FLOOD READY LONDON

The London Surface Water Strategy

Increasing resilience through collective action **2025-30**

Foreword

Water does not observe political, administrative or community boundaries, and neither does our commitment to protect London from surface water flooding. We are Flood Ready London, a partnership working to find the best, most practical, cost-effective ways to help everyone in London, from business owners to basement renters, become flood ready.

There are almost 320,000 properties at high risk of flooding in London.[1] There are also at least 56,000 basements, many of which are inhabited; which are especially vulnerable because their below-ground location leaves them more exposed. Surface water flooding can be extremely impactful. Extensive flooding in July 2021 resulted in damage and disruption across the Underground, schools and hospitals and to people's homes and businesses, and causing an estimated insurance loss of at least £281 million[2]. With a changing climate and urban landscape, these events are predicted to become more frequent and severe.

As a city, we all need to do everything we can to prevent such high levels of disruption and loss from happening again. We need to capture as much rainfall as possible where and when it falls, control how surface water flows during heavier storms to prevent it from becoming overwhelming, and adapt and respond so that when extreme rainfall hits the city, London is resilient enough to handle it without major disruption.

To tackle this challenge we – the six main organisations who manage or respond to flooding in London, or represent those who do – formed this partnership in 2022, with support from the Thames Regional Flood and Coastal Committee. Together, we have assessed the sources of surface water flooding, the effectiveness of existing drainage systems, the hydrology of catchments and how climate change ties into these. We identified where the most vulnerable locations and communities are, researched how to access funding more effectively, explored what the most sustainable and effective nature-based solutions are, and what existing projects we can use to get London flood ready. Solutions to surface water flooding do more than reduce flood risk – they can can deliver broad water quality, environmental, community and other benefits.

We have developed this Strategy through a series of consultations with London boroughs, environment and development managers, the public and many others associated with surface water management – an engagement process that will continue as we deliver these changes.

The appendices contain a rich resource of hydrological and geographical data and information open to all to help inform and guide future decisions.

So, whether you are from a Risk Management Authority, you work in the water industry, you are a developer, planner or community leader, or you are someone who is interested in learning more about London's flood risk, there is something here for you.

This Strategy is a statement of intent and a call to action for all of us. We hope you find it informative, useful and relevant to your work or your community, but above all inspiring – because together we can create a Flood Ready London.

We are Flood Ready London, a partnership of influential decision-makers from across London consisting of:

The **Environment Agency's** strategic overview role, under the Flood and Water Management Act 2010, ensures a coordinated, consistent approach to managing flood and coastal erosion risks across England. It leads on strategy and integrated approaches while supporting Risk Management Authorities (RMAs) in their responsibilities for surface water and sewer flooding caused by heavy rain. This is outlined in the National Flood and Coastal Erosion Risk Management Strategy for England.

London Councils is the collective of London local government, representing the 32 London boroughs and the City of London Corporation. It has been a Flood Ready London partner since its inception, ensuring borough voices have been heard throughout the Strategy development.

London Fire Brigade is the UK's busiest fire and rescue service in the country and one of the largest in the world, with the primary aim of keeping London and Londoners safe. The Brigade raises awareness of safety and wellbeing via a range of activities, from water safety and road safety, through to caring for the most vulnerable residents & educating tomorrow's young Londoners.

The **Mayor of London** is responsible for making London a better place for everyone who visits, lives or works in the city. The Mayor provides citywide leadership, setting an overall vision for London and creating plans and policies to achieve it.

Thames Water serves 16 million customers across London and the Thames Valley, from that first cup of tea in the morning through to baths at bedtime. As well as supplying water to people's taps, we take wastewater away. We collect and treat sewage, returning clean water to our rivers. We are here to keep taps flowing for generations to come. Delivering life's essential service, so our customers, communities and environment can thrive.

Transport for London Part of the Greater London Authority family led by Mayor of London, we are the integrated transport authority responsible for delivering the Mayor's aims for transport. We have a key role in shaping what life is like in London, helping to realise the Mayor's vision for a 'City for All Londoners' and helping to create a safer, fairer, greener, healthier and more prosperous city.

Supported by

The **Thames Regional Flood and Coastal Committee** works to reduce flood risk, increase communities' resilience and adapt to climate change across the Thames catchment. We work in partnership with other organisations, especially in local government, and with local communities. This involves investing significant amounts of public money including the funding for London Surface Water Strategy and, increasingly, securing funds from multiple sources.

Our Vision

> "Increasing London's resilience to surface water flooding through collective action that benefits people, places and the environment."

This Strategy sets out our collective approach to delivering this Vision by aligning our efforts and bringing together stakeholders around common goals. Following the 2021 flooding, we agreed that our focus must be on increasing resilience and adaptation, reducing flood risk to minimise its impact when it does occur, and making recovery quicker and easier. Our Strategy will mobilise the step change our city needs to become more prepared, sustainable, and safe, especially for the most vulnerable.
It defines how we can work together across London to plan and deliver solutions that reduce surface water flood risk, while empowering positive action by, and creating benefits for, everyone who lives in, works in, and visits our city.

To achieve this Vision we need to act in the short, medium and long term. Our Roadmap (Figure 1) shows what we will do in the first year:

Figure 1: Year One Roadmap

SPRING 2025

Launch the Strategy and Priority Catchments

- Publish the technical Strategy documents
- Initiate two priority Surface Water Catchment Partnerships (SWCPs)
- Develop a funding mechanism for initial investment to support priority SWCP delivery

AUTUMN 2025

Identify schemes and progress Surface Water Catchment Partnerships

- Publish sustainable drainage systems (SuDS) Opportunity Modelling data for use by all London boroughs so they know where the most beneficial locations are to install SuDS
- Develop and implement our strategic solution hierarchy

SUMMER 2025

Begin a Community Campaign and release a data toolbox

- Assist the SWCPs with creating Action Plans
- Publish a public-facing version of the Strategy
- Launch a webpage and share community focused materials
- Establish new Flood Action Groups in the SWCPs
- Train community leaders on climate resilience
- Publish data and mapping for the whole of London that determines where action needs to be taken

WINTER/SPRING 2025-26

Undertake annual monitoring and continue rollout of catchment partnerships

- Implement an annual monitoring mechanism
- Investigate the feasibility of creating a London blue-green funding mechanism
- Share learning from priority SWCPs and develop a business case for delivery of remaining Catchment Partnerships

Throughout the year

We will continue to engage with national government to drive policy improvements and strengthen the national push for increased resources for surface water management.

We will engage with developers and landowners through the London Plan to encourage the inclusion of strategic surface water management in all new and retrofit developments.

We will continue to engage with wider stakeholders to promote the inclusion of SuDS into any redevelopment programmes.

We will progress schemes from Priority Catchment Action Plans.

Establish the integral position of Flood Ready London through the alignment with other key workstreams, programmes and plans to achieve multiple benefits.

Contents

Executive Summary

Executive Summary

The London Surface Water Strategy is an ambitious vision of how London can address the real and growing risk of surface water flooding on our communities, the environment and the economy.

It builds on the work done to date in the context of the city's unique challenges – and its unique opportunities. It sets out a series of actions and recommendations that the Flood Ready London partnership will progress to deliver transformational change for the benefit of current and future generations.

The city is already experiencing the impacts of a changing climate, with severe weather events such as flooding and extreme heat becoming more frequent. London has a growing, changing population, predicted to reach 9.6 million by 2035. It also has a highly urbanised landscape with complicated infrastructure networks. Policy and governance is complex and fragmented, with funding, investment and skills in short supply.

The development of the Strategy follows the publication of other recent reports, including the London Climate Resilience Review[3] which warned that London is underprepared for the impacts of climate change. Alongside this, the Environment Agency's latest National Flood Risk Assessment[4] data highlights that almost 320,000 properties in London are at high risk of surface water flooding. Our Vision is a London that has increased resilience to surface water flooding through collective action that benefits people, places and the environment.

Our guiding principles

Underpinning all of our work are six guiding principles:

1. **Prioritise the most vulnerable**
   To better understand where the impacts of flooding on the health, wellbeing and mobility of London's most vulnerable residents are likely to be greatest, so we can find effective solutions.

2. **Prioritise nature-based solutions**
   To effectively absorb and slow rainfall runoff, whilst creating healthier, more resilient urban environments.

3. **Develop evidence-based actions informed by hydrology**
   To align organisations with the way water moves, providing a framework for collaborative partnerships and facilitating the sharing of resources.

4. **Work in more effective partnerships**
   To leverage our collective expertise, resources, and capabilities so we can deliver solutions that meet the needs of London.

5. **Enable change through strong leadership**
   To ensure that the conditions are in place to drive the changes we need to better protect our city.

6. **Manage surface water flood risk at the right scales**
   To allow for better resource management, prioritisation of funds and targeted actions based on where they are needed most.

In order to focus our efforts and achieve our Vision, we have divided our work into three ambitions:

Ambition 1: Resilient Places
London's 'places' – our homes, workplaces, and the environments in which we live – are better prepared to manage surface water.

Ambition 2: Empowered People
London's residents and communities and businesses actively contribute to increasing surface water flood resilience.

Ambition 3: Coordinated Delivery
All stakeholders involved in managing surface water flooding will work together to ensure coordinated planning and delivery.

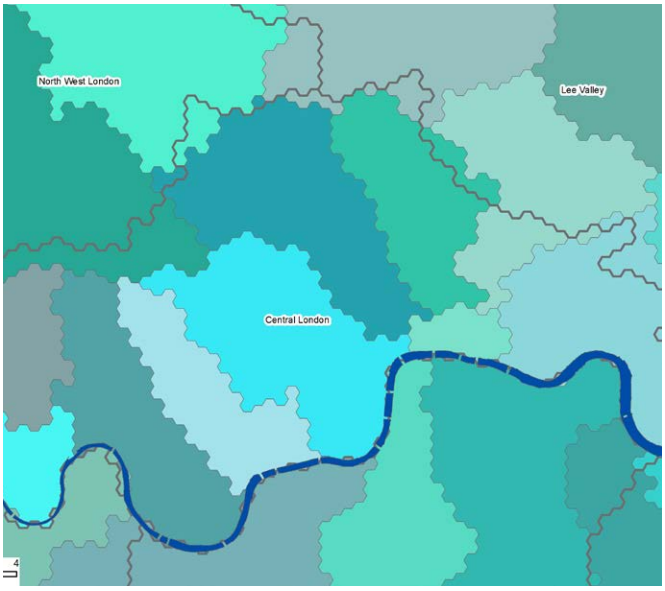
Our key fundamental changes

To ensure the delivery of these ambitions, we have done extensive action planning. The key fundamental changes we propose, some of which are already under way, are summarised below.

1. **Create Surface Water Create Surface Water Catchment Partnerships**
   Surface water does not stop at administrative boundaries, yet these boundaries can hinder collaborative flood management. Therefore, we have created ten new Surface Water Catchment Partnerships (SWCPs) which will bring together relevant organisations and create the conditions to share resources, plan jointly and manage flood risk more effectively. Organisations will have a framework through which to deliver interventions together.

   Figure 2 shows how the Surface Water Catchments do not follow borough boundaries.

Figure 2: Section of Surface Water Catchment map showing catchment boundaries in black, the River Thames in blue, and London boroughs in shades of blue and green.



2. **Adopt a flexible approach for solutions**
   London needs a mix of solutions to manage surface water and reduce flood risk across catchments and boroughs. Rather than setting a single design standard for all infrastructure, we propose a flexible approach where each SWCP delivers solutions that, together, provide the necessary flood protection, ensuring a tailored, effective response to surface water challenges.

   We have classified these solutions as **'Capture'** solutions, aiming to capture and retain water where it falls (up to 15mm); **'Control'** solutions, aiming to control and slow the flow of surface water (up to 45mm); and **'Adapt & Respond'** solutions, aiming to minimise the impacts of any rainfall event (up to 75mm) that results in floodwater that is too much to be captured and controlled.

3. Prioritise action for the most vulnerable people and their livelihoods

Across London, our assessment shows that surface water flood risk disproportionately affects the most vulnerable groups of residents. Rather than purely focusing on where flood risk is greatest and the more traditional approach of quantifying flood damages based on cost impacts to properties and businesses, we have instead adopted a greater focus on vulnerability. We will prioritise reducing risks and improving the resilience of our most vulnerable groups.

4. Establish a robust funding framework

An estimated £41 million per year of investment (present value) will be required every year to reduce our forecast of surface water flood risk in London by 75% in 2075; and enable adaptation to challenges such as climate change, land use change, and population growth. We will launch pathfinder projects to explore how a simplified 'London surface water fund' could improve funding efficiency for more effective flood risk management.

Scaling up finance and investment will be achieved, in part, by expanding ongoing market-based approaches and taking steps toward developing a blue-green infrastructure (BGI) funding mechanism.

Figure 3: Our flexible approach to surface water management

5. Integrate surface water management into development

New development provides a unique opportunity to go beyond the norm and take a place-based approach to water management. Integrating the capture and control of surface water, where it falls and where it floods, into local development projects will simultaneously reduce flood risk and give communities the opportunity to co-create places that matter to them. The incorporation of sustainable drainage systems also improves water quality and enables many additional wider environmental and economic multiple benefits.

6. Provide strong and dedicated leadership

Flood Ready London will act as a co-ordinating body to guide partners and maintain progress. SWCPs will be required to monitor and report progress to the group at regular intervals as part of the strategic allocation of funding and resources. Crucially, the group will continue to advocate for surface water resilience, influencing statutory and non-statutory policy at the regional and national levels and champion behavioural changes to put surface water management at the heart of all sustainable development in London.

We are committing to a Roadmap to demonstrate the intended next steps, and it is proposed that this is reviewed and updated at least annually.

Introduction

This Strategy is for...

No single organisation can tackle these challenges alone. We need a shared vision, a long-term ambitious strategy, and clear actionable steps to ensure solutions are both effective and affordable. By developing these through a coordinated approach, Flood Ready London aims to bring organisations and communities together to better prepare London for the future.

We have worked with organisations and groups from across London that have responsibilities or interests in surface water management, flood risk, and the wider water environment. Flood Ready London builds on insights from recent reports, including the 'State Of The Environment' reports;[5] the London Climate Resilience Review;[6] and the National Infrastructure Commission's (NIC's) Second National Infrastructure Assessment.[7]

As well as driving direct change, this Strategy is to be read alongside a number of other policies, strategic workstreams, programmes and documents. Figure 4 shows a summary of such examples from across the Partnership's organisations, although this is not an exhaustive list of existing relevant and relatable material. Flood Ready London will further support the delivery of these strategies and enable a unified and consistent approach across the surface water flood risk management (and wider environmental) industry.

This Strategy focuses on the activities London needs to improve resilience to surface water flooding before and after surface water flooding events. Preparedness for the response to surface water flooding incidents when they do happen remains the responsibility of the London Resilience Partnership[8] and sits outside the scope of our Strategy. Members the London Resilience Partnership do, however, remain a key part of Flood Ready London to ensure alignment between prevention, preparedness and response activities.

The Strategy is meant for:

Risk Management Authorities (RMAs)

RMAs, such as London's Lead Local Flood Authorities (LLFAs), Highway Authorities, Thames Water, the Environment Agency and Transport for London (TfL), will be at the forefront of delivering the Strategy. This Strategy provides the technical and policy context to the catchment-based approaches that underpin the Strategy, and our Objectives outline the proposed steps by which RMAs will work together and with other partners to deliver the Strategy's outcomes.

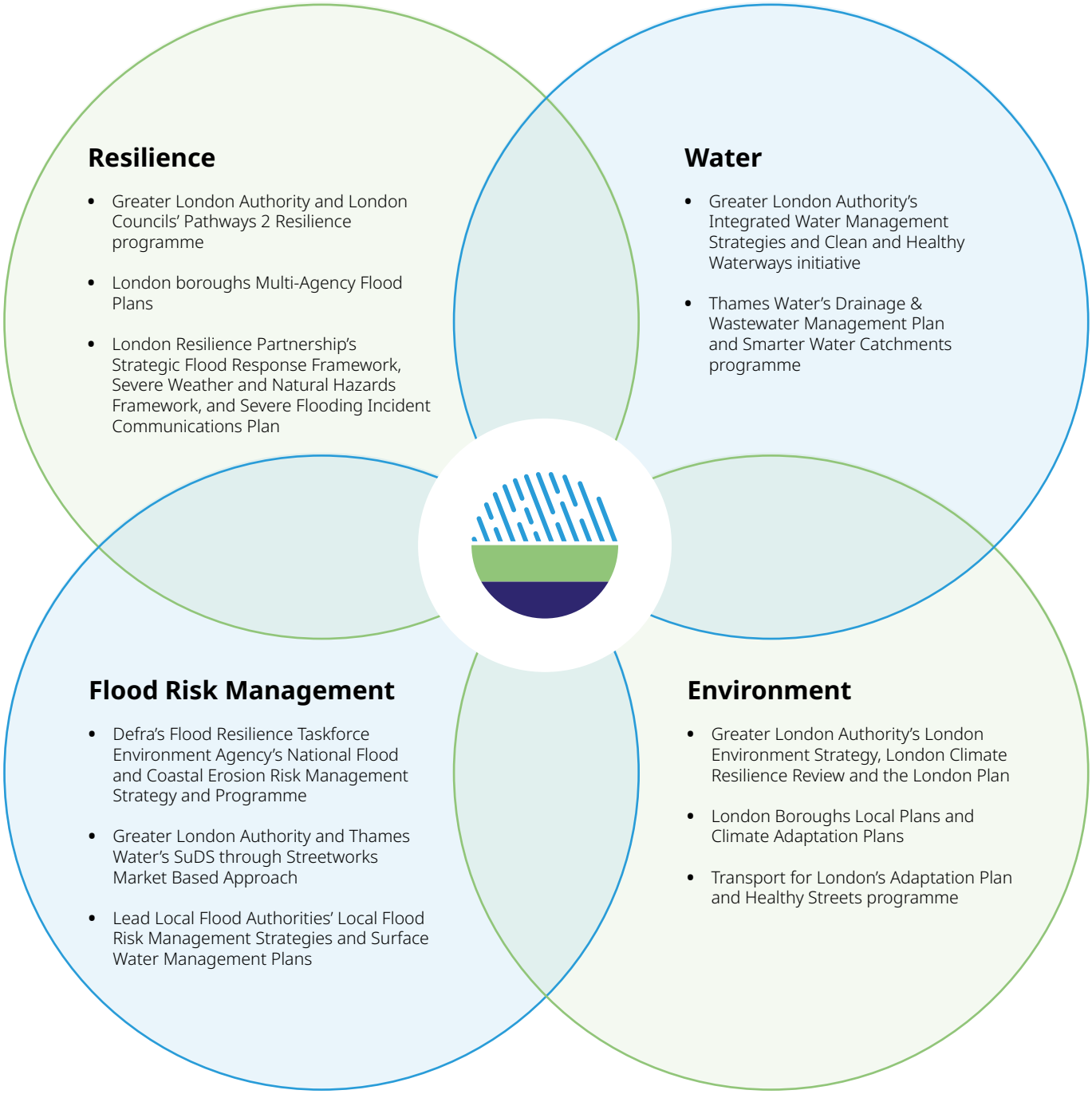
All water and environmental managers

We want to encourage collaboration by closely integrating everyone involved in water management. Our Strategy will set the overarching vision, outcomes and objectives, providing a framework for collaboration and a clear way to track the progress of the actions of the Strategy.

Residents and community groups

The places we live in should be safe, healthy and sustainable. This is why we designed the Strategy for, and with, Londoners. London's communities, essential places and services need the support of its residents to make this happen.

Figure 4: Our Strategy's relationship with existing programmes and workstreams being undertaken by the Flood Ready London partnership organisations



Understanding surface water flooding

Surface water flooding is the joint biggest flood risk source in London (alongside fluvial flooding). London's Risk Register, which sets out all threats and hazards facing London, identifies it as a "very high" risk for the capital[9] within the Natural Hazards section.

In London, almost 320,000 properties, corresponding to around 1 in 13, are at high risk of surface water flooding. In fact, London contains the highest percentage of high-risk properties in England, with around 30% of all such properties in the country located in the capital.[10] Basements are especially vulnerable to flooding due to their location below ground level, and we have identified at least 56,000 across London.[11] Furthermore, there are around 300,000 commercial properties in London, with over 40% of them estimated to be at risk of surface water flooding.[12]

Surface water flooding happens when heavy rainfall cannot drain away quickly enough and accumulates in large quantities. The water can rapidly overwhelm drainage systems, turning streets into streams, submerging homes, and damaging vital local services and infrastructure. It can strike suddenly and without warning, leaving little time to react, posing a serious threat to lives and communities across London. It is different from river flooding, which occurs when river levels exceed the heights of a riverbank, though both types can occur simultaneously.

Almost 320,000 properties in London are at high risk of surface water flooding

London's geography significantly impacts how water moves though the city when it rains. The capital's many impermeable surfaces, such as concrete paving, limit how quickly rain can soak into the ground. This is further affected by the clay soils across much of London, which are less permeable, especially if the ground is already wet.

The July 2021 floods

In the summer of 2021 this risk showed itself in a very clear way. On the 12th and 25th of July that year, many areas in London saw more rain in just a few hours than would normally fall in a month, with some places receiving almost double the average July rainfall in just one hour.[13] This quickly overwhelmed the local drainage systems. Further details about London's drainage systems can be found in Appendix C.

During these events, homes, businesses, schools, underground stations, hospitals, and critical roads were impacted. Over a four-hour period London Fire Brigade received 1,755 calls related to surface water flooding and attended 1,430 incidents as a result.[14] We have estimated that at least 2,000 properties in London were flooded by the two storms.[15]

The flood damage and disruption resulted in estimated insurance losses of at least £281 million[16] (see also Appendix F – flood impact projections). Closures and delays across the London Underground network caused by the 12th of July flood event alone resulted in around 197,128 lost customer hours, equating to an economic loss to London of almost £2million.[17]

Following the 2021 flooding, a number of reviews identified the lessons to be learned from these events. These included an Independent Flood Review by Thames Water, an Environmental Committee Report by the London Assembly, recommendation from the London Surface Water task and finish group, presented in a briefing paper by London Councils, a debrief paper from the London Resilience Partnership, and numerous flood investigations led by various London boroughs. Each review independently identified the need for strategic leadership to manage surface water in London.

Surface water flood risk in London results from several factors. Some of the factors, such as climate change and urbanisation, affect all large cities. Other factors, including our governance, our infrastructure, our demographics, and how these shape our public spaces, are unique to London.

Climate change will make London more prone to surface water flooding

A changing climate will bring increased rainfall intensity and frequency of extreme rainstorms,[18] meaning our existing drainage systems will struggle to cope. Droughts will also be more frequent, which will make our green spaces and soils less able to soak up rainwater. The Met Office's climate projections warn that storms causing surface water flooding in London will occur four times more frequently in the future.[19]

Policy and governance is complex and fragmented

There is no single organisation with overall responsibility for managing surface water flood risk. Surface water flood risk management is the statutory responsibility of LLFAs and other RMAs, such as the Environment Agency and Thames Water. This fragmented policy landscape can make it difficult to determine responsibilities, agree funding, and deliver outcomes, especially when a surface water flooding problem, or its solution, crosses administrative boundaries.

A growing, changing population

London's expanding population – predicted to reach 9.6 million people by 2035[20] – will also mean an increased population density in many areas. For example, we are already seeing growing occupancy and conversion of basement properties, both for accommodation and commercial uses;[21] the total number across London is not known but likely larger than the 56,000 we have already identified.

Funding, investment and skills are in short supply
There is not enough money available to address the challenge, whether it's for building and maintaining infrastructure or hiring the skilled professionals we need. Even when funding is available, accessing it is often inconsistent, time-consuming, and complex, and while some organisations have capacity to secure it, many do not.

Urbanisation is changing London's surfaces
London's development and the way its urban spaces are used are increasing the risk of surface water flooding. As green spaces are replaced with impermeable surfaces like concrete, less water can soak into the ground, increasing surface water flood risk.

Complicated infrastructure networks
London's infrastructure for managing surface water is complicated, shaped by its geography, history and mix of drainage systems. It includes combined and separate sewers, highway drainage, and both culverted and natural watercourses. These systems are critical, yet vulnerable. Their capacity to manage water effectively can be strained during heavy rainfall. Moreover, the limited availability of transparent data on these assets makes it even harder to fully understand and solve the problem.

Why we are tackling surface water flooding

In July 2024, the final report from the London Climate Resilience Review[22] delivered a stark warning: London is underprepared for the impacts of climate change. The report called for urgent action, highlighting surface water flooding as one of the city's most pressing climate risks. It warned that without a "step change" in approach, surface water flooding could become a "lethal risk", particularly for the most vulnerable communities across London.

Emma Howard Boyd CBE, Chair of the London Climate Resilience Review, stated that London needs a collaborative and fast-paced approach to tackle surface water flooding.

> **"We need to recognise that Londoners now face lethal risks, and a step change is needed"**
>
> Emma Howard Boyd, CBE, Chair, London Climate Resilience Review

To lower current and future risks to life
Thankfully, London did not suffer loss of life during the 2021 floods; however, surface water flooding has been directly responsible for loss of human life in the UK and globally. For example, there have been tragic fatalities elsewhere in the UK, Germany, Spain, Denmark, Brazil, China, South Korea and across North America.

To reduce risk to our most vulnerable residents and communities
Research shows that surface water and sewer flooding will disproportionately impact those most vulnerable.[23] They are projected to be the most likely to experience flooding, may need more support to evacuate during a flood, and have access to fewer resources to recover quickly from any damage and disruption.

To prevent damage to the natural environment
The damage and contamination caused by surface water flooding to London's natural environment, along with the carbon emissions linked to infrastructure repair and replacement, is significant. Given that London's natural environment plays a critical role in reducing surface water flooding risk, damaging it reduces our ability to manage flood risk. It also reduces the wider benefits that these green and blue spaces provide to our communities, including supporting biodiversity, storing carbon, cooling our city, absorbing pollutants, supporting health and wellbeing, and encouraging social cohesion.

To lessen negative economic and financial impacts
The 2021 flooding events had a huge financial and economic impact on the city. The flooding resulted in extensive damage to homes, properties and infrastructure including schools, hospitals, train stations, restaurants and shops. Property insurance cost in areas flooded during the July 2021 storms have increased by up to five times, making flood insurance unaffordable for many and impacting property values.

Progress so far

Since 2021 we have encouraged new approaches with stakeholder organisations and groups at a national, regional and local level. Some of the achievements by Flood Ready London and its partners so far are as follows:

Developing the London Surface Water Strategy

For the first time, representatives from every London borough and key stakeholder groups worked together on surface water flooding to commission an in-depth analysis on the causes of flooding in London and how widespread the issue is. This work formed the basis for the Strategy and Action Plan.

Carrying out new risk modelling

New modelling outlines the surface water flood risk for people, property and infrastructure in London. It is helping us to understand surface water flood risk across the city, estimate potential costs associated with flooding, and identify where RMAs working together will bring the greatest benefits, especially across administrative boundaries.

Installing sustainable drainage systems

Since July 2021, the Flood Ready London partners have put in dozens of sustainable drainage systems (SuDS) across London. These can be seen on the SuDS Retrofit Map[24]. SuDS help by slowing the rate and volume of rainwater entering the drainage system and can include projects such as rain gardens at Tolworth roundabout, and green roof and permeable paving at Old Street station. By the end of the current Department for Environment, Food & Rural Affairs (Defra) flood and coastal erosion risk management (FCERM) investment programme (2021/22-2025/26), the Environment Agency and Thames Regional Flood and Coastal Committee (RFCC) are estimated to have allocated and helped distribute £60 million for surface water schemes.

Identified and delivered new sources of funding

We have found new ways to get funding for SuDS. For example, the Department for Environment, Food & Rural Affairs (Defra) has provided £1m for small-scale SuDS. We are supporting the development of a market-based approach to delivering SuDS through streetworks, which was awarded £1.3 million from the Ofwat Innovation Fund. This initiative will provide a delivery mechanism for the installation of SuDS by leveraging infrastructure providers that carry out planned excavations across London's roads (e.g. utility companies) to deliver SuDS on their behalf. This approach has the potential to significantly increase the delivery of SuDS in an efficient manner in line with the ambitions of this strategy, whilst reducing disruption experienced by London's road network and communities.

Protection from sewer flooding

The risk of sewer flooding has been reduced for over 570 London properties so far with the installation of devices such as non-return valves. Thames Water has prioritised installation in basement flats (at the highest risk of flooding) and occupied by vulnerable people. Over the next two years, further properties will be better protected.

New Community Flood Action Groups

The National Flood Forum, a charity that helps communities to prepare, respond and cope with flooding, has been funded by the Thames RFCC to support up to fourteen communities affected by the July 2021 flooding. So far, six communities have developed Community Flood Action Plans, which identify actions to improve local resilience to flood risk.

Stakeholder engagement and public awareness campaigns

We have delivered a broad range of communication activities to public and private sector stakeholders, London's residents, and wider communities. Our activities included launching webpages[25] and carrying out basement awareness campaigns in 2022, 2023,[26] and 2024 with over 150,000 leaflets sent to people living and working in basements.

Revision and development of response procedures

The London Resilience Partnership response procedures have been reviewed and updated based on lessons identified from the 2021 flooding. Updated triggers bring multi-agency partners together sooner upon receipt of weather warnings, leading to earlier pre-emptive action and a more proactive response. The development of a specific Severe Flooding Incident Communications Plan has increased sharing of flood warning information and guidance ahead of periods of severe weather.

Further insights on progress so far can be found in our July 2024 Annual Monitoring Report here. From 2025 on, this Strategy replaces the Annual Monitoring Report.

Our guiding principles

Our guiding principles

This chapter covers our six guiding principles by which we will implement this Strategy. These principles help to shape our decision making as we deliver the Strategy and the new ways of working it requires. We will always prioritise action to protect our most vulnerable communities and we will ensure that our institutions and organisations can adapt and transform to enable the change that is needed to deliver this.

Our approach encourages collaborative partnerships to develop based on hydrological catchments (i.e., how water moves across London), rather than where administrative boundaries are. Depending on the specific problem, we want to manage surface water with the right interventions and at the right scale across London and, where possible, we will prioritise using nature-based solutions (NbS).

Each guiding principle includes a commitment statement that Flood Ready London partners have signed up to alongside the Vision.

Figure 5: Guiding principles for London's surface water strategy

1. **Prioritise the most vulnerable**

4. **Work in more effective partnerships**

2. **Prioritise nature-based solutions**

5. **Enable change through strong leadership**

3. **Develop evidence-based actions informed by hydrology**

6. **Manage surface water flood risk at the right scales**

Principle 1: Prioritise the most vulnerable

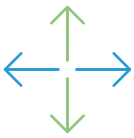
Our shared commitment:

"We will commit to delivering risk-based action for the most vulnerable."

This principle will be applied by:

Collecting and using robust data to identify where vulnerabilities exist and classify what makes people, properties, and infrastructure susceptible to surface water flooding.

Working with local community organisations to identify and implement measures to reduce risk.



Considering a wide range of solutions that can both lower the sensitivity of communities to flooding and increase resilience.

Flooding awareness and vulnerability

Across the UK there is generally low awareness and understanding of the term 'surface water flooding'. Around 1 in 5 people are confident that they know what the term means, while understanding is lower among younger age groups, lower-income groups, and tenants or renters.[27]

Vulnerability to surface water flooding is linked to a variety of factors. Age, gender, primary language, and type of property that people in London live in can all influence an individual's ability to deal with flooding, while socio-economic status can affect their ability to respond and recover. Flooding often affects those most vulnerable disproportionately,[28] particularly those with lower income:

- They are less likely to have flood insurance,[29] making financial recovery from flooding more difficult.
- They tend to rely more on public transport and other services, which can be heavily disrupted during floods.
- They face more significant risks to their health and wellbeing, including life-threatening situations, when flooding occurs.[30]

Given that London has a high proportion of residents who rent, or have a relatively low income, we deem this challenge to be particularly significant. As Ambition 2 (Empowered People) outlines, our actions seek to tackle poor awareness and support collective action to manage risk through engagement with voluntary and community organisations.

Insurance

Insuring properties and assets against flood risk is becoming increasingly challenging.[31] Some initiatives, such as FloodRe, provide affordable flood insurance to eligible households by providing reinsurance cover to insurance providers (rather than insurance directly to homeowners). However, FloodRe's eligibility criteria mean that certain properties (such as flats in multi-property buildings in central London) cannot access insurance through this scheme. So, whilst the initiatives are welcome, more needs to be done. It is essential to engage with the insurance sector to develop approaches for prioritising and financing projects, underpinned by an understanding of the differing vulnerabilities to surface water flooding.

Prioritising vulnerable people

Through our risk assessment we found that 76% of London's most vulnerable residents are at risk of surface water flooding (see chapter: Our flood risk assessment).

To effectively manage surface water flooding, we will prioritise the most vulnerable people, places, and infrastructure for our delivery and investment planning and work with voluntary and community sector organisations to co-create solutions. This approach ensures that everyone benefits from improved flood management. It reduces inequalities and strengthens community cohesion in high-risk and marginalised areas.

We will promote and develop solutions based on community outreach and co-creation, emphasising inclusivity as a key pillar. We will build on existing initiatives, like Newham's Just Transition Plan,[32] and the Greater London Authority's (GLA's) Climate Risk Map,[33] which show how climate stresses overlap and how these can guide resources to be directed to the communities most at risk. We will also build on the work of the London Communities Emergencies Partnership and the GLA's Community Resilience Fund to promote engagement between VCS organisations and boroughs to develop resilience solutions.

RMAs must use evidence and local knowledge to target actions for vulnerable people, properties, and infrastructure. To better understand the factors contributing to vulnerability and develop the most effective solutions, they will work with local communities and stakeholders.

Promoting community involvement

Community and stakeholder consultation is commonplace during the design and delivery of surface water schemes. However, many projects do not foster long-term engagement with their communities once completed. As a result, they miss out on important benefits of ongoing community involvement, such as:

- improved health and wellbeing
- better social cohesion
- improved long-term acceptance of the project
- lower maintenance costs
- encouragement for positive changes in behaviour
- increased public understanding of surface water management.

These benefits are especially relevant when solutions are part of urban placemaking and designed for public interaction. That's why our approach includes borough-scale or community-scale action. Engaging community groups to monitor and maintain surface water infrastructure is a key part of project design. By targeting action at the borough level to capture surface water at its source, we aim to ensure that communities in these areas are engaged, inspired, and motivated to take personal steps that benefit more vulnerable downstream communities.

Principle 2: Prioritise nature-based solutions

Our shared commitment:

"We will commit to promoting nature-based solutions that manage surface water at the source where practical."

This principle will be applied by:

Developing approaches to manage surface water that mimic natural processes.

Exploring ways to develop varied and interconnecting drainage solutions on the surface.

Demonstrating the wider natural, social, and economic value of nature-based approaches.

We want to prioritise nature-based solutions (NbS), such as SuDS, to manage surface water flooding and boost climate resilience in London. NbS can effectively absorb and slow rainfall runoff, reducing pressure on the sewer network. While a balanced approach that combines traditional "grey" infrastructure with green solutions is important, our goal is to significantly increase the use of natural methods. This shift not only improves urban sustainability but also helps lower carbon emissions and spreads out infrastructure investment. RMAs should seek to promote NbS first, capturing and managing surface water at (or as close to) its source as is practical.

The wider benefits of nature-based solutions

NbS offer far more benefits beyond just managing floodwater, they create healthier, more resilient urban environments. By capturing runoff, they prevent pollutants from reaching open watercourses, protecting London's rivers. Furthermore, blue-green infrastructure (BGI) can help cool urban areas and create welcoming areas that encourage people to connect with each other and improve neighbourhoods.

They also attract various funding sources, appealing to investors interested in projects that deliver the environmental, social, and economic benefits, which in turn can help play a key role in helping London become more resilient to flooding.

Recommending targeted interventions

Key to achieving our strategic ambitions is understanding how viable NbS are in reducing flood risk, and at what scale they can be implemented. Even though wider benefits of NbS are significant, we focused on their primary role in mitigating flood risk 'to ensure surface water flood risk reduction outcomes are prioritised. We also deemed it important to determine where traditional measures, such as sewer upgrades, are needed to address flood risk, using the most suitable infrastructure type. Appendix K provides further details about targeted intervention.

To guide NbS delivery, we organised different solution types by their main functions (such as storing rainfall or reducing runoff) and mapped these to our "Capture, Control, Adapt and Respond" intervention framework. More on that framework can be found in chapter: A flexible approach to delivering surface water solutions.

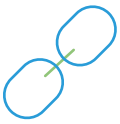
Principle 3: Develop evidence-based actions informed by hydrology

Our shared commitment

"We will align the planning of strategic action around hydrological catchments."

This principle will be applied by:

Securing agreements across organisations managing surface water to deliver on shared plans and actions.



Considering the linkages and interactions of all drainage systems and runoff mechanisms.

Building a shared understanding of how local interventions can contribute to managing catchment priorities.

Administrative barriers to working together

London's political and administrative boundaries make it difficult for organisations to work together on managing flood risks. A key challenge is the natural movement of water after it has fallen. Where heavy rain falls is not necessarily where floods occur. Often, this risk presents itself across borough boundaries. This can lead to uncoordinated responses, with responsibility for flood risk management falling mainly on the area that gets flooded rather than where the rain fell. Moreover, these political and administrative barriers often prevent us from taking advantage of cost-effective upstream measures that could reduce flood risk in lower-lying areas.

To address these challenges, we set out to divide London into hydrological catchments, defined by natural water flow rather than political boundaries.

Deriving hydrological catchments

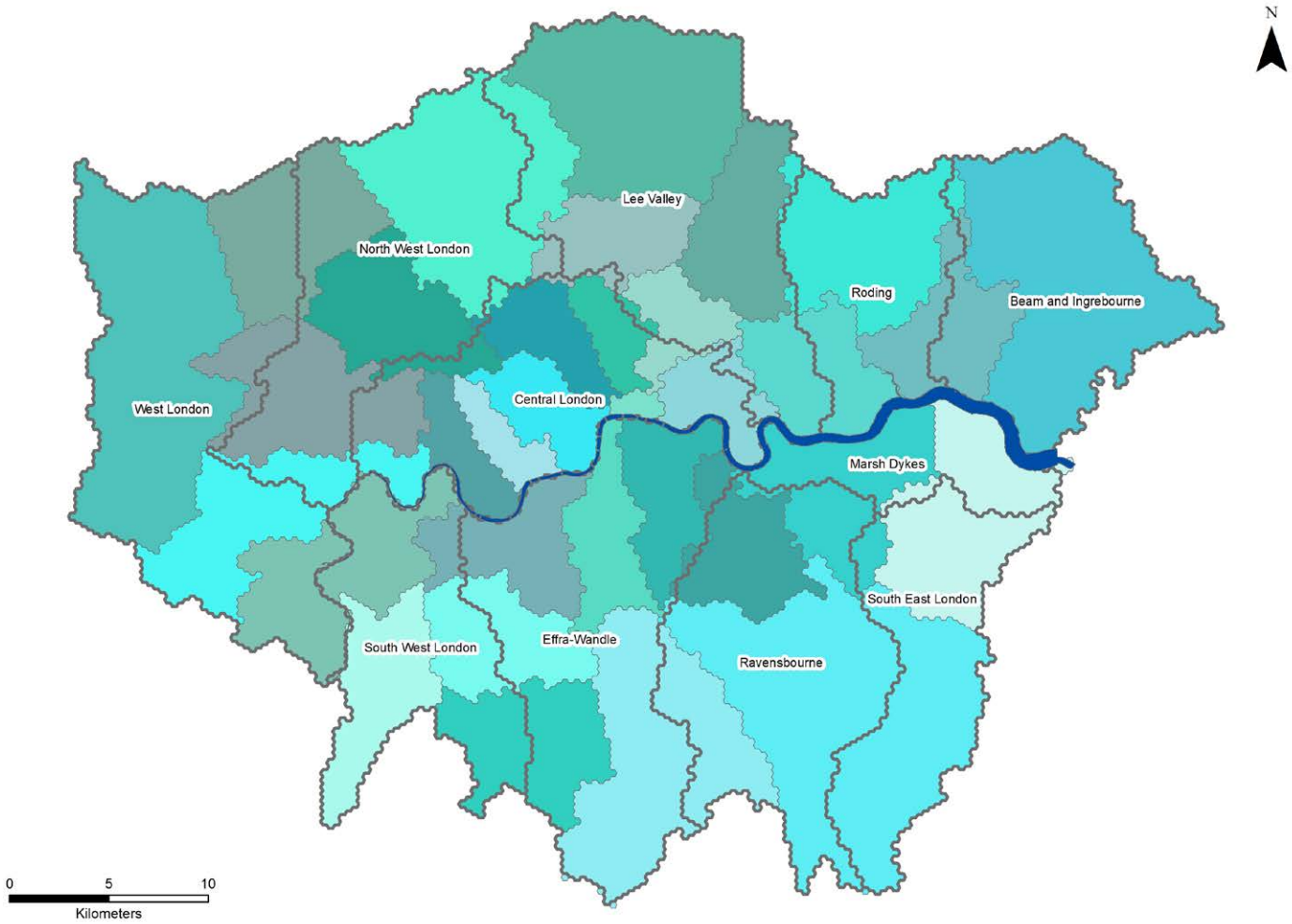
Surface water flooding brings unique challenges and opportunities. It varies across locations, and current models (and therefore maps) are prone to significant uncertainty due to how they have to be built with assumptions to best replicate complex real-world conditions. However, applying hydrological principles helps to better understand London's exposure and vulnerability to rainfall flooding.

A hydrological catchment, also known as a drainage basin or watershed, is an area of land where all surface water from rain converges to a single point, typically a river, lake, or ocean. Typically, this area is defined by natural geographical boundaries such as hills and mountains. In London, however, our hydrological catchments refer to the areas where rain collects and runs over the surface, or through a combination of manmade drainage networks and natural watercourses, into a common outlet. In most cases this is either the River Thames (for watercourses) or one of the eight sewage treatment works (for wastewater).

Compared to entirely natural catchments, London's catchments are characterised by high levels of paved and impermeable surfaces which reduce natural infiltration and increase surface runoff. Although we have accounted for the effects of sewer networks, when viewed at a high level, the movement of water over London's surface still conforms to historical river catchments, giving a sound hydrological basis for our proposed catchments.

Figure 6 shows the resulting catchments across London. For more information on how we modelled and derived the hydrological catchments see Appendix J. For the purposes of implementation, this means taking a holistic approach to managing surface water, with a greater focus on dealing with water at source, and as it travels through London, rather than simply where it causes flooding.

Figure 6: Proposed SWCPs for managing surface water flooding in London



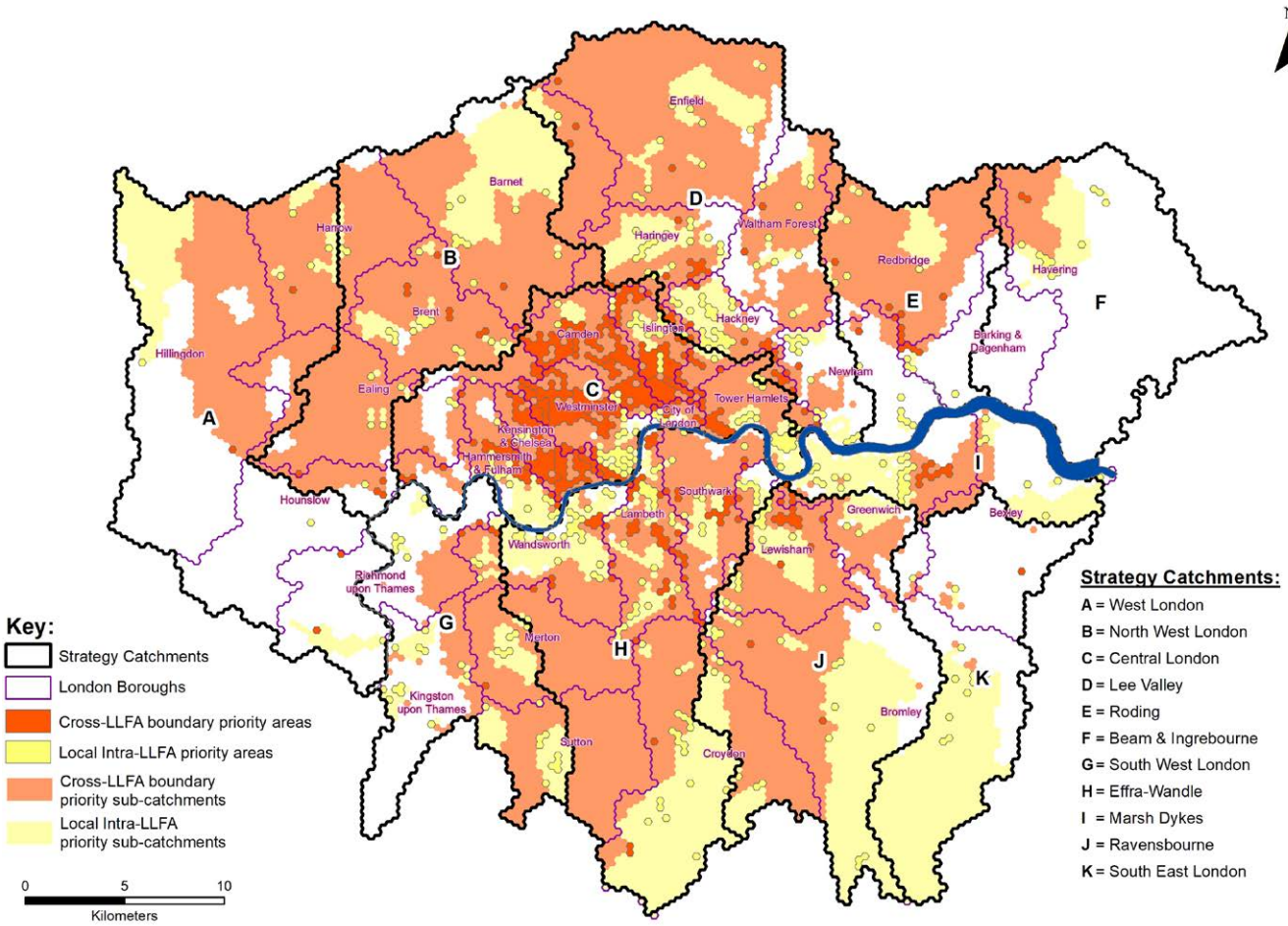
Need for cross-boundary collaboration

By considering surface water in catchments, we identified where the sources, pathways, and receptors of surface water can be found across London. Furthermore, our methodology allowed us to identify where opportunities can be found to address both strategic and local flood risks.

Over the whole of London, we estimated where flood impacts from a given rainfall event exceed the average impact within each Strategy catchment (see chapter: A flexible approach to delivering surface water solutions). This analysis has helped to determine our strategic priority areas. For each priority area we have identified, we investigated where solutions to reduce flood risk could be implemented, both within and beyond the impacted area itself. Simply said, for each priority area we have determined the catchment which the priority area is part of. Some of these catchments cross LLFA boundaries, therefore indicating that flood risk reduction solutions in these areas will benefit from collaborative efforts across these boundaries. Figure 7 demonstrates where actions could be best targeted to address flood risk in priority areas, many of these crossing LLFA boundaries.

Our analysis defined these original 11 catchments. However, through subsequent Flood Ready London engagement work, the boroughs within the Roding and Beam and Ingrebourne Catchments have merged together (to form the North East London catchment) to reflect current and continued good working and to provide efficiencies.

Figure 7 Map showing sub-catchments within London's priority flood risk areas.



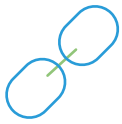
Principle 4: Work in more effective partnerships

Our shared commitment:

"We will work collaboratively in partnerships to deliver and coordinate integrated solutions."

This principle will be applied by:

Developing and maintaining strategic and technical relationships between RMAs.



Building connections with local stakeholders and potential investors.

Securing and maintaining community representation within partnerships.

Working together in partnerships is key to managing surface water effectively. By pooling our expertise, resources, and capabilities, we can achieve more than working alone. Partnership working helps guide our plans, sparks innovation, reduces costs, and ensures successful implementation of actions. Through a collaborative approach, we can overcome complex challenges and deliver solutions that meet both catchment and local needs.

Surface Water Catchment Partnerships

Our ten strategic (SWCPs) will serve as the foundation for coordinated action and planning and support a more holistic approach to managing surface water flood risk across London.

Within each catchment, we will help create and support the formation of SWCPs. These partnerships build on existing regional collaborations by pooling resources, sharing knowledge, and standardising processes to overcome traditional political and organisational barriers. Participating organisations will work together to plan, develop, and implement solutions, whether through new or existing relationships. The SWCPs will build on existing success stories and relationships from across London where people are already managing surface water.

We will not dictate the exact makeup of each partnership, as it will vary to suit local needs. However, they should include all boroughs and relevant RMAs in the area. Boroughs can be part of multiple SWCPs, and many likely will be. Locally specific organisations and communities should be engaged and integrated into the catchments as appropriate. In Appendix J we outline borough participation in each catchment.

We recommend that organisations that currently operate at a pan-London scale, such as Thames Water, the Environment Agency, GLA, TfL, and London Fire Brigade participate in all proposed catchments.

Furthermore, we recommend that all RMAs and relevant partners adopt collaboration agreements to implement the proposed SWCPs. Working together under a shared vision will enhance communication, build stronger partnerships, and help identify opportunities to share resources and funding effectively.

Surface Water Catchment Action Plans

The SWCPs will develop Surface Water Catchment Action Plans (SWCAPs) that set out the policies and actions needed to manage flooding in the catchments. In doing so, they will plan, design, and deliver flood reduction measures that are inventive, efficient, and ambitious. In each SWCAP there will be a clear focus on a 'blue-green first' approach (see principle 2).

We build upon successful catchment partnerships in London

Successful partnerships already exist in London. River catchment partnerships, concerned with the catchments that influence the dynamics of rivers and streams, have brought together government organisations and other stakeholders like community groups and charities. They provide a collective voice for London's rivers and raise their profile for more strategic, catchment-scale action.[34]

To capture other organisational and administrative partnerships, the SWCPs were compared to the Thames RFCC[35] and Drain London[36] boundaries. Where organisations such as LLFAs were already successfully collaborating on the delivery of flood risk management actions, the boundaries of the SWCPs were calibrated to reflect this.

In Thames Water's Drainage and Wastewater Management Plan (DWMP) 23 catchments were reviewed against the flood impact assessment undertaken as part of this Strategy. This combined overland flow from rainfall with the influence of sewer flooding, where sewers carrying excess surface water reach capacity and surcharge into the street. It is therefore important to align the SWCPs with the proposed action plans for Thames Water's catchments.

The boundaries and participating organisations of these catchments were overlaid onto our hydraulic modelling to identify any shared boundaries and trends, and to capture the influence of London's 'lost rivers' on surface water flooding in the city. Appendix D contains further detail about the hydraulic modelling undertaken.

The Strategy combined the new, evidence-driven SWCPs with the boundaries and organisational structures of these existing catchment partnerships. This hybrid approach captures the complex physical and administrative influences on surface water management in London, and harnesses the work already being done to reduce flood risk.

Principle 5: Enable change through strong leadership

Our shared commitment:

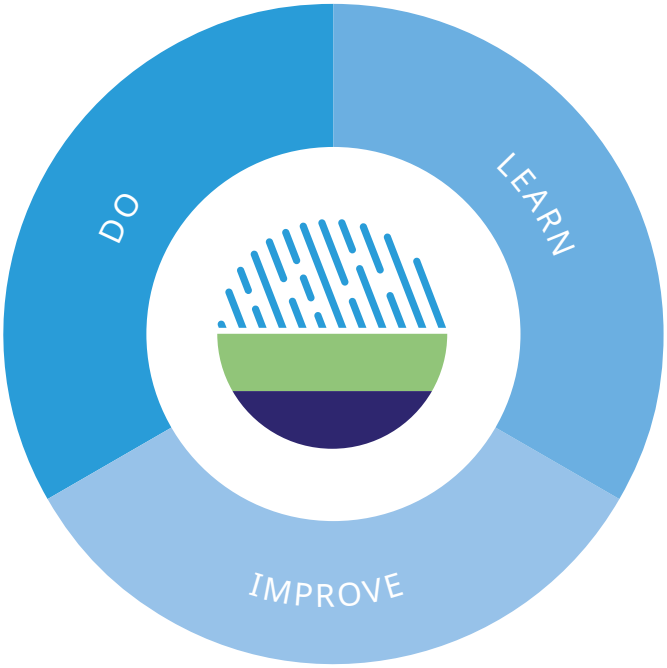
"We will ensure that institutions and organisations are equipped to enable and drive the changes we need to better protect London from surface water flooding."

This principle will be applied through:

Creating a shared governance approach to foster trust between organisations and the public.

Influencing statutory and non-statutory policy at the regional and national level to champion behavioural changes.

Empowering organisations to enable continuous learning about, and implementing, sustainable surface water management approaches.



Encouraging institutions and organisations to adapt their systems of governance is key to developing resilience. This requires the embedding of systems and behaviours that encourage adaptiveness, flexibility, and the ability to learn and improve quickly.

We aim to provide support for London's institutions and organisations to access the means to adapt how they work (together) on surface water management and build a shared understanding of institutional resilience. Transformational change can happen in big leaps or more gradual shifts in the ways people think, work, and collaborate with others. We aim to provide actions that enable institutional change from the outset. Placing adaptability and learning at the core of London's surface water management, the strategic actions help to empower RMAs and Londoners to have their say in how surface water flooding is tackled.

We will do this through formal institutional transformation such as creating shared governance and clearly defining collaboration mechanisms, placing a focus on measuring success with data and evidence.

Informal institutional transformation is just as important: our actions will work to change behaviours, understandings of resilience, and the way that we all interact and live with water as part of our daily lives.

We have analysed London's surface water policy landscape to identify areas for improvement and guide our proposed actions. Outcomes from our analysis is available in Appendix A. We recommend policy improvements to further encourage a change to long-term planning where surface water is managed in a more sustainable manner. We also advocate for BGI to be a visible, acknowledged positive and normal part of every streetscape. As included in our Roadmap for future delivery, we will detail specific asks to advise national Government as to how these could be achieved.

Guiding the transformation

A unified guiding governance body is required. Flood Ready London aim to fulfil this role, and must be resourced and funded to guide and ensure the delivery of the Strategy, and its accompanying actions, over the next five years as a minimum. We will report annually on the overall London-wide progress of the Strategy.

Designated leads for SWCPs should monitor and report progress, programmes, and profile resourcing and funding requirements, and collaborate with partner organisations to develop long-term action plans, inclusive of funding, capacity and efficiency.

Action at the borough scale should continue, as required by the duties of LLFAs under the Flood and Water Management Act (2010). We will support efforts to ensure London takes a leading role in promoting the implementation of Schedule 3 of the Act at the earliest opportunity.

We will also investigate and promote the potential adoption of a legal collaboration agreement across all participating organisations and stakeholders in the SWCPs. This will incentivise shared planning and delivery on priority actions and help to unify London's water management landscape toward a common vision and ambitions.

Contributing partner organisations, such as Thames Water and TfL, should explore where their data can be used to track progress and benefits arising from the SWCPs.

The London Plan[37] guides strategic growth and development in London. We recommend strategic updates, to give greater focus to surface water flooding and reduce barriers to implementing best practice in flood risk management. This should include:

- standards on surface water management
- sewer separation on new developments
- the incentivisation of local and property-scale rainfall capture and control measures
- the inclusion of SuDS in all urban developments across London.

This would ensure a balanced approach, integrating SuDS and retrofitting NbS into highways, public spaces, and existing properties while also making the most of opportunities in new developments.

Principle 6: Manage surface water flood risk at the right scales

Our shared commitment:

"We will collaboratively manage surface water flood risk at the most appropriate geographical scale."

This principle will be applied by:

Targeting action around risks and impacts considered strategically important for London.

Considering the full impact of surface water flooding when tackling strategic priorities, accounting for emerging data sources.

Applying a data-driven approach to understanding surface water flood impacts to enable the objective justification of action at any scale.

Manage surface water flood risk at the relevant scale

Through partnerships with other authorities, stakeholders, and local communities, RMAs will deliver surface water management actions at city-wide, catchment, borough, and local community scales.

This will provide a mechanism for local and strategic flood risks to be addressed under the same framework:

Flooding will be classified as a borough, catchment, or city-wide issue, which will determine who is responsible for dealing with it.

These efforts will complement local flood risk management activities within borough boundaries (e.g. Local Flood Risk Management Strategies (LFRMS) and Surface Water Management Plans (SWMP)), emphasising the importance of local knowledge and experience in effective surface water management.

Managing different priority scales

Understanding the scale of each surface water flooding risk is essential for resource management, particularly for ensuring funds and actions are prioritised based on where they are needed most. This may mean an individual borough tackling a flooding location on its highway network, or boroughs working together to mitigate runoff that results in a city-wide flooding problem. By carrying out flood risk modelling over London, we have categorised flood risk into the appropriate scale at which it should be addressed. These are:

Borough priorities

These are the borough- and community-level priorities. The boroughs (as LLFAs), supported by other RMAs, will manage local flood risks within their boundaries, implementing high-priority projects, and taking actions to protect local residents.

Catchment priorities

These are the catchment-level priorities, where flood risks extend across borough boundaries. The SWCPs will coordinate efforts, working together to develop solutions that address both local and regional challenges. Some actions delivered in a catchment may benefit other catchments and will need to be overseen by Flood Ready London.

London priorities

These are city-level priorities to address flood impacts that affect London-wide infrastructure, RMAs and communities. We will help oversee the management of the collective actions and programmes being undertaken to address the most significant surface water flood risks. We will align solutions with broader strategic priorities and lead long-term efforts, while also supporting smaller, high-priority projects and community-level actions undertaken by RMAs.

How to achieve a Flood Ready London

(Ambitions, Outcomes, Objectives)

Setting the Strategy's outcomes

This page outlines our Strategy's framework, where three core Ambitions, tailored to London's unique challenges and informed by national policy, drive clear Outcomes, Objectives and Actions that unite our collective efforts to support our Vision. An overview of how this looks is given in Figure 8.

Ambitions

Our Ambitions set out the big changes we aim to achieve. They define the transformative impact we want to see and help steer our collective efforts.

Outcomes

Outcomes are our intended, more tangible, results for London. They show the benefits we deliver for people, communities, and the environment, helping us track our progress.

Objectives

Objectives break down our Outcomes into clear, measurable targets. They provide the steps needed to realise our Outcomes and move closer to our Vision.

Actions

Actions are the detailed, practical steps and projects that bring our strategy to life. We are currently developing an internal Action Plan, which will provide detail on who does what, when, and how. We created a Roadmap, summarising the priority tasks that will be initiated upon commencement of the Strategy. This aligns with the Step Change Actions and any short-term actions already identified for commencement in 2025 and 2026. Annual monitoring and updates to the Roadmap will occur annually, as well as whenever additional budgetary or resource commitments are secured.

Monitoring

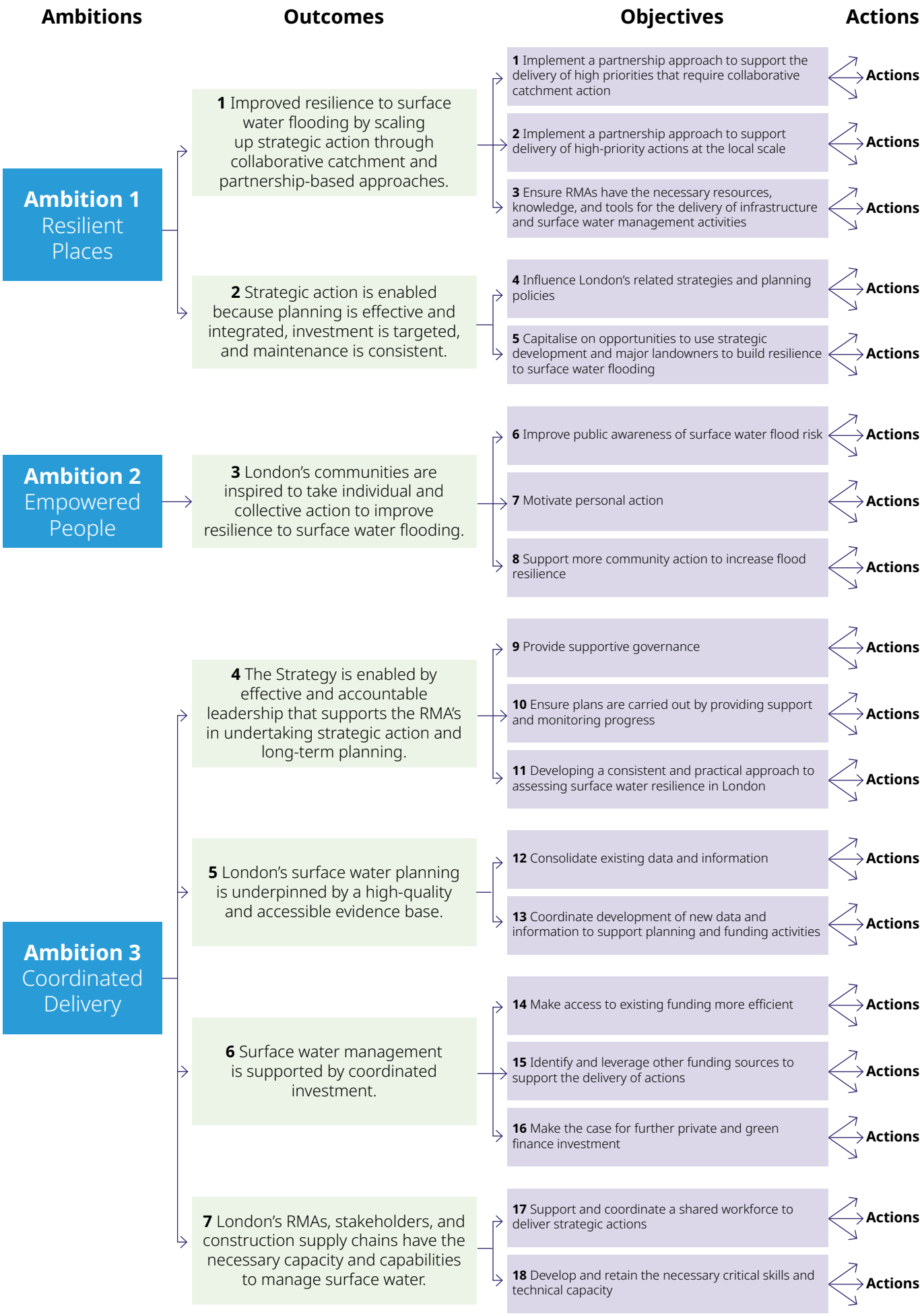
We have defined outcome statements and success metrics for each Ambition to measure successful implementation of the Strategy. Once the Strategy's Action Plan is completed, specific milestones and metrics will be assigned to each Action to measure tangible improvements. Similarly, once the SWCAPs are finalised, they will have similar milestones and metrics to track progress.

Timescales

We have set three timescales for our Objectives and Actions. Short-term Actions will be delivered by the end of 2026, medium-term Actions between 2026 and 2028, and longer-term Actions up to 2030. Some Objectives and Actions extend across multiple timescales.

In the rest of this chapter, we will go into more detail about our Ambitions, Outcomes and Objectives, and introduce the Step Change Actions.

Figure 8: Ambitions, Outcomes, Objective and Actions Framework



Ambition 1 Resilient Places

> "London's 'places' – our homes, workplaces, and the environments in which we live – are better prepared to manage surface water."

Why do we need this?

National strategies lack a clear framework for improving flood resilience at the city level. To effectively manage both current and future flood risks, London needs strong strategies and plans of its own and the tools to deliver them. Many of the challenges we face come from administrative and organisational structures that do not always support working across boundaries. That's why it's essential to step up and speed up our efforts to remove these obstacles.

What are we aiming to achieve?

Our aim is to increase adaptation and resilience through better collaboration across boundaries and within catchments. We will focus on areas that play a key role in flooding, either contributing to flooding or affected by it.

We aim to build stronger trust between organisations and communities, creating a shared mandate for collective action across London.

RMAs, other key stakeholders, and London's communities all have a part to play in building this resilience. Resilient places encompass all parts of the city, including all the supporting infrastructure that keeps London working.

This ambition will ensure that we have the right resources, knowledge, and tools to manage surface water effectively, implement catchment plans, and develop critical infrastructure.

To realise this Ambition, we need to achieve two key Outcomes. To meet these we have developed five Objectives with underlying Actions.

Outcome 1

Improved resilience to surface water flooding by scaling up strategic action through collaborative catchment and partnership-based approaches.

RMAs, other stakeholders and communities in London must work together more strategically and innovatively to tackle flooding. This includes working together to address flooding where rain falls, not just where flooding happens. We want to ensure the right conditions are in place so planning and action delivery can happen at the right scale, making cooperation more effective across boundaries.

For this we propose the new SWCPs, which we introduced above (Guiding principle 4: work in more effective partnerships).

The SWCPs will be shaped by how floodwater moves across London, cutting through political and organisational barriers to unite key stakeholders and drive priority projects forward more effectively. By working together and sharing resources, the SWCPs will not just create (long-term) plans, but ensure real action on the ground by delivering schemes and interventions that directly reduce surface water flood risk. By ensuring that the SWCPs have the resources, knowledge, and tools to work effectively, we will drive best practice and accelerate progress.

Objective 1

Implement a partnership approach to support the delivery of high-priority actions that require collaboration at the catchment scale.

Organisations managing surface water must form collaborative catchment partnerships, building on existing partnership relationships, and develop plans to enable the delivery of strategically important cross-boundary action. This coordinated, long-term approach will address London's highest priority risks more effectively, meet local needs, and deliver broader benefits for the city.

Short to medium term

Objective 2

Implement a partnership approach to support the delivery of high-priority actions at the local, borough scale.

We must work with organisations across London to form collaborative catchment partnerships to enable the delivery of strategically important action at the borough scale by providing needed resource and funding support. We must empower RMAs with the guidance they need to address priority risk areas and carry out essential surface water management activities.

Short term

Objective 3

Ensure RMAs have the necessary resources, knowledge, and tools for the delivery of new infrastructure and surface water management activities.

Organisations managing surface water must have access to the guidance and information necessary to enable the development of sustainable surface water solutions that align with the Guiding Principles of the Strategy. For effective, collaborative work across catchments, we must ensure a consistent approach to designing and implementing interventions.

Short to medium term

Outcome 2

Strategic action is enabled because planning is effective and integrated, investment is targeted, and maintenance is consistent.

Surface water management must be supported by improved policy and legislation. Development projects, including highway and public realm works and new property, should not only be optimised to reduce flood risk, but also for improving placemaking and enhancing the environment.

Retrofitting infrastructure in London is highly constrained due to the presence of existing property and infrastructure, land-use types, green space and topography. Where new development occurs, there is an opportunity to integrate best-practice surface water management into its design, especially where these developments fall in strategic priority areas. The effectiveness of surface water flood risk measures relies on continuous maintenance and management of assets and infrastructure.

Objective 4

Influence London's related strategies and planning policies to support the delivery of the strategy.

Improved strategies and planning policies must better support the delivery of surface water infrastructure as part of integrated placemaking initiatives and strategic development sites. City-wide and local strategies (e.g. Mayors, Environment Strategy, Transport Strategy, as well as local transport and flood risk strategies) and planning must work together and should apply our Guiding Principles.

Medium to long term

Objective 5

Capitalise on opportunities to use strategic development and major landowners to build resilience to surface water flooding.

We must support RMAs to leverage opportunities to integrate surface water interventions into key locations, through new construction, property development, and land management. Strategic developments delivered in higher-priority areas must actively contribute to making local communities more resilient to surface water flooding.

Medium to long term

Measuring success: Resilient Places

We define and will measure the successful delivery of Ambition 1 through specific outcome statements and clear success metrics (Table 1) to measure successful implementation. **The outcome statements are:' needs to be added to be consistent with ambitions 2 and 3.**

1. By the end of 2026, two initial SWCPs action plans are developed.
2. By the end of 2026, a policy recommendation for the incorporation of NbS or SuDS in all urban development has been produced.
3. By the end of 2026, a schedule of borough-scale priority actions has been identified.
4. By the end of 2028, all ten SWCPs have been formalised and their respective SWCAPs are developed and published.
5. By the end of 2026, a schedule of priority surface water runoff control areas has been identified and integrated into all SWCAPs.
6. By the end of 2030, all statutory plans and documents integrate London's surface water strategic priority areas and actions.

Table 1: Success metrics for Ambition 1

Success metric	Reporting frequency
Total area of SuDS or NbS installed by SWCPs, and the volume/ flow of surface water managed by these features	Annually, per SWCP
Total area of SuDS or NbS installed within urban development opportunities, and the volume/flow of surface water managed by these features	Annually, per SWCP and per borough
Total area depaved by community depaving projects supported or funded via the Strategy or SWCPs, and its predicted effect on surface water flooding	Annually, per SWCP and per borough
Total area of depaving implemented across London by Flood Ready London partner organisations, and its predicted effect on surface water flooding	Annually, across Flood Ready London partner organisations
Number of professionals from member organisations who have completed accredited adaptation and BGI	Annually, by Flood Ready London partner organisations

Key to the evaluation and reporting process will be understanding enablers and constraints to success. Should the success metrics prove difficult to achieve, the Strategy should allow for the dynamic improvement of actions to overcome implementation barriers.

Ambition 2 Empowered People

> "London's residents and communities and businesses actively contribute to increasing surface water flood resilience."

Why do we need this?

People must be aware and empowered to act on surface water flood risks. Without the sharing of information, engagement with, collaboration and action of Londoners, we cannot become more resilient to flooding. Designing better, more holistic spaces, with active community involvement, will be key. Involving communities in shaping their spaces makes solutions more effective,[38] attracts investment, and can reduce maintenance burdens. This Ambition also presents an opportunity to improve the built environment for London's most vulnerable communities.

What are we seeking to achieve?

Our goal is to help people and communities understand their flood risk and provide the information needed to take action. By a collaborative approach, we aim to increase a sense of ownership and responsibility that equips residents with the tools to better protect themselves. This enables them to reduce their personal risk and strengthen the resilience of their community. We also highlight the benefits of co-created spaces that align residents' needs with the need for more flood protection infrastructure.

To realise this Ambition, we need to achieve **one** key Outcome. To meet it we have developed **three** Objectives with underlying Actions.

Outcome 3

London's communities are inspired to take individual and collective action to improve resilience to surface water flooding.

We recognise the need to significantly increase awareness of surface water flood risk in London, particularly for its most vulnerable residents and communities, who are also more likely to live in flood-prone areas. Every intervention to manage surface water is beneficial, whether at home or in the community. Therefore, we designed our objectives and actions to motivate and incentivise Londoners to take both personal and collective action to adapt and respond to flooding. Surface water management should be an important part of London's approach to placemaking, with communities actively involved in planning, delivering and maintaining solutions.

Objective 6
Improve public awareness of surface water flood risk

London's residents must better understand the potential causes and impacts of surface water flooding on their lives and livelihoods. They must be empowered to work with others to take action to reduce the impact.

Short term

Objective 7
Motivate personal action

Londoners must have access to clear, comprehensive information on flood management to help them take more responsibility and make an active positive difference in enhancing surface water flood resilience.

Medium term

Objective 8
Support more community action to increase flood resilience

Residents and local communities must become influential stakeholders in the delivery and maintenance of local surface water solutions. This means boosting their representation and actively involving them in planning and developing these solutions.

Short to long term

Measuring success: Empowered People

We define and will measure the successful delivery of Ambition 2 through specific outcome statements and clear success metrics (Table 2) to measure successful implementation.

The outcome statements are:

1. By the end of 2026, a consolidated map of London's most vulnerable groups and their associated flood risk will have been produced.
2. By the end of 2026, a Flood Ready London-branded surface water flood resilience website will be launched across London.
3. By the end of 2028, community-led projects and initiatives will have been launched across all ten SWCPs.

Table 2: Success metrics for Ambition 2

Success metric	Reporting frequency
Number of projects where engagement toolkit has been implemented	Annually, per SWCP
Number of visitors to Flood Ready London-branded website	Annually, per SWCP and per borough
Total subsidisation (£) of small-scale attenuation systems	Annually, across Flood Ready London partner organisations and London-wide
Total number of outreach and education sessions delivered by Flood Ready London members and partners	Annually, across Flood Ready London partner organisations
Total number of community-led SuDS or BGI projects implemented by Flood Ready London members and partners	Annually, by Flood Ready London
Total spend (£) on Property Flood Resilience measures	Annually, across Flood Ready London partner organisations

Ambition 3 Coordinated Delivery

> "All stakeholders involved in managing surface water flooding will work together to ensure coordinated planning and delivery."

Why do we need this?

No single organisation can deliver the action needed to make London resilient to surface water flooding. Planning, funding, and delivery need to be a coordinated effort. Strong leadership and effective governance will be crucial to align efforts and make strategic decisions, and allocate funding and resources to projects efficiently. A key part of this coordination is collecting, sharing, and using data and information, which enables informed decision-making and tracking of progress. Ensuring that every partnership has enough resources will be vital to sustain projects and support long-term planning.

What are we seeking to achieve?

Our aim is to create a comprehensive framework that helps support delivering actions and infrastructure, from planning to operation. This involves setting up proper governance for the Strategy, providing evidence to support planning and development, consolidating funding options, and ensuring a skilled and capable workforce is available.

To realise this Ambition, we need to achieve **four** key Outcomes. To meet them we have developed **ten** Objectives with underlying Actions.

Outcome 4

The Strategy is enabled by effective and accountable leadership that supports the RMAs in undertaking strategic action and long-term planning.

To make London more resilient to surface water flooding, we need strong strategic leadership and effective management. That's why we will bring together the right people from the right organisations to drive this change and oversee delivery of our Strategy. A London-wide programme, with key organisations working together, will make planning and the delivery of actions more effective. This will also allow us to track progress against our objectives and actions. A shared, consistent understanding of flood resilience and adaptation will help to ensure common standards across London.

Objective 9
Provide leadership and guidance

London must have strong leadership to drive the delivery of strategic priorities and investment, while shaping longer-term governance, planning, funding and delivery frameworks.

Short term

Objective 10
Ensure plans are carried out by providing support and monitoring progress

We will support the delivery of actions and catchment solutions through programme management and integrating these actions into statutory mechanisms.

Medium to long term

Objective 11
Develop a consistent and practical approach to assessing surface water resilience in London

By working with policy makers, RMAs, and wider stakeholders, we must develop a London-specific surface water resilience standard that reflects London-specific risks and considers social, environmental, operational, and commercial factors.

Short to medium term

Outcome 5

London's surface water planning is underpinned by a high-quality and accessible evidence base.

Improving the sharing and quality of existing data and information, via formalised Data Sharing Agreements and standardised templates, will be essential to enable short-term progress. By ensuring that all organisations follow consistent and robust processes and standards for data collection, sharing and analysis, we can better support planning, funding, and delivery of surface water management projects. London should embrace innovation and technology to better model, visualise, and understand flood risk, as well as opportunities for sustainable development.

To provide readily available, consistent and coherent information, organisations should focus on generating and sharing data that will be useful for the long-term success of our Strategy. This data could include, for example, the costs of surface water flood incidents, locations of vulnerable communities, detailed hydraulic flood modelling results, locations and conditions of surface water and other underground assets, and prospective flood risk management projects. RMAs will identify the most critical data needed to strategically manage surface water flood risk, at London-wide and catchment levels, through the implementation of the SWCPs. The most beneficial data should be proactively shared and managed by the most relevant organisation or partnership.

We recommend a wider adoption of technology to improve understanding of the condition and performance of assets. Not only will this complement the drive towards improved data and evidence; it will also provide synergies with other pressing topics such as water quality and pollution.

Objective 12
Consolidate existing data and information

RMAs must have consolidated evidence and systems in place to enable continuous improvement, helping to better inform future risk and investment needs for managing surface water flooding

Short term

Objective 13
Coordinate development of new data and information to support planning and funding activities

RMAs must facilitate the development and operation of new tools and data to optimise the approaches to assess future risk and investment needs to manage surface water flooding.

Medium to long term

Outcome 6

Surface water management is supported by coordinated investment.

There is not enough funding available to meet the scale of the challenge. This applies both to capital investment and maintenance of infrastructure, and for hiring people who can deliver our ambitions. Where funding is available, access is intermittent, time-consuming, and complex.

If we upskill existing staff and recruit or share specialists to support and speed up funding applications, we can release existing funding more efficiently. Organisations should keep prioritising schemes that reduce flood risk, particularly to the most vulnerable, and maximise benefits to places, people and the environment.

A centralised funding pot for surface water management projects, specifically dedicated for use in London, would allow us to accelerate the most crucial actions and align better to shared (and costed) catchment-scale plans.

Addressing funding challenges for small-scale SuDS and property level resilience will help our most vulnerable residents adapt to flooding, while also delivering broader local benefits to those most in need.

Investment in surface water management must increase rapidly. Our ambition is to establish a dedicated funding vehicle for the delivery of management in London, operating within the governance of Flood Ready London and the SWCPs to support effective delivery. Measures to engage and integrate with private finance must be scaled up.

Objective 14
Make access to existing funding more efficient

RMAs must have the capacity to draw down upon a proportionate share of public funds more efficiently.

Short term

Objective 15
Identify and leverage other funding sources to support the delivery of actions

Spending on strategic priorities and long-term programmes of work will be supported through pan-London coordination of funding and investment.

Medium to long term

Objective 16
Make the case for further private and green finance investment

The LSWSG will formulate a surface water infrastructure finance plan to contribute to the investment needs for managing surface water flooding.

Medium to long term

Outcome 7

London's RMAs, stakeholders, and construction supply chains have the necessary capacity and capabilities to manage surface water.

London currently lacks the skilled people it needs to tackle surface water flooding with the necessary scale and urgency, including flood risk officers, engineers, engagement specialists, and many other skilled professionals. To achieve the aims of the Strategy, London will need many more competent people to overcome this industry-wide shortage. Meanwhile, RMAs face competing priorities and limited resources, which only adds to the challenge. Addressing both short-term and long-term resource constraints is essential for building the necessary workforce capacity in London. We recommend the recruitment or re-skilling of financial specialists, business development experts, and/or green finance experts into Flood Ready London partner organisations. Establishing strong, formal relationships with private sector investors will be essential for ensuring the long-term success and sustainability of the Strategy. In parallel, organisations managing surface water should strengthen academic and career-focused pathways into the sector, ensuring its long- term sustainability and growth.

It is also essential to work closely with the Mayor of London's Infrastructure Coordination Service (ICS),[39] which is pursuing a similar vision to ours for long-term infrastructure planning, bringing together the organisations responsible for building and maintaining the capital's infrastructure, and improving the coordination of planning, maintenance and construction. Working in synergy with them will help alleviate the pressures on resource and skills availability in London and save time and funds.

London should proactively build a sustainable resource model by promoting specialised higher education and apprenticeship programs in surface water management, as well as by re-skilling and sharing experts within current organisations. In addition to further strengthening local expertise, we can speed up delivery of necessary actions by creating a "London Alliance": a centralised network of consultants and contractors. This could follow the existing success of the ICS Contractor Alliance.[40]

Objective 17

Support and coordinate a shared workforce to deliver strategic actions

We must establish a mechanism to support resource sharing. This will involve uniting stakeholders to manage and coordinate a shared workforce and resource pool based on agreed priorities, streamlining roles and eliminating duplication of efforts.

Medium term

Objective 18

Develop and retain the necessary critical skills and technical capacity

RMAs will work together with academic institutes and policy groups to support research and the development of key skills and actionable innovation.

Medium to long term

Measuring success: Coordinated Delivery

We define and will measure the successful delivery of Ambition 2 through specific outcome statements and clear success metrics (Table 3) to measure successful implementation.

The outcome statements are:

1. By the end of 2026, Flood Ready London is integral in influencing planning and supporting delivery of surface water flood risk management in London.

2. By the end of 2026, a surface water resilience standard for London has been developed and agreed.

3. By the end of 2028, a robust and standardised data portal has been established in London and is used to coordinate the planning and delivery of surface water works across the city.

4. By the end of 2028, a London alliance of contractors and consultants, for RMAs to utilise, is established to deliver SWCAPs and borough-scale priority actions.

5. By the end of 2028, a centralised, devolved Special Purpose Vehicle is utilised to fund the delivery of SWCAP projects.

6. By the end of 2030, the London Plan and other relevant plans have been updated to include recommendations arising from the Strategy .

7. By the end of 2030, the delivery of the Strategy is supported by a dedicated Surface Water Infrastructure Investment Plan, unlocking the approximately £41 million of annual investment required in surface water management projects (see: Funding Landscape).

Table 3: Success metrics for Ambition 3

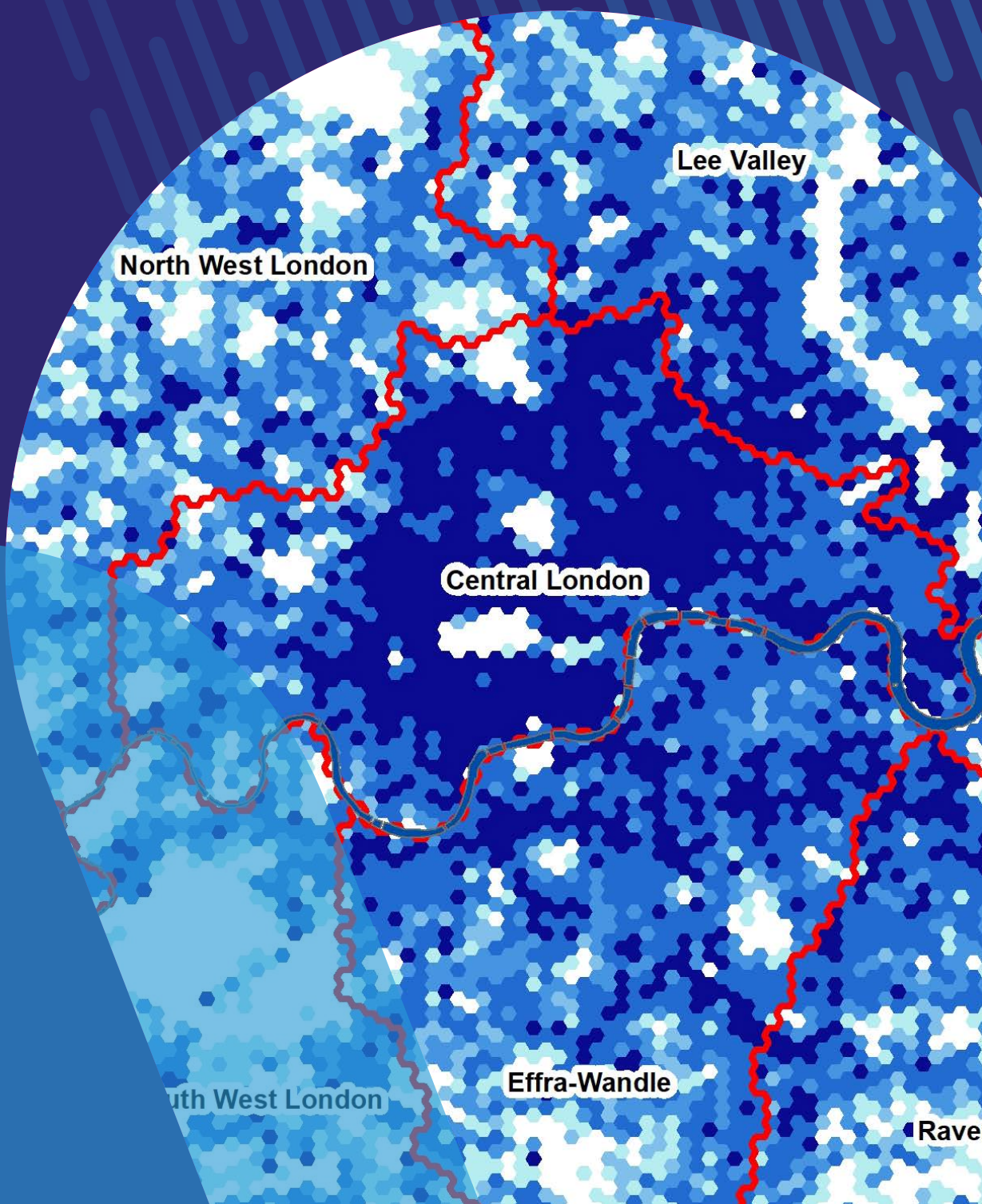
Success metric	Reporting frequency
Total committed investment (£) into the operations and delivery of the London Surface Water Strategy by member organisations	Annually, per SWCP
Total number of strategic priority actions and projects (planned and delivered) captured in consolidated database	Annually, per SWCP and per borough
Number of Capture, Control, Adapt & Respond-related projects delivered by SWCPs, and the volume/rate of surface water managed by each project	Annually, across Flood Ready London partner organisations
Total committed investment (£) in development of data collection and management tools and systems (for application within ICS)	Annually, across Flood Ready London partner organisations
Total number of SuDS & BGI projects delivered as integrated infrastructure or development schemes	Annually, by Flood Ready London partner organisations
Total committed funding for Property Level Resilience/ Property Flood Resilience (£) across Flood Ready London members and partners	Annually, across Flood Ready London partner organisations
Total area of BGI or SuDS delivered by alliance framework approach	Annually, across Flood Ready London partner organisations
Total perceived skills and resource capacity shortage of RMAs across London (FTE %)	Annually, per SWCP and per borough

Delivering step change

Every action we take to achieve our goals in London is important and interconnected. Notably, we have identified several key actions that could, on their own, deliver a significant "step change" in managing surface water in London. These Step Change Actions, and their benefits, align with one of the Strategy's three Ambitions. Along with short term Objectives and Actions, the Step Change Actions have been used to help create an initial Roadmap for the implementation of the Strategy.

	Step Change Actions
Ambition 1	**Initiate the SWCPs:** Initiate the first priority catchments and promote the catchment-based approach across London.
	Collate and maintain a shared knowledge base: Develop and maintain a central repository that includes the engineering and design standards for all London Boroughs and RMAs. Promote standardisation in the use of these standards and engineering tools as best practices emerge.
	Champion a place-based approach: Engage with major estates and developers involved in strategic developments to create policy recommendations that integrate net-water-negative design into new projects.
	Consolidate strategic priority areas: Align these areas with existing critical drainage areas (CDAs) and, if necessary, propose updates to the CDA approach.
	Policy recommendations for the London Plan: Prepare and submit policy recommendations for inclusion in the next update of the London Plan, inclusive of planning, climate resilience, and water management.
Ambition 2	**Develop a dedicated website:** Create a Flood Ready London-branded surface water flood resilience website to host the strategy, action plan, mapping data, and awareness information, and to direct users to a public flood reporting portal.
Ambition 3	**Establish the integral position of Flood Ready London:** Position Flood Ready London as a core part of London's surface water management system and establish its long-term governance framework.
	Implement our strategic solution hierarchy: Use this hierarchy as the foundation for developing a London surface water resilience standard.
	Standardise data collection: Introduce a uniform approach to collecting and recording surface water flood event data and information.
	Create a special purpose funding vehicle for the delivery of strategic SWCP projects
	Evaluate governance and funding needs: Assess what is required to establish a strategic surface water authority for London over the long term.
	Explore a BGI funding mechanism: Investigate the feasibility of creating a London BGI funding mechanism.
	Develop a shared resourcing framework: Create a framework to support all organisations in London to get the necessary capacity and capability to achieve the strategy's objectives.
	Assess a city-wide alliance framework: Evaluate the possibility of using a city-wide surface water infrastructure design and delivery alliance framework, building on the existing ICS alliance approach and framework contracts.

Our flood risk assessment for London



Our flood risk assessment for London

London is particularly prone to surface water flooding due to its extensive and growing impermeable surfaces, the increasing frequency and intensity of extreme rainfall and the inability of sewers to cope with both of these challenges. Furthermore, predicting the flow of surface water over land and through London's drainage systems is complicated, making surface water flooding highly localised and difficult to forecast.

The Intergovernmental Panel on Climate Change defines risk as "the potential for adverse consequences for human or ecological systems, recognising the diversity of values and objectives associated with such systems".[41] In relation to surface water, we define this as the potential social, economic and environmental impacts of a flood event.

Calculating flood risk

We calculated the current risk of surface water flooding in London on a high-level basis, using the TfL Hex Grid as its spatial unit (350m x 350m). Our calculation combined three key elements:

Exposure to flood water
Identifying the number of people or structures at risk during rainfall events.

Vulnerability to flooding
The susceptibility and limits to adaptability of people or structures to flood depths, calculated by combining a series of social and demographic metrics.

Consequence of flooding
The financial and human costs (£) associated with a flood event on both a London-wide and community scale.

A detailed methodology is provided in Appendix F.

Consequences and risk results

Costs, referred to below as impact, were calculated for several different rainfall events, which were used to derive an Annual Average value, based on expected frequency of each event.

We calculated that in the present day, an extreme rainfall event could cause up to £1.6 billion in damages (Table 4).

Table 4: Consequences of flooding

Scenario	Annual average damages (£m)	Description
Heavy rain	Up to £79 million (±25%)	Equivalent to 30mm of rain in less than 2 hours, typically occurring every few years
Severe rain	Up to £475 million (±25%)	Equivalent to 50mm of rain in 2 hours, typically occurring every few decades
Extreme rain	Up to £1.6 billion (±25%)	Greater than 50mm of rain in less than 2 hours, typically a generational event

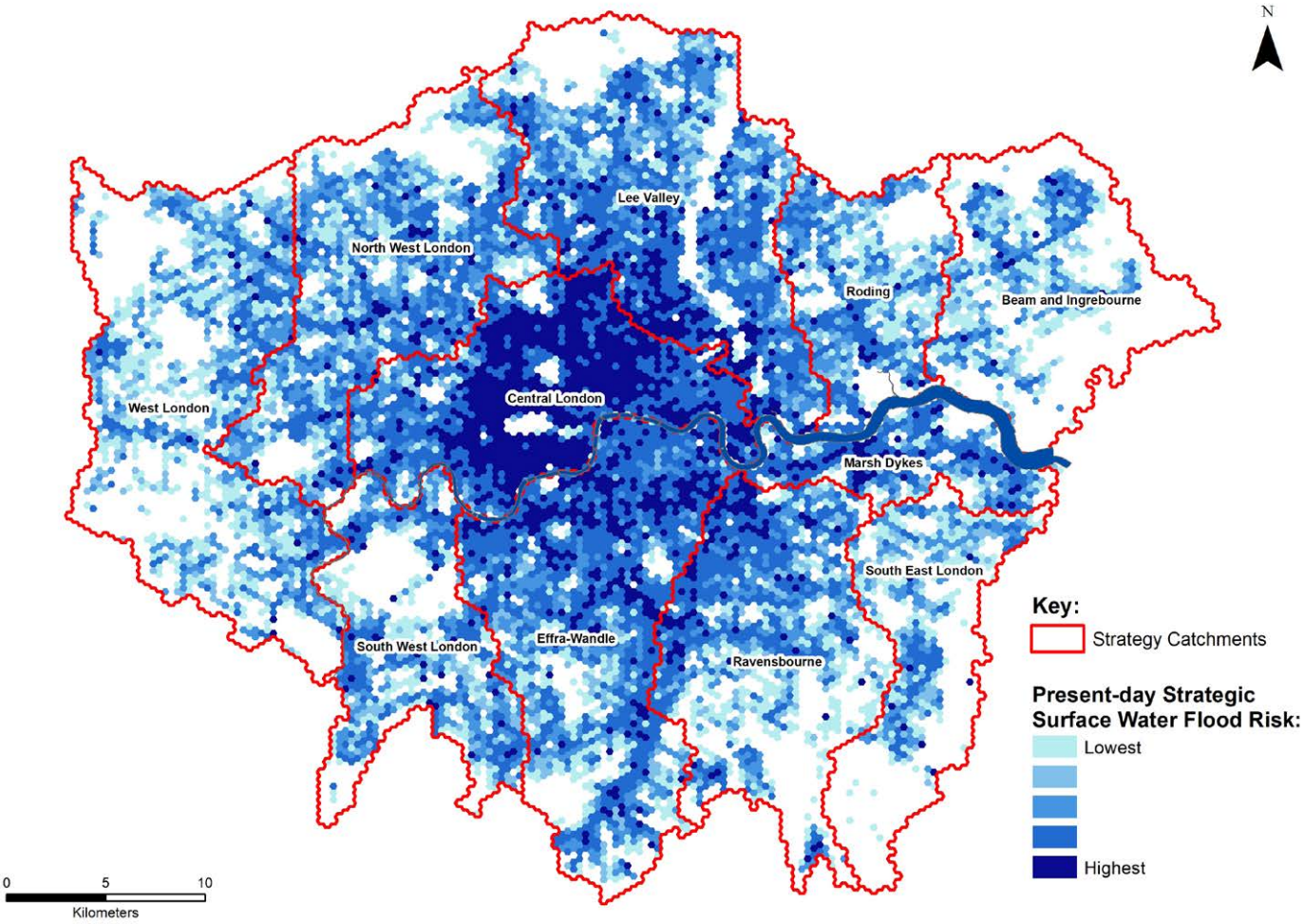
Strategic risk

As we said before, almost 320,000 residential properties are at risk of surface water flooding in London,[42] including at least 45,000 basements.[43] There are around 300,000 commercial properties in London, with over 40% of them estimated to be at risk of surface water flooding.[44]

We adopted a greater focus on vulnerability when quantifying risk, compared to traditional fluvial or tidal approaches to calculating potential flood damages, which primarily focuses on cost impacts to properties or businesses. As a result, our assessment provides a strategic insight into where the impacts of flooding on the health, wellbeing and mobility of London's most vulnerable residents are likely to be greatest.

As shown in Figure 10, flood risk is concentrated in central London, where both vulnerability and exposure to surface water flooding are relatively high.

Figure 10: Present-day strategic surface water flood risk across London

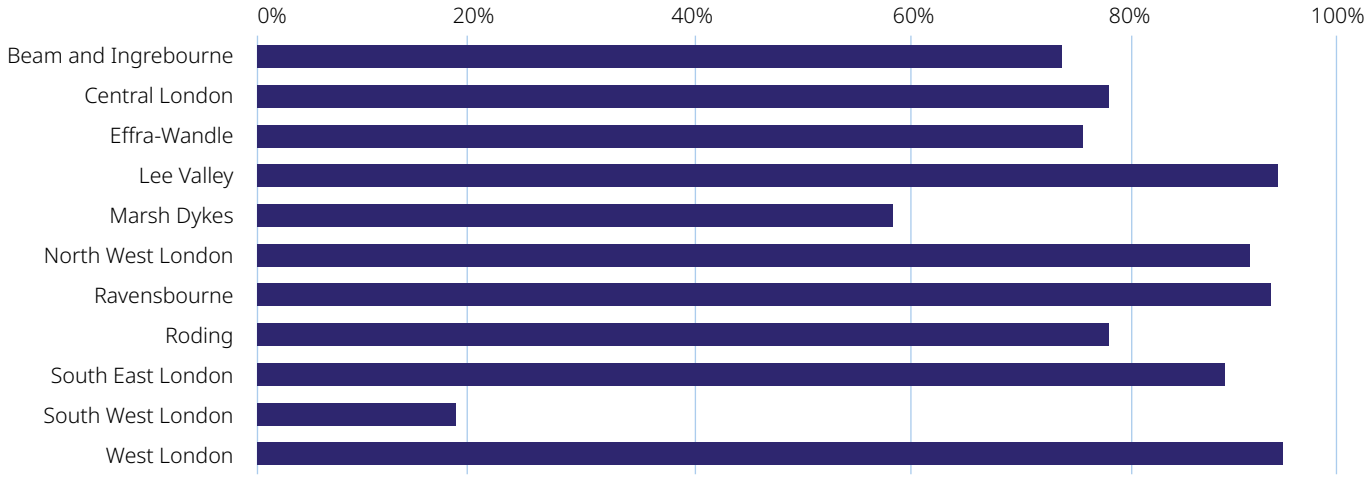


Capturing risk to vulnerable groups and infrastructure

For each Strategy catchment, our assessment mapped the proportion of vulnerable residents (Figure 11), and the infrastructure that supports them (Figure 12), against the risk of flooding. Across London, our assessment shows that surface water flood risk disproportionately affects the most vulnerable groups of residents. In many parts of the capital, more than 75% of vulnerable people are already at risk of surface water flooding (Figure 11). Aside from the direct damages of flooding, the indirect costs of stress, poor wellbeing, insurance premiums, and disruption to public services and places amplify the negative impacts to these individuals.

These vulnerable individuals and communities were shown to be relatively more likely to live in places where flood risk is highest, and therefore where the potential costs and impacts of flooding may be greatest. Vulnerability has been factored into the' selection of priority selection of priority areas for inclusion in our Strategy.

Figure 11: Percentage of vulnerable people within each strategy catchment that are at risk of surface water flooding

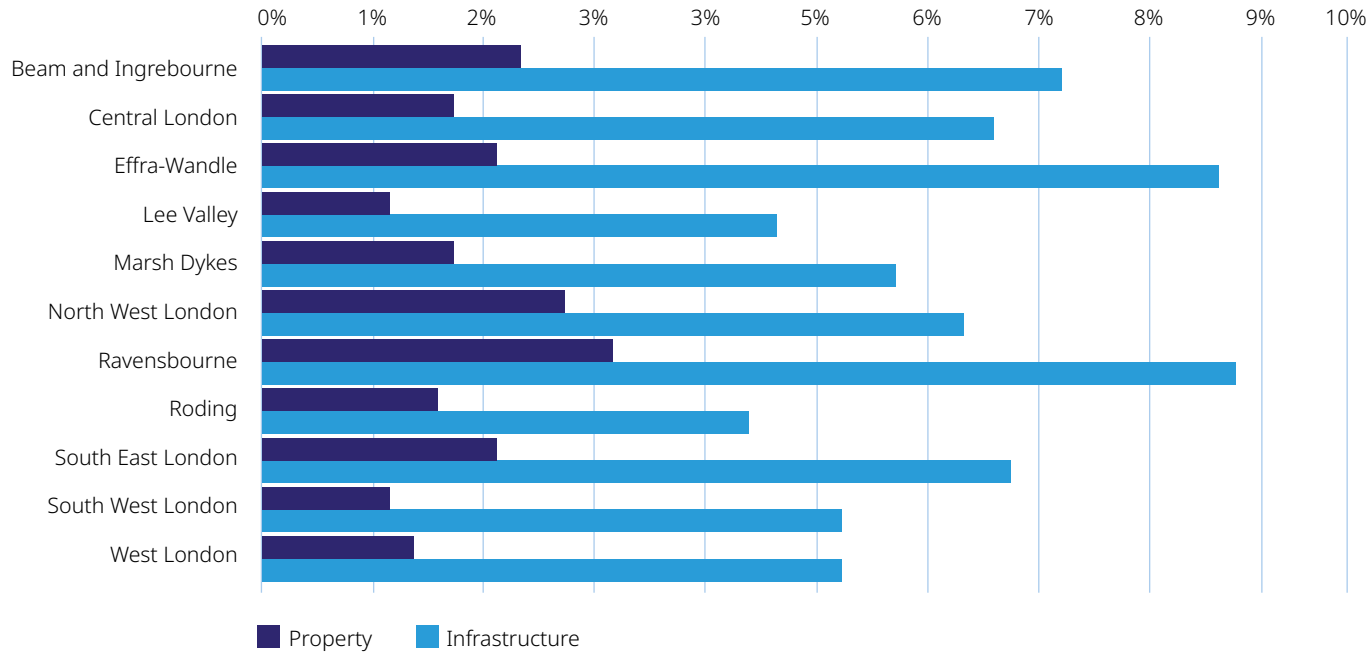


Flood risk to critical infrastructure

Capturing the flood risk to critical infrastructure in London is vital. In the July 2021 storms, underground stations, hospitals, critical roads and highways, and schools were all affected by surface water flooding, some severely. The UK National Risk Register[45] (published annually) specifically highlights the risk that extreme rainfall poses, particularly to urban transport systems and other urban infrastructure.

A clear understanding of how property and infrastructure are exposed to surface water flooding provides a more complete picture of the challenge, and is essential for developing effective solutions.

Figure 12: Distribution of London's vulnerable infrastructure and property at risk of surface water flooding



A changing climate further increases London's risk

Recent projections show that London's surface water flood risk is set to rise significantly as a result of climate change.[46] For investigating this change in flood risk, we have adopted a 50-year time horizon.

To account for climate change, we have used one scenario: the Met Office's UKCP18 convection-permitting model to project future rainfall changes, also used by the Environment Agency. However, it is important to note that these changes will vary regionally within the city.

We have averaged this future uplift across London, **resulting in a projection of a 33% increase in rainfall intensity by 2075**. While these projections are widely used, the actual future increase in rainfall is uncertain. Planning for a range of scenarios is important.

Urban development and population growth will result in increased exposure and vulnerability to surface water flooding by 2075. However, climate change is expected to have the most significant influence on future risk in London.

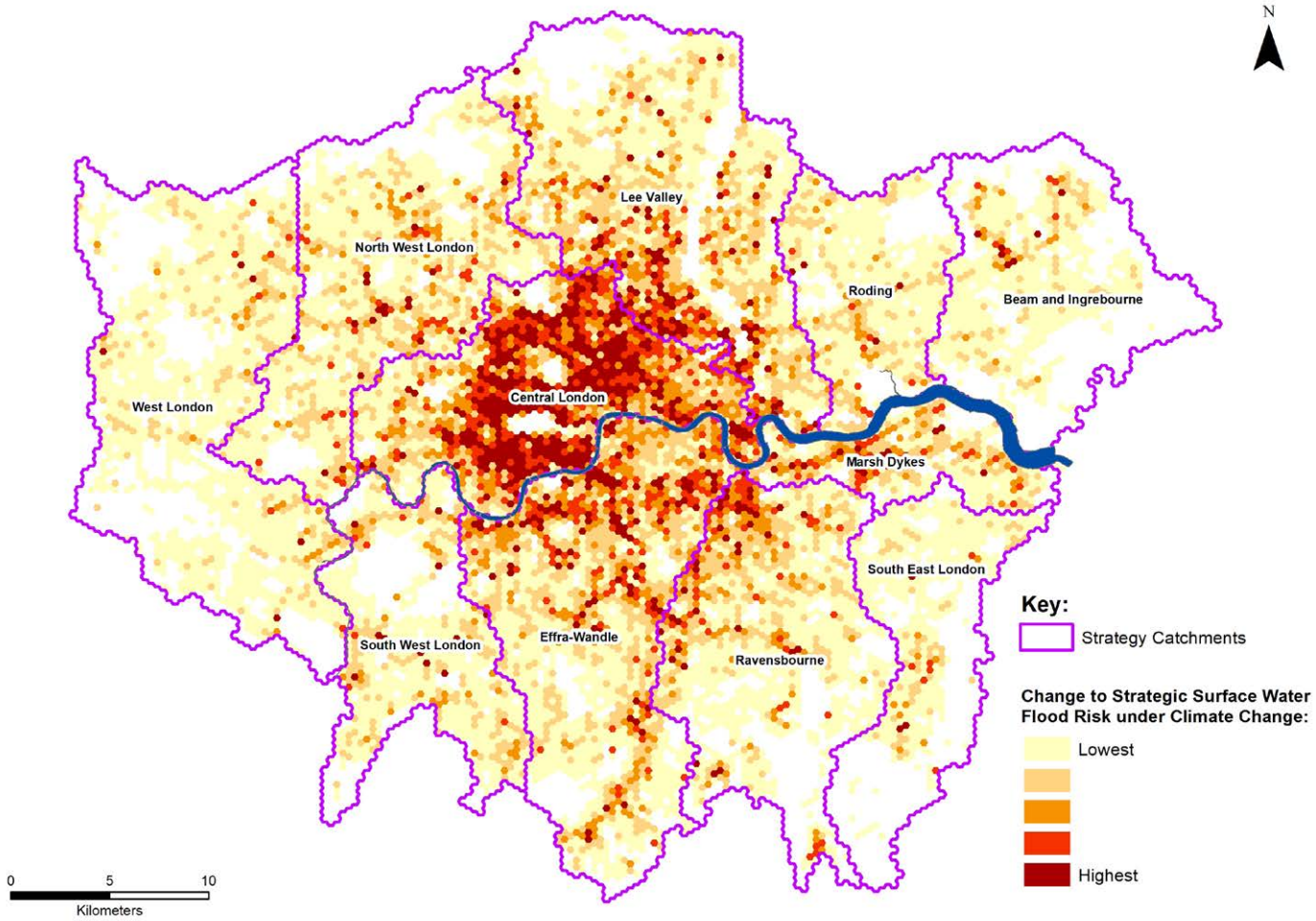
Fast-tracking planning and building solutions to reduce surface water flood risk is needed, given the accelerating challenges of climate change, urbanisation, and population growth, all of which will contribute to an increase in the number of properties, people and places at risk of flooding.

Figure 13 shows the scale of future change in risk, with the highest future risks in red, and the lowest in yellow, emphasising that climate change will bring increased risk of flooding across the majority of London.

The results of the modelling carried out for the Strategy show that the estimated average annual impact of surface water flooding on London will be £24 million by 2075 – an increase of 53% compared to the present day. Should a severe rainstorm similar to the July 2021 event occur, the projected scale of damages could reach up to £730 million.

Should an extreme rainstorm hit London, we have calculated that, by 2075, the projected scale of resulting damages could increase from £1.6 billion to £2.4 billion.

Figure 13: Increase in strategic surface water flood risk by 2075, under climate and urban change



A flexible approach to delivering surface water solutions

A flexible approach to delivering surface water solutions

This chapter outlines the approach we need to take to reduce surface water flood risk across London by 75% by 2075. This chapter outlines our approach and the interventions needed to achieve this target.

Resilience to surface water flooding is not just about engineered interventions; it also involves how institutions and organisations adapt. For resilience to be effective, all organisations working on flood risk management must share a common definition of resilience that is applied and understood uniformly and is translatable to the infrastructure we build. Therefore, we propose a pathway towards a new resilience standard for London.

At this stage, it would be impractical to prescribe a single engineering design standard for all infrastructure built in London. The built environment varies too much across boroughs. Some areas may lack the space for an ideally sized storage tank, while others cannot allocate large areas to SuDS.

A 'Source-Pathway-Receptor' approach

We propose that each SWCP provides interventions that, when combined, deliver the cumulative benefits needed to manage surface water flooding. This approach follows the 'Capture, Control, Adapt & Respond' philosophy.

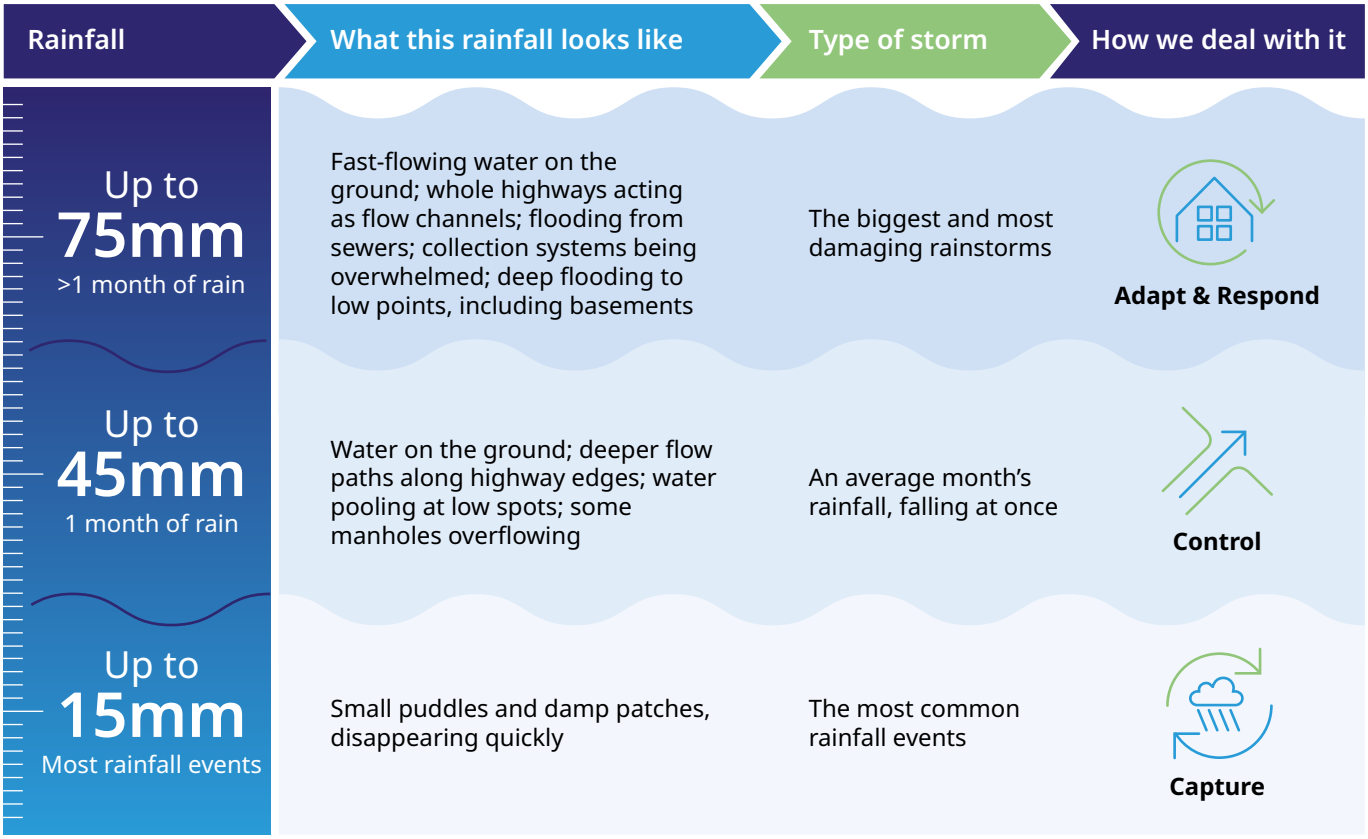
To simplify the characterisation of surface water flooding, we have taken a 'Source-Pathway-Receptor'[47] approach. Rainfall lands on the surface at source areas. If it cannot be absorbed into the ground or stored at this source, it travels along **pathways** across London, influenced by the landscape, including topography, land use types, drainage networks and other waterways. Where the drainage systems are unable to control this water, or where systems to collect and store water are overwhelmed, the water on the surface reaches areas where '**receptors**' (people, property and places) are affected by flooding.

What this might look like is shown in Figure 14. Sources and pathways for surface water are as crucial to identifying and understanding flooding as the spaces where flooding occurs.

London needs a holistic mix of solutions to manage surface water priorities strategically and reduce flood risk at both catchment and borough levels. Our proposal provides a starting point for us to further develop this resilience standard in conjunction with the similar work being undertaken by other organisations (such as the Environment Agency's own work on resilience). By using an approach based on rainfall depth we allow the standard to be updated as the climate changes, and as we continue to evolve our systems for dealing with surface water.

This pathway guides the combination, and prioritisation, of differing solution types. Ideally, London will explore and implement a holistic combination of approaches to manage surface water flood risk and enhance resilience to flooding.

Figure 14: A proposed pathway to surface water flood resilience



Capture solutions

Capture solutions are the first level in the hierarchy. Their goal is to manage rainfall where it falls. These approaches can be installed relatively easily into existing urban areas and are highly sustainable. They reduce the volume of runoff at the source, lower flood risk and improve drainage. Furthermore, they deliver co-benefits such as enhanced community wellbeing and environmental quality.

Examples of capture solutions are:

- green roof installations (retrofit and new build)
- rain gardens/bioretention swales, on both public and private land
- de-paving to increase permeable area in shared public realm and (front) gardens
- water butts.

Control solutions

Complementing capture solutions, control solutions are the second level in the hierarchy. When capturing water at the source is not enough, due to the nature of flooding or constraints in the built environment, control solutions take over. These measures manage the flow of excess stormwater and reduce the overall volume that needs to be managed, both above and below ground. The primary aim is to divert water away from vulnerable areas and minimise flood depths.

Examples of control solutions are:

- swales that slow and can route flows away from at risk areas
- de-culverting (or daylighting) existing culverted watercourses, increasing their capacity
- smart use of the existing sewerage network to maximise capacity
- upgrading drainage infrastructure.
- increasing sewer capacity.

Adapt & Respond solutions

Despite best efforts, some flooding will still occur, now and in the future, due to some rainfall events being too much to handle with Capture and Control measures. Adapt & Respond solutions focus on helping communities cope with and recover from flood events. This tier involves supporting community- and household-level actions, making resilience a part of everyday life. By preparing local areas for recurring flood risks, these solutions help mitigate the impact of floodwaters and reduce long-term damage, ensuring that communities remain robust in the face of ongoing challenges.

Examples of Adapt & Respond solutions are:

- property level resilience measures, such as flood gates.
- design routes for flood water to take, diverting it away from people and property (e.g. Increasing road kerb heights)
- engagement and communication campaigns (to build awareness and empower communities)
- flood action planning (to ensure communities are prepared for flooding).

Mixed solutions

This developing resilience landscape shows that managing surface water in London requires a mix of solutions. These solutions must be planned, designed, and implemented with unique local contexts in mind, using combinations of approaches that complement one another.

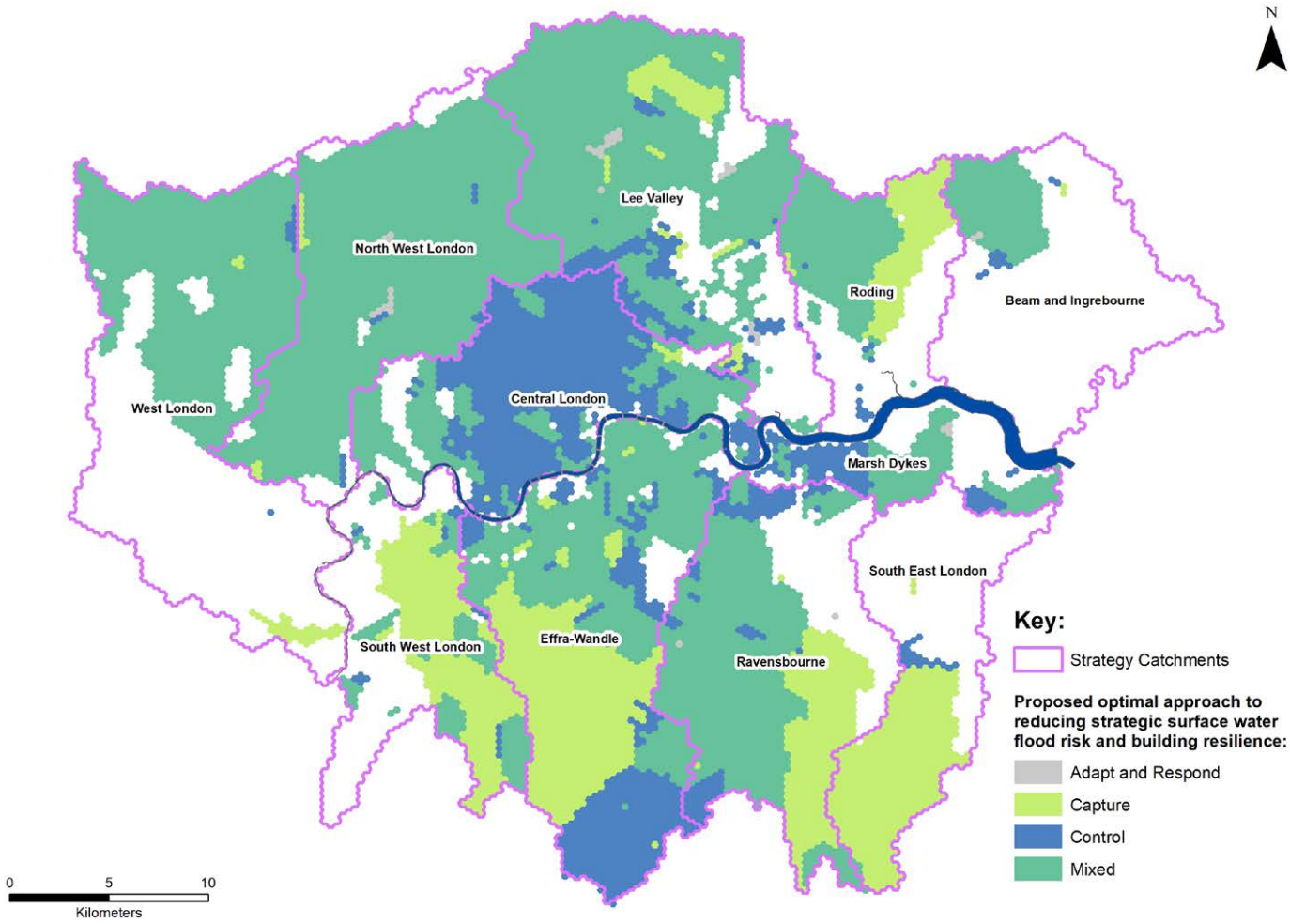
We propose mixed solutions in areas where constraints to the delivery of capture or control solutions hinder implementation. This means that the required reduction in flood risk can only be achieved when organisations work together. For the majority of London, a mixed, holistic approach to dealing with surface water flooding will be a core part of future action.

Solutions hierarchy

When developing their SWCAPs, Catchment Partnerships should first consider solutions that capture rainfall at source, such as small-scale SuDS. Solutions that control surface water, such as traditional sewerage systems, or larger-scale SuDS, should be installed as close to the rainfall source as possible as secondary solutions of the hierarchy. Where surface water cannot be fully managed, stored, or conveyed by 'Capture' and 'Control' solutions, actions that help London adapt and respond to flooding should be adopted. Any residual risk to flooding should be addressed by actions such as planning for emergency response.

In Appendix B we provide a more detailed overview of these solutions. Figure 15 outlines our assessment for the proposed optimal solution approaches to reducing strategic surface water flood risk and building resilience across London.

Figure 15: Proposed optimal solution approaches to reducing strategic surface water flood risk and building resilience across London



While action is needed across London at different scales and levels, our core principles remain the same: prioritising the most vulnerable areas and addressing upstream sources to prevent downstream flooding. Based on this approach, there are five catchments where the majority of strategic action needs to be focused (see Figure 16).

This Resilience Pathway should be further investigated and refined to keep it aligned with ongoing national and regional scale studies into resilience. Crucially, the prioritisation of source control drainage solutions should be at the heart of any surface water resilience standard, given the hydrological, water quality, wellbeing, and amenity benefits these solutions provide.

To deliver a 75% reduction in surface water flood risk by 2075, we have calculated both the total potential opportunity for implementation of capture and control solutions and estimated the likely scale of actions required per Strategy catchment (Figure 16). Delivery of actions is either constrained or unconstrained:

- Constraints to delivery include the presence of existing property and infrastructure, challenging land use types, the availability of green space, and the nature of the local topography. For any given Hex grid cell, a weighting for the relative ease or difficulty of implementing surface water management solutions was applied to represent this constraint.
- Unconstrained implementation characterises areas, or grid cells, where it is expected to be easier to implement solutions, based on engineering judgement and the absence of obvious constraints.

Figure 16: The distribution of required interventions to reduce surface water flood risk across London, and their relative constraints to implementation for each strategy catchment

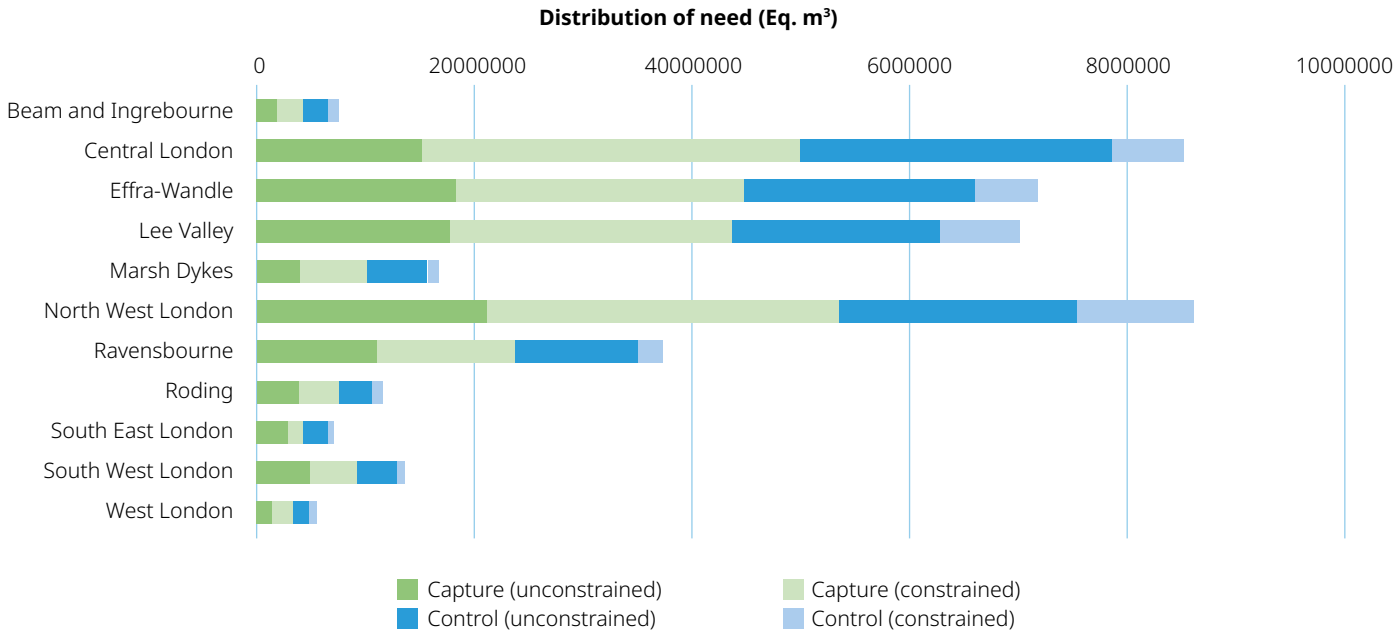
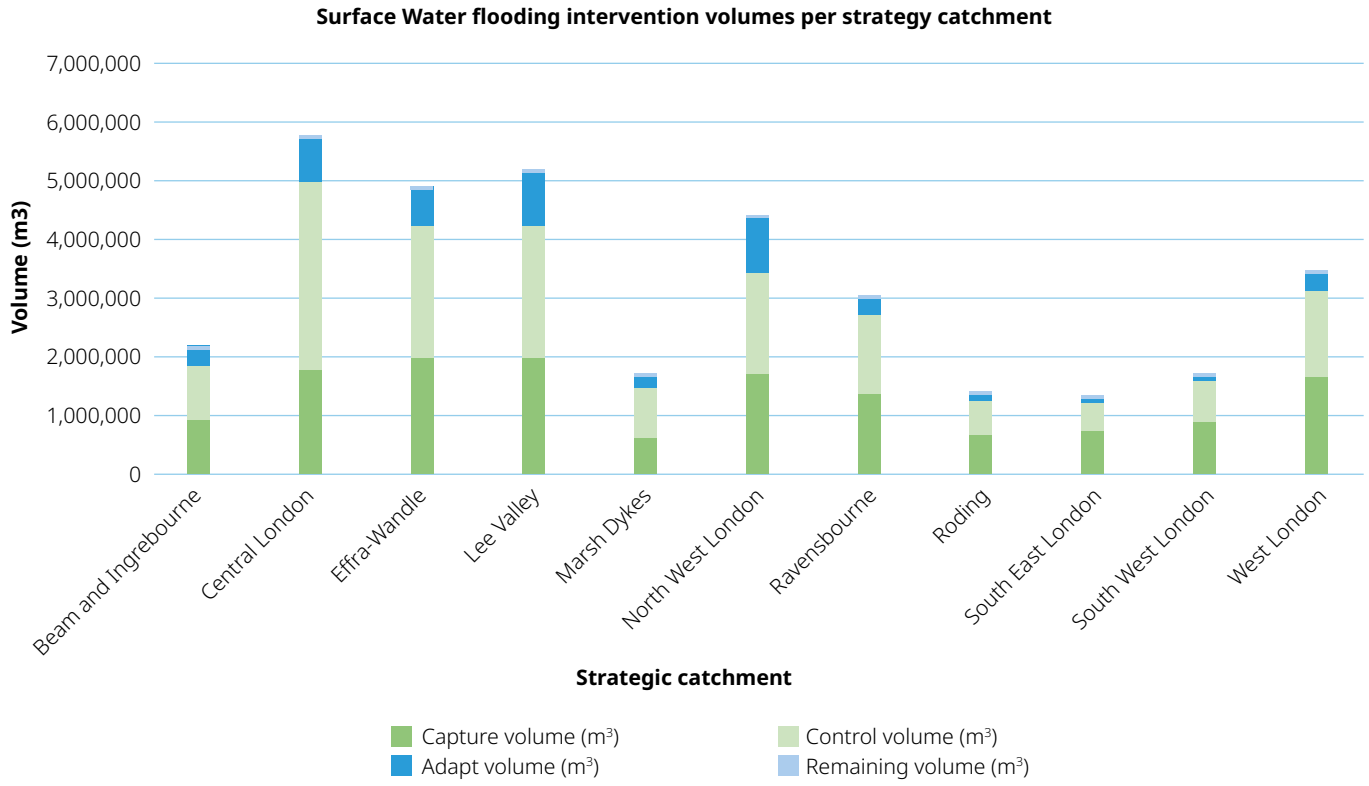


Figure 17 shows the volume that must be managed through interventions in each Strategy catchment to reduce surface water flood risk by 75% by 2075. These volumes are allocated across the three approaches: Capture, Control and Adapt & Respond.

Figure 17: Required volumetric action for each strategy catchment, across the strategic solutions hierarchy



Cross-boundary and local priorities

Identifying cross-borough priority catchments

Understanding where the priority sources of flooding across borough and organisational boundaries are, is critical to our strategy. This lays the groundwork for shared commitments in planning, funding, and taking effective action.

We defined strategic priority areas as locations where the estimated flood impacts from a given rainfall event exceed the average impact within each Strategy catchment. This definition also considers associated climate change and socio-economic scenarios.

This method helps both partnerships and individual boroughs identify their local priorities alongside considering more London-wide strategic priorities.

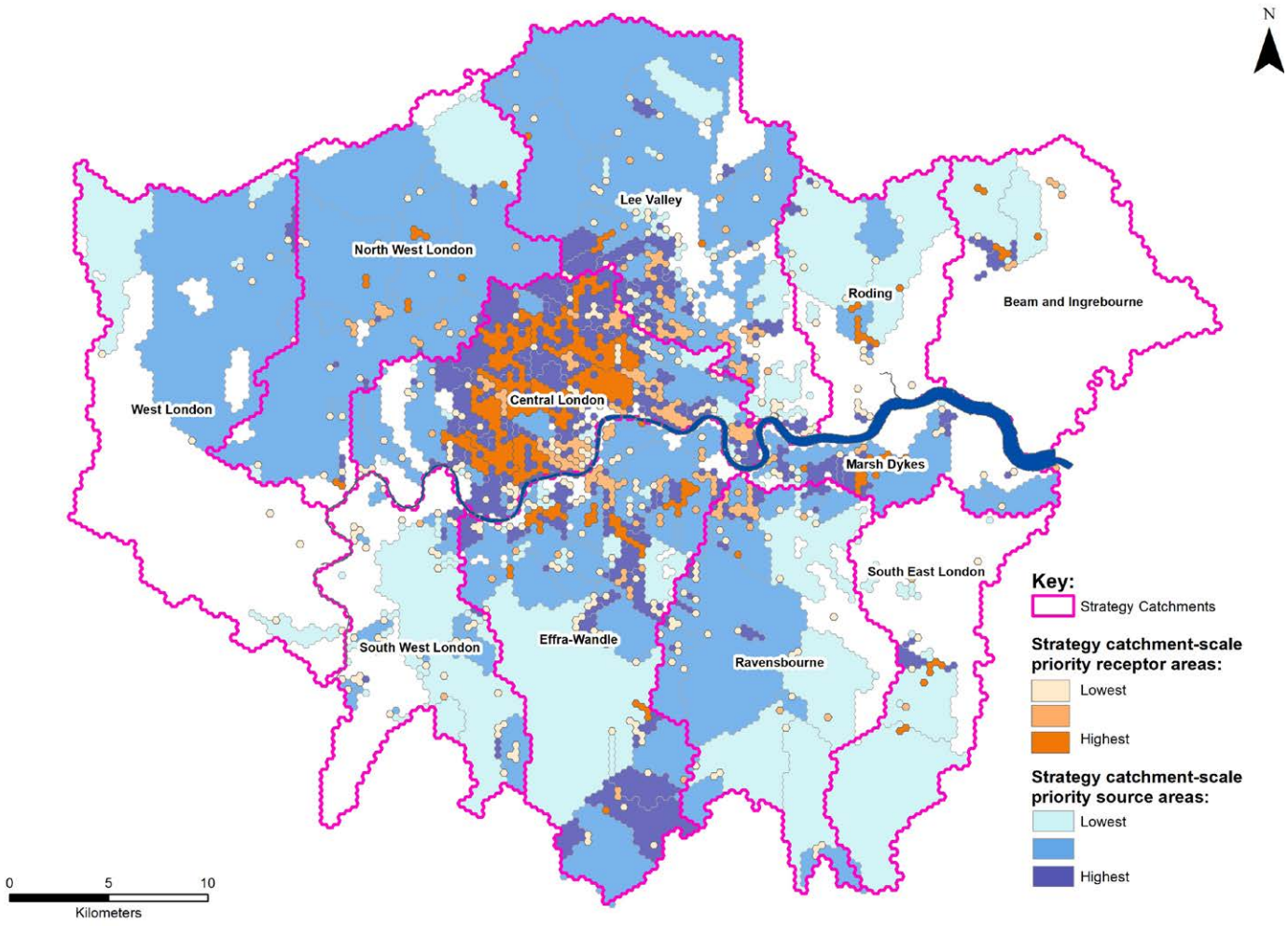
These catchments cover areas where strategic action, stretching across multiple boroughs, is likely needed to improve adaptation and resilience. Partnership and collaboration will be essential to identify solutions, secure funding, and develop a shared programme of works to realise the benefits.

We delineated the cross-borough priority catchments by using topographic and elevation data to plot the predominant surface water flow routes around London. This method accounts for strategic sewers but does not consider the more complex connectivity of the drainage systems. This is something that the RMAs and partnerships will need to consider in future evaluation and planning stages.

Source areas: Source areas indicate Hex grid cells, clustered where they have similar source or conveyance properties, that are net sources or pathways for flooding.

Receptor areas: Receptor areas indicate Hex grid cells, or clusters of cells, that are net recipients of damaging flood waters.

Figure 18: Catchment-scale strategic priority surface water source and impact areas



Our assessment identified that the need for catchment-level action to address strategic priority areas is concentrated around central London and the areas immediately to the north and south. There are several likely reasons why there is a concentration of strategic priority catchments in these areas:

- Boroughs are more densely clustered, leading to many flow pathways crossing borough boundaries.
- The historical 'lost rivers', and the existing drainage network, result in underground connectivity between boroughs and potential associated combined sewer flood risks.
- The natural and built landscape flows towards the Thames.
- London's varied socio-economic, demographic and land use characteristics are particularly concentrated in these areas of London. This increases the relative strategic priority for action on surface water flood risk, in line with the vulnerability-first approach taken by the Strategy.
- These areas also have a high concentration of varied socio-economic, demographic, and land-use characteristics, making them a priority for reducing flood risk in line with our vulnerability-first approach.

We aim for an accelerated pool of funding to be made available for the priority catchments to launch the initial SWCPs. The scale of this funding can be reviewed and re-profiled upon evaluation of progress, for the subsequent launch of the remaining SWCPs.

Identifying borough priorities

Understanding priority areas for managing surface water at a borough level drives local action to reduce risk. Our approach, using the same Source-Pathway-Receptor framework as for catchment and London-wide priorities, ensures that strategic measures effectively target flood risk reduction.

Boroughs are primarily responsible for managing local flood risks and must secure the necessary funding and resources to deliver effective solutions. Although these priority areas are local, they are also deemed of strategic importance for London as a whole, offering significant benefits for residents, visitors, and the environment. Each borough will continue to manage surface water through its own LFRMSs.

By scaling up actions in these priority areas, boroughs can align and complement their existing plans and programmes with the collaborative work of SWCPs. This integration supports statutory initiatives such as SWMPs and LFRMSs.

In line with the Strategic Actions set out under Ambition 1, organisations managing surface water are encouraged to incorporate measures and projects informed by SWCPs and strategy mapping into their future statutory plans.

Funding and investment

Understanding the funding landscape

Funding for surface water management is complicated and currently constrains actions. Figure 19 summarises the key challenges we identified through the development of the Strategy. Important to this understanding is the benefit cost ratio (BCR), which measures how much benefit can be expected for each unit of cost (investment).[48]

Figure 19: Funding landscape challenges in London

Specialist skills and expertise are required to unlock funding efficiently – in particular private finance and investment. Few organisations currently have these capacities and skills.

Urban surface water projects are difficult to justify within the current Grant in Aid process. Lower BCRs and the undervaluation of wider benefits make it difficult to move beyond initiating projects.

Funding sources are constrained by organisational and administrative silos and boundaries. Poor suitability to surface water and small-scale schemes, and highly competitive bidding processes all limit the ability to deliver projects.

Maintenance of assets is not eligible for Grant in Aid funding. An estimated 10% of total capital budget is likely required to meet the maintenance burden.

Intermittent, unpredictable and short-term funding sources are difficult for organisations to bid for, programme against works, and allocate long-term resource to.

Funding for cross-boundary source-pathway-receptor mechanisms is challenging to justify.

Sources of funding

Funding is available from a variety of sources. Many of these are challenging to draw-down, time-consuming and resource-intensive to secure, and often incompatible with the size of surface water schemes and projects.

By using a methodology (for details and caveats see Appendix H: Funding and investment estimates) we have estimated the current funding availability for surface water management in London to be around £168 million per annum, distributed across the wide range of organisations that manage surface water flood risk. It is important to note that there is possibly a larger amount of funding available. Private funding sources are currently poorly mapped and understood. It is possible that additional investment in surface water management takes place in the private sector.

Figure 20 highlights the complex interconnections between funding sources and recipients, showing how funding and investment are mainly driven by three key sources:

- Defra, via the Environment Agency
- the Ministry for Housing, Communities and Local Government (MHCLG)
- Thames Water.

Diversification of funding sources is crucial to the success of the Strategy and is encompassed in the recommended Strategy Actions previously mentioned in the document.

Maintaining our assets

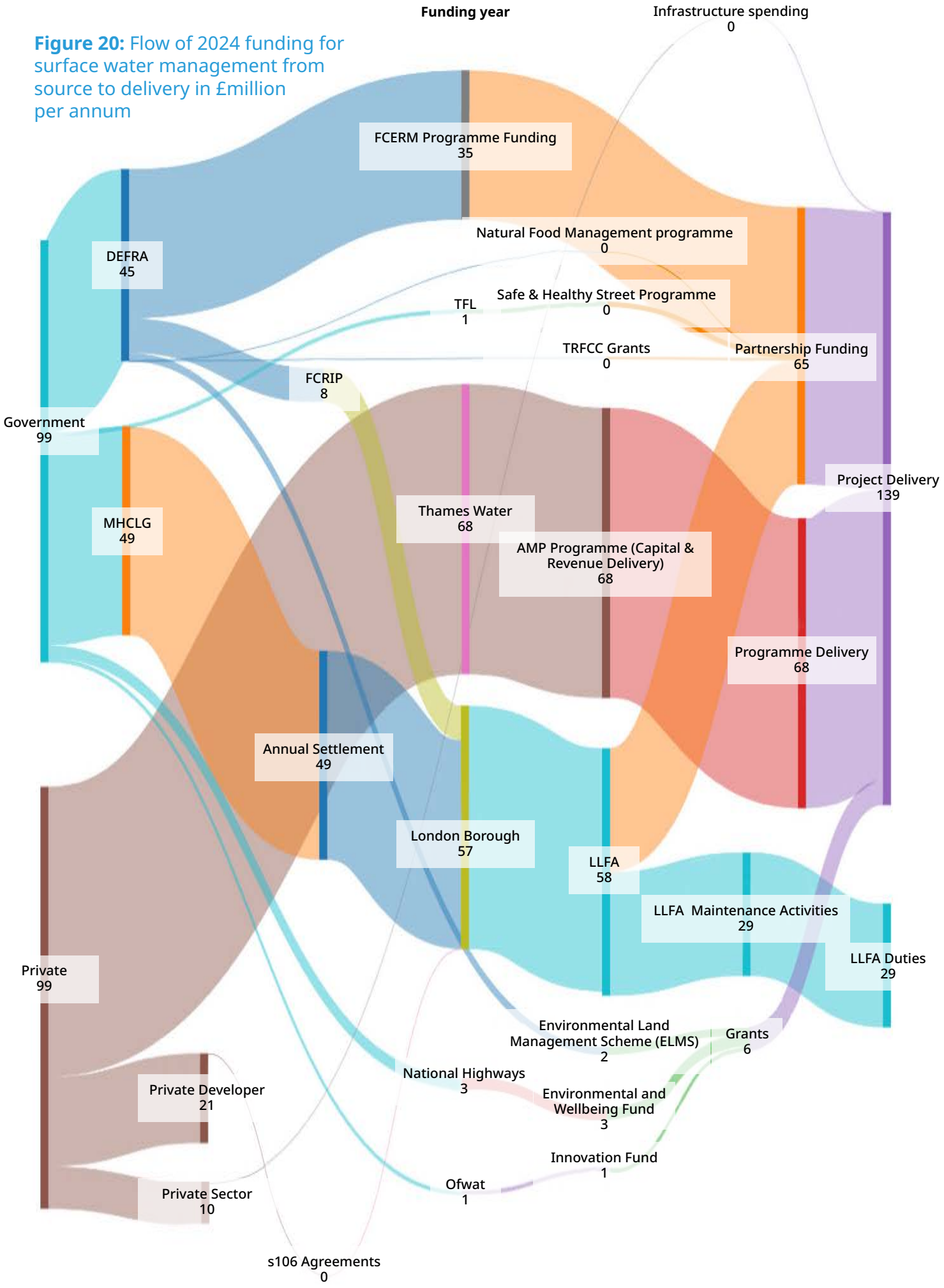
Maintaining and managing surface water assets is essential for their effectiveness. In London, many organisations face funding challenges for maintenance. For instance, LLFAs cannot access central Government funding from Defra, known as Grant in Aid, for the upkeep and management of their assets. If the scale of action recommended by this Strategy is to be delivered, these organisations will find it increasingly challenging to effectively maintain the performance of their surface water assets.

Rather, MHCLG provides LLFAs with revenue funding, but these funds are not ringfenced for flood risk use, nor specifically set aside for maintenance and management of assets. It is important to recognise the significant operational costs, because poor maintenance of surface water assets can lead to reduced performance in water flow, water quality, and environmental benefits.

The modelling for this Strategy did not account for general lack of maintenance of assets when assessing the impact of surface water flooding. Without proper maintenance, assets will deteriorate and could put even more people and properties at risk.

To complicate matters further, LLFAs are not responsible for maintaining highway drainage systems or the capacity of the underground combined sewerage network—these duties fall to local Highways Authorities and Thames Water. This complex web of responsibilities, combined with differing priorities and agendas, makes it challenging to collaborate, agree on shared approaches, and distribute resources effectively for maintaining our assets.

Figure 20: Flow of 2024 funding for surface water management from source to delivery in £million per annum



Determining investment need

Upscaling investment and action

We formulated an indicative estimate to gauge the scale of long-term investment required and highlight current funding limitations. Using a range of typical BCR to appraise the economic viability of projects within the flood risk management sector, we estimated a cost of reducing flood risk by 75% over a 50-year period (to 2075).

Adopting a scaled approach to BCR, also known as return on investment, captures the reality of surface water management in London. While specific schemes will deliver advantageous returns, other essential projects may have very low returns. Action is required at both ends of the spectrum.

Investment need

To reduce the flood risk across the whole of London by 75% our "central estimate" projects the need for around £1.8 billion in capital investment in surface water flood risk management over the next 50 years, or approximately an additional £36 million annually.

Our "upper estimate", where the likely BCR was assumed to be lower, showed that the 50-year investment could be as high as £5.9 billion (equivalent to £117 million annual investment required).

Further details about future investment need are provided in Appendix I.

Adding maintenance to investment need

We promote a total expenditure philosophy, where both capital and maintenance costs are accounted for when funding projects. Consideration of maintenance and asset replacement costs will increase the investment required in London. Typically, an allowance of 10% additional cost is allocated to maintenance, although it is difficult to provide a precise figure without more standardised and detailed financial reporting which is not readily available. We determined that accounting for maintenance will require an additional investment of between 10% and 20%. The total cost estimate increases to around £2 to £2.2 billion, adding around £5 million to the annual investment need and raising the required amount to around £41 million annually (present value).

Unlocking investment opportunities

Working at scale can help to address some of the key barriers to the private financing of flood risk management projects. By clustering projects to provide large-scale risk reduction and working with a shared 'nature first' vision, the SWCPs can maximise the wider benefits that are inherently part of most surface water schemes. Reducing investment risk, for example by clustering smaller schemes, and leveraging opportunities for creative new fundraising (e.g. a BGI funding mechanism), will help to rapidly scale the pool of available funding in London.

In line with the NIC's recommendations,[49] we recommend the creation of centralised surface water-specific funding for London's SWCPs. This allows SWCPs to focus on rapidly addressing London's strategic surface water priorities using a streamlined funding pathway to reduce administrative burden and facilitate low regret investment in London.

Furthermore, we recommend the allocation of proportional maintenance funding, accessible equally by London's LLFAs, as part of a transformational shift to investing in surface water infrastructure through a 'total expenditure' lens.

Co-creating the London Surface Water Strategy

Co-creating the Strategy

We have developed this Strategy in collaboration with organisations and groups from across London that have responsibilities or interests in surface water management, flood risk, and the wider water environment. Their guidance and insights have helped shape our approach.

Delivering ambitious change to surface water flood risk requires thinking differently. We have leaned on our relationships with other global cities for their invaluable knowledge on how they have developed similar flood risk strategies. This means we have been able to translate international best practice into our own vision and objectives, whilst ensuring the Strategy has a London focus.

Additionally, the collaborative approach we have taken to developing the Strategy, along with our partner organisations, means that we are confident that our SWCP approach will be aligned to other strategic plans, and will maximise shared benefits and opportunities.

Stakeholder engagement and partnership working have been vital to the development of this first pan-London strategy. We have worked with Londoners and other stakeholders alike to test ideas, identify priorities, share information, and develop actions and solutions that speak to the lives and experiences of Londoners. We used various ways of gathering insight and feedback, from surveys to face-to-face workshops and focus sessions.

We aimed to develop a Strategy that resonated with London's RMAs, water and environmental professionals, community groups and residents and laid out the first steps on a path towards reduced flood risk and improved physical and social environments.

Figure 21 reflects a snapshot of how we engaged and collaborated with the people at the heart of London

Co-creating the Strategy

Partners

- Thames Water
- Environment Agency
- Transport for London
- Greater London Authority
- London Councils
- London Fire Brigade
  - Stakeholder engagement approach developed with regulators
  - 50+ strategy progress meetings and workshops
  - 4x London SW Strategic Group briefings
  - Draft strategy consultations
  - 18 agreed strategy objectives

Stakeholders

- All 32 London boroughs and the City of London Corporation
- Surface Water Catchment Partnerships
- Environmental Action Groups
- Independent specialist organisations
- Charities and NGOs
- Land & Asset Owners
  - 15+ strategy development workshops
  - Online survey
  - >50 responses from local authorities and organisations
  - 1x LoDEG workshop session

Londoners

- London's communities actively involved
  - 1x World Water Summit Workshop
  - Dedicated inbox for feedback & questions
  - 2x Webinars for London Flood Awareness Week
  - Produced Interim Strategy Report
  - Engagement sessions with the National Flood Forum and Community & Faith Groups
  - 3 x Focus group sessions with residents
  - 2 x London Community Flood Awareness Workshops

Conclusions

Conclusions

London must be better prepared for the risks and impacts associated with surface water flooding. Failure to do so will result in significant levels of loss and disruption to the city and its residents. Surface water flooding is managed best when as much as possible is captured and controlled where and when it falls. This is especially true for London, as the city is particularly affected by flooding events that result from, or are amplified by, surface water crossing administrative boundaries.

With this Strategy, we have outlined the Vision of our partnership, Flood Ready London. It proposes our plans to work together, with our partners and London's many stakeholders, to ensure our ambitions can be realised.

Underpinning all of our current and future work are our six guiding principles: We will prioritise those most vulnerable, emphasise NbS, develop evidence-based actions informed by hydrology, work in more effective partnerships, enable change through strong leadership, and manage surface water at the right scales. We have set short-, medium- and long-term objectives to make London flood ready, with our short-term targets translated into a "Year 1 Roadmap", designed to maximise early impact.

We will begin by establishing the first priority SWCPs. Managing surface water through these partnerships will provide multiple, increasing, benefits. It will unite organisations under a shared vision for London, building trust and a sense of common purpose between them. It will formalise governance for collaboration, and encourage the sharing of resources, funding, information, and expertise. Furthermore, it will highlight actions and solutions most relevant to the local and regional challenges that Londoners experience, extending beyond surface water to include broader social, economic, and environmental issues. To enable these partnerships to work effectively, we need to create the right institutional and organisational conditions. Over the next two years we will establish all ten of these Catchment Partnerships, covering the whole of Greater London.

On the financial side, in order to significantly reduce surface water flood risk for a constantly changing London, we estimate that an additional £41 million of investment (present value) per year will be required. Delaying investment at this scale will increase the extent of spending needed in the future, miss opportunities to create wider benefits, and in the short term, leave the city without the protection it so desperately needs already.

While it is impossible to stop surface water flooding altogether, we can better prepare London to adapt and respond to it when it happens. We advocate for solutions that focus on capturing and controlling water, using sustainable BGI like SuDS wherever possible, while Londoners must be made more aware of the personal and community actions available to reduce their flood risk, and feel more empowered to act.

We hope that this Strategy will create a new 'London Way of Working', building on existing and emerging partnerships, for the benefit of all Londoners. To achieve this, inspirational and experienced leaders from London's RMAs and beyond must champion these alliances, lending their support to a new direction for surface water management, and ultimately creating a Flood Ready London.

Glossary and definitions

Glossary

Abbreviation	Definition
AMP	Asset Management Plan
BCR	Benefit Cost Ratio
BGI	Blue-green infrastructure
CaBA	Catchment Based Approach
CDA	Critical Drainage Area
CDRC	Consumer Data Research Centre
CIWEM	Chartered Institution of Water and Environmental Management
DWMP	Drainage and Wastewater Management Plan
FCERM	Flood and Coastal Erosion Risk Management
FWMA	Flood and Water Management Act
GLA	Greater London Authority
ICS	Infrastructure Coordination Service
LFRMS	Local Flood Risk Management Strategy
LiDAR	Light Detection and Ranging
LLFA	Lead Local Flood Authority
LoDEG	London Drainage Engineers Group
MHCLG	Ministry for Housing, Communities and Local Government
NbS	Nature-based Solutions
NGO	Non-Governmental Organisation
NIC	National Infrastructure Commission
ONS	Office for National Statistics
OS	Ordnance Survey
RFCC	Regional Flood and Coastal Committee
RMA	Risk Management Authority
RoFSW	Risk of Flooding from Surface Water
SFRA	Strategic Flood Risk Assessment
SuDS	Sustainable Drainage System
SWCAP	Surface Water Catchment Action Plans
SWCP	Surface Water Catchment Partnerships
SWMP	Surface Water Management Plan
TfL	Transport for London
TWUL	Thames Water Utilities Limited
WaSC	Water and Sewerage Company

Definitions

Description	Definition
Biodiversity	The variety of plant and animal life.
Combined sewer overflows	Some places have 'combined sewers' which collect both rainwater and wastewater. During heavy rainfall, combined sewers can become full as their content cannot be treated fast enough at sewage treatment works. When this happens, they are designed to discharge (overflow) excess sewage into nearby rivers, lakes, and the sea. This avoids sewage backing up into property or roads. Combined sewer overflows are also known as storm overflows.
Flood Risk Areas	Areas which have been identified by lead local flood authorities and the Environment Agency as having a 'significant' risk of flooding. The exact criteria for identifying Flood Risk Areas are set out in government guidance.
Flood Risk Management Plans	The Environment Agency develops a Flood Risk Management Plan for each of England's seven river basin districts. These plans explain the risk of flooding from the sea, surface water, groundwater and reservoirs – and how the Risk Management Authorities in each region will manage those risks. These plans must be reviewed every six years.
Lead Local Flood Authorities	The public body with lead responsibility for managing the risk of surface water flooding in a local authority area. This is typically a team within an upper tier local authority (i.e. a London Borough).
Local highways authorities	The public body legally responsible for managing and maintaining the local road network in a local authority area. This is located in the upper tier local authority (i.e., a London Borough).
Local planning authorities	The public body legally responsible for managing town planning in a local authority area, including consideration and determination of planning and development applications. This is located in the upper tier local authority (i.e., a London Borough).
Main river	Larger rivers or streams, managed by the Environment Agency. Flooding from main rivers is also known as fluvial flooding.
Nature-based solutions	Natural ways of slowing or reducing the flow of water through an area, ultimately reducing the risk of surface water flooding. These may include planting trees, improving soil, and restoring marshes.
Ordinary watercourse	Smaller rivers or streams, managed by Local Authorities.
Permeable / impermeable	'Permeability' refers to whether water can pass through a surface. This is an important risk factor in surface water flooding. 'Impermeable' surfaces, such as paved driveways and garden patios, prevent rainwater from soaking down into the earth.

Definitions

Description	Definition
Property-level resilience	'Property-level measures' (also known as property level 'resilience' or 'protection') are ways of protecting individual properties from flooding, separate from area-wide flood defence schemes. Sealed barriers on doors and windows are examples of property level measures.
Runoff	The flow of water over the ground, following rainfall. This can result in surface water flooding.
Solutions hierarchy	Sets out the order in which drainage interventions should be considered to maximise the benefits and reduce costs. It prioritises maintenance and optimisation, followed by above ground interventions, with below ground interventions (pipes and sewers) considered last.
Surface water flooding	Following intense and / or long duration rainfall, runoff which ponds in low-lying depressions; also known as pluvial or flash flooding.
Sustainable drainage systems	Sustainable drainage systems (often abbreviated as 'SuDS') use natural processes to catch, drain or store water above ground – reducing the amount of water that enters underground sewers. Permeable paving, ponds and rain gardens are examples of sustainable drainage systems.
Surcharge	The overloading of a sewer, beyond its capacity to convey.
Urbanisation	The conversion of natural (often permeable) environments to urban (often impermeable) environments. Urbanisation may include the construction of buildings on previously green land and making previously permeable surfaces (i.e. soil) impermeable (e.g. through paving over front gardens to make driveways).
Wastewater	A term often used to collectively mean used water from buildings and sewage (also known as foul water).

Endnotes

1 Environment Agency. 'National assessment of flood and coastal erosion risk in England 2024' 2024 (viewed on 3 April 2025)

2 Post Online, 'Perils pegs London's 2021 summer flood losses at £281m' 2021 (viewed on 3 April 2025)

3 London Assembly. 'London Climate Resilience Review' 2025 (viewed on 3 April 2025)

4 Environment Agency. 'National assessment of flood and coastal erosion risk in England 2024' 2024 (viewed on 3 April 2025)

5 Environment Agency. 'State of the environment' 2023 (viewed on 3 April 2025)

6 London Assembly. 'London Climate Resilience Review' 2025 (viewed on 3 April 2025)

7 National Infrastructure Commission. 'Second National Infrastructure Assessment' 2023 (viewed on 3 April 2025)

8 London Resilience Partnership | London City Hall

9 London Resilience Partnership. 'London Risk Register' 2025 (viewed on 4 April 2025)

10 Environment Agency. 'National assessment of flood and coastal erosion risk in England 2024' 2024 (viewed on 3 April 2025)

11 Based on work by the GLA, distributing leaflets on flood risk to basements

12 Zurich UK. 'Two-fifths of London firms at risk of climate-fuelled flash floods' 2022 (viewed on 3 April 2025)

13 Thames Water. 'London Flooding Response' 2021 (viewed on 4 April 2025)

14 London Assembly. 'Extreme weather events and London Fire Brigade' 2025 (viewed on 3 April 2025)

15 Collation of figures derived from published Section 19 reports

16 Post Online, 'Perils pegs London's 2021 summer flood losses at £281m' 2021 (viewed on 3 April 2025)

17 Transport for London. 'Adapting to Climate Change' 2022 (viewed on 4 April 2025)

18 Department for Environment, Food & Rural Affairs. 'UK Climate Change Risk Assessment 2022' 2022 (viewed on 3 April 2025)

19 Met Office. 'UK Climate Projections (UKCP)' 2025 (viewed on 3 April 2025)

20 Greater London Authority. 'London's Population Projections' 2024 (viewed on 3 April 2025)

21 The Strategy technical team undertook assessment of Thames Water and other project partner basement data to develop an estimate for the number of basement properties within respective boroughs

22 London Assembly. 'London Climate Resilience Review' 2025 (viewed on 3 April 2025)

23 Environment Agency. 'Social Deprivation and the Likelihood of Flooding' 2022 (viewed on 4 April 2025)

24 Greater London Authority London Retrofit SuDs Map 2025 (viewed on 2 May 2025)

25 Greater London Authority. London's Surface Water Strategy 2024 (viewed on 2 May 2025)

26 London Councils. Basement Flash Flooding Campaign 2023 2023 (viewed on 2 May 2025).

27 National Infrastructure Commission. 'Surface Water Flooding Social Research' 2023 (viewed on 4 April 2025). Environment Agency. 'Social Deprivation and the Likelihood of Flooding' 2022 (viewed on 4 April 2025)

[28] Environment Agency. 'Social Deprivation and the Likelihood of Flooding' 2022 (viewed on 4 April 2025)

[29] Flood Re. 'Annual Review 2024' 2024 (viewed on 3 April 2025)

[30] Climate Just. 'Present and Future Flood Vulnerability, Risk and Disadvantage: A UK Assessment' 2017 (viewed on 4 April 2025).

[31] Flood Re. 'Annual Review 2024' 2024 (viewed on 3 April 2025)

[32] London Borough of Newham, Just Transition Plan, 2023 (viewed on 1 May 202

[33] Greater London Authority, London Climate Risk Maps, 2024 (viewed on 1 May 2025)

[34] Thames21. 'Catchment Partnerships' 2025 (viewed on 3 April 2025)

[35] Environment Agency. 'Thames Regional Flood and Coastal Committee' 2025 (viewed on 3 April 2025)

[36] London Assembly. 'Drain London Partnership' 2025 (viewed on 3 April 2025)

[37] The London Plan, Greater London Authority, 2021

[38] Local Government Association. *Sustainable drainage systems* 2025 (viewed on 3 April 2025)

[39] The Mayor of London's Infrastructure Group brings together senior executives from infrastructure providers, regulators, government, and industry to plan for London's long-term infrastructure needs and jointly tackle issues.

[40] Infrastructure Coordination Service, Greater London Authority

[41] Intergovernmental Panel on Climate Change. 'Guidance Note – The Concept of Risk in the IPCC Sixth Assessment Report: A Summary of Cross Working Group Discussions' 2021 (viewed on 4 April 2025).

[42] Environment Agency. 'National assessment of flood and coastal erosion risk in England 2024' 2024 (viewed on 3 April 2025)

[43] Mayor of London. 'Mayor warns Londoners in basement properties about flooding' 2022 (viewed on 3 April 2025)

[44] Zurich UK. 'Two-fifths of London firms at risk of climate-fuelled flash floods' 2022 (viewed on 3 April 2025)

[45] Cabinet Office. 'National Risk Register 2023' 2023 (viewed on 3 April 2025

[46] Environment Agency. 'National assessment of flood and coastal erosion risk in England 2024' 2024 (viewed on 3 April 2025)

[47] Department for Environment, Food & Rural Affairs. 'River modelling: technical standards and assessment' 2023 (viewed on 3 April 2025)

[48] Department for Transport. 'Value for money indicator 2019' 2019 (viewed on 3 April 2025)

[49] National Infrastructure Commission. 'Reducing the risk of surface water flooding: Final report' 2022 (viewed on 3 April 2025)

Image credits

Page 1 Image provided by Greater London Authority
Page 4 Image provided by Thames Flood Advisors
Page 11 Image provided by Greater London Authority
Page 12 Image provided by Royal Borough of Kensington and Chelsea
Page 13 Image provided by Greater London Authority
Page 14 Image provided by Defra
Page 18 Image provided by London Resilience Unit
Page 22 Image provided by Greater London Authority
Page 27 Image provided by Greater London Authority
Page 36 Image provided by Greater London Authority
Page 37 Image provided by London Borough of Enfield
Page 40 Image provided by Royal Borough of Kensington and Chelsea
Page 44 Image provided by Greater London Authority
Page 47 Image provided by Transport for London
Page 52 Image provided by Greater London Authority
Page 54 Image provided by Greater London Authority
Page 58 Image provided by London Surface Water Strategy Team
Page 62 Image provided by London Borough of Harrow
Page 64 Image provided by London Surface Water Strategy Team
Page 71 Image provided by Greater London Authority
Page 74 Image provided by Greater London Authority
Page 79 Image provided by Greater London Authority
Page 80 Image provided by Greater London Authority
Page 81 Image provided by Greater London Authority
Page 83 Image provided by GLA

FLOOD
READY
LONDON