

Placemaking Opportunities

Bristol Avon Flood Risk Management Strategy




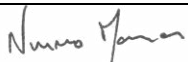
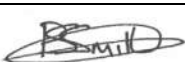

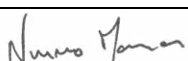
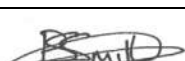

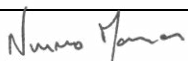
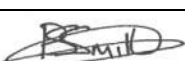

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Bristol City Council, supported by the Environment Agency, have an aspiration to ensure that raised flood defences built as a result of the Bristol Avon Flood Strategy become integrated into wider multi-functional public realm infrastructure. This report has been produced to consider the potential opportunities for the flood defence design to be integrated within meaningful public spaces, exploring the role and synergies between grey and green infrastructure in urban environments.

The Bristol Avon Flood Strategy sets a strategic approach; there are no detailed proposals at this stage. This placemaking opportunities report sets out aspirational opportunities not “designs”. Where the proposals pass through areas of growth and regeneration such as Western Harbour and Bristol Temple Quarter/St Philips this study has set out various integration options and approaches, for consideration in future masterplanning and design development.

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Introduction

Bristol City Council is working with the Environment Agency and other partners to create a long-term strategy for managing the flood threat from the River Avon, supported by Arup. The strategy will outline actions to be taken in phases to reduce the chance and impact of flooding from the River Avon, and how each phase will be funded.

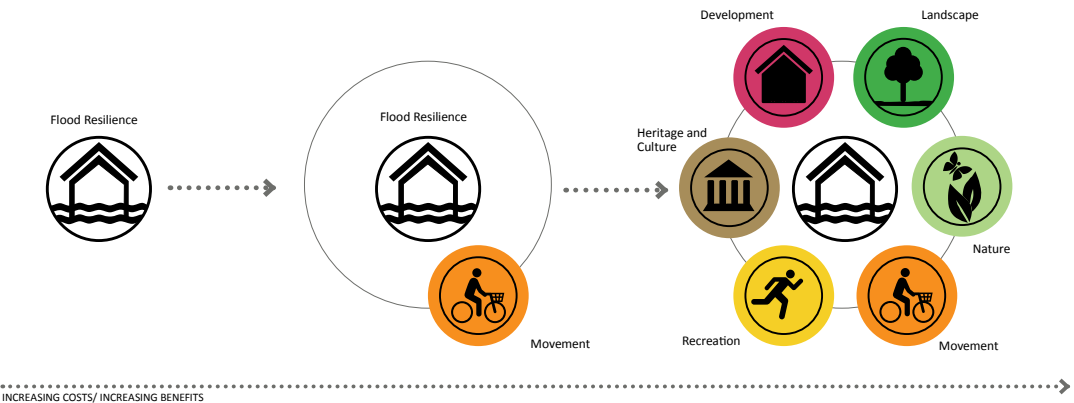
The project’s objective is for the provision of infrastructure to manage the risk of flooding of the centre of Bristol from the River Avon and to seek potential placemaking opportunities for inclusive growth, quality of life, environment and resilience.

We see placemaking as people-centric design. This means that throughout this document we will be looking at capitalising on the creating of meaningful public spaces that cater for people’s health, wellbeing and happiness, whilst seamlessly integrating flood defences. They can also be integrated with other development opportunities and masterplans. Placemaking also integrates transport links and the historic and natural environments. This approach is reflected in the diagram below.

This report builds on the work done previously by Bristol City Council and looks at potential and aspirational opportunities for placemaking and wider benefits. Previous work includes New Cut Greenway Place Concept (NCGPC), the BCC River Avon Heritage Assessment and AECOM’s tidal strategy. The NCGPC provides detailed analysis of the site, which has been re-used in this document, including the definition of character areas and opportunities and constraints diagrams.

To support this early stage of the Business Case, but still provide enough detail on the look and feel of the potential placemaking opportunities, an approach has been agreed during workshops with Bristol City Council to use previous work, focusing on developing a series of typologies of interventions, which reflect broad character areas, and that can be rolled out throughout the scheme. Therefore, using the NCGPC document as a base, the site was divided into 4 character areas and within each a design solution has been explored. The benefits that these strategic opportunities will bring are articulated below.

Design Approach (extract from the NCGPC report, p.18)



Objectives

This scheme provides a unique opportunity to re-think the role and synergies between grey and green infrastructure in urban environments and in particular Bristol, with the objective of improving people’s lives, beyond the flood resilience aspect.







Below is a list of strategic objectives that the flood strategy aims to achieve:

- To support the safe living, working and travelling of people in and around central Bristol by ensuring flood threat is reduced and that measures address residual risks.
- To facilitate sustainable growth of Bristol and the West of England by supporting opportunities for employment and residential land and infrastructure
- To maintain natural, historic, visual and built environments with the waterfront corridor and where possible deliver enhanced recreational, heritage and wildlife spaces.
- To ensure navigation of the river and marine activities continues.
- To ensure the options are technically feasible and deliverable.

The placemaking opportunities explored in this document will be assessed against three further objectives:

- To enhance walking and cycling links to enable greater access to opportunity work and housing.
- To bring existing communities closer together, as well as providing the opportunity to unlock new housing development land and attract residents, businesses and visitors.
- To deliver enhanced recreational, heritage and wildlife spaces, to create healthier and more resilient communities, particularly those with higher inequality or limited access to green space.

The Benefits (extract from the NCGPC report, p.19)

Heading	Social	Economic	Environmental
 Development: supporting economic vibrancy by providing the waterfront setting for existing and future major development sites.	New development establishes new communities and can create new destinations; increase activity and liveliness and natural surveillance of the public realm	Increased quality development promotes development and increases values and footfall for local businesses	Delivers a high quality, sustainable public realm that balances development, movement and nature
 Landscape: creating a publicly accessible, linear greenspace; connecting healthy and well communities across the city.	As green infrastructure, landscape positively affects both mental and physical health	Landscape can provide a high quality, natural setting that increases land values and inward investment	Helps to mitigate climate change and air pollution through new tree planting
 Movement: connecting people and jobs through enhanced walking and cycling links.	Active travel choices increase levels of activity and fitness, and the physical and mental health and wellbeing of the population	Providing better active transport choices helps to reduce motor vehicle usage and highway maintenance, with the associated cost benefits	Reduces motor vehicle use which will reduce air pollution and improve air quality
 Heritage and Culture: protecting and conserving Bristol’s harbour heritage. Supporting the visitor experience. Fostering opportunities to integrate public art.	Cultural heritage tells the story of places and communities by providing contextual identity	Stabilisation, repair and reuse of historic assets is a cost effective, sustainable approach	The repair, reuse and integration of historic assets is key to creating a quality environment, and helps to reduce the environmental impact of construction
 Recreation: encouraging social and physical activity by designing in sociable places, fitness trails and resting spaces.	Fitness and play enhances and promotes healthy lifestyles and social activity	Encouraging a healthy population through recreation choices helps to reduce the costs of health care	Increased activity and liveliness in urban areas enhances a sense of ownership of the public realm
 Nature: providing habitats and food for wildlife to enhance the biodiversity of the river corridor, and the movement of nature through the city.	Connection to nature has a positive affect on the mental and physical health of people	Nature based design approaches can reduce maintenance and operation costs	Reduces/ mitigates biodiversity lost through development

Character Areas

WESTERN HARBOUR

This area is characterised by the presence of large infrastructure such as roads and bridges and industrial buildings such as the bond warehouses. It is where the New Cut and the Floating Harbour come together and therefore there is a large constant presence of water. Historically this is a very important area, being within a Conservation Area and with links to the nationally historic engineers of William Jessop (1745 to 1814) and Isambard Kingdom Brunel (1806 to 1859). It is the most iconic gateway to Bristol with privileged views of the Clifton Suspension Bridge. The road infrastructure integration has been done by a prominent landscape architect, Dame Sylvia Crowe.

WESTERN CORRIDOR

This area extends from the western end of Cumberland Road up to Temple Meads station in the east. It is characterised by a linear nature and consolidated urban development in close proximity to the River Avon. The few brownfield sites left are being developed currently. There are two major road crossings from the city centre to Bedminster and Totterdown as well as three iconic wrought iron pedestrian bridges. North South links are very important in this area as are East West links along Cumberland Rd and Coronation Rd, which connect Temple Meads to Ashton Gate and Ashton Court. A series of tourist destinations can be found along this corridor such as the SS Great Britain, the historic Working Docks, the Mshed and Industrial Museum. The more recent Whapping Wharf development is also an attraction. All of the above destinations are in easy reach and within walking distance of Temple Meads.

There is an 1.8 mile long low level path, “the Chocolate Path”, that runs for part of the Western Harbour before running under Commercial Rd towards Bathurst basin. It has been traditionally used for cycling and walking between Temple Meads and Western Harbour. It is adjacent to the route of Brunel’s historic railway line that fed goods from the Americas into the heart of Britain via Temple Meads.

EASTERN CORRIDOR

The Eastern corridor extends from Temple Meads station on the west to Netham weir. This area is characterised by a strong presence of industrial uses with low quality buildings and warehouses. Most of the area turns its back to the river, particularly along the northern bank. As a result this area is not inviting or attractive for recreation, with the exception of Spark Evans park, and is a haven for fauna and flora. In contrast to the Western Corridor’s New Cut, here the River Avon retains its naturally winding character, which turns the River Walk into a journey of discovery. The river path is often very narrow, particularly when shared with cyclists. A large number of bridges cross this area, establishing North South links for pedestrians and vehicles, as well as the railway link east towards Bath.

NETHAM LOCK

This area includes the lock at the junction of Feeder Road and Netham Road, immediately south of Netham Park. This is where the River Avon diverges into the Feeder Canal. The south of this area has a strong industrial character, similar to the Eastern Corridor area, however this is balanced by the presence of the naturalised vegetated slopes of Netham park, to the north of the Feeder Canal. This area is not a destination per se, apart from Netham Park, with the main interest points being the lock and weir. The historic lock gates and house are grade II listed and part of the Avon Valley Conservation Area. The road infrastructure from the 70’s also has a strong presence with imposing concrete arches of the New Brislington Bridge.



Character Areas

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

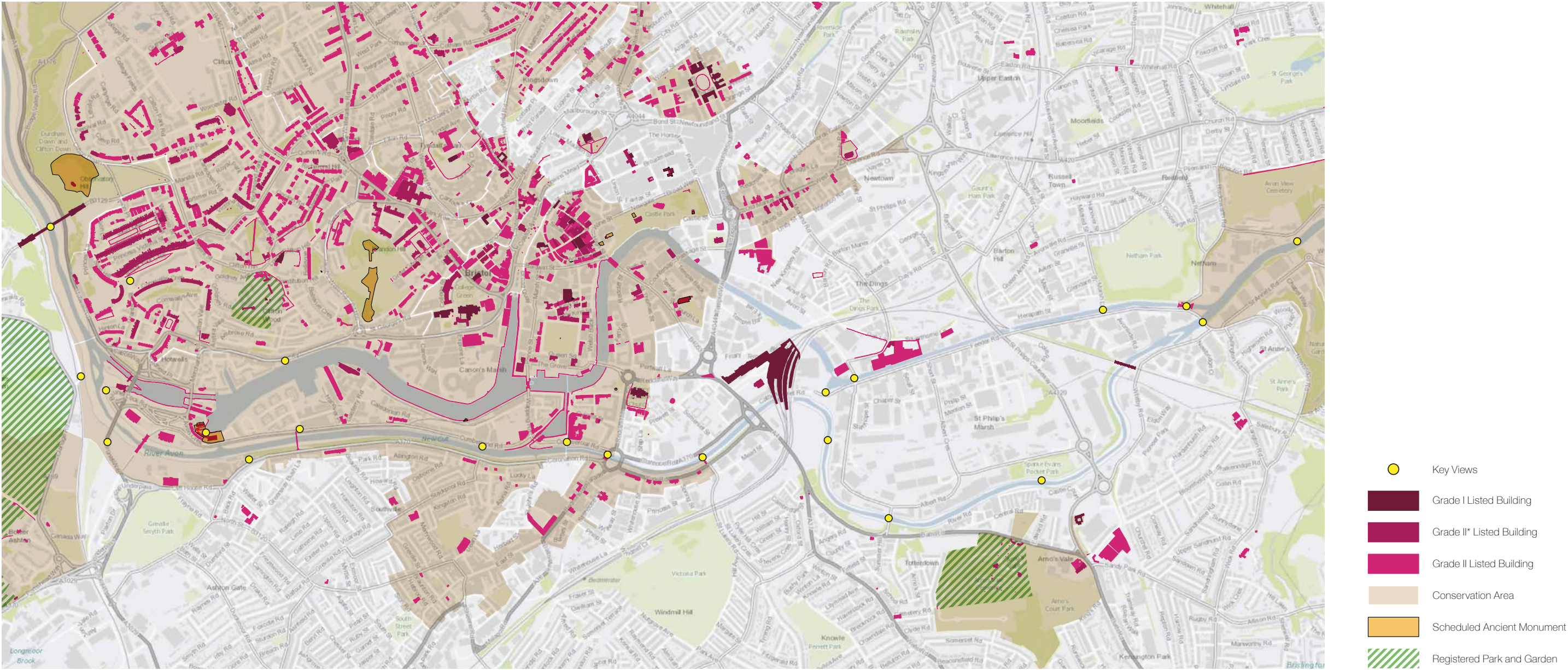
Heritage Context

HERITAGE ASSETS

There is a strong heritage presence throughout Bristol city centre and along the extents of the proposed flood defence scheme, particularly at the Western Harbour, Western Corridor and Netham Lock character areas. Most of these are within Conservation Areas and have several listed buildings or structures near the River, as the plan below illustrates.

KEY VIEWS

Views are one of the key aspects that help defining the experiential value and aesthetics of any area. They can be panoramic or focused on a singular landmark. The design of the flood defence proposals can and should contribute to the preservation and enhancement of key views, as well as looking for opportunities to reveal new ones. A series of key viewpoints is highlighted in the plan below, in line with previous conservation area character appraisals from Bristol City Council. The impact on these views, and any others considered relevant, will require assessment as part of any future proposals.



Heritage Designations and Assets

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Opportunity Areas


GREEN AND BLUE INFRASTRUCTURE

The diagram below reveals the network of green and blue infrastructure assets present in Bristol’s city centre and its immediate vicinity, including local green spaces and watercourses. The river Avon corridor is instrumental in establishing these connections both E-W and N-S. A fully integrated network of green corridors will generate health, wellbeing, movement and biodiversity benefits for the city as well as improving its resilience in the face of the climate emergency.


PUBLIC SPACE IMPROVEMENTS

The flood defence scheme provides the opportunity to establish a sequence of key areas, dotted along the river corridor, to implement public space improvements. These areas are located at strategic nodes, with potential to establish strong connections with the wider urban areas and to function as gateways. The diagram below reveals how the key opportunity areas interface with the areas of growth and regeneration at Western Harbour and St Philips Marsh and highlights the potential for connectivity enhancements along the E-W river corridor with N-S links into the city centre.


BENEFITS




Landscape




Development




Heritage and Culture



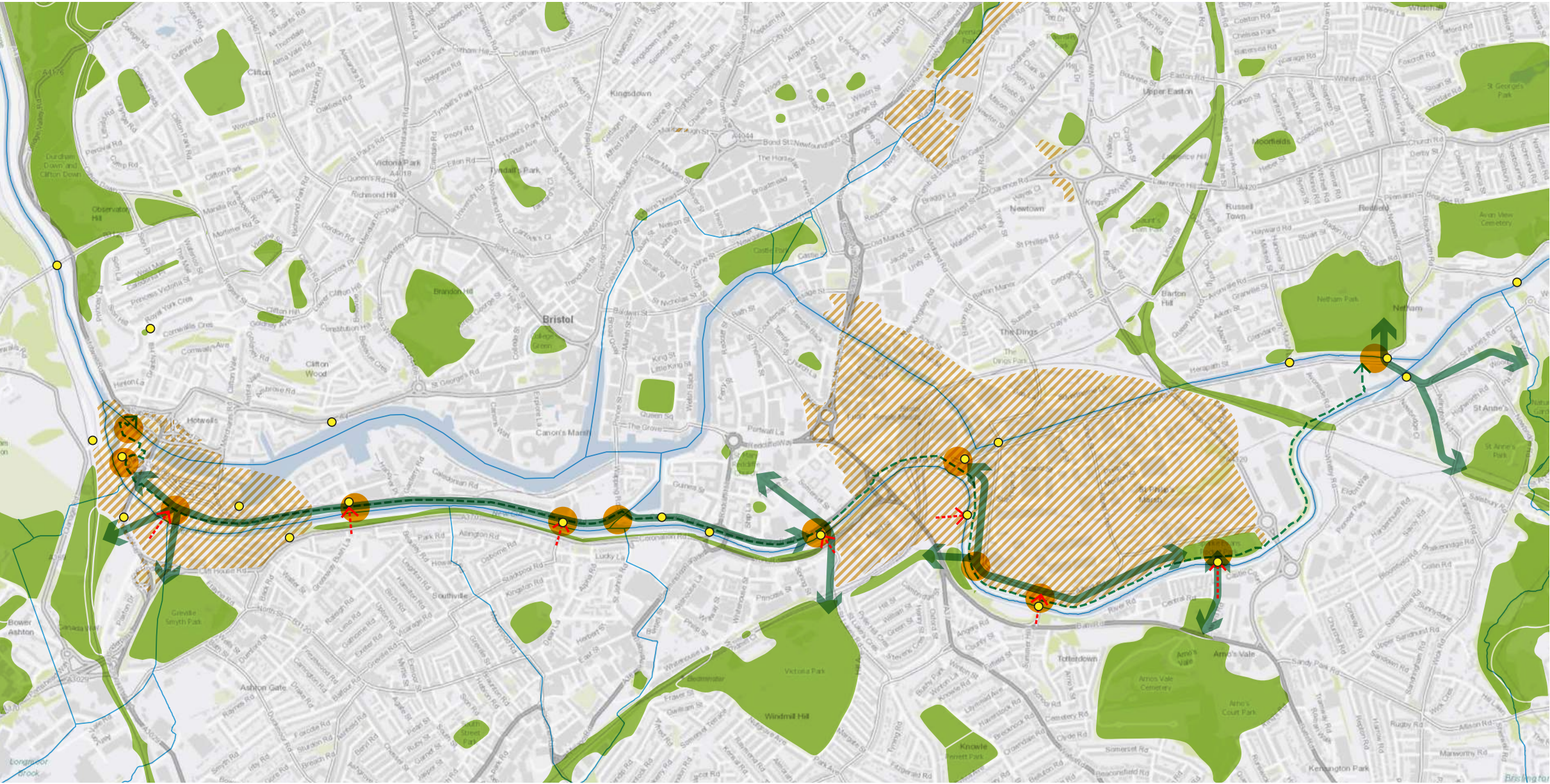
Recreation



Nature



Movement



Key opportunity areas

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Flood defences

The main driver of the scheme is to manage the risk from the River Avon flooding the centre of Bristol. Flooding events will become more severe and more frequent in the future, increasing disruption to the city and affecting businesses, homes, transport links and heritage features. The images across show the predicted present-day impact of a 1 in 200 year flooding event.

Protection from these will be achieved through constructing flood defences in the short term (2020s), which can then be further raised in future (2060s). This approach ensures appropriate flood protection is in place when needed, while being adaptable enough to fit in with the changing landscape of Bristol over the next hundred years. The height of defences will be influenced by the economic assessment, affordability, benefits and consideration of visual impact.

This scheme focuses on the centre of Bristol as this is where flooding will have the greatest impact, but measures are incorporated both upstream of Netham Lock and downstream in Shirehampton, Pill and Sea Mills to ensure there is no increase in risk to these areas.

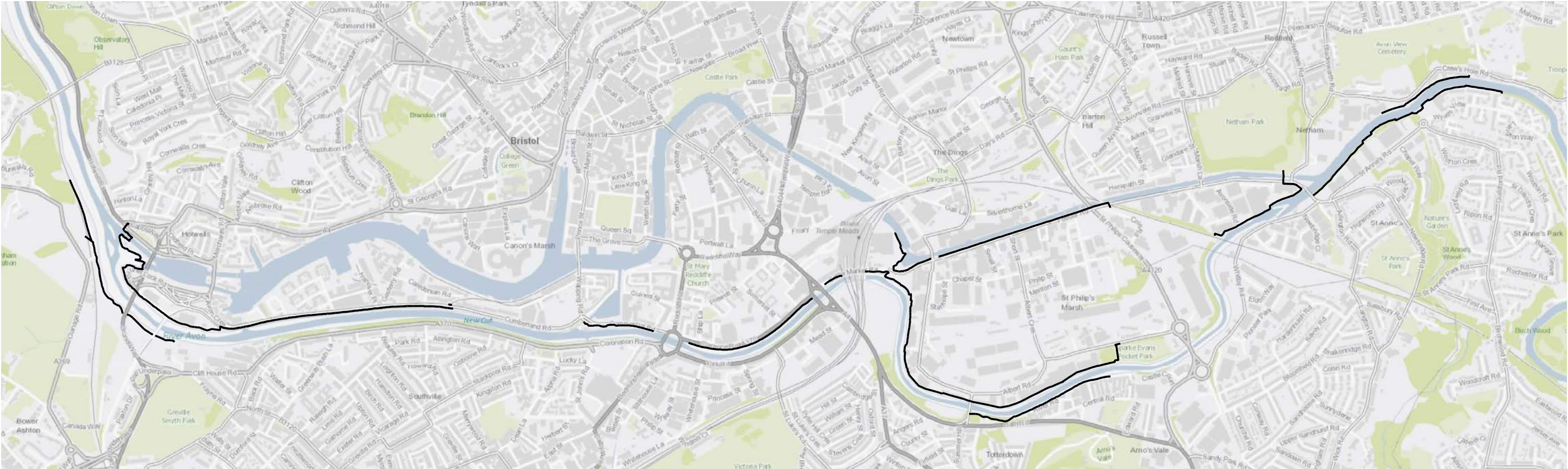
The strategy can be delivered using a variety of mechanisms, incorporating both public and private developments. As well as providing flood defence, the scheme provides an opportunity to align with inclusive growth, improved quality of life, recreation and green transport links.



BCC Flood visualisation - Cumberland Basin present day severe tidal flood (1 in 200 annual chance)



BCC Flood visualisation - St Philip's Marsh present day severe tidal flood (1 in 200 annual chance)



Flood defence locations

Design Integration Strategies

To improve the integration of the flood defence into the surrounding landscape, a series of design strategies can be considered. The icons below identify general solutions which could be implemented separately or in combination throughout the scheme in particular locations. These range from creating more space for recreation near the water setting back defences from the river, raising the ground or road behind them to reduce the relative height of the defences, retaining important views through the use of reinforced glass walls as part of the raised defence measures or using measures to disguise the flood defences. These help to sustain the views and connection to the waterfront whilst enhancing amenity but increase costs, so the decision will have to weight which aspects and components of the design are the most important to each particular area. The design should also be informed by a landscape and visual impact assessment, local engagement and consultation.

BALCONIES



BENEFITS

- Helps to emphasize important views
- Increases usable public space
- Introduces interest and improves the experience along the riverside

CHALLENGES

- Potential complexity and cost of works
- Marginal increase water movement

BOARDWALKS



BENEFITS

- Allows connectivity where space is limited

CHALLENGES

- Complexity and cost of works
- Doesn't perform as a flood barrier on its own
- Marginal increase water movement

SUBMERGIBLE PATHS



BENEFITS

- Maximises amenity value and seasonal use of space
- Allows proximity and easy access to the water's edge

CHALLENGES

- Likely to require maintenance following flood event

TERRACING



BENEFITS

- Helps to reduce the perceived height of the wall
- Allows views over the wall
- Creates seating opportunities

CHALLENGES

- Construction footprint and cost

DISGUIISING WALLS



BENEFITS

- Flood structure disguised as planter, seat or boundary wall
- Provides other functions and increases amenity value

CHALLENGES

- Can only be applied in locations where low walls are effective

RAISING INFRASTRUCTURE



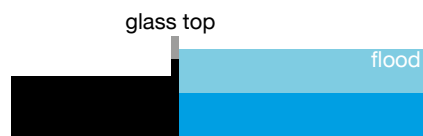
BENEFITS

- Applied to existing roads, railways or footpaths
- Minimal additional footprint required

CHALLENGES

- Potential complexity and cost of works

RETAINING SIGHTLINES



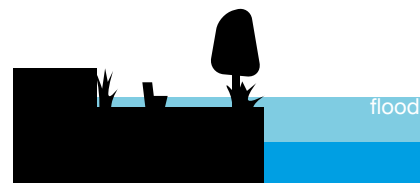
BENEFITS

- Retains important vistas
- Reduces height of wall perception
- Sympathetic solution within heritage areas

CHALLENGES

- Likely to require cleaning following flood event
- Requires water tight specialist product

SUBMERGIBLE FURNITURE AND VEGETATION



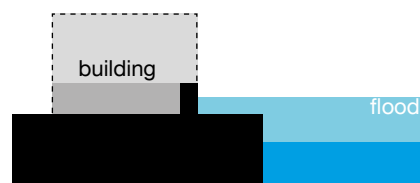
BENEFITS

- Maximises amenity and recreation opportunities

CHALLENGES

- Requires the use of robust furniture and appropriate species
- Likely to require maintenance following flood event

INTEGRATED INTO NEW DEVELOPMENT



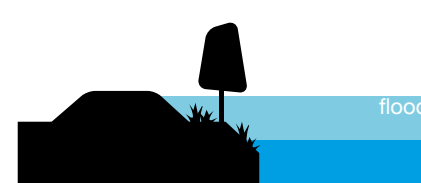
BENEFITS

- Maximises building development
- Wall integrated into building

CHALLENGES

- Loss of active frontage
- Required maintenance works are integral to building envelope

EMBANKMENT



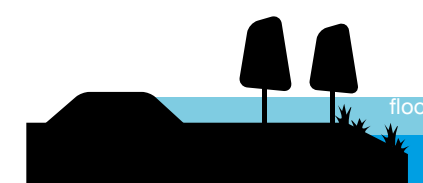
BENEFITS

- Natural appearance
- Could be integrated into existing parks

CHALLENGES

- Requires large footprint

SETTING BACK EMBANKMENTS



BENEFITS

- Natural appearance
- Could be integrated into existing parks
- Slight increase on water storage capacity
- Helps reducing the movement of water

CHALLENGES

- Requires large footprint
- Likely to require maintenance following flood event

RAISING HISTORIC FEATURES lock gates and walls



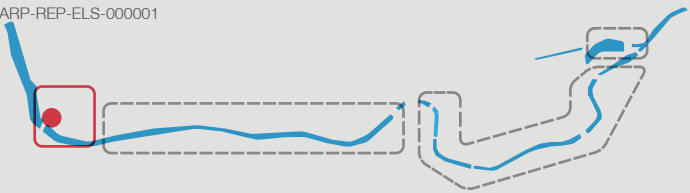
BENEFITS

- Integration into existing structures
- Minimal additional footprint required

CHALLENGES

- Potential impact on listed structures
- Complexity of the works
- Additional consents required (Heritage)

WESTERN HARBOUR

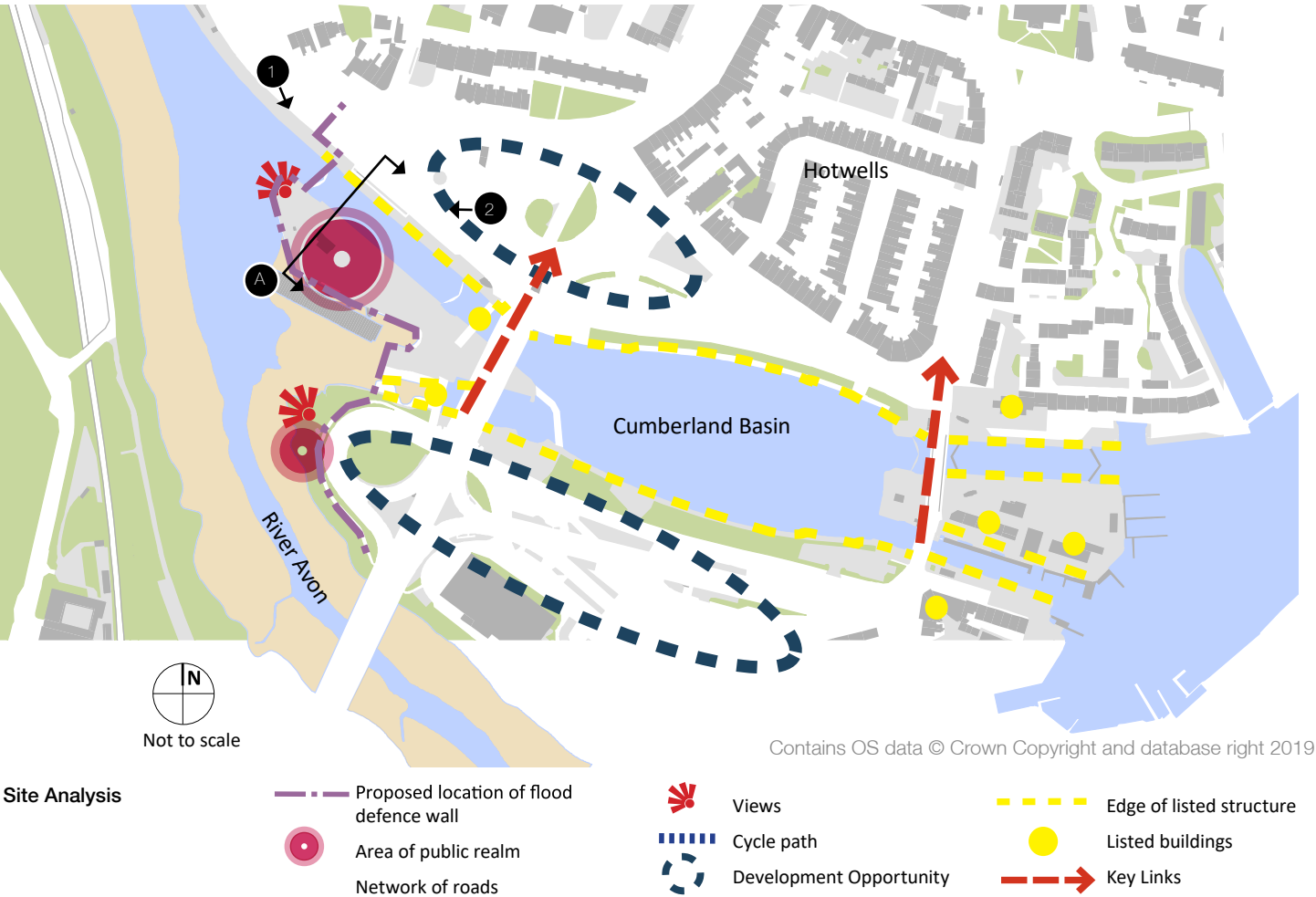


Western Harbour - The Knuckle

This area, also known as the “knuckle”, presents the largest opportunity to create a space that allows for gathering of groups, events, promotion of the city’s heritage and recreation. From here, one can afford some of the most iconic views of Bristol towards the Clifton Suspension Bridge and the colourful terraced houses of Clifton Wood and Hotwells. The space is used by runners and walkers, mostly passing by without stopping for too long. There is a lack of seating areas and other general amenities. Brunel’s tubular iron bridge is a neglected historic asset which has the opportunity to be turned into a focal point and attraction.

The layout of the road and land use in the area is under review by BCC.

The flood defence may have to be integrated into any plans or installed in advance depending on the programme and agreed interface arrangements with any regeneration proposals of the area. A joined up approach is advisable to make overall cost savings and to maximise benefits but it is paramount that the flood defences are installed within the timescales required. Incorporation of the agreed approach will have to be set into planning policy.



Entrance lock view towards Clifton suspension bridge..
By Jezhotwells - Own work, CC BY 3.0

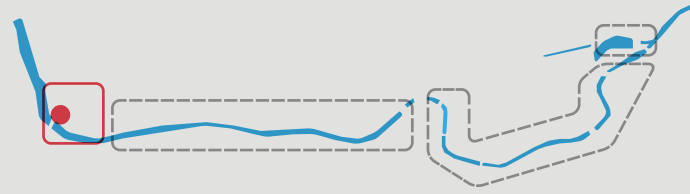


Brunel's tubular wrought iron bridge.
By Andy Dingley - Own work, CC BY-SA 3.0,

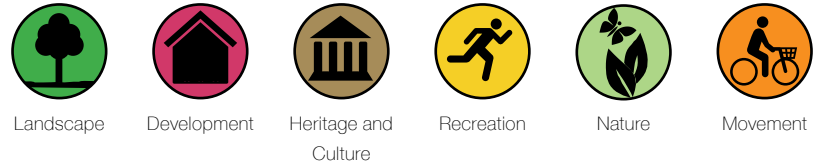


View of Clifton and Hotwells skyline

WESTERN HARBOUR



BENEFITS



Birdseye view 1
Visualisation of aspirational opportunity

The image to the left shows how the flood defence (shown in dashed red) could be integrated into the public realm. The modelling done for the next 50 years results in a wall which is approximately 2m above existing ground level. A standalone structure of this height would cause a likely detrimental effect on this sensitive area, making it unlikely to achieve planning consent.

Due to the above, the proposed solution looked into moving the flood wall to the outer edge of the harbour as much as possible to facilitate its integration by reducing its perceived height, through a series of terraces. These would allow people to afford iconic views of Bristol's landmarks. The proposal creates a destination space than can be used for events with the potential to be supported by a cafe/tea house.

The terraced space provides areas for people to sit and allows different experiences of the space and the surroundings. Green islands between the terraces provide the opportunity for tree planting, creating shade and habitat pockets.

Modelling shows that the walls would need to be raised in the future. This could be achieved by retrofitting an appropriate glass panelled solution to the top of the wall. The principles of the solutions proposed can be integrated with any developments or designed as a stand alone solution.



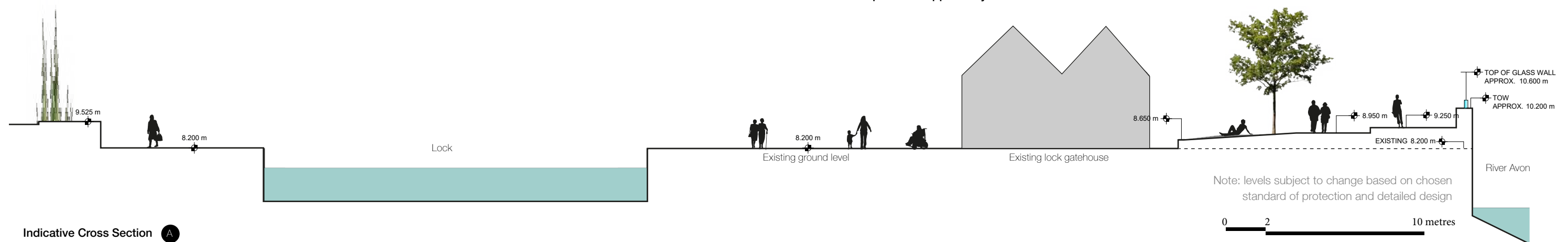
Birdseye view 2
Visualisation of aspirational opportunity



Hamburg Hafen City

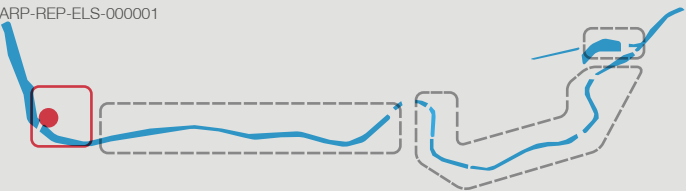


Hamburg Hafen City



Indicative Cross Section A

WESTERN HARBOUR



Western Harbour - Warehouses

This area functions as a destination due to the presence of the CREATE centre and the popular Lockside cafe. It is well used by cyclists and walkers, being part of the River Avon Trail and cycle route 33, and provides a safe and pleasant link to Greville Smyth park and Ashton Court through the newly refurbished Ashton Avenue bridge. It also has good bus route links through the presence of the Metrobus line.

The Western Harbour (including Bond A and B warehouses) has been identified by BCC as a main area for regeneration by re-use of existing land currently occupied and cut-off by an inefficient roadway system. This opens up the opportunity to build the flood defences and incorporate them as part of the regeneration plans. The phasing of the defences and the regeneration will have to be set out such as the integration of the flood defence is not compromised. Therefore, planning policy for this area needs to be developed to accommodate for this approach.

It would be more economical to develop the regeneration projects alongside the flood defence plans together in this area. There are significant heritage assets that will enhance the regeneration plans if developed as part of the regeneration scheme.

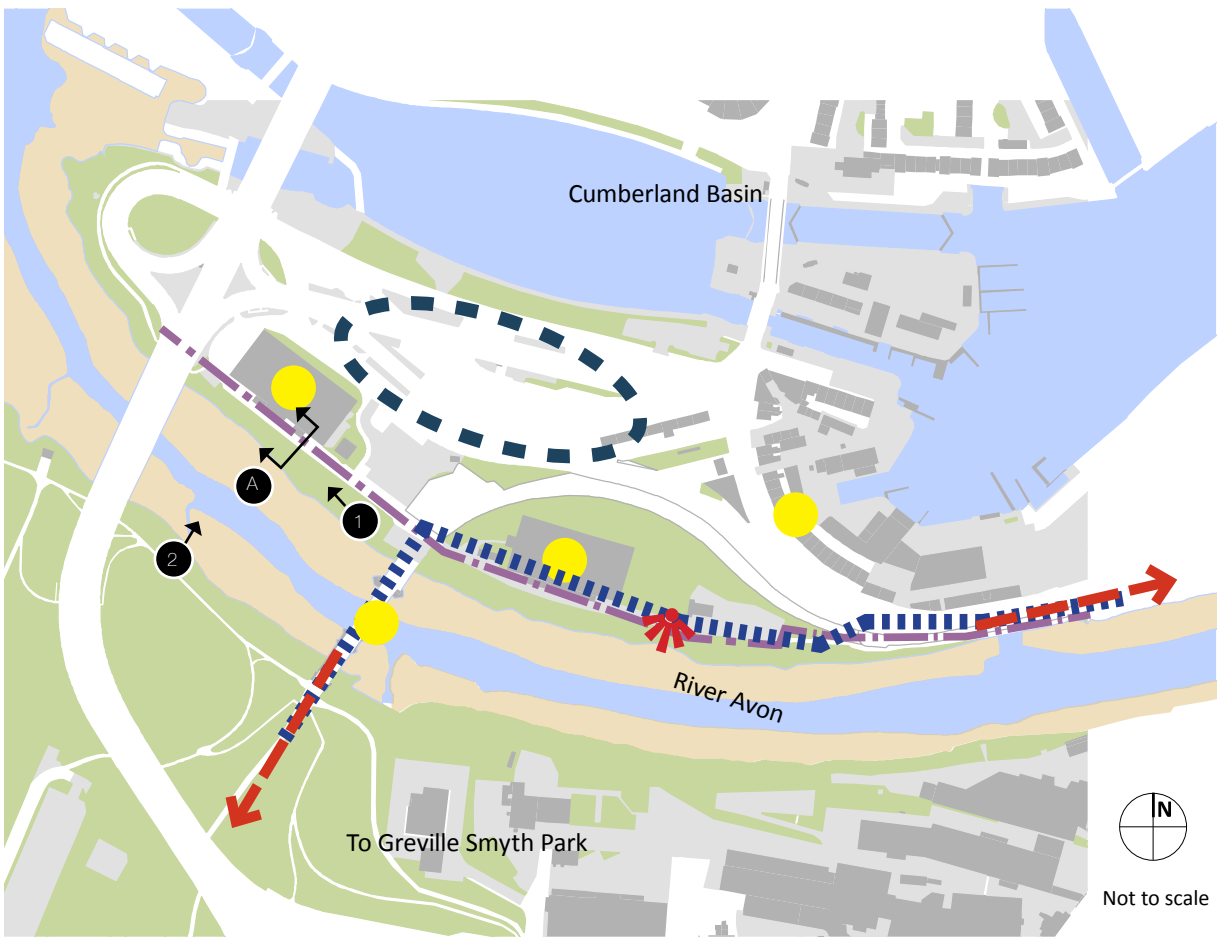


B Bond warehouse



Ashton Avenue Bridge

By Keith Murray - CC BY-NC-ND 2.0

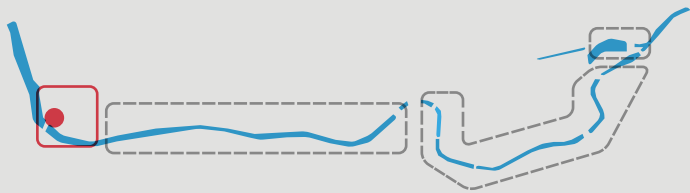


Site Analysis

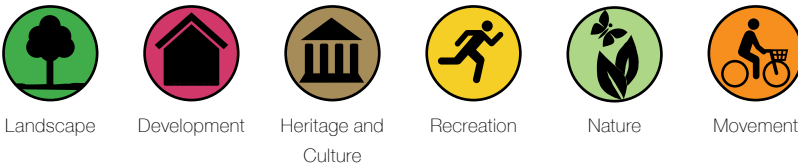
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- Proposed location of flood defence wall
- Area of public realm
- Network of roads
- Views
- Cycle path
- Development Opportunity
- Edge of listed structure
- Listed buildings
- Key Links

WESTERN HARBOUR

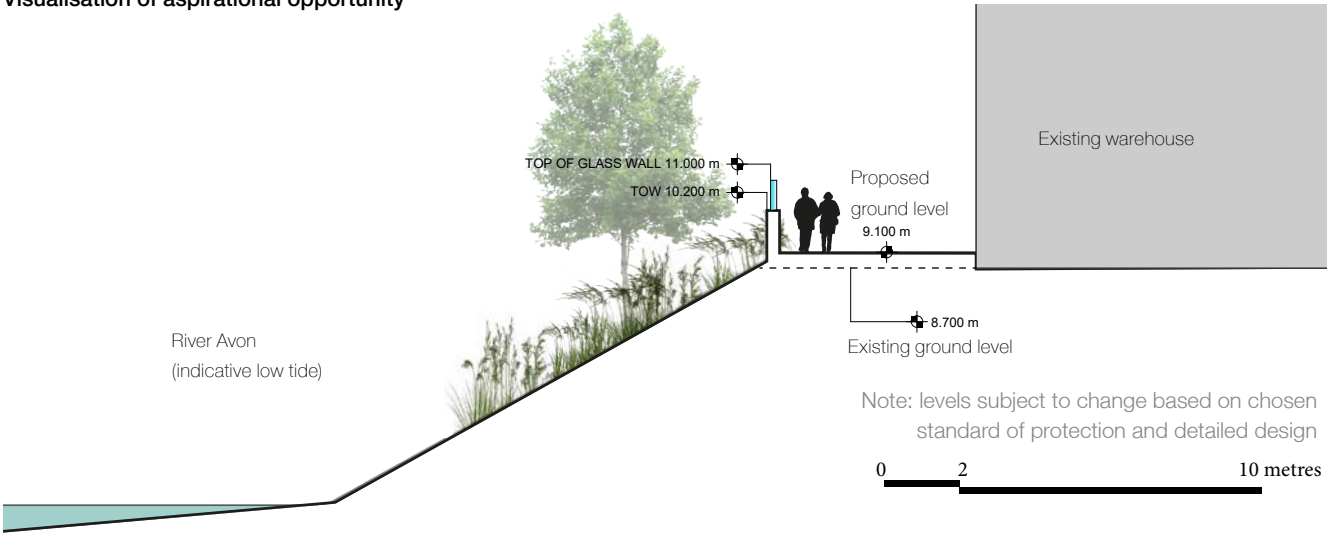


BENEFITS



Birdseye view 1

Visualisation of aspirational opportunity



Indicative Cross Section A

The area alongside the Grade II listed A and B-bond warehouses will require a flood defence approximately 2m above the existing ground level. This would likely result in detrimental effects on the setting of the buildings and users of the River Avon Trail, with the wall acting as a visual barrier to the river. Due to the limited width between the wall and the warehouses, the introduction of terraces to decrease the wall height has been discounted, however the existing ground levels can be raised up to the entrance level of the warehouses, as seen in the typical cross section below. Further detailed design work is required to be undertaken to fully understand the implications of this. At this point, the proposed solution is a combination of raising existing ground levels, to minimise the perceived height of the wall, and the introduction of a 1.1m high wall with a 0.8m high glass panelled top.

Other public space improvements could be done with wayfinding and heritage interpretation elements to complement the CREATE centre and adjacent eco house.



Wayfinding on surface



Glass panels



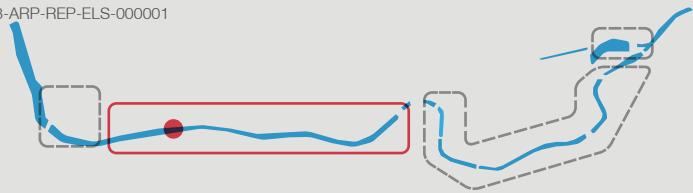
Flood wall in action



Eye level view from opposite bank 2

Visualisation of aspirational opportunity

WESTERN CORRIDOR



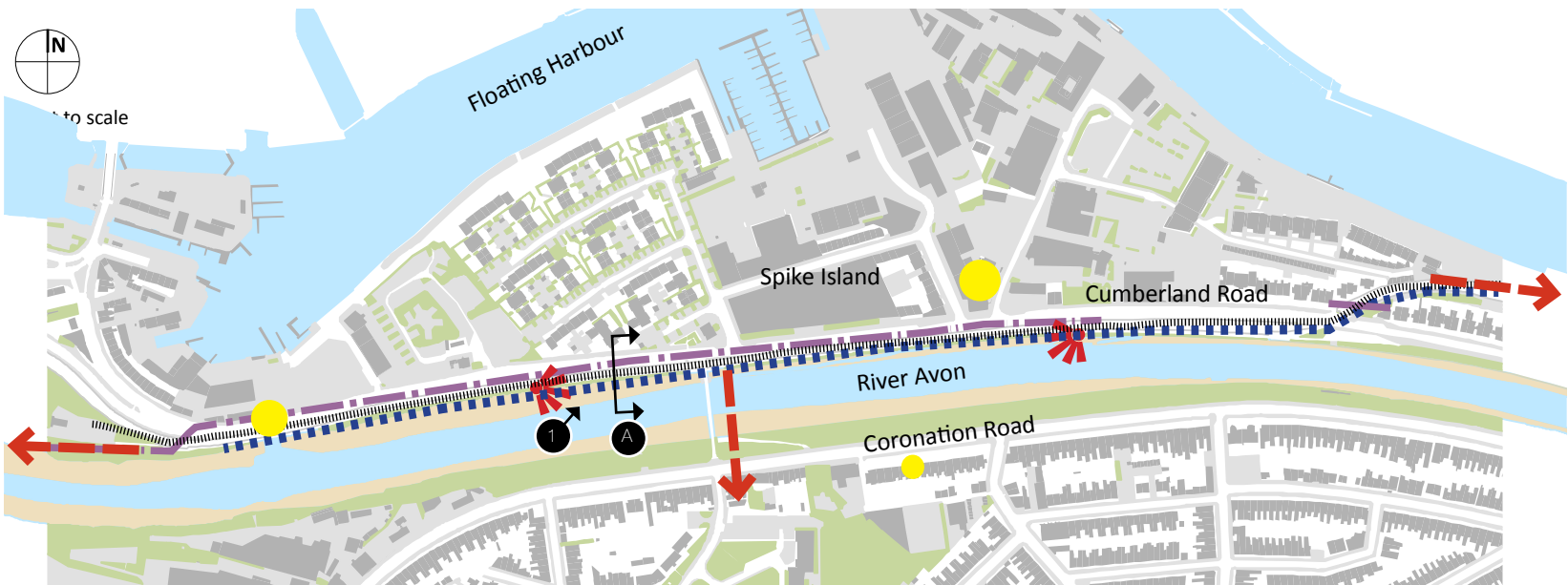
Western Corridor

This is a key area for cycling and walking, being an important corridor for connectivity along the river. The recent flood events have originated an area of failure and emergency repairs might have bought more time to develop a solution which is holistic with the overall plan and could make overall cost savings on the proposed design.

Retention of recreational use in this area is paramount, however functionality should be the most important aspect since this is key East-West link between Temple Meads train station and the western edge of Bristol, including Ashton Court.

The Metrobus line runs along this area and the interfaces with the bus stops will need to be considered and developed in subsequent design stages. This is also a key corridor for strengthening biodiversity links with wider benefits as well as links to wider transport plans across the river. Other aspirational opportunities include the restoration of the historic railway line adjacent to the “Chocolate Path” with the benefit of strengthening the historic character of the area, boosting tourism and recreation.

Public realm improvements along this area are limited by the space between the river’s edge and the adjacent road infrastructure. The largest potential for placemaking enhancements are along the stretch known as Chocolate Path, named as such due to the resemblance of the paving blocks and pattern to a chocolate bar. This is a well used path by pedestrians and cyclists, which is part of the River Avon Trail and runs adjacent to the Bristol Harbour Railway, which used to link Ashton Bridge with Wapping Wharf. Currently, all train movements are under banksman near the M Shed and it is recognised that banksman control along Cumberland Road might not be practical, however we believe that future railway line reinstatement proposals should consider alternative solutions to maximise the flexibility and recreational value of this space.



Site Analysis

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- Proposed location of flood defence wall
- Area of public realm
- Network of roads
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- Edge of listed structure
- Listed buildings
- Key Links



Steam train Portbury running along the Chocolate path.

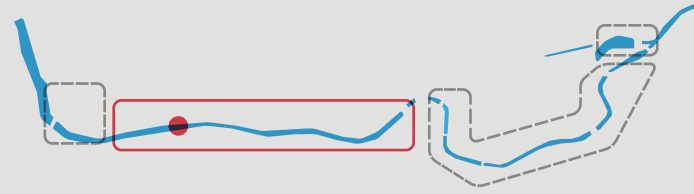
By Geof Sheppard - Own work, CC BY-SA 4.0



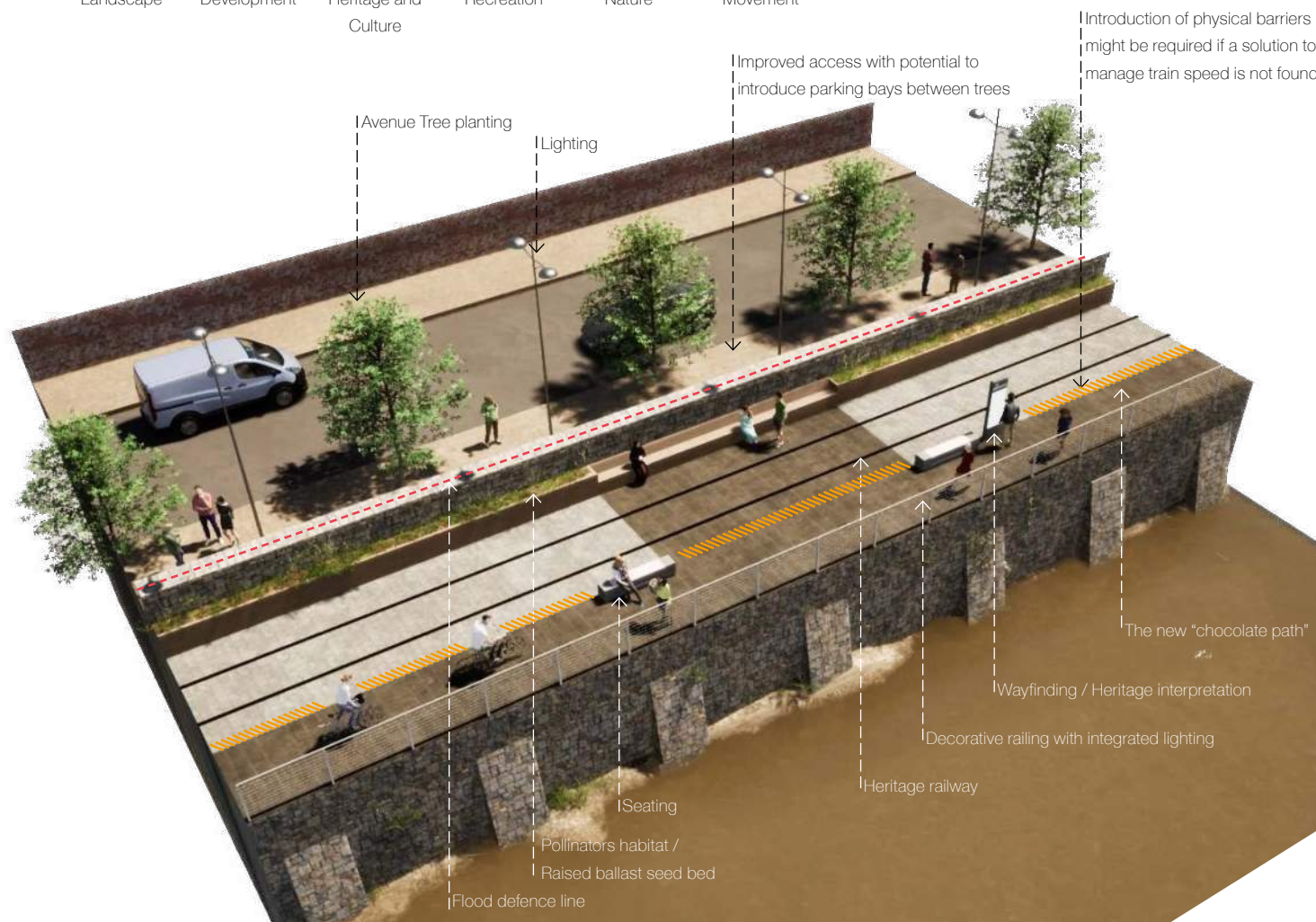
Vauxhall footbridge and Chocolate path.

By Nilfanion - Wikimedia UK, CC BY-SA 4.0

WESTERN CORRIDOR

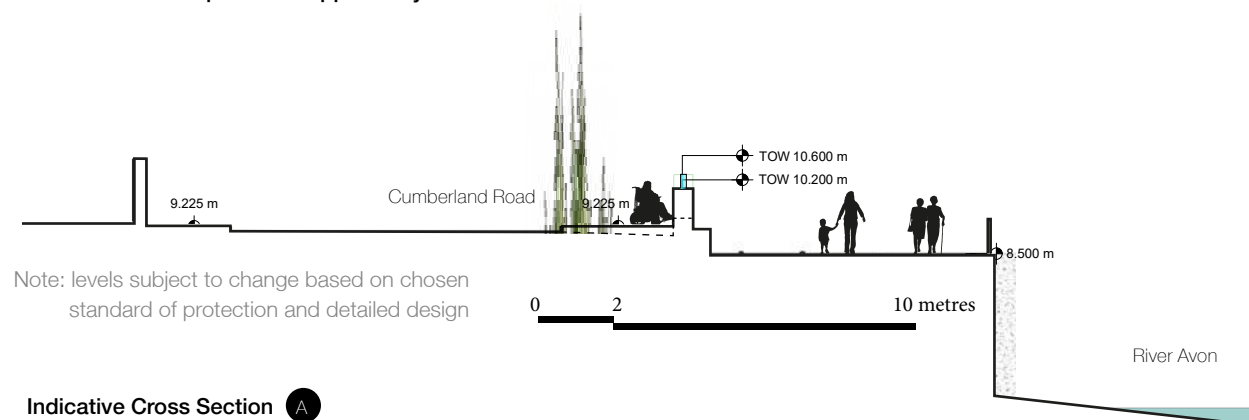


BENEFITS



Birdseye view 1

Visualisation of aspirational opportunity



Indicative Cross Section A

The image to the left illustrates the potential of this area. It shows a connected and open space, in line with what happens near the M Shed, with two corridors defined by different surface materials and occasional seating.

The presence of the railway creates a unique opportunity to explore the history of the harbour and be a tourist attraction. Due to the above, habitat creation and introduction of vegetation within this area is limited to a raised bed running along the flood defence wall. This raised bed could be an important corridor for pollinators as well as helping to reduce the scale of the wall.

Due its extent and linearity, this area naturally lends itself to the creation of significant green corridor. Placemaking could be greatly improved by the introduction of a continuous tree lined footpath along the southern edge of Cumberland road. This would allow people to get close to the river's edge even during flood events, it would scale down the presence of the road and introduce a continuous line of large avenue trees creating a significant habitat and recreational corridor. This could be one of the few limited opportunities to introduce large avenue trees in Bristol's city centre and increase canopy coverage.

Depending on the future planned use for the railway, further opportunities could be considered, such as the provision of a more engaging public space and the introduction of trees and other significant vegetation along this corridor. The image below illustrates this scenario whilst retaining the historic references to the presence of the railway.



Touristic railway through public space in Mallorca.

Image by hansiline from Pixabay



Railway integration into public space - Brussels

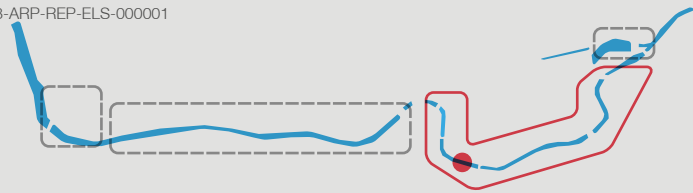


Vauxhall Reach Place Concept (extracted from New Cut Greenway Place Concept, Nov 2017)



Corridor delineation through pavement

EASTERN CORRIDOR



Eastern Corridor

This area is heavily constrained by the limited width of path available. It is a long established and well-used footpath, part of the River Avon Trail, and cycle route (NCN3) and therefore public realm improvement works should retain a minimum width of 2.5m as per best practice guidance.

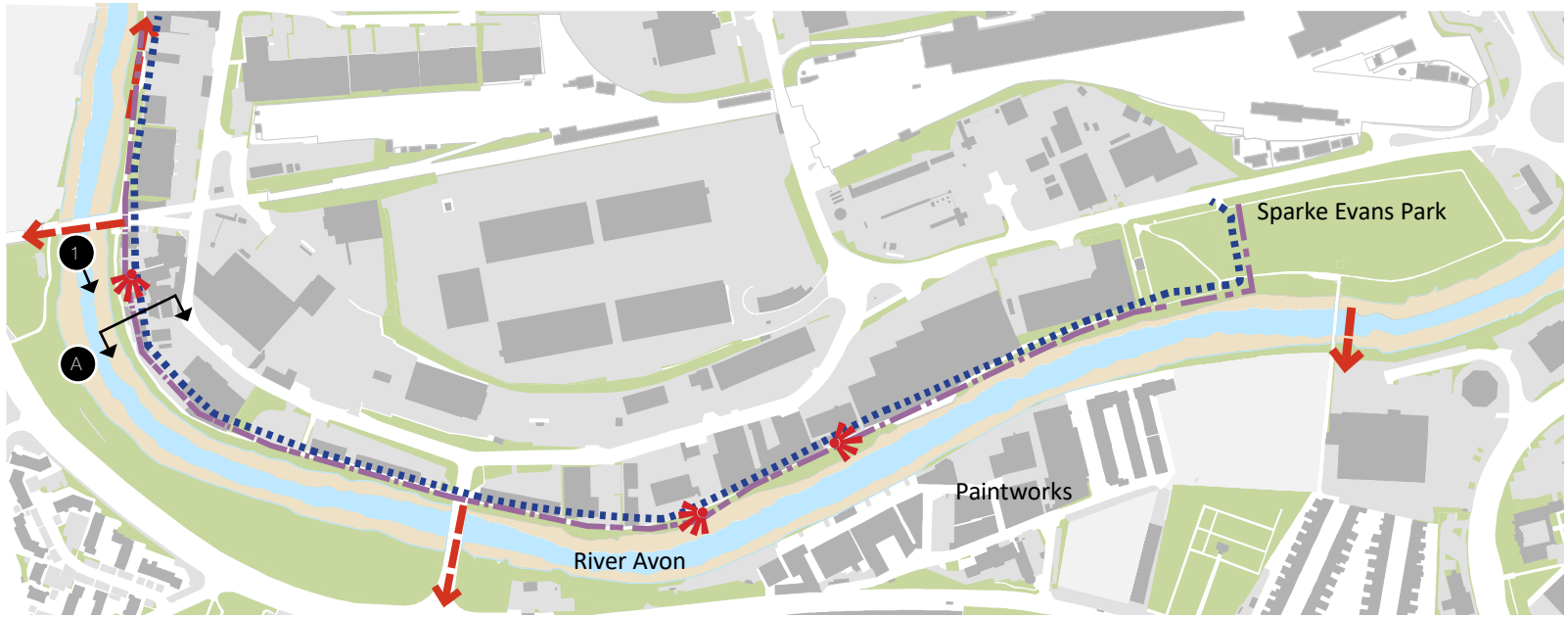
This area is the lowest lying part of Bristol, and to provide a long lasting flood defence, the height of the structure is significant. It is worth noting though that the height is not completely fixed at this stage, and as certainty over the future development plans for the area emerges, the height could be refined.

St Philips Marsh has been identified by BCC as a main regeneration area for housing and businesses. There is the opportunity to build the defences and incorporate them as part of this regeneration plan as a series of walls or bunds. The phasing of the defences and the regeneration will have to be set out such as the integration of the flood defence is not compromised.

It is suggested that the Planning policy for this area needs to be developed to accommodate for this approach.

It would be more economical to develop the regeneration projects alongside the flood defence plans together in this area. Land ownership and leasing approach needs to be developed with consideration made to Compulsory Purchase of land adjacent to the Avon.

Links to wider transport plans across the river and into St Philips Marsh will provide wider benefits and need to be further developed in future stages of the project.



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Site Analysis

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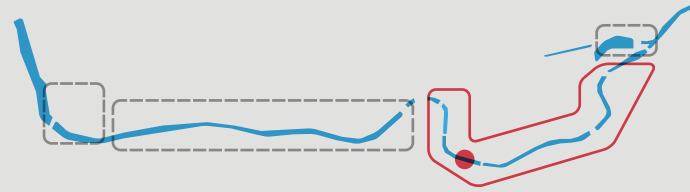


River Avon Trail and cycle route

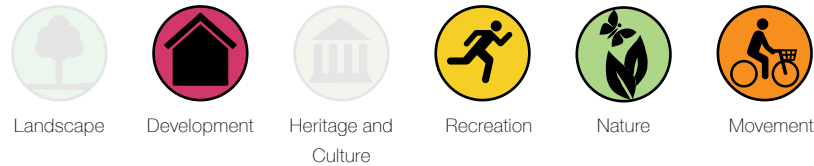


New footbridge by Knight Architects (© Lance McNulty)

EASTERN CORRIDOR



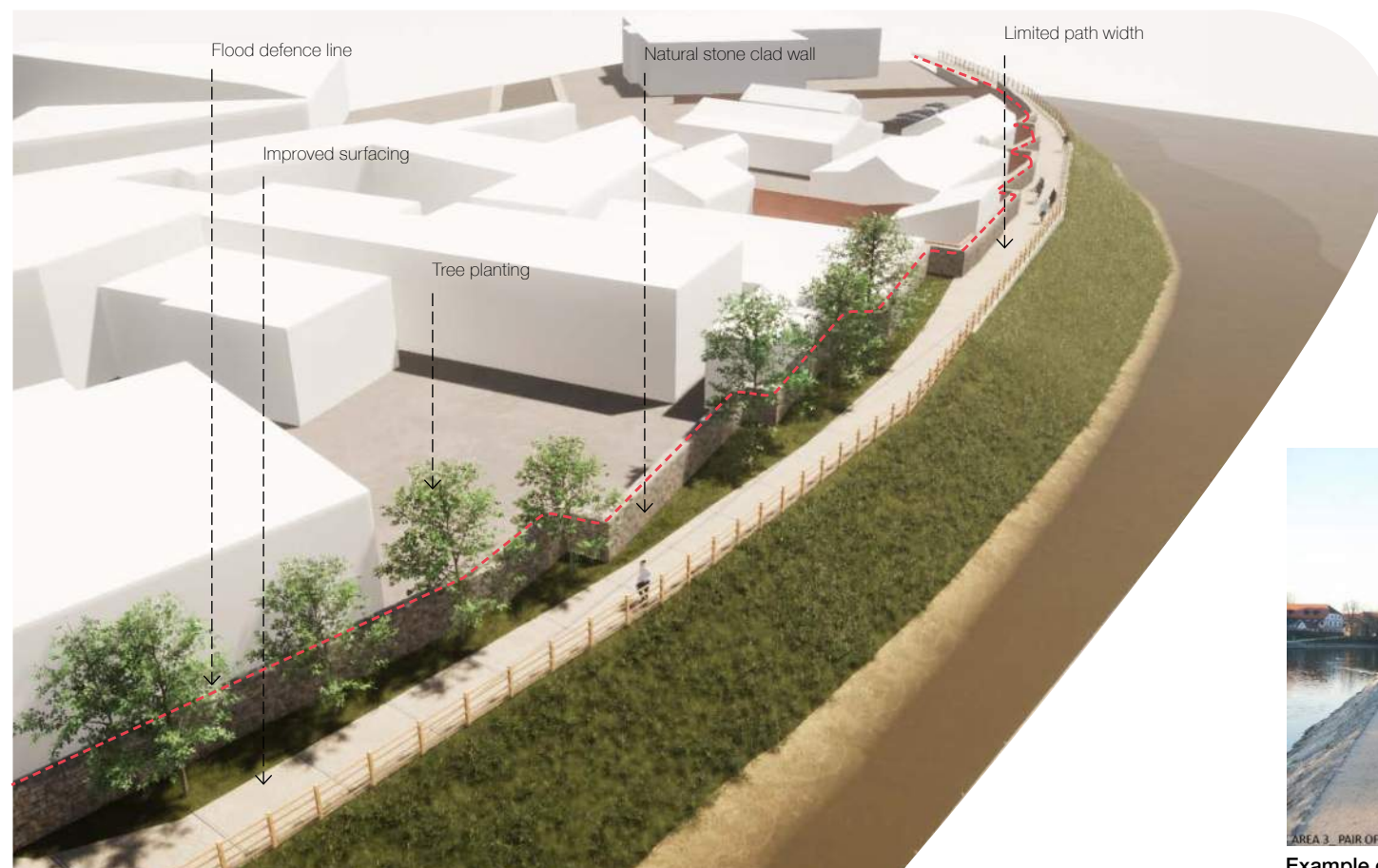
BENEFITS



Most of the path along this area is quite narrow and with limited space to expand inland. The image below shows a location which might present some opportunities for tree planting, where the boundary walls zig zag in and out. However this is not the norm and having the path immediately adjacent to a boundary wall is more common, as it can be seen further in the distance of the same image. Works should retain a minimum width of 2.5m as per best practice guidance, and with the introduction of the new flood defence, this will require encroaching into the river channel or into adjacent industrial unit plots. The cross sections across show the proposals at a pinch point. An alternative solution to address encroaching into the riverside banks would be to create a cantilevered structure as per the cross section below.

Placemaking opportunities here are focused on improving the aesthetics of the wall, the paving surface, pockets of planting and occasional seating areas. A natural stone clad wall and a timber post and rail fence would help to soften this narrow corridor.

Ecological enhancement of the river corridor should also be explored, through new habitat creation measures and conservation of existing habitats. Art elements could be introduced at key points, building on the existing River Avon art sculptures along this stretch which draw attention to environmental features of the area. This could also reflect the industrial heritage of the area or raise awareness for the need of the scheme, due to current climate and environmental issues, by showing past, current and future flood level markers.



Birdseye view 1

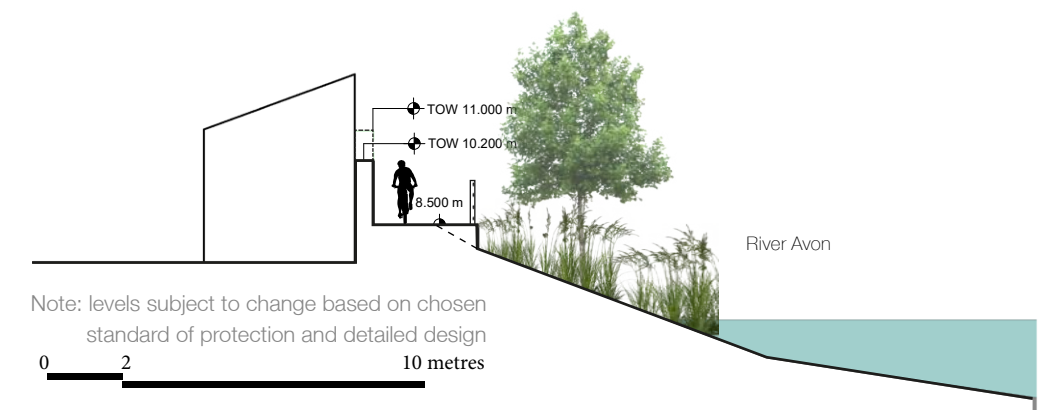
Visualisation of aspirational opportunity



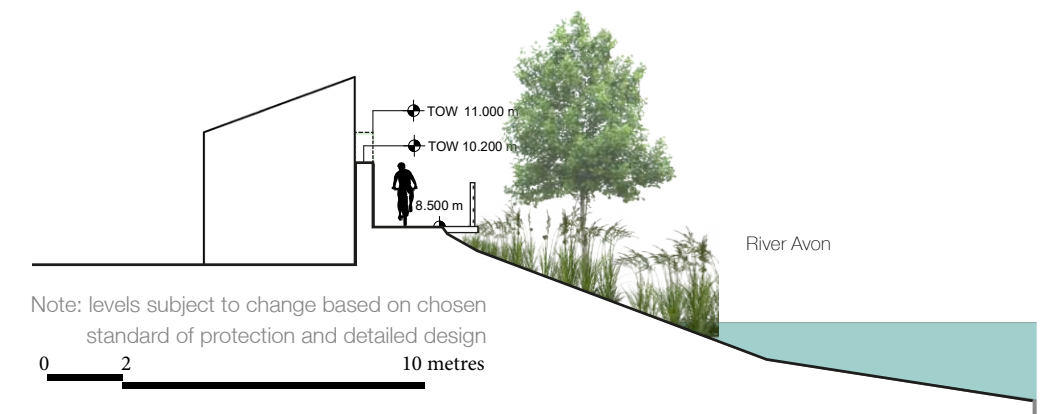
Example of amenity provision in narrow spaces



Albert Reach Place Concept (extracted from New Cut Greenway Place Concept, Nov 2017)

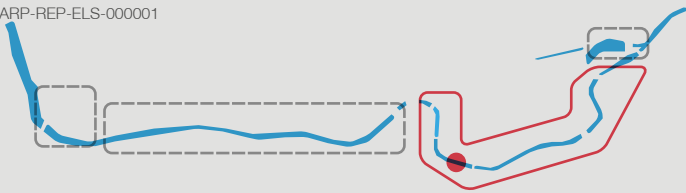


Indicative Cross Section A



Indicative Cross Section with cantilever solution A

EASTERN CORRIDOR



Eastern Corridor Long Term Aspiration

Future development of this area based on the emerging Temple Quarter Masterplan should integrate the flood defence proposals in a sympathetic way and maximise the potential of creating a green corridor and significant recreational asset for the development and the wider city.

Land ownership could prove a challenge when it comes to implement coherent solutions with a wider community benefit. The plan below shows the land that Bristol City Council owns along this corridor, although many are on long-term leases and so release for development may be complex. However, some of the plots could be used as pioneer plots which demonstrate best practice and set the precedent for future development along the river interface.

The sketch plan to the right illustrates the potential and opportunity for new development to sensibly integrate flood defence solutions into the design. The plan shows how a phased approach, where some plots get developed whilst others retain their current uses, could look like. This approach will benefit both the new development users and the users of the riverside path, by providing recreation, visual amenity, increased property value, habitat creation and increased flood profile capacity.

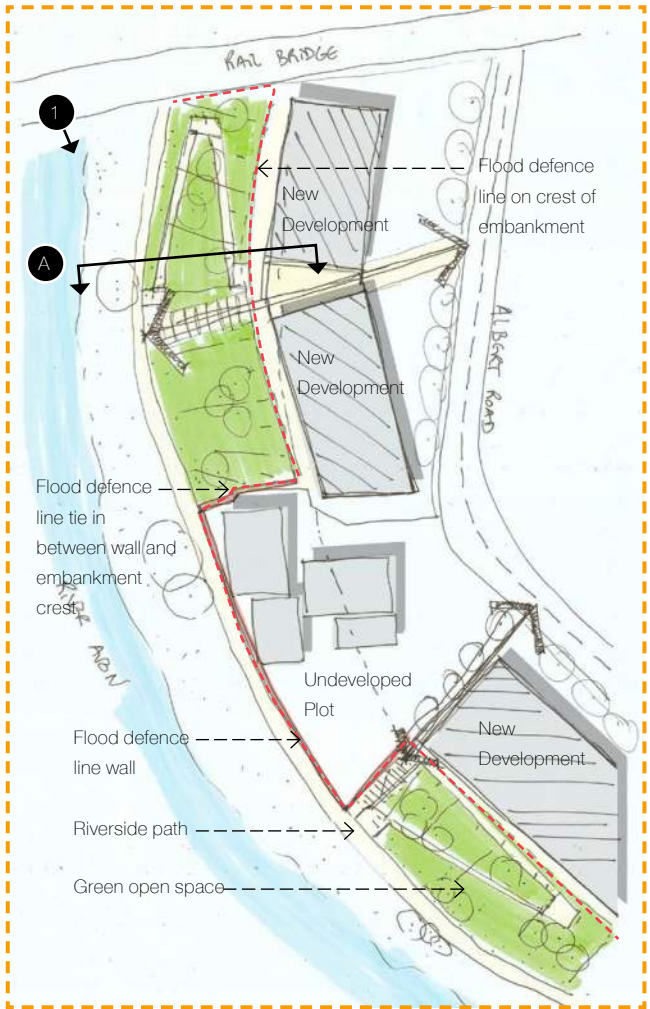
Ultimately, the implementation of the above approach would result in a continuous green link along the river from Sparke Evans park to the new Bristol University site near Temple Meads.



Bristol City Council Land ownership

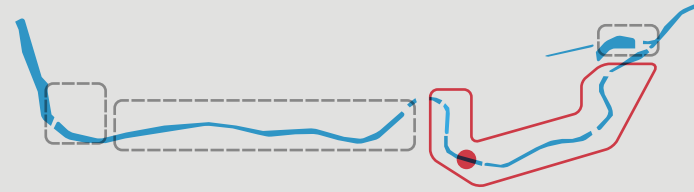
- Land-Industrial
- Store/Depot/Warehouse
- Industrial/Workshop
- Land-Public Park
- Land-Quay/Marina/Slipway/Mooring
- Land-Highway/Pavement/Path

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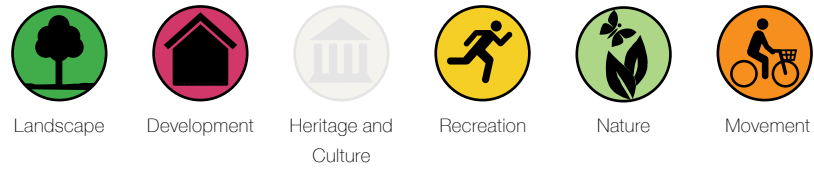


Sketch plan of recommended flood defence integration (see location on left plan)

EASTERN CORRIDOR



BENEFITS



The image below shows what a flood defence solution could look like when fully integrated into a new development plot. The amenity value of the area is improved drastically both for the general public and residents. There are also significant biodiversity gains.

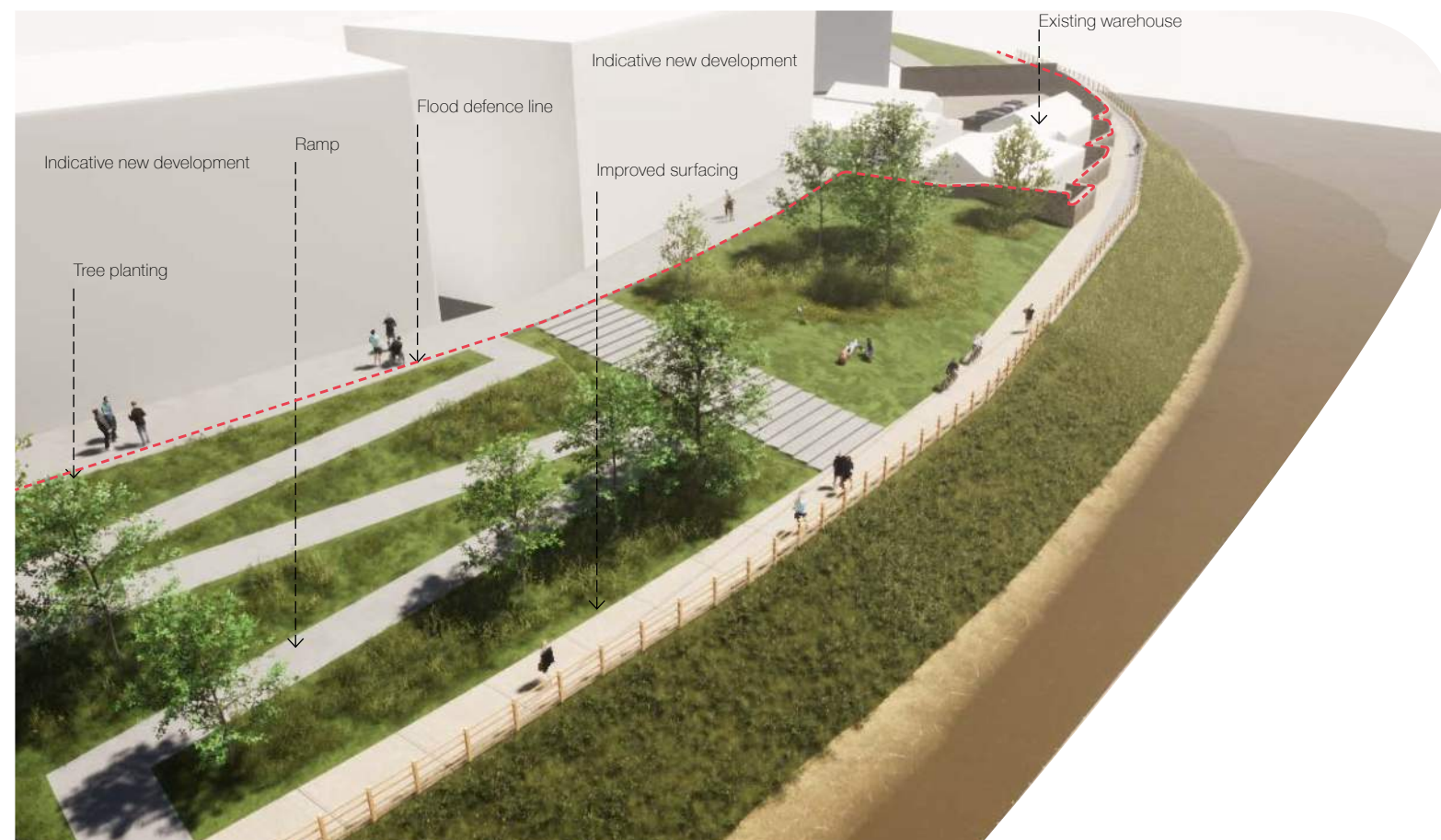
This vision could be delivered through a phased approach, where some plots are developed earlier than others.

The image shows how a plot which retains its current use could work adjacent to a newly developed plot.

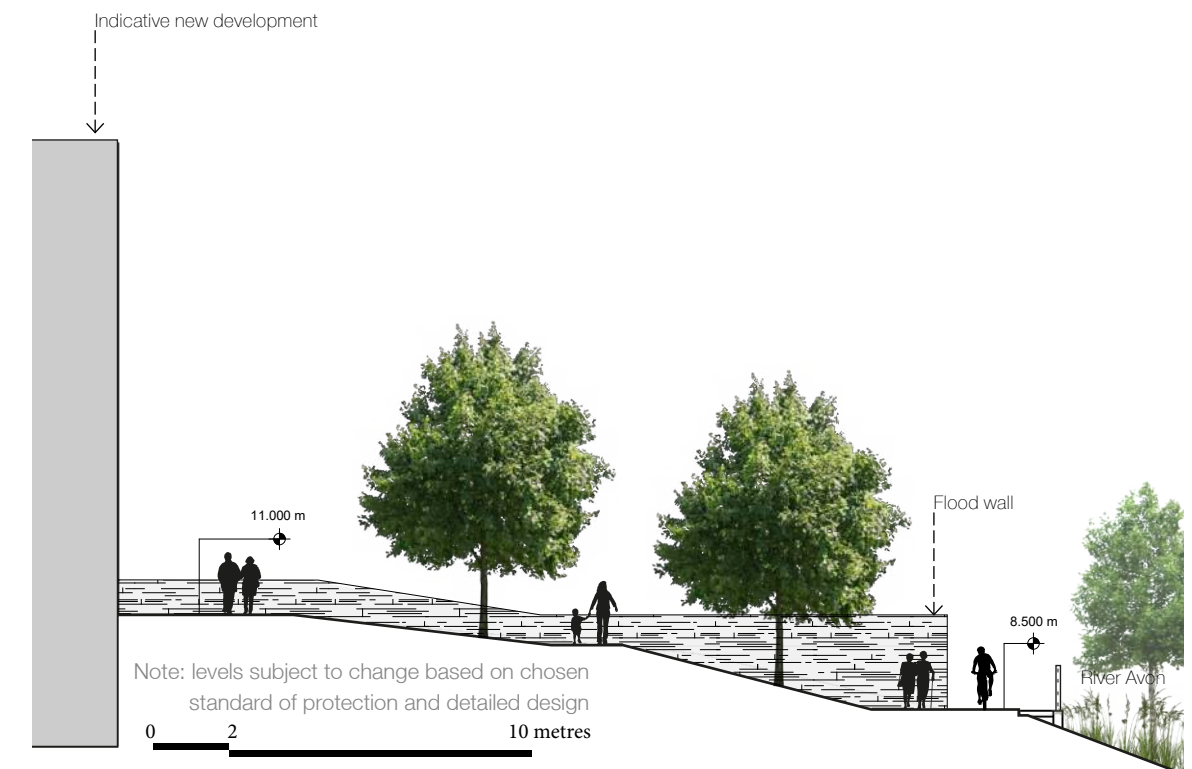
This green corridor would help to establish a stronger ecological connection between Sparke Evans park and the existing woodland belt to the west.



Examples of riverside corridors regeneration

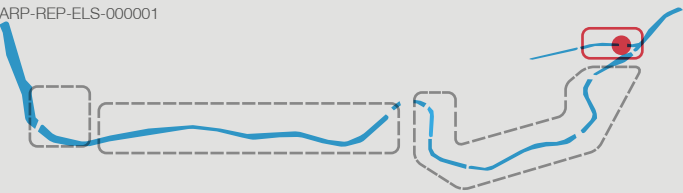


Birdseye view 1
Visualisation of aspirational opportunity



Indicative cross section of recommended flood defence integration A

NETHAM LOCK



Netham Lock

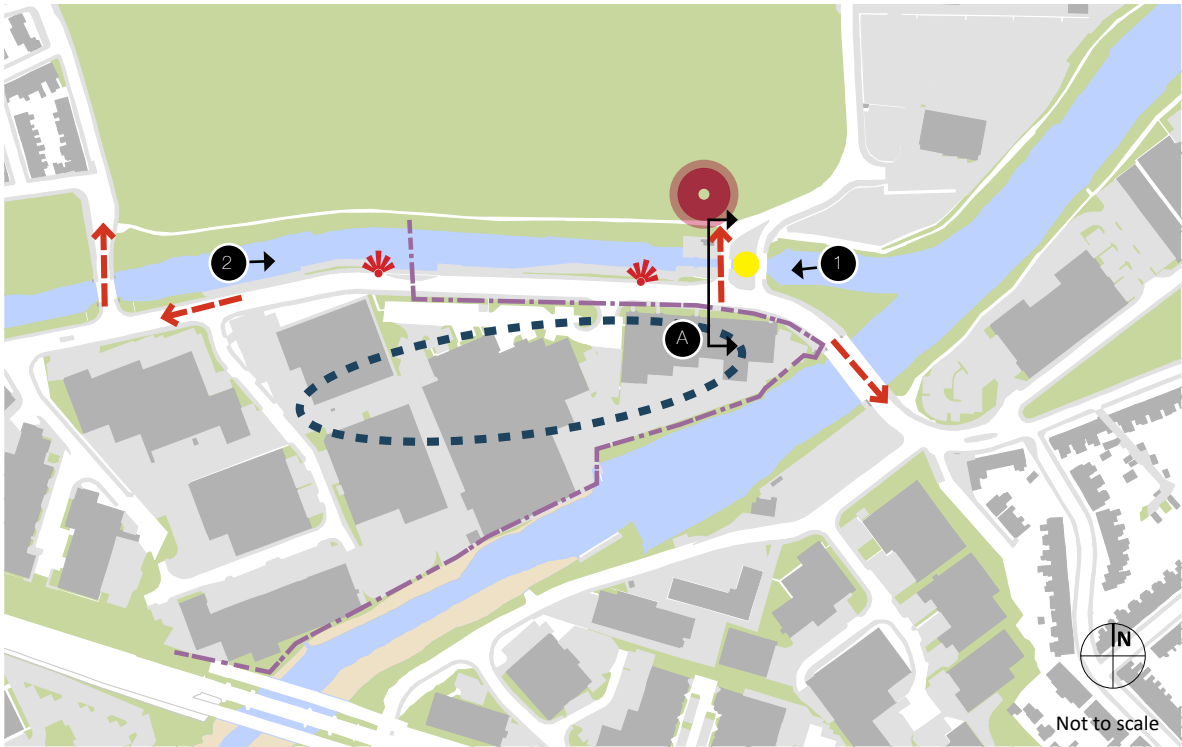
This area is the main gateway for boats coming down the Avon from Bath wishing to enter Bristol’s floating harbour. People are ‘greeted’ with the grade II listed lock’s keeper cottage before entering the Feeder canal. Apart from the above point of interest, this area presents limited opportunities for placemaking. Access around the cottage could be improved with additional heritage interpretation elements, however the main opportunity resides in the creation of a gateway feature, announcing the start of the floating harbour. This should be explored at following stages by looking to engage with an artist.



Netham weir and New Brislington bridge.
By mattbuck (category) - Photo by mattbuck., CC BY-SA 3.0



Netham lock.
By Philip Halling, CC BY-SA 2.0

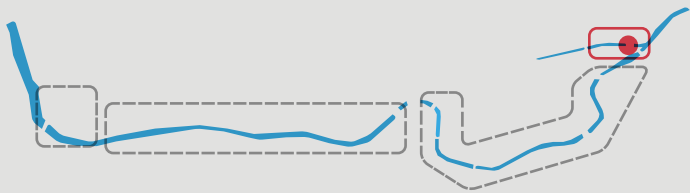


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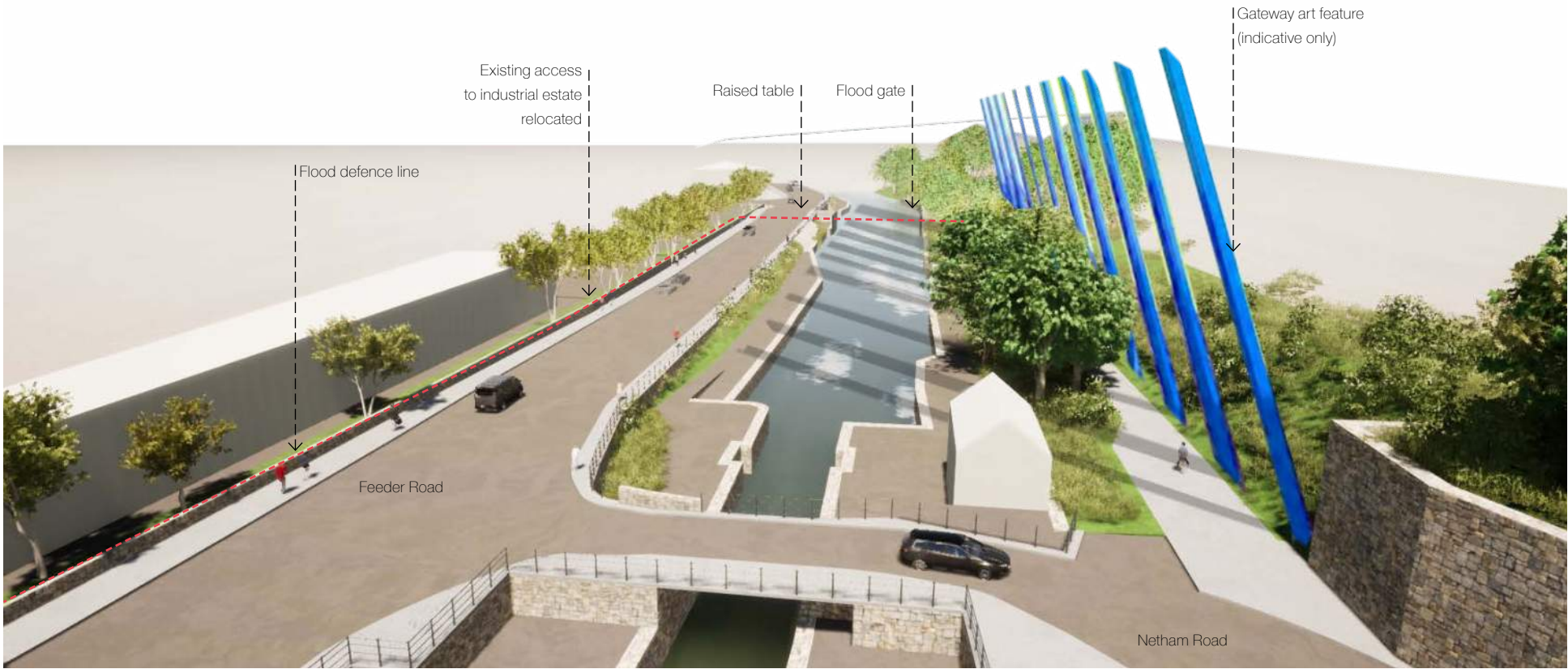
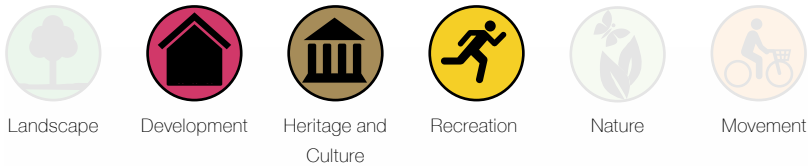
Site Analysis

- | | | | | | |
|--|---|--|-------------------------|--|--------------------------|
| | Proposed location of flood defence wall | | Views | | Edge of listed structure |
| | Area of public realm | | Cycle path | | Listed buildings |
| | Network of roads | | Development Opportunity | | Key Links |

NETHAM LOCK

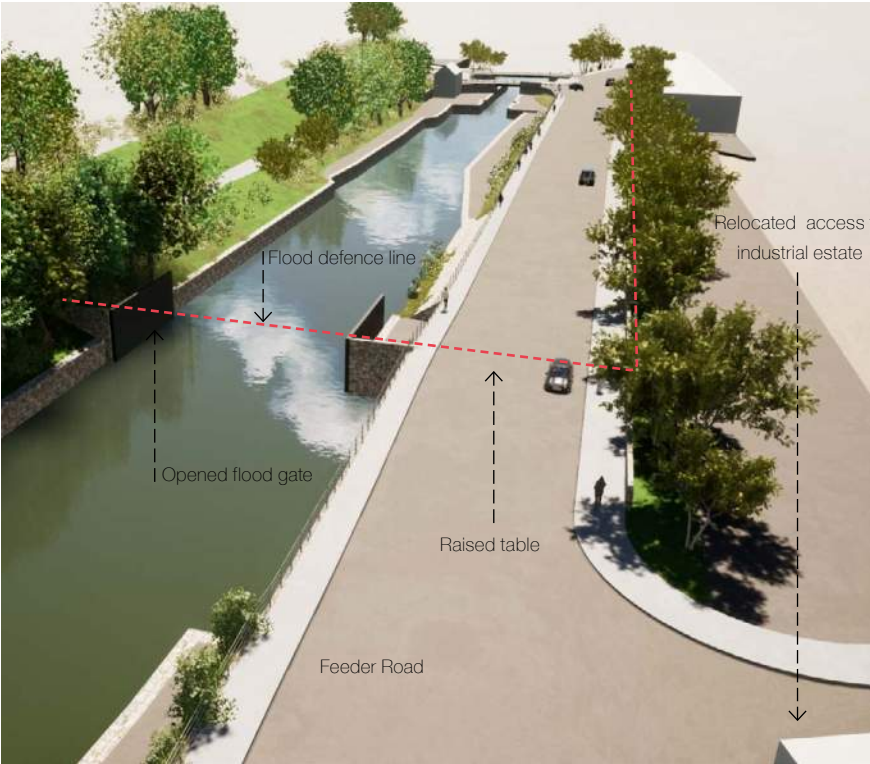


BENEFITS



Birdseye view 1

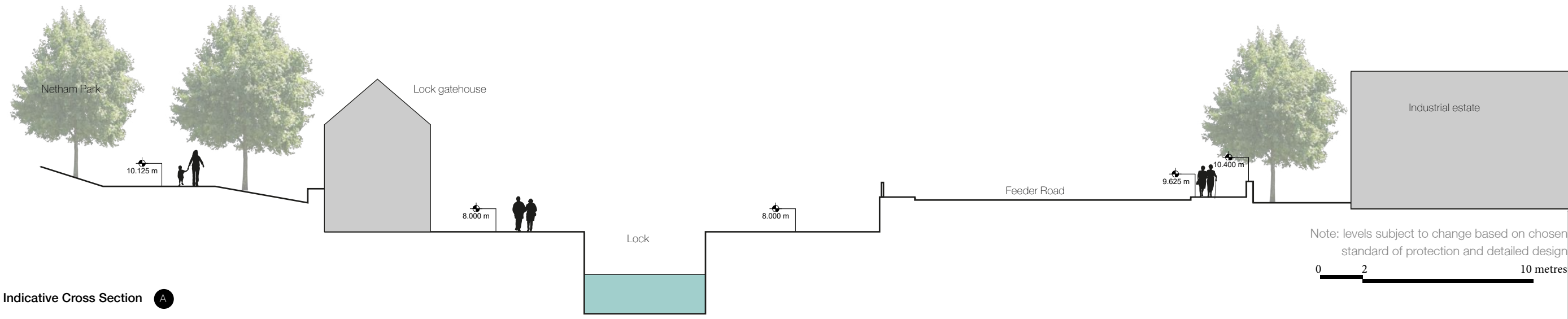
Visualisation of aspirational opportunity



Birdseye view 2

Visualisation of aspirational opportunity

The flood defence solution will require a continuous wall along the industrial estate. To minimise the number of floodgates, the existing access is proposed to be moved further west, beyond the proposed raised table and flood gate on Feeder Road. The flood wall would vary in height from 0.8m to 1.4m, which is unlikely to cause any detrimental visual effects.



Indicative Cross Section A

Conclusion and Recommendations

The diagram across demonstrates the value of Placemaking in delivering wider benefits. This scheme provides a unique opportunity to re-think the role and synergies between grey and green infrastructure in urban environments and in particular Bristol, with the objective of improving people’s lives, being clear that the benefits go beyond flood resilience.

A red/amber/green system has been used to mark the placemaking interventions in terms of delivering multiple benefits.

- These benefits will ultimately help to facilitate inclusive growth throughout Bristol by contributing in some form to the following objectives:
- To support the safe living, working and travelling of people in and around central Bristol by ensuring flood threat is reduced and that measures address residual risks.
 - To facilitate sustainable growth of Bristol and the West of England by supporting opportunities for employment and residential land and infrastructure.
 - To maintain natural, historic, visual and built environments with the waterfront corridor and where possible deliver enhanced recreational, heritage and wildlife spaces.
 - To ensure navigation of the river and marine activities continues.
 - To ensure the options are technically feasible and deliverable.
 - To enhance walking and cycling links to enable greater access to opportunity work and housing.
 - To bring existing communities closer together, as well as providing the opportunity to unlock new housing development land and attract residents, businesses and visitors.
 - To deliver enhanced recreational, heritage and wildlife spaces, to create healthier and more resilient communities, particularly those with higher inequality or limited access to green space.

The New Cut Greenway Place Concept, from Bristol City Council, used a pilot tool (Arup’s GIVE) to estimate the value of Green Infrastructure. It concluded that air quality, carbon sequestration, surface water management, and health (access/view green space and informal recreation) could provide up to £127 million worth of benefits over the next 30 years, whilst transport benefits could total £30-50 million over the same period.

Attractive and inclusive public spaces encourage people to go outdoors, exercise and interact socially. They provide opportunities for learning and discovering about nature and local heritage, as well as habitat creation and biodiversity.

The above benefits are difficult to quantify when looking at value for money, however they should not be underestimated or dismissed by decision makers.

This project is a major opportunity to improve connectivity along the river Avon, as well as into the city centre, as captured in the Placemaking Concept Report. Therefore it is recommended that further work is undertaken to look in more detail at wider city synergies and maximise benefits. Delivering the placemaking opportunities identified here will often require the Council and developers to work together to realise the potential benefits, as well as sources of funding for the works the Council is developing.

The urban context of the river Avon is currently underestimated and underused. As one of the main backbones of the city it is of great value as a green infrastructure asset and therefore, any future projects should respect an overarching vision for the river corridor. This is even more relevant in light of the recent climate and ecological emergencies declared by BCC, in addition to the goals of increasing tree canopy cover, improving air quality, promoting healthy living and sustainable transport.

Heading	Western Harbour	Western Corridor	Eastern Corridor	Netham Lock
 Development: supporting economic vibrancy by providing the waterfront setting for existing and future major development sites.				
 Landscape: creating a publicly accessible, linear greenspace; connecting healthy and well communities across the city.				
 Movement: connecting people and jobs through enhanced walking and cycling links.				
 Heritage and Culture: protecting and conserving Bristol's harbour heritage. Supporting the visitor experience. Fostering opportunities to integrate public art.				
 Recreation: encouraging social and physical activity by designing in sociable places, fitness trails and resting spaces.				
 Nature: providing habitats and food for wildlife to enhance the biodiversity of the river corridor, and the movement of nature through the city.				

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