide opportunities to:

- ◆ *reduce the causes and impacts of flooding;*
- ◆ *remove pollutants from urban runoff at source;*
- ◆ *combine water management with green space with benefits for amenity, recreation and wildlife."*

The planning requirements were strengthened in 2015 by introducing the requirement for consultation with LLFAs on major planning applications which complements their duties to prepare plans for managing surface and other 'local' sources of flood risk.

The PPG sets out a preferred hierarchy of SuDS (MHCLG, 2019b, flood risk and coastal change section, Paragraph 080) where 'reasonably practicable' of:

- ◆ *"into the ground (infiltration)*
- ◆ *to a surface water body*
- ◆ *to a surface water sewer, highway drain, or another drainage system*
- ◆ *to a combined sewer..."*

while recognising that:

"...Particular types of sustainable drainage systems may not be practicable in all locations. It could be helpful therefore for LPAs to set out those local situations where they anticipate particular sustainable drainage systems not being appropriate."

The case studies in Part B and C of this guide demonstrate the range of circumstances where different SuDS approaches are appropriate.

The PPG requires that design, construction and maintenance arrangements and costs are considered by LPAs when considering the overall viability of development and recommends that the technical standards published by Defra are used as non-statutory guidance. However, an important qualification on the general requirement to provide SuDS is that: *"expecting compliance with the technical standards is unlikely to be reasonably practicable if more expensive than complying with Building Regulations – provided that where there is a risk of flooding the development will be safe and flood risk is not increased elsewhere."* (MHCLG, 2019b, flood risk and coastal change section, Paragraph 083).

6.5.3 Natural environment

The natural environment section of the PPG makes several references to the concept of IWM. In particular, water bodies are included in the scope of 'GI': "[GI] can also include 'blue infrastructure' such as streams, canals and other water bodies. References to green infrastructure in this guidance also apply to different types of blue infrastructure where appropriate." (MHCLG 2019b, Natural Environment section, Paragraph 004) and... "GI is a natural capital asset that provides multiple benefits, at a range of scales. For communities, these benefits can include enhanced wellbeing, outdoor recreation and access, enhanced biodiversity and landscapes, food and energy production, urban cooling, and the management of flood risk. These benefits are also known as ecosystem services" (MHCLG, 2019b, natural environment section, Paragraph 005).

The PPG encourages the use of a GI assessment to inform frameworks or strategies and local and neighbourhood plans (MHCLG 2019b, natural environment section, Paragraph 007), and states the value of GI in planning policies aimed at:

- ◆ *"Building a strong, competitive economy*
- ◆ *Achieving well-designed places*
- ◆ *Promoting healthy and safe communities*
- ◆ *Mitigating climate change, flooding and coastal change*
- ◆ *Conserving and enhancing the natural environment"* (MHCLG 2019b, natural environment section, Paragraph 006).

It also encourages planners to consider GI requirements early in the planning process, and to ensure that management arrangements are in place for the long term.

The PPG (July 2019 version) contains new advice on considering ecosystem services (MHCLG 2019b, natural Environment section, Paragraph 017) and net biodiversity gain in planning (MHCLG 2019b, natural Environment section, Paragraphs 020-028). Taking an IWM approach to local plans and projects can help to deliver an ecosystems services and/or net biodiversity gain.

6.5.4 Plan making

The plan making section of the PPG provides useful advice for helping to support a IWM approach. *Maintaining effective co-operation*, which includes a section on statements of common ground, can provide a useful framework for securing some of the CSFs – particularly early engagement, partnerships and good management. LPAs, LLFAs, water companies, the Environment Agency and other stakeholders with an interest in achieving IWM should actively engage to include their co-operation in statements of common ground.

The section on evidence base refers to several documents that can help ensure local plans promote IWM (MHCLG, 2019b, plan-making section, Paragraph 036)

"River basin management plans, Areas of Outstanding Natural Beauty management plans, green infrastructure plans (including environmental net gain and Nature Recovery Networks), tree and woodland strategies, and landscape character assessments. Working with local nature partnerships and other public bodies where appropriate, this should include an assessment of existing and potential components of ecological networks, biodiversity resources and landscapes."

"climate change... adaptation; strategic flood risk assessment and assessments of the physical constraints on land use, such as land instability, contamination and subsidence; water resource management plans; groundwater source protection zones; catchment management plans produced by catchment partnerships."

As delivery of IWM will partly depend on funding being identified, it is important that deficits, requirements and opportunities are identified and included in infrastructure funding statements (MHCLG, 2019b, plan-making section, Paragraph 055).

6.6 PLANNING POLICY WALES (PPW)

Planning Policy Wales (PPW) Welsh Government, 2018) is the overarching planning policy document for Wales and is in its tenth iteration. It is partly based on the statutory duties of the Welsh Government to produce well-being objectives, and to take reasonable steps to meet those objectives in the context of the principle of sustainable development. This approach is underpinned by the Government of Wales Act 2006 and the Well-being of Future Generations (Wales) Act 2015. The Welsh Government is one of a few in the world to have such a statutory duty. Since 7 January 2019, SuDS are legally required in most new developments and have to be approved by local authorities. This implements parts of Schedule 3 of the Flood and Water Management Act 2010 and will help ensure the more widespread adoption of SuDS.

Policy on flood risk and other water issues has not changed significantly from edition 9, but the style of the document is markedly different, with an emphasis on achieving well-being through place-making throughout.

The 'keystone' of PPW is the following paragraph:

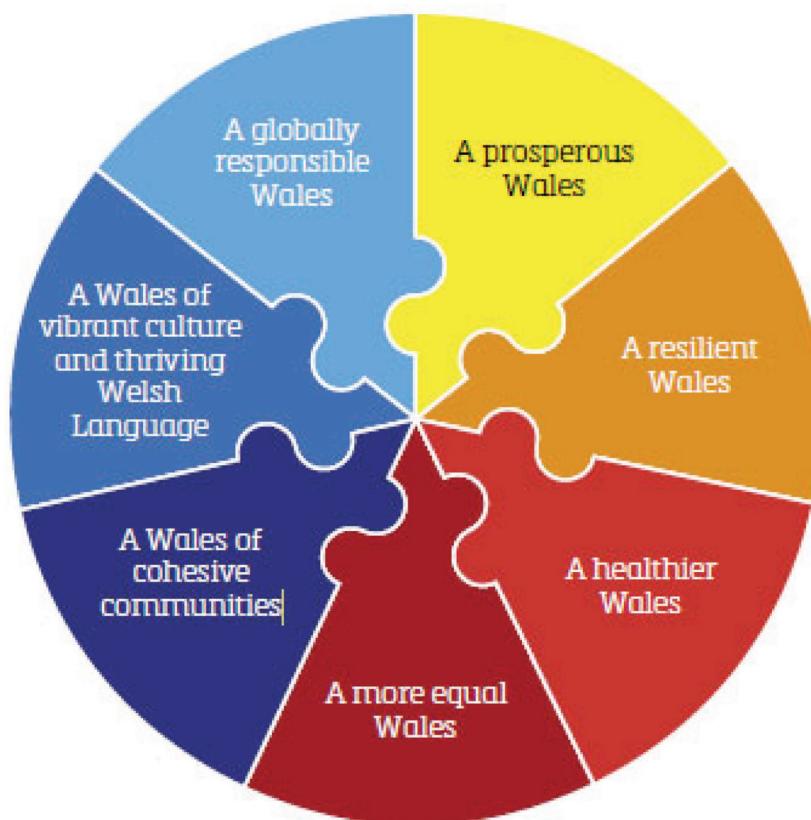
"The Planning Act introduced a statutory purpose for the planning system. Any statutory body carrying out a planning function must exercise those functions in accordance with the principles of sustainable development as defined in the Well-being of Future Generations (Wales) Act 2015. The planning system is central to achieving sustainable development in Wales. It provides the legislative and policy framework to manage the use and development of land in the public interest so that it contributes positively to the achievement of the well-being goals." (Welsh Government, 2018, Paragraph 11.5).

The concept of integrated sustainable water management is supported by Welsh Government's interpretation of sustainable development, explained in Chapter 4 of PPW.

The Welsh Government's definition of sustainable development is:

"Sustainable development" means the process of improving the economic, social, environmental and cultural well-being of Wales by taking action, in accordance with the sustainable development principle, aimed at achieving the well-being goals. Acting in accordance with the sustainable development principle means that a body must act in a manner which seeks to ensure that the needs of the present are met without compromising the ability of future generations to meet their own needs." (Paragraph 1.10, Welsh Government, 2018).

This is divided into seven 'well-being' goals as presented in [Figure 6.1](#).



[Figure 6.1 Well-being goals \(from Welsh Government, 2016\)](#)

While the term 'IWM' is not used in PPW, promoting IWM can help achieve several of these goals. The primary one is 'a resilient Wales':

"A nation which maintains and enhances a biodiverse natural environment with healthy functioning ecosystems that support social, economic and ecological resilience and the capacity to adapt to change (for example climate change)."

The emphasis on sustainable place-making is summarised in Paragraph 2.3:

"The planning system should create sustainable places which are attractive, sociable, accessible, active, secure, welcoming, healthy and friendly. Development proposals should create the conditions to bring people together, making them want to live, work and play in areas with a sense of place and wellbeing, creating prosperity for all."

PPW aims to achieve five sustainable place-making outcomes:

- 1 Creating and sustaining communities.
- 2 Growing our economy in a sustainable manner.
- 3 Making best use of resources.
- 4 Maximising environmental protection and limiting environmental impact.
- 5 Facilitating accessible and healthy environments.

PPW is structured around four themes which contain the policy needed for development plans and proposals on the ground to achieve the five sustainable place-making outcomes:

- ◆ strategic and spatial choices (Chapter 3)
- ◆ active and social places (Chapter 4)
- ◆ productive and enterprising places (Chapter 5)
- ◆ distinctive and natural places (Chapter 6).

The policies that will help to achieve better IWM are mainly in Chapters 3, 4 and 6.

Chapter 3 promotes good design, including for environmental reasons. **Figure 6.2** shows the objectives of good design.

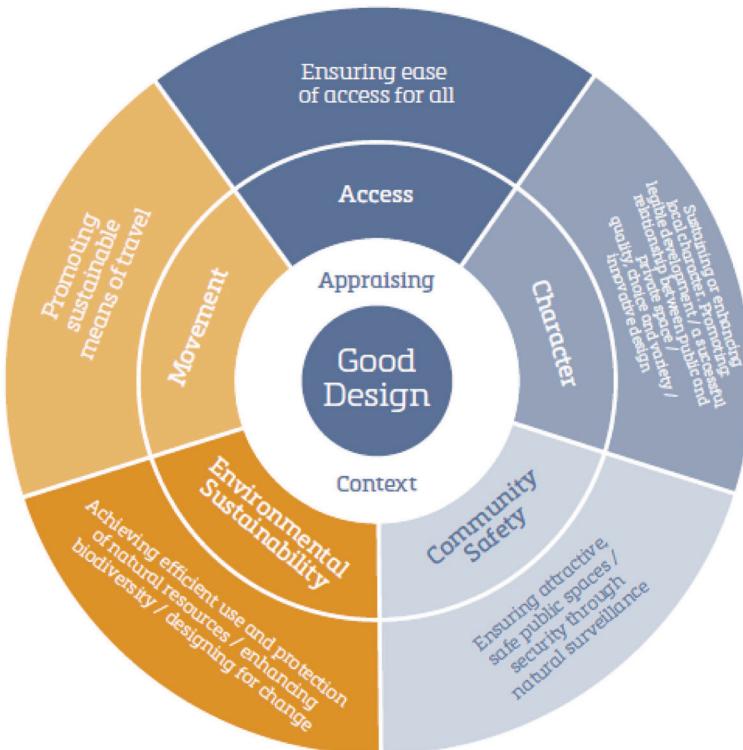


Figure 6.2 The objectives of good design (from Welsh Government, 2016)

This is discussed in Paragraph 3.8, which states that the elements of good IWM should be designed in to new developments:

"Good design can help to ensure high environmental quality. Landscape and green infrastructure considerations are an integral part of the design process. Integrating green infrastructure is not limited to focusing on landscape and ecology, rather, consideration should be given to all features of the natural environment and how these function together to contribute towards the quality of places. This embraces the principles of 'ecosystems services' and sustainable management of natural resources where multiple benefits solution become an integral part of good design. In a similar manner, addressing environmental risks can make a positive contribution to environmental protection and improvement, addressing land contamination, instability and flood risk and providing for biodiversity, climate protection, improved air quality, soundscape and water resources benefits."

Chapter 3 is partly based on the legal requirement for sustainable management of natural resources which includes:

- ◆ "improving the resilience of ecosystems and ecological networks;
- ◆ halting and reversing the loss of biodiversity;
- ◆ maintaining and enhancing green infrastructure based on seeking multiple ecosystem benefits and solutions;
- ◆ ensuring resilient locational choices for infrastructure and built development, taking into account water supplies, water quality and reducing, wherever possible, air and noise pollution and environmental risks, such as those posed by flood risk, coastal change" (Paragraph 3.32).

Good design should promote environmental sustainability (Paragraphs 3.7 and 3.8), and green infrastructure is recognised as being important in helping enhance well-being (Paragraphs 3.32 and 3.33). The importance of well-designed green infrastructure in new street layouts is recognised in Paragraph 4.1.20.

Chapter 6 is where most of the policy that will help deliver better IWM in Wales is located.

"A resilient Wales can be supported by protecting sufficient scales, extent and connectivity of, and between, landscapes and habitats to enable them to withstand the pressures of change and protect and enhance biodiversity, to tackle pollution, to protect and enhance water resources, to protect soils and to enable flood mitigation, the creation of carbon sinks, especially in urban areas, and to promote opportunities for social and economic activity based on valuing and enabling access to the natural, historic and built environment." (Introduction, Chapter 6)

This is illustrated in the figure at the start of the chapter.



Figure 6.3 How sustainable development outcomes are linked and work together as a whole, with natural and distinctive outcomes emphasised

Green infrastructure has statutory backing and an important role: *"Its provision can make a significant contribution to the sustainable management of natural resources, and in particular to maintaining and enhancing biodiversity and the resilience of ecosystems in terms of the diversity between and within ecosystems and the extent, condition and connectivity of ecosystems and their ability to adapt."* (Paragraph 6.2.2, Welsh Government, 2018).

Paragraph 6.6.5 also has strong integrated policy on water resources and sustainable drainage:

"The planning system should:

- ◆ *protect and improve water resources by promoting and encouraging increased efficiency and demand management of water as part of new developments, particularly in those areas where water resources may be under pressure or may not be available;*
- ◆ *ensure that the infrastructure on which communities and businesses depend is adequate to accommodate proposed development so as to minimise risk to human health and the environment and prevent pollution at source;*
- ◆ *ensure sustainable drainage systems are an integral part of design approaches for new development; and*
- ◆ *ensure the protection of the quantity and quality of surface and ground water supplies is taken into account as part of development proposals."*

Paragraphs 6.6.14 to 6.6.19 contain strong policies on the need for the multiple benefits of SuDS to be recognised, for a whole catchment approach to be taken, and for SuDS to work with natural processes.

Paragraphs 6.6.22 to 6.6.29 contain flood and coastal risk management policies, Paragraph 6.6.27 requires the use of SuDS to manage local flood risks from surface and ground water, and Paragraph 6.6.28 recognises the multiple benefits of green infrastructure:

"Nature-based solutions should be the first consideration given the opportunity to deliver other multiple benefits, including habitat creation, biodiversity enhancement and water quality improvements. Overall, green infrastructure opportunities can benefit ecosystem resilience and provide opportunities for leisure facilities or renewable energy generation."

Paragraph 6.7.12 promotes green infrastructure for its role as: *"an important means of addressing the cumulative impacts of air and noise pollution and soundscapes on individuals and society and provide benefits for social and ecosystems resilience."*

6.7 TECHNICAL ADVICE NOTES

Technical advice notes are produced by the Welsh Government and provide guidance to planners in Wales. They are material planning considerations in the preparation of local development plans and development management decisions.

Welsh Government (2016b) includes considering the context of developments, and the importance of good design in helping to manage water sustainably and to adapt to climate change.

Section 8 and Appendix 4 of Welsh Government (2004) on development and flood risk recognises that:

"Development in one part of a catchment may increase runoff and hence flood risk elsewhere, therefore, the aim should be for new development not to create additional runoff when compared with the undeveloped situation, and for redevelopment to reduce runoff where possible. It is accepted that there may be practical difficulties in achieving this aim.

Such systems can also provide habitat and amenity enhancements and passive treatment to improve water quality prior to discharge." (Paragraph 8.3 to 8.4)

It also sets a 'high bar' for SuDS: *"Developers will need to give good reason why SuDS could not be implemented. If a conventional drainage system does not improve the status quo or has a negative impact then this can be a valid reason for refusal;" and "Consideration must also be given to maintaining the effectiveness of any drainage system, including pipes." (Paragraph 8.5)*

The multiple benefits of SuDS are recognised in Appendix A4.9:

"Their use provides a significant contribution towards more sustainable development since they:

- ◆ *manage environmental impacts at source, rather than downstream;*
- ◆ *manage water runoff rates, reducing the impact of urbanisation on flooding;*
- ◆ *protect or enhance water quality;*
- ◆ *are sympathetic to the environmental setting and the needs of the local community;*
- ◆ *provide opportunities to create habitats for wildlife in urban watercourses;*
- ◆ *can encourage natural groundwater recharge (where appropriate); and*
- ◆ *can protect water resources through recycling."*

6.8 NATIONAL POLICY STATEMENTS

National policy statements are produced by the UK Government under the Planning Act 2008 and provide the policy context for deciding nationally-significant infrastructure projects in the energy, waste, transport and water sectors. In some cases, these decisions are devolved to the Welsh Government. The national policy statements were published (or 'designated') from 2010 onwards and contain largely similar, generic policy on planning matters. Except for the 'new nuclear' national policy statement, they are not location-specific.

The most recent national policy statements to be 'designated' was the Department for Transport's (2018) airport national policy statement in July 2018. It only refers to south-east England. It encourages the use of green infrastructure in adapting to climate change (Paragraph 4.43), biodiversity (Paragraph 5.104) and *"to enable developments to provide positive environmental and economic benefits."* (Paragraph 5.106).

Its policies on ‘local’ flooding and water quality are largely derived from the NPPF. For example, a flood risk assessment submitted with the application for development consent should include consideration of local flood risks for the lifetime of the development. The Water Framework Directive is a material consideration in deciding applications for development consent orders, and SuDS are encouraged to control drainage (Paragraphs 5.147 to 5.186).

6.9 NATIONAL ADAPTATION PROGRAMME

The *National Adaptation Programme and Third Strategy for Climate Adaptation Reporting* (Defra, 2018b) sets out the UK Government’s response to the 2017 climate change risk assessment (HM Government, 2017). It applies to England. It draws heavily on the 25 year environment plan and its natural capital approach. The concept of IWM is not referred to, but the need to increase resilience to increased flooding, water shortages and threats to water quality and aquatic biodiversity are recognised.

The national adaptation programme emphasises an integrated approach to tackling climate change threats, such as on building ecological resilience (Paragraph 2.2.1):

- “1 Protect and improve our protected sites and other areas of important wildlife habitat;
- 2 restore degraded ecosystems, for example by restoring ecological and hydrological functions and expand and connect high-quality wildlife-rich habitat; and
- 3 reduce pressures from other sources such as water and air pollution and invasive non-native species.”

Section 7 of the National Adaptation Programme sets out the UK Government’s requirements for adaptation reporting by public and private bodies. Many of the reporting requirements relate to threats from flooding or to the water environment. If those bodies adopt an IWM approach, it would help them address multiple threats.

Annex 1 of the National Adaptation Programme is a useful table summarising climate threats and their urgency. Together with Table 2 (an actions log), they could provide a guide for any LPA, LLFA or other body that wants to use IWM to address climate change threats.

6.10 FUTURE DEVELOPMENTS IN PLANNING POLICY AND GUIDANCE

The European Union (Withdrawal) Act 2018 copies current EU laws into UK law before Brexit. There remain questions over its implementation, including where powers are devolved for planning, flooding and water management.

6.10.1 England

The UK Government is reviewing planning practice guidance to reflect the revised NPPF.

In England, the government consulted on a draft national policy statement concerning water resources in late 2017, including the need to respond to pressures such as population growth, climate change, and on the environment (Paragraph 1, Defra, 2017).

The draft national policy statement refers to a ‘twin-track’ approach including promoting demand management that includes leakage control, water efficiency and metering, while developing new resources such as reservoirs and transfer systems, and while protecting the environment. The consultation document did not refer to IWM, green infrastructure or SuDS, despite the potential for their role in protecting and enhancing water quality and encouraging infiltration of surface water into groundwater.

Defra has consulted on a proposed standardised, mandatory approach to biodiversity net gain approach to give developers and planners clarity and certainty on how to improve the environment, to help implement the NPPF (Defra, 2018a). While aimed at protecting habitats and species, it could help IWM by being developed in future for water resources, flood risk and blue-green infrastructure.

6.10.2 Wales

A review of technical advice notes that provide guidance to support PPW is being carried out. The review of Welsh Government (2004) was undertaken in 2017 (JBA Consulting, 2017), and a revised version is likely to be issued for consultation in future. Its main feature is likely to be proposing to move away from a purely precautionary approach to a more risk-based approach, allied to more emphasis on both the plan-led system and to resilience in new development.

It is also expected that a draft National Development Framework (a spatial sister document to PPW (Welsh Government, 2018), and a replacement for the Wales spatial plan) will be issued in August 2019 and will cover blue-green infrastructure quite extensively.

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Statutes

Acts

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Localism Act 2011 (c.11)

Planning Act 2008 (c.29)

Directives

Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora

Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds

Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy

Part E

Characteristics of good local policy

Part A
Main guide

Part B
Physical case
studies

Part C
Local case studies

Part D
National policy
review

Part E
Characteristics
of local policy

7 Introduction

7.1 CHARACTERISTICS OF GOOD LOCAL POLICY

This section of the '*Delivering better water management through the planning system*' guidance will be particularly useful for policymakers looking for examples of local plan policies that help to deliver integrated water management (IWM) that are 'sound'. **Table 7.1** sets out the characteristics of good local policy, while **Tables 7.2 to 7.8** provide more detail about how the examples of good local planning policy (**LP1 to LP15**) demonstrate some of these.

Table 7.1 Characteristics of good local policy

Characteristic	Recommendations
Evidence based	Justify policies by linking to and referencing: <ul style="list-style-type: none">◆ strategic flood risk assessments◆ local flood risk management strategies◆ surface water management plans◆ river basin management plans◆ water resource management plans◆ drainage and wastewater management plans◆ catchment management plans◆ green infrastructure strategies◆ infrastructure delivery plans/infrastructure funding statements◆ water cycle studies and/or IWM strategies◆ policies and supporting evidence from strategic and/or joint spatial development strategies or local plans◆ viability assessments and other relevant evidence.
Visionary	IWM policies should help deliver a clear vision for sustainable development, or a theme such as ecosystems services or climate change adaptation.
Strategic	Local plans should include a strategic policy that integrates managing flood risk, water quality, water efficiency and blue-green networks, and sets the framework for any non-strategic local plan or neighbourhood plan policies.
Avoid duplication	Do not reproduce national policy, but translate it into locally-specific policy.
Clear and positive	Use opportunities to introduce appropriate water consumption standards, flexible enough to allow for future improvements in national standards. Use strong language (eg 'will only be permitted when...') that emphasises the requirements for new development to deliver positive benefits, preferably identified as targets (eg what constitutes 'reduced water demand' or 'better water quality').
Co-operative	Develop policies with strategic partners and neighbouring LPAs. Include IWM issues in statements of common ground to help pass the soundness test.
Deliverable	Include IWM in infrastructure delivery plans/infrastructure funding statements and longer term masterplans, including identifying long-term management. Ensure that LPA development management staff understand the IWM policies by having ease of access to a clear and simple evidence base, and produce a developer guide, or supplementary planning guidance to produce the detail to show others how it works.

Table 7.2 Examples of local policy being evidence based

Characteristic and observations from the case studies	Example	Recommendations
Evidence based A wide variety of evidence sources is used in the case study local policies.	Cambridge City Council's policy is based on joint studies with South Cambridgeshire Council (LP1). The London Borough of Lewisham's policies include a list of key evidence base documents (LP2). London's evidence base includes innovative elements such as urban greening factors and natural capital accounts, as well as a more conventional flood risk appraisal and a water resources management plan (LP3). The supporting text to Warwick's local policies refers to several studies used to justify them (LP7). The Ashford Water Group was brought together to implement the actions from an IWM strategy, and this work has now influenced supplementary planning guidance and a new local plan. (LP12).	Clearly justify policies by linking to and referencing strategic flood risk assessments, local flood risk management strategies, river basin management plans, water resource management plans, catchment management plans, water company's drainage and wastewater management plans and water resource management plans, green infrastructure strategies, infrastructure delivery plans/infrastructure funding statements, water cycle studies and/or IWM strategies, viability assessments and other relevant evidence.
	Arun District Council's policies are based on a jointly-prepared surface water management study (LP14).	
	St Helens Council base their policies on a wide variety of evidence (LP15).	

Table 7.3 Examples of local policy demonstrating vision

Characteristic and observations from the case studies	Example	Recommendations
Vision	Cambridge City Council's developments should comply with 15 sustainability objectives (LP1). Peterborough's local policies are helping to deliver a long-term vision for the Nene Valley, as set out in a nature improvement area, and maximise delivery of ecosystems services and active and healthy lifestyles (LP4). North Northants include a strategic objective of protecting and enhancing ecosystem services, and an overarching place-making policy that encompasses biodiversity by design (LP6). South Downs' plan is based on the ecosystems services approach (LP8). Brighton and Hove's policies CP8 and CP11 are part of the city's aim of achieving a One Planet vision of sustainability (Bioregional, undated)(LP11). Arun District Council has seven sustainability objectives overarching their local plan. The objectives are reproduced at the start of each chapter (LP14).	It is difficult to see a clear link between the detailed policies and strategic ones in many local plans. IWM policies should help deliver a clear vision for sustainable development, or a theme such as ecosystems services or climate change adaptation.

Table 7.4 Examples of local policy demonstrating strategic factors

Characteristic and observations from the case studies	Example	Recommendations
Strategic Many local policies that can help deliver IWM are spread throughout local plans and not well signposted to each other.	Cambridge City Council's policy on water management is in a chapter called <i>Responding to climate change and managing resources</i> which places it with other complimentary policies (LP1).	Local plans should include a strategic policy that integrates managing flood risk, water quality, water efficiency and blue/green networks, and sets the framework for any non-strategic local plan or neighbourhood plan policies.
	London has policies that apply across all boroughs, and that commit the GLA to working with bodies outside its administrative boundaries (LP3).	
	Hull City Council groups its IWM policies together and identifies that they are an important contribution to climate change adaptation (SP10) (LP13).	
	Arun District Council recognises the role of green infrastructure in helping to deliver sustainable water management. It has many neighbourhood plans so the policies provide a strategic approach for them (LP14).	
	St Helens Council includes reducing flooding and improving water quality as important elements of its Strategic Policy LPA01, explaining what the presumption in favour of sustainable development means. St Helens also includes a small table with each detailed policy, showing how it meets strategic aims and objectives (LP15).	

Table 7.5 Examples of local policy demonstrating the avoidance of duplication

Characteristic and observations from the case studies	Example	Recommendations
Avoid duplication Some local policies repeat the National Planning Policy Framework (NPPF) with little local distinctiveness.	Cambridge City Council has developed an ambitious policy that goes beyond NPPF requirements and is locally tailored (LP1).	Don't reproduce national policy but translate it into locally-specific policy.
	The London Borough of Croydon requires SuDS in all developments – NPPF is major developments only (LP5).	
	Arun District Council's policy for SuDS adds detail to the NPPF policy, by distinguishing between SuDS in private areas and public areas depending on the size of development (LP14).	

Table 7.6 Examples of local policy being clear and positive

Characteristic and observations from the case studies	Example	Recommendations
Clear and positive Many local policies use 'weaker' language, emphasise the negative ('Development will not be permitted...') and are not clear about what developers have to comply with – no clear targets.	Cambridge City Council's policy identifies the circumstances in which development will be permitted, and contains illustrations showing how it can be done (LP1). London Borough of Lewisham's Policy 10 seeks positive improvements to flood risk (LP2). London's policies include ambitious targets for water efficiency and an innovative approach to securing green infrastructure (LP3). Peterborough City Council's policies LP22 and LP24 use strong positive language to protect existing green infrastructure, prevent increases in flooding and identify preferred improvements to green infrastructure. (LP4). North Northants Policy 5 has clear requirements for new developments for water consumption and to help meet the river basin management plan objectives (LP6). Most of Warwick District Council's plans use strong language and refer to specific targets, eg achieving good water status (LP7). SDNPA has developed guidance and checklists to help developers and householders integrate ecosystems services into schemes (LP8). Brighton and Hove City Council's Policy CP11 has strong wording requiring localised flood risks to be assessed and mitigated, and its Policy CP8 is more ambitious than national policy (LP11). Arun District Council's policies have requirements that developers must satisfy, eg a list of SuDS options for minor and major development, and a requirement for all major housing in inland Arun to have a comprehensive strategy for surface water management. Arun has also included a water consumption standard for new residential developments (LP14).	Use opportunities to introduce appropriate water consumption standards flexible enough to allow for future improvements in national standards. Use strong language (eg 'will only be permitted when...') that emphasises the requirements for new development to deliver positive benefits, preferably identified as targets (eg what constitutes 'reduced water demand' or 'better water quality').

Table 7.7 Examples of local policy being co-operative

Characteristic and observations from the case studies	Example	Recommendations
Co-operative A co-operative approach to policy-making is clear in the case study local policies.	North Northants' policies cover an area that includes several district council areas (LP6). Warwick District Council refers to achieving strategic partners' objectives in 'bold text' policies (LP7). Ashford Borough Council's evidence base and policies have been developed by the Ashford Water Group (LP12). Hull City Council's policies on water management are part of a wider LWW partnership that reflects the city's unique, and challenging, relationship with water (LP13). Arun District Council's SuDS policy was developed through co-operative working between district councils, the county council LLFA and the water company (LP14). St Helens Council's policies were scoped with the LLFA and through discussions with neighbouring LPAs in the catchment and the wider catchment partnership, to seek the widest policy links (LP15).	Develop policies with strategic partners and neighbouring LPAs. Include IWM issues in statements of common ground to help pass the Soundness test.

Table 7.8 Examples of local policy being deliverable

Characteristic and observations from the case studies	Example	Recommendations	
Deliverable Some local plans do not have a clear link to their infrastructure delivery plans, which do not always contain proposals for IWM	<p>Cambridge City Council identifies green infrastructure, water and flood risk infrastructure in its policy for planning obligations and Community Infrastructure Levy (LP1).</p> <p>Peterborough City Council's policies make it clear that planning conditions, obligations and Community Infrastructure Levy will be used to secure long-term maintenance (LP4).</p>	Include IWM in infrastructure delivery plans/infrastructure funding statements and longer term masterplans, including identifying long-term management arrangements and partners.	
	<p>North Northants have set up a joint implementation unit shared with several districts and the local enterprise partnership (LP6).</p>		
	<p>Brighton and Hove include groundwater, sewerage, surface water and green infrastructure protection and improvements in its infrastructure delivery plan (LP11).</p>		
	<p>The London Borough of Hillingdon's policies are supported by a comprehensive strategic infrastructure plan that incorporates commitments from other important IWM partners (LP10).</p>		
	<p>Hull City Council's infrastructure delivery programme includes the Environment Agency, Yorkshire Water and East Ridings Council projects (LP13).</p>		
	<p>Arun District Council's SuDS policy requires developers to sign up to a maintenance and management plan/regime, to ensure long-term funding (LP14).</p>		

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Autodesk Ltd
Balfour Beatty Civil Group
BAM Nuttall Ltd
Barratt Developments Plc
Black & Veatch Ltd
BSG Ecology
Buro Happold Engineers Ltd
BWB Consulting Ltd
City of Glasgow College
City University of London
Costain Ltd
COWI UK Ltd
Curtins Consulting
Darcy Products Ltd
Durham University
E3P
Environment Agency
Esri UK & Ireland
Galliford Try Plc
Gatwick Airport Ltd
Gavin & Doherty Geosolutions Ltd
Geobrugg AG (UK office)
Geotechnical Consulting Group
Glasgow Caledonian University
Golder Associates (UK) Ltd
Grosvenor Britain and Ireland
Heathrow Airport Ltd
Henderson Thomas Associates Ltd
Highways England
High Speed Two (HS2) Ltd
HR Wallingford Ltd
Hydro Water Management Solutions Ltd
Imperial College London
Institution of Civil Engineers
Ischebeck Titan Ltd (Ground Engineering Department)
J Murphy & Sons Ltd
James Fisher Testing Ltd
Kier Group plc
Laing O'Rourke Civil Engineering Ltd
London Underground Ltd
Loughborough University
Maccaferri Ltd
Marshalls Plc
Ministry of Justice
Mistras Group Ltd
Morgan Sindall Construction and Infrastructure Ltd
Mott MacDonald Group Ltd
Network Rail
Newcastle University
Northumbrian Water Ltd
OES Consulting Ltd
O'Keefe Group
Pinssar (Australia) Pty Ltd
Polypipe
Rail Safety and Standards Board
Royal HaskoningDHV Ltd
SafeLane Global Ltd
Sir Robert McAlpine Ltd
SLR Consulting Ltd
Smith and Williamson LLP
Southern Water Services Ltd
Stantec
Stuart Michael Associates
T&S Environmental Ltd
Temple Group Ltd
Thames Water Utilities Ltd
TOPCON (Great Britain) Ltd
Transport Scotland
UK Green Building Council
United Utilities Plc
University College London
University of Birmingham
University of Bristol
University of Cardiff
University of Edinburgh
University of Liverpool
University of Reading
University of Southampton
Wessex Archaeology
WSP
WYG Environmental
Zero Waste Scotland

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Water is only one element of planning, but it is fundamental to every aspect of people's lives. Better water management reduces the impact of flooding, ensures that drinking water is available in times of scarcity and helps protect the environment for future generations. These things enable other outcomes such as economic growth and regeneration, new housing development, increased biodiversity, better blue-green infrastructure, improved accessible public spaces and places and well-being, mitigating and adapting to climate change, and more sustainable and effective use of resources.

This guidance explains the critical success factors required for successful integrated water management (IWM). Using case studies, examples of good local planning policy and, with reference to national policy, the reader is supported in identifying water-related opportunities and challenges, and in determining the appropriate approach to put in place policies to improve water management.

This guidance is an invaluable source of information and support for anyone involved with, or interested in UK planning. This includes local planning authorities, lead local flood authorities, developers, water companies, landscape architects and engineers involved in infrastructure and drainage.



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