

LOCAL FLOOD RISK MANAGEMENT STRATEGY



PREPARED FOR THE LONDON BOROUGH OF HOUNSLOW

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EXECUTIVE SUMMARY

As Lead Local Flood Authority (LLFA), the London Borough of Hounslow (Hounslow) has a responsibility for leading the co-ordination of flood risk management within the borough. This includes ensuring that flood risks from local sources such as surface water, groundwater and ordinary watercourses, and their interactions, are identified and managed.

The overall purpose of this Local Flood Risk Management Strategy (LFRMS) is to outline how the LLFA and other stakeholders will manage local flood risk in the borough for the next 6 years and beyond. It develops on the borough's previous LFRMS which was published in 2015 and aligns with the National Flood and Coastal Erosion Risk Management Strategy ([NFCERMS, 2020](#)) and other local flood risk planning documents such as the updated Surface Water Management Plan ([SWMP, 2021](#)) and the West London Strategic Flood Risk Assessment ([SFRA, 2018](#)).

The LFRMS sets out the roles and responsibilities that the LLFA and other risk management authorities (RMA) have in the borough with regard to flooding. The cooperation between these RMAs, other stakeholders and the local communities is key to developing a sustainable and resilient approach to flood risk management. The strategy also aims to increase the awareness of local flood risk within the communities and provides guidance on how individuals can increase their own resilience.

The LFRMS intends to manage flood risk in a way that delivers the greatest benefit to the residents, businesses, and environment of Hounslow. It sets out four local strategic objectives and the accompanying action plan outlines the measures that will be taken to achieve them. These objectives have been developed in line with the NFCERMS and with consideration for the local flood issues affecting Hounslow. They are as follows:

- Establish and maintain collaborative partnerships with key stakeholders, such as utility companies, local government, and other risk management authorities to maximise joint-working opportunities.
- Pro-actively encourage holistic and sustainable, nature-based solutions that deliver wider environmental, social, and economic benefits.
- Engage, educate, and empower local communities to take action and contribute to the management and reduction of flood risk, including through the uptake of flood resilience.
- Seek to identify funding and resources available for flood risk management, targeting resources where they could have the greatest effects.

The LFRMS also recognises that flooding is a natural occurrence which is unavoidable. As the frequency and severity of flooding increases with climate change, it is important that the actions contribute to building flood resilience and are adaptable to future climate scenarios.

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ACRONYMS AND ABBREVIATIONS

Abbreviation	Definition
BCP	Brent Catchment Partnership
CFMP	Catchment Flood Management Plan
CVP	Crane Valley Partnership
DfE	Department for Education
DLUHC	Department for levelling up Housing and Communities
EA	Environment Agency
Ealing	London Borough of Ealing
FCERM	Flood and Coastal Erosion Risk Management
FRR	Flood Risk Regulations
FWMA	Flood and Water Management Act
GiA	Grant in Aid
Hammersmith and Fulham	London Borough of Hammersmith and Fulham
Hounslow	London Borough of Hounslow
HRA	Habitat Regulations Assessment
IPCC	Intergovernmental Panel on Climate Change
LFRMS	Local Flood Risk Management Strategy
LLFA	Lead Local Flood Authority
LPA	Local Planning Authority
MHCLG	Ministry for Housing, Communities and Local Government
NFCERMS	National Flood and Coastal Erosion Risk Management Strategy
NFF	National Flood Forum
NFM	Natural Flood Management
NPPF	National Planning Policy Framework
PFRA	Preliminary Flood Risk Assessments

Abbreviation	Definition
PFR	Property Flood Resilience
Richmond	London Borough of Richmond upon Thames
RMA	Risk Management Authorities
RoFSW	Risk of flooding from surface water
SEA	Strategic Environmental Assessment
SFRA	Strategic Flood Risk Assessment
SuDS	Sustainable Drainage System
SWMP	Surface Water Management Plan
TfL	Transport for London
TTD	Thames Tidal Defences
TWSP	Thames Water Strategic Partnership
TWUL	Thames Water Utility Limited

1 INTRODUCTION

1.1 What is flooding?

The [Flood and Water Management Act 2010 \(FWMA\)](#) defines flooding as the submerging of an ordinarily dry area by an excess amount of water. In 2020, there were more than 5.2 million properties in England at risk from flooding and coastal erosion according to the [National Flood and Coastal Erosion Risk Management Strategy \(NFCERMS\)](#) for England. Flooding can be caused by several factors including high levels of rainfall, rivers overflowing, rising groundwater and reservoir breaches. The definition of flooding outlined in the FWMA does not include the overflow or breaches from sewage treatment works or burst water mains as these are instead covered under the [Water Industry Act \(1991\)](#).

There are six main types of flood risk which are fluvial, surface water, tidal, sewer, groundwater, and reservoir/artificial sources. Not all areas are affected by all types of flood risk, and the specific types of flood risk which affect the London Borough of Hounslow (Hounslow) are identified in *Section 3*.

Flood risk cannot be avoided and is expected to increase as the effects of climate change and sea level rise increase. However, there are many methods which can be used to effectively manage flood risk. This Local Flood Risk Management Strategy (LFRMS) is one such document which helps play an important role in flood risk management for local communities, businesses, and the environment.

1.2 Background

In line with the FWMA, Hounslow has the role of Lead Local Flood Authority (LLFA). The LLFA are responsible for managing surface water, groundwater and ordinary watercourses and are required to produce and maintain a LFRMS. This document will be an updated replacement for the existing LFRMS, published in 2015.

The LFRMS and its action plan should align itself with documents such as the NFCERMS for England and all existing local flood risk planning documents.

This LFRMS is aimed at the LLFA as the main authority responsible for managing local flood risk. Other departments within Hounslow should also be familiar with this LFRMS, namely Highways, Contingency Planning, Development Management and Parks and Open Spaces as they are involved in achieving statutory LLFA duties and the management of local flood risk. Risk Management Authorities (RMAs) such as the Environment Agency (EA) may use this LFRMS as they are the authority with a strategic overview role on all types of flooding. Finally, this LFRMS is aimed at residents and local businesses as they are directly impacted by flooding and are those who will benefit from improved flood risk management. It is also encouraged that residents, businesses and local landowners take action and contribute to the management and reduction of local flood risks.

1.3 Purpose

The overall purpose of a LFRMS is to outline how the LLFA and other stakeholders will manage flood risk in the borough. It covers flood risk from local sources such as surface water, groundwater, and ordinary watercourses (small rivers, brooks and drainage ditches). The LFRMS sets out Hounslow's objectives for managing these flood risks and outlines the actions which will be taken to achieve these.

The actions are to be outlined in a detailed action plan, which is accompanied by a reviewing and monitoring plan to keep track of the progress made.

This LFRMS aims to manage flood risk in a way that delivers the greatest benefit to the residents, businesses, and environment within the borough. It will act as a guide to local flood risk management for the LLFA (and other council departments), RMAs, local public (residents and businesses) to ensure all groups are aware of the local flood risk and their responsibilities in managing them.

With the uncertainty regarding flooding impact from future climate change predictions, it is important to develop a flexible and resilient LFRMS that takes account of these uncertainties to help reduce the probability and impact of flooding while recognising that flooding is a naturally occurring phenomenon that will continue to occur.

1.4 LFRMS structure

The LFRMS document will take on the following structure:

- **Introduction** – Provides an overview on the background, purpose, and structure of the LFRMS. Summarises the key legislative policies related to the LFRMS and outlines the strategic objectives.
- **Roles and responsibilities** – Outlines the roles and responsibilities of the LLFA and other RMAs, alongside local and regional partnership groups relevant to local flood risk management.
- **Local Flood Risk** – Provides an overview of the local flood risks that Hounslow is vulnerable to. This includes flooding from fluvial, tidal, surface water, groundwater, sewer and artificial sources both historically and in the future.
- **Adaptation and Resilience to Flooding** – Summarises how climate change will affect flood risk management, highlighting the need for resilient and adaptive strategies. This chapter also provides an overview on how the council will support local communities and provides guidance for them to increase their own resilience.
- **Sustainable Management** – Focuses on sustainable flood risk management strategies such as sustainable drainage systems (SuDS), natural flood management (NFM), and property flood resilience (PFR). The section outlines Hounslow plans and policies for delivering sustainable solutions.
- **Community and stakeholder engagement plans** – Outlines plans for carrying out community and stakeholder engagement in line with the actions outlined as a part of this LFRMS.
- **Action plan for delivering flood risk management between 2021-2027** – Outlines the results and benefits of actions taken since the last LFRMS. Introduces the action plan which accompanies this LFRMS and outlines possible funding options.
- **Conclusion and next steps** – Summarises the LFRMS document and action plan, providing recommendations and next steps.

1.5 Legislative context

Legislation around flood risk management in the UK can be linked back to the European Union (EU) directives, namely the [EU Water Framework Directive \(2000\)](#) which require all Member States to

improve the state of all water in order to achieve “good” ecological status, and the [EU Flood Directive \(2007\)](#) which defines a framework for approaching flood risk management. Both directives were adopted into UK law in 2003 and 2009 respectively.

Following the severe flooding that took place over the summer 2007, the Government commissioned Sir Michael Pitt to carry out a comprehensive review of the state of flood risk management in England. The recommendations formulated in the Pitt Review were used to develop the FWMA which defines the roles and responsibilities of the RMAs involved in flood risk management. Large metropolitan boroughs, such as Hounslow, were attributed the role of LLFA and the responsibility of lead local flood risk management.

Table 1-1 Summary table of relevant policies / legislation to FRM

International	
EU Water Framework Directive (2000)	The EU Water Framework Directive (WFD), published in 2000, makes it a requirement for Member States of the EU to improve and maintain the state of all waters, including surface waters and groundwater. All waters are to achieve a “good” ecological status by 2015 or, at the latest, by 2027. The WFD request that water management plans are developed using a river basin approach. The WFD was adopted into UK law in 2003.
EU Flood Directive (2007)	The EU Flood Directive dictates how Member States should approach the flood risk management of all types of floods. A three-stage process is to be followed. By 2011, Member States have to produce Preliminary Flood Risk Assessments (PFRAs) to identify areas where watercourses and coast lines are potentially at risk of flooding. By 2015, mapping of flood risk areas showing the extent, assets and number or inhabitants at risk must be carried out. By 2015, Flood Risk Management Plans (FRMPs) for areas at high risk of flooding must be produced, including measures to reduce flood risk. The EU Flood Directive was implemented in UK law through the Flood Risk Regulations (2009).
IPCC Climate Change Report (2021)	The Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report aims to assess the physical science basis of climate change. The headlines from the 2021 report include predictions of +1.5°C temperature change in the next two decades and that climate change is presently affecting every populated region of the globe.
National	
Civil Contingencies Act (2004)	The Civil Contingencies Act is a legislative framework for civil protection in the UK that establishes the roles and responsibilities on organisations that play a role in preparing for and responding to emergencies. Under the Act, local authorities are a Category One responder. Some of their duties include putting in place emergency plans, sharing and co-operating with other local responders to enhance efficiency.
The Pitt Review (2007)	Following the extreme flooding that took place in the summer of 2007, a comprehensive review led by Sir Michael Pitt known as the Pitt Review was commissioned by the UK Government. The Pitt Review provides 92 recommendations to improve flood risk management in England, notably that County Councils, large metropolitan boroughs, and Unitary Authorities should take lead on the management of flood risk. The Pitt Review

	recommendations were accepted by the Government and gave way to the FWMA (2010).
Flood Risk Regulations (2009)	The Flood Risk Regulations (FRR) implement the EU Flood Directive in England. Flood risk management, as set out by the framework, requires the production of PFRAs, the identification of flood risk areas, mapping of such areas and FRMPs.
Flood and Water Management Act (2010)	FWMA aims to provide better, more sustainable management of flood risk and coastal erosion along with improving the sustainability of water resources. The FWMA defines structures and responsibilities for managing flood risk, notably with the introduction of LRFAs which impart the role of managing local flood risk to County Councils, large metropolitan boroughs, and Unitary Authorities. The EA is appointed to hold the strategic overview role of all sources of flooding, in addition to managing the flood risk from main rivers and the sea. The FWMA also places a statutory duty on the EA to develop a NFCERMS for England.
National Flood and Coastal Erosion Risk Management Policy (2020)	The Flood and Coastal Erosion Risk Management Policy Statement reflects the government’s long-term ambition to increase the resilience to flood and coastal erosion risk nationwide.
National Flood and Coastal Erosion Risk Management Strategy (2020)	The NFCERMS sets out a framework for RMA’s involved in managing flood risk in order to increase the nation’s flood resilience. The publication of the NFCERMS was followed by an Action Plan aligned with the long-term objectives of the strategy.
National Planning Policy Framework (2021, revised)	The National Planning Policy Framework (NPPF) sets out the planning policies to deliver sustainable development and is published by the Ministry of Housing, Communities & Local Government. The NPPF provides guidance on developing Local Plans in line with national planning policies. These policies include avoiding and managing risks from flooding, in line with the role of local planning authorities to prepare local plans and to decide on planning application permissions.
Regional	
Thames Catchment Flood Management Plan (2009)	The Thames Catchment Flood Management Plan (CFMP) is a plan which helps RMA’s such as the EA to plan and agree the most effective ways to manage flood risk in the future. A CFMP considers all types of inland flooding from rivers, groundwater, surface water and tidal flooding but not directly from the sea (coastal flooding) which is instead covered in Shoreline Management Plans. CFMPs also consider likely impacts of climate change, land use change/management and the need for future development.
Mayor of London’s Climate Change Adaption Strategy (2011)	This Mayor of London’s Climate Change Adaption Strategy sets out the framework for improving the quality of life in London and for protecting the natural environment. It provides an action plan for making London more sustainable by using three ‘pillars’: retrofitting London, greening London and cleaner air for London. The strategy presents the understanding of main climate change impacts on London as well as analysing the impacts on cross-sector issues including health, economy, and infrastructure. The strategy also provides a ‘roadmap to resilience’ outlining key actions, with lead and partner organisations.

Thames Estuary 2100 Flood Risk Management Plan (2012)	<p>The Thames Estuary 2100 (TE 2100) Plan was developed by the EA and provides strategic direction for managing flood risk in the Thames Estuary to the end of the century. The TE 2100 plan is an adaptive strategy and is reviewed on an interim basis every 5 years and on a full basis every 10 years. The plan considers different long-term options for managing tidal flood risk depending on factors such as sea level rise.</p>
London Regional Flood Risk Appraisal (2018)	<p>The London Regional Flood Risk Appraisal (RFRA) provides an overview of all sources of flooding in London and addresses both its probability and consequences. The evidence of the London RFRA subsequently informs the London Plan and should inform local-level flood risk assessments and local plans.</p>
The London Plan (2021)	<p>The London Plan is a general Strategic Development Strategy (SDS) for London. Producing an SDS is a requirement of the London Mayor established under Greater London Authority (GLA) legislation. The London Plan establishes an integrated economic, environmental, transport and social framework for the development of London for the next 20-25 years. London boroughs local plans need to align with the London Plan, and its policies guide decisions on planning applications by councils and the Mayor.</p>
Local	
Local Plan (2015-2030)	<p>The Local Plan is developed by the Local Planning Authority and sets out a vision and framework for the future development of the area. It addresses needs and opportunities in relation to housing, the economy, community facilities and infrastructure; as well as conserving and enhancing the natural and historic environment, mitigating and adapting to climate change and achieving well designed places. The plan consists of strategic policies, addressing key priorities of the borough, and non-strategic policies.</p>
Biodiversity Action Plan (2011)	<p>The local Biodiversity Action Plan outlines the actions that must be taken at a local level to achieve the objectives of the National Biodiversity Action plan. The Hounslow BAP prioritizes actions for protecting, conserving, and enhancing wildlife and habitats, enables monitoring of biodiversity and helps gauge the quality of our surroundings through the indicators provided by the health of habitats and species supported.</p>
West London Strategic Flood Risk Assessment (2018)	<p>A Strategic Flood Risk Assessment (SFRA) is required by the NPPF and provides a strategic overview of all forms of flood risk within a designated area. A SFRA assesses the risk from all sources of flooding, the cumulative impact that development or changing land use could have, and the effect of climate change on the risk of flooding. A SFRA should also identify opportunities to reduce the causes and impacts of flooding. The SFRA provides guidance for the local plan, individual planning applications, future flood management and emergency planning.</p>
Surface Water Management Plan (2021)	<p>The Surface Water Management Plan (SWMP) is produced by LLFAs to assess the surface water flood risk in an area and outlines a plan on how to manage this with local partners. A SWMP considers flooding from sewers, drains, groundwater, and surface runoff from land, small watercourses and ditches that occur as a result of heavy rainfall. The SWMP also includes a long-term action plan to manage surface water flood risk which will influence land-use planning, emergency planning and future developments.</p>

1.6 Strategic objectives of the LFRMS

A key aim for the Hounslow LFRMS is to establish a series of objectives which can be taken forward to deliver effective local flood risk management through measures and actions. The LFRMS has a statutory requirement to ensure that these objectives are consistent with the EA's NFCERMS. This outlines three core ambitions concerning future risk and investment needs:

1. Climate resilient places: working with partners to bolster resilience to flooding and coastal change across the nation, both now and in the face of climate change
2. Today's growth and infrastructure resilient in tomorrow's climate: Making the right investment and planning decisions to secure sustainable growth and environmental improvements, as well as resilient infrastructure.
3. A nation ready to respond and adapt to flooding and coastal change: Ensuring local people understand their risk to flooding and coastal change and know their responsibilities and how to take action.

The local strategic objectives have been developed in line with those of the NFCERMS and with consideration for the local flood issues affecting Hounslow. They are as follows:

Strategic Objective A:

Establish and maintain collaborative partnerships with key stakeholders, such as utility companies, local government, and other risk management authorities to maximise joint-working opportunities.

Strategic Objective B:

Pro-actively encourage holistic and sustainable, nature-based solutions that deliver wider environmental, social and economic benefits.

Strategic Objective C:

Engage, educate, and empower local communities to take action and contribute to the management and reduction of flood risk, including through the uptake of flood resilience.

Strategic Objective D:

Seek to identify funding and resources available for flood risk management, targeting resources where they could have the greatest effects.

2 ROLES AND RESPONSIBILITIES

2.1 RMAs and other stakeholders

One of the purposes of the LFRMS is to set out the roles and responsibilities for RMAs and other stakeholders in managing flooding and coastal change in the borough. There are four main types of flood RMAs working within the borough, they are:

- EA
- LLFA (Hounslow)
- Water and Sewerage Company (TWUL)
- Highways Authorities (Hounslow, Highways England, and Transport for London (TfL))

The roles and responsibilities of the main RMAs are summarised in *Table 2-1*.

Table 2-1: RMAs' responsibilities in managing types of flooding occurrences

Responsibility	Risk Management Authority				
	Hounslow	Environment Agency	Thames Water	Transport for London	Highways England
Highway drainage and asset management of major A-roads				✓	
Highway drainage and asset management of motorways					✓
Highway drainage and asset management of other public roads	✓				
Management of flood risk and regulation of main rivers, estuaries and the sea		✓			
Management of the flood risk and regulation of ordinary watercourses	✓				
Management of the public sewer network			✓		
Management of the risk of groundwater flooding	✓				
Management of the risk of statutory reservoir flooding		✓			
Management of the risk of surface water flooding	✓				

2.1.1 The Environment Agency

The EA is a lead RMA in flood risk management. Section 165 of the [Water Resource Act \(1991\)](#) appoints permissive powers related to Main Rivers to the EA, including the maintenance and improvement of existing works as well as the construction of new works. The FWMA also gives responsibility for the management of fluvial (river) flooding to the EA.

The Main Rivers within the borough of Hounslow are:

- River Crane
- River Thames
- River Brent
- Duke of Northumberland
- River Lower Feltham Brook
- Felthamhill Brook

As part of their permissive powers, the EA performs regular maintenance activities, including the inspection of any flood risk assets (EA or third party owned) for debris build up. Under the [Civil Contingencies Act \(2004\)](#), the EA is also regarded as a Category One Responder.

2.1.2 Hounslow

Hounslow has multiple RMA roles and functions, including as a Highway Authority, an LLFA, a landowner, and a Category One responder.

As a **Highway Authority**, Hounslow is responsible for maintaining any highway assets on any roads not on the Strategic Road Network i.e. are not managed by TfL. Hounslow's internal highways team is responsible for drainage assets such as drains, kerbs, road gullies, ditches, and pipes. These must be maintained and routinely inspected to ensure that highway runoff on and from highways is well managed. Hounslow's highways team is responsible for the highway gullies and pipework up to the point it connects to the public sewer network. At this point, it becomes Thames Water's (TWUL) responsibility and so cooperation with TWUL is key.

Under the [FWMA](#) and as an **LLFA**, Hounslow is the lead RMA for managing flood risk from surface water, ordinary watercourses, and groundwater sources. Their functions include:

- Development, implementation, and maintenance of a LFRMS.
- Maintenance of a register of structures or features which are likely to have a significant effect on flood risk in the area.
- Reviewing and consulting of surface water drainage proposals for major planning developments.
- Regulating works within the proximity of ordinary watercourses (consenting and enforcement).
- Carry out works to help alleviate surface water, groundwater, and ordinary watercourse flooding in collaboration with other RMAs.

- Undertake flood investigations (under Section 19 of the FWMA) for flood incidents which meet a defined threshold. This threshold is defined by Hounslow LLFA as follows:

SECTION 19 THRESHOLD

- Four or more internal property flood incidents on any street, including within adjacent streets over a 6-month period.
- Six or more external property flood incidents on any street, including with adjacent streets over a 6-month period.

Basement flood incidents where the cause is groundwater flooding entering through cracks in the basement's walls or floor will not be investigated.

As a **landowner**, Hounslow has a responsibility to safeguard their own land and property against flooding. Landowners are required by common law to not increase the risk of flooding to a neighbouring property, through carrying out maintenance tasks on their assets, such as drain cleaning. As a riparian owner, Hounslow has the responsibility of carrying out maintenance tasks for the riparian area of any main rivers and ordinary watercourses that fall within Hounslow's owned land.

Hounslow's Contingency Planning team are a **Category One Responder** under the [Civil Contingencies Act \(2004\)](#). They are responsible for responding to incidents and emergencies that occur within the borough, of which flooding is one such potential emergency. The Contingency Planning team is also responsible for preparing and updating Emergency Plans for flood incidents within the borough.

The Development Management team in Hounslow also has a key role in flood risk management. They, as the **Local Planning Authority**, are responsible for reviewing planning applications and ensuring development proposals are located in areas of the lowest flood risk.

2.1.3 Thames Water Utilities Limited

TWUL is the regional water and sewerage company responsible for managing the risk of flooding from sewers including surface water, foul, and combined sewer systems. Under Section 94 of the [Water Industry Act \(1991\)](#), TWUL have a duty to inspect, maintain, and repair their sewers and other drainage assets. TWUL should advise the LLFA about any works being carried out and provide a platform for which sewer flooding incidents can be reported by residents. TWUL is also a clean water provider in Hounslow and is responsible for mitigating water main leaks including reinstatement of the public highway if any damage occurs.

2.1.4 Transport for London

TfL are responsible for managing the operation of the public transport network across London and the drainage of surface water of the red routes of their Strategic Road Network. TfL's red routes within the borough are the following:

- A315 – Staines Road
- A315 - London Road
- A310 – Twickenham Road
- A3004 – South Street
- A3002 – Half Acre
- A312 – Causeway
- A312 – Harlington Road East
- A312 – Hampton Road West
- A244 – Hounslow Road
- A244 – High Street
- A3063 – Wellington Road
- A3006 – Bath Road

2.1.5 Other Category One Responders

The Civil Contingencies Act (2004) categorizes all blue light emergency services as Category One Responders. For flood incidents within the borough, the most relevant services are the London Fire Brigade and the Metropolitan Police Service.

2.1.6 Other Landowners

Landowners have the primary responsibility of safeguarding their own land and property against flooding. Under common law they are also required to ensure that they do not take action to their property in a way that increases the risk of flooding to a neighbouring property. Common law also enables landowners to take reasonable measures to protect their property from flooding, provided the measures do not cause harm to others. Riparian landowners are responsible for ensuring that any structure(s) on their land linked to a neighbouring watercourse is kept clear of debris and the watercourse can flow naturally.

2.1.7 Overview of relevant council departments and RMAs

As many internal and external RMAs are involved in flood risk management in Hounslow, ***Error! Reference source not found.*** provides an overview of the Hounslow departments and external RMAs which are linked with the LLFA's duties in flood risk management. It also provides a generic email for each team.

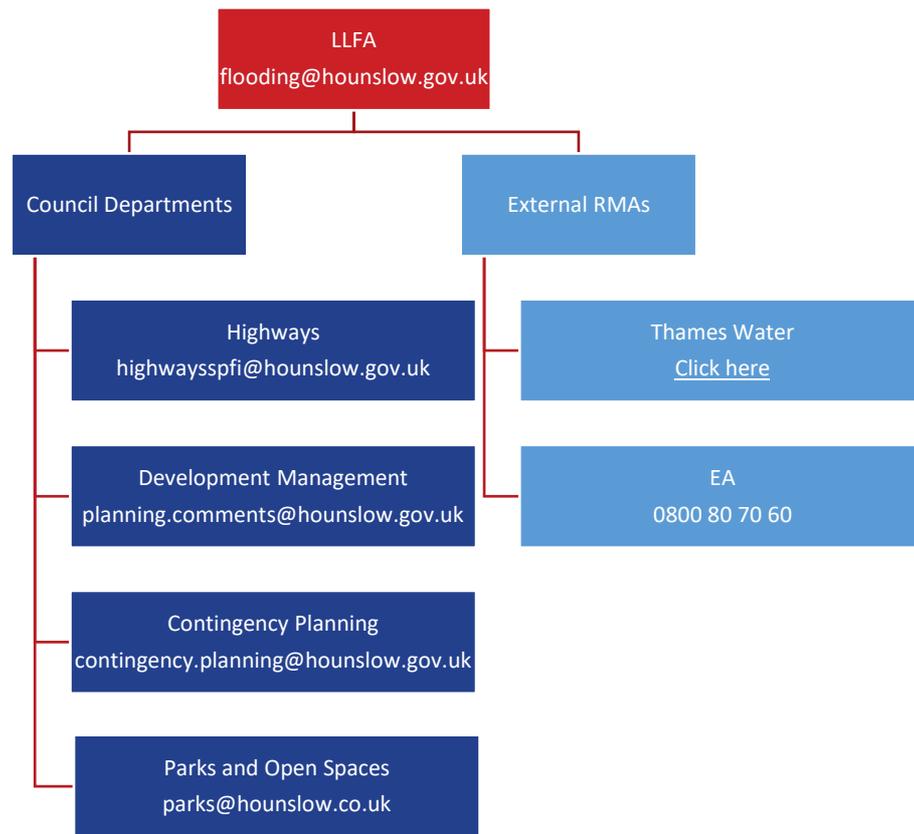


Figure 2-1 Key departments and RMAs linked with the LLFA

2.2 Local and Regional Partnership Groups

In line with the NFCERMS, Hounslow is committed to working in partnerships to enable co-operation between RMAs and contribute to a more holistic and sustainable approach to flood risk management. Partnerships will improve the sharing of information and expertise and can engage wider community groups to get involved in flood risk management activities. Partnership funding has also enabled more projects to go ahead, giving communities a bigger say in the flood risk and coastal erosion solutions being developed in their local places.

Hounslow is a part of several key partnership groups including the Brent Catchment Partnership, Crane Valley Partnership, the Northwest London Flood Risk Management Strategic Partnership, Thames Water Strategic Partnership and the Hounslow Internal Flood group.

2.2.1 Brent Catchment Partnership

The [Brent Catchment Partnership \(BCP\)](#) represents a group of organisations working together to make the streams, lakes, and canals of the River Brent catchment cleaner, more accessible and more attractive, to benefit both local communities and wildlife. The BCP network provides a forum where members can share information and build knowledge about sustainable water and river management and energy guided by a strategic agreement. Key catchment partners include the 5 London boroughs in which the River Brent flows through (Harrow, Barnet, Hounslow, Brent and Ealing) as well as other groups such as All London Green Grid, Brent Rivers and Canals Society, the EA, TWUL and Natural England.

Current projects being delivered by the BCP which may have flood risk benefits in Hounslow include:

- [Restoring Brent Rivers and Communities](#) which aims to restore and rewild sections of the river Brent by planting native aquatic plants, removing toeboards and helping the river meander more naturally. This will increase flood storage, reducing the risk of flooding nearby and downstream.
- [Silk Stream Flood Resilience Innovation Project](#) which aims to create new wetlands in several parks in the Silk Stream catchment and incorporate more SuDS into the urban streetscape to help build flood resilience. The Silk Stream is a tributary of River Brent which flows through the borough. Any flood risk management schemes in this greater catchment area will likely benefit flooding downstream such as in Hounslow.

2.2.2 Crane Valley Partnership

[The Crane Valley Partnership \(CVP\)](#) is a collection of charities, community groups, borough councils, private businesses & government agencies in the five boroughs within the River Crane catchment area (London Boroughs of Harrow, Hillingdon, Ealing, Hounslow, and Richmond upon Thames). The Partnership aims to restore the river systems, conserve surrounding habitats and improve public access so that nearby communities can enjoy contact with the natural world.

2.2.3 North West London Flood Risk Management Strategic Partnership

The GLA's Drain London Project grouped the London boroughs in to 8 groups. The North-west London Flood Risk Management Strategic Partnership is made up of group 1 and 2 from the Drain London project which includes Barnet, Brent, Ealing, Harrow, Hillingdon, and Hounslow. The group aims to provide the boroughs with the platform to deliver their LLFA requirements of the FMWA (2010) and the FRR (2009) in the sub-region. Meetings are held quarterly and are attended by external partners and stakeholders who have an interest in flood risk management. The group has representation on the Thames Regional and Coastal Committee (RFCC).

2.2.4 Hounslow Internal Flood Group

The Hounslow Internal Flood Group is a partnership between the teams within the Hounslow that play roles in or are affected by flood risk management in the borough. This facilitates the sharing of information within the council and allows collaboration on projects which benefit the shared aims of the departments. This group meets regularly and keeps update on all projects and flood issues currently active in the borough, and those that may be present in the future. The LLFA is responsible for leading these meetings and reporting on progress made in other external partnership groups.

2.2.5 Thames Water Strategic Partnership

The Thames Water Strategic Partnership (TWSP) is a five-year project due to finish 31st March 2025, which aims to improve surface water management across the borough by using SuDS. Hounslow is working in partnership with Thames Water to increase their sewer capacity by permanently disconnecting or temporarily attenuating surface water runoff from Thames Water's networks. The SuDS features will also provide multiple benefits to residents and businesses in Hounslow, primarily a reduction in flood risk, but also biodiversity enhancements, improvements to water quality and

enrichment of local amenity. Within this project, there are currently plans to incorporate SuDS at approximately twenty-five locations across Hounslow, and feasibility investigations to do so are ongoing.

3 LOCAL FLOOD RISK

3.1 Local flooding characteristics

Hounslow is located in West London and covers an area of 56 km². It is made up of urban areas as well as green spaces. Hounslow shares its borders with the London Boroughs of Ealing to the North, Hillingdon in the North-west, Richmond upon Thames to the South and Hammersmith and Fulham to the East, with Surrey County Council (Surrey CC) to the West. The highest points within the borough are in the north-west, whilst the lowest are within Chiswick and in Brentford and Isleworth, bordering the River Thames. There are further low points along the River Brent which flows from Ealing to Brentford. Within Hounslow, the bedrock geology consists mainly of London Clay, silt, sand, and gravel while the superficial geology is made up of sand and gravel (see the [BGS Geology of Britain viewer](#)).

The borough contains the following significant infrastructure and amenity areas:

- Water reclamation works in West Bedfont, water works in Hanworth, and Mogden Wastewater Treatment Works in Isleworth;
- Network Rail (Hounslow loop line into Waterloo), London Underground (District and Piccadilly Lines) and London Overground rail lines cross the borough, with a multitude of associated railway stations and maintenance assets;
- Treaty Centre (largest shopping centre in Hounslow) in Hounslow Town Centre in addition to Chiswick, Brentford and Feltham High Streets;
- Gunnersbury Park, Syon House and Park, Boston Manor House and Park, Chiswick House and Gardens Trust, National Trust – Osterley House and Park, Crane Park, Hounslow Heath, Hanworth Park, Bedfont Lakes Country Park;
- Part of the southern perimeter road of Heathrow Airport bordered by the borough administrative boundary and infrastructure relating to the Airport;
- West Middlesex University Hospital in Isleworth; and
- Fourteen A roads and one Motorway (the M4)

3.2 Properties at risk of flooding

The number of properties at risk of flooding within Hounslow is shown in *Table 3-1*, which has been adopted from the [SWMP](#). The number of properties at risk were determined using the EA's Properties at Risk of Flooding for the 1 in 30, 1 in 100 and 1 in 1000-year events (2014) datasets. 'Other' refers to commercial, transport or other such defined infrastructure properties. 'Unclassified' refers to properties which have been mapped and are at risk of flooding but have not been identified under a specific use due to a lack of information. The EA periodically reviews the 'Unclassified' properties when new information is provided to them.

Table 3-1 Properties at risk of flooding (from SWMP)

	Residential	Other	Unclassified
1 in 30-year rainfall event	276	24	123
1 in 100-year rainfall event	2,904	476	483
1 in 1000-year rainfall event	15,088	1,770	1,733

3.3 Types of flood risk

Hounslow is at risk of flooding from multiple sources including tidal (caused by surges in the Thames Estuary), fluvial (from other rivers, such as the rivers Brent and Crane) and surface water, sewers, and groundwater. The risk of flooding from all these sources throughout the borough can be viewed in the [SWMP](#) web maps.

3.3.1 Fluvial flood risk

The flood risk from a main river is termed as fluvial. Fluvial flooding occurs when heavy or prolonged periods of rain causes a river to exceed its capacity, overflowing onto adjacent land. Main rivers have the potential to cause flooding with a high level of damage and wide impact. The EA has duties and powers in relation to main rivers and maintains spatial information on them while Local Authorities have rights and responsibilities relating to ordinary watercourses. Main rivers in Hounslow are the River Thames, River Crane, River Brent, Duke of Northumberland's River, Longford River, Lower Feltham Brook and Felthamhill Brook.

The borough is bounded by the River Thames to the east, the River Crane to the west and south, and the River Brent to the east. The confluence of the River Crane into the River Thames is at the borough boundary on the edge of Isleworth. The Duke of Northumberland's River is a man-made tributary of the River Crane from the 16th century. It flows into the River Crane near Hatton and Hounslow Heath, before separating outside the borough boundary in Twickenham, flowing through Isleworth and into the River Thames. The River Brent flows into the River Thames in Brentford. It has been heavily modified between Hanwell and Brentford in order to straighten the river channel. This stretch of the river forms part of the Grand Union Canal. Where separate from the River Brent, the Grand Union Canal is an ordinary watercourse. More information about fluvial flood risk, can be found in the [West London SFRA Level 1 \(2018\)](#).

3.3.2 Tidal flood risk

Tidal flooding occurs during extreme high tide and / or storm surge events. The River Thames is at risk of tidal flooding and provides the greatest risk when storm surges coincide with extremely high tide levels. The risk of tidal flooding In Hounslow is relatively low due to the presences of the Thames Tidal Defences (TTD) which have been established downstream of the borough. These defences consist of a collection of walls (most notably the Thames Barrier), embankments, flood gates, pumping stations and barriers. The TTD currently protects 'at risk' properties up to a 1 in 1000-year event.

3.3.3 Surface water flood risk

Surface water flooding occurs as a result of high intensity rainfall when water is ponding or flowing over the ground surface before it enters the underground drainage network or a watercourse. Surface water flooding is intensified in urban areas, like Hounslow, where there is impermeable land as rainfall is unable to infiltrate below ground or enter drainage systems at sufficient rates. The excess water can pond at local low points and often form flow pathways along roads, built up areas or open spaces.

Surface water flooding typically occurs for a similar timescale as the rainfall event that caused it, but ponding can persist in low-lying areas for longer. Due to its typically shorter duration, surface water tends to have less serious consequences compared to other forms of flooding but can still cause significant local damage and disruption in sudden, intense rainfall events.

Hounslow, as LLFA, holds records of past surface water flooding within the borough. Hounslow have also carried out their own surface water modelling which builds upon the EA Risk of Flooding from Surface Water (RoFSW) dataset and incorporates the local sewer network. This can be viewed as part of the [SWMP](#) flood maps.

Flooding from ordinary watercourses occurs under similar circumstances as fluvial flooding but is associated with non-main river watercourses or ditches. Unlike main rivers, the Hounslow LLFA have the responsibility and powers over ordinary watercourses. The most prominent ordinary watercourses in the borough are the Longford River and an unnamed drain through Hounslow West. Flooding from the ordinary watercourse is included in the [EA RoFSW datasets](#).

3.3.4 Groundwater flood risk

Groundwater flooding occurs because of the underground water table rising, which can result in water emerging through the ground and causing flooding in extreme circumstances. This source of flooding tends to occur after extensive periods of heavy rainfall. During these periods, a greater volume of water infiltrates through the ground, causing underlying aquifers to rise above its regular depth below the ground's surface. Springs and low-lying areas, where the water table is likely to be closer to the surface, pose greater risks of groundwater flooding. Groundwater flooding can occur in areas where the underlying soil and bedrock can become saturated with water. Therefore, ground composition and aquifer vulnerability are significant influences on the potential rate of groundwater flooding.

There are many impacts linked to high groundwater levels. When small volumes of water seep through building walls, there may be a temporary loss of services. In extreme cases, this may lead to the loss of possessions and failure of the structural integrity of buildings. The extended duration of flooding often leads to the overall damages being high. Inundation of roads, and agricultural, commercial, and residential land can lead to structural damage and the disruption of activities, with financial consequences. The surcharging of sewers and drains from high groundwater can be harmful to health, and recurring flooding of buried services can cause supply to be interrupted. Areas within the borough with potential of elevated groundwater such as Feltham, Hanworth, Hounslow town centre, and North Brentford have the greatest potential of groundwater flood risk within the borough.

3.3.5 Sewer flood risk

The sewer system in Hounslow is owned and operated by TWUL. The borough is predominantly served by separate foul and surface water sewers, except for a small number of combined sewers remain in the eastern part of the borough. Sewer flooding occurs when the amount of rainfall entering the sewer network is too large to be contained. A lack of capacity in the sewer networks may be due to:

- An increase in flow (such as climate change impacts on rainfall and / or new developments);
- Having to sustain events larger than the system designed event;
- The failure of key infrastructure such as pumps or valves;
- A watercourse having been fully culverted or incorporated into the drainage network;
- A lack of maintenance which can sometimes lead to total blockage;
- Groundwater infiltration into pipe networks in poor condition; and
- Limited outflow from the sewer network due to high water levels in receiving watercourses.

The impact of sewer flooding is usually restricted locally but can be rapid and unpredictable. Flood waters from sewers are also often contaminated with sewage which can be harmful to health. Based off historic records of sewer flooding from Thames Water, Hounslow postcodes which are, TW3 2, TW7 6, W6 0 are the most vulnerable to sewer flooding. More information on sewer flooding can be found in the [SWMP](#).

3.3.6 Flood risk from other sources

Artificial flooding occurs when the failure of infrastructure or human intervention results in flooding. Artificial flood sources include reservoirs, canals, water retention ponds, docks, and other artificial structures. Though the probability of a structural breach is low, the potential extent of damage is significant. Flooding from an artificial source could leave many properties at risk. Locks and weirs maintain the water levels of the Grand Union Canal (where not merged with the River Brent) which flows into the south-east of the borough before discharging into the River Thames.

3.4 Flooding history within the borough

Flooding has occurred historically in Hounslow and has taken place due to a number of causes and factors. Hounslow LLFA collects information of flooding and keeps a register of historic incidents. This includes all sources of flooding, due to the potential for interaction between sources, and is not restricted to significant flood events.

A Section 19 flood investigation was carried out in 2019 for Ferndale Avenue due to multiple reports of flooding in the area. Reports state that flooding occurred on the carriageway and footway following heavy rainfall and affected residents at the eastern end of Ferndale Avenue. The Section 19 concluded that these events were caused by a number of factors including heavy rainfall, the topography, a lack of surface water drainage and insufficient capacity/poor condition of the soakaway.

Historic sewer flooding incidents are collected by Thames Water at a district-level in postcode sectors, as shown in *Table 2-2* in the [SWMP](#).

3.5 Future flood risk considerations

Climate change is predicted to increase the risk of flooding from all sources. The EA has defined a climate change allowance in the [EA Guidance for Flood Risk Assessment \(updated in 2021\)](#) to assess the impact of current climate change predictions. There are allowances for:

- Peak river flow
- Peak rainfall intensity
- Sea level rise
- Offshore wind speed

These allowances should be used in flood risk assessments to account for climate change and to increase resilience to flooding and coastal change. There are allowances for different climate scenarios over the coming century including figures for extreme climate change predictions. [The Fluvial & Tidal Flood Risk Web Maps](#) associated with the West London SFRA (2018) show the predicted flood extents for different scenarios using the following climate change allowances (for the River Brent and River Crane):

- 1 in 100 year flood event + 25% climate change.
- 1 in 100 year flood event + 35% climate change.
- 1 in 100 year flood event + 70% climate change.

This map also shows the potential tidal defence breach inundation area up until the year 2100. This is considered an appropriate representation of climate change impacts on tidal flooding for the Thames Estuary.

Climate change allowance for peak rainfall intensity should be used in any assessment of surface water flooding due to climate change, as per the latest guidance. However, there are no climate change scenarios available for the RoFSW maps and so in line with the Hounslow [SWMP](#), this LFRMS considers:

- The 1% annual probability extent to represent the current likely risk; and
- The 0.1% annual probability extent to represent the potential climate change adjusted impact of current risk.

These predicted flood extents are shown in the SFRA Surface Water Flood Risk Web Map and give an indication of the risk of surface water flooding in Hounslow in the future.

4 ADAPTATION AND RESILIENCE TO FLOODING

4.1 What is climate change?

The United Nations define climate change as the long-term shifts in temperatures and weather patterns. Although these shifts can be natural such as through variations in the solar cycle, humans are the most dominant driver of climate change. This is primarily due to the vast amount of greenhouse gases emitted by human activities.

The [Sixth Assessment Report \(2021\)](#) published by the Intergovernmental Panel on Climate Change (IPCC) highlights the fact that climate change is already affecting extreme weather conditions across the globe. For example, the intensity and frequency of heatwaves and rainfall events has increased since the 1950s. The UK Met produces [UK Climate Change Projections \(UKCP18\)](#) which are climate predictions for how the climate may change in the UK over the 21st century. These predictions include “an increased chance of warmer, wetter winters and hotter, drier summers along with an increase in the frequency and intensity of extremes”.

4.2 What is resilience and adaptation?

As climate change increases the frequency and intensity of flooding, flood risk management is becoming significantly more challenging. It is important that we are prepared for flood events, to minimise the damage they cause and to ensure communities and local economies recover quickly. This is referred to as flood resilience.

The NFCERMS frames resilience as “the capacity of people and places to plan for, better protect, respond to, and recover from flooding and coastal change. This includes making the best land use and development choices, protecting people and places, responding to, and recovering from flooding and coastal change whilst all the time adapting to climate change.” The NFCERMS also focuses on ‘building back better’ so that properties and infrastructure are more resilient to future flooding.

Flood adaption refers to measures taken to ensure that places remain flood resilient to future flood risk over the longer term. The risk of flooding is constantly changing and therefore requires adaptive approaches to identify the best combination of resilience actions and the right time to take action. The NFCERMS outlines ‘adaptive pathways’ to enable local places to better plan for future flood and coastal change and adapt to future climate hazards.

To ensure effective flood risk management now and in the future, it is important that resilience to flooding and adaption to future flood risks are achieved simultaneously.

4.3 Supporting resilient local communities

Hounslow declared a climate emergency on the 18th of June 2019, joining with other local authorities, the Mayor of London, and the UK Parliament in the call for urgent action. The borough's [Climate Emergency Plan](#), published in 2020, sets out Hounslow's response to this declaration and details the initiatives which will be put in place to deal with climate issues.

In line with the regional response to "create a resilient and green London", Hounslow will carry out an assessment of the risks that climatic events such as flooding pose on the borough and its residents and identify the opportunities available to respond.

In February 2020, Hounslow introduced the [Greener Borough Framework](#) which provides a high-level framework for delivering a cleaner, greener environment and reducing resource consumption within the borough. A key action plan from this framework is the 'Greening the Borough Action Plan' for improving the green infrastructure and maximising the benefits from current green spaces. The expansion of green infrastructure will have direct benefits for flood risk management, as it can reduce stormwater runoff and help protect floodplains, alleviating both surface and fluvial flooding.

The framework will also establish a Community Reference Group for Cleaner Greener Borough who will work with the officer led boards to co-create and prioritise actions, as well as assist in making things clear and increasing public understanding around these actions. A Greener Borough focus group was formed from a community workshop held in June 2019 and has met several times. This will form the initial basis of the Greener Borough reference group.

The LLFA have a vital role in ensuring flood risk management plans and policies coincide with these wider action plans and framework. Achieving flood resilience and adaptation for the local communities is a priority of the LLFA and the specific actions that will be taken are detailed in *Section 7*.

The environmental and ecological impacts of the LFRMS and its actions have also been assessed through a Strategic Environmental Assessment (SEA) and Habitats Regulation Assessment (HRA). Both documents accompany this LFRMS as *Appendix 2* (SEA) and *Appendix 3* (HRA). These assessments will ensure that any proposed actions outlined in this LFRMS will have no adverse impacts on the people, economy, and environment of Hounslow.

TWSP FLOOD ALLEVIATION PROJECTS

Hounslow is working closely with TWUL to implement various SuDS schemes throughout Hounslow. A key outcome of this project is to improve flood resilience for the local communities, specifically targeting areas which are more vulnerable to surface water flooding. The project also aims to achieve wider community benefits such as improving amenities, and biodiversity.

4.4 Guidance for local communities

4.4.1 How to reduce the risk

There are many ways different groups, organisations and individuals can help to reduce the risk of flooding within the local area. At a property-level, residents and businesses can follow the guidance from the National Flood Forum to ensure that the risk is minimised effectively and that they are able to respond when a flood does occur. This guidance document outlines a six-step approach, as follows:

1. Understand the risk
 - Review the EA flood maps for risk of flooding from rivers and sea.
 - Alternatively, you can review the West London SFRA online flood maps for the risk from all sources of flooding.
 - Both sources are updated regularly and should be periodically reviewed, for example, when your home insurance policy is due for renewal.
2. Planning a scheme
 - The National Flood Forum's Blue Pages puts together a directory of property flood products and services that are available to help reduce the risk of flooding to your home or business. It allows you to search different categories, giving a short description of what the product/services should do, where it is applicable and the relevant standards that should be met.
 - Check with your insurer about their policy on property level flood resilience technologies, you may be eligible for a reduction on insurance premiums (not guaranteed).
 - Contact the LLFA or local EA officer for more information on the types of funds that may be available.
3. Property surveying
 - To check all possible points where water can easily seep in, such as doors, windows, air bricks and even toilets.
 - You can search for local, professional chartered surveyors on [Royal Institute for Chartered Surveyors](#) website.
4. Design and specification
 - The survey will recommend a combination of products. The National Flood Forum can direct you to reputable companies that can fulfil the specifications.
 - As a rule, the EA recommends products that are covered by the [British Standards Kitemark \(PAS 1188\)](#).
5. Product installation
 - It is good practice to inspect the installation once it is complete.
 - A post-installation survey may also be an option.
6. Maintenance and operation

- Property owners are ultimately responsible for ensuring that the installed products are maintained in accordance with the product manufacturer's recommendations.
- Typically, maintenance should be annual or biannual, or whenever a flood warning is issued.

For more information of Property Flood Resilience, see *Section 5.2.3*.

Local residents and businesses can also help reduce flood risk in the borough by incorporating small scale green infrastructure on their properties. Fully paved/cemented driveways contribute to surface water flooding as they do not allow water to naturally infiltrate into the ground. De-paving gardens, particularly front gardens can help minimise surface run-off from properties, help to reduce the risk of flooding. Rain gardens and planters are small-scale SuDS options which can be effective at a property level and can be easily incorporated into garden landscape designs. Introducing greening features into gardens can also have many other benefits such as improving air quality and biodiversity. Other options include small rainwater harvesting features such as water butts which can collect rainwater so it can be re-used. This effectively reduces the risk of flooding by reducing the amount of water reaching the ground and can help reduce potable water consumption.

The local community can play an active role in flood risk management activities by getting involved in borough SuDS schemes through local flood action groups. For more information on these groups, their activities and how to get involved you can visit [Hounslow's Flooding website](#).

4.4.2 Before, during and after a flood

There are actions which can be taken to prepare and plan for a flooding event in order to minimise the damage and ensure fast recoveries. Firstly, local residents and businesses in areas at high risk of flooding should sign up to the EA's free 24 hour Floodline Warnings Direct service. Information on the actions that should be carried out before, during and after a flood event are summarised in *Figure 4-1*. More information on this can be found on the [National Flood Forum](#) (NFF) website or in the [EA guidance](#) or by calling the following helplines:

- The EA Floodline: 0345 988 1188
- National Flood Forum: 01299 403 055



Figure 4-1 checklist of task for before, during and after a flood (Adapted from the NFF)

How to Report a Flood

For Surface Water, Groundwater, Ordinary Watercourses

Report to Hounslow by filling out the [Hounslow Flood Reporting Survey](#)

For Main River and Reservoir flooding

Report to the Environment Agency through this link:

<https://www.gov.uk/report-flood-cause>

For Sewer Flooding

Report to Thames Water through this link:

<https://www.thameswater.co.uk/help/report-a-problem>

Figure 4-2 How to report a flood

5 SUSTAINABLE MANAGEMENT

5.1 Sustainability and flood risk management

As the frequency and severity of storms and rainfall increase with climate change, developing sustainable flood risk management strategies is a priority. This is to ensure that existing defences and areas at risk of flooding now and in the future are protected in the long term. At the core of sustainable flood risk management is the need to build flood resilience and adaptation. In general, sustainable flood risk management should aim to:

- Invest appropriately to protect the most vulnerable and areas which are at the greatest risk of flooding to reduce the number of people, homes and property at risk of flooding;
- Utilise rural and urban landscapes to store and slow the flow of water;
- Implement sustainable surface water management that reduces stresses on sewer systems to reduce flood risk and improve water and environmental quality;
- Effectively manage coastlines and estuaries to reduce flooding whilst respecting the changing nature of the coast and considering impacts of associated interventions;
- Continually keep the public well-informed on understanding flood risk and appropriate actions they can take to protect themselves, their property, and businesses; and
- Create adaptable flood managing actions that can adapt to a changing climate.

5.2 Strategies for sustainable development

The FWMA states that flood and coastal erosion RMA should aim to contribute towards the achievement of sustainable development when exercising their flood and coastal erosion risk management functions. The definition of sustainable development centres on the theme of improving life in ways which do not restrict the ability of others, now or future generations.

Part of sustainable development is by using alternative engineering approaches in new cases or alongside existing flood risk management strategies. Increasing awareness and preparedness are also key factors, through supporting individuals, communities, and businesses to build their resilience to flood events and speed up the recovery process by incorporating greater measures into the design of new buildings and retro-fitting at risk properties, including historic buildings with flood resilience measures.

5.2.1 Sustainable drainage systems

Sustainable Drainage Systems (SuDS) are a range of drainage systems that are designed to mimic natural drainage processes. SuDS work by managing water runoff to reduce the quantity of surface water entering the traditional sewer networks and to improve the quality of runoff. Different types of SuDS exist and are often categorised based on the process they employ such as water harvesting (water butts, blue roofs), infiltration (soakaways, infiltration trenches), detention or attenuation (retention ponds, geocellular storage) and conveyance (swales, conveyance channels). More information on SuDS can be found on the [Susdrain website](#).

SuDS can be used for new developments and can also be retrofitted in existing developments. In both cases, considering the potential benefits and opportunities when designing SuDS can help deliver the best results. SuDS can provide a range of benefits that are linked to water management including improving amenity and biodiversity spaces, creating recreation areas, and contributing to education by including SuDS in schools.

Successfully designing and incorporating SuDS in developments relies on effective design. The [SuDS Manual \(CIRIA publication C753F\)](#) is widely used for technical advice and guidance on planning, designing, building, and maintaining SuDS.

5.2.2 Natural flood management

Natural Flood Management (NFM) involves implementing measures that help to protect, restore, and emulate natural functions of catchments, floodplains, rivers, and the coast in order to reduce the risk of flooding.

The overall aim of NFM is to reduce the maximum water volume of a flood (peak flood flow) and/or delay the arrival of the flood peak downstream, increasing the time available to prepare for floods.

There are four key mechanisms by which this can be achieved:

1. *Increasing flood storage:* creating temporary storage which fills up during a flood event and empty slowly e.g., reconnecting functional floodplains and creating storage ponds.
2. *Increasing catchment and channel roughness:* This 'slows the flow' by increasing the resistance to surface and in-channel water flow e.g., planting trees and hedgerows and restoring meandering rivers.
3. *Increasing losses:* Increasing the amount of water that infiltrates into the ground or is lost to the atmosphere through evapotranspiration e.g., techniques to reduce soil compaction and infiltration SuDS.
4. *De-synchronising peak flows from tributaries:* Slowing down one tributary compared to another can reduce flood peaks downstream in the main river body.

While restoring the natural function of the river catchment is the primary aim of NFM, where this is not possible, designing techniques to emulate these processes can help manage flood risk. The EA has developed an [evidence base](#) for different NFM techniques, with several case studies on how they can be implemented and the benefits they provide for flood risk management.

5.2.3 Property flood resilience

Property Flood Resilience (PFR) are measures which can be introduced to households or businesses which can help build up a properties resilience to flooding. There are two main targets of PFR which are to help reduce the flood risk to a property, and/or reduce the recovery time after a flood for a building to be usable. PFR can be incorporated into new developments and also be added as retrofitted options to buildings. From this there are many choices of PFR available on the market and individuals living in areas at high risk of flooding or in hotspot areas are advised to seek PFR advice. A useful guide for property owners is the [Homeowners Guide to PFR](#), and the [Blue Pages](#) are the UK's leading independent flood directory to help find PFR products or installers.

5.3 Future plans for delivering sustainable solutions

Flood risk management needs to support national, regional, and local plans for sustainable development and ensure that solutions developed to meet today's water management challenges do not compromise the opportunities of future generations. Hounslow's [Local Plan](#) (2015-2030) recognises the importance of sustainable development and the need for an integrated approach to water management across the borough through a number of plans and policies.

5.3.1 Policy EQ2 – Sustainable Design and Construction

This aims to encourage sustainable design and construction including passive solar design, water efficiency standards, sustainable urban drainage and the reuse and recycling of construction materials, green roofs, and urban greening. This policy encourages sustainable solutions for new builds as well as refurbishments.

5.3.2 Policy EQ3 – Flood Risk and Surface Water management

This policy specifically addresses sustainability within flood risk management and outlines Hounslow's plans to reduce flood risk by ensuring new developments are located appropriately and incorporate any necessary flood resistance and resilience measures.

Hounslow aim to achieve this within the planning system by:

- Using the sequential and exception tests to inform planning decisions in flood risk areas to ensure inappropriate development is avoided;
- Promoting improved surface water drainage across the borough, by working with partners to identify, manage and reduce risk of flooding;
- Promoting the opening up of river corridors and making space for water through the creation of buffer zones to watercourses and increasing floodplain connectivity;
- Providing for the maintenance of flood defences, in-line with the Infrastructure Delivery Plan and in collaboration with partners;
- Encouraging the take-up of opportunities to improve flood resistance and resilience in the borough's existing built environment, including drainage improvements, flood guards and raising electrical sockets and other vulnerable fittings; and
- Working with the Environment Agency to implement actions of the Thames Estuary 2100 plan.

5.3.3 Policy GB5 – Blue Ribbon Network

Hounslow recognises the role that rivers and waterbodies play in flood and surface water management in the borough. Hounslow plans to protect and enhance the borough's Blue Ribbon Network, by safeguarding access to flood defences and working with the EA and other partners to implement the actions of the [TE 2100 plan](#). This policy also addressed wider sustainability aims such as promoting biodiversity, in line with the Hounslow [Biodiversity Action Plan \(2011\)](#) and improving water quality in line with the [Water Framework Directive](#).

5.3.4 Green and Blue Infrastructure Strategy

As a part of the Greener Borough Framework, Hounslow have taken these on in a [Green Infrastructure Strategy](#) which recognises green and blue infrastructure (GBI) as an essential component of resilient, healthy and sustainable communities.

GBI is defined as “a network of multi-functional green and blue spaces and other natural features, urban and rural, which is capable of delivering a wide range of environmental, economic and, health and well-being benefits for nature, climate, local and wider communities and prosperity”.

A key aim of the strategy is the creation of resilient spaces to deal with the climate emergency through adaptation and mitigation. It brings consideration of GBI to the forefront of planning decisions in the borough, establishing it as of equal importance to ‘grey’ infrastructure. Some of the opportunities identified in this strategy which will likely have direct benefits for flood risk management include:

- Planting one tree per child each year
- Greening Schools
- De-paving gardens
- Urban greening
- Re-naturalising stretches of river corridors
- Improving catchment management
- Enhancing the riverside environment

5.3.5 Hounslow Infrastructure Delivery Plan

The [Infrastructure Delivery Plan](#) was published in 2019 (still in consultation) to support the provision of key infrastructure set out in the [Local Plan](#). This has an important role in flood risk management as it outlines Hounslow’s plans for ensuring that the risk of flooding is minimised in the delivery of infrastructure. Although, Heathrow Airport is not within the boundary of the borough, it is a major infrastructural development, and the borough is working closely with the Crane Valley Partnership and other regional groups to ensure the best outcomes in terms of flood risk are achieved. The strategy also identifies other opportunities for natural flood alleviation such as through naturalisation and floodplain reinstatement, extending meadow areas and creating and restoring wetlands.

6 COMMUNITY AND STAKEHOLDER ENGAGEMENT PLANS

6.1 Plan for community engagement

A borough-wide stakeholder engagement strategy is currently being developed to increase awareness of the LFRMS and the opportunities for collaborative working to mitigate local flood risks. The plan outlines how different partners can use the strategy to enable effective and ongoing collaborative working within Hounslow now and in the future.

There is a long list of stakeholders who should be engaged as a part of this LFRMS. The stakeholders identified will be engaged through specific actions within the action plan, while others will be engaged/involved at relevant times. Stakeholders with high level of interest and influence should be targeted for collaboration as they can be valuable for future projects and actions. Stakeholders who will be affected by policy changes but are perceived to have less influence in decision-making should also be consulted to ensure their voices are not overlooked.

Lobbying and campaigning type organisations such as local charities and community societies should be involved as they can provide valuable local knowledge, funding and can be effective in mobilising communities to get involved in projects. Academic/research focused organisations linked to water policy might be called upon to provide expert input as and when necessary. This LFRMS’s community engagement plan will coincide with the engagement plan outlined in the [SWMP](#). *Table 6-1* shows the engagement strategy level and actions for different combinations of interest and influence which was outlined in the SWMP.

Table 6-1 Stakeholder strategy

Interest	Influence	Strategy	Level	Actions
High	High	Collaborate	Heavy	Stakeholder panels Steering groups Facilitated meetings
High	Low	Consult	Medium	Surveys Meetings Interviews
Low	High	Involve	Medium	Workshops Forums Focus groups
Low	Low	Inform	Light	Briefings Electronic documents Exhibitions

6.2 Key Stakeholder groups

6.2.1 London Borough of Hounslow

Within the action plan, several teams within Hounslow were identified for potential future collaboration. This includes but is not exclusive to, Development Management, Highways and Parks

and Open Spaces internal service teams. These teams should be engaged collaboratively through the Internal Flood Group.

The Development Management team has a key role in reducing the risk of flooding in new developments. The LLFA should work with the Development Management team to review major planning applications as part of their statutory consultee role and ensure all new developments are located appropriately and incorporate any necessary flood resistance and resilience measures. They are also responsible for ensuring that SuDS are implemented in all new developments to minimise surface water flooding.

The LLFA should work closely with the Highways and Traffic and Transport teams to identify collaborative opportunities for delivering schemes which provide multiple benefits within the borough. For example, SuDS schemes can be easily incorporated into highway projects and by designing and building these schemes jointly, they can be less disruptive, more financially viable and achieve wider benefits. The Highways team is also responsible for the maintenance of the drainage systems to ensure gullies and drains are operating correctly. It is important for the LLFA to communicate with the Highways team, particularly for areas at high risk of flooding so these drainage assets can operate at capacity.

The Parks and Open Spaces team should be consulted when proposing schemes as they are particularly helpful in reaching out to and working with wider stakeholders such as Friends' groups and allotment societies, amongst others. The Transport and Environmental Strategy teams should also be contacted when identifying potential funding contributors and securing funding for schemes and working collaboratively on their programmed opportunities.

The Housing and Estates Regeneration team within Hounslow is another key stakeholder which should be engaged as a part of this LFRMS. Significant regeneration is planned for Hounslow, particularly in the four main town centres: Brentford, Feltham, Chiswick and Hounslow town centres. There is a major opportunity to implement flood risk management schemes alongside these projects. It is therefore important that the LLFA works alongside the Housing and Estates Regeneration team to identify and implement these opportunities as they arise.

The Environment Strategy team should be engaged to help identify where the LLFA and other RMAs can reduce their carbon emissions to ensure that flood risk management actions are in line with Hounslow's [Greener Borough Framework](#) and the [Climate Emergency Plan](#).

The Digital Communications team is also important when communicating with local residents and businesses about local flood risk and to encourage the uptake of property-level mitigation measures.

6.2.2 Key Organisations

The EA, TWUL and TfL are important stakeholders to engage as they can provide data, advice and funding which are essential for delivering flood risk management activities. They should be engaged by workshops/meetings, as per the action plan. Close co-operation with TWUL is crucial to ensure that sewer network systems are maintained effectively to ensure the system can operate at capacity, particularly in areas at high risk of flooding. Hounslow LLFA will also work closely with TWUL through their Strategic Partnership so regular communication will help to ensure that these schemes are delivered efficiently and effectively. Beyond this partnership, it is important that this

relationship is maintained for future project and funding opportunities. Engagement with Highways England and TfL would be critical in ensuring that the maintenance of the drainage system is consistent to allow the integral drainage network to operate at capacity. They should also be consulted regarding opportunities to integrate surface water flood risk reduction measures within existing or future development or mitigation plans.

6.2.3 Cross-boundary Local Authorities

Hounslow maintains strong partnerships with neighbouring local authorities through river catchment partnerships and the Northwest London Flood Risk Management Strategic Partnership. These partnerships have enabled a more holistic and sustainable approach to flood risk management. Keeping them engaged is essential for driving future flood risk management both within Hounslow and at wider catchment level.

Table 6-2 List of relevant stakeholders

Stakeholder Categories	Examples of individual stakeholders
Local Communities / Community groups	<ul style="list-style-type: none"> • Residents • Local religious groups • Local Schools • Local Community and Volunteer Groups e.g. Friends groups or Dukes Meadow Trust • Student/Youth Councils • Disability Groups • Flood Action Groups • Environment Action Group e.g. Heston Action Group or Air Quality Brentford • Sports Clubs e.g. Bowls, Tennis, Parkrun etc. • Community gardens e.g. The Salopian Garden • Allotment societies
Public Services	<ul style="list-style-type: none"> • The London Fire Brigade • The Metropolitan Police • Local Hospitals or GP's
Charities and Funding Bodies	<ul style="list-style-type: none"> • Catchment Partnerships • Charities with aligning aims e.g. Thames21 • Wildlife groups e.g. London Wildlife Trust • Southwest London Environment Network • Environment Trust • Canal and River Trust
Council Departments/ Partnerships	<ul style="list-style-type: none"> • Highways team • Housing and Estate Regeneration team • Environment team • Parks and Open Space team • Traffic and Transport team • Planning and Development Management team • Hounslow Internal Flood Group
Government Approving Bodies (Also funding bodies)	<ul style="list-style-type: none"> • The Environment Agency • The GLA • Highways England • Hounslow Highways
External Partnerships	<ul style="list-style-type: none"> • Brent Catchment Partnership • Crane Valley Catchment Partnership • Thames Water Strategic Partnership (until April 2025)

Stakeholder Categories	Examples of individual stakeholders
	<ul style="list-style-type: none">• North-West London Flood Risk Management Strategic Partnership
Businesses	<ul style="list-style-type: none">• Businesses who will be affected by the projects. Also businesses with vested interests (potential funders)
Private organisations	<ul style="list-style-type: none">• Thames Water• Network Rail• TFL

7 ACTION PLAN FOR DELIVERING FLOOD RISK MANAGEMENT BETWEEN 2021-2027

7.1 Actions since the previous LFRMS

Since the previous LFRMS was published in 2015, Hounslow has carried out various flood risk management actions which have contributed to the improvement of flood risk throughout the borough. The key actions are summarised in *Figure 7-1*.

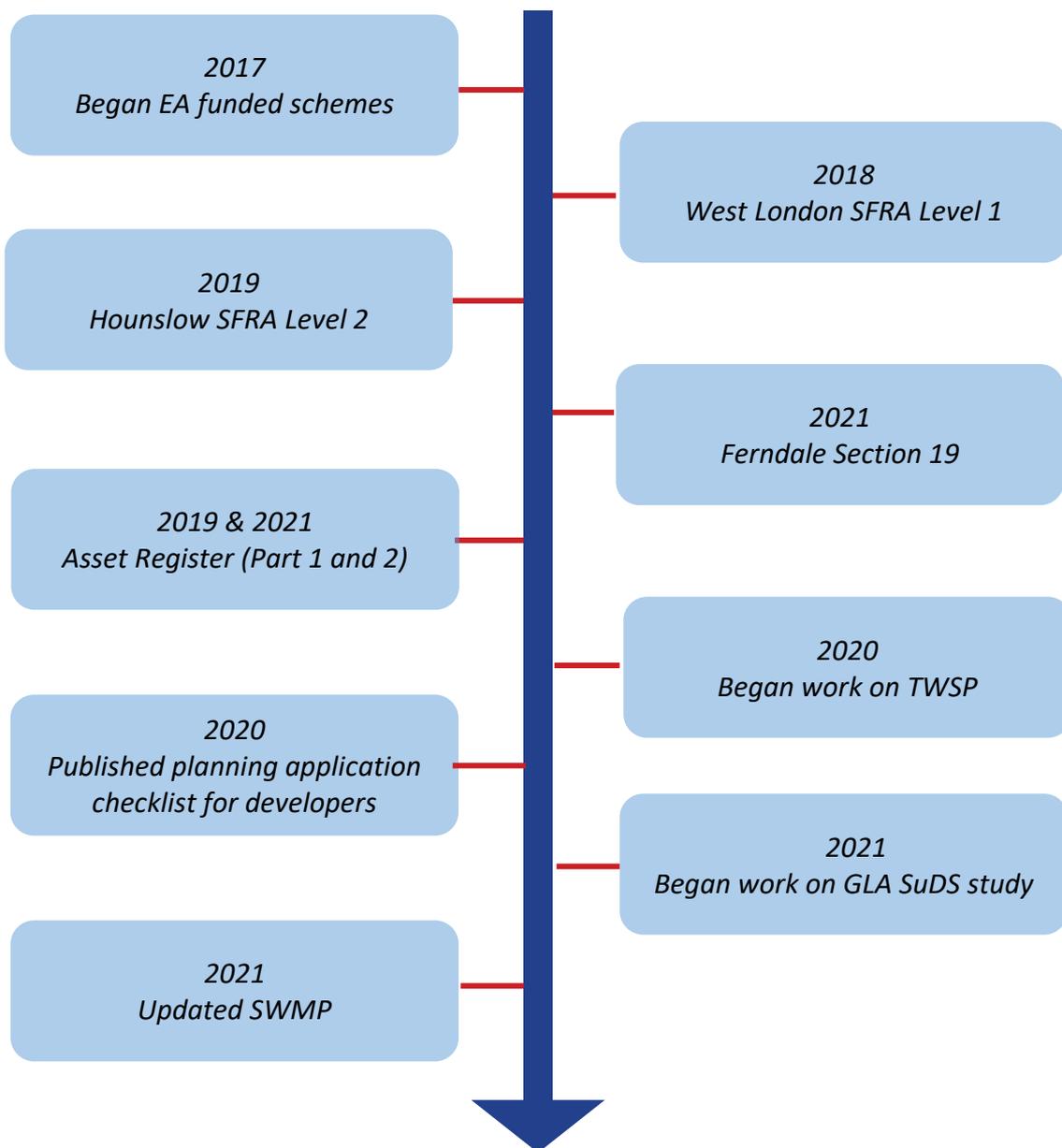


Figure 7-1 Timeline of key actions since previous LFRMS

7.2 Benefits and results

The activities outlined in *Section 7.1*, have set up the direction of this updated LFRMS which plans to build on from these actions to continue reducing flood risk within the borough. For activities which are still on-going, the ‘benefits’ included are the projected benefits of the projects/schemes.

Table 7-1 Summary of the benefits from previous actions

Activity	Summary	Status	Benefits
West London SFRA	Collaboration with 5 boroughs (Barnet, Brent, Ealing, Harrow, Hillingdon, and Hounslow).	Completed in 2018	<ul style="list-style-type: none"> Partnership working provides consistency and clarity within the shared river catchment Provides a holistic assessment of flooding Online mapping was easily accessible to users Improves data sharing (LPAs, RMAs, and the public) which reduces data requests (time and cost savings) Established Flood Zone 3a (surface water) which enabled surface water flooding to be easily considered when applying the sequential test.
Level 2 SFRA	Detailed assessment of all sources of flood risk for specific site allocations.	Completed in 2019	<ul style="list-style-type: none"> Guidance for developers Ensures appropriated mitigation measures Minimises flood risk Encourages flood resilience
Planning Application document checklist	Clear and concise guidance on what is required when submitting a full planning application.	Completed in 2020	<ul style="list-style-type: none"> Clearly informs developers Ensures necessary documents are submitted Reducing time (and costs) of the reviewing process Improves communications between LPA and developers Supports development while helping to ensure that flood risk and drainage is properly assessed in new developments
Asset register	Record of structures and features which are likely to have a significant effect on flood risk within Hounslow. This includes information on the state of repair, ownership, and maintenance	Completed in 2021	<ul style="list-style-type: none"> Ensures maintenance is effective and regularly carried out Meets statutory requirements for FWMA Information can be used for planning purposes Improves information sharing

Activity	Summary	Status	Benefits
	responsibilities for each asset.		
Highway SuDS schemes	The scheme at Wigley Road Estate involved the installation of tree pits and shrubs SuDS positioned within buildouts at various locations. At Southhall lane, an attenuation storage unit was installed at the waste depot.	Completed in 2016	<ul style="list-style-type: none"> • Increased attenuation of rainwater • Reduced the risk of sewer and surface water flooding • Achieved wider benefits such as improved amenities and biodiversity
GLA SuDS modelling study	Using hydraulic modelling to develop a high-level decision-making tool for identifying suitable locations for small scale SuDs interventions.	Ongoing	<ul style="list-style-type: none"> • Provides Retrofit SuDS Schedule with flood risk benefits, capital, and operational costs • Can be used to access multiple funding avenues such as FCERM GiA. TRFCC Local Levy and TWSP funding • Optimises delivery of SuDS scheme • Maximises flood risk management benefits from schemes
EA funded schemes	There are flood alleviation schemes ongoing in Northwest Hounslow, Feltham, Chiswick and Grove Park, Isleworth and Brentford End, Hounslow town centre and Brentford North.	Ongoing	<ul style="list-style-type: none"> • Manage the quantity or rate of runoff of surface water (and so improve flooding resilience) • Reduces the number of properties at risk of flooding • Reduces the risk of sewer and surface water flooding • Achieves wider benefits such as improved amenities and biodiversity
TWSP funded schemes	A total of 25 SuDS schemes are planned for Hounslow to increase the capacity of the sewer system.	Ongoing	<ul style="list-style-type: none"> • Manage the quantity or rate of runoff of surface water (and so improve flooding resilience) • Improve the quality of surface water run-off (and so reduce the risk of pollution) • Improve the amenity of public spaces as well as wider community benefits • Help improve biodiversity and experience of the local environment

7.3 The action plan

A detailed action plan was developed to outline how the LLFA and other RMAs plan to achieve the objectives of this LFRMS. These actions include the statutory duties of the LLFA, community engagement and education, partnership working, funding, flood management schemes and more. Where possible, the actions outlined aim to provide multiple benefits in line with the NFCERMS. While they are listed individually, the actions are not mutually exclusive and often benefit more than one objective. The estimated LLFA cost, timescale and progress for each action is also included as part of the action plan. The timescale for each action is categorised as following:

- Short term (0 - 2 years)
- Medium term (2 – 4 years)
- Long term (4 - 6 years)
- Ongoing (Continuing throughout the LFRMS cycles)

Actions with short term timescales are aimed to be delivered within the next 3 years. Medium term actions are those that will be delivered within the next 6 years, corresponding to the end of this LFRMS cycle. Longer-term timescales are set out to account for actions which are on-going and will be continued beyond 6 years and carried forward to updated versions of the LFRMS. The action plan also indicates the status of each action, as follows:

- Red: The action has not been started yet
- Green: The action is in progress
- Blue: The action is complete

The full action plan can be found in *Appendix 1* of this document.

7.4 Funding options

It is important that details on how proposed actions could be funded is provided to ensure that the objectives are achievable. This section outlines the funding mechanisms that are available to Hounslow. It is likely that funding will need to be sought from a variety of sources in order to deliver projects as central government funding is limited each year. Hounslow will continue to work with partnership groups, RMAs and other stakeholders to ensure that new and innovative funding opportunities are taken advantage of as they emerge.

7.4.1 National Funding

Flood and Coastal Erosion Risk Management Grant in Aid (FCERM GiA)

This funding option is provided by Defra and can be used for any type of flood and coastal erosion risk management (FCERM) project. According to the [Defra guidance](#), a FCERM project may be:

- A scheme to reduce flood or coastal erosion risk
- A study to investigate options for a scheme
- A study leading to a strategy or management plan
- Work to prepare a strategy

Local Levy (Thames Regional Flood and Coastal Committee)

Local Levy funding is available for Hounslow through the Thames Regional Flood and Coastal Committee for flood risk schemes, both traditional and natural, but only those not funded by the FCERM GiA. Funds are raised by a levy on local authorities and committee members are appointed from the LLFA and the EA to plan and invest in flood and coastal erosion risk management.

7.4.2 Local and additional funding

Department for levelling up Housing and Communities (DLUHC)

General LLFA related duties are funded by the DLUHC Revenue Grant Support Funding. This is made available to councils for LLFA duties under the FWMA and FRR within the budget of the DLUHC. The DLUHC recently replaced the Ministry for Housing, Communities and Local Government (MHCLG) Revenue Grant.

Community Infrastructure Levy

The Community Infrastructure Levy is a charge which can be levied by local authorities on new developments in their area. The funding raised can be spent on a range of infrastructure including transport, flood defences, schools, hospitals, recreation, and open spaces. This is an important tool for Hounslow for delivering its infrastructure needs to support development in the borough.

Thames Water funding

As a part of the TWSP, Hounslow will receive £3 million in funding between 2020-2025 to invest in improving surface water management by incorporating sustainable drainage systems across the borough.

8 CONCLUSION AND NEXT STEPS

8.1 Conclusion

This LFRMS outlines Hounslow's plan for managing flood risk within the borough for the next 6 years. The strategic objectives, which are outlined in *Section 1*, form the basis of the LFRMS and the specific actions which will be taken to achieve them are outlined in the action plan (*Appendix 1*). The roles and responsibilities of the LLFA and other RMAs in flood risk management within Hounslow have been clearly defined and should improve clarity to the public and support better co-operation. The LFRMS also provides guidance for local communities on how they can reduce the risk of flooding at a property level, signposting to relevant guidance from the EA and the National Flood Forum. A checklist on what to do before, during and after a flood has also been outlined to help people that are living in areas at risk of flooding to prepare for flooding events. Clear instructions on how to report a flood and who to contact in the case of an emergency has also been provided. This can help local communities to take action on improving their own flood resilience and contribute to more efficient response efforts and decreased recovery times.

The LFRMS works alongside the updated [SWMP \(2021\)](#) and other wider strategies such as Hounslow's [Greener Borough Framework](#) and [Climate Emergency Action Plan](#) for making Hounslow a greener and a more sustainable place. Developing sustainable, holistic, and resilient flood risk management is a key aim of the LFRMS and is reflected in the planned actions and in other borough plans and policies for delivering sustainable solutions.

8.2 Next steps

8.2.1 Planned Action Summary

This section is to be completed post- public consultation.

8.2.2 Recommended next steps

This section is to be completed post- public consultation.

8.3 Monitoring and reviewing

This LFRMS will be updated regularly, as policies, events or new guidance becomes available. The trigger for the review may be any of the following:

- Every six years;
- Where significant changes update knowledge relating to flooding or flood modelling; and
- Significant changes to legislation

The Action Plan will be reviewed in full every 2 years, with the status of each action being updated accordingly. A monitoring and reviewing plan has also been developed to help the Hounslow LLFA keep on track of the actions and to ensure that they are all effectively delivered within the outlined timescales. This plan will also ensure that the LFRMS objectives are achieved. The monitoring and reviewing plan will be an internal document which outlines the procedure and frequency for reviewing and monitor each individual actions. The Hounslow LLFA will be responsible for monitoring and reviewing the actions as outlined in this plan.

REFERENCES

[About Flooding – National Flood Forum](#)

[Civil Contingencies Act 2004 \(legislation.gov.uk\)](#)

[Environment Agency – National Flood and Coastal Erosion Risk Management Strategy for England \(publishing.service.gov.uk\)](#)

[Flood and coastal resilience innovation programme - GOV.UK \(www.gov.uk\)](#)

[Flooding - Your Rights and Duties \(environmentlaw.org.uk\)](#)

[Flood risk management: information for flood risk management authorities, asset owners and local authorities - GOV.UK \(www.gov.uk\)](#)

[Managing flood risk: roles and responsibilities | Local Government Association](#)

[Surface Water Management Plan \(hounslow.gov.uk\)](#)

[West London Strategic Flood Risk Assessment - West London SFRA](#)

USEFUL LINKS

Flooding in Hounslow	Webpage on Hounslow website. Provides information on: <ul style="list-style-type: none">• What is flooding?• Flood Risk Management in Hounslow• Am I at risk?• Flood response• Flood Risk guidance documents
What to do before, during and after a flood	Government advice on what to do before, during and after a flood.
Property Owners Flood Guide	Information on: <ul style="list-style-type: none">• Property insurance• Dealing with flood risk to properties• Installing flood defences to properties• Advice on what to do if your property is flooded
Blue Pages – UK Flood Directory	Directory for property flood products and services, also including advice on how to help reduce the risk of flooding to your home or business.
Emergency Flood Plan Template	A useful template for households to use in preparing for a flood, including a checklist and emergency contacts.

APPENDICES

Appendix 1 – Full Action Plan

Appendix 2 – SEA Screening Report

Appendix 3 – HRA Screening Report