

Appendix A - City of London Riverside Strategy Committee Adoption version – November 2021

Contents

1. Introduction.....	2
2. Our Vision.....	2
3. Background	3
4. Where are we now?	7
5. Realising our vision	9
IMPLEMENTATION APPROACH – TE2100 alignment SP1	10
IMPLEMENTATION APPROACH – Development SP2	11
IMPLEMENTATION APPROACH – Cyclical replacement and maintenance SP3	12
IMPLEMENTATION APPROACH - Major works SP4	13
IMPLEMENTATION APPROACH - Direct intervention SP5.....	14
IMPLEMENTATION APPROACH – Sequencing of flood defence raising SP6.....	15
DESIGN.....	15
DESIGN – Flood defence and walkway continuity SP7	16
DESIGN – Accessibility SP8	17
DESIGN – River safety SP9.....	18
DESIGN – Biodiversity SP10	18
DESIGN – Historic environment SP11	19
DESIGN – Buildings, facilities and infrastructure interfaces SP12.....	20
DESIGN – River views SP13.....	21
DESIGN – Flood defence and edge protection SP14.....	21
DESIGN – Lighting SP15.....	22
FUNDING SP16	23
GOVERNANCE and STRATEGY REVIEW SP 17	24
6. IMPLEMENTATION, RESOURCES and RISKS.....	25
7. APPENDIX 1 Where are we now – Riverside maps.....	26
8. APPENDIX 2 Illustrative defence raising options.....	Error! Bookmark not defined.

1. Introduction

- 1.1. The City of London and the wider capital has throughout the centuries benefited from its position on the River Thames. As a tidal river the need to defend against the highest of tides is well understood and the river's flood defences have long protected the Square Mile from flooding. Through this next century sea level rises and changes to the wider estuary defences are expected. There is a need to protect the City from tidal flooding which brings with it an opportunity to shape an outstanding riverside space.
- 1.2. The Thames Barrier forms an essential part of the flood defences for the estuary and currently protects central London (including the City) from flooding. Closure of the barrier is becoming more frequent but there is a limit to the number of times per year that the barrier can be closed without affecting the river's ecology, navigation and the maintenance regimes for the barrier itself.
- 1.3. The second major element of the City's flood protection is provided by a flood defence at the river's edge. This protects from fluvial waters when the barrier is raised and higher tides which do not require closure of the barrier. The Thames Estuary 2100 Plan (TE2100) considers a number of options for how to protect the estuary from sea level rise including a proposal for a replacement barrier later this century.
- 1.4. Most of the riverside is accessible to the public due to a long-term ambition to complete the entire riverside walk on the north bank of the Thames. The need to raise significant sections of the flood defence will affect users experience of the riverside walk and adjoining premises and must be planned in a pre-emptive way to avoid unnecessary costs and disruption.
- 1.5. This City Riverside Strategy provides a roadmap to guide the City of London Corporation as Lead Local Flood Authority (LLFA) and Local Planning Authority for the Square Mile. Our aim is to ensure that the City remains at low risk of flooding throughout this century and beyond, taking account of the predicted changes in sea level rise as a result of climate change. The strategy sets out how we plan to deliver the local flood defences that contribute to this overall aim. The options set out in this strategy will be reviewed at least every 10 years in the light of new evidence and may change in the future.
- 1.6. Successful implementation of this strategy in the coming decades will be dependent on suitable funding mechanisms being put in place. Options for funding should be a key consideration during the early stages of the strategy.

2. Our Vision

- 2.1. The City Corporation is dedicated to shaping an outstanding riverside environment, protecting and supporting a flourishing society and a thriving economy fit for the coming century.
- 2.2. In its role as Lead Local Flood Authority, the City Corporation will progress this vision through a strategy that uses the opportunities brought about by the need

to raise our river flood defences to overcome challenges and ensure benefits to the people who live, work, learn and visit the Square Mile.

2.3. The following are the long-term goals of the strategy, balancing these will be key to its success and will guide future decisions for the riverside:

- To ensure continued flood protection to the end of the century and beyond by raising the defences and improving future maintenance.
- To maintain and improve pedestrian access along the entire length of the riverside.
- To protect and enhance our historic riverside assets.
- To promote the safe use of the river and riverside as a vibrant place to be for health and wellbeing.
- To increase the value of the riverside for natural capital and ecology.
- To safeguard protected and valued views.
- To maintain appropriate land use adjacent to the river.

2.4. This strategy and the wider TE2100 Plan will have implications for the City Corporation and Bridge House Estates as a riparian property owner. The full implications for the City Corporation's riparian properties within and outside the Square Mile will require further investigation. This strategy will be reviewed at least every 10 years in line with the TE2100 Plan and may be revised at any time in the light of new evidence that emerges.

3. Background

3.1. The River Thames flows through the City from its boundary with the City of Westminster to the west of Blackfriars Bridge, to its boundary with the London Borough of Tower Hamlets at the Tower of London. The river has a tidal range of seven metres twice per day, throughout this section. Along this stretch, one and a half miles of flood defences protects riverside properties and public realm at high tide. At low tide wide areas of foreshore are visible at several locations along the river within the City. The original natural state of the river has been modified and restricted with extensive land reclamation from the Roman Period and continual development of warehouse, quays, wharfs and jetties. Six bridges span the river within the City (Blackfriars road-bridge, Blackfriars railway-bridge, Millennium footbridge, Southwark Bridge, Cannon Street railway-bridge and London Bridge). The navigable river channel is used for a variety of vessels including barges towing waste and construction materials, river buses, leisure boats and river patrol boats. The ecology of the river has improved in the last 50 years and it is now designated as a Site of Metropolitan Importance for Nature Conservation (SMINC).

3.2. The historical development of the City is closely bound with its location on the Thames. The Roman settlement, established in the mid-1st Century grew rapidly, becoming the capital of Roman Britain and an important port. A permanent bridge is likely to have been in place by c52AD, at the most seaward point that

the river could be easily bridged. At this time the river was wider and shallower, and the riverbank was on the north side of modern Thames Street. The construction of successive waterfronts and land reclamation continued in the early medieval and later periods. The building and rebuilding of extensive wharves, docks, alleys and a network of narrow streets, linking the waterfront with the principal medieval markets at Cheapside and Eastcheap, underpinned the trading and commercial role of the City in the country and abroad. The significance of London meant that the Pool of London handled half the nation's trade by the end of the middle ages and was the world's busiest port in the eighteenth century. Construction of new, larger docks and expansion of the port to the east gradually diminished the importance of the City as a port, a trend that accelerated from the late 1940s onwards. Warehouse buildings and wharfs went out of use and many sites were redeveloped for offices and housing. A riverside walk was established, incorporated into new developments and eventually linking to form a continuous pedestrian route.

- 3.3. The significant contribution of the River Thames to the civic life of London and the development of its riverside has meant that throughout the centuries steps have been taken to manage flooding in this important area. Following the Great Fire of 1666, the Rebuilding of London Act stipulated that the riverside should be raised three foot to better prevent it from flooding. Further raising was undertaken following flooding in 1928. Other incidents of flooding including the North Sea Flood of 1953 led to the implementation of new flood control measures that culminated in the construction of the Thames Barrier.
- 3.4. A range of policies and strategies protect and shape the City's riverside (Table 1)

Table 1: Policies and strategies affecting the City's riverside

City of London	Greater London Authority	Other statutory bodies
Local Plan / City Plan 2036	The London Plan 2021	Environment Agency Thames Estuary 2100 Plan
	Implementation Report - Safeguarded Wharves Review 2018-2019	Dept for Housing Communities and local Government Wharves safeguarding direction Feb 2021
Thames Strategy SPD 2015	Mayor's River Action Plan 2013	Marine Management Organisation South-East Inshore Marine Plan June 2021
Transport Strategy 2019	Mayor's Transport Strategy 2018	
Climate Action Strategy 2020-27		
Local Flood Risk Management Strategy (LFRMS) 2021-27		

Riverside Walk Enhancement Strategy 2014		
Waste Strategy 2014-2020 (Under review)		

- 3.5. The Environment Agency led TE2100 Plan identifies actions that will need to be taken during this century to protect the land adjacent to the tidal Thames from flood risk. This area, including parts of the City, is protected from severe tidal flooding by the Thames Barrier and the other estuary defences. However, climate change impacts such as sea level rise and the prevalence of more extreme weather events mean that additional local and estuary-wide protection will be needed later this century.
- 3.6. The primary function of the Thames Barrier is to prevent tidal flooding in London, and it is currently closed when water levels are forecast to overtop the river flood defences upstream of the Barrier. Water levels in the tidal Thames are increasing as a result of climate change resulting in more frequent barrier closures. A limit of 50 closures per year on average has been set to allow sufficient time for maintenance and navigation. Raising the statutory heights of local flood defences along the Thames will help to manage the frequency of barrier closures by allowing higher water levels to pass up the Thames thus maintaining the reliability of the existing barrier. As water levels increase further, a major upgrade or replacement of the Thames Barrier will be required to protect London in the future. These options are being considered in the TE2100 Plan.
- 3.7. Within the City the TE2100 plan identifies the need to raise flood defences to 5.85m AOD (above ordinance datum) by 2065 and 6.35m AOD by 2100. For the City's riverside this means raising parts of the flood defence by up to 1m although some sections are already at the required level for 2100. The adaptive pathways approach adopted in the TE2100 plan links the flood defence raising to sea level rise. Through the TE2100 ten -year review it is looking increasingly likely that these dates will be brought forward since sea level rise is accelerating faster than anticipated.
- 3.8. This defence raising will have an impact on riverfront structures and walkways, on views of the river from the riverside walk and from nearby buildings. These impacts will need to be managed in a way that integrates the raised defences with the wider riverside environs. It also presents opportunities to enhance the user experience of the riverside, improve opportunities for biodiversity and highlight the historic importance of the City's riverside. Planning now will enable the most cost-effective options to be implemented in a pro- active way, thus maximizing the potential opportunities associated with programmed works.
- 3.9. In the City riparian owners are responsible for maintaining their part of the flood defence which is usually associated with the legal ownership of a site on the landward side of the defence. Various licenses and permits are required before any work is undertaken on the riverside or flood defence structures. (Table 2) This

ensures that navigation, flood protection and natural capital are not compromised during or as a result of these works. Works may also need planning and listed building consents.

Table 2: Permits and Licenses that may be required for flood defence works

Organisation	License or permit required	Details
Port of London Authority (PLA)	River Works License	Any works in, on, over or under the river. This includes permanent works such as a new pier and any temporary works such as repairs to a river wall which requires access/ scaffolding
Environment Agency (EA)	Environmental Permit for Flood Risk Activity	Flood Risk Activities are activities in, under and over a main river and other activities that could affect flooding from a main river or sea which includes any works taking place within 16m of the landward extent of a tidal flood defence Including any below ground structures.
Marine Management Organisation (MMO)	Marine License	Activities within the UK marine area that occur below mean high water springs including construction dredging deposit or removal of any substance or object, incineration, scuttling (sinking) or use of explosives
City of London Corporation	Planning Approval and/or Listed Building Consent	Any works related to changes to a development site or a listed building or structure.
Historic England	Scheduled Monument Consent	Any works that will affect a scheduled monument, whether above or below ground.
Transport for London/Highway Authority	Highway Licenses	Any works that impact the highway.

3.9 The City Corporation's Climate Action Strategy (CAS) 2020- 2027 includes a strong focus on Climate Resilience against the six climate risks that the City faces:

- Flood risk
- Heat stress
- Water resources
- Natural capital
- Pests & diseases
- Food & trade

Implementation of this strategy will require an integrated approach so that solutions for each risk incorporate responses to other risks where possible. For example, measure to address flood risk on the City's riverside, should also incorporate greening to reduce heat stress; taking care to choose suitable

plants which improve natural capital and biodiversity and are resistant to emerging pests and diseases.

- 3.10 The CAS approach sits well with the TE2100 Plan riverside strategy approach. This integrates improvements to flood risk management defences into wider redevelopment, enhancing the social, environmental and commercial aspects of the riverside. The Environment Agency is encouraging councils and strategic planning authorities to use this approach to achieve additional benefits whilst addressing climate change related flood risks. Figure 1 summarises the co-benefits that will result from this Riverside Strategy Approach.
- 3.11 Following this approach, the City's ambition is to take every opportunity to create an attractive, accessible riverside which is resilient to the increasing risks of flooding through this century.

Principles of the riverside strategy approach



Figure 1: Benefits of the TE2100 Riverside Strategy Approach

4. Where are we now?

- 4.1. The City's riverside and surrounding area is used in a variety of different ways; ranging from an office or residential location, educational use, recreational uses and safety elements, and has routes for walking, cycling and public transport. It is a dynamic area that has evolved over time to become what it is now, a historic, multi-use area.
- 4.2. In order to develop a strategy that incorporates all these elements, it has been necessary to understand the existing riverside features and how they add to the character and environment of the area.
- 4.3. An extensive desktop study was undertaken (including commissioned a UAV drone survey) to help identify the scale of the challenge faced along the City's

1.5 mile stretch of riverside. Appendix 1 provides detailed maps and assessment of the following aspects:

- Raising requirements – end of Stage 2 (2065)
- Raising requirements - end of Stage 3 (2100)
- Non - developable sites
- Historic environment
- Land use and ownership
- Access to the riverside
- River safety
- Natural capital and biodiversity
- Public realm furniture
- Lighting

The research and evidence have informed the Implementation Approach and Design policies set out in section 5 of this strategy.

DRAFT

5. Realising our vision

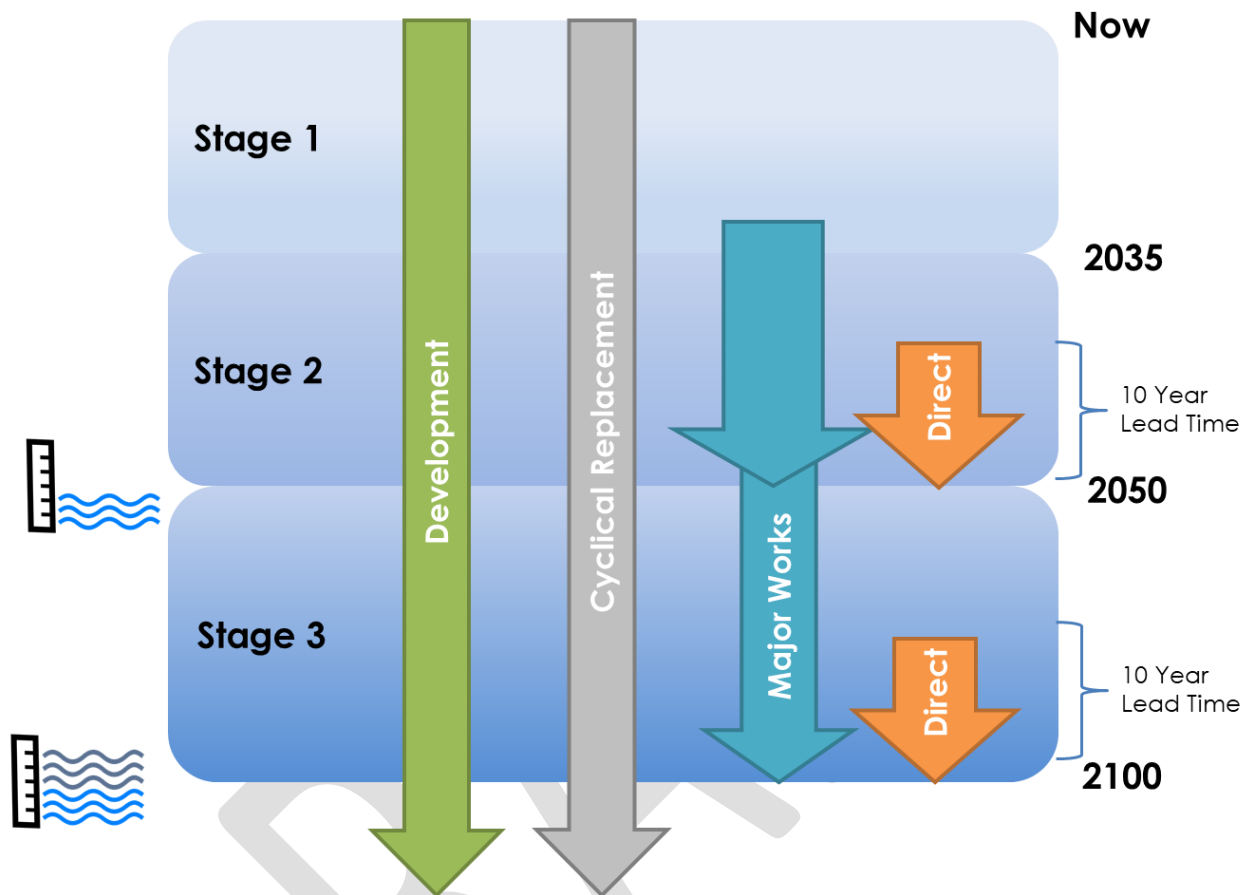


Figure 2: Suitable interventions for each time horizon

5.1. The long-term nature of this strategy risks decisions being delayed until later in the century. This would result in missed opportunities and increased costs in the future. By setting out what can be done in each time period (fig 3), this strategy leads the way in resilience planning, reducing disruption and overall cost of works. Each element of the strategy includes:

- the strategy point and the related policy
- why the policy is a good approach
- when the policy will apply and for how long
- in which areas the policy is relevant
- how the policy can be taken forward (recommendations)

IMPLEMENTATION APPROACH

5.2. The approach to implementing raising is detailed in the policies set out below. These policies outline the expected response to flood defence raising as opportunities arise as a result of development and cyclical maintenance. It is recognised that some parts of the riverside will need a coordinated approach

across several adjacent sites. It is proposed that major works are planned and co-ordinated to minimise disruption for riverside occupiers and users. Finally, some sections will not be covered by the preceding scenarios and will require direct intervention before the implementation dates set out in the TE2100 plan.

IMPLEMENTATION APPROACH – TE2100 alignment SP1

SP1 - TE2100 alignment

The City of London Corporation will follow the adaptive approach set out in the Thames Estuary 2100 Plan, using the dates and time periods it sets out. The City Corporation will commit to working in partnership with the Environment Agency, neighboring London Boroughs and other relevant parties to achieve the long-term aims of the Thames Estuary 2100 Plan.

- 5.3. The Thames Estuary 2100 Plan is the partnership plan for maintaining the flood defences for the entire tidal Thames. By committing to the timeframes as set out by the TE2100 Plan (and any revisions thereof) the City Corporation will be able to ensure that its flood defence remain sufficient for the risk and maintain the continuity of the wider defence with adjoining areas, including the London Boroughs with which it shares a riparian and land boundary (City of Westminster, London Boroughs of Tower Hamlets and Southwark).
- 5.4. This strategic point is a continuation of the City Corporation's existing policy and should continue to be applied going forward. This strategic point applies generally to the whole of the City's riverside.

SP1 Recommendations:

1. The City Corporation should continue to include in its Planning Policy and Local Plan an alignment with the TE2100 requirements
2. The City Corporation should regularly review the Riverside Strategy to coincide with reviews and updates of the TE2100 Plan and the City's own Local Plan.
3. The City Corporation should maintain a robust partnership with the EA, neighbouring boroughs and other partners in support of the wider TE2100 plan.

Three time horizons – three themes for flood risk management



 <p>First 25 years</p>	<p>The first 25 years from 2010 to 2034</p> <p>“Maintaining confidence and planning together”</p>	<ul style="list-style-type: none"> • Continuing maintenance, operation and essential improvements. • Creating new habitats, safeguarding the spaces for future flood management and working in partnership with others to reduce flood risk. • TE2100 will have a real influence in the preparation of, and updating of local strategic and spatial plans.
 <p>Middle 15 years</p>	<p>The middle 15 years from 2035 to 2049</p> <p>“Renewal and reshaping the riverside”</p>	<ul style="list-style-type: none"> • Many of the existing walls, embankments and smaller barriers will need raising and major refurbishment or replacement in this period. • These major projects provide an opportunity to reshape our riverside environment through working with spatial planners, designers, environmental groups and those who live and work in the Estuary area.
 <p>Up to 2100</p>	<p>To the end of the century from 2050</p> <p>“Preparing for, and moving into the 22nd century”</p>	<ul style="list-style-type: none"> • From 2070 (based on government’s current climate change guidance) a major change will be needed. • The decision on the “end of the century” option to be adopted must be made at the start of this period followed by planning and preparation for implementation • By 2070, flood risk management arrangements must be in place to take us to the end of the century – and beyond.

Figure 3: Thames Estuary 2100 Plan time horizons

IMPLEMENTATION APPROACH – Development SP2

SP2 - Development:

Where development is proposed on a riparian site the following will be expected at each stage:

Stage 1 (2021-2034): As a minimum the developer must demonstrate that the flood defence is capable of being raised to the future level. Developers are encouraged to implement raising to the 2100 level at this time where feasible.

Stage 2 (2035-2065): As a minimum, when new sites come forward for development during this period developers will be required to raise the river defence to at least the 2065 level and demonstrate that future raising to higher level is feasible. Developers should implement raising to the 2100 level at this time where feasible.

Stage 3 (2065 onwards): When new sites come forward for development during this period, developers will be required to raise the river defences to the 2100 level.

5.5. Development where it occurs in the immediate vicinity of the river can offer a cost-effective and less disruptive opportunity to provide defence raising and to implement a design that provides wider holistic benefits to the riverside. In addition, it offers an opportunity to resolve conflicts with building levels and the defence levels. The infrequent nature of development is likely to mean that this opportunity will not occur multiple times for individual sites during the course of this strategy.

5.6. Going forward there will be a continuation of the policy requiring developers to demonstrate that future defence raising is possible, this should include that the building will not be negatively impacted by future raising and developers are encouraged to raise defence levels to the 2100 level as part of the

development. From 2035 developers will be required as part of major new developments to raise defence levels to at least the 2065 level and as a minimum demonstrate that future raising to the 2100 can be accommodated.

- 5.7. This strategic point is a continuation and enhancement of existing policy which will apply from now on. This point will apply generally to the entire riverside where development is likely.

SP2 Recommendations:

1. The City Corporation should clarify existing planning policy through an update to the Thames Strategy Supplementary Planning Document (SPD)
2. The City Corporation should produce guidance on demonstrating the feasibility of future defence raising, this should include guidance on potential impacts that need to be addressed and resolving conflicts with adjoining sites.

IMPLEMENTATION APPROACH – Cyclical replacement and maintenance SP3

SP3 - Cyclical replacement and maintenance:

Where the City Corporation is responsible for the maintenance of the river defence, should a section need replacing or a major repair, raising opportunities should be evaluated for each stage (other riparian owners should be encouraged to take a similar approach):

Stage 1 (2021-2034): As a minimum the City Corporation must consider the feasibility of raising the river defence as part of the works or at least enabling future raising.

Stage 2 (2035-2065): As a minimum the City Corporation must enable future raising to the 2065 level where feasible and consider the feasibility of implementing to the higher level as part of the works.

Stage 3 (2065 onwards): The City Corporation must consider the feasibility of raising the defence as part of the works and enabling future raising to the higher level.

Riparian owners should take account of river wall raising on adjacent sites and co-ordinate works where feasible

- 5.8. All river defences have a limited effective lifespan and require regular maintenance. Across the time period concerned with this strategy it is possible that some defence structures will need replacement, which presents an opportunity to incorporate raising and associated co benefits. Conversely where direct intervention is undertaken to implement raising, the life expectancy of the defence should be assessed and if appropriate the opportunity taken to consider wholesale replacement of the asset.
- 5.9. This is a new approach for the City Corporation as a riparian owner and should be implemented going forward, other riparian owners should be encouraged to follow suit through demonstration of best practice. The point applies generally to the entire riverside.

SP3 Recommendations:

1. The City Corporation should change its internal procedures to ensure raising is considered as part of cyclical works.
2. The City Corporation should work in partnership with the EA asset monitoring team to encourage riparian owners to consider raising as part of their own maintenance regime.

IMPLEMENTATION APPROACH - Major works SP4

SP4 - Major works:

The City Corporation will work with the Environment Agency and riparian owners to identify stretches where major substantive works will be required to implement raising and seek to ensure that these come forward at the appropriate time such that:

Stage 1 (2021-2034): The City Corporation will have identified the stretches covered by this implementation approach, and instigated planning in conjunction with other stakeholders as required.

Stage 2 (2035-2065): By the end of this period the stretches identified at Stage 1 will have been raised to at least the 2065 level.

Stage 3 (2065 onwards): Further progress on these stretches will have ensured that the defences are raised to the 2100 level before the end of the century.

- 5.10 Some stretches of the river defence require significant works to enable raising and are either; due to their position unlikely to come forward as part of a development or are where a single structure covers multiple riparian sites in a way that restricts the capacity for a single development to implement raising meaningfully. Where this occurs a more thorough approach will be needed to ensure that raising occurs in a coordinated and timely fashion and incorporates appropriate co-benefits. When these sites occur at the City's boundary further considerations will be needed to ensure continuity with the neighboring borough.
- 5.11 It is likely that this approach will be required for raising to the Victoria Embankment, which mostly sits within the City of Westminster. Other possible structures which have been identified include London Bridge and the board walk structure over the river from Adelaide House to Old Billingsgate.
- 5.12 Dealing with these sections in a coordinated way, assists in overcoming challenges within a suitable timeframe and may unlock opportunities for external funding.

SP4 Recommendations:

1. The City Corporation should conduct a review of the flood defences within the Square Mile to identify areas where major works may be needed, including but not limited to:

- a. Victoria Embankment: With Westminster City Council and other interested parties (including Transport for London as Highway and Traffic Authority) to consider issues arising from the need to raise the flood defences at Victoria Embankment.
- b. Adelaide House to Old Billingsgate Market: With riparian owners and other interested parties to consider issues arising from the need to raise or replace flood defences at the elevated walkway structure between Adelaide House and Old Billingsgate Market.
- c. London Bridge: Conduct a detailed engineering review of the implication of heightened water levels on the balancing structure with London Bridge's northern and southern abutments.

IMPLEMENTATION APPROACH - Direct intervention SP5

SP5 - Direct intervention:

Where raising is required but has not been fulfilled by the other implementation approaches (including where works have only prepared for future raising) the following should be undertaken:

Stage 1 (2021-2034): The City Corporation will engage with riparian owners to help them understand their legal responsibilities for flood defence raising and the consequences and implications on their sites of future raising.

Stage 2 (2035 – 2065): Stretches still requiring raising ten years before the end of stage 2 will be identified and the City Corporation as Lead Local Flood Authority will work with the Environment Agency to enable riparian owners to fulfil their legal responsibility under The Metropolis Management Act (1879 to 1962) for flood defence raising at least to the 2065 level.

Stage 3 (2065 onwards): Ten years ahead of the end of the century raising date any stretches yet to be raised to the higher level will be identified and the City Corporation as Lead Local Flood Authority will work with the Environment Agency to enable riparian owners to fulfil their legal responsibility for flood defence raising.

- 5.13 Any remaining sites where defence raising has not been implemented alongside development, other works or major projects, will need to be addressed through direct intervention in order to provide a contiguous defence. These interventions should seek to improve the riverside as much as is feasible in line with other policies in this strategy. The City Corporation as LLFA, will work with the Environment Agency as enforcement authority, to ensure that riparian owners are able to fulfil their legal responsibilities resulting in continuous protection from sea level rise along the City's riverside.
- 5.14 This strategic point will be a progression of SP 2,3 and 4 beginning at the start of the second epoch and will need to be completed by the first raising point. This will apply at discreet local sites along the length of the riverside.

SP5 Recommendations:

1. The City Corporation should produce tailored site-specific guidance on raising requirements through Flood Risk Briefing Notes for individual riparian sites. Detailed technical designs will be the responsibility of riparian owners.
2. The City Corporation should develop a riverside flood defence communication strategy targeted at riparian owners which aims to establish a partnership approach and raise awareness of the flood risk of individual sites.
3. The City Corporation should maintain an up to date record of flood defence levels to identify sites that will need direct intervention at key dates

IMPLEMENTATION APPROACH – Sequencing of flood defence raising SP6

SP6 - Sequencing of flood defence raising

Where stretches will require raising in both periods (2065 and 2100) riparian owners or their agents should consider the feasibility of implementing the complete raising in a single intervention and as a minimum demonstrate that the higher level of raising is achievable.

- 5.15 In the stretches which require the most raising it may be more economical and cause less disruption to implement raising to the 2100 level at the same time as the implementing the earlier level. This will be most appropriate where changes to associated structures with a design life that exceeds 2100 will also be required. As a minimum works to raising should demonstrate that further raising is achievable in future. In some locations it will be more appropriate to implement raising to the different levels at separate times, particularly where the design life expectancy of the defence structure may mean the asset needs replacing ahead of 2100.
- 5.16 The TE2100 Plan will be reviewed periodically to ensure its effectiveness in the face of climate change. The raising requirements are unlikely to change but the dates may be brought forward if sea level rise accelerates. This possibility should be considered when assessing each site.
- 5.17 This strategic point should be considered for all raising intervention types and will apply to all sites that require raising at the end of the first epoch.

SP6 Recommendations:

1. The City Corporation should use the review of the City of London Strategic Flood Risk Assessment to evaluate the feasibility of single or multistage interventions.

DESIGN

- 5.18 The City of London Riverside Survey report (Sept 2020) produced by Arcadis for the City Corporation includes a range of possible options for flood defence raising (appendix 2). Decisions on the most suitable option will need to be considered on a site by site basis taking account of engineering constraints,

permits and licenses, planning considerations, aesthetics and potential for co-benefits.

DESIGN – Flood defence and walkway continuity SP7

SP7 - Flood defence and walkway continuity

Where raising is being considered, either through immediate works or in preparation for future raising, sufficient consideration shall be given to the adjacent sites and walkway levels to ensure the continuity of the defence and the riverside walk.

- 5.19 Raising an individual stretch, either through development or as part of cyclical works will affect the surrounding defences and walkway levels, particularly if these also require raising. The boundary of defences should be designed to enable raising the appropriate level in future and landscaping should enable level access between sites for all stages of implementation. Similar consideration will be required when demonstrating the achievability of future raising.
- 5.20 The walkway level plays an important role in the users experience of the riverside and how it functions as a space. It affects both the loading on the riverside defences, the interaction with adjoining buildings and provides inherent resilience to flooding. Provided that the walkway height is at a suitable height future raising should be able to be achieved within the parapet in most cases. Establishing a walkway level early can also benefit maintaining the accessibility and continuity of the riverside path and access to riparian assets such as river steps, piers and jetties.
- 5.21 Approvals for such works must ensure that the continuity of the flood defence and walkway with adjacent properties is maintained and future raising of adjacent sections is not compromised. The historic nature of the walkway and implications for historic assets and archaeology will be a consideration in the development of proposals. Where practicable walkway access should also be maintained during construction.
- 5.22 This strategic point will apply going forward and will apply in locations where stand-alone raising or development take place. It will be a particular consideration for sites on the Local Authority boundary.

SP7 Recommendations:

1. The City Corporation should produce guidance on demonstrating the feasibility of future defence raising; which should include the need for suitable designs which ensure continuity of both the flood protection and the riverside walk whilst avoiding compromising future raising of neighbouring sections.
2. The City Corporation should update the Riverside Walk Enhancement Strategy to take into account the need to provide a continuous defence and inclusive access between sites.

3. The City Corporation will work with the EA to ensure that flood defence and walkway continuity are considered as part of the defence permitting and licensing scheme.
4. The City Corporation will work with the London Borough of Southwark to ensure that London Bridge and Blackfriars Bridge's southern bridgeheads continue to provide a continuous flood defence along the southern bank of the Thames.

DESIGN – Accessibility SP8

SP8 - Accessibility

Defence raising should maintain access to and improve the accessibility of the existing Thames Path along the City's riverside and enhance connections with the rest of the City, including during construction.

- 5.23 The Thames Path National Trail runs along the north bank and the City Corporation has successfully secured public access parallel to the river for much of this stretch. The current diversions are a distraction for users and diminish the linear form of the public realm. As well as being part of the national path the riverside should be considered an important local east-west walking route. In recent years the City Corporation has through implementation of the Riverside Walk Enhancement Strategy undertaken work to provide step-free access across the route and to riverside infrastructure including piers, jetties and lifts. Works to defence raising should not diminish this and where possible should improve accessibility through appropriate treatment of difference in walkway levels.
- 5.24 The City's riverside is separated from the rest of the City by a series of busy roads including dual carriageways and underpasses. At grade crossing points are infrequent and high-level walkways can be disjointed and difficult to navigate. Every opportunity should be taken to improve the connection of the riverside with the rest of the City through crossing points and opening up views of the riverside in between buildings.
- 5.25 This is a continuation of the City Corporation's existing approach and will apply along the full length of the City's riverside.

SP8 Recommendations:

1. The City Corporation should continue to secure public access to an uninterrupted riverside pedestrian route through implementing planning policy as part of the Thames Strategy SPD. This shall include seeking opportunities to improve connectivity between the City's riverside and the wider area.
2. The City Corporation should ensure that accessibility remains a focus of updates to the Riverside Walk Enhancement Strategy.
3. The City Corporation should produce planning guidance on demonstrating the feasibility of future defence raising. This will include a requirement to provide level access between sites and allow for further works where raising is

proposed to occur at different times. This will apply during construction and thereafter.

DESIGN – River safety SP9

SP9 - River safety

River safety must be of primary concern and must not be compromised in the design, construction and the ongoing use of the river, flood defences and riverside walk.

- 5.26 Through the Port of London Act 1968 (as amended), the Port of London Authority (PLA) has the primary responsibility of maintaining safe access and managing and supporting the safety of vessels, the general public and all users of 95 miles of the tidal River Thames. A PLA River Works License is required for all works on the riverside.
- 5.27 River Safety is of paramount importance and is dependent on a range of structures and riverside equipment including stairs connecting the foreshore to the riverside walk, access/egress ladders and grab chains along the whole length of the City's riverside. In addition, drowning and suicide prevention equipment such as lifebuoys, barriers and signs are key to preventing fatalities in the river. The PLA's 'A Safer Riverside' guidance (2020) provides best practice for developments alongside and in the tidal River Thames. The Tidal Thames Water Safety Forum's 'Drowning Prevention Strategy (2019)' gives further information on suicide prevention measures.
- 5.28 Designs for flood defence raising must ensure that river safety equipment is extended to the new flood defence height, including points for accessing to and from the foreshore. The effectiveness of the safety equipment must be retained throughout construction periods and ongoing maintenance regimes must be put in place.
- 5.29 This requirement applies along the whole length of the City's riverside and will take priority. Mapping, maintenance and inspection of river safety equipment will be particularly important as changes are made to the flood defences and adjoining riverside walk and foreshore

SP9 Recommendations:

1. The City Corporation should work with the Environment Agency licensing teams to ensure that work on the flood defences is conditional on the retention of functioning safety equipment throughout any works and ongoing maintenance thereafter.

DESIGN – Biodiversity SP10

SP10 - Biodiversity

Opportunities for terrestrial and aquatic biodiversity should be designed into flood defence raising and associated works to create a 'string or pearls' of habitats. Works

should consider future raising needs, be designed for future climate projections and not encroach into the river.

- 5.30 The River Thames is a site of metropolitan importance for nature conservation providing habitats and movement corridors for a range of species. As well as conserving existing natural capital features, such as established tree canopies, works on the riverside provide an opportunity to enhance this biodiversity and will be expected to deliver a net gain in biodiversity. As a south facing riverside the impact of climate change on heat stress will be a key issue as temperatures rise and periods of drought increase. Care must be taken to ensure that planting designs are suitable for the future climate and resilient to the pests and diseases that will become more prevalent.
- 5.31 For development sites a target Urban Greening Factor of 0.3 has been set in the City Plan 2036 Other sites should aim to achieve this level of greening where possible. All development and sites should aim to deliver a net gain in biodiversity through improvement or maintenance works and consideration should be given to the Biodiversity Action Plan 2021-26 (BAP). Aquatic environments should be a focus for achieving Biodiversity Net Gain for riverside sites.
- 5.32 [Estuary Edges](#) guidance, coordinated by the Thames Estuary Partnership, provides a set of design principles which will maximize the ecological value of the riverside on both the land and in the water. A key concept within the guidance is the creation of a 'string of pearls' of habitats, meaning that all intervention can contribute to wider improvements to biodiversity.

SP10 Recommendations:

1. The City Corporation should incorporate the estuary edges guidance as appropriate into the Riverside Walk Enhancement Strategy and other guidance as applicable.
2. Those undertaking work to the flood defence should seek expert ecological advice when designing works on the riverside to maximize natural capital benefits, deliver net gains in biodiversity and ensure the longevity of planting in the face of climate change.

DESIGN – Historic environment SP11

SP11 - Historic environment

The significance of the heritage assets, including their setting, on the riverside must be protected and enhanced and opportunities for education and interpretation included wherever possible.

- 5.33 The rich history of the City's riverside is obscured by layers of development and visible only as glimpses in certain areas. The flood defence walls and associated structures are listed in some locations e.g. Victoria Embankment and there are scheduled ancient monuments at Baynard House and Queenhithe Dock. Many

riverfront buildings and structures are designated heritage assets, listed buildings or Scheduled Monuments and may be in conservation areas. There are also areas of significant archaeological potential and non-designated assets.

- 5.34 Proposals that may alter or affect heritage assets would need careful consideration of potential options and their impact to protect the special architectural and historic interest of a listed building. Where works involve disturbance to the foreshore, permissions, licenses and permits will be required and any archaeological finds must be recorded with the Museum of London.
- 5.35 This strategy provides a significant opportunity to incorporate education and interpretation along the riverside through temporary and permanent exhibitions and signage.

SP11 Recommendations:

1. The City Corporation's design and archaeology team, Historic England and the Museum of London must be consulted during the design stage for all works on the City's riverside and their recommendations agreed and implemented.
2. The City Corporation should include sections on historic sensitivity in the Flood Risk Briefing Notes for individual riparian site.

DESIGN – Buildings, facilities and infrastructure interfaces SP12

SP12 – Buildings, facilities and infrastructure interfaces

Designs must take account of the interface between buildings, riverside facilities, infrastructure, walkways and flood defences to maintain functionality, accessibility, and views of the Thames.

- 5.36 The buildings along the Thames riverside have many points where they interface with the river and riverside environment. This includes entrances and thresholds which align with the walkway levels, window heights which allow views towards the river and in some cases steps down to the river. In some areas, basements will be within the zone of the defence structure. As the flood defences and walkways are raised buildings will need to be designed or modified in relation to the new levels.
- 5.37 The City's riverside has a number of marine structures and infrastructure that provides facilities for river use. This includes the Safeguarded Walbrook Wharf, Blackfriars Pier, Crown Pier and several other mooring points, including private facilities and infrastructure not currently in use. Defence raising works could present an opportunity to increase the provision of riverside facilities.
- 5.38 The flood defences also accommodate infrastructure such as sewer outflows, as well as moorings and access piers for river craft. Designs must incorporate the necessary infrastructure for continued use of these facilities and riparian owners should work with infrastructure owners and providers to achieve this.

When new infrastructure is required its design should take account of future defence raising.

- 5.39 From now onwards whenever changes to buildings, facilities and infrastructure are undertaken through redevelopment, refurbishment or maintenance, the relationship to the 2100 flood defence levels must be considered through design. For some areas this will require minimum intervention whilst others will need significant alteration. The defence raising requirement map provides an indication of the most challenging areas where maximum defence raising is required. Special attention must be given to historic buildings to ensure that historically significant features are conserved or enhanced through this process.

SP12 Recommendations:

1. The City Corporation should produce planning guidance on demonstrating the feasibility of future defence which will include building and infrastructure interfaces
2. The City Corporation as LLFA and the Environment Agency, as part of its riverside flood defence communication strategy, should engage with riparian owners to highlight future requirements and encourage them to take action ahead of the deadlines for flood defence raising. A riverside partnership would facilitate collaborative working between affected riparian owners.

DESIGN – River views SP13

SP13 - River views

All works on the riverside must be designed to maintain views of the river from pedestrian walkways, seating areas, buildings and the lanes and passages between buildings

- 5.40 Views of the River Thames from the riverside walk, adjacent seating areas and glimpsed between buildings provides a unique context for the southern part of the City. Insensitive flood defence raising could obscure views of the river and the rich range of activities it supports. The opportunity to view the river from ground and first floors of riverside buildings and the public realm is greatly valued by occupants and should be incorporated into designs taking account of future defence raising needs. Views for wheelchair users and children should be maintained.

SP13 Recommendations:

1. The City Corporation should incorporate guidance on the importance of river views into the Flood Risk Briefing Notes for individual riparian sites.

DESIGN – Flood defence and edge protection SP14

SP14 - Flood defence and edge protection

Works to the riverside must result in a functional flood defence, effective edge protection and should incorporate principles of good riparian design.

- 5.41 The flood defences and edge protection measures are a significant element in the riverside public realm, affecting user experience of the riverside walk. With notable exceptions the flood defences also form the edge protection to prevent people from entering the water. In some places the edge protection takes the form of railings or parapets above the functional flood defence. As a general principle, the edge protection should prevent people from climbing over, through or ducking under but should allow safe egress from the tidal River Thames or the foreshore. Parapets should be designed to act as a barrier that prevents anyone from sitting or climbing on them.
- 5.42 Raising the functional flood defence will result in changes to the edge protection in places, for example by replacement of railings with a solid structure. These changes will impact on the feel of the associated riverside and should be designed sympathetically to the surrounding site. Raising could also impact the surface water drainage arrangements for the riverside by disconnecting the direct route to the river.
- 5.43 Taking into account the other design related strategy points, proposed works should apply the principles of good riparian design to ensure that appropriate designs are implemented.
- 5.44 This strategic point is a continuation of the existing planning and corporate policy and corporate policy and will apply to all stretches requiring raising.

SP 14 Recommendations:

- 1. The City Corporation should produce guidance on demonstrating the feasibility of future defence raising which promotes best practice in riparian design and that this should be incorporated into future updates of the Riverside Walk Enhancement Strategy.

DESIGN – Lighting SP15

SP15 - Lighting

Suitable lighting must be maintained along the riverside but lighting columns should be removed from the flood defence structures, to enable future raising, unless they are of historic significance.

- 5.45 The flood defence wall throughout most of its length supports lighting columns some of which are of historic significance. This will present challenges to incremental raising of the flood defence for 2065 and 2100 requirements. As a general principle, lighting columns should be removed from the flood defence structures unless they are of particular historic significance e.g. Sturgeon Lamps. The City Corporation has published a [Lighting Strategy](#) including recommendations for lighting of the City's riverside (section 4.3.14). Designs should comply with this guidance whilst maintaining continuity along the

riverside, due regard should also be given to impacts of lighting on ecology and to ensure that there is no negative impact on river navigation.

- 5.46 Subways and underpasses present opportunities for lighting to the walls as well as bridge soffits to help create positive thresholds for pedestrians after dark.
- 5.47 Undercrofts may present challenges where flood defence raising reduces light level during the day. Maximum natural light and views of the river should be maintained by using glass for raising where possible.

SP15 Recommendations:

1. The City Corporation team should ensure that future updates of the lighting strategy and riverside walk enhancement Strategy retains historic lighting but enables incremental raising of the flood defence structures
2. Those undertaking works to the flood defence should retain or reposition lighting structures of historic significance to enable flood defence raising.

FUNDING SP16

SP 16 - Funding

The City Corporation will work with the Environment Agency, Defra, the Greater London Authority and riparian owners to explore effective funding mechanisms for future flood protection to combat sea level rise in line with the TE2100 Plan.

- 5.48 A key issue that has arisen throughout discussions on implementing the Thames Estuary 2100 Plan is that of funding and who will be responsible for funding the required works.
- 5.49 The [Metropolis Management \(Thames River Prevention of Floods\) Amendment Act 1879](#) requires riparian owners to carry out flood works maintaining the flood defences that they own. The act defines flood works as follows: *The expression "flood works" means the entire or partial construction, alteration, reconstruction in the same or any altered position of any bank and the repairing, raising, strengthening improvement or removal of any bank and the enlargement, contraction, raising, lowering, arching over, improvement or alteration of any sewer, channel or water course, and the discontinuance, closing up or destruction of any such sewer channel or watercourse necessary for the protection of lands within the limits of this Act from floods or inundations caused by the overflow of the River Thames.*
- 5.50 For the City's short stretch this would apply to over 20 riparian owners. The costs for each riparian owner will vary depending on the length of flood defence, the level of raising required, the opportunity to incorporate raising into other planned works and the degree to which they incorporate other benefits. Other potential options for funding include the use of a Community Infrastructure Levy which could be applied to all areas that would benefit from the improved flood defences. Alternatively, the flood defence raising could be centrally funded as a nationally significant infrastructure project or through flood defence grant in aid with contributions from beneficiaries. Exploration of these options is outside

the scope of the City Corporation's strategy and must be considered at a wider scale. The City Corporation will seek to carry out a cost benefit analysis for some City Corporation owned sections of the flood defence. This will provide evidence for funding discussions, and a realistic picture of potential costs to riparian owners of implementing the TE2100 Plan.

- 5.51 Some riparian owners may challenge the legal basis of this requirement and the degree to which other TE2100 planned works such as replacement of the Thames Barrier should prevent the need for local defence raising. The logistics of ensuring that the whole of the flood defence is raised to the required level and connected to adjacent stretches will be a challenge. There is a danger that lack of funding will result in riparian owners failing to adequately complete this task. There are also challenges in establishing ownership and riparian responsibility, particularly where flood defence structures are not associated with adjacent buildings or extend over the riverbed or where lease arrangements are in place.

SP15 Recommendations:

1. The Environment Agency should work with central Government, the GLA, LLFAs and riparian owners to establish what level of financial support will be needed to implement the TE2100 riverside strategy approach.
2. The Environment Agency, Defra or GLA should develop a mechanism for Thames wide financial support to ensure that flood protection is not compromised by lack of funding.
3. The City Corporation should seek to carry out a cost benefit analysis for raising of some City Corporation owned sections of the flood defence.
4. The City Corporation as LLFA should assist with funding applications for the raising of flood defence infrastructure.

GOVERNANCE and STRATEGY REVIEW SP 17

SP17 - Governance & strategy review

The Planning & Transportation (P&T) Committee, supported by the officer level Flood Risk Steering Group, will oversee the implementation of this strategy which will be reviewed at least every 10 years.

- 5.52 Sea level rise and other climate impacts are dependent on the global effort to reduce carbon emissions in line with the Paris Agreement. Ten-year reviews of the UK Climate Projections (UKCP18) and the Thames Estuary 2100 Plan will highlight changes in the speed of sea level rise. This in turn will influence the dates when action is needed for local flood defences. If sea level rise accelerates the dates may be brought forward rather than the actions changing. Alongside this the City Corporation has committed to reviewing its Strategic Flood Risk Assessment every five years providing local data to inform this strategy. These sources of evidence are essential to ensure that the City's response takes account of the latest climate data.

5.53 The City Corporation's actions as Lead Local Flood Authority have been delegated to the P&T Committee. The actions outlined in this strategy will be implemented and monitored through the City Corporation's statutory Local Flood Risk Management Strategy (LFRMS) reporting progress annually to the P&T Committee, the Environment Agency and Defra.

SP16 Recommendations:

1. The City Corporation will keep up to date with climate impacts on the City's riverside through a range of evidence sources and review this strategy at least every 10 years.
2. Implementation, monitoring and reporting will be through the LFRMS and will be overseen by the officer level Flood Risk Steering Group and P&T Committee.

6. IMPLEMENTATION, RESOURCES and RISKS

6.1 The implementation of this strategy will be led by the City Corporation in its statutory roles as Lead Local Flood Authority and Local Planning Authority. The adopted Local Flood Risk Management Strategy 2021-27 (LFRMS), which is a requirement of the Flood and Water Management Act 2010, includes a commitment to prepare a Riverside Strategy. This strategy 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.

6.2 Where recommendations relate to external bodies, existing partnerships and relationships shall be used where possible to facilitate these actions. Governance structures, confidentiality agreements, and memorandums of understanding will be used where necessary to facilitate partnership working, setting out the key objectives, working arrangements, decision making processes and any dispute resolution for the duration of the collaboration.

6.3 The City Corporation has developed a range of resources which have informed this strategy and are available on request:

- Drone video showing the City's riverside – July 2020
- Point cloud of the flood defences and riverside - July 2020
- Survey report including details of the flood defence structures and possible raising options 2020
- Flood Risk Briefing Notes for individual riparian sites on the City's riverside
- City of London Strategic Flood Risk Assessment
- Strategic Environmental Assessment SEA and Equalities Test of Relevance

6.4 This strategy has been developed in response to Corporate and Departmental risks relating to climate change and flood risk. The strategy seeks to provide

both appropriate flood defences and shape an outstanding riverside space. Without appropriate flood defences, there is a risk of damage to property and infrastructure and potential loss of life through catastrophic flooding. If opportunities are missed to shape an outstanding riverside space, the experiences of riverside users will be greatly diminished with an impact on the City's reputation. This could also represent a failure to realise the full potential of the City's riverside as a strategically important asset.

- 6.5 There remains substantial uncertainty with regards to the speed and impact of sea level rise and the implementation, funding and future legislative requirements of the Thames Estuary 2100 Plan. This strategy has been developed fully acknowledging this uncertainty (and also the adaptive approach of the wider plan) and has been written to enable future flexibility while still allowing practical interventions now. However, this uncertainty still represents a risk to the successful implementation of this strategy.

7. APPENDIX 1 Where are we now – Riverside maps

See separate document