# City of London Corporation

# Local Flood Risk Management Strategy

# 2021-2027

## February 2021

CLIMATE ACTION STRATEGY

# Contents

**Forward**

We are now entering the second cycle of action under the Flood Risk Regulations 2009 and Flood and Water Management Act 2010. This requires a review of the City of London Local Flood Risk Management Strategy (LFRMS). We have made substantial progress in implementing the LFRMS 2014-2020 but there is still more to do, not least to address the impacts of climate change on flood risk in the City and to improve awareness of the actions that businesses, residents and visitors to the City can take to minimise the risks and consequences of flooding.

Flooding does not respect local authority boundaries so the flood risks in the City are influenced by policies and actions implemented in other Lead Local Flood Authority (LLFA) areas. The City Corporation is committed to working in partnership with LLFAs Thames Water and other risk management authorities to collectively address the flood risks we face.

# 1 Introduction

1.1 The City is at relatively low risk of flooding with specific areas at some risk from tidal and river flooding and surface water/sewer flooding (Fig 1). However, the consequences of flooding in these restricted parts of the City could be very high in terms of disruption to business, inconvenience to occupiers and reputational damage.

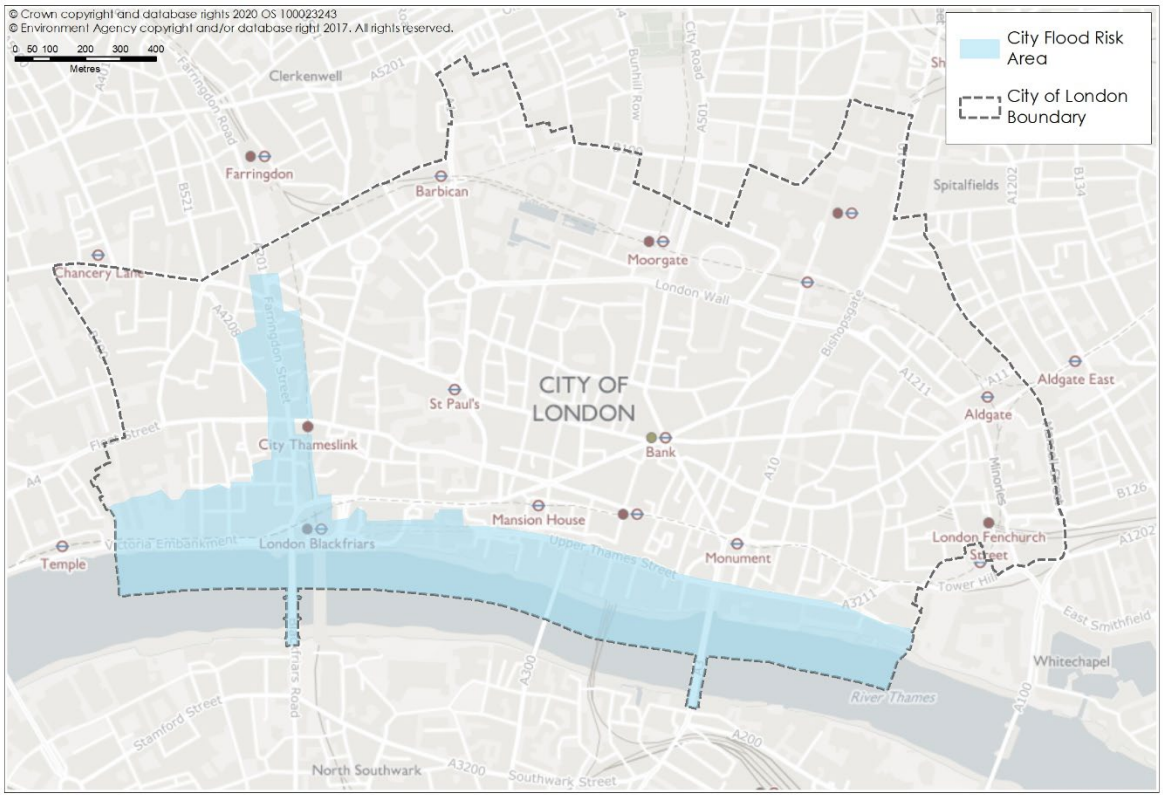


**Figure 1: Flood Risk in the City of London from Local Plan Policies map**

1.2 Our changing climate means that past experience of flooding is not a predictor of future flood risk. Sea level rise will increase the risk of tidal river flooding and more intense rainfall will make surface water flooding and sewer surcharge more likely.

1.3 Tackling flood risk requires local and regional action. The Environment Agency's Thames Estuary 2100 Plan requires flood defence raising in the City alongside replacement of the Thames barrier to provide continued protection. The implementation of Sustainable Drainage Systems (SuDS)across a wide catchment extending to Hammersmith in the west and Hampstead to the north is needed to reduce flood risk in the City

1.4 Resistance and resilience measures will help with speedy recovery in the event of flooding, preventing water entering properties and enabling rapid recovery, whilst emergency planning provides reassurance that the City can respond effectively.

1.5 This strategy identifies the approach the City Corporation is taking to the flood risks that affect the City, the actions that are underway or planned to reduce these risks and the processes by which this strategy will be kept up to date.

1.6 The Flood and Water Management Act 2010[1] assigns various responsibilities to Lead Local Flood Authorities including the requirement to develop, maintain apply and monitor a strategy for local flood risk management in its area. The City Corporation, as unitary authority for the Square Mile is the Lead Local Flood Authority for the City.

1.7 Although Local Flood Risk only covers flood risk from surface water runoff, groundwater and ordinary watercourses this LFRMS must also include any objectives included in the authority's flood risk management plan prepared in accordance with the Flood Risk Regulations 2009. Actions related to river and tidal flood risk have therefore been included in this strategy

1.8 This strategy covers flood risk affecting the City's geographic area; it does not include flood risks on City owned or managed land beyond the City's boundaries.

[1] See Appendix 1 Legislative context

# 2 Flood Risk Management Strategy requirements

2.1 The Flood and Water Management Act 2010 specifies the Lead Local Flood Authority's duties regarding Local Flood Risk Management Strategies and outlines the elements that must be included in a Local Flood Risk Management Strategy. Table 1 shows these requirements and where each one is covered in the City of London Local Flood Risk Management Strategy 2020.

Table 1: Flood and Water Management Act 2010 section 9 (4) Strategy Requirements

| The Flood and Water Management Act 2010 section 9 (4) requires that the strategy must specify: | Where it is covered in this strategy |
|---|---|
| (a) the risk management authorities in the authority's area, | Appendix 2 |
| (b) the flood and coastal erosion risk management functions that may be exercised by those authorities in relation to the area, | Appendix 2 |
| (c) the objectives for managing local flood risk (including any objectives included in the authority's flood risk management plan prepared in accordance with the Flood Risk Regulations 2009), | Section 5 |
| (d) the measures proposed to achieve those objectives, | Section 6 |
| (e) how and when the measures are expected to be implemented, | Section 6 |
| (f) the costs and benefits of those measures, and how they are to be paid for, | Section 7 |
| (g) the assessment of local flood risk for the purpose of the strategy, | Section 4 |
| (h) how and when the strategy is to be reviewed, and | Section 8 |
| (i) how the strategy contributes to the achievement of wider environmental objectives. | Section 9 |

# 3 Assessment of local flood risks

*Signpost to the Flood and Water Management Act 2010 Section 9 (4) requirements*

*This section deals with:*

*(4)(g) the assessment of local flood risk for the purpose of the strategy*

3.1 **Flood risk modelling**. Historically the City has not experienced significant flooding, but weather patterns are changing due to climate change. To predict future risk of flooding The City's Strategic Flood Risk Assessment 2017 has used modelling to predict future flood risk. This incorporates risks from climate change and urbanisation, to identify those parts of the City that are at highest risk and the likely impact in terms of flood depths and velocities. Neighbouring boroughs' SFRAs and Local Flood Risk Management Strategies provide further evidence of the risks elsewhere in London which may affect the City. The Environment Agency publish various flood maps for coastal and river flooding, flood maps for surface water and reservoir flood maps which give a wider perspective. However, the SFRA modelling carried out for the City reflects the most accurate picture for the Square Mile and has been incorporated into the Environment Agency's Maps.

3.2 **River and tidal flood risk**. The City of London 2017 Strategic Flood Risk Assessment (SFRA) shows that limited areas of the City are at risk from river flooding in the absence of any flood defences. The Environment Agency Breach modelling 2017 shows that the risk is confined to the riverside south of Upper and Lower Thames Street (A3211) and the Temples area (Fig 2). The Thames Barrier and local flood defences protect the City, but changes will be needed to address risks from sea level rise. The Thames Estuary 2100 Plan identifies the need to raise flood defences in central London by 0.5m by 2065 and by 1 m by 2100, to provide protection up to a 1:10,000-year standard. These dates may need to be brought forward if sea level rise accelerates.

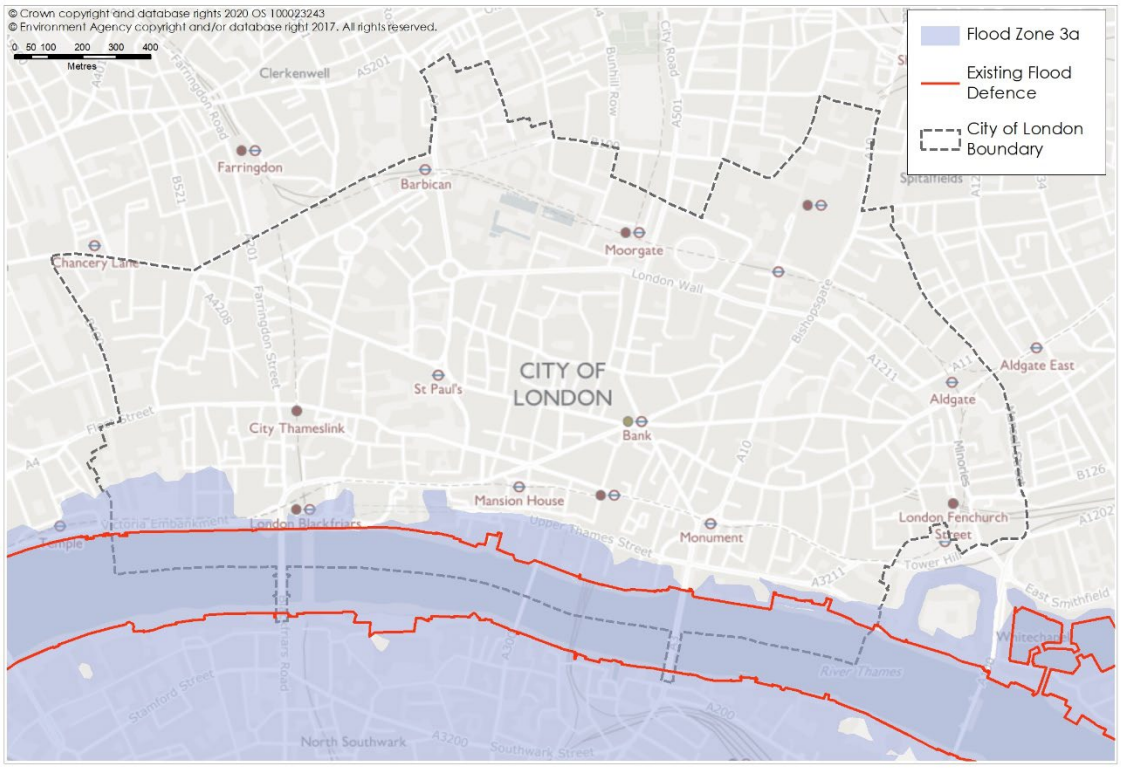


**Figure 2 Areas at risk of river flooding**

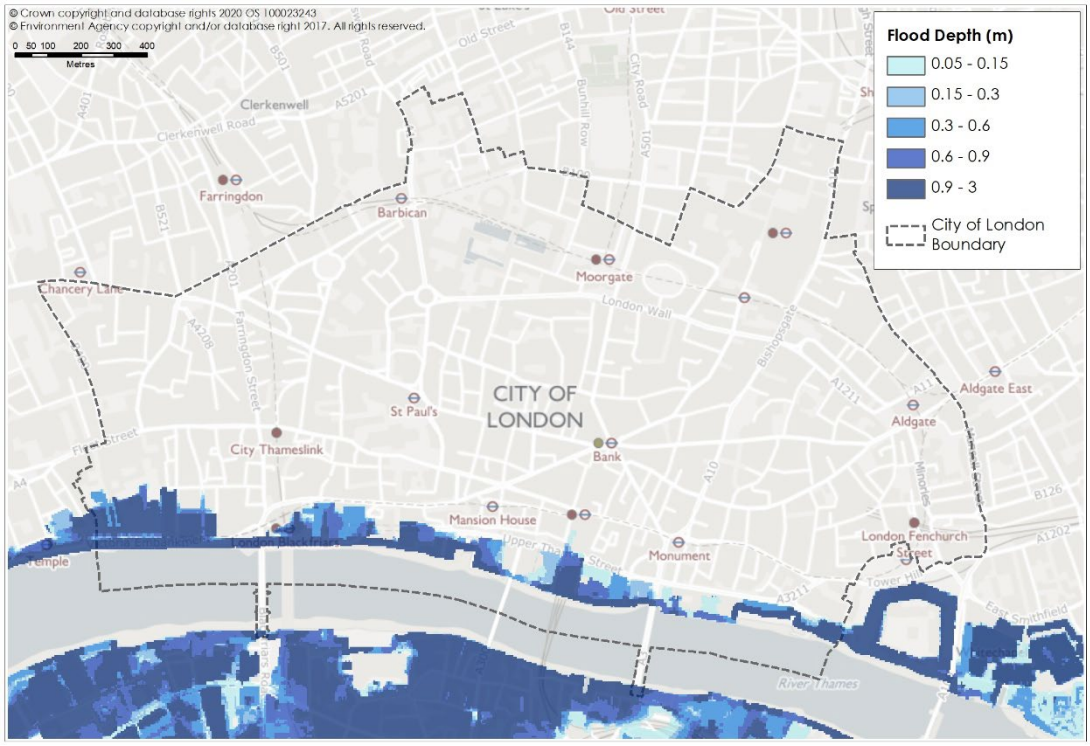


**Figure 3: Thames Tidal Breach modelling flood extent**

3.3 **Surface water and sewer flood risk**. The risk of flooding from surface water and sewer overflow is also confined to restricted areas of the City including the former Fleet Valley at Farringdon Street and the Thames Riverside (fig 4). This flooding is caused by overloading of the combined drainage and sewer network resulting in overflows from manholes in these areas. The use of Sustainable Drainage Systems in buildings and landscaping helps to reduce the rate at which surface water enters the sewer network thus reducing the risk of sewer surcharges. Local action is not sufficient to prevent this flooding, SuDS measures need to be implemented over a wide catchment area (fig 5 and 6).

**Example of local actions to reduce surface water flood risk**

The City's Open Spaces Department supports this corporate strategy by making sure paving in the City's gardens drains to natural ground, for example by using soak-aways, rather than to the piped City drainage system. Trees and other planting, the use of green roofs and green walls are also assisting in flood risk reduction, where appropriate.

Given the density of the buildings and development in the City, building rainwater harvesting is encouraged through the planning process. An example is the harvesting of rainwater as part of the redevelopment of 10 Trinity Square to irrigate Seething Lane Garden

Monitoring of the impact of SuDS secured through the Planning System is underway and will be reported to the City's Officer level Flood Risk Steering Group

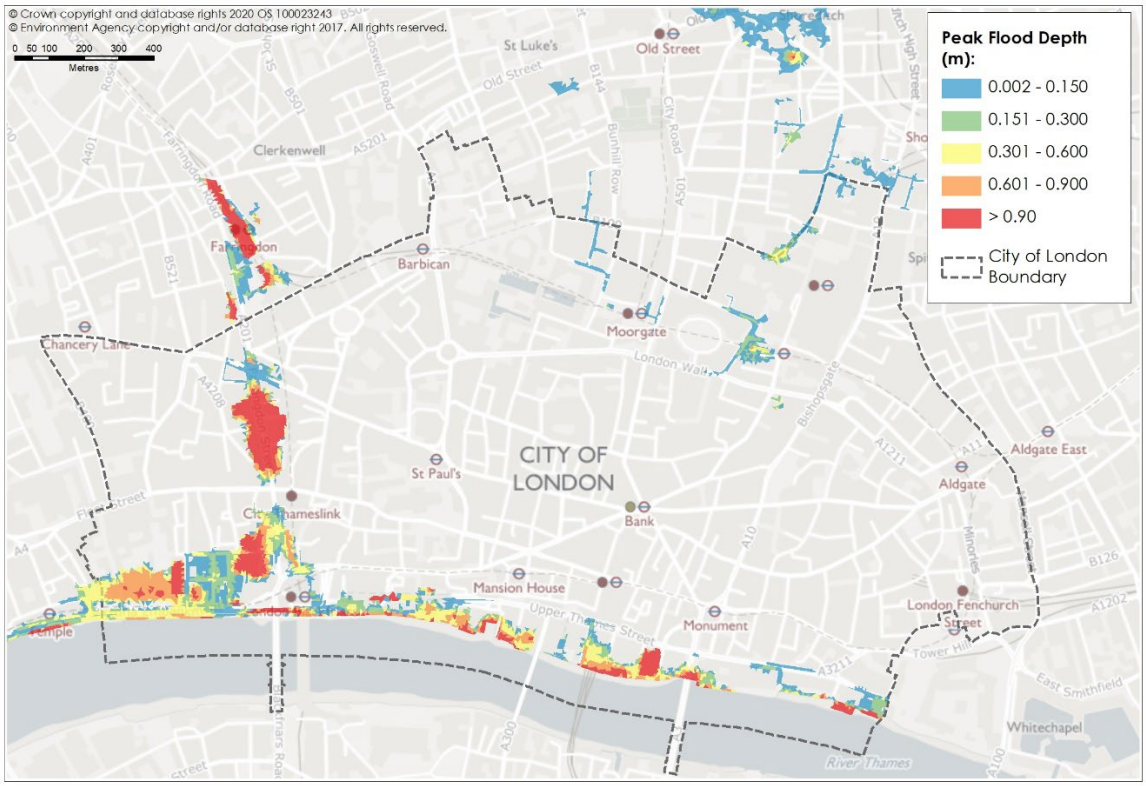


**Figure 4: Map showing Surface Water Peak Flood Depth 1 In 100 (Annual Probability) +40% Climate Change**

**Example of a wider action which reduces flood risk in the City.**

The surface water catchment areas for the City's flood risk areas extend to the edge of Hampstead Heath (Figs 5 & 6). The City Corporation has carried out works to ensure that the pond dams on Hampstead Heath do not fail or cause flooding in the local area following a major rainfall event. This provides consequential benefits in reducing the risk of sewer overflows elsewhere in this catchment area, including the flood risk areas in the City.

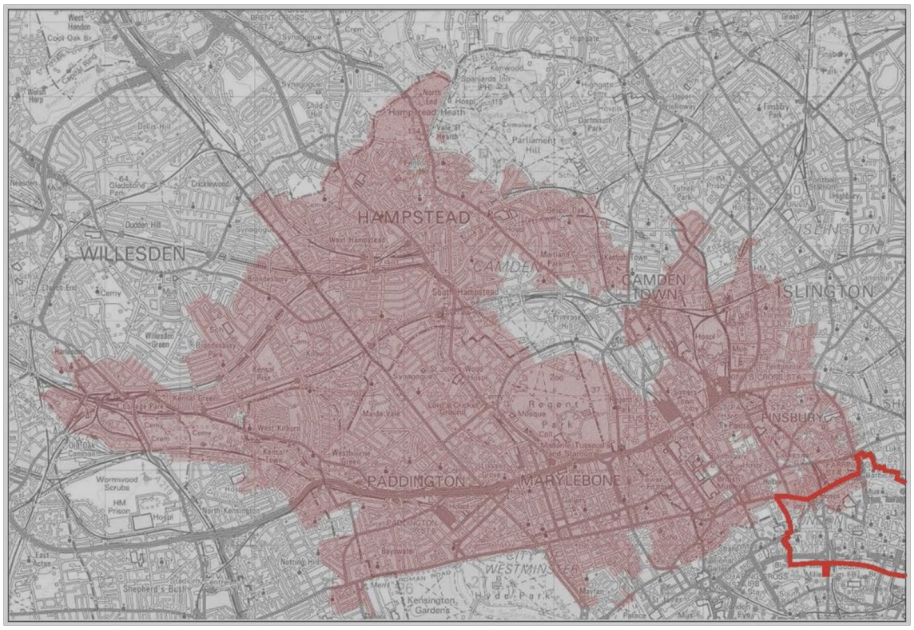


**Figure 5: Catchment area for flood risk in Farringdon Street**

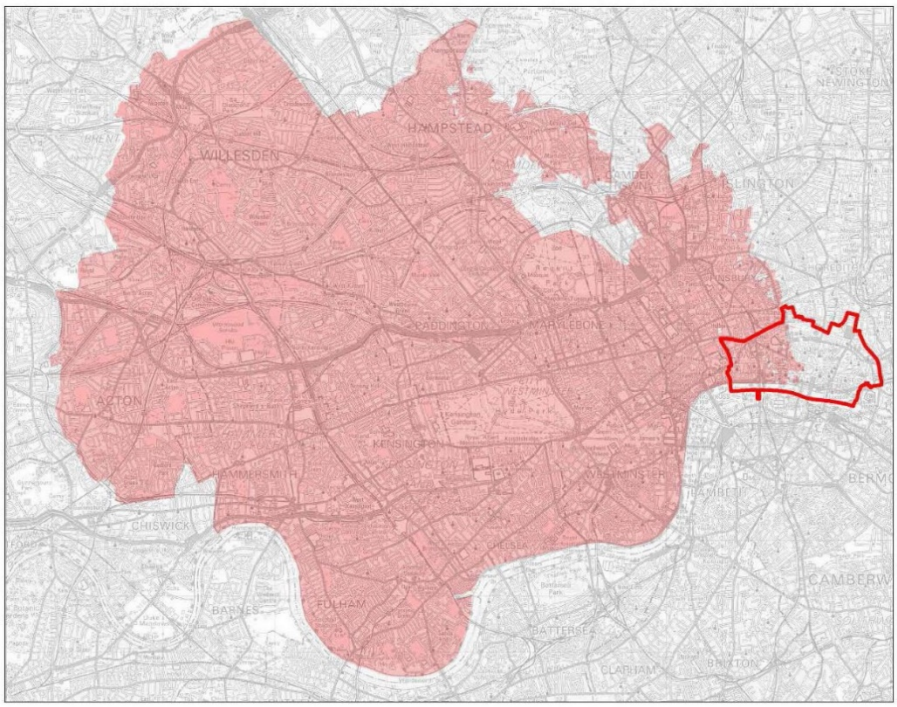


**Figure 6: Catchment area for flood risk in the Paul's Walk area**

3.4 **Ground water flood risk**. The City is protected from ground water flooding by the GARDIT programme which maintains groundwater levels in the deep chalk aquifer at between -30 and -50 m AOD. The City may also be vulnerable to groundwater flooding from the shallow aquifer which comprises sand and gravel with high porosity and permeability (fig 7). Complex interactions between rainfall infiltration, basement barriers and the predominance of impermeable surfaces in the City, makes this type of flood risk difficult to predict, however flooding from this source is not thought to be likely in the short to medium term. Longer term impacts of climate change on ground water flood risk are less certain.

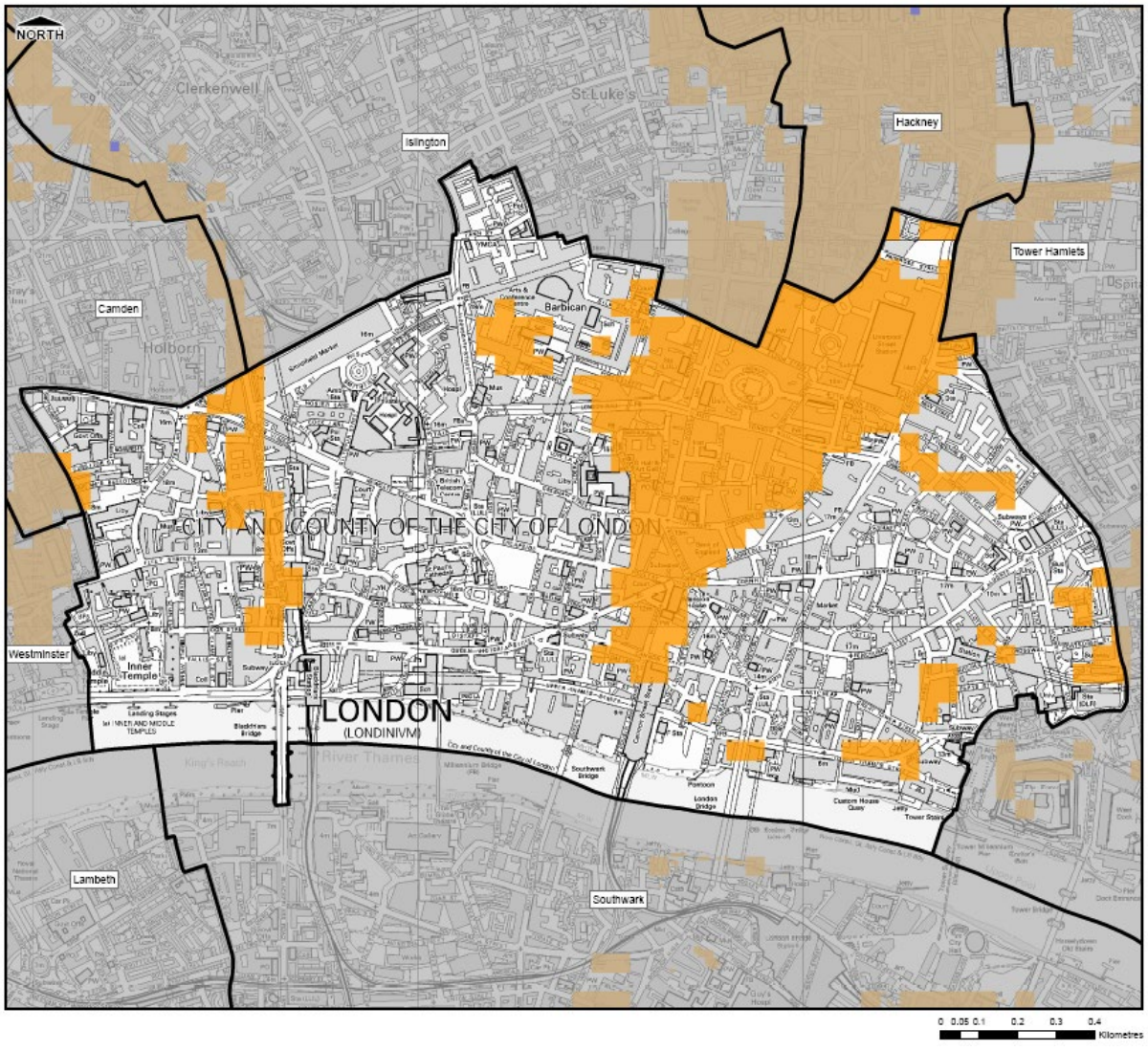


**Figure 7: Areas with increased potential for elevated groundwater**

3.5 **Climate change and flood risk**. Our climate is changing and is likely to continue to change for many decades to come. With climate change, the frequency, velocity, depth, patterns and severity of flooding are forecast to increase causing flash flooding. Heavier average winter precipitation will put us at greater risk of flooding. The City of London Climate Action Strategy (2020) includes climate resilience measures based on probabilistic data from the UK Climate Projections 2018 (UKCP18). No climate model can give a single definite answer to what the future will look like, however, CP18 predicts that winter rainfall could increase by around 20% by 2080 with greater intensity of rainfall increasing the risk of localised flash flooding and sewer surcharge (Table 2).

Table 2 Change in average precipitation rate (%) compared to 1981-2000 average

| | Summer rainfall % change | Winter rainfall % change |
|---|---|---|
| 1990-2025 | -5.9 | +10.3 |
| 2025-2050 | -26.5 | +8.9 |
| 2050-2080 | -33.9 | +19.7 |

3.6 **Sea level rise**. Sea level is predicted to rise with consequential increases in flood risk from the tidal Thames. Although the Thames Barrier and any future replacement barrier will provide protection, local flood defences will also be needed to be enhanced to cope with peak tides and surges as outlined in the Environment Agency's TE2100 plan.

# 4 Objectives for managing flood risk in the City

*Signpost to the Flood and Water Management Act 2010 Section 9 (4) requirements*

*This section deals with*

*(c) the objectives for managing local flood risk (including any objectives included in the authority's flood risk management plan prepared in accordance with the Flood Risk Regulations 2009),*

The following objectives for managing local flood risk aim to reduce the risk and impact of flooding on the City. These objectives have been developed in conjunction with the Environment Agency who are co-ordinating the Thames River Basin District Flood Risk Management Plan (2nd cycle).

1. **Climate resilient places – reducing the likelihood of flooding**

*By 2027 risk management authorities[2] will have worked together to develop and implement adaptive approaches to future flooding to enhance the resilience of the flood risk area.*

2. **Minimising the consequences of flooding for human health**

*By 2027 risk management authorities will have developed and delivered a programme of flood risk management capital schemes and maintenance to reduce risk of flooding and coastal change and its adverse consequences for human health and wellbeing.*

3. **Minimising the consequences of flooding for the environment including cultural heritage**

*By 2027 actions by risk management authorities to address current and future risk of flooding and coastal change will have helped achieve the environmental objectives set out in the river basin district's river basin management plan.*

4. **Minimising the consequences of flooding for economic activity (infrastructure)**

*By 2027 risk management authorities will have provided evidence and advice to infrastructure providers and supported them to take account of future flooding and coastal change in their infrastructure investment.*

5. **Minimising the consequences of flooding for economic activity (businesses)**

*By 2027 risk management authorities will have worked with communities and businesses to understand and implement a plan for how flood and coastal erosion risk management activities can contribute towards sustainable growth and prosperity in a climate resilient way (and vice versa).*

[2] See Appendix 2 – Risk Management Authorities include Lead Local Flood Authorities (LLFA), the Environment Agency, water companies, highways authorities, internal Drainage Boards (not relevant to the City), District and borough councils.

## 6. A nation of climate champions – reducing the likelihood of flooding

*By 2027, risk management authorities will have worked with communities across the risk area to: raise awareness of the level of flood risk that they face; help them understand the role of emergency responders and ensure they know what to do in an emergency to help themselves*.

# 5 Measures to achieve the objectives

*Signpost to the Flood and Water Management Act 2010 Section 9 (4) requirements*

*This section deals with*

*(d) the measures proposed to achieve the objectives,*

*(e) how and when the measures are expected to be implemented,*

A series of measures aimed at fulfilling each objective has been drawn up. These measures form the local interpretation/ implementation of what the City Corporation will lead on to fulfil each objective. These measures cover surface water, sewer surcharge, river and coastal flood risks for the Square Mile.

**5.1 Objective 1: Climate Resilient places – reducing the likelihood of flooding.**
By 2027 risk management authorities will have worked together to develop and implement adaptive approaches to future flooding to enhance the resilience of the flood risk area.

5.1.1 As the climate changes, parts of the City will become more vulnerable to flooding. The area between the riverside walk and Thames Street will be at risk from sea level rise and without action could flood to a depth of up to 3 meters.[3] Working with developers, landowners the Environment Agency and others to implement the Thames Estuary 2100 Plan, the City Corporation will facilitate plans to raise flood defences on the City's riverside to protect the City against higher tides.

5.1.2 Farringdon Street and New Bridge Street (the former valley of the River Fleet) will become more susceptible to sewer overflow flooding, as will the Thames Riverside. This is because London's extensive sewage network, which runs under these streets and walkways, is a combined system which collects rainwater in the same pipes as foul drainage. Heavy rainfall over a wide catchment area collects in these sewers which can surcharge when overloaded. We will need to reduce the speed and quantity of rainwater entering drains, through the implementation of Sustainable Drainage Systems (SuDS) wherever possible, reductions in peak flows and increases in storage capacity to reduce the risk of sewers surcharging. We also need to encourage the use of building level measures to protect individual developments within the vicinity.

5.1.3 Groundwater flooding is not expected to increase in the short to medium term. However, climate change is likely to increase the existing groundwater flood risk due to higher rainfall and increased leakage from drains and sewers

[3] https://www.cityoflondon.gov.uk/assets/Services-Environment/climate-action-climate-reslience-flood-risk-sfra-thames-tidal-breach-modelling-flood-extent-2017.pdf

infiltrating into the ground. Increased water levels in the Thames will also increase groundwater levels. We will review groundwater levels and continue to model other flood risks, through our Strategic Flood Risk Assessment review every 5 years, so that we can bring forward flood resilience plans if climate impacts accelerate.

5.1.4 Action now will help to reduce the likelihood of flooding and improve the City's resilience to changed weather patterns whilst protecting and enhancing opportunities for biodiversity and the City's historic assets. All measures implemented to improve flood resilience must be designed to comply with disability requirements.

5.1.5 What we will do:

**Measure 1: Incorporating SuDS in the public realm and minor development**. By Q4 of 2022 the City of London Corporation will have procedures in place to maximise the use of sustainable drainage systems, using the SuDs hierarchy, in new public realm works and appropriate minor developments to reduce the risk of flooding.

**Measure 2: Strategising flood defence raising.** By Q2 of 2021 the City of London Corporation will have prepared a Riverside Strategy which will drive forward the requirements of the Thames Estuary 2100 Plan to reduce the risk of flooding, while unlocking sustainable growth opportunities along the Thames in the Square Mile, including protecting heritage assets.

**Measure 3: Reviewing the Strategic Flood Risk Assessment.** By Q4 of 2022 the City of London Corporation will have reviewed its Strategic Flood Risk Assessment to provide sound information on the flood risk in the City. This will include identifying infrastructure at risk of flooding from all sources including burst watermains, guidance on safe access and egress plans for all from development in at-risk areas and analysis of flooding events.

5.1.6 **Links to the Climate Action Strategy** These actions will help to implement **seven** climate resilience measures from the City of London's Climate Action Strategy[4]:

- Resilience Action 2.1 Continue to fund flood modelling, which includes SuDS and other mitigation strategies, to complement EA flood models
- Resilience action 2.4 Sacrificial land and/ or natural flood risk management areas
- Resilience action 2.5 Sustainable rain and surface water management policies and implementation
- Resilience action 2.7 Increase the quality and provision of green space and coverage in the Square Mile and wider City Corporation spaces
- Resilience Action 3.1 Building retrofit programme

[4] City of London Climate Resilience Adaptive pathways report 2020 prepared by Buro Happold for the City Corporation. Available on request from floodrisk@cityoflondon.gov.uk

- Resilience Action 3.3 Flood defence assets maintenance and management regimes
- Resilience Action 4.2 Expand use and availability of non-sensitive data

5.2 **Objective 2: Minimising the consequences of flooding for human health**. By 2027 risk management authorities will have developed and delivered a programme of flood risk management capital schemes and maintenance to reduce risk of flooding and coastal change and its adverse consequences for human health and wellbeing

5.2.1 It is impossible to completely eliminate the risk of flooding in the City. The measures proposed under this objective aim to minimise the consequences of flooding enabling efficient recovery if flooding does occur. This can be done through property level resistance and resilience measures.

5.2.2 Resistance measures prevent the ingress of flood water and include flood defence walls, flood gates and local emergency measures such as the use of sandbags to divert flood waters. Effective maintenance of such structures, that is sensitive to their historic and biodiversity value, is imperative to ensure that they function when needed.

5.2.3 Resilience measures enable efficient recovery from flooding and include moving flood sensitive equipment onto higher floors, using flood resilient materials such a tiles or solid surfaces, avoiding the use of areas at risk of flooding for storage and providing sumps and soak-aways.

5.2.4 These measures can be implemented as part of new development or routine maintenance in vulnerable areas but must begin now to embed these actions across all properties that are at risk of flooding.

**5.2.5 What we will do:**

**Measure 4: Promoting flood resilience measures.** By 2025, the City of London Corporation will have reviewed opportunities to improve the flood resilience in residential properties in the Square Mile and taken action to implement these measures. Funding will be sought from sources including the Flood Defence Grant in Aid, Local RFCC Levy and private funding sources where appropriate.

**Measure 5: Enabling effective maintenance of flood risk assets.** By 2026, the City of London Corporation will have continued to maintain a register of flood defence assets, including information of their condition where appropriate. Using this data, the City of London Corporation in partnership with asset owners, Team 2100 and other stakeholders will review mechanisms for ensuring that assets remain in good condition, minimising the consequences of flooding.

5.2.6 **Links to Climate Action Strategy** These actions will help to implement **five** climate resilience measures from the City of London Climate Resilience Adaptive Pathways Report:

- Resilience Action 2.8 Introduce climate resistant and adaptive landscaping
- Resilience Action 3.1 Building retrofit programme

- Resilience Action 3.3 Flood defence assets maintenance and management regimes
- Resilience Action 3.4 Protect key assets, critical infrastructure and sensitive equipment in flood zones
- Resilience Action 4.7 Strengthen resilience requirements for planning

5.3 **Objective 3: Minimising the consequences of flooding for the environment including cultural heritage**. By 2027 actions by risk management authorities to address current and future risk of flooding and coastal change will have helped achieve the environmental objectives set out in the river basin district's river basin management plan

5.3.1 The City of London is the historic centre of London and has a rich and varied historic environment that reflects this, including over 600 listed buildings alongside other historic statues, monuments, sculptures and archaeological remains.

5.3.2 Although these assets have survived numerous stresses over the centuries the threat caused by climate change presents new challenges. Flooding could damage sensitive structures or create environments that are unsuitable for their current uses. Historic assets on the City's riverside to the south of Thames Street and Tudor Street and along Farringdon Street are particularly at risk as are the historic Inner and Middle Temple Gardens.

5.3.3 By acting now in conjunction with Historic England we can develop guidance to enable building owners to minimise the consequences of flooding for their historic assets.

**5.3.4 What we will do:**

**Measure 6: Managing flood risk for historic assets**: By 2023, the City of London Corporation will have identified all historic assets in the Square Mile at risk of flooding and will work to encourage building owners to develop and adopt resilient design measures, minimising the consequences of flooding for the City's cultural heritage, through guidance for retrofitting flood resistance and resilience measures specifically for historic assets.

5.3.5 These actions will help to implement **one** climate resilience measure from the City of London Climate Resilience Adaptive Pathways Report:

- Resilience Action 3.1 Building retrofit programme

5.4 **Objective 4: Minimising the consequences of flooding for economic activity (infrastructure).** By 2027 risk management authorities will have provided evidence and advice to infrastructure providers and supported them to take account of future flooding and coastal change in their infrastructure investment.

5.4.1 The City relies on a range of utility services and transport infrastructure to function. Flooding of these assets and infrastructure could adversely affect the City's businesses, residents and visitors through temporary interruptions in

services. Prolonged service breakdown could also affect the City's reputation as a resilient place to do business.

5.4.2 The responsibility for protection of infrastructure rests with the utility owner e.g. UK Power Networks, Thames Water, Transport for London and National Rail but businesses in the City can also draw up contingency plans if they know the risks that they may face from flooding of such infrastructure.

5.4.3 Working with utility and transport providers the City Corporation can help to identify vulnerabilities and disseminate information to enable suitable prevention measures to be put in place.

5.4.4 What we will do:

**Measure 7: Engaging with Thames Water on mains bursts and sewerage infrastructure.** By Q4 of 2022 the City of London Corporation, working in partnership with Thames Water, will have identified sensitive properties at risk of water main burst and sewer surcharging and will have developed guidance with Thames Water and property occupiers on measures to mitigate these risks thus minimising the consequences of this type of flooding.

**Measure 8: Liaising with infrastructure providers (electricity, gas, pipe-subways, transport etc)** By Q4 of 2024 the City of London Corporation, working in partnership with utility providers and other infrastructure owners will have shared information on assets at risk of flooding and encouraged owners to take steps to mitigate this risk where appropriate thus reducing the consequences of flooding for economic activity.

5.4.5 These actions will help to implement **five** climate resilience measure from the City of London Climate Resilience Adaptive Pathways Report

- Resilience Action 3.2 Diversify energy sources and partner with regional organisations and utility providers to increase back up power for critical services
- Resilience Action 3.4 Protect key assets, critical infrastructure and sensitive equipment in flood zones
- Resilience Action 4.2 Expand use and availability of non- sensitive information
- Resilience Action 5.3 Strengthen community and business networks to build adaptive capacity
- Resilience Action 5.5 Public communications and awareness raising campaigns

5.5 **Objective 5: Minimising the consequences of flooding for economic activity (businesses**) By 2027 risk management authorities will have worked with communities and businesses to understand and implement a plan for how flood and coastal erosion risk management activities can contribute towards sustainable growth and prosperity in a climate resilient way (and vice versa).

5.5.1 As planning authority for the Square Mile, the City Corporation has a responsibility to ensure that new development does not put future occupants at risk from flooding. The City Plan 2036 includes policies which strengthen the previous approach, thus minimising the risks to new development from all

sources of flooding, incorporating resilience and addressing flood emergency planning.

5.5.2 For existing commercial buildings, the safety of occupants is the responsibility of the building owner or by agreement the leaseholder. The City Corporation has a role in ensuring that flood risk information and guidance is available to enable businesses to develop suitable flood resilience programmes.

**5.5.3 What we will do:**

**Measure 9: Implementing City Plan 2036 flood risk policies**. By Q4 2021 the City of London Corporation will have adopted new flood risk and urban greening policies through the City Plan 2036 and produced procedures to ensure that the policies relating to flood risk and climate resilience from the City Plan 2036 are being universally implemented and are being effectively monitored thus contributing to sustainable growth.

**Measure 10: Managing flood resilience for commercial buildings**. By 2023, the City of London Corporation will have collated guidance specific to retrofitting flood resistance and resilience measures to commercial buildings (including those in Farringdon Street, Pauls Walk and Victoria Embankment), minimising the consequences of flooding for economic activity.

5.5.4 **Links to Climate Action Strategy** These actions will help to implement **three** climate resilience measure from the City of London's Climate Resilience Adaptive Pathways Report:

- Resilience Action 3.3 Building retrofit programme
- Resilience Action 4.7 Strengthen resilience requirements for planning
- Resilience Action 2.1 Continue to fund flood modelling, which includes SuDS and other mitigation strategies, to complement EA flood models

5.6 **Objective 6: A nation of climate champions – Reducing the likelihood of flooding**. By 2027, risk management authorities will have worked with communities across the risk area to: raise awareness of the level of flood risk that they face; help them understand the role of emergency responders and ensure they know what to do in an emergency to help themselves.

5.6.1 The City Corporation has Emergency Response plans in place. These plans include the Multi Agency Flood Plan, the Emergency Management Manual and Rest Centre Plans for those evacuated from their homes. In exercising these plans any equality implications will be highlighted.

- The **Multi Agency Flood Plan** (MAFP) An agreed framework between category 1 and 2 responders which sets out a co-ordinated response and recovery phase to severe flooding in the City of London.

- The **Emergency Management Manual** is a plan used by the City Corporation to respond to major incidents within the City.

- The City Corporation also has a **Rest Centre Plan** which details how the Local Authority could care for those evacuated from their homes due

to an incident. The City Corporation has plans for Rest Centres in more than one location within the City.

5.6.2 Local Authorities can be contacted 24/7 to initiate a response capability. The contact numbers for the City Corporation (daytime hours) are 020 7332 3417/1969/3584 and 3914. Out of hours the City Corporation can be reached on 020 7606 3030.

5.6.3 During the latter stages of a major flooding incident (the recovery period and return to normality) the City Corporation may be able to provide services and staff to assist with a range of issues ( see Multi Agency Flood Plan for details)

5.6.4 Where more than one property is affected by a single source of flooding, the City Corporation will investigate the causes and impact of flooding and prepare a report outlining any actions to reduce the risk of reoccurrence.

5.6.5 Unlike other local authority areas, the predominant community in the City is the business community with almost 18,000 businesses and over 500,000 workers based in the City. Alongside this there is a resident community of around 7500 people and up to 21.5 million visitors to the City annually. We must engage in different ways with each of these communities to make sure that they remain safe from flooding. Different working patterns due to the COVID19 pandemic may affect these figures in the future. Nonetheless flood resilience will remain important.

5.6.6 Property insurance claims for flood damage across the UK have increased significantly over recent years and are set to increase further due to the impacts of climate change. The Flood RE reinsurance scheme provides affordable flood insurance for residents but not for commercial premises. Providing appropriate information on flood risk will not only reduce the consequences for human health but may also reduce insurance costs for these businesses.

5.6.7 People who are not familiar with the City such as visitors or students need more immediate information if a flooding incident is imminent but may also be interested in the history, experience and future climate impacts on flooding for the City.

5.6.8 Climate impacts are likely to affect disadvantaged communities disproportionately and may affect some people with protected characteristics such as people with a disability. Awareness raising and support will be particularly important for these communities.

**5.6.9 What we will do:**

**Measure 11: Exercising a reviewed Multi Agency Flood Plan.** By Q2 of 2021 the City of London Corporation will have reviewed and updated the Multi Agency Flood Plan. The plan will be tested in regular exercises thus reducing the consequences of flooding for human health.

**Measure 12: Communicating flood risk** By 2027, the City of London Corporation will explore innovative ways to engage with our workers, residents, visitors and learners

to communicate flood risk and resilience and help them understand the risks they may face thus reducing the consequences of flooding for human health.

5.6.10 **Links to Climate Action Strategy** These actions will help to implement **four** climate resilience measures from the City of London Climate Resilience Adaptive Pathways Report:

- Resilience Action 5.3: Strengthen community and business networks to build adaptive capacity
- Resilience Action 4.3: Embed principles of inclusion and equity throughout all climate action strategies
- Resilience Action 5.5 Public communications and awareness raising campaigns
- Resilience Action 4.2 Expand use and availability of non-sensitive information

# 6 Costs, benefits and funding of measures

*Signpost to the Flood and Water Management Act 2010 Section 9 (4) requirements*

*This section deals with*

*(f) the costs and benefits of those measures, and how they are to be paid for,*

6.1 Costs

| | Measure | Who | When | Resources | Funding |
|---|---|---|---|---|---|
| 1 | SuDS in public realm | DBE Developers | Q4 2022 | DBE Public realm and resilience teams | Climate Action budget |
| 2 | Riverside strategy | DBE, EA riparian owners | Q2 2021 | DBE resilience team | DBE climate action budget and TRFCC[5] funding |
| 3 | SFRA | DBE | Q4 2022 | DBE Planning team | DBE planning budget |
| 4 | Flood resilience measures- residential | DBE, DCCS | 2025 | DBE resilience team | Residential property owners |
| 5 | Flood defence asset maintenance | City Surveyor | 2026 | City Surveyors | City Surveyors |
| 6 | Flood resilience guide historic assets | DBE, Historic England | 2023 | DBE resilience team | DBE budget |
| 7 | Water mains and sewer infrastructure | DBE CPAT | Q4 2022 | DBE resilience team CPAT Thames Water | Thames Water |
| 8 | Other infrastructure (transport, electricity, gas, etc) | DBE CPAT | Q4 2024 | DBE resilience team Transport strategy team | Infrastructure providers |
| 9 | City Plan 2036 | DBE | Q4 2021 | DBE planning | DBE planning |

[5] Thames Regional Flood and Coastal Committee

| | | | | | |
|---|---|---|---|---|---|
| | | | | | budget |
| 10 | Resilience in commercial buildings | City Surveyors | 2023 | Commercial property owners, DBE resilience team, CPAT | Commercial property owners |
| 11 | Emergency Planning | Town Clerks | Q2 2021 | Emergency and contingency planning team | Town Clerk's budget |
| 12 | Communications | Town Clerks, DBE | 2027 | Communications team | Town Clerk's budget |

6.2 Implementation of these measures will contribute to ensuring that the Square Mile remains at low risk from flooding and is prepared to resume normal working quickly after any flooding incident. Several of these measures will also have benefits further afield than the Square Mile:

- SuDS in the public realm will help to protect down-stream areas in Tower Hamlets and beyond from surface water/ sewer flooding
- The Riverside Strategy will act as a pilot for other riparian boroughs demonstrating the challenges and opportunities of implementing the TE2100 plan
- Flood defence maintenance will help to protect areas up and downstream of the City
- Working with infrastructure providers will help to develop resilience of their networks across wider parts of London
- Guidance on flood resilience of historic assets will be applicable to many historic assets elsewhere

6.3 Funding & Resources

Funding and resources to implement this strategy will come from a number of different sources.

- As LLFA the **City Corporation** is responsible for co-ordination and co-operation with other risk management authorities to address flood risk in the City and in this role will use existing resources to fulfil many of the actions identified in the action plan. This work will be integrated into the City's Climate Action Strategy work in order to maximise benefits across a range of climate risks.
- In addition to this, **grant funding** may be available from external sources such as the GLA and TfL and the flood and coastal erosion risk management Grant in Aid (FDGiA) which is administered by the Environment Agency on behalf of Defra, TRFCC levy funding and organisations such as infrastructure providers .
- **Thames Water** is responsible for the upgrading of sewerage infrastructure to prevent sewer flooding and to take account of future climate predictions.

- Utility companies and **property owners** are responsible for site specific flood risk alleviation, resistance and resilience of their premises. Where premises will benefit from wider flood alleviation schemes property owners will be encouraged to provide a contribution towards such schemes.
- City **developers** are responsible for ensuring that flood risks are addressed in building design and associated landscaping.

Resourcing considerations will need to include direct project funding, staff resources, expert consultancy requirements and training needs to implement the Local Flood Risk Management Strategy.

# 7 Strategy monitoring & review

*Signpost to the Flood and Water Management Act 2010 Section 9 (4) requirements*

*This section deals with:*

*(h) how and when the strategy is to be reviewed,*

*And Flood and Water Management Act. Section 9 (6)*

*A lead local flood authority must consult the following about its local flood risk management strategy—*

*(a)risk management authorities that may be affected by the strategy (including risk management authorities in Wales), and*

*(b)the public*

7.1 **Public Consultation and adoption.** The draft Local Flood Risk Management Strategy was subject to public consultation in Autumn 2020 in line with the requirements of the Flood and Water Management Act 2010. The Local Flood Risk Management Strategy was adopted by the Planning and Transportation Committee on 16 February 2021.

7.2 **Governance**. Implementation of the LFRMS will be overseen by the officer led Flood Risk Steering Group. The Flood Risk Steering Group is chaired by the City Corporation's District Surveyor and Environmental Resilience Director and includes representatives from Built Environment, City Surveyors, Contingency Planning, and Town Clerks. Authority to exercise the City's functions as Lead Local Flood Authority in relation to the Flood and Water Management Act 2010 have been delegated to the Director of the Built Environment.

7.3 **Monitoring** Progress in implementation of the proposed measures will be overseen by the officer led Flood Risk Steering Group. Periodically progress against the LFRMS objectives and Climate Action Strategy aims will be made public through reporting to the City Corporation's Planning and Transportation Committee. Reporting of progress to the Environment Agency/ Defra will be carried out on request – normally on an annual basis.

7.4 **Review.** The Local Flood Risk Management Strategy will be reviewed by the Planning & Transportation Committee every six years in line with the Environment Agency's Flood Risk Management Plan for the Thames river basin. The next review is due in 2027.

# 8 Wider sustainability objectives

*Signpost to the Flood and Water Management Act 2010 Section 9 (4) requirements*

*This section deals with*

*(i)how the strategy contributes to the achievement of wider environmental objectives*

8.1 **Strategic Environmental Assessment**. The City of London draft Local Flood Risk Management Strategy has been subject to Strategic Environmental Assessment (SEA) which evaluates the impact that the strategy will have on wider sustainability objectives. Strategic Environmental Assessment (SEA) is the process by which strategic plans and programmes are assessed to ensure that they take account of social, environmental and economic objectives for the area, fulfilling the requirements of the Strategic Environmental Assessment (2001/EC/42) (SEA Directive). SEA was used during the preparation of the strategy to evaluate options for achieving the flood risk objectives against a series of wider sustainability objectives.

8.2 The sustainability objectives relevant to the Local Flood Risk Management Strategy were determined at the SEA scoping stage in 2014 which included consultation with the Environment Agency, English Heritage, Natural England, GLA and flood risk partnership group members and are as follows:

- To protect the health, wellbeing and safety of workers, residents and visitors
- To protect property and essential infrastructure
- To protect the historic environment, archaeological heritage and landscape
- To protect and enhance biodiversity
- To protect water quality and resources
- To adapt to the impacts of climate change
- To minimise adverse impacts on the economy

8.3 The impact of the flood risk strategy options was assessed against these wider sustainability objectives taking account of the positive, negative and neutral impacts, and the geographic scale and timescale of the impact (short, medium or long term). Comments are included to highlight the significant effects of the preferred options in terms of direct or indirect effects, whether effects are permanent or temporary and whether there are likely to be cumulative effects.

8.4 The conclusions of the SEA are reported in the Strategic Environmental Assessment Report and are summarised below:

**SEA Objective 1: To protect the health safety and wellbeing of workers, residents and visitors.** Assessment concluded that implementation of the LFRMS measures would have positive impacts for the health safety and wellbeing of workers residents and visitors. For some measures this will be a local impact but for others such as those associated with SuDS and flood defences the impact would extend outside the Square Mile.

**SEA Objective 2: To enable social and economic inclusion for all.** Assessment identified some uncertainty regarding the impact of several measures particularly on

people with disabilities. The design of some physical measures, such as SuDS and flood emergency plans, will be key to preventing accessibility problems. Suitable wording has been included to emphasise the need for accessible design.

**SEA Objective 3: To protect and enhance biodiversity.** The assessment identified that measures 2 and 5 would benefit from greater emphasis on biodiversity. Changes to the supporting text for these measures is recommended

**SEA Objective 4: To protect water quality and resources.** The measures proposed will have beneficial impacts on water quality and resources. In particular, Measure 7 focusses on water quality and resources issues in collaboration with Thames Water.

**SEA Objective 5: To mitigate and adapt to the impacts of climate change**. The measures proposed will assist in adaptation to climate change and are strengthened by supporting guidance elsewhere which emphasises the need for climate change to be considered in SFRAs.

**SEA Objective 6: To minimise adverse impacts on the economy.** The assessment concluded that the measures proposed will have positive impact on the City's economy, providing protection from flooding in comparison with other global financial centres which are more vulnerable.

**SEA Objective 7: To protect property and essential infrastructure** Positive impacts on property and essential infrastructure are expected from these measures.

**SEA Objective 8: To protect the historic assets, archaeological heritage and landscape.** The appraisal identified that measure 5 regarding maintenance of flood risk assets did not sufficiently address protection of heritage assets. Additional supporting text is proposed.

**Overall conclusion** The appraisal showed that the implementation of these measures will have mainly beneficial impacts against the SEA objectives. Where uncertainties exist clarification within the supporting text is recommended

# Appendix 1 Legislative context

Flood risk planning has assumed a high profile due to the increasing frequency of extreme flooding events over the last 2 decades. In 2009/10 the City assumed new duties under the Flood Risk Regulations 2009 and the Flood and Water Management Act 2010, requiring liaison with the Environment Agency to produce a Flood Risk Management Plan for areas at risk of flooding and preparation of a Local Flood Risk Management Strategy for the City's geographic area. We are now entering the second cycle of these plans having successfully implemented the first plans over the last decade.

**The Flood Risk Regulations 2009** came into force on 10th Dec 2009. These regulations transpose EC Directive 2007/60/EC assessment and management of flood risks and impose duties on the Environment Agency and local authorities, including the City as a lead local flood authority. The 2nd cycle of flood risk regulations requires. The Floods and Water (Amendment etc.) (EU Exit) Regulations 2019 ensure that floods and water legislation will continue to be operable in the United Kingdom after the UK leaves the EU[6]. The duties include:

- Preparation of a preliminary flood risk assessment, showing the probability of flooding and consequences for human health, the environment, cultural heritage and economic activity
- Preparation of flood risk maps and flood hazard maps
- Preparation of a flood risk management plan for areas which are at significant risk of flooding – this includes most of Greater London.

**Flood and Water Management Act 2010** – received Royal Assent on 8th April 2010. It gives local authorities responsibilities as Lead Local Flood Authorities (LLFA):

**Part 1** of the act requires all Lead Local Flood Authorities in England to:

- Develop, maintain, apply, and monitor the application of, a strategy for local flood risk from surface run off, groundwater and ordinary watercourses, in their area. The strategy must at least set out who the risk management authorities are in the area and their relevant functions, the authority's objectives for managing flood risk, as well as proposed measures to deliver the objectives, and timescales for implementation of the measures; how those measures are to be paid for as well as their costs and benefits, how and when the strategy will be reviewed, and how the strategy contributes to

[6] Explanatory memorandum to The Floods and Water (Amendment etc) (EU exit)Regulations 2019 https://www.legislation.gov.uk/ukdsi/2019/9780111176283/pdfs/ukdsiem_9780111176283_en.pdf

Floods directive 2007/50/EC will be carried forward – no further amendments will be made after UK Exit day https://www.legislation.gov.uk/eudr/2007/60/chapter/v

the achievement of wider environmental objectives. The Lead Local Flood Authority must consult affected risk management authorities and the public about its strategy and provide guidance on the application of the strategy.

- Investigate flooding incidents in its area and report on its findings.
- Establish and maintain a register of structures or features which may significantly affect flood risk in their area including information regarding ownership and state of repair.
- Contribute to sustainable development in the discharge of its flood risk duties.
- Assume the power to designate features with respect to flood risk and subsequently to act as responsible authority for such features.

**Part 2** of the act gives local authorities new duties as "approving bodies" with regard to drainage including:

- Approving rainwater drainage systems before commencement of any construction works which have drainage implications
- Adopting and maintaining approved systems which affect more than one property
- Approval of surface water drainage systems prior to connection to public sewers. (Automatic right of connection to public sewers is removed by this Act).

**Part 3** of the act provides legislative powers for:

- Consolidation of legislation relating to flood risk including Water Industry Act 1991, the Water Resources Act 1991, the Land Drainage Act 1991, the Reservoirs Act 1975, the Highways Act 1980 (so far as relevant to water), the Environment Act 1995 (so far as relevant to water), the Public Health Act 1936 (so far as relevant to water) and the Coast Protection Act 1949.
- Provision of funding by Parliament to pay for expenditure under the Act

As Lead Local Flood Authority, the City Corporation is responsible for preparing and implementing a Local Flood Risk Management Strategy for the City. The Requirements of the Flood and Water Management Act with respect to this Local Flood Risk Management Strategy are set out in Figure 9.

(1)A lead local flood authority for an area in England must develop, maintain, apply and monitor a strategy for local flood risk management in its area (a "local flood risk management strategy").

(2)In subsection (1) "local flood risk" means flood risk from—

(a) surface runoff,

(b) groundwater, and

(c) ordinary watercourses.

(3)In subsection (2)(c) the reference to an ordinary watercourse includes a reference to a lake, pond or other area of water which flows into an ordinary watercourse.

(4)The strategy must specify—

(a) the risk management authorities in the authority's area,

(b) the flood and coastal erosion risk management functions that may be exercised by those authorities in relation to the area,

(c) the objectives for managing local flood risk (including any objectives included in the authority's flood risk management plan prepared in accordance with the Flood Risk Regulations 2009),

(d) the measures proposed to achieve those objectives,

(e) how and when the measures are expected to be implemented,

(f) the costs and benefits of those measures, and how they are to be paid for,

(g) the assessment of local flood risk for the purpose of the strategy,

(h) how and when the strategy is to be reviewed, and

(i) how the strategy contributes to the achievement of wider environmental objectives.

(5)The strategy must be consistent with the national flood and coastal erosion risk management strategy for England under section 7.

(6)A lead local flood authority must consult the following about its local flood risk management strategy—

(a) risk management authorities that may be affected by the strategy (including risk management authorities in Wales), and

(b) the public.

(7)A lead local flood authority must publish a summary of its local flood risk management strategy (including guidance about the availability of relevant information).

(8)A lead local flood authority may issue guidance about the application of the local flood risk management strategy in its area.

(9)A lead local flood authority must have regard to any guidance issued by the Secretary of State about—

(a) the local flood risk management strategy, and

(b) guidance under subsection (8).

**Fig 9: Requirements of the Flood and Water Management Act 2010 Section 9 Local flood risk management strategies: England**

This strategy must be subject to Strategic Environmental Assessment (SEA) as required by the SEA Directive and will be reviewed by other stakeholders during a period of public consultation prior to adoption.

### Civil Contingencies Act 2004

Local Authorities have 7 duties under the Civil Contingencies Act 2004

- To operate with other local responders to enhance coordination and efficiency;
- Ensure information is shared with local responders to enhance coordination:
- Carry out risk assessments
- Have emergency plans in place

- Have business continuity management arrangements in place
- Have arrangements in place to warn and inform the public in the event of an Emergency
- Provide advice and assistance to businesses and voluntary organisations regarding business continuity management

**Planning Guidance**

The National Planning Policy Framework (NPPF) was introduced in 2012 and provides Government guidance on Planning. The Core Planning principles include the following requirements

- support the transition to a low carbon future in a changing climate, taking full account of **flood risk** and coastal change, and encourage the reuse of existing resources, including conversion of existing buildings, and encourage the use of renewable resources (for example, by the development of renewable energy)
- promote mixed use developments, and encourage multiple benefits from the use of land in urban and rural areas, recognising that some open land can perform many functions (such as for wildlife, recreation, **flood risk mitigation**, carbon storage, or food production)

Section 10 of the NPPF states that "Local planning authorities should adopt proactive strategies to mitigate and adapt to climate change, taking full account of flood risk, coastal change and water supply and demand considerations.

**National Planning Policy Framework requirements for development**

Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk, but where development is necessary, making it safe without increasing flood risk elsewhere. Local Plans should be supported by Strategic Flood Risk Assessment and develop policies to manage flood risk from all sources, taking account of advice from the Environment Agency and other relevant flood risk management bodies, such as lead local flood authorities and internal drainage boards. Local Plans should apply a sequential, risk-based approach to the location of development to avoid where possible flood risk to people and property and manage any residual risk, taking account of the impacts of climate change, by:

● applying the Sequential Test;

● if necessary, applying the Exception Test;

● safeguarding land from development that is required for current and future flood management;

● using opportunities offered by new development to reduce the causes and impacts of flooding; and

● where climate change is expected to increase flood risk so that some existing development may not be sustainable in the long-term, seeking opportunities to facilitate the relocation of development, including housing, to more sustainable locations.

The NPPF is supported by National Planning Practice Guidance which provides details of how the flood risk elements of the NPPF should be applied.

**Other City of London strategies and plans**

The City Corporation has adopted a number of plans and strategies which are relevant to this Flood Risk Management Strategy and these have been taken into account in its preparation:

- **Responsible Business Strategy**

The City of London Corporation's Responsible Business Strategy includes under outcome 2 *The Planet is Healthier* and Priority 4 *Climate Change,* a commitment to reduce the risk and impact of flooding on the Square Mile by implementing the City of London Local Flood Risk Management Strategy.

- **Climate Action Strategy**

The City of London's draft Climate Action Strategy includes a range of climate resilience actions related to flood risk. Key short-term actions are taken from the City of London Adaptive Pathways Study.

- **Climate change adaptation strategy**

The City of London's Climate Change Adaptation Strategy (2010 update) uses the UK Climate Projections, UKCP09 and builds on the impacts previously identified in the London Climate Change Partnership's publication, 'London's Warming'1.

The climate change risks for the City are summarised below:

- Hotter, drier summers,
- Milder, wetter winters,
- More frequent extreme high temperatures,
- More frequent heavy downpours of rain,
- Significant decreases in soil moisture content in summer,
- Sea level rise and increases in storm surge height,
- Possible higher wind speeds.
- Longer periods when weather systems are locked into the same pattern

The City of London's Climate Change Adaptation Strategy, aims to identify the priority risks associated with climate change and proposes adaptation measures which are designed to ensure that the City's infrastructure and services cope under a changing climate. The City Corporation will continue to review emerging

experience of climate change affecting south east England for its impacts on the City.

- **Local Plan 2015 and emerging City Plan 2036**

The City's Local Plan 2015 sets out the future vision and key polices for planning the City of London. This will be replaced by the City Plan 2036 in 2021/22. The Plan sets out the vision for shaping the Square Mile in the future and contains the policies by which planning decisions will be made.

The Local Plan 2015 and emerging City Plan 2036 set out the City's approach to flood risk associated with new development requiring flood risk assessments for any development sites located in the City Flood Risk Area.

The Local Plan is accompanied by a Policies Map (in two parts) that shows where its policies operate.

- **Multi Agency Flood Plan**

The Multi Agency Flood Plan outlines the various responsibilities of different organisation with regard to emergency and contingency planning for flood risk.

# Appendix 2 Flood Risk Powers and Responsibilities

| |
|---|
| Signpost to the Flood and Water Management Act 2010 Section 9 (4) requirements<br>a) The risk management authorities in the authority's area and<br>b) The flood and coastal erosion risk management functions that may be exercised by those authorities in relation to the area, |

**Risk Management Authorities and other interested parties**

The Flood and Water Management Act 2010 recognises the following authorities as risk management authorities:

- Lead Local Flood Authorities (LLFA)
- The Environment Agency
- Water companies
- Highways authorities
- Internal Drainage Boards (not relevant to the City)
- District and borough councils

These risk management authorities have a duty to co-operate with each other in the exercise of their duties and the power to take on flood risk functions from other authorities by mutual agreement.

The relevant risk management authorities for the City are the City Corporation as LLFA for the square mile, the Environment Agency which exercises a national and regional role in co-ordinating flood risk management, Thames Water as the water company and sewerage undertaker for the City, and Transport for London as the Highways Agency for parts of the City.

A number of other authorities, although not defined as risk management authorities, have a role to play in the management of flood risk in the City. These include the Greater London Authority (GLA) and Transport for London TfL; Network Rail which manages mainline stations feeding the City; the Emergency Services and first responders in tackling flooding incidents; the Marine Management Organisation and the Port of London Authority; and neighbouring boroughs as LLFAs for their areas since they also influence the City's flood risk management.

**Risk management functions in the City**

| Authority | Function | Responsibilities |
|---|---|---|
| City Corporation | Lead Local Flood Authority | Strategic role in overseeing the management of local flood risk i.e. flood risk from surface water runoff, groundwater and ordinary watercourses. This includes responsibility for<br>• Preparing a Local Flood Risk Management Strategy<br>• Investigation of flooding incidents and preparation of flood incident reports<br>• Maintaining register of assets that impact |

| Authority | Function | Responsibilities |
|---|---|---|
| | | on flood risk and registering appropriate assets<br>• Implementing SuDS Approval Body (SAB) |
| City Corporation | Planning Authority | Ensuring that development does not increase vulnerability to flood risk for new and existing properties |
| City Corporation | Category 1 responder under the Civil Contingencies Act | Ensuring that systems and processes are in place to provide emergency response to flooding |
| City Corporation | Highway Authority | Duty to maintain the highway including responsibility for drain and gully maintenance on non-strategic roads in the City |
| Environment Agency | Strategic Role | Taking a strategic overview of the management of all sources of flooding and coastal erosion. This includes setting the direction for managing the risks through strategic plans; providing evidence and advice to inform government policy and support others; working collaboratively to support the development of risk management skills and capacity and providing a framework to support local delivery. |
| Environment Agency | Operational role | Operational responsibility for managing the risk of flooding from main rivers, reservoirs, estuaries and the sea, as well as being coastal erosion risk management authority.<br>Responsible for inspection of flood defences and maintenance of the Thames Barrier.<br>Advisory and statutory consultee role in the assessment of flood risk associated with planning policy and development.<br>Advisory role in assessment of Multi Agency Flood Plans. |
| Marine Management Organisation | Strategic Role | Responsibility for preparing marine plans for English inshore and offshore waters including the tidal extent of the River Thames |
| Thames Water | Sewerage undertaker | Responsible for provision and maintenance of the sewer network<br>Upgrade of sewer network to facilitate increased drainage capacity requirements |

| Authority | Function | Responsibilities |
|---|---|---|
| | | Responsible for implementation of Thames Tideway Tunnel to reduce sewer outflows into the Thames |
| Transport for London | Transport infrastructure provider | Responsible for provision and maintenance of strategic road network and London Underground and bus networks ensuring their resilience to flood risk |
| Network Rail | Transport infrastructure provider | Responsible for provision and maintenance of railway network serving mainline stations in the City and their resilience to flood risk |
| Greater London Authority | Drain London/LoDEG | Facilitation of co-ordinated working on flood risk across London including provision of guidance and information |
| Neighbouring boroughs | LLFA s for their areas | Strategic role in overseeing the management of local flood risk in their areas and liaison with other LLFAs affected. |
| Businesses and Residents | Property owners | Responsible for flood resistance and resilience and emergency and contingency planning associated with properties<br>Riparian owners are responsible for the maintenance of flood defences |
| Utility companies | Utility providers | Responsible for provision and maintenance of utility infrastructure – electricity, gas telecommunications etc. and ensuring its resilience to flood risk |

# Appendix 3 Glossary

**City Flood Risk Areas** – Areas of the City that are at risk of river or surface water flooding as defined in the City of London Local Plan

**Flood Zones** – Environment Agency defined zones with varying probabilities of river flooding

- Flood Zone 1- Low probability of flooding - less than 1 in 1,000 annual probability of river or sea flooding (<0.1%)
- Flood Zone 2 – Medium probability of flooding - between a 1 in 100 and 1 in 1,000 annual probability of river flooding (1% – 0.1%)
- Flood Zone 3 - High probability of flooding - a 1 in 100 or greater annual probability of river flooding (>1%)

**FMfSW – Flood Map for Surface Water –** National scale maps published by the Environment Agency showing surface water flood risk.

**LLFA - Lead Local Flood Authority** – The local authority with the statutory responsibility for flood risk management in its local area. The City Corporation is the LLFA for the City of London geographic area.

**LFRMS – Local Flood Risk Management Strategy** – Strategy for managing flood risk at a local level as required by the Flood and Water Management Act 2010

**MAFP Multi Agency Flood Plan** – Emergency Plan for responding to flooding

**NPPF – National Planning Policy Framework** – The government's statement of planning guidance to local planning authorities, issued by the Department of Communities and Local Government in March 2012. The City Corporation must take account of it in preparing and implementing its planning policies.

**Preliminary Flood Risk Assessment –** preliminary assessment of the risk of flooding as required by the Flood Risk Regulations 2009

**Risk Management Authorities** – authorities defined in the Flood and Water Management Act as having flood risk responsibilities

**Sequential Test and Exceptions Test –** Tests to be applied to proposals for new development in order to avoid allowing vulnerable uses in areas that are prone to flooding. Details of these tests can be found in the National Planning Practice Guidance to the National Planning Policy Framework

**SEA – Strategic Environmental Assessment** – assessment of the likely environmental, social and economic assessment of the implementation of plans and programmes as required by the EU Strategic Environmental Assessment Directive

**SFRA – Strategic Flood Risk Assessment –** comprehensive assessment of the risks of flooding from all sources

**Surface Water Management Plan** – plan for the management of surface water to reduce risk of flooding from this source.

**TE2100 – Thames Estuary 2100 Plan** – Environment Agency's plan for addressing flood management in the Thames Estuary up to 2100

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