Environment Agency

Derby City Council

Our City Our River

Unlocking Economic Potential Along the Lower Derwent

Masterplan

July 2012

Foreword

OUR CITY OUR RIVER

This Masterplan sets out our shared vision to reduce flood risk in Derby and transform the City's relationship with the River Derwent by helping to encourage economic regeneration in areas currently at risk of flooding.

Currently large parts of Derby are at risk of flooding. Working together, Derby City Council and the Environment Agency have identified the absolute need to improve existing flood defences that would protect local homes and businesses in Derby, as well as essential infrastructure, in the event of a severe flood. This is a flood that has a 1% chance of occurring each year and that would have significant consequences. The current level of flood risk creates uncertainty for communities and for developers, as well as placing a financial burden on home owners and businesses seeking to insure their properties.

Our commitment to protect Derby also presents a once in a generation opportunity to greatly improve the environment along the River Derwent. This Masterplan sets out our vision for how work to improve flood defences can be integrated into new mixed-use developments and the urban environment. We are confident this Masterplan will be instrumental in attracting new investment and ultimately creating high-quality public realm and commercial and residential areas, which will provide local people with attractive places to live, work and visit.

Following sincere and open consultation with stakeholders and local communities we are confident this Masterplan will help shape the transformation of the areas in Derby that surround the river as it passes through the City. We are keen to showcase our approach, which remains nationally unique, and look forward to working with partners to make the ideas this Masterplan sets out a reality in the years to come.

OUR VISION IS:

"Together through innovative planning, design and delivery we will, create a first class river corridor that fulfils its true potential for recreation and waterside development utilising its rich cultural heritage. Our river corridor will provide a series of linked and high quality open spaces overlooked by development. It will create significant opportunity for new business, investment and City living reconnecting local neighbourhoods, employment areas in 'Our City to Our River'. Existing homes and businesses beyond the river corridor will benefit from an improved standard of flood defence that is integrated with new development and the public realm thereby adding value through improving the quality of the landscape and built form".

Contents

Figures

1

Our City Our River

1. Our City Our River

INTRODUCTION

'Our City Our River' represents a commitment from Derby City Council ('the City Council') and the Environment Agency (EA) to manage the impact of flooding within Derby and to create a first class river corridor that reconnects the City to the River and enables long-term sustainable development. The Masterplan presented here is the first step in a long process of transforming Derby's relationship with the River Derwent and safeguarding thousands of properties and lives along the river. This project forms just one part of the EA's much wider reaching Lower Derwent Flood Risk Management Strategy (the 'Strategy') which covers an area extending from Milford to the River Trent confluence – it is however a critical part of that wider strategy.

The Strategy identified that to provide sustainable flood risk management through Derby the defences through the City should be realigned away from the river. 'Our City Our River' presents a preferred realignment route for the flood defences, and through an innovative approach it combines this with the City's need to unlock economic potential within the existing floodplain and reconnect Our City with Our River. The need for this approach is driven by a number of key factors:

- Raising the height of flood defences on their current alignment would have a negative impact on the riverside and City environment. The required height of the defences would prevent people seeing over them, segregate the river from the surrounding communities, and could create hostile environments. It would degrade the urban environment and further harm the relationship between the City, its people and the river. It would also significantly increase flood risk at Darley Abbey Mills;
- Funding for flood defence schemes can no longer be wholly met by national government agencies; the delivery of future schemes would be dependent upon attracting private sector investment and funding from other public sector agencies, including local authorities. Flood risk management strategies therefore require a partnership approach that delivers positive outcomes for all; and

Regeneration and development in Derby is a major priority for the City Council and its partners. There is a clear and long standing desire to use potential investment within the river corridor as a catalyst for the regeneration. Improving connectivity to the river and making the most of the heritage assets is also a key priority. Currently development is subject to the guidance in national Planning Policy Statement 25: Development and Flood Risk (see Text Box 1.1).

NEED FOR PROJECT

In Derby, the EA predict that 2,150[1] properties are currently at risk from flooding in a severe flood event. The extent of this area is shown on Figure 1.1. This number only paints one part of the picture. The properties at risk include thousands of peoples' homes, vital businesses, key elements of energy infrastructure and many important historic buildings. A severe flood event would also sever transport networks, hamper the work of emergency services and could, ultimately, cost lives. The cost of a severe flood event on the local economy in Derby would also be catastrophic and the clean up could last weeks, forcing businesses to close temporarily and leaving homes destroyed.

The existing defences only offer a low standard of protection and some are coming to the end of their design life. Over the coming decades climate change is likely to inevitably exacerbate the situation leading to more frequent and severe flood events (see Text Box 1.2).

In addition to the above, the risk of flooding affects the ability to insure homes and businesses which stifles investment. Regeneration and development opportunities along the banks of the River Derwent have also been frustrated with many prominent sites (Darley Abbey Mills, Aida Bliss, former Magistrates Court and Police Station, North Riverside and Bath Street Mill) left vacant as viable uses (for the most part residential) are not categorised as an appropriate use within a zone of high flood risk. These prominent riverside locations require protection so that the vacant areas can be replaced with active and attractive uses that engage with the river and reconnect it to the City Centre. As well as new investment in new development additional recreation and leisure facilities would be created along the length of the River Derwent providing formal and informal open space for all to enjoy.

To afford protection to existing properties and to create new opportunities, the existing Standard of Protection against flooding needs to be raised to reduce the probability of flooding to an acceptable level (see Text Box 1.3).

Doing nothing would mean abandoning large areas of the City to flood risk. This is not an option. The Our City Our River project is designed to respond to these challenges and deliver real benefits for Derby.

1:100yr Predicted Flood Zone

Existing Defences 1:25yr Protection Walls/Embankments & Topography (Dotted)

Darley Abbey Existing Defences 1:50yr Protection

[1]Environment Agency (2009) 'Lower Derwent Strategy Approval Report – V4'

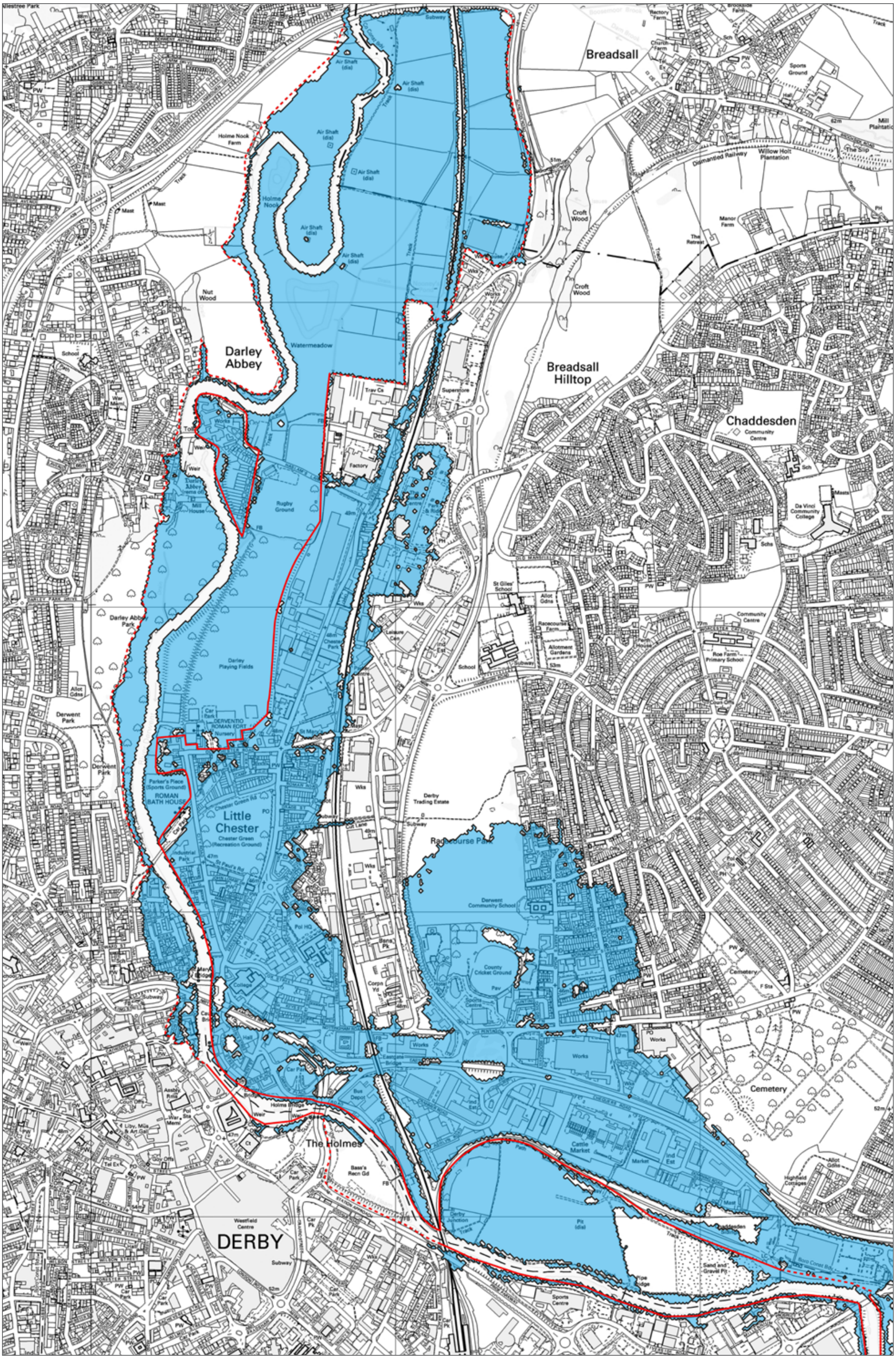


Figure 1.1: Predicted flooding impact from the River Derwent on Derby City Centre. 1:100 year predicted impact with the existing level of defence maintained

Text Box 1.1: Development in Flood Risk Areas

In areas that have a greater than 1 in 100 (1%) annual chance of flooding from a river any proposed development is subject to the guidance provided by the National Planning Policy Framework and associated Technical Guidance. This policy aims to ensure that flood risk is taken into account at all stages in the planning process to avoid inappropriate development in areas at risk of flooding, and to direct development away from areas at highest risk. Where appropriate sustainable development is accepted in such areas, the policy aims to make it safe without increasing flood risk elsewhere and where possible, reducing flood risk overall.

Text Box 1.2: What is the relationship between Climate Change and flooding?

Our climate is changing and this is likely to have an impact on flooding. Changes in weather patterns and, in particular, more torrential rainfall is likely to increase flood risk from rivers. In delivering improved flood defences in Derby consideration needs to be given to climate change. Where defences are integrated with new development it is likely that the height of the defences needs to make an allowance for future climate change as future adaptation of the defence would not be possible.

MASTERPLAN AREA

'Our City Our River' encompasses a linear area through the heart of Derby comprising a wide range of land uses including farmland, residential communities and City Centre business areas, stretching from Darley Abbey in the north through to Derby Junction Rail Bridge in the south. The Masterplan area is shown on Figure 1.2. It includes a rich heritage resource incorporating Darley Abbey Mills and the Silk Mill, which together form a key part of the Derwent Valley Mills World Heritage Site. In addition, there are a number of listed buildings and structures as well as significant archaeological interest including a Roman fort and settlement. The river corridor also provides a much loved and used recreational resource including extensive sports pitches, riverside walks and cycle ways linking local facilities and communities to the City Centre and beyond.

The river corridor includes many peoples' homes, businesses and local facilities. The communities of Darley Abbey, Little Chester and Strutts Park and the City Centre all address the river and are affected by the proposals in the Our City Our River Masterplan. In and around these communities are significant employment areas and development opportunities, particularly close to the City Centre and along the eastern bank of the river. Increased levels of flood risk have hampered regeneration in these locations and this project would help developers overcome those barriers.

Text Box 1.3 Probability of Flood Risk

Every year in Derby there is a 1 in 25 (4%) chance that the River Derwent would overtop the existing defences. This is a high level of risk. The Association of British Insurers recommends that for properties to be insured against flooding the maximum annual chance of flooding should be less than 1 in 75 (1.3%). Many cities in England and Wales now have a 1 in 100 (1%) maximum annual chance of flooding.

Text Box 1.4 What about downstream areas?

Whilst the Masterplan focuses on the area between Darley Abbey Mills and Derby Junction Railway Bridge, the delivery of the proposed scheme does increase flood risk downstream of the railway bridge, all the way to the confluence with the River Trent near Shardlow. Therefore, mitigation measures in these areas must be delivered as an integral part of the delivery of Our City Our River.

Any development proposals within Flood Zone 2 or 3 in the downstream areas will need to consider the impacts of Our City Our River on the flood levels in their Flood Risk Assessments.

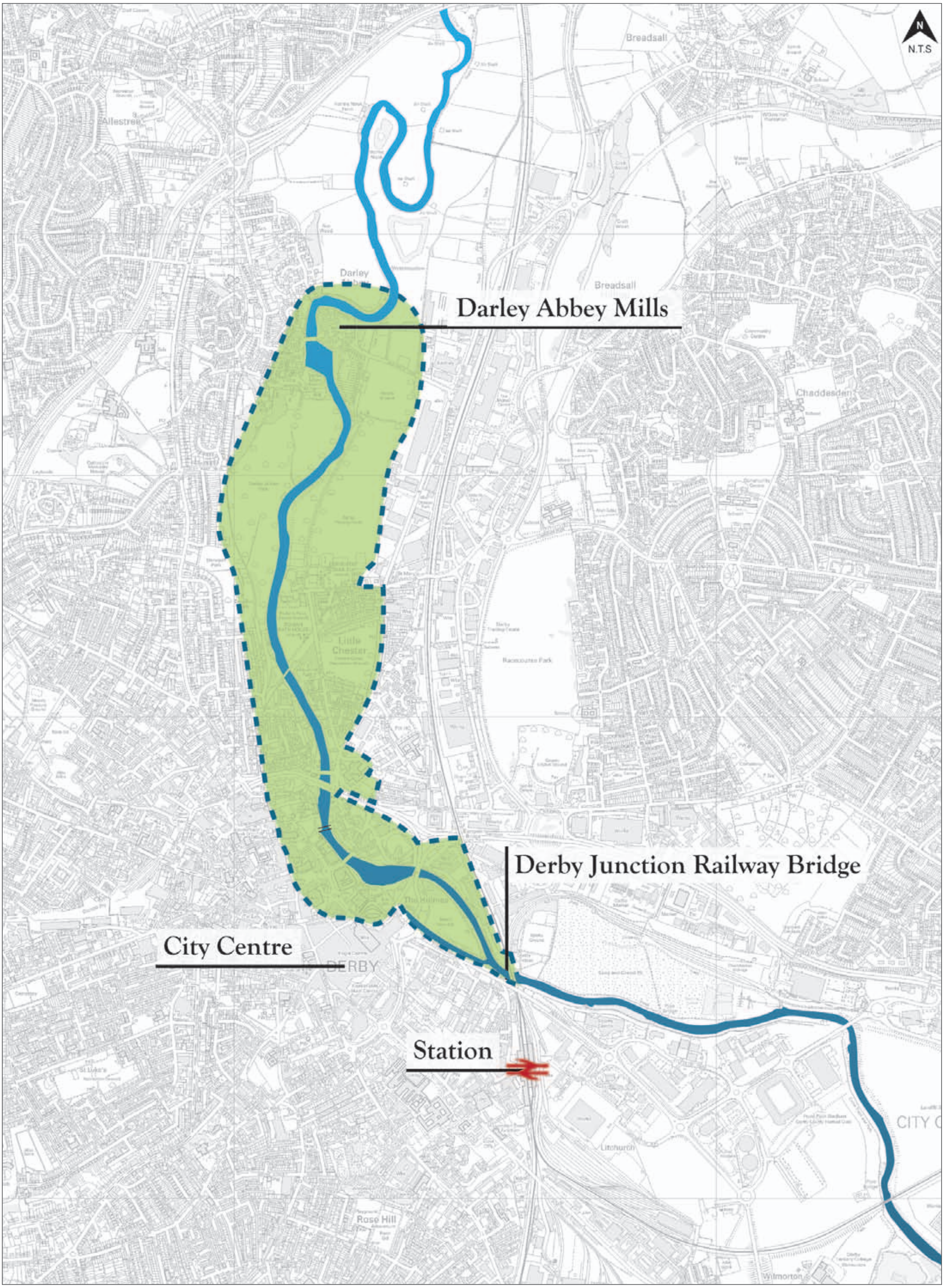


Figure 1.2: Our City Our River Masterplan area of search for the revised alignment of flood defences

THE MASTERPLAN AND LOCAL AND NATIONAL PLANNING POLICY

Derby City Council's Cabinet has approved the Masterplan as guidance, which will be a material consideration when determining planning applications. The Masterplan should be read alongside the relevant adopted policies in the Council's statutory City of Derby Local Plan (2006) and national planning guidance as set out in the National Planning Policy Framework (NPPF).

The NPPF states (para 94) that Local Planning Authorities should adopt positive strategies to mitigate and adapt to climate change, taking full account of flood risk and other factors. It retains the policies of the previous PPS25 in terms of the application of the 'sequential test' and 'exception test' in preparing Local Plans for areas of flood risk. The overall aim of the sequential test is to steer development to areas of lower flood risk. However if this is not possible the exception test can be applied. For the exception test to be passed:

- the development should provide *"wider sustainability benefits to the community that outweigh flood risk"*[1]; and
- *"a site-specific flood risk assessment must demonstrate that the development will be safe, without increasing flood risk elsewhere, and where possible will reduce flood risk overall"*[2].

In considering planning applications the Council will have regard to this national guidance. It will also have appropriate regard to the relevant local plan polices and the content of the Masterplan.

Derby City Council is preparing a new local planning framework for the City in the form of its Local Development Framework Core Strategy. This will provide an opportunity to incorporate the planning principles of the Masterplan into the statutory planning framework for the City.

All individual planning applications will need to be accompanied by a site specific Flood Risk Assessment (FRA). The FRA will need to clearly demonstrate how the development proposals have taken account of national and local planning policy, together with the aims and content of the Masterplan, along with any detailed Design & Development Briefs that are later produced.

DEVELOPMENT OF THE MASTERPLAN & CONSULTATION

Collaboration and partnership working have underpinned the development of this Masterplan. The EA and the City Council embarked on a collaborative design process, supported by external consultants, in December 2009. Through a series of studies, workshops, design reviews and technical analyses the parties have developed an innovative and integrated approach to the future of Derby's flood defences. The Masterplan proposals and the wider EA scheme in the Lower Derwent Valley, without mitigation measures would increase flood levels in specific areas of the Strategy, such as Darley Abbey Mills and areas downstream of Derby, within South Derbyshire.

Over time, the Masterplan shall be supplemented with detailed Design and Development Briefs for specific sites within the area. The purpose of the Briefs will be to help inform investment decisions and through detailed analysis of the site specific constraints and opportunities they will guide the use, design and shape of new development.

[1 & 2] DCLG (2012) 'National Planning Policy Framework'. DCLG, London

STRUCTURE OF THIS DOCUMENT

Section 2 describes what would happen to Derby now during a 1 in100 annual chance flood event on the River Derwent. This descriptive section establishes the need for flood defences which provide an increased Standard of Protection.

Section 3 outlines the process undertaken to develop this Masterplan in response to the flooding issues facing Derby.

Section 4 sets out the Principles and Objectives that underpin the Masterplan.

Section 5 is the core of the Masterplan. This describes and illustrates the proposed works within the Masterplan area using a series of seven Opportunity Areas to provide an appropriate level of detail. Comments on this section will be particularly welcomed.

Section 6 sets out the proposed approach to implementing and delivering the Masterplan.

Section 7 describes what would happen to Derby during a 1 in 100 annual chance flood event following the implementation of the Masterplan. It offers a significant contrast to Section 2.

2

What would happen now in a major Flood Event?

2. What would happen now in a Major Flood Event?

PEOPLE AND PROPERTY

Warning time for a flood event along the River Derwent is just four hours. A 1 in100 annual chance flood would have a potentially devastating impact on Derby. Figure 1.1 illustrates the probable extent of flooding within Derby City Centre. Rising topography largely protects the western extent of the City but the eastern bank is low lying and within the natural floodplain of the river.

During a 1 in100 annual chance event the defences at Darley Abbey Mills would be overtopped and the mills and properties along Folly Road would be inundated with flood water. Both the Toll Bridge and Haslam's Lane would also be underwater disconnecting these properties from dry land. The western bank in this location would remain unscathed as existing ground levels afford the necessary protection. The defences on the eastern edge of Darley playing fields, north of Little Chester, would also overtop and flood water would inundate Alfreton Road Industrial Estate and businesses would see an impact arising from the inability to trade resulting in loss of earnings. Parts of the Midland Mainline Railway would be affected, and flood water would affect the businesses and properties along Mansfield Road.

As the flood nears the City Centre, water would rise and engulf the community at Little Chester, affecting both people and historic buildings. Businesses along Fox Road and Prime Parkway would also be flooded and severely affected. The divisional police headquarters of Derbyshire Constabulary and Landau Forte College would also be subject to flooding.

Defences along Bath Street and Duke Street to the west of the river would overtop. This would flood the lower lying parts of Strutt's Park Conservation Area and Bath Street Mill. The residential community surrounding Duke Street and Bath Street would also flood. The extent of flooding in this area is limited by the rising topography of North Parade which prevents flood water moving westwards.

Flood water would continue south and upon entering the City Centre area, St Mary's Bridge would be situated above the flow of water as would the Listed Chapel and the Bridge House. Homes at Christchurch Court on the corner of Sowter Road and St. Michael's Lane would flood, as would the Silk Mill and the electricity sub-station opposite which serves thousands of properties in Derby. The remaining majority of the western bank in the City Centre would be protected due to the rising topography

On the eastern bank North Riverside, which includes Phoenix Street, Stuart Street, Derwent Street, Exeter Street and Meadow Road, would flood. This area is home to a NHS Derby City office, several commercial properties and several blocks of residential flats. Trent Barton bus depot and the Derby Telegraph on Riverside Road would also flood. Significantly flood water on the eastern side of the river would flow along the A52 and Nottingham Road under the Midland Mainline Railway to Pentagon Island and beyond. Approximately half of the Racecourse Park would be submerged and the residential community surrounding St Mark's Road, Beaufort Road, and Kerry Street would all be heavily affected. In additional a number of commercial properties along the A52 would also be engulfed by flood water.

To the south of Pentagon Island, Chequers Road Industrial Estate would be submerged. Flood water would continue downstream, forcing its way through the arches of Derby Junction Railway Bridge leaving a trail of destruction and devastation behind.

Text Box 2.1: What are appropriate land use activities within areas of high flood risk?

Less Vulnerable Uses

- "Police, ambulance and fire stations which are not required to be operational during flooding.
- Buildings used for: shops; financial, professional and other services; restaurants and cafes; hot food takeaways; offices; general industry; storage and distribution; non–residential institutions not included in 'more vulnerable'; and assembly and leisure.
- Land and buildings used for agriculture and forestry.
- Waste treatment (except landfill and hazardous waste facilities).
- Minerals working and processing (except for sand and gravel working).
- Water treatment works which do not need to remain operational during times of flood.
- Sewage treatment works (if adequate measures to control pollution and manage sewage during flooding events are in place).

Water Compatible Uses

- Flood control infrastructure.
- Water transmission infrastructure and pumping stations.
- Sewage transmission infrastructure and pumping stations.
- Sand and gravel workings.
- Docks, marinas and wharves.
- Navigation facilities.
- MOD defence installations.
- Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location.
- Water-based recreation (excluding sleeping accommodation).
- Lifeguard and coastguard stations.
- Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms.
- Essential ancillary sleeping or residential accommodation for staff required by uses in this category, subject to a specific warning and evacuation plan".

Source: *DCLG (2012) 'Table 2: Flood Risk Vulnerability Classification' DCLG, London 'Technical Guidance to the National Planning Policy Framework'*

Flooding on Darley Playing Fields, Derby

Flooding on Alfreton Road, Derby in 1965

Flooding at Chester Green, Derby in 1965

INFRASTRUCTURE AND TRANSPORT

A 1 in 100 annual chance flood event would also have significant implications upon the City's infrastructure and services. A major electricity substation sits on the western bank of the river adjacent to the Silk Mill, this would be affected and its loss during a flood event would result in the loss of electricity to thousands of homes and businesses within the City Centre. Spondon Sewage Treatment Works is also at risk of flooding and provides a vital service to the City. If this site were inundated it would result in the contamination of flood water with untreated sewage.

Flooding would also cause significant access problems both to and from the City Centre with access from the North, East, and South East being heavily restricted due to flood water (see Figure 2.1). Significant parts of the principal road network would be affected including some primary routes and trunk roads. Significant parts of Derby's secondary highway network would also be affected by a major flood event limiting access to and exits from the flood affected areas.

This would be unacceptable as it would severely restrict emergency vehicle access to many parts of the City Centre, which would hamper rescue efforts and could contribute to the loss of life.

There would be severe disruption to public transport including many of the key bus routes into the City Centre. The Pride Park and Meteor Park and Ride sites would be deluged. Rail services would also be affected, the whole of Derby Station and Derby South Junction would be flooded and in these circumstances all train services out of Derby Station would be cancelled. Finally, pedestrian and cycle movement along the banks of the river would become inaccessible and dangerous.

Electricity Sub Station

Meadow Road and access into Darwin Place

Station Approach

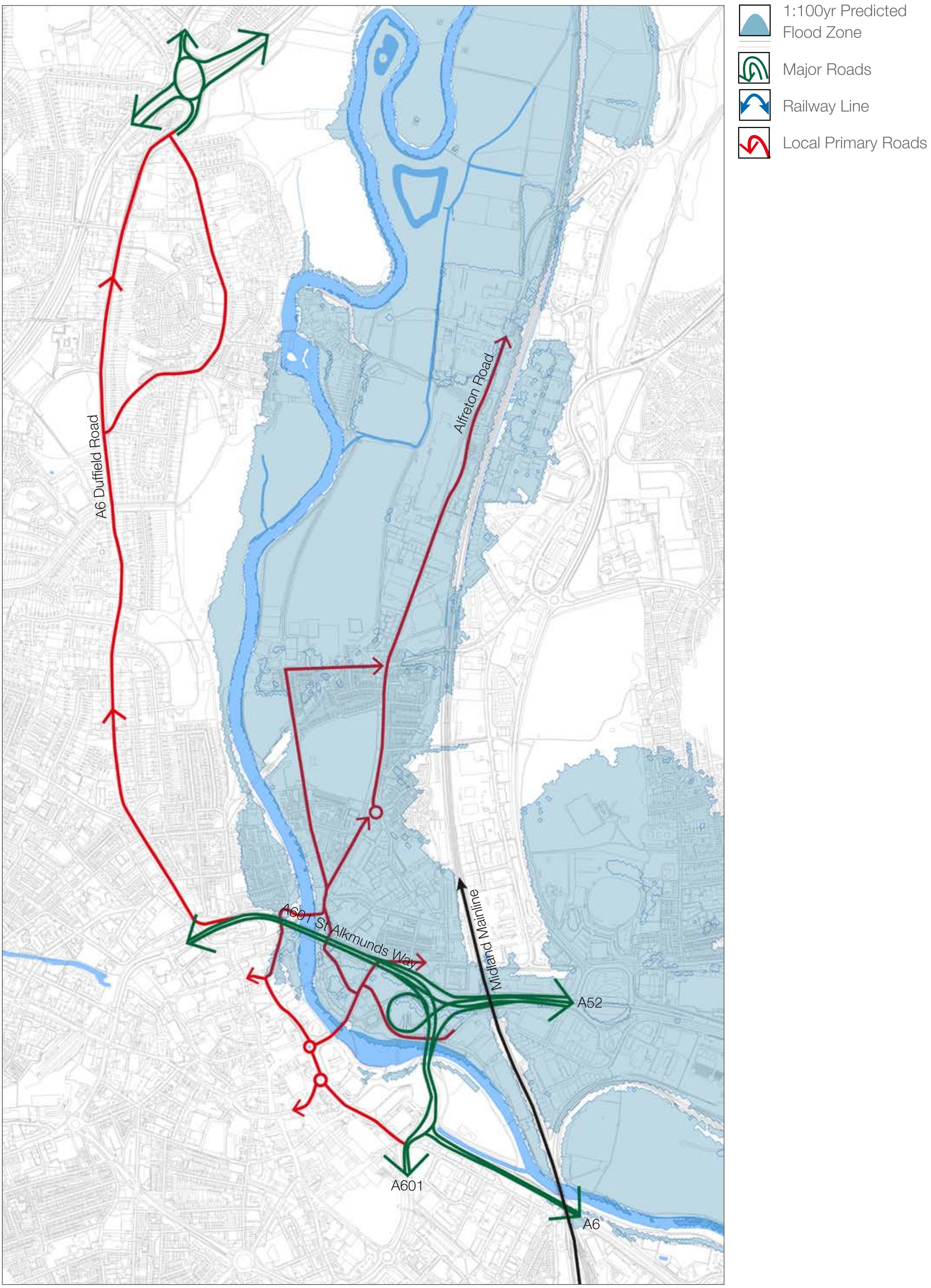


Figure 2.1: Existing Highways and Connections Affected by the Predicted Flood Zone

LOCAL ECONOMY

It would take some significant time for homeowners and businesses to recover from a flood event with the consequent adverse impacts upon the local economy (see Text Box 2.2). The impacts of the loss of utilities would have an associated cost and loss of services for the period of the flood and clean up would have a negative effect on a much wider area and many more people.

Even before a flood occurs there are consequences associated with people anticipating a severe event. Over time properties in high risk areas may be abandoned and at least devalued, due to restrictions on future use and the difficulties in securing adequate buildings insurance. Degraded and abandoned property present a poor environment, which would affect the image of the City as an inspiring place to live, work and visit. Furthermore, the land and buildings which are currently subject to flooding but are vacant, underutilised or derelict would continue to be unused, further affecting the City's image and economic vitality. This includes development sites such as Aida Bliss, Bath Street Mill, Darley Abbey Mills, the former Police Station and Magistrates Court on Full Street and Darwin Place.

As flood risk increases with climate change, the outlook for future development opportunities and economic investment within areas of rising flood risk would worsen. Any new development within areas of high flood risk would also be limited to less vulnerable or water compatible uses. The sites would therefore become increasingly unattractive to investors and delivery of regeneration projects on them would be sluggish at best.

The effects and costs of a severe flood would be catastrophic in the short term however the anticipated affects of a flood could severely stifle the economic regeneration and vitality of the City Centre.

Text Box 2.2 What are the costs of flooding?

The EA estimate that the proposed increase in the standard of flood protection to residential and commercial property in Derby will provide £318m* of economic benefit to the City in the reduction of damages that arise from floods.

Footnote:

* This is based on annual average damages over the 100 year design life of the scheme.

Source: Environment Agency (2009) 'Lower Derwent Strategy Approval Report – V4'

3

Developing the Masterplan

3. Developing the Masterplan

Our City Our River is designed to address the very real risks of flooding whilst enabling future growth and development in Derby. The following briefly sets out the process behind the development of the Masterplan.

LOWER DERWENT FLOOD RISK MANAGEMENT STRATEGY

In September 2008, the Environment Agency published its Lower Derwent Flood Risk Management Strategy Public Consultation Document and associated Strategic Environmental Assessment Report. Following a period of consultation the Strategy was formally adopted by the EA and published in January 2011. The Strategy looked at ways of reducing the existing 1 in 25 annual chance of flooding from the River Derwent in Derby.

Discounted Options

A number of options were discounted by the Strategy. Options such as upstream storage, channel dredging, creating a bypass channel or tunnel were not technically, economically, and/or environmentally feasible.

The Preferred Approach to Flood Risk Management

With its preferred approach the Strategy identified the following priorities:

1) **Continue and review existing activities:**

- Flood warning;
- Channel maintenance;
- Maintain existing defences;
- Control development;
- Education and awareness.

2) **Upstream land use management:**

- Changes in land management;
- Increase woodland coverage;
- Create and restore wetland habitats.

3) **Provide flood defences and improve conveyance:**

- Replace and raise defences to reduce flood risk;
- Realign and construct new defences through Derby city centre to reduce flood risk;
- Improve conveyance around structures.

The Environment Agency is continuing its existing activities and encourages all residents and owners of commercial premises within areas of flood risk to sign-up to their Flood Warning service.

This can be done on-line at:

http://www.environment-agency.gov.uk/homeandleisure/floods/default.aspx

Improvements to upstream land management continues to be investigated by the EA to help reduce the volume of water flowing downstream. Considering that the River Derwent's catchment upstream of Derby is over 1,000km^2, the timescale for realising benefits from this option is long-term and the magnitude of any benefit will be relatively small and limited to helping combat climate change.

Achieving a reduction in flood risk to properties across Derby results in a narrowing of the floodplain through the city centre. This narrowing could act as a throttle to flood flows, and results in an increase in flood risk in upstream areas (due to water backing up at the throttle) and also downstream areas (due to water being passed through Derby more quickly). In providing flood defences and improving conveyance, the option of raising defences in Derby on their existing alignment was therefore discounted due to the required height of the defences and the resulting significant increase in flood risk to upstream and downstream communities.

At the time the Strategy was prepared, flood modelling indicated that if the defences were realigned away from the river, and the conveyance capacity of bridges increased, the required height of the defences and the areas of increased flood risk could reduce. The Strategy identified that the optimum solution in terms of flood risk would be to create a 120 metre wide 'blue corridor'. At this width, in a flood event with a 1 in 100 annual chance, there would be no increase in flood risk at Darley Abbey Mills and hence no impact on this part of the World Heritage Site. This width would also reduce any increase in flood risk to downstream areas; to levels which could be managed by improvement to the defences in those areas.

Our City Our River looks at how the third aspect of the Strategy's preferred approach to managing flood risk, providing flood defences and improving conveyance, can be implemented through Derby City Centre.

The first two aspects continue to be undertaken by the Environment Agency.

Copies of the Strategy can be downloaded from:

http://www.environment-agency.gov.uk/homeandleisure/floods/38465.aspx"

OUR CITY OUR RIVER: PREPARING THE MASTERPLAN

Since the emergence of the Strategy, the City Council has worked in partnership with the EA to deliver a solution to flood risk that meets the aspirations of the City Council and affords the City protection from a severe flood event. The Masterplan presented here is the result of that collaborative working following the principles of the Strategy (making space for water), whilst minimising the impacts in both upstream and downstream areas in the context of the form of the City and the built and natural environment.

The preparation of the Masterplan has involved a detailed assessment of current environmental conditions, issues and assets along the river corridor. This drew on the Strategic Environmental Assessment for the Lower Derwent Strategy but involved considerable additional work relating to character of the City, economic performance, and transport and understanding constrictions along the river. This work identified a "zone of influence" in which a search for appropriate physical solutions could be undertaken. This was inside the notional 120 metre corridor width identified in the Strategy.

Following on from the detailed assessment a series of physical solutions have been tested throughout the "zone of influence". Informed by the EA's predictive flood model and the baseline considerations the zone was divided into Opportunity Sites. Various alignment options were considered within the zone and then the detailed local impacts of the alignment were investigated.

The physical solutions to flood management balance the width of the flood corridor, against the "height" of the required defence; all in the context of the constraints and opportunities within each site. From this, the physical, social, environmental and economic benefits and disbenefits were analysed and used to develop the preferred alignment. This alignment was then modelled using a predictive flood model.

Following modelling and further design iterations in consideration of the baseline conditions a slightly adjusted alignment was agreed. This revised alignment formed the basis for the Masterplan. Over a period of four months the partners and consultants developed a series of options and concepts for the seven Opportunity Sites along the river corridor. Throughout the design process the options and alignments have been presented to officers of the City Council and the EA and feedback has informed the presented preferred alignment and solutions in the following chapters.

Text Box 3.1: What did the Model Show?

The EA has undertaken an extensive modelling exercise to inform the decision making process in the production of the Masterplan. An initial 'baseline' realignment of the defences was modelled which was based on the core principles of "making space for water", protecting people and property, encouraging appropriate regeneration, protecting and enhancing the historic and natural environment and the strategic highway assets.

A whole series of further options were then modelled whereby small changes were made to the 'baseline' realignment to test their sensitivity on flood levels. In this way, where modifications were shown to reduce flood levels whilst still meeting the objectives of the Masterplan, a 'preferred' alignment evolved and it is that which is presented in this document. The flood risk management constraints to the proposed regeneration opportunities will be detailed within the proposed Design and Development Briefs that will be required when implementing the Masterplan.

4

Our City Our River – Principles and Objectives

4. Our City Our River - Principles and Objectives of the Masterplan

INTRODUCTION

Embedded within the Masterplan are a series of underlying principles and objectives that guide its direction and establish its parameters for success. The principles combine the EA's approach to flood risk management with the regeneration aspirations of the City Council that encompass social, community, leisure, recreation, business, investment, historic, cultural and biodiversity considerations. It is from this background that a unique project emerges, one that requires a partnership approach to enable the Masterplan vision to be delivered. The partnership requires the involvement of the City of Derby, its council, its businesses alongside the technical expertise of the EA to contribute to the delivery of the Masterplan and its objectives.

Our City Our River, is about much more than safeguarding people and property, it is also fundamentally about re-establishing a positive relationship between the City and River and ensuring that Derby remains a vibrant and attractive place for people to live, work and visit. Consequently, the Masterplan seeks to enhance the natural environment, create better access and connectivity, encourage greater footfall, improve safety and the perception of safety, and generally exploit a great natural asset to the benefit of the City as a whole.

It is important to acknowledge that the Masterplan presents a vision and framework for the future of the corridor, it does not prescribe land use nor does it dictate the scale, mass or appearance of the development opportunities. It is a strategic,high level document that presents indicative proposals, and sets out a viable solution to flood risk management. Detailed designs will be required for individual projects and developments within the Masterplan area. It is also the case that there are a number of possible options within each Opportunity Site area. The overall proposed approach to flood defence and environmental enhancements is discussed in the following section identifying the Masterplan's proposals.

The Principles and Objectives set out in this section have guided and informed all the physical change and development opportunities within the areas identified along the river in the City.

Riverlights Phase 1

View south towards Causey Bridge and the City Centre

Existing properties at St Mary's Court

OVERARCHING OBJECTIVES

The following overarching objectives provide broad parameters within which the proposals set out in the following section have been developed.

Reduce Flood Risk to Residents and Commercial Property – implementing the Lower Derwent Strategy to reduce flood risk through the City of Derby.

Maximise Development Opportunities – the Masterplan must be deliverable and must involve private as well as public investment and this requires realising the full development potential of the area.

Encourage Investment – delivering existing and new investment opportunities through the protection of buildings, potential development sites and access routes currently at risk from flooding needs to be achieved to support Derby's economic vitality.

Deliver Regeneration Aspirations – delivering the Masterplan should encourage short and long term investment. Current lack of viability means that some sites cannot be delivered until they are unlocked through the delivery of this project and complimentary initiatives.

Manage Change – the Delivery Strategy in the Masterplan would enable communication and consultation, within which options can be assessed and reviewed, and the planning and legal framework integrated.

Enable Phased Delivery – given the need for private investment a long term solution is the only practical way forward, this also means that a comprehensive defence for the City would not be achieved until the last development is complete.

Mitigate Against the Adverse Effects of 'Flood Defences' – currently some defence walls are 1.1 metres tall or higher. In order to protect against the flood event with a 1 in 100 annual chance of occurring the defences could increase to 2 to 3 metres high in some locations. To reach acceptable design solutions, tall structures would be incorporated in appropriate development locations, either as 'part' of buildings or walls located and designed to enhance the area. Green solutions, embankments and contours would also be used where possible to allow and enhance public access and contribute to the existing parkland and wildlife.

Capture the Opportunity for 'Betterment' – the creation of a linear park aligning the river, giving access to the whole length of the River Derwent, thereby 'softening' and restoring the natural character which has considerable potential to enhance the quality of life of residents'. Improved connections between the City Centre and local residential communities would also need to be provided.

Minimise Disruption to Existing Residents and Business – in key areas where existing people and property are likely to be significantly affected by new defences sensitive approaches would be required; however to provide protection to the wider area some local disturbance and relocations would occur in order to deliver physical defences.

Protect Strategic Infrastructure – the City and emergency services need to function during a flood event. Principal highways, the Midland Mainline Railway, and utility services need to be safeguarded against flooding.

Protect and Enhance Ecology, Wildlife, Biodiversity – this is a significant opportunity for all areas within the Masterplan.

Protect and Enhance Heritage Assets – minimising impacts on significant historic buildings, structures and archaeology is important, particularly in relation to the World Heritage Site. Opportunities to promote appropriate and sustainable uses should also be sought.

Create a Framework of Opportunities – to maximise the potential for delivery, the Masterplan cannot be deterministic. Each locality has specific requirements which would be articulated through 'Design and Development Briefs', which would be subject to normal planning application processes.

Figure 4.1: The Masterplan

These overarching objectives are supplemented by more detailed topic specific principles and objectives which are set out in the following section.

Proposed Defences – Walls and Buildings

Proposed Defences – Embankments and re-profiling of the ground

Existing Contours provide a natural flood defence

Active defences of temporary nature needed during a flood event

Open Space – amenity, recreational, leisure, wildlife

Proposed vehicle access

Proposed pedestrian access

Existing buildings. Those within the proposed flood corridor will require resilience measures

Proposed development sites incorporating flood defence

Strategic Highway

TOPIC SPECIFIC PRINCIPLES AND OBJECTIVES

Introduction

The five specific principles and objectives which have been identified for further explanation are:

- Regeneration Opportunities;
- Historic Environment;
- Ecology;
- Access, Public Realm and Landscape; and
- Transport.

These five topic areas have informed and guided the physical characteristics and constraints of the proposals for the seven Opportunity Sites along the river, which are set out in Section 5.

Regeneration

Background

In September 2010 the City Council undertook a review of the Derby Cityscape Masterplan, the Derby City Centre Public Realm Strategy and the Derby Public Art Strategy. The review culminated in a draft City Centre Regeneration Framework (CCRF) which was adopted in January 2012. The draft CCRF identifies five key issues, which are highlighted as:

- Sustainable economic growth, lack of high quality office accommodation;
- Retail/ leisure/ cultural diversity, lack of investment in leisure/ cultural venues;
- Dereliction, housing, quality of built and natural environment, underused heritage assets;
- Flood risk management, riverside development, green infrastructure; and
- Communication, connectivity, placemaking and community cohesion.

Also highlighted are a number of priority projects and areas of investment. The former Magistrates Court and Police Station, the Silk Mill, Riverlights Phase 2 and Castleward are identified as priority projects. North Riverside is identified as an area of land for investment opportunities, where under-utilised vacant land could be transformed into alternative uses. Flood risk acts as a barrier to investment in all of these locations, as it devalues the land and restricts the type of development that can be built. Development in some of these areas has not been forthcoming, but it is more likely to be stimulated if the impacts of flooding can be mitigated.

Principles

Encouraging investment in these prominent areas is a fundamental priority for the Masterplan, through planned growth and a collaborative approach the required flood defences can be provided as part of the development proposals (see Text Box 4.1 and 4.2). Through investment and development of vacant, under-utilised brownfield land these sites can be transformed into areas of betterment that provide key nodal points, landmarks and gateways and most importantly reconnect the City to the river through the provision of new public spaces. The nature of the land and its previous use means that it is likely to suffer from contamination in the ground and in the groundwater which is closely linked to the river. New development proposals would need to consider this alongside the other constraints and mitigate accordingly to ensure that there are no adverse effects on the quality of the river water.

Objectives

Detailed objectives for the Masterplan include:

- The promotion of development and alternative uses to allow for betterment;
- To increase market confidence in parts of Derby where regeneration is stifled;
- To improve the River Corridor and create a better, safer, more connected and legible environment with new development that engages with the river and creates an attractive facade; and
- To minimise the use and number of active defences/ flood gates required to protect Derby.

Derby Silk Mill

Vacant Magistrates Court at Full Street

Redevelopment opportunities at Aida Bliss

Riverlights Phase 1

Text Box 4.1: How many Flood Gates will there be?

In order to allow the regeneration of some of the opportunity sites and afford the City centre protection, flood gates/active defences would be required. The use of flood gates/active defences is not encouraged by the Environment Agency as the gates can pose operational issues, such as the need for a flood warning system to be in place to close them, the time taken from receiving the warning to closing the gates, the risk of false alarms, risk of failure and the costs of maintenance and inspection.

In certain scenarios the provision of gates is the only option. Where this is the case opportunities to minimise the frequency at which the gates need to be closed will be pursued. This would include local ground level raising to raise the threshold of the gate. The use of gates has been weighed against other measures such as viability, physical and environmental constraints. Therefore to ensure the floodwater is contained within the defined area, up to eight flood gates would need to be installed and closed during a flood event, at the following locations:

- Darley Abbey Mills Toll Bridge (one at each end);
- Haslams Lane (one at each end);
- Duke Street;
- Exeter Bridge (adjacent to the Council House);
- Derwent Street; and
- Meadow Lane.

The EA would be responsible for closing these gates or devolving responsibility to an alternative body. The successful operation of the flood gates would be an integral part of the flood risk management for the City.

Text Box 4.2: What is an Integrated Defence?

In areas where there are regeneration opportunities the Masterplan proposes that the defences are integrated into the development proposals. Integrating the defences would have significant benefits to the public realm in comparison to a standalone flood wall. Flood walls would carve the City into two and separate people and property from the river, this goes against the regeneration aspirations of the City Council as it would create an uninviting urban environment.

Integrating the defences with buildings and the public realm poses a much softer solution, creating an attractive setting for the river and new public parks. This approach would also ensure that public spaces are overlooked increasing safety and the perception of it. However, integrating defences into new development has issues that need to be considered further during the development of more detailed proposals. The flood defence would be a critical asset for the whole of the City and not just the local landowner. The defence therefore needs to be regularly inspected, periodically maintained, and generally managed by a competent organisation. This is unlikely to be a private individual or small business. Appropriate access would therefore be required to the flood defence. Thought also needs to be given to the consequence of a failure of the defence and the impact it could have in the immediate vicinity. The safety of people will be a critical aspect of this.

Further detail on the design, implementation, maintenance and inspection of integrated defences will be provided in the Design and Development Briefs.

Historic Environment

Background

Few rivers in the UK can boast such rich and important heritage as the River Derwent. Its role in the UK's industrial revolution is well known and internationally acknowledged through the inscription of the Derwent Valley Mills onto the World Heritage List. The Masterplan area encompasses the southern extent of the World Heritage Site from its beginning at the Silk Mill in Derby City Centre to Darley Abbey Mills and Village at the edge of the City (as shown on Figure 4.2).

In addition, the Masterplan area also contains nationally important scheduled Roman remains at Little Chester. The nationally important scheduled and listed St Mary's Bridge with associated Chapel, a number of other important listed buildings and locally recorded archaeological sites and areas where further remains are likely to survive. Outside of the Masterplan area but within the current 1 in100 annual chance flood area are a significant number of other listed buildings, conservation areas and key heritage assets.

Principles

Safeguarding this heritage, within and outside of the corridor, whilst also delivering benefits for its long term conservation and use is a headline priority for the Masterplan. To help ensure that benefits are maximised and impacts minimised the following broad principles have been embedded in the design process:

- Physical alteration of designated heritage assets e.g. listed buildings and scheduled monuments, would be avoided wherever possible**;
- Interventions would respond to the setting and context of designated assets;
- Flood defence measures would, wherever possible, reduce flood risk for designated heritage assets; and
- Access to, and understanding of, the heritage of the corridor would be improved wherever feasible.

Objectives

Detailed objectives for the Masterplan include:

- The EA seek to mitigate against increased flood risk at Darley Abbey Mills. The City Council would like to reduce flood risk at the Darley Abbey Mills and hence improving prospects for its regeneration and conservation;
- Mitigation and enhancements at the Roman viscus (settlement) and fort;
- Mitigation and enhancement's to Parker's Piece (Roman bathhouse) and Little Chester Conservation Area;
- Potential Enhancements to the Strutt's Park Conservation Area (Bath Street Mill);
- Managing the impact of flooding on the St Mary on the bridge, the Chapel and associated house; and
- Reducing flood risk for numerous listed buildings within Derby City Centre.

**Development of the scheme around these historic assets would be carried out with the benefit of advice from English Heritage, Derby City Council's Conservation Officer, the County Archaeologist and Derwent Valley World Heritage Site Partnership. Elements of the scheme likely to have heritage impacts include: any mitigation measures to St Mary's Bridge to facilitate conveyance; changes to the setting of designated heritage assets; and changes to the character of the Little Chester, Strutt's Park, Darley Abbey and the City Centre Conservation Areas. It is considered probable that any local adverse impacts would be mitigated through the detailed design process. Any residual negative impacts are unlikely to outweigh the potentially major benefits that the scheme could bring for the heritage of Derby and the Derwent Valley Mills World Heritage Site through safeguarding historic buildings and enabling viable long-term uses at Darley Abbey Mills.

Text Box 4.3: Why is Darley Abbey Mills included in the Masterplan?

Darley Abbey Mills was not originally part of this study and it was initially intended that the current level of protection at the Mills would be maintained. However, the reduction in flood risk to properties across Derby reduces the width of the floodplain and creates a throttle at Chester Green. This throttle causes flood water to back-up and increases flood levels at Darley Abbey Mills. As a minimum intervention, this increase in flood risk must be mitigated and this can only be achieved by raising the height of the current defences. It is considered that the appropriate mitigation can be achieved without having significant adverse impacts upon the mills although this needs to be confirmed through a formal impact assessment and consultation with English Heritage, the Derwent Valley Mills Heritage Partnership and other interested stakeholders.

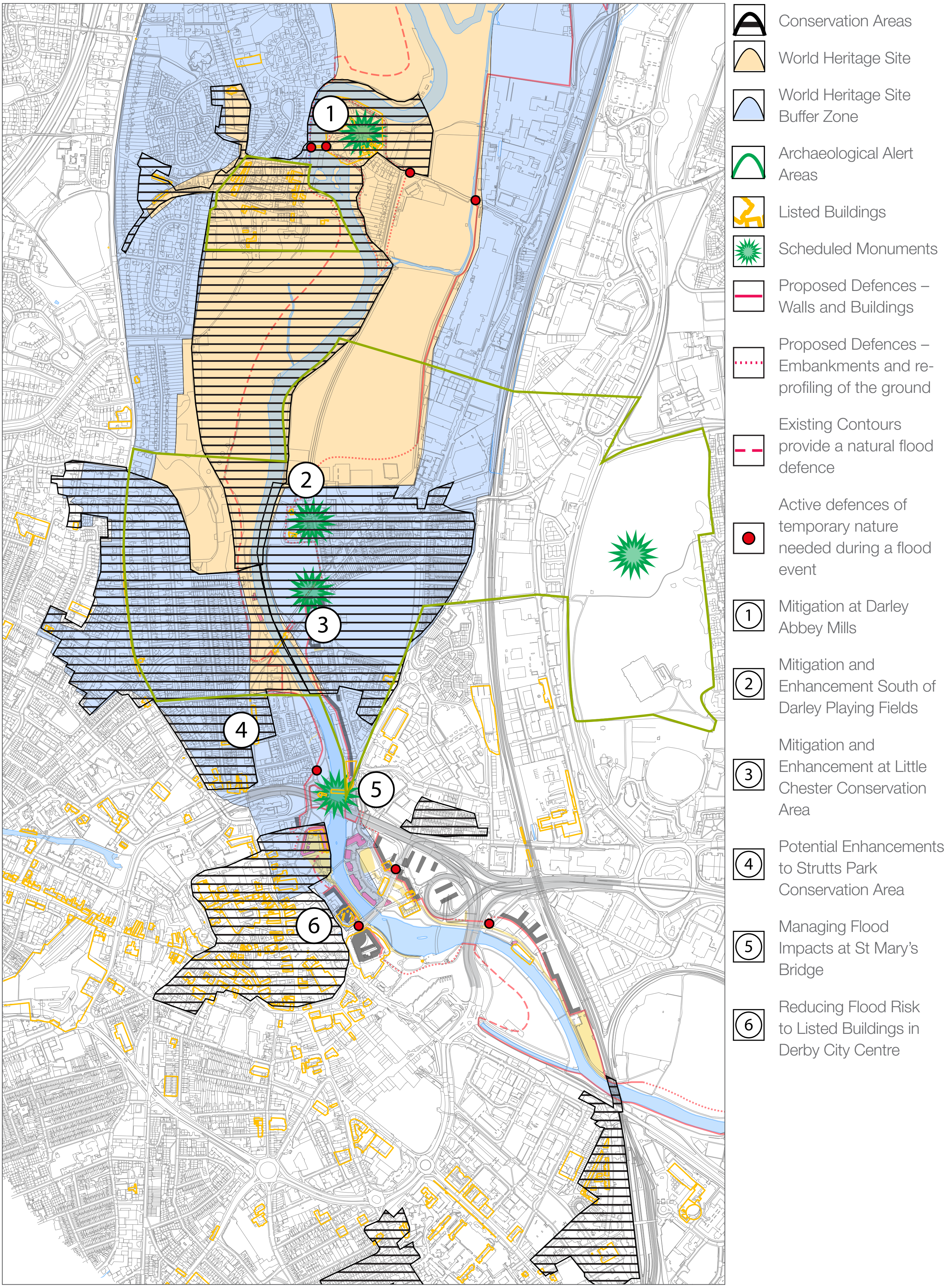


Figure 4.2: Heritage Assets and Opportunities

Ecology

Background

The Masterplan area incorporates a range of habitats and opportunities for wildlife both through the more rural / open stretches in the north and the more urban reaches in the south (see Figure 4.3).

Local Biodiversity Action Plan (LBAP) habitats that are already present in the study area include rivers and streams; wet grassland and broadleaved woodland. LBAP species that are known (or are considered likely) to use the river and environs include otter, water vole, grass snake, song thrush and bats. Bluebells are also present in the study area. These species have specific needs for targeted action and it is noted that some of these have been identified in the LBAP as they are *"popular with local people or particularly characteristic of Derby"* (see Text Box 4.4).

Principles

Although opportunities for wildlife are reduced in the urban areas, the current value of the river as a wildlife corridor in its own right should not be overlooked. The Masterplan would provide opportunities to increase this value through the creation of new and the linking of existing habitats thereby encouraging more wildlife to travel through the City Centre and to make use of habitats it provides.

Four key aims have been identified for the overall strategy relating to nature conservation. These aims look to achieve the following:

- Create a Continuous Wildlife Corridor;

Ensure the provision of a continuous green corridor along the river on at least one bank. This may include use of 'soft' engineering solutions' along river banks where space is restricted, rough grassland, hedgerows and tree lines could also be incorporated. The existing hard river edges would be softened and naturalised where possible to link habitats and provide opportunities for wildlife. 'Wildlife sensitive' lighting would be used where required to minimise disruption to otters and bats (crepuscular and nocturnal species).

The use of stepping stones would be considered where the river may become 'enclosed' at times of flood, detailed design would consider the use of ramps/ladders that would allow wildlife (e.g. otters) to move to higher ground.

Bats use vegetation for foraging along the banks of the Derwent

Otters use the River Derwent and they are a target species for habitat creation and enhancement

Bluebells are present in Nutwood and Darley Tip LNR

- Actively Discourage the Spread of Invasive Plant Species;

Invasive plant 'hotspots' would be identified and an Invasive Species Management Plan produced for the area. The EA and the City Council would work with landowners (including adjacent properties) to where practical eradicate invasive plant species or where more appropriate to discuss methods for controlling and limiting their spread.

- Identify Opportunities for Habitat Creation;

Habitat creation and enhancement would be focused on target species including otter, water vole, fish and birds. Artificial otter resting sites would be provided on islands where considered appropriate or dead wood piles would be introduced which could provide habitat for species such as otters, invertebrates and birds. Kingfisher nest boxes would be installed on less disturbed banks where appropriate. New 'wetland' habitats would be provided where land would be lowered and in particular provide reedbeds which have been identified in the Derby City Nature Conservation Strategy as an important priority. Opportunities for this exist in areas such as upstream of the Silk Mill, and at proposed new riverside parks.

Consideration would be given to the expansion of the existing Local Nature Reserve (Nutwood and Darley Tip LNR) or as a minimum, an Ecological Management Plan would be created for the Darley area, which takes management objectives of the LNR into account and works with them. The existing value of Local Wildlife Sites (River Derwent LWS and Darley Park LWS) would be enhanced and consideration be given to increasing their size. The EA and the City Council would work with Derbyshire Wildlife Trust to ensure development in this area meets objectives set by the Lower Derwent Valley – Living Landscape Scheme and that development or habitat creation/enhancement within or close to the Local Wildlife Site is sympathetic to their objectives.

- Provide Open Spaces that Work for both Wildlife and People.

Where appropriate 'informal' paths would be used as opposed to hard standing which can be achieved by creating meadow areas with mown paths through them. Designated viewing areas would be created or enhanced which could have benches and signage regarding wildlife. Where this occurs, the opposite bank shall be undisturbed with a wide undisturbed margin. The EA and the City Council would also work with the Biodiversity Action Plan for the Derwent Valley Mills World Heritage Site.

Kingfisher: New nest boxes would be provided on less disturbed banks

Slow worms: Expansion of the Nutwood and Darley Tip LNR would benefit this species

Water Voles: A target species for habitat creation and enhancement

Objectives

In addition to the above, a series of key priorities have been outlined with regard to ecological enhancements. These aim to increase the biodiversity value of the river corridor and its value to the local community. Key species that are considered to be 'targets' for ecological enhancement include otters, water vole, fish (particularly salmon which have been reintroduced into the Trent catchment since 1998) and birds (particularly kingfisher and sand martin). The enhancements include:

- Use of soft engineering and landscaping to enhance existing or create new habitats;
- Where possible to provide continuous habitat links even through the most built up parts of the City Centre, this could be achieved through the use of marginal planting, or tree planting along the river corridor;
- Sensitive lighting is also suggested to reduce disturbance to crepuscular and nocturnal species (e.g. otter and bats); and
- Communication with local groups such as the Wildlife Trust and local business is also recommended to ensure opportunities to work in partnership to deliver ecological improvements are explored.

Text Box 4.4: What does the LBAP Lowland Derbyshire say?

"The River Derwent provides an important habitat corridor into the City centre".

LBAP Vision: "An area where all people have access to and value their wildlife rich environment close to where they live and work. This is provided by an interlinking green infrastructure system having the River Derwent at its spine. Open land would be sustainably managed for people and wildlife, new built development will play a part in delivering new and enhanced habitats".

Key Actions within the LBAP include: "the maintenance, restoration and expansion of any semi natural habitat; to increase connectivity of semi natural habitats to create larger habitat complexes using priority habitats wherever possible. Habitat creation, through development, will be key to achieving this objective."

Source: Lowland Derbyshire Biodiversity Action Plan 2011 – 2020

Text Box 4.5: What is the Water Framework Directive?

The Water Framework Directive is a European Directive with the objective of improving the ecological condition of waterbodies. The Humber River Basin Management Plan classifies the section of the Derwent that would be impacted by the Masterplan as a heavily modified water body and sets out measures for the EA and other partnership organisations to help improve the river to reach good ecological potential. The EA are currently engaged in an investigative exercise that would identify specific activities based on these measures. The Masterplan provides the ideal vehicle from which to deliver these measures and the enhancements and further advice on their delivery would be incorporated into the detailed design as they develop.

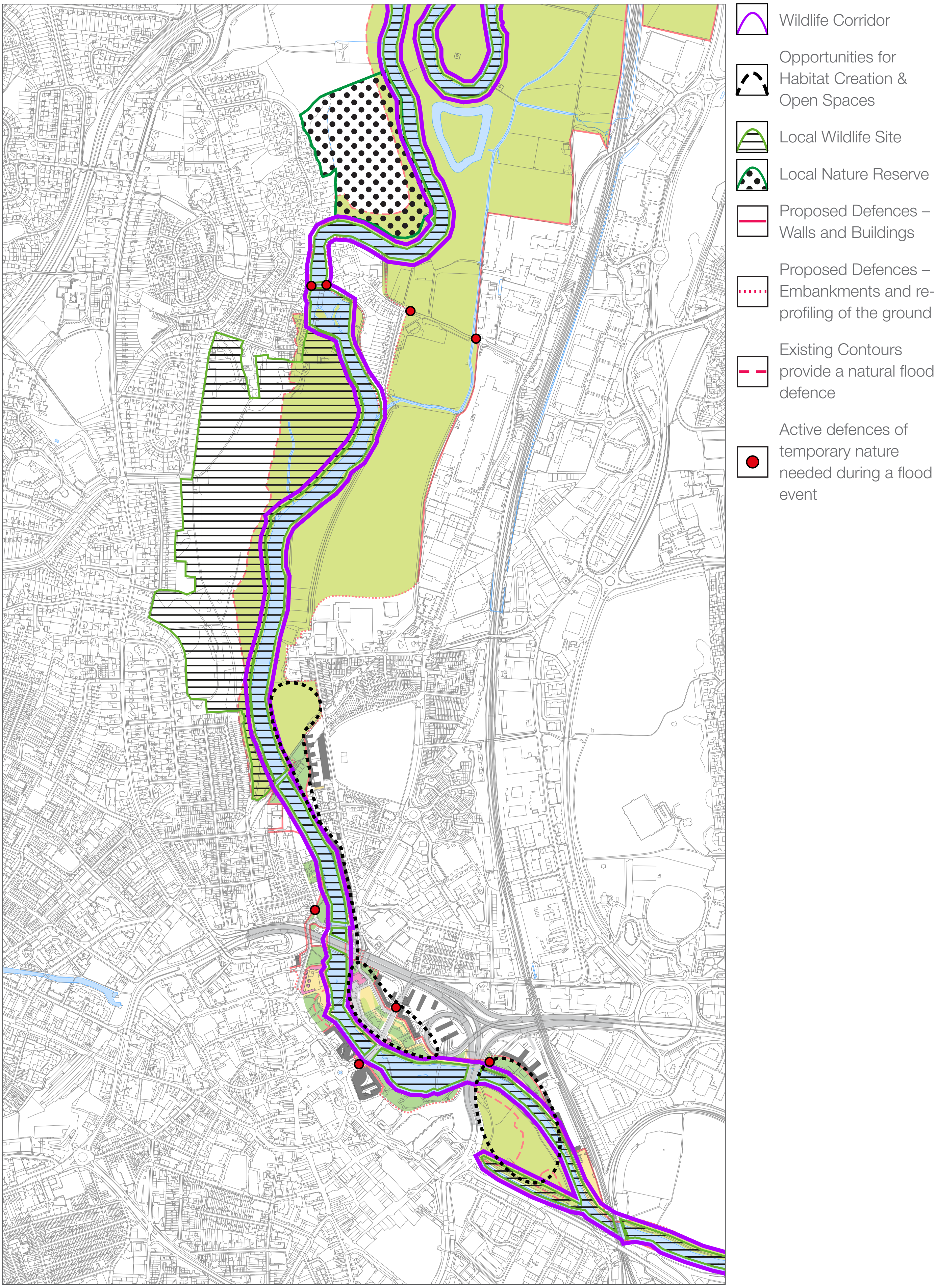


Figure 4.3: Ecology with Proposed Opportunities for Enhancement

Access, Public Realm and Landscape

Background

Travelling through the river corridor from Darley Abbey to the south side of the City Centre involves navigating a diverse set of increasingly urbanised and formalised landscapes. In the north, there are open meadows moving down to tree lined river banks and expansive formal parklands and recreational areas around Darley Abbey and through to the playing fields. As Little Chester is reached the landscape becomes more sub-urban, albeit a characterful Victorian suburb. The river gets hemmed in at this point and moves into an increasingly dense and sometimes fractured urban landscape. St Mary's Bridge provides a key crossing that unites views up and down the river. As the river corridor passes the Silk Mill it becomes entirely urbanised in character with contrasting development on either bank. Beyond this, the formality of Council House steps marks a key point on the river which leads onto to more open formal landscaping and vibrant new development at the Riverlights. At this point transport infrastructure briefly dominates before the corridor is once again dominated by formal parkland on one side and low level and low quality development on the other.

This complex changing landscape has been categorised into eight distinct and interrelated landscape character areas (see Figure 4.4), which have been used to inform the vision put forward in each of the Opportunity Sites

The public realm is somewhat disjointed along the riverbank and certain areas become confusing and disorientating for pedestrians and cyclists. Pedestrians are currently diverted from the river in the southern part of Darley playing fields and the sense of the river disappears as the footpaths are diverted along City Road. On the eastern bank footpaths run though Darley Park and continue south along the river bank, the lack of surveillance in this are discourages the use of this route. As pedestrians and cyclists continue into the City Centre, they can rejoin/continue along the river and pass under the lengthy underpasses. Emerging from the river walk, the environment is dominated by strategic highways and associated traffic, with poor signage and pedestrian crossing points and there are opportunities to create new townscape and public realm in these locations. Through the City Centre there are a series of poorly connected but high quality City spaces (Cathedral Green, Council House Steps, Bass Recreation Ground). As the pedestrian exits the City Centre the footpath is sub standard and traverses past the Trent Barton bus depot and the Derby Telegraph Building. There are a number of the footbridges providing east – west connections along the river, these are of good quality but the surrounding built environment does not make their position known, which again causes confusion and disorientation for the pedestrian.


1. Darley Riverside Meadows


5. Britannia Court, Duke Street


2. Darley Abbey Playing Fields


6. City Centre


3. Parker's Piece, Chester Green


7. Meadow Lane


4. Mansfield Road Area


8. Bass Recreation Ground

Principles

Retaining the diversity of landscape and the inherent characteristics of the individual landscape areas along the river corridor is important in ensuring the scheme's acceptability within the City. The Masterplan needs to enable people to access this rich resource and explore the entire length of the Derwent in Derby. Reconnecting the City to the river through the provision and enhancement of public spaces along the Derwent between Darley Abbey Mills and Derby Junction Railway Bridge is a major priority for the Masterplan.

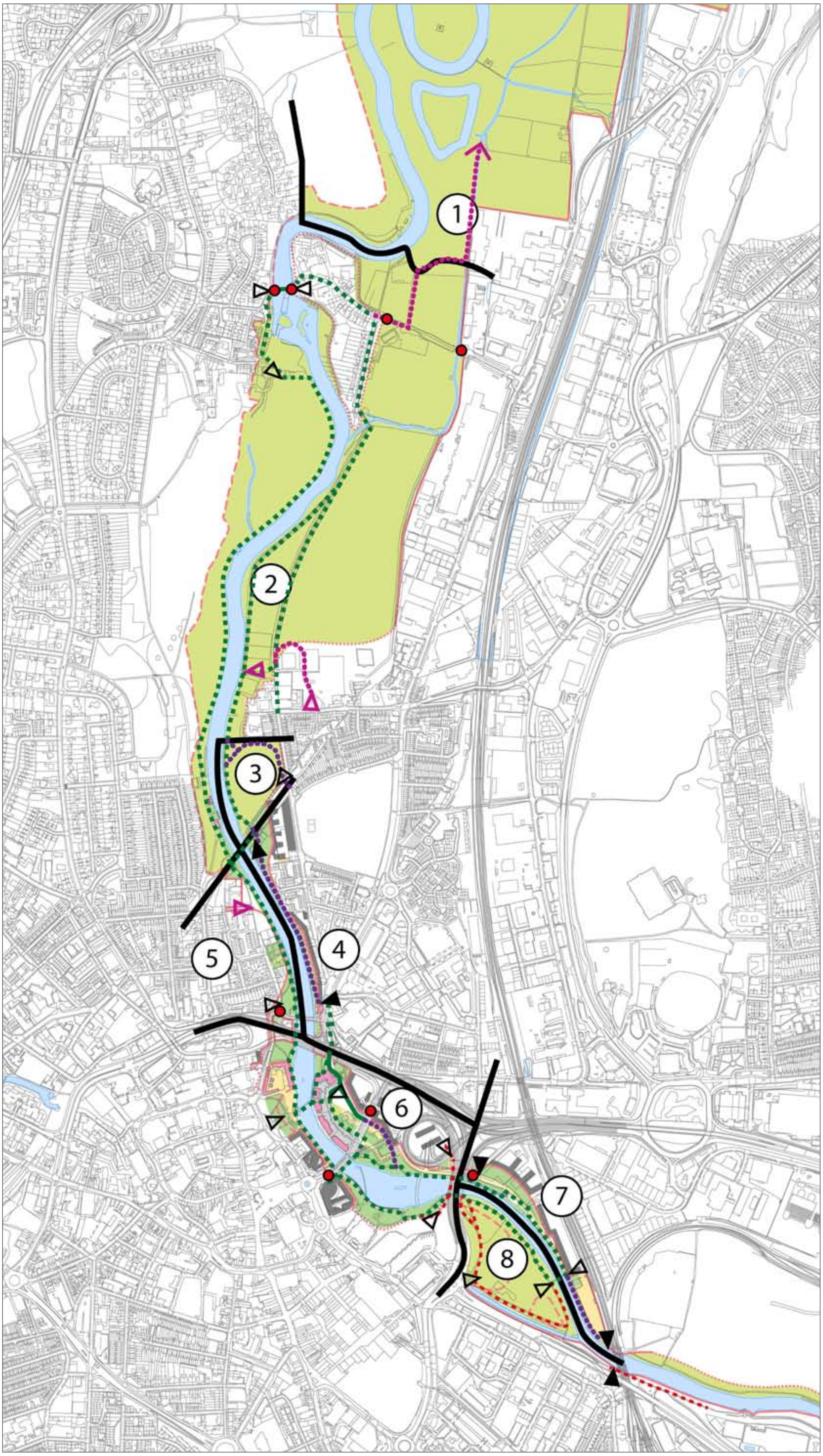
Objectives

Detailed objectives for the Masterplan include:

- To create a continuous and publicly accessible orbital route from Darley Abbey Mills to the Bass Recreation Ground which includes sub-loops utilising intermediate crossing points;
- Provide opportunities for leisure and recreational enhancements along the corridor;
- Enhance the quality of pedestrian and cycle routes between the river, the City Centre, neighbourhoods and employment areas;
- Improve the legibility of the public realm through new development proposals;
- Improve connectivity between communities, the river and wider City;
- Provide new access points to the river corridor to enable exploration and utilisation;
- Provide a riverside corridor that works for both people and wildlife;
- Re-engaging the riverside as an attraction and key integral feature of Derby's public realm, improve way finding, and explore the possibility of integrating education into the public realm through the enhancement of existing signage and information points; and
- To take into account the need of vulnerable groups such as older people and those with physical disabilities.

In order to achieve these aims a number of landscape interventions have been incorporated into the Masterplan. These are set out in Section 5 under the Opportunity Sites and include elements such as the delivery of new foot bridges, new riverside walks, enhanced cycle facilities and a better and safer urban realm in the City Centre.

Darley Water Meadows



Existing Pedestrian Path

Proposed Pedestrian Path

Proposed Pedestrian Access Points

Existing Pedestrian Access Points

Maintenance Access

Study Area Boundaries

Character Area Boundaries

Active defences of temporary nature needed during a flood event

1 Darley Riverside Meadows

2 Darley Park & Darley Playing Fields

3 Little Chester

4 Mansfield Road Area

5 Strutts Park

6 Derby City Centre

7 Meadow Lane Area

8 Bass Recreation Ground

Figure 4.4: New and Existing Public Realm Opportunities and Pedestrian Accessibility

Transport

Background

Falling under the overarching principles of Access further consideration has been given to the specific objectives relating to transport across the City.

Objectives

Protecting strategic transport infrastructure and enabling access for the emergency services in the event of a major flood event is a critical objective for the Masterplan. Several permanent changes to the primary highway network are therefore envisaged to enable the implementation of robust flood defences and allow the regeneration of key Opportunity Sites. These changes are concentrated in the area alongside the river between Causey Bridge and Bass's Recreation Ground. All changes would be subject to future technical assessments. Key changes include:

- Alteration of the vehicular entry and exit slips at Darwin Place; and
- Alteration to the entry and exit slip at Meadow Lane onto the A52.

These changes would have a limited negative impact upon the network during construction. However, the longer term flood protection benefits and economic benefits associated with unlocking development sites outweigh any short term disruption.

Other local highway network changes would also be required to support the flood defence and encourage the regeneration objectives of the Masterplan, these are addressed further Section 5, but in summary they include:

- Alteration to access along Duke Street, this would be dependent upon further consultation;
- Severance / realignment of the link from Darwin Place and Meadow Road. Meadow Lane would be realigned such that so that it joins with Derwent Street immediately north of the Brewery Tap Public House; and
- A realigned Exeter Street would commence with a junction from Meadow Lane where Exeter House is currently located. The road would then run to Derwent Street forming a cross-roads junction with Stuart Street.

View north towards Causey Bridge. Causey Bridge would remain open in a flood event

View west over St Mary's Bridge. St Mary's Bridge would be closed during a flood event

View east along Meadow Road and Darwin Place loop. Meadow Road would be closed during a flood event

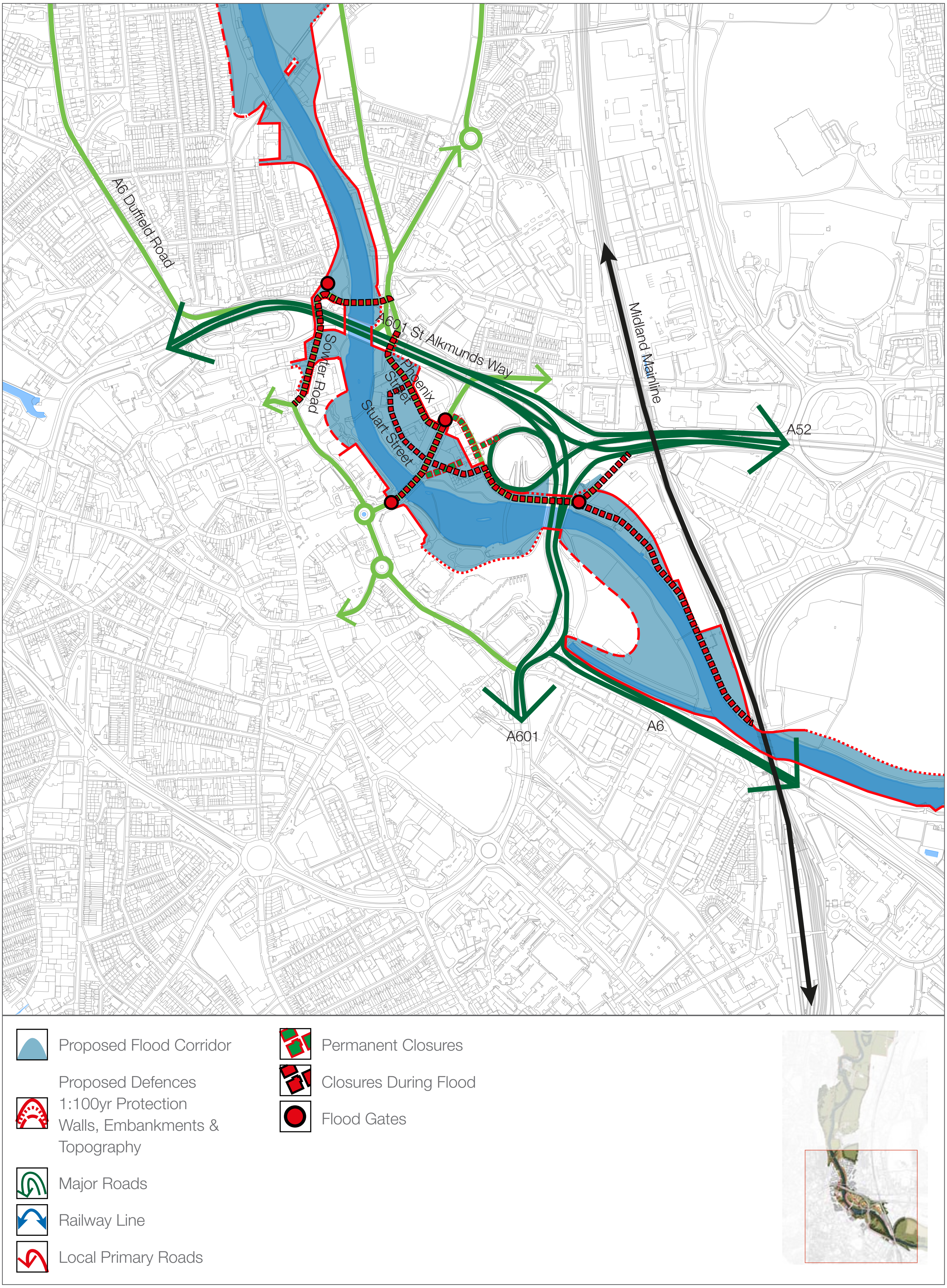


Figure 4.5: Highway Closures in a Flood

Whilst every effort has been made to minimise changes to the local highway network it is clear that the changes would have an impact upon local communities, however these changes are essential to being able to deliver the Masterplan, provide development and subsequently provide flood defences. At the detailed design stage these alterations would need to be reviewed and assessed technically. The alterations have been weighted against the need to deliver flood defences in a way that minimises harm and disruption in the longer term. None of these alterations would substantially affect cross City movement and where access to the front of properties is lost, alternative arrangements can be provided to the rear of properties.

Existing view north along Derwent Street. Parts of Derwent Street would be closed in a flood event

Existing vehicle entry/exit into Darwin Place. This entrance/exit would be closed in a flood event

Sowter Road underpass. The underpass would be closed in a flood event

5

Proposals

5. Proposals

INTRODUCTION

Seven 'Opportunity Sites' have been identified along the Masterplan corridor. These Opportunity Sites encompass the entire length and width of the corridor, they include:

1. Darley Abbey Mills
2. Darley Abbey Playing Fields including Little Chester and Parkers Piece
3. Aida Bliss to St Mary's Bridge
4. Duke Street/Strutts Park
5. St Mary's, the Silk Mill to Holmes Bridge (the western bank)
6. North Riverside
7. Meadow Lane to Castleward

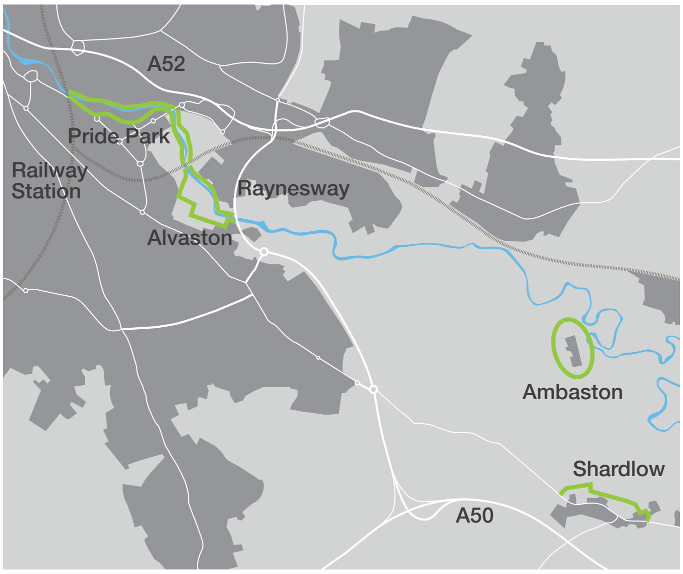
The breaking down of the Masterplan area in this way has a number of advantages. Firstly, it allows detailed scrutiny of proposals at a local level. Secondly, it allows future change to be delivered flexibly but in the context of an integrated whole; and finally it can encourage development and change to come forward in manageable and realisable parcels. The Opportunity Sites have also been identified for their potential to integrate highway and pedestrian links, improve access to the river and wider area, and provide feasible development opportunities in terms of scale and range of possible uses.

Numerous scenarios / options have been considered for each Opportunity Site, looking at the implications, benefits and disbenefits of each. Logical and innovative solutions were proposed for each and design solutions were formally discussed in detail at a series of specialist technical multidisciplinary workshops hosted by the City Council and the EA.

The preferred solutions have been considered by the City Council and EA technical teams to ensure that the shared objectives have been delivered.

Opportunity Sites are illustrated in Figure 5.1 and explained below in terms of:

- Issues and Opportunities;
- Options Considered;
- Preferred Approach; and
- Implementation.



Location plan of required downstream mitigation work

Text Box 5.1: What about downstream areas?

The proposals for the seven opportunity sites result in an increase in flood risk to some downstream areas. This will require mitigation that must be delivered as an integral part of Our City Our River. The areas where mitigation work is required to address this are between the Derby Junction Railway Bridge and the A5111 Raynesway, Ambaston and Shardlow. The work is likely to involve the raising of existing defences but the Environment Agency is also looking at options to realign the defences through the Sand & Gravel Pits by Chaddesden Sidings and through the Chaddesden Triangle adjacent to Wyvern Way. The works at the Chaddesden Triangle will take into account the proposed reinstatement of the Derby Canal.

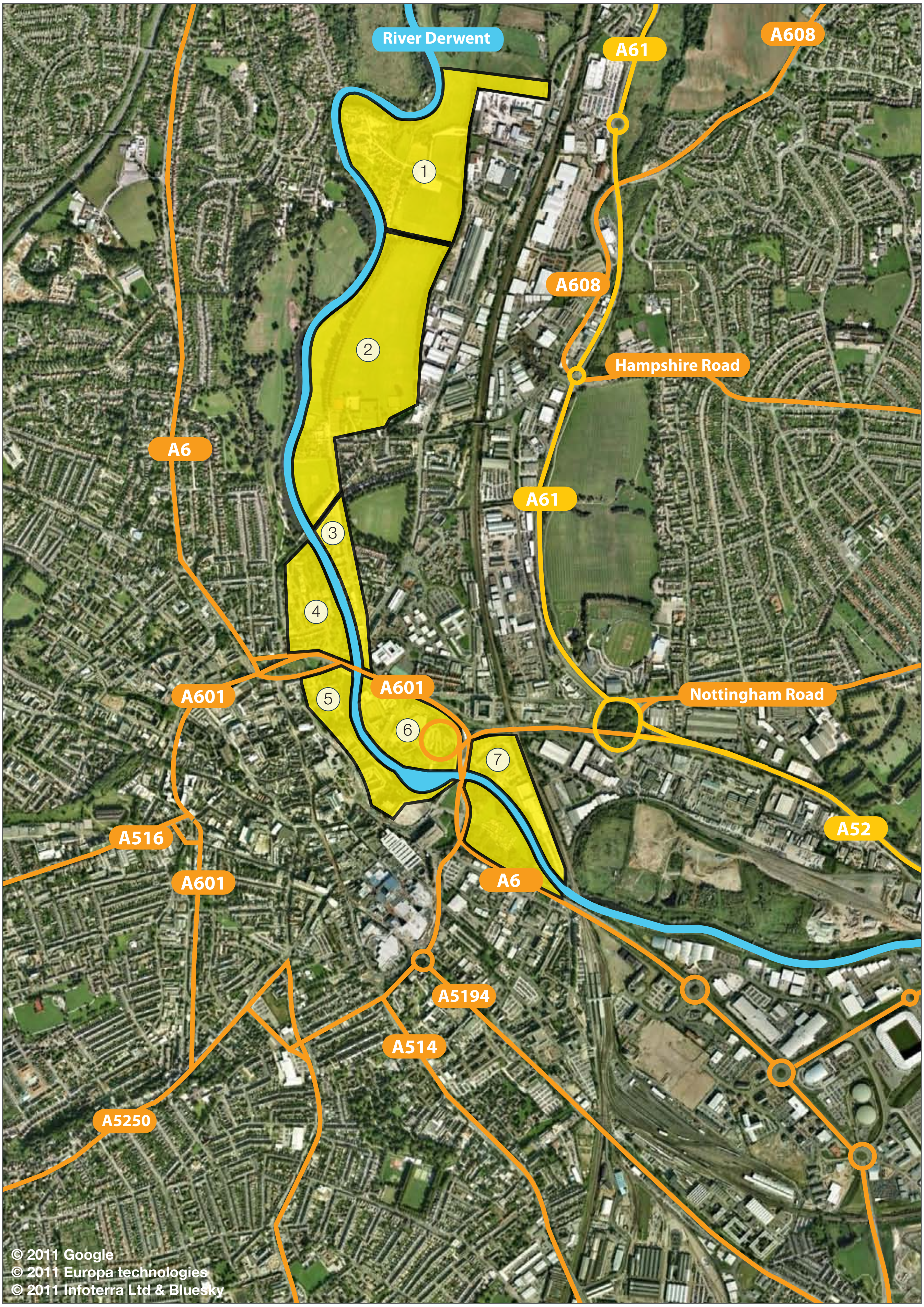


Figure 5.1: Location of Opportunity Sites

Opportunity Site 01
DARLEY ABBEY MILLS

Issues and Opportunities

Sitting within the lower reaches of the Derwent on a broad flood plain is Darley Abbey Mills and Stables. The Mills and Stables are fundamental elements of the Derwent Valley Mills World Heritage Site and are some of the City's most important historic assets. Together they form an unrivalled complex of 18th century Mills that epitomise Britain's industrial revolution. The river meanders sharply around three sides of the Mills almost encapsulating them on an island. There are two Local Nature Reserves within the vicinity of Darley Abbey (Nutwood and Darley Tip) and there are opportunities to enhance the value of these sites within the Masterplan. Evidence of otter and a range of bird species are also present along this stretch of the Derwent. A small pocket of residential development is situated to the south of the Mill complex. Vehicular and pedestrian access is provided by a Toll Bridge to the west of the Mills and Haslam's Lane to the east.

Recent history has not been kind to the Mills and by the early 21st century they were in serious decline. As a group they were placed on the Derby City Council 'Buildings at Risk' Register whilst some of the individual buildings were placed on the national 'Heritage at Risk Register'. The Mills also suffer from unrealised economic potential and in 2010 the City Council adopted the Darley Abbey Mills Regeneration Strategy in an attempt to support the long term economic rejuvenation of the Mills. The Regeneration Strategy is now being implemented. Private investment at the Mills complex is slowly increasing and some recently vacated buildings are now being returned to new mixed uses in line with aspirations of the Strategy.

The Darley Abbey Mills and Stables Regeneration Strategy identified that high levels of flood risk were having a detrimental impact on economic investment in the Mills and recommended that the existing defences be raised to 1 in100 annual flood chance level and allow a wider range of uses to be acceptable. Without such uses the internationally important buildings within the Mills complex could face the threat of continuing decay and decline.

View looking east across the Toll Bridge towards the Mills

Options Considered

Flood defence proposals within other Opportunity Sites would increase flood risk at Darley Abbey Mills. The minimum requirement is therefore to undertake works that would maintain the existing Standard of Protection.

If the existing Standard of Protection (1 in 50 annual chance event) is maintained then this would limit the ground floor use of the Mills to those activities appropriate in areas of high flood risk (see Text Box 2.1) this would threaten the economic viability of bringing the Mills back into sustainable use. This would conflict with the key objective of aiding the regeneration of the Mills.

Therefore, options have been explored to raise the Standard of Protection to the 1 in 100 annual chance event. Given that intervention is required to maintain existing levels of flood risk, it is expected that the additional works required to raise the Standard of Protection to 1 in 100 annual chance should have limited cost implications. The cost of additional works would therefore be assessed during detailed scheme design. The required works would involve raising existing defences around the Mills which comprises walls and earth bunds.

Given the reasons outlined above, it is recommended that further technical and environmental appraisal is undertaken to try to raise that standard of protection in accordance with the recommendations of the Darley Abbey Mills Regeneration Strategy.

Options have been considered for a new footbridge to: improve pedestrian access between Darley Abbey Village and the Mills and Stables, as identified in the Regeneration Strategy; and to provide a means of escape and emergency access from the Mills in times of flood. Three broad locations for this were identified:

- To the North of the existing Toll bridge (5a) – this provides an escape point and reduces pedestrian-vehicle conflicts on the existing bridge. It also follows the established line of access into the Mills. The ‘take-off and landing’ areas could also be incorporated into the flood defence designs on both banks of the river. The construction costs of the bridge would be substantially less than other options given the length of crossing and the ease of access for construction;
- A High level crossing to the south of the Mills (5b) –this location would deliver the greatest long-term regeneration benefits and reflects the proposals in the Regeneration Strategy. This option has not been discounted however it does have the highest cost; and
- To the North on higher ground (5c) – this provides an escape point but little additional regeneration benefit or access improvements. It would however provide a useful link into the wider footpath network.

During public and stakeholder consultation, concerns were raised regarding the impact of a new footbridge on the World Heritage Site. We will therefore assess the potential for adaptation or renewal of the existing Toll Bridge to better accommodate foot traffic and provide any requirement for emergency access.

Finally, the provision of flood gates would also be required either side of the Toll Bridge and at either end of Haslam’s Lane. The Toll Bridge would be breeched in a severe event and flood water would overtop the bridge, losing the Toll Bridge in its entirety would be detrimental to the economic revival of the Mills. Gates will therefore be required at either end to protect Darley Abbey Mills and the properties on the western bank from flooding. Consideration has been given to the use of ramps at either end of Haslam’s Lane. However, the required gradients to allow vehicles up and over the defences would extend them into the flood plain and obstruct the flow of water.

The Mills Complex

The Preferred Approach

The preferred approach would see the existing defences around Darley Abbey Mills raised to provide protection against the 1 in 100 annual chance flood event thereby protecting the Mills and providing a significant opportunity for their economic regeneration. Gates will be provided either side of the Toll Bridge and Haslam's Lane to afford protection in an event, whilst maintaining vehicular access under normal conditions. Options to adapt or replace the existing Toll Bridge will be considered with the objectives of:

- Providing an escape route for residents and users in a severe flood event;
- Minimising the frequency of use/overall need for floodgates; and
- Improve pedestrian access to help increase visitor footfall and regeneration.

Delivery of the defences in this part of the World Heritage Site would require a detailed and highly sensitive landscape design and engineering solution. Issues relating to tree loss, quality of design, change to the setting of the Listed Buildings and Disability Discrimination Act compliance will all need to be addressed and overcome. Whilst the works are likely to result in localised adverse impacts on Darley Abbey Mills they will deliver very substantial public benefits in terms of safeguarding the internationally important Mills complex, enabling job creation and delivering enhanced access for all to the Mills.

The works should be acceptable in terms of Local Plan and the National Planning Policy framework and would be undertaken subject to appropriate environmental assessments.

View looking north towards the Toll Bridge and Mills

Implementation Strategy

It is likely that the works would be implemented by the EA with support from the City Council. The City Council would work with the owners of the Mills, through their established partnership, to aid the project particularly where these activities contribute to improvements in the quality of the public realm and setting of the Mills.

Further work and investigation would be required to assess the impacts of raising the defences; any proposals to raise the defences would need to be supported by the appropriate environmental assessment.

Given the importance of the Mills, and the critical stage that they are at in their regeneration cycle it is recommended that these works are progressed as a matter of priority in the 1st phase of the 'Our City Our River' project.

Option 5b: View of Darley Abbey Mills and proposed footbridge option to the south of the Mills. A new footbridge/cyclebridge would offer safe access in a flood event.

DARLEY ABBEY MILLS

Proposed Defences – Walls and Buildings

Proposed Defences – Embankments and re-profiling of the ground

Existing Contours provide a natural flood defence

Active defences of temporary nature needed during a flood event

Open Space – amenity, recreational, leisure, wildlife

Proposed vehicle access

Proposed pedestrian access

Existing buildings. Those within the proposed flood corridor will require resilience measures

Proposed development sites incorporating flood defence

Strategic Highway

Sketch Location

1. Enhance existing value of Nutwood and Darley Tip Local Nature Reserve (LNR) by creating a management plan and provide new/enhanced habitat.
2. Raising the existing flood defence embankments on the western bank to protect parts of Darley Abbey village that are currently at risk from flooding.
3. The flood plain to the east of the Mills will offer conveyance around the Mill complex.
4. Provide otter ledges at the bridges and weirs at Darley Abbey.
5. Options have been considered for the provision of a new pedestrian footbridge over the river. Three potential options would provide pedestrian access and escape in the event of a flood (Options 5a, 5b & 5c on the plan below). There is a preference for adapting or replacing the existing Toll Bridge rather than one of these options.
6. Existing Toll Bridge would require flood gates at each end and would be closed in the event of a flood. Adaption or replacement of bridge will be considered, to provide emergency access between the Mills and village in times of flood; eliminate the need for flood gates; and to avoid debris collection on the piers supporting the bridge in the river.
7. Exploration into the use of islands and river banks to create artificial otter holts and provide habitats for other species (e.g. kingfisher nest boxes/dead wood piles).
8. Existing flood defence embankments would be raised to increase protection levels to the Mills complex and residential properties on Folly Road. The increased protection at the Mills complex would support its regeneration. The scheme would be subject to detailed design.
9. A gated flood defence would be required at Haslam's Lane to provide protection in the event of a flood. Haslam's Lane would be closed in a flood event.
10. Raising the existing defences between the playing fields and Alfreton Road Industrial Estate.

Figure 5.3: Darley Abbey Mills Footbridge Options 5a, 5b & 5c

Figure 5.2: Darley Abbey Mills

Opportunity Site 02
DARLEY ABBEY PLAYING FIELDS INCLUDING LITTLE CHESTER AND PARKERS PIECE

Issues and Opportunities

Beyond the Mills, the river continues through the World Heritage Site gently meandering through an open parkland setting. On the western bank the land rises through Darley Park, a fine 18th century, Victorian parkland with large areas of general amenity grassland intermixed with areas of woodland, avenues, formal gardens and shrubberies. A Local Nature Reserve is located on the high ground and Darley Park itself is highlighted as a Local Wildlife Site. Opportunities exist to enhance these locally important sites. The rising topography in this location offers protection and therefore man-made defence mechanisms are not required on the western bank beyond the southern end of Darley village.

Immediately south of Haslam's Lane there is a private rugby club and further south are Darley Abbey Playing Fields, which are an important recreational resource for the local communities. There are a number of football pitches, tennis courts (grass and clay), bowling greens and cricket wickets which have a largely municipal feel and character. The majority of the pitches are subject to flooding during winter months. Flood water breeches the embankment and spills onto the open grassland. An established tree lined avenue on a raised embankment bisects the western area of the park in a north-south direction and a buried Roman road bisects the playing fields in this direction also. The playing fields form a valuable flood plain and the current flood defences (an embankment) are located between the playing fields and the Alfreton Road Industrial Estate to the east.

As the river passes through the park, the flood plain becomes much narrower and developed. To the south of the playing fields lie the remains of a Roman Vicus (settlement), which extends to Little Chester (south) where the remains of a Roman Fort and a Bath House lie. Two listed farmhouses (Stone House Prebend and Derwent House) are located adjacent to the river on the eastern bank and would restrict the flow of water in a flood event. The remains of the Roman bathhouse extends beyond the cricket pavilion at Parker's Piece.

Views across Darley Playing Fields

Options Considered

A number of possible approaches have been considered in this area:

- With the exception of the wall running between the Alfreton Road Industrial Estate and Darley Abbey Playing Fields and the western side of Derwent House and Stone House Prebend raising the current defences in their existing location has been discounted. Although this would provide the required level of flood defence it would sever the river from the community and parkland and would result in the loss of trees. It would also fail to provide any additional benefit for the local area in terms of improved landscape or new facilities.
- Consideration was given to the provision of a wall along the southern boundary of the Darley Abbey Playing Fields; however it was considered that such a structure would have a detrimental effect upon the parkland setting and the visual links to the green spaces and heritage assets, consequently this option was discounted.
- Bisecting Parker's Piece with a flood defence has been considered. This is not the preferred option due to the impacts on the Scheduled Monument and recreation facilities. Further discussions will be undertaken with English Heritage, Derby City Council and Sport England to determine the exact location of the earth bund.
- Raising the existing defences at Parker's Piece along City Road was also discounted for a number of reasons. The increase in the height of the wall would involve the removal of existing trees and replanting. The wall would create a physical and visual separation between the community at Little Chester, the river and recreational space. Furthermore, a wall of approximately 3 metres high on City Road would create a poor quality streetscape with an oppressive impact for local residents looking out onto and along the street. Pedestrian access would also need to be controlled and would involve steps and ramps over the wall.

Discounted Option: Little Chester flood defences increased along the existing alignment at City Road. The wall would need to increase significantly in height. The existing trees would need to be removed. The wall would create a physical and visual separation between the existing community and the river.

The Preferred Approach

Given the recreational value of the area and its historic and archaeological sensitivity the preferred option utilises a 'soft' solution to deliver defences in a manner that responds to local need and character. The alignment of the defence in this location has yet to be agreed with key stakeholders such as English Heritage, however the design will aim to achieve the following:

1. Minimise the impacts on the Scheduled Ancient Monument and maintain visibility of heritage features at Parkers Piece (both scheduled and otherwise);
2. Improve access to the open space for local people;
3. Avoid any net loss of sports space in the Little Chester area; and
4. Maintain views to the river from City Road.

Along the southern boundary of the playing fields the flood defences have been moved north in order to protect the recreational facilities, the scheduled ancient monument and the listed buildings. New recreational facilities could also be provided to the south of the earth bund where they would be protected from a flood event. The existing wall at Parker's Piece would be removed and new flood defences would be incorporated into the landscape design. The existing defences adjacent to the river in this location would also be removed to create a high quality riverside park.

Preferred Approach: Flood Defences along the proposed alignment at City Road. New flood defences would be incorporated into the landscape design, creating an embankment. The existing wall would be removed and visual and physical links between the river and the existing community would be restored.

Implementation Strategy

Flood defence works are likely to be undertaken by the EA using its powers for the provision of new and improving existing flood defences. The City Council would assist with the re-provision of car parking and take the opportunity for improving recreational facilities as appropriate. Due consideration will be given to the archaeological sensitivity in this area and any scheme put forward will be subject to consultation and agreement with English Heritage.

Ecological enhancements aligned with the Water Framework Directive objectives would be provided by the EA together with the implementation of a strategy for archaeological investigation, recording and mitigation. This is required to address the potential for encountering significant archaeological remains in the area.

The works in this area would be undertaken in the short term (years 1 -5 of the programme). A number of consents would be needed in order to deliver the defences; these are likely to include Conservation Area Consent, Planning Consent and Environmental Impact Assessment, which would provide opportunities for further comment by interested stakeholders.

Existing view north on City Road with walled flood defence on left within tree line

DARLEY ABBEY PLAYING FIELDS INCLUDING LITTLE CHESTER AND PARKERS PIECE

- Proposed Defences – Walls and Buildings
- Proposed Defences – Embankments and re-profiling of the ground
- Existing Contours provide a natural flood defence
- Active defences of temporary nature needed during a flood event
- Open Space – amenity, recreational, leisure, wildlife
- Proposed vehicle access
- Proposed pedestrian access
- Existing buildings. Those within the proposed flood corridor will require resilience measures
- Proposed development sites incorporating flood defence
- Strategic Highway
- Sketch Location

1. Existing flood defences between Alfreton Road Industrial Estate and Darley Playing Fields will be raised on the existing alignment.
2. Wildflower meadow grassland strips can be provided along the length of the western bank through Darley Park – these should be mown once a year to provide shelter for a range of wildlife and to encourage more invertebrates which will in turn provide foraging opportunities for birds and small mammals. Where possible the wildflower meadow grassland strips should be widened and informal mown paths introduced on the western bank.
3. Where existing trees are present along banks and at the top of banks of the river, additional rows of native shrubs / trees can be introduced. The aim of this would be to 'widen' the bankside margin and provide additional shelter and opportunities for flora.
4. Existing defences would be moved northwards and would be aligned to deflect water downstream. The tennis courts and scheduled monument (Roman Fort) would be protected. The car park could be extended in this location should there be an identified need for it following the loss of car parking at Handyside Car Park. Within the protected area there is scope to provide replacement leisure facilities to mitigate the loss of facilities at Parker's Piece. There is an opportunity to work with English Heritage to protect and enhance the heritage interest in the area.
5. Ramps and steps would also provide pedestrian access to Darley Playing Fields and the ramps would also provide vehicular access for maintenance purposes. A new public realm would assist with way-finding and provide a gateway to the new liner walk and cycle route.
6. Along the river there are opportunities to provide signage at specific vantage points and enhancements to existing bird watching points and information regarding wildlife and flora that may be seen by users of the park and fields.
7. The defences would be raised on their existing alignment around the Community Centre, Park Rangers Office, Derwent House and Stone House Prebend. The relocation of the bowling green would be considered as this forms an area of high ground at a critical pinch-point in the floodplain. Careful consideration is required as to the impact on archaeological sub-surface remains, the setting of the listed farmhouses, and the Conservation Area status of the site.
8. Removal of the current defence wall at Parker's Piece which will connect Little Chester to the Open Space and Riverside Walk, the retention of the trees would be subject to detailed design and their loss would be mitigated against. The existing wall will be replaced with a higher landscaped earth bund, which could also provide a terrace of seating on the river side of the bund. The exact line footprint and form of the new defence at Parkers Piece will be informed by further archaeological investigations and stakeholder consultation. The impacts on the Roman Bath House Scheduled Monument (largely under the existing cricket pavilion) and other archaeological interests will need to be carefully balanced with the need to connect the Chester Green community with the riverside. These archaeological interests could be nationally important. Should deposits of significance be encountered designs will be adapted as far as possible and appropriate mitigation agreed. Opportunities will be sought to enhance the public's awareness and understanding of their local heritage.
9. Existing embankments would be removed to facilitate flood conveyance.
10. The Cricket Pavilion would be retained in its existing location and the wicket and its outfield. A maintenance track would be created. The Pavillion would need to be serviced via Handyside car park to the rear and servicing compound would be constructed within the defence (cut away from the earth bund).
11. The designs would also safeguard the character and setting of the Little Chester Conservation Area reconnecting the area to the open space and river beyond.

Figure 5.5: Darley Playing Fields & Parker's Piece

Opportunity Site 03
AIDA BLISS TO ST MARY'S BRIDGE

Issues and Opportunities

Little Chester Conservation Area comprises largely of Victorian terraced housing on the broad flood plain on the eastern bank. In this area the flood plain becomes more urban and its width is significantly reduced by built form. The Aida Bliss and City Road sites present an opportunity to reconnect the residential community of Little Chester to the river and provide public access along the river bank from Parkers Piece to the City Centre. At present to access the City Centre, pedestrians and cyclists cross the River and continue along the western bank.

Existing buildings on the Aida Bliss site front onto City Road providing a strong frontage to Chester Green. Although the building is not nationally listed, its frontage appears on a 'local list' as it adds value to the character of the Conservation Area. The site is largely vacant and it has redevelopment potential. There are however issues in terms of deliverability and previous proposals have been deemed unviable due to the levels of flood risk and consequential restrictions relating to the use.

Further south lies Etruria Gardens, a residential development arranged around a cul de sac. The residents are protected by an existing wall, however this disrupts views and access to the river. To the south of Etruria Gardens lie a number of businesses located along the river bank and private ownerships restrict access to the river. St Mary's Bridge (a Scheduled Ancient Monument) acts a constriction to the flow of water. The habitat value of the area is somewhat constrained by the limited amount of vegetation along the river bank as the Derwent enters the City Centre.

Options Considered

A number of design options for Aida Bliss site have been examined. These all reflect the fact that the site does have significant redevelopment potential and there is an opportunity for the development to provide the required defence rather than the provision of a potential intrusive and divisive standalone structure. Given this potential and the likely impact of a stand-alone wall type defence, setting back the defences to City Road has been discounted.

In contrast locating defences closer to the river would allow maximum redevelopment potential. Given the potential this option was explored. However to achieve an adequate defence significantly higher defences would be required on both sides of the river bank. This would have further severed the river from the City and would not have improved or enhanced access to the river. The approach would also restrict the flow of water, creating a pinch point which would worsen the effects upstream. Consequently this approach was discounted.

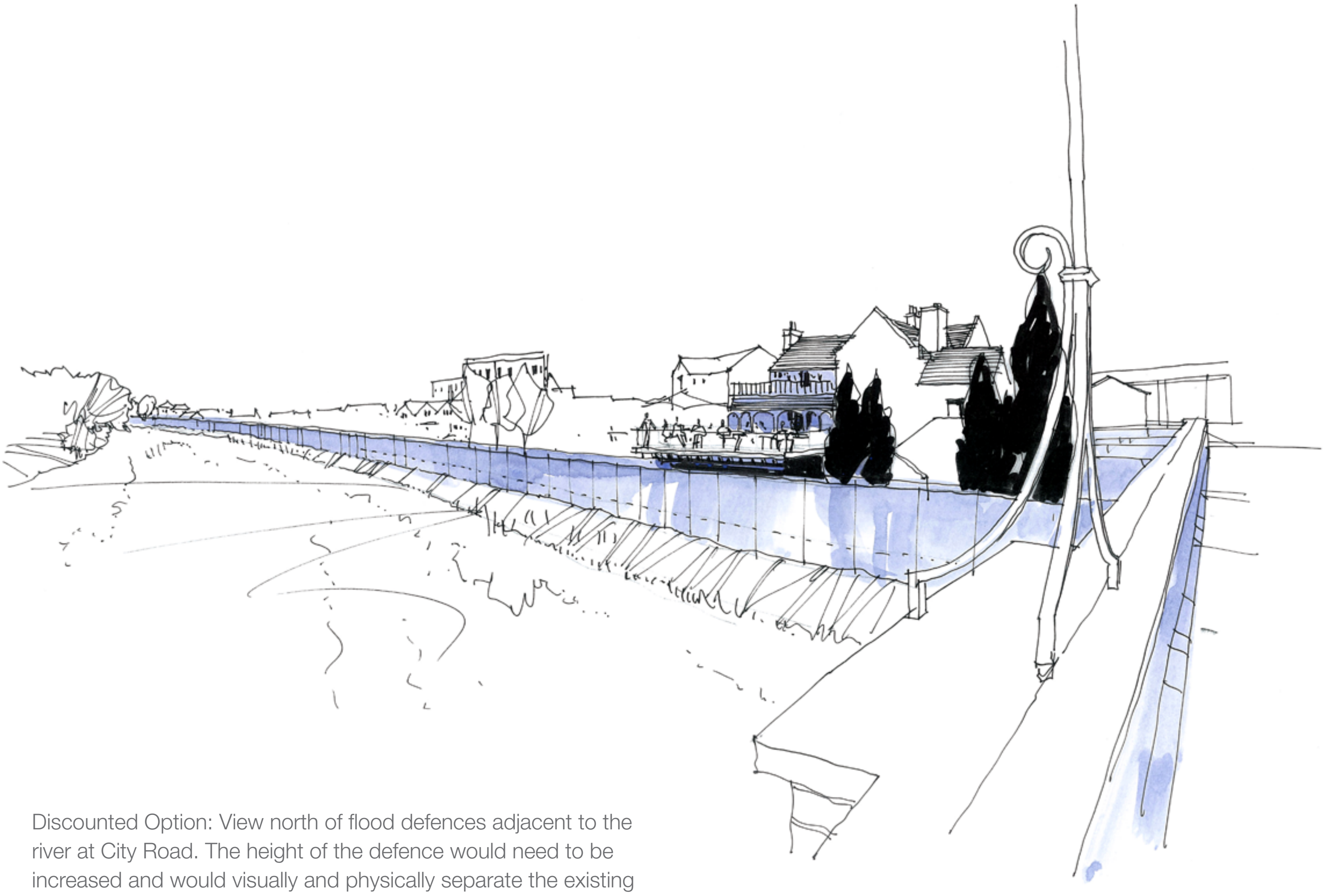
Options for Etruria Gardens and City Road were initially considered alongside the development of Duke Street and the scale of intervention has been balanced across the two areas as there is an interrelationship between both sides of the river in terms of flood risk and the benefits from flood defences. Consideration was given to the redevelopment of a number of properties to provide a wider area for the flow of flood water and allow new development to front onto the river. However, it was considered that the costs of redevelopment would outweigh any value generated from the development. This option was therefore discounted.

Provision of improved defences in this location is critical in protecting the land, property, businesses and residents east of Mansfield Road. Consideration was given to realigning the defences along City Road, however this would result in the need to close and demolish the existing businesses to provide space for flood water. Consequently, this option was discounted as it would be difficult to implement and would probably result in closure of the existing businesses. The wall would also have a significant impact upon the public realm along City Road.

Increasing the existing defence in its current location was also discounted as it would not contribute to improving the public realm and the connectivity along the bank of the river. It would also lead to increased flood risk upstream.

St Mary's Bridge

Existing properties along City Road



Discounted Option: View north of flood defences adjacent to the river at City Road. The height of the defence would need to be increased and would visually and physically separate the existing communities from the river.

The Preferred Approach

Regeneration in this area presents an opportunity for a new development to provide the required defence. A new alignment has therefore been developed based on the redevelopment of the City Road area. This approach would deliver the required flood protection as well as a waterside development opportunity.

Elsewhere in the Opportunity Site the defence line would be relocated to create a riverside walk / linear park along the eastern bank with the entire river edge being softened and landscaped. The existing Handyside Bridge would continue to provide pedestrian and cyclist access between Little Chester and Duke Street and would provide links to the Aida Bliss site. The Aida Bliss site itself could be redeveloped to offer a high quality residential development with designs incorporating the defences.

The existing defences at Etruria Gardens would be realigned to provide space for a new riverside walk and cycle path. The visualisation below illustrates the form of the realigned wall and how landscaping can be used to soften the impact of the wall and the views from the existing properties. The realigned wall would ensure that all of the existing homes at Etruria Gardens are retained and protected in a flood event.

Implementation Strategy

Aida Bliss would ideally be delivered in the short-term (1-5yrs) with the landowner and potential developer working closely with the City Council and EA. A Design and Development Brief would be prepared and the City Council could work in collaboration with the landowner to devise a scheme that would support a planning application. New defences would be integrated with new development. To improve the viability of the development, the City Council could include part of their existing car park by means of a Developer Agreement. In this case, a revised parking strategy for Chester Green would be required.

Etruria Gardens would require a new defence in the form of a new wall and in a position closer to the existing residential properties. The design of the defence should incorporate ramps and steps to allow access to the river embankment. This would be a short term project (1 - 5 years).

Within the southern part of City Road the new defences would need to be integrated with the new development in this area. A consistent approach would be required in order to prevent any breach in the defence and therefore development would need to at least be co-ordinated. This could be achieved through a detailed Design and Development Brief. It would also be preferable for the area to be developed by a single developer.

As this area would need to be delivered in partnership with landowners, public intervention by the City Council could be considered. If private development does not come forward in a reasonable timescale, the strategy in this area will be reviewed.

Preferred Approach: View from St Mary's Bridge with new development along City Road with defences integrated into new buildings. The pedestrian and cycle route would extend along the eastern bank of the river. New development would over look the public realm and engage with the river. St Mary's Bridge is a Scheduled Ancient Monument and consideration will be given to the detailed design of defence in this location.

Sketch A

Existing view of Etruria Gardens with flood defence in front of the tree line

Preferred Approach: Enhanced flood protection at Etruria Gardens. The existing properties would be protected by a relocated defence. The urban environment would be softened by new landscaping screening the wall and providing opportunities for wildlife and a new pedestrian and cycle route along the river bank. The exact position of the defence is to be determined.

Sketch B

Sketch C

Preferred Approach: View under Handyside Bridge with new riverside development with integrated defences at the Aida Bliss site. New high quality development would engage with the river and public realm. A new pedestrian and cycle route would be provided alongside an enhanced wildlife corridor.

AIDA BLISS TO ST MARY'S BRIDGE

- Proposed Defences – Walls and Buildings
- Proposed Defences – Embankments and re-profiling of the ground
- Existing Contours provide a natural flood defence
- Active defences of temporary nature needed during a flood event
- Open Space – amenity, recreational, leisure, wildlife
- Proposed vehicle access
- Proposed pedestrian access
- Existing buildings. Those within the proposed flood corridor will require resilience measures
- Proposed development sites incorporating flood defence
- Strategic Highway
- Sketch Location

1. New ramped access would be provided to ensure Handyside bridge continues to provide a pedestrian and cycle connection over the river between Little Chester and the City Centre. A section of the City Road car park will be lowered to match adjacent ground levels at Parkers Piece and the Aida Bliss site to increase the amount of flood water that can flow around Handyside Bridge.

2. Regeneration of the Aida Bliss site could deliver new flood defences as part of new development. Its riverside setting should be utilised with primary aspects over Chester Green, Parkers Piece and the River Derwent. Space for flood water to flow around Handyside Bridge is required and therefore only the City Road side of the site should be redeveloped. The site is within the Little Chester Conservation Area and therefore the development will be subject to Conservation Area consent. The existing frontage facing Chester Green makes a positive contribution to the character of the Conservation Area and is therefore protected under conservation area legislation. The core of the historic building, including the imposing façade should be retained, but it is acknowledged that this may affect the economic viability of the redevelopment of the site and so sensitive alterations may be necessary.

3. The riverside walk will open up views of the heritage assets along the corridor, including views of St Mary's Bridge, the Bath Street Mill and the Silk Mill.

4. Eturia Gardens would continue to be protected by a wall. The wall would be relocated to enable the continuation of the river walk along the left bank to St Mary's Bridge. The wall would be landscaped to soften its appearance.

5. Through the provision of the green corridor there is opportunity to soften the banks of the River with gentle sloping of river banks at the water edge. Widening the margin and providing emergent vegetation will offer opportunities to fauna for foraging and shelter.

6. Along City Road – new development would need to be dual aspect, fronting onto City Road and also providing a frontage to the river overlooking the public realm. The redevelopment would provide the required level of flood defence.

7. The public access and connectivity along the eastern bank of the River will be significantly enhanced as a result of the proposals. Sufficient space will need to be provided to increase pedestrian connectivity but also allow habitat creation.

8. Pedestrian and cycle ramped access to the river corridor could be incorporated adjacent to the Bridge Inn. Public realm enhancements in this location would direct pedestrians and cyclists under Phoenix Street underpass. A careful design solution is required through the area around the Bridge Inn Public House where car park and beer garden access is considered to be important to the operation of the business. The impact on the setting of St Mary's Bridge, which is a Scheduled Monument, will be an important factor.

9. There would be no access across St Mary's Bridge to Duke Street or Sowter Road during a flood event. A structural assessment of the bridge is required to ensure increased flood levels in the river channel will not cause a structural failure of the bridge. Bridge strengthening and scour prevention work may be required.

Affected areas – landmark properties labelled for reference

Figure 5.6: Aida Bliss to St Mary's Bridge

Opportunity Site 04
DUKE STREET / STRUTTS PARK

Issues and Opportunities

Strutts Park is an important residential area rich in character and historic association. It was originally part of the Darley Hall estate and some parts of it have been granted Conservation Area status. Housing types are mixed with some dating back to the early 1800s. At the northern end of Bath Street is the burnt out shell of the mid 19th century Bath Street Mill, which has lain vacant since an arson attack in June 2009. Another prominent building is Rivermead House, a 1960's tower block that sits close to the Mill. As the river continues south there is a distinct change in housing from large Victorian dwellings to more modern houses around Duke Street. The residential community of Duke Street is set back from the River and a footpath meanders along the river bank to St Mary's Bridge.

Whilst the western bank could provide a riverside link between Darley Abbey and the City Centre, a combination of narrow paths, overhanging vegetation, derelict property, and a lack of surveillance discourages the use of the riverside area. The City Council are currently proposing to demolish the vacant Britannia Court and replace it with public open space.

Although the majority of the western bank is afforded protection by the rising topography, properties in and around Duke Street are located on the flood plain and are therefore at risk of flooding.

Britannia Court proposed for demolition by the City Council

Options Considered

Given that flood issues potentially affect directly a large number of homes a number of options are described below which will provide the basis of consultation and engagement with the local community.

- A "Do-Nothing" scenario has been considered, where neither the Environment Agency nor the City Council would deliver raised defences. In this case, the implementation of the rest of the Our City Our River scheme would result in an increase in flood risk to the Duke Street area. A flood event would result in the need to undertake substantial repairs to properties and would be detrimental to the quality of life for at least a number of months. Upon completion of the clear up and repair process, it is conceivable that home owners would find it difficult to insure their property and indeed sell their property. A worst case would be that the area deteriorates and becomes an undesirable residential area resulting in increased vacancies and dereliction.
- A second option would be to reduce flood risk by constructing new stand-alone defences for the Duke Street area. The defences would be needed between Handyside Bridge and St Mary's Bridge. The required height of the defences is around 2.7m above the typical level of Duke Street itself. In places there is little space to provide such defences whilst delivering a sustainable design that can be integrated into the community.
- A final option would involve some redevelopment of property, whereby over the medium to longer term the existing housing stock could in part be replaced by new homes which incorporate the required flood defence and resilience measures. These homes would need to have acceptable ground floor uses such as car ports and garages, with living accommodation above. Intervention would provide new properties that overlook the river, creating an attractive frontage to the riverside walk. Balconies and terraces would interact with the pedestrian and cycle route increasing the perception of security in this location to create an attractive leisure resource.

The Preferred Approach

A preferred approach has been directed by the local community's response to the public consultation on the Masterplan and a specific consultation for the Duke Street community on their key issues and priorities. The vast majority of the community want to see a reduction in flood risk and certainly do not want it increased. Therefore the "Do-Nothing" option has been discounted. There is little appetite to see wider redevelopment of the Duke Street area, due to the impact on existing homes. Whilst there are also concerns over the idea of a 2.7m high flood "wall", there is clearly a community preference for further design work to be undertaken on the principle of stand-alone defences.

In developing a solution on this principle, the following key objectives are borne in mind:

- Realign defences away from the river to make space for water;
- Maximise the volume of water that can flow round St Mary's Bridge;
- Sustainable design that integrates the defences into the community including natural surveillance over public areas; and
- The protection and enhancement of heritage assets.

In terms of managing flood risk across the City and at Darley Abbey Mills and Stables, the need to maximise the flow around St Mary's Bridge is critical. It is therefore proposed to lower a section of the existing flood bank upstream of St Mary's Bridge, and downstream of Causey Bridge, to allow flood water to pass through the Sowter Road underpass of St Alkmund's Way (the inner ring road). Then the most appropriate alignment for flood defences, balancing flood risk and social impacts, is between the existing defences along the river's edge and Duke Street itself.

Implementation Strategy

In finding a detailed solution of delivering flood defences between the river and Duke Street, there needs to be detailed consideration of the over-arching issue of providing perceived and real safe public areas including access routes. In doing so, there are likely to be eight specific areas requiring their own specific solution as noted in Figure 5.7. These solutions will be developed in consultation with key stakeholders, including those directly affected local residents, during 2012 and early 2013.

The delivery of the preferred solution would ideally be brought forward in the short to medium term (1-5 years). An early intervention is preferred as the delivery of other sections of the scheme could result in an increase in flood risk to the Duke Street area.

The river bank provides opportunity for play areas and informal recreation

DUKE STREET / STRUTTS PARK

- Proposed Defences – Walls and Buildings
- Proposed Defences – Embankments and re-profiling of the ground
- Existing Contours provide a natural flood defence
- Active defences of temporary nature needed during a flood event
- Open Space – amenity, recreational, leisure, wildlife
- Proposed vehicle access
- Proposed pedestrian access
- Existing buildings. Those within the proposed flood corridor will require resilience measures
- Proposed development sites incorporating flood defence
- Strategic Highway
- Sketch Location

1. A section of the existing flood bank upstream of St Mary's Bridge would be lowered to allow flood water to pass through the Sowter Road underpass. In a flood event, access to Sowter Road and Duke Street from St Mary's Bridge would be closed. Under normal everyday use there would be no change to existing access.

2. A flood defence is required along the footway of Sowter Road, tying into the raised embankment of St Alkmunds Way. Any solution should minimise significant adverse impact on the ground floor apartments of 1 - 10 St Mary's Court. Access along Church Walk is maintained; and the footway is perceived to be and is safe to use.

3. A flood defence across Duke Street is required. The solution may or may not result in the permanent closure of Duke Street at its intersection with Sowter Road and St Mary's Bridge.

4. The flood defence alignment should pass between 37-45 Duke Street and the existing defences along the river bank. In order to push the defences back from the river's edge to make space for flood water, the alignment is likely to be along the boundaries of the rear gardens.

5. The City Council are proposing to demolish the derelict Britannia Court. Since these buildings currently sit in very close proximity to the top of the river bank, their removal would help create more space for flood water. A sustainable future use for this site is required which delivers the required flood defence and new public access to the riverside footpath.

6. A flood defence is required to the rear of the Furnace Inn. A solution which retains and hopefully promotes the economic use of this site is required.

7. The location of Waterside House immediately adjacent to the river bank creates a pinchpoint to both public access along the riverside path and to flood water. A flood defence is required through the area and a solution needs to be found that does not have a significant adverse impact to the ground floor apartments.

8. A flood defence is required in the public area in front of Rivermead House that allows access between the Duke Street area and the footpath to Handyside Bridge.

9. Bath Street Mills is part of the Derwent Valley Mills World Heritage Site and is within the Strutts Park Conservation Area. The Mills are currently derelict and if they are to be saved a new sustainable use needs to be found for them. Any re-development of the Mills will need to consider the interface of new flood defences through this area.

10. The existing riverside path would be enhanced by widening, improving sight lines, and increasing natural surveillance and the number of access points.

11. Street-scene improvements along Duke Street could be considered to make it more pedestrian friendly and uplift the public realm.

Figure 5.7: Duke Street

Opportunity Site 05
ST MARY'S BRIDGE TO HOLMES BRIDGE (THE WESTERN BANK)

Issues and Opportunities

In terms of Derby's relationship with the River Derwent the stretch along the western bank from St Mary's Bridge to Holmes Bridge is critical. Currently that relationship is fragmented and not high quality. Providing new flood defence measures along this stretch offers an opportunity to enhance the public realm, increase connectivity to, and along, the river and re-establish Derby's historic links to the river. Delivering these enhancements and the necessary flood defence works is not however, without its challenges.

St Mary's Birdge and the Silk Mill are nationally important heritage assets of the highest significance as set out in the National Planning Policy Framework Section 12 *"Local Planning Authorities... should recognise that heritage assets are an irreplaceable resource and conserve them in a manner appropriate to their significance"*[3]. However, these assets provide a potentially serious bottleneck in a flood event, and would significantly restrict the flow of the river as it arrives in the city core. A level of protection needs to be achieved in a manner that safeguards the significance and setting of the scheduled St Mary's Bridge (also Grade II* listed), the associated Grade I listed Chapel and Grade II* listed St Mary's Bridge House, as well as the Grade II listed Silk Mill which forms a key element of the Derwent Valley Mills World Heritage Site.

In terms of the public realm, the existing arrangements for movement between the north and the City Centre lack quality. Pedestrians and cyclists can either move along the river bank on an average route to new and improved Cathedral Green, or emerge onto Sowter Road and pass through an uninviting underpass, past Christchurch Court before making their way toward the City Centre. This second route also requires them to pass through an area of low quality townscape dominated by the rear of Silk Mill and the oppressive walls of the electricity sub-station. Enhancing these routes would improve the quality of the City Centre and lives of local communities but existing development and transport infrastructure make change difficult.

Beyond Cathedral Green, lies the former Police Station and Grade II Listed Magistrates Court. This area is due for redevelopment and offers the potential to reconnect this stretch of river bank into the historic and commercial core of Derby City Centre whilst also delivering significant regeneration benefits for the City. Flood management measures will need to be integrated into the redevelopment to ensure that the City's relationship with the river is improved whilst also safeguarding large numbers of properties within the City Centre.

Just to the south, lies the impressive locally listed Council House, the public realm in this location (Derwent Street) is somewhat poor and illegible. There is an opportunity to create a new high quality pedestrian crossing in this location which connects the riverside walk directly to the Council House steps. To support wider flood defence measures this building will require modification and additional resilience measures. Some of these mitigation measures are being undertaken as part of the refurbishment of the Council House e.g. protection of access routes. Additional mitigation measures such as

View looking south with Council House on the right

[3] DCLG (2012) 'National Planning Policy Framework'. DCLG, London

raising window cill levels will be required in the longer term. Its locally listed status means that care will be required to ensure works are sympathetic to the building. Beyond the Council House and its steps is the emerging Riverlights development. This mixed use scheme would be designed to include compatible ground floor uses and to be resilient in flood events.

Options Considered

Options considered for this sensitive, complex and important stretch of river bank:

- 'Do–Nothing' – The option has been discounted for two principal reasons. First of all, measures that would be undertaken up-stream would result in increased flood levels downstream. Consequently, intervention is required to at least maintain existing flood levels. Second, the flooding of the west bank and a substantial part of the City Centre core would have massive and unacceptable impacts on people, property and the local economy.
- Improve Existing Defences – this would involve strengthening and increasing the height of existing defences on existing alignments. However, this would further segregate the central area of the City from the river and create a substantial barrier with significant detrimental social, physical and visual impacts.

The Preferred Approach

Delivering enhanced and sensitive flood defence measures is critical to the viability of this area and the wider City Centre. This would be achieved by a number of different approaches to managing flood risk including provision of resilience measures for existing property such as the Council House and enabling new development and redevelopment which incorporates flood defences. The approach would provide landowners and investors with certainty of how flood defences can be incorporated into new development and so encourage investment to be made. This will support the regeneration of the west bank and maximise private sector investment. The preferred approach also seeks to maintain and promote existing heritage assets and improve the quality of the public realm. The approach will result in a rejuvenated west bank resolving current issues of vacant and derelict property and a disjointed public realm.

Cost and practical difficulties mean that the electricity sub-station cannot be moved. Whilst removal would enhance the City's townscape and the setting of the Silk Mill it is accepted that this is not likely to occur in the near future.

Measures to protect the sub-station in its current location are therefore required. It is surrounded by substantial walls on three sides and a gate could be easily retro fitted to the structure to provide adequate protection; this will need to be delivered by the energy network organisation.

Existing banks upstream of St Mary's Bridge and downstream of Causey Bridge are being lowered to increase flood flows around St Mary's Bridge by utilising Sowter Road underpass. Christchurch Court lies adjacent to the downstream end of the Sowter Road underpass and is low lying. As a result flood levels would be significantly higher than the property threshold levels. To date the following options have been considered for Christchurch Court:

- Option 1: Construction of floodwall 1.5-2m high from end of underpass along eastern edge of Christchurch Court, cutting across access into property and tying into high ground on St Michael's Lane. This floodwall would extend above the level of ground floor windows and require a flood gate to maintain access to the property. This clearly would have a negative impact upon residents and the already disjointed public realm.
- Option 2: Redevelop the site providing integrated defences as part of the new development. The current residential accommodation would need to be re-provided elsewhere within the City. This option could be designed to improve the public realm and legibility of the area, directing pedestrians on a route along the river or towards the City Centre.
- Option 3: Combine the redevelopment of Christchurch Court with a new development on the site of Sowter Road car park. This could allow a phased approach whereby alternative accommodation is provided on the car park prior to the demolition of Christchurch Court on which new development could be provided or a new replacement car park and public realm improvements.
- Option 4: Christchurch Court could be adapted to form a flood defence. Any use of temporary defences in front of ground floor windows and access to site would need to be maintained and operated by the site owner's maintenance team. Potential use of temporary defences would be at the property owner's own risk and could only be considered appropriate as there are no further properties behind them at risk of flooding. This is the preferred approach which will be considered further with the owners of the property.

Implementation Strategy

Delivery of the works would be via a variety of approaches. The future Riverlights Phase 2 and Full Street developments would include appropriate defences and compatible uses delivered by the private sector. These will be developed over the short to medium term (1-10 years) as market conditions improve. The guidance provided by the Masterplan would also provide greater certainty of future design solutions that can overcome the key constraint of flood risk. It would therefore help promote the regeneration of these sites.

Adaptation of Christchurch Court, off Sowter Road, to form a flood defence would be achieved by negotiation with the site owner.

Resilience measures would be installed to the Council House and Silk Mill by the City Council. Any strengthening

Existing view looking south towards City Centre and Sowter Road underpass

Preferred Approach: Proposed view looking south towards City Centre – Using walls and a realigned church walk, with residential terrace and ground floor flood defence at Sowter Road Underpass. Flood water will be directed under Sowter Road underpass by new walls and reprofiling the existing green space, which will also provide public realm opportunities.

Sketch A

works to St Mary's Bridge would be delivered by the EA. A well designed scheme supported by robust evidence would be required to achieve the required listed building consents and scheduled monument consent. These applications would demonstrate very substantial public benefits associated with the works. To support this process the EA is currently undertaking detailed studies on the potential issues associated with flooding and the structural integrity of St Mary's Bridge. These works would be carried out over the short term (1-5 years).

The EA would be the Lead Delivery Authority in providing the flood gates at Exeter Bridge. A management regime would be established by the City Council and the EA.

Existing view of Council House and Exeter Bridge

Preferred Approach: Proposed view over Exeter Bridge into City Centre with flood gates integrated into the public realm. A series of gates could be provided across the highway prior to a flood event. The gates could be drawn from a number of permanent podiums which would be designed to feel part of the civic character provided by the adjoining buildings and bridge and be sensitive to the heritage context. They could therefore add value to the quality of the public realm.

Sketch B

ST MARY'S BRIDGE TO HOLMES BRIDGE (THE WESTERN BANK)

Proposed Defences – Walls and Buildings

Proposed Defences – Embankments and re-profiling of the ground

Existing Contours provide a natural flood defence

Active defences of temporary nature needed during a flood event

Open Space – amenity, recreational, leisure, wildlife

Proposed vehicle access

Proposed pedestrian access

Existing buildings. Those within the proposed flood corridor will require resilience measures

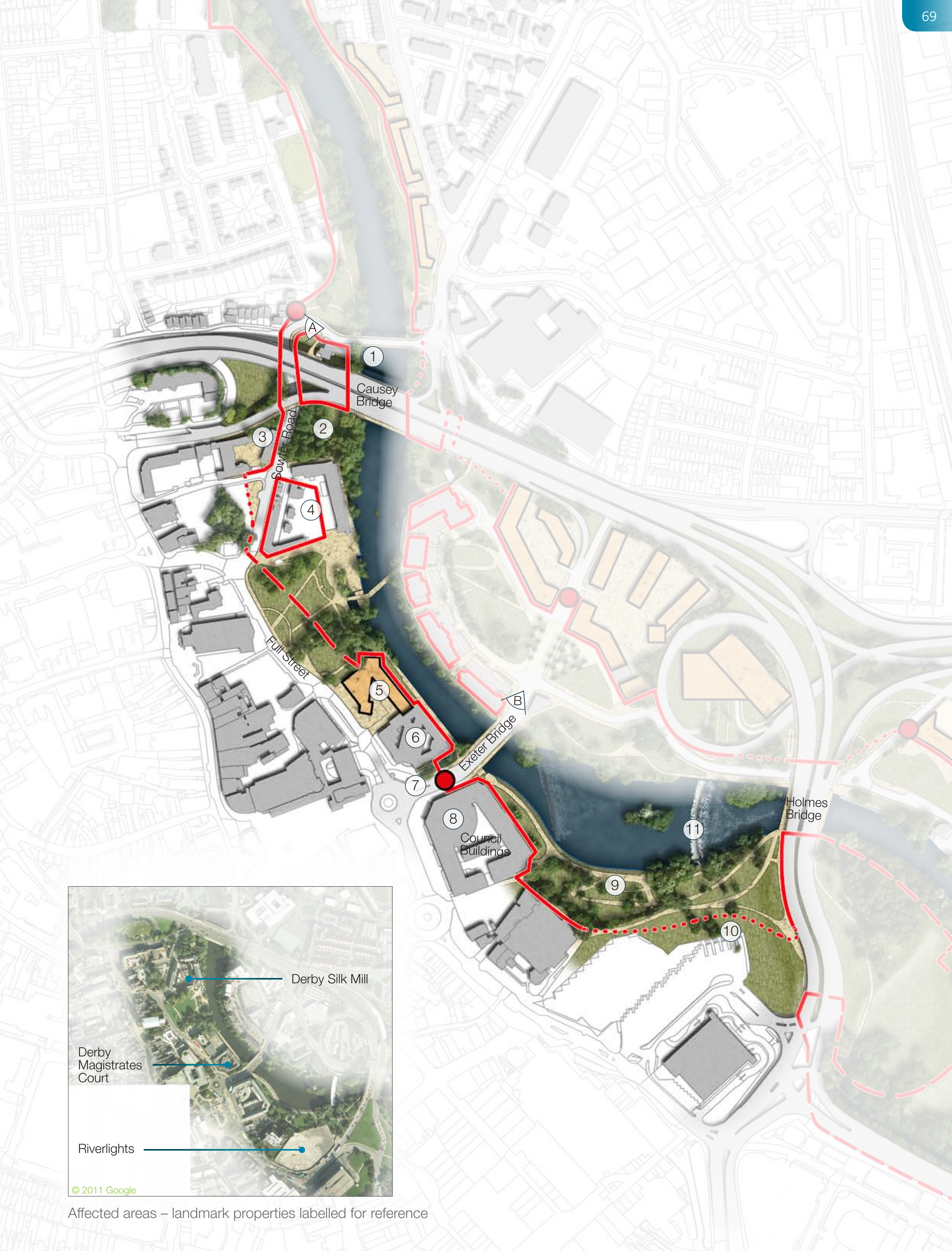
Proposed development sites incorporating flood defence

Strategic Highway

Sketch Location

1. Works within the river corridor to address risks associated with scouring and the potential undermining of St Mary's Bridge would be undertaken following detailed study.
2. Flood water conveyance route from Sowter Road to rejoin the river through re-contoured land around the Silk Mill. Sowter Roud underpass would undergo improvements to the public realm to improve the pedestrian experience.
3. Christchurch Court would be adapted to form a flood defence. Any use of temporary defences in front of ground floor windows and access to site to be maintained and operated by site owner's maintenance team. Potential use of temporary defences is at property owner's own risk. Their use is only appropriate as there are no further properties behind them at risk of flooding.
4. The Silk Mill sub-station may require flood resilience measures.
5. New development to the former police station, to incorporate flood defences integrated into 'active' ground floor uses (leisure, retail, cafe/restaurant uses) adjacent to the River's edge.
6. The former Magistrate's Court is a Grade II listed building and would be sensitively converted for re-use and would incorporate the required flood defence. Listed Building consent will be required.
7. Installation of flood gates between the Council House and the Magistrates Court to afford the City Centre protection, the design would be visually sensitive to the context of the public realm and the adjoining listed buildings. They would also incorporate the following principles:
   - the gate would be permanent to prevent increased flood risk associated with the use of temporary gates stored off-site;
   - the gate system would be unobtrusive and fully integrated into a rejuvenated urban realm between the buildings that marks the entrance into the City Centre; and
   - the gate and associated public realm works would maintain and improve access to the riverside.
8. Resilience measures for the Council House have already been agreed and are being implemented by the Council as part of their refurbishment works.
9. Civic park around the Council House would be redesigned to emphasis the Civic Core. The redesign would incorporate landscaped earthbunds which provide the flood defence. The new earthbunds would be integrated into this space through careful, innovative design that reflects the heritage importance and architectural interest of the area.
10. Proposals for a new swimming leisure facility as part of the Riverlights development will incorporate a new flood defence.
11. Ecological enhancements on the western bank are limited due to the existing nature of the space and its heritage status, Otter ledges could be installed under the bridges and at the weirs.

Example underpass treatment: Vauxhall Cross Interchange



Affected areas – landmark properties labelled for reference

Figure 5.8: The Western Bank

Opportunity Site 06
NORTH RIVERSIDE

Issues and Opportunities

At a city level the regeneration potential of this area has long been recognised. Development has been delivered on an adhoc basis particularly along Stuart Street where there is a mix of commercial and residential development fronting onto the river. Attempts to define an overarching vision that can be delivered have been frustrated by fundamental constraints including its location in a high flood risk area. The Our City Our River Masterplan seeks to unlock this regeneration potential, and support the creation of a high quality and substantial mixed use City Quarter that maximises the potential offered by its waterside location; whilst also providing critical flood defence measures for properties to the east and the City's transport infrastructure.

Consequently, the vision and approach for the area is ambitious – but that is as it should be. This is a vital area for the City that offers major potential. Importantly the design approach will provide land owners and prospective developers with clarity and certainty about the future opportunities in this regeneration area enabling a private sector-led approach guided by the City's aspirations.

Exeter Bridge sits within the flood channel providing a constriction on flows. Flood water would flow over and around the bridge. The area also includes some of the City's strategic highways including St Alkmunds Way which is elevated and provides the east and northern boundary to the North Riverside area. The Darwin Place interchange is a key strategic route to the A52 taking traffic out of the City to the east. These roads have a detrimental impact upon local air and noise quality. The views of the elevated highways in this area, for their most part do not provide an attractive impression at a key gateway location for the City.

Options Considered

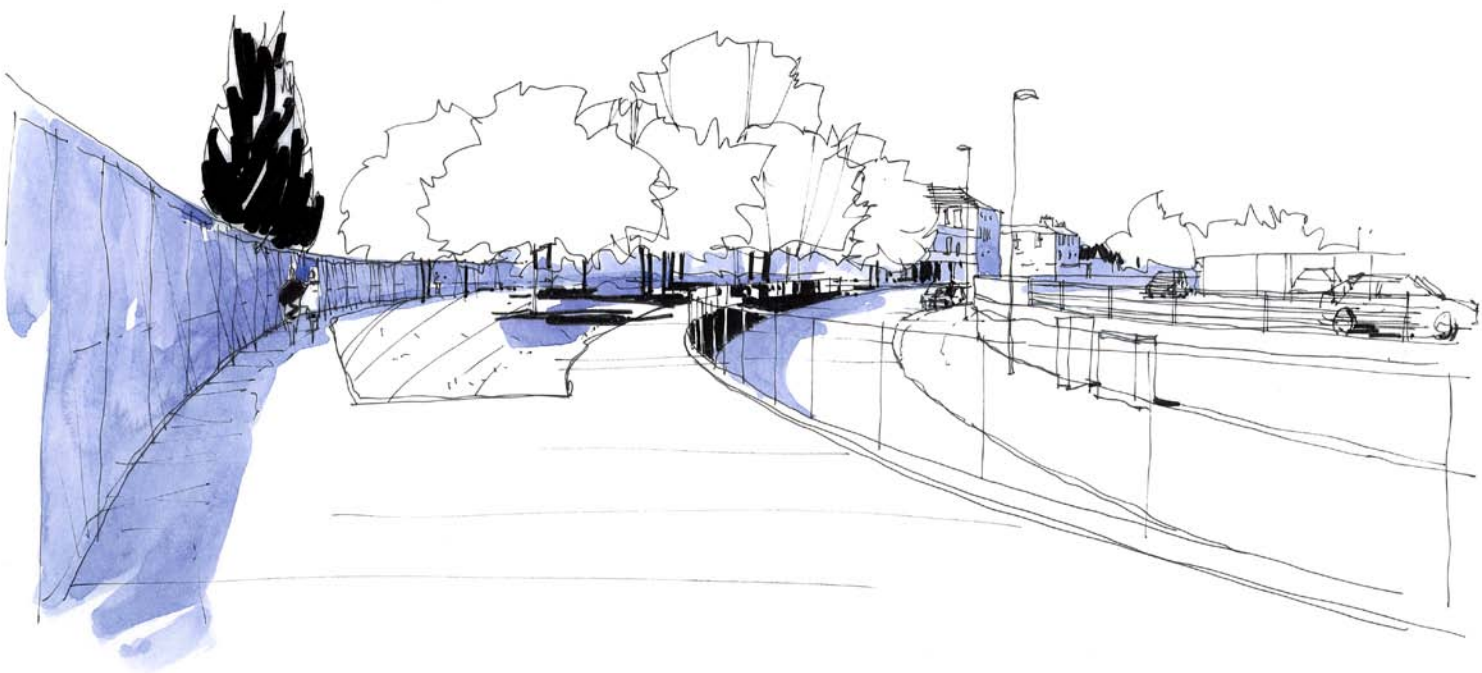
A number of alternative options have been considered for the area, including:

- Setting the flood defence back against St Alkmund's Way, a strategic highway, to the east and clearing the majority of the area, thereby creating a wide flood plain suitable for conveyance. The impact of this approach on existing property would be substantial and it would make future investment unviable and result in the gradual dereliction of the area. Any new

View from Cathedral Green across footbridge to Stuart Street open space would be underused and could become a hostile environment as a result of low levels of building occupation which would provide limited natural surveillance. This option has therefore been discounted.

- Raise the flood defences along the banks of the river thereby creating a larger development area. The height of such defences would however be substantial, creating a visual and physical barrier between the river and any active uses. This option was also discounted on the basis that it would encourage a built form that would be detrimental to the quality of the river corridor and City Centre.
- Removal of Stuart Street riverside properties to provide an enhanced conveyance corridor for flood water and maximise development east of Stuart Street. These properties have been designed to accommodate flood water and contain appropriate ground floor uses. The substantial cost involved in the acquisition, demolition, and landscaping of the riverbank makes this approach unaffordable. Therefore this option has been discounted.
- The creation of a conveyance corridor between Phoenix Street and St Alkmunds Way. This would create an island of development east and west of Stuart Street. This would provide practical difficulties in managing flood water through this area and protecting Darwin Place interchange. It would also increase the amount of development that would be encompassed by flood water. This option has therefore been discounted.

The preferred approach is the creation of a conveyance corridor between Stuart Street and Phoenix Street and is described below:



Discounted Option: View north from Meadow Road looking north with the height of the existing flood defences increased on the eastern bank of the river. Meadow Road and the Darwin Loop Road would be unchanged. The pedestrian route and public realm would be detached from the river and visual links to the City Centre would be lost.

Preferred Approach

An innovative solution has been developed through a collaborative design process; it will however require substantial change. At its core is the concept of including new flood defences as part of the new buildings and using these to establish a defended line behind which major new development opportunities could be realised. The new development would be constructed on a realigned Meadow Road between the Darwin Place Car Park and Derwent Street. This linear development would also extend on the eastern side of Phoenix Street. The delivery of the new buildings would have to be co-ordinated in order to ensure that a consistent and robust flood defence is provided. This would be aided by the provision of a detailed Design and Development Brief for the entire area. The new development would require the relocation of Machine Mart and the loss of the former Territorial Army premises, but would retain the Exeter Arms public house.

The area between, and including, Phoenix Street and Stuart Street would be used to allow the conveyance of water in a flood event. This corridor would be extended east of Derwent Street to reconnect into the river channel. In order to create this corridor Exeter House, Bio House (including Balloon & Party Ideas and the Cob Shop), the locally listed Crompton House (the NatWest Bank), and Derbyshire Housing Aid would all need to be demolished as they would form a significant blockage to flood flows. The existing flood bank immediately downstream of Causey Bridge would be lowered. This would help to minimise flood levels around St Mary's Bridge (Scheduled Monument) and all the way upstream to Darley Abbey. In terms of national planning policy the conveyance corridor would become Flood Zone 3b "Functional Floodplain" which is normally limited to 'water compatible' uses. It is therefore suggested that this area forms a new city park incorporating new recreational and leisure facilities and some parking provision. This park would be framed by the new development on its north-eastern boundary.

Extensive works would also be required to provide a new road layout within this area including road closures (Exeter Place and Exeter Street) and the creation of a new link road between Meadow Road and Derwent Street to create an intersection opposite Stuart Street. This will allow new development to take place whilst maintaining vehicular access to Meadow Lane.

Existing buildings along the river-side of Stuart Street (Derby City NHS offices at Derwent Court, offices at Epworth House and Peat House, and the 86 apartments of Derby Riverside) and the Brewery Tap public house would be retained. These properties are in Flood Zone 3a. The ground floor use of the offices has been previously considered an appropriate use. The ground floor use of Derby Riverside is under-croft parking and again has previously been considered appropriate.

The Our City Our River proposals increase the probability of flooding at the Stuart Street riverside properties and the Brewery Tap from around a 1 in 50 annual chance to around a 1 in 25 annual chance. In order to provide mitigation for this a number of proposals need to be considered, including:

- Flood resilience measures to the offices and the Brewery Tap;
- A high level emergency pedestrian escape route from the Derby Riverside apartments to the footway on St Alkmunds Way or the new development on east side of Phoenix Street; and
- A Flood Warning and Evacuation Plan as the proposed flood gates on Derwent Street would restrict vehicular movements in and out of the flood corridor. The frequency at which the gates are likely to be closed needs to be minimised. It also needs to be accepted that there are likely to be instances when flood warnings are given but flood levels do not actually reach critical levels. These 'false alarms' will be frustrating to affected people and business.

Development could be permitted within Darwin Place car park. A new access would be created through the provision of a new slip road off the A52 access road. There is an existing slip road out of the car park which would continue to be used for site egress. The A52 access road would be protected with improvements made to the existing structures on the eastern edge of Meadow Road.

Setting the defences back would allow the existing wall along the river to be removed, the bank could be regraded and there would be opportunities for planting and habitat creation.

Existing view from Meadow Road looking north

Preferred Approach: Proposed view from Meadow Road of new defence wall concealing Darwin Place with new landscaping. Darwin Place would provide an opportunity for redevelopment. The pedestrian routes and public realm would be enhanced with new landscaping treatments which would provide leisure and recreational opportunities.

Sketch A

Implementation Strategy

Redevelopment of this area would only be delivered over the medium to long term (5-20 years) dependant upon future market conditions. Although the provision of flood defences to protect large parts of the City are an important reason for intervention in the Derwent Street area, the overriding need is to maximise the potential of this area in terms of creating a high quality waterside City Quarter that can support Derby's long term economic viability. The City Council will therefore take a leading role in delivery of this area.

The current envisaged delivery programme fits well with the approved design life of the recent refurbishment of Exeter House and hence it is not expected that the flats would be lost before 2024. Alternative appropriate accommodation would be provided that allows existing residents to relocate and remain within the community before Exeter House is lost.

View north of existing residential development along Phoenix Street

Preferred Approach: View North towards Phoenix Street underpass with new development incorporating flood defence overlooking new city park and with high level pedestrian escape route. The new city park would facilitate the movement of flood water in a flood event. The park would also provide recreation opportunities and a mixed use destination for the City Centre.

Sketch B

Within the area there are works that the EA would undertake using its statutory powers e.g. the flood gates on Derwent Street and works along Meadow Road. Overall, the majority of the works would need to be driven by the City Council working with landowners and developer(s). As described above, the regeneration proposals are likely to require the acquisition of significant land and property which is currently in private ownership. The City Council would seek to assemble the land by negotiation and work in partnership with existing landowners. If this proves unsuccessful then the Council could consider utilising its powers to compulsory purchase as an intervention of the last resort. The Council would also need to use its statutory powers to enable the significant highways works including the realignment of Meadow Road between Derwent Street and Meadow Lane.

Existing view east into North Riverside

Preferred Approach: View east over Exeter Bridge into the new City Quarter. Derwent Street would be framed with new development incorporating defences. New mixed use development could include cafe/restaurant/bars/commercial ground floor uses.

Sketch C

NORTH RIVERSIDE

Proposed Defences – Walls and Buildings

Proposed Defences – Embankments and re-profiling of the ground

Existing Contours provide a natural flood defence

Active defences of temporary nature needed during a flood event

Open Space – amenity, recreational, leisure, wildlife

Proposed vehicle access

Proposed pedestrian access

Existing buildings. Those within the proposed flood corridor will require resilience measures

Proposed development sites incorporating flood defence

Strategic Highway

Sketch Location

1. Public realm improvements could improve the appearance of the Phoenix Street underpass to create a pedestrian friendly environment.
2. The existing flood embankment to the south of Causey Bridge would be lowered to help improve conveyance around Exeter Bridge and help reduce flood levels at St Mary's Bridge and all the way upstream to Darley Abbey.
3. Flood defences delivered as part of new development to create 'active' street facades. The new development would require the relocation of Machine Mart and the loss of the former Territorial Army premises, but would retain the Exeter Arms public house with possible modifications.
4. There will be an increase in the probability of flooding to existing development along Stuart Street and the Brewery Tap Public House. The consequences of this will be managed through a Flood Warning and Evacuation Management Plan, additional flood resilience measures and a new high level pedestrian access between the Derby Riverside apartments and the footway along St Alkmunds Way or the new development along Phoenix Street.
5. Flood gates would be required across Derwent Street which would be closed on issue of a Flood Warning. The frequency at which the gates are likely to be closed needs to be minimised as their closure would restrict vehicular movements in and out of the flood corridor. Beyond the gates Derwent Street underpass would join on to Nottingham road where public realm improvements could improve the appearance of Derwent Street underpass.

Conveyance Corridor

6. The area between, and including, Phoenix Street and Stuart Street would be used to allow the conveyance of water in a flood event. This corridor would extend east of Derwent Street to reconnect with the river. In order to create this corridor Exeter House, Bio House (including Balloon & Party Ideas and the Cob Shop), the locally listed Crompton House (the NatWest Bank), and Derbyshire Housing Aid would all need to be demolished as they would form a significant blockage to flood flows. This area could become a new city park incorporating new recreational and leisure facilities and some parking provision. This park would be framed by the new development on its north-eastern boundary.
7. Soft engineering options along the eastern waterside edge of river banks would be considered to compensate for the urban civic space on the western bank. This would provide emergent vegetation along the edge of the river which in turn would offer opportunities to fauna for foraging and shelter.
8. A new road layout within this area would include the closure of Exeter Place and Exeter Street. A new link road between Meadow Road and Derwent Street would be created where Exeter House is currently located. A cross roads would be created on Derwent Street opposite Stuart Street.
9. Where amenity grassland runs adjacent to water's edge or bank tops an un-mown strip alongside the river would be created to soften the margin and discourage disturbance. The option to remove the existing floodwall along the river's edge will be considered.
10. Darwin Place could provide a potential development opportunity with existing slip road egress, and new slip road access. Pedestrian access would be retained along Meadow Road and over Holmes Bridge to the opposite bank.
11. Otter ledges at bridges and otter passes at the weir will be provided.
12. A new flood wall would be required to protect the A52 Slip Road and screen the sight and sound of the road from the river corridor.

Affected areas – landmark properties labelled for reference

Figure 5.9: North Riverside

Opportunity Site 07
MEADOW LANE TO CASTLEWARD

Issues and Opportunities

The Meadow Lane area is located opposite Bass' Recreation Ground and is the final Opportunity Site along the length of the corridor. The area forms a triangular shape and is largely constrained by the Midland Mainline railway, and Holmes Bridge. Derby Junction Railway Bridge acts as a significant obstruction to the flow of the river. The Derby Evening Telegraph, Trent Barton bus depot and the Smithfield public house currently occupy the majority of the site.

Access into the site is derived from the A52 via a one way entry slip and via Meadow Road. Pedestrians and cycles can pass through the site freely, and the pedestrian route for most of its part is diverted away from the river bank along a formal pedestrian footpath at Meadow Road. Where the pedestrian route rejoins the river there is a narrow footbridge providing pedestrian access onto Station Approach on the eastern bank.

To the south of Station Approach lies the Castleward area, which is highlighted by Derby City Council as a significant regeneration opportunity incorporating Derby Rail Station.

View of car park beyond Telegraph

View of bus depot

Options Considered

The Strategy identified that the conveyance of flood water through Derby Junction Railway Bridge should be improved to help reduce flood levels upstream of the bridge. It was suggested that this should be achieved by lowering ground levels in the outer arches of the bridge. Further investigation and modelling has shown that this has a very limited benefit and would be very expensive to deliver. Improving conveyance through the south bank arch would require the diversion of the main sewer from the City Centre to the sewage treatment works at Spondon. This would be extraordinarily expensive as it would involve drilling a new tunnel through the railway embankment. The cost of lowering ground levels in the north bank arch is more feasible, but the benefit of lowering flood levels is very small and limited in its upstream impact. The cost of constructing slightly higher defences (50-100 millimetres) in the Meadow Lane to Castleward area is likely to be a more cost-effective solution.

Alternative Options have been considered for the area, these are:

- A 'Do-Nothing' Scenario: All of the uses in this location are appropriate under the NPPF. However, 'do-nothing' is not an option as flood water would penetrate the bus depot and pass under the elevated railway. The bus depot could not be retrofitted with the required protection. Meadow Road also needs a form of defence in order to protect the A52 corridor. This option was therefore discounted.
- Constructing a flood wall around the full perimeter of the site would have a detrimental impact upon the townscape and this approach would require flood gates to be provided to the bus depot access. The flood wall would also need to be extended across Meadow Road to provide adequate protection to the A52 corridor as raising the highway is not practical solution.
- Setting the flood defences back along the railway embankment: Again the bus depot cannot be afforded the adequate level of protection in this option. The improved defences elsewhere within the Masterplan area worsen the situation for the Bus Depot. Only through redevelopment can improved defences be provided that also protect the A52 corridor.

Preferred Approach

The Our City Our River Masterplan seeks to unlock the regeneration potential in this area. In the preferred approach a continuous line of built form would be provided at Meadow Lane, thus providing the defence. In order to achieve this, the Trent Barton bus depot would need to be relocated and the existing structures would be demolished. A new development would be built in its place and would provide a continuous defence. It is likely that a flood gate will be required across Meadow Road (slip road from A52) as no suitable alternative routes are available and wholesale reprofiling of the road is not technically feasible. Access to the bus depot and Derby Telegraph sites when the flood gates are closed needs to be considered and a new access arrangement may be required. The Derby Telegraph Building would potentially need additional resilience measures to maintain its existing Standard of Protection.

New balconies and terraces will engage with the river and the leisure route that will be created to the front of the buildings. Bass' Recreation Ground will be retained and will continue to provide a green oasis to the City Centre. The Smithfield public house will be retained and resilience measures retro fitted to the building to maintain its current Standard of Protection. Vehicular access will also be provided to the front of the buildings.

A flow control structure will be required at the end of Markeaton Brook culvert at Bass' Recreation Ground. This will prevent the River Derwent backing up Markeaton Brook culvert and surcharging the existing drainage system which would result in surface water flooding in the City Centre. A pumping station may also be required to allow water from Markeaton Brook, which collects the majority of surface water drainage from the City Centre, to discharge into the Derwent.

In a severe flood event Station Approach and the Cock Pitt interchange could suffer from localised flooding but no properties are at risk. The option of providing a new flood defence along Station Approach to prevent flooding of the highway has been discounted as it would hinder the Council's ambition to see improved pedestrian access between the Castleward area and Bass's Recreation Ground.

Text Box 5.1: What about undertaking works to Derby Junction Railway Bridge?

The Strategy identified that the conveyance of flood water through Derby Junction Railway Bridge should be improved to help reduce flood levels upstream of the bridge. It was suggested that this should be achieved by lowering ground levels in the outer arches of the bridge. Further investigation and modelling has shown that this has a very limited benefit and would be very expensive to deliver. Improving conveyance through the south bank arch would require the diversion of the main sewer from the City Centre to the sewage treatment works at Spondon. This would be extraordinarily expensive as it would involve drilling a new tunnel through the railway embankment. The cost of lowering ground levels in the north bank arch is more feasible, but the benefit of lowering flood levels is very small and limited in its upstream impact. The cost of constructing slightly higher defences (50-100mm) in the Meadow Lane to Castleward area is likely to be a more cost-effective solution. However, work to the bridge may be required to mitigate the increased hydraulic loading and risk of scour damage during a flood event.

Implementation Strategy

This approach could be delivered through private negotiation, provided a suitable relocation site for the Trent Barton bus depot is found. The new development would include flood defences as part of the design of the new buildings. Uses could include residential, hotel or commercial. This project would be delivered over the medium to long term (5-20 years) given the need for relocation and new development would be dependent upon market conditions.

The Derby Telegraph property would need to install additional resilience measures. If the site was vacated creating an opportunity for redevelopment, new build could incorporate flood defences and offer uses similar to the bus depot site taking advantage of the riverside setting and overlooking the Bass Recreation ground.

The Smithfield public house would sit within an area of high flood risk. A Flood Warning Management Plan and resilience measures will be required for Smithfield public house to remain in the flood conveyance corridor. If the pub at some point in the future closes then it could continue its use under new ownership or the land could be offered to improve the riverside walk.

The flow control structure and pumping station will be designed in liaison with our Land Drainage team Severn Trent Water to help reduce surface water flooding from drains and sewers.

Markeaton Brook

Bass Recreation Ground

MEADOW LANE TO CASTLEWARD

- Proposed Defences – Walls and Buildings
- Proposed Defences – Embankments and re-profiling of the ground
- Existing Contours provide a natural flood defence
- Active defences of temporary nature needed during a flood event
- Open Space – amenity, recreational, leisure, wildlife
- Proposed vehicle access
- Proposed pedestrian access
- Existing buildings. Those within the proposed flood corridor will require resilience measures
- Proposed development sites incorporating flood defence
- Strategic Highway
- Sketch Location

1. Potential new vehicular access and egress to the Trent Barton Bus Depot site and Derby Telegraph Building outside of the flood zone.
2. Pedestrian connectivity between the City Centre, river corridor and community north and east would be retained through a re-profiled landscape.
3. Flood gates would potentially be provided on Meadow Road. Alternative routes enabling road closure have height restrictions and are not deemed apprpriate.
4. Further flood resilience measures would be retrofitted to the Derby Telegraph Building. If the site is redeveloped, then the required flood defence can be delivered as part of the new development.
5. Flood Warning Management Plan and resilience measures required for Smithfield public house to remain in the flood conveyance corridor.
6. Soft engineering options would be explored along the waterside edge of river banks to provide emergent vegetation along the edge of the river which in turn will offer opportunities to fauna for foraging and shelter. Where possible the existing tree cover would be widened to soften the river bank. At Bass Recreation Ground options would be explored to widen the existing tree lines and/or provide strips of un-mown grassland.
7. Installation of a new flow control structure and pumping station to prevent flood water from the River Derwent backing up Markeaton Brook and into the City's sewer system. Water would be pumped out of Markeaton Brook, when river levels are high, to help prevent surface water flooding associated with the sewer system backing up.
8. The existing footbridge between Bass' Recreation Ground and Meadow Lane would be retained.
9. Existing ground levels along Station Approach provide a good level of flood defence. In a severe flood event there could be some localised flooding along Station Approach and the Cock Pitt intersection but no property is at risk and alternative routes are available.
10. Work to the railway bridge may be required to mitigate the increased hydraulic loading and risk of scour damage during a flood event.

Affected areas – landmark properties labelled for reference

Figure 5.10: Meadow Lane

6

Implementation Strategy

6. Implementation Strategy

INTRODUCTION

Our City Our River is essentially a complex series of projects connected through an integrated strategy that seeks to improve flood defences for Derby and deliver substantial long term benefits for its resident communities and businesses. As a substantial proportion of the new defences would be integral to and reliant upon new development they would have to be delivered over a long period of time (possibly 20 years or more).

Whilst this approach means that flood risk would not be immediately lessened for everyone and everywhere, it does offer two very important benefits. Firstly, new defences would be largely designed within new and high quality built form; they would therefore not appear as obvious and obtrusive structures that segregate the City from the river, this would have substantial long-term benefits for the prosperity and social well being of the City. Secondly, by integrating the defences into development the demand on public sector finance would be greatly reduced which is vital in our economy where the availability of public funding is increasingly limited and likely to remain so.

Text Box 6.1: What are Design and Development Briefs?

A series of Design and Development Briefs will be produced for the regeneration sites, namely North Riverside, Aida Bliss, City Road, Meadow Lane and if necessary Duke Street. The Design and Development Briefs will act as a tool for developers, providing detailed guidance on the form of viable development and the appropriate uses. The Briefs will address in detail, the individual constraints that affect development within each opportunity sites. The City Council will continue to work with the EA to generate Development Briefs that allow development whilst also providing the required flood defences.

Development Briefs will set the processes required to achieve planning consent to satisfy both the EA and the City Council.

A PARTNERSHIP APPROACH

As set out in Section 1, the City Council and the EA would work as an integrated team to deliver the 'Our City Our River' project. They would lead the project, working closely with a wide range of stakeholders to achieve the shared objectives.

The City Council and the EA have agreed a Memorandum of Understanding (MoU), which helps shape their partnership and commitment to deliver the Our City Our River project. It sets out roles and responsibilities to reach a point where funding is secured to commence and commit to delivery. There is no legal commitment within the MoU but crucially it allows the EA to add Our City Our River to their Medium Term Plan for budgeting purposes. Once funding for the project has been agreed by both parties, they would sign a series of Partnership Agreements which would then legally bind the partners to delivering phases of the project.

It is anticipated that the EA will use its powers provided by the Water Resources Act to deliver and fund flood defence works where they do not form part of new buildings. Some key activities for the EA would include:

- Maintain the existing defences until such time that they become redundant or the scheme is complete;
- Earthworks to improve flood embankments and control conveyance through the corridor by improving topography;
- Provision of new flood defences;
- Improve existing defences as required;
- Removal of existing defences as required;
- Installation and maintenance of flood gates (the management of the flood gates would be a co-ordinated response between the City Council and the EA);
- Provision of alternative access to the cricket club at Parkers Piece including for service and maintenance requirements;
- Reinforcing existing structures including bridges; and
- Ecological Enhancements including Habitat Creation

The EA would act as a lead delivery authority for various elements of the project. This would involve matters such as detailed design, preparation of planning applications, procurement of contractors, site supervision and maintenance of the works. Generally these works would be located outside of the regeneration sites but not exclusively so.

The City Council would work with the EA assisting in the delivery of the above works using its powers and influence as a landowner and statutory planning and highway authority. The City Council would also shape future requirements in terms of identifying strategies for the provision of leisure, housing and community infrastructure.

The City Council would take overall responsibility for the project and in particular it would lead in the delivery of the regeneration sites working with land and property owners and future developers and investors. The City Council will need to consider taking a lead role on the following:

- Ensure that the existing development proposals incorporate the required defence/flood resilience measures;
- Develop strategies for future parking and leisure facilities and open space;
- Develop site specific proposals in co-operation with land owners;
- Undertake resilience measures to its own property within the corridor (e.g. Council House and Silk Mill);
- Procurement of developers as required;
- Relocation of recreational facilities around Little Chester as required;
- Lead on Design and Development Briefs (see Text Box 6.1);
- Identification of funding to support the delivery of the regeneration sites;
- Utilisation of its highways powers to deliver highway and car parking improvements;
- Through the regeneration of Castleward, secure an appropriate pedestrian crossing for Station Approach;
- Develop an access strategy providing new links within the corridor and making the wider connections; and
- Any relocations that maybe required including identification of alternative accommodation.

WORKING WITH THE PRIVATE SECTOR

The Masterplan seeks to promote regeneration projects that are attractive to existing land owners and prospective developers and investors. The Masterplan provides a future vision and confidence that future development is achievable. It puts forward practical solutions that would deliver high quality mixed use developments and associated public realm. This would represent a major step forward as many of the Opportunity Sites have been frustrated for many years by the limitations created by flood risk.

The Our City Our River project would create a high quality public realm along the length of the river corridor through the City which would provide a significant uplift in adjoining site values. Indeed, an objective will be to make this corridor one of the most desirable places within the City. This process will over the medium to long term improve the economic viability of development.

New development within the Opportunity Sites would incorporate new flood defences and consequently the associated costs would be met through the cost of constructing the new development, thereby reducing the cost of the overall flood risk management strategy to the public sector.

In the first instance the City Council would support and encourage land owners to bring forward appropriate regeneration proposals for the Opportunity Sites rather than be directly involved in project delivery. However, it is expected that some of the more complex sites would require public sector assistance which could be in the form of; acquisition of land and property, the provision of new infrastructure, public realm improvements, the payment of compensation to existing businesses and residents where relocation is the only possible option.

The City Council owns some property within some of the Opportunity Site areas and it would need to consider how these assets can be utilised to enable regeneration and development. Furthermore, the City Council can consider how it uses current and future maintenance and investment budgets to help provide a coordinated approach to its spend within these areas. An example would be in how it manages its highway and parks maintenance budgets that plan for the installation of new defence thereby ensuring spend is complimentary and supportive.

A number of public funding sources would be considered to support the regeneration projects but it is expected that partnership with the private sector would be critical in delivering the regeneration proposals within the Opportunity Sites.

Developer partners could assist in reducing the funding burden upon the public sector by purchasing and developing land acquired by the Council and phasing public funding interventions thereby allowing income from development to be reinvested. Land and property could be acquired by negotiation by the City Council. If negotiations cannot be concluded successfully then the City Council could consider using its powers to compulsory purchase land and property for regeneration purposes as an instrument of last resort.

Where required developer partners would be selected on a competitive basis unless they hold ownership of part or all of the Opportunity Site.

FLOOD RISK ASSESSMENTS

A site specific Flood Risk Assessment (FRA), will be required with each individual planning application. The FRA will need to clearly demonstrate how the development proposals have taken account of national and local policy and the aims and aspirations of this Masterplan, along with the Design & Development Briefs that will be produced. In preparing a FRA under this Masterplan, it is important to recognise the likely timescales for the completion of the whole scheme. During this implementation period, as sections of improved flood defences are delivered, the flood risk and hazard to people will change over time. The FRA must therefore consider both the interim period as well as the situation that would be in place if the defences were fully complete.

The FRA must fully consider any potential increase or change in flood risk to third parties that may be caused as a result of a development proposal. The optimum delivery sequence of the scheme in terms of management of flood risk during the implementation period, including the areas where mitigation is required for the complete delivery of this scheme, is defined under 'Delivery Programme'. This phasing is provided for information but is not designed to be overprescriptive and should not prevent the delivery of sites out-of-sequence as long as flood risk impacts are considered and appropriately managed.

The maintenance of the existing flood defences is as important as the construction of the new defences during the implementation period to ensure there is no increase in flood risk. The transition from the existing defences to the new defences, and the eventual removal of the existing defences, must be carefully planned and managed.

The construction, inspection and maintenance of the new defences must also be fully considered. More detailed information will be provided in the Design & Development Briefs but the following flood defence issues require consideration:

- Design criteria;
- Approval of construction drawings;
- Construction supervision;
- Record drawings and data;
- Commissioning and future inspections;
- Access and maintenance arrangements by competent parties;
- Third party asset enforcement; and
- Covenants on Title Deeds to manage ownership changes.

DELIVERY PROGRAMME

Although the overall Masterplan comprises a large number of projects it would need to be delivered as one single coordinated project. It is anticipated that the overall programme for delivery would be up to 20 years. This is because the regeneration of the Opportunity Sites requires significant promotion and development and would ultimately be dependent upon market demand and economic conditions. However, the Masterplan is a significant first step that would lead to the transformation of the river corridor comprising high quality public realm and waterside development maximising the potential of what is a major environmental, economic and cultural asset.

Both the City Council and EA are committed to delivering this scheme in as short a timeframe as possible with the funding constraints they operate within and in a sustainable manner. The proposals laid out within this Masterplan currently offer the best opportunity of doing this.

Initial modelling has helped determine the optimum delivery sequence of Our City Our River in terms of managing changes in flood risk. The optimum sequence consists of the following four phases:

Phase 1:

- Darley Abbey Mills to Handyside Bridge;
- Duke Street & Sowter Road;
- Cathedral Green to Holmes Bridge; and
- Pride Park.

Phase 2:

- City Road: Handyside Bridge to St Mary's Bridge;
- Ambaston; and
- Shardlow.

Phase 3:

- North Riverside; and
- Meadow Lane.

Phase 4:

- Chaddesden; and
- Alvaston Park.

The basic rationale behind this sequence is:

Phase 1:

- Delivery of the scheme should start at the upstream end in order to start delivering a reduction in flood risk to people and property. If works in this area are not undertaken at the start, flood water will pass down Alfreton Road, through Chester Green and flood the east bank of Derby regardless of any other work undertaken;
- Work at Darley Abbey Mills and Stables is required at the start of the project as delivery of improved defences along Alfreton Road Industrial Estate and across the southern boundary of Darley Abbey Playing Fields will increase flood risk at the Mills; and
- Delivery of improved flood defences downstream of Handyside Bridge would increase flood risk to the Duke Street area, the city centre and Pride Park. Therefore defences in these west bank areas should be delivered as part of Phase 1.

Phase 2:

- Following Phase 1, the defences along City Road between Handyside Bridge and St Mary's Bridge can be delivered without causing a significant increase in flood risk in other areas; and
- Works at Ambaston and Shardlow should be delivered before the North Riverside and Meadow Lane areas to avoid an increase in flood risk.

Phase 3:

- The North Riverside and Meadow Lane areas can be delivered as Phase 3 without causing a significant increase in flood risk in other areas.

Phase 4:

- The delivery of mitigation work at Chaddesden and Alvaston Park will conclude the delivery of the scheme; and

The defined four phase approach is the optimum delivery sequence in terms of managing flood risk during the implementation period, and securing FDGiA funding. It should not be over-prescriptive and does not prevent individual sites from being delivered 'out-of-sequence' as long as there is a hazard led design approach to that site and due consideration and appropriate management of the flood risk impact to other sites.

Now that the Masterplan has been adopted, the City Council and EA will prepare a Funding Strategy for the delivery of the Masterplan, and progress design development through further stakeholder engagement. Once funding has been secured the Environment Agency and the City Council would enter into a Partnership Agreement which will legally commit both parties to deliver the project. This would represent Day 1 of the delivery programme.

It is possible that Day 1 would take between 18 and 24 months to reach allowing for the consultation process, design development, and the need to bid and secure substantial funds.

It is recommended that the Masterplan is supplemented with detailed Design and Development Briefs to help further promote investment and aid the planning process in determining planning applications.

At Day 1 the EA would embark on the process of preparing and submitting planning applications for their programme of flood defence schemes and procure contractors to implement the works. Planning applications would be supported by various supporting evidence and studies including Transport and Environmental Impact Assessments. The City Council would carry out detailed design work to implement some of their short term interventions. At the same time they would commence the process of promoting the regeneration projects including procurement of developer partners. It may prove advantageous to appoint a single strategic development partner which may attract more private sector investment given the scale of development would be much more significant. The City Council and EA could also consider establishing a Special Purpose Vehicle that incorporated the EA's flood defence infrastructure and engineering works as well as the regeneration development opportunities.

The delivery programme would seek to commence work on all elements of the project on Day 1. This will ensure that the more complex projects are delivered at the earliest possible time. Flood modelling undertaken by the EA has demonstrated that there is no stretch of the river that is more important than any other in terms of flood protection. It is proposed that the EA would implement with the support of the City Council and relevant stakeholders new and improved defences, principally from the north working down towards the City Centre. In these northern areas down to City Road implementation is more straight forward and can therefore be delivered from Day 1 over a short term period (up to 5years). During this period the City Council would be working with stakeholders to progress the regeneration Opportunity Sites including working with landowners in achieving redevelopment at Aida Bliss and City Road.

7

Scale of Improvement

7. Scale of Improvement

Figure 7.1 presents the current situation as described in Section 2 of this report. Figure 7.2 illustrates the impact of a 1 in 100 annual chance flood event with the Masterplan in place. This is fundamentally different to current situation and represents a radical improvement in the flood defence afforded to the City.

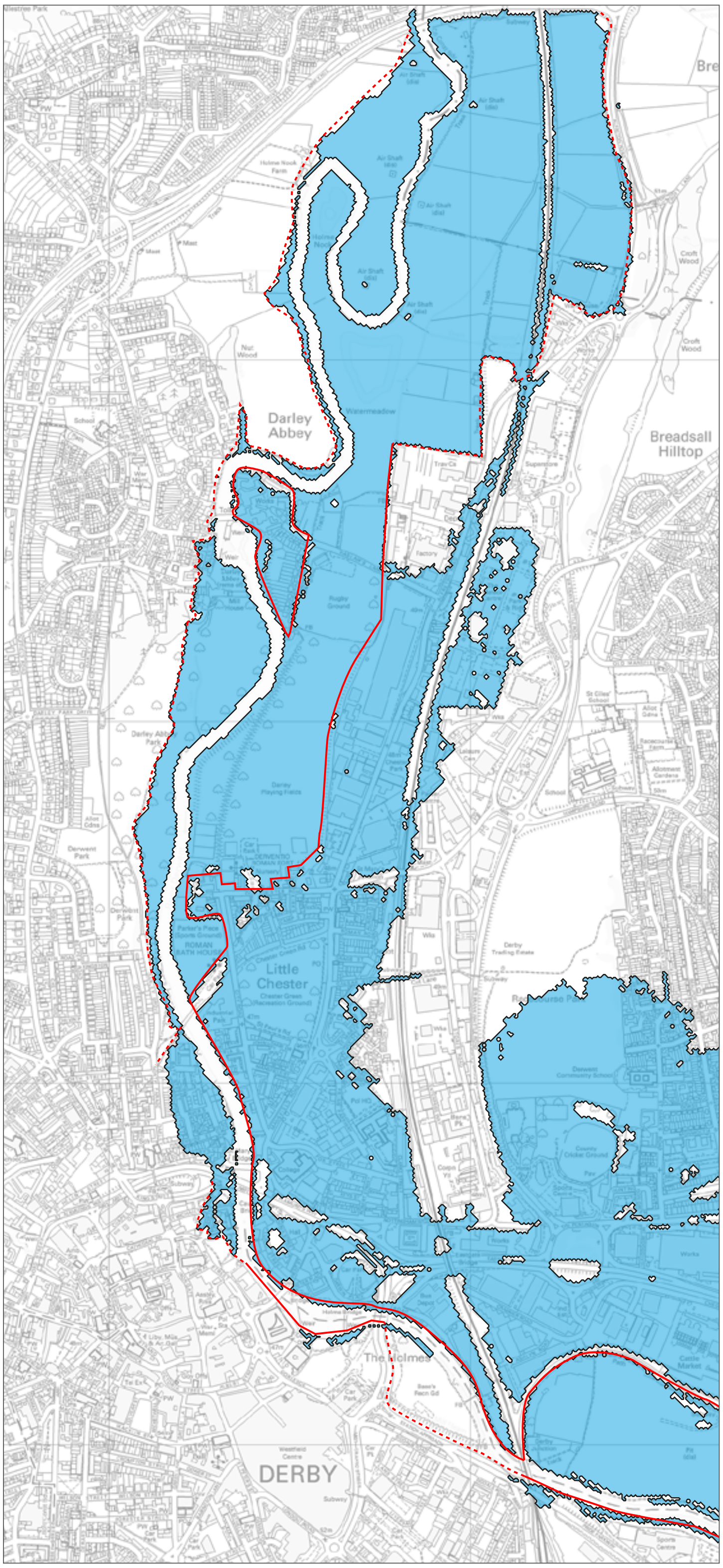


Figure 7.1: Predicted flooding impact from the River Derwent on Derby City Centre. 1:100 year predicted impact with the existing level of defence maintained

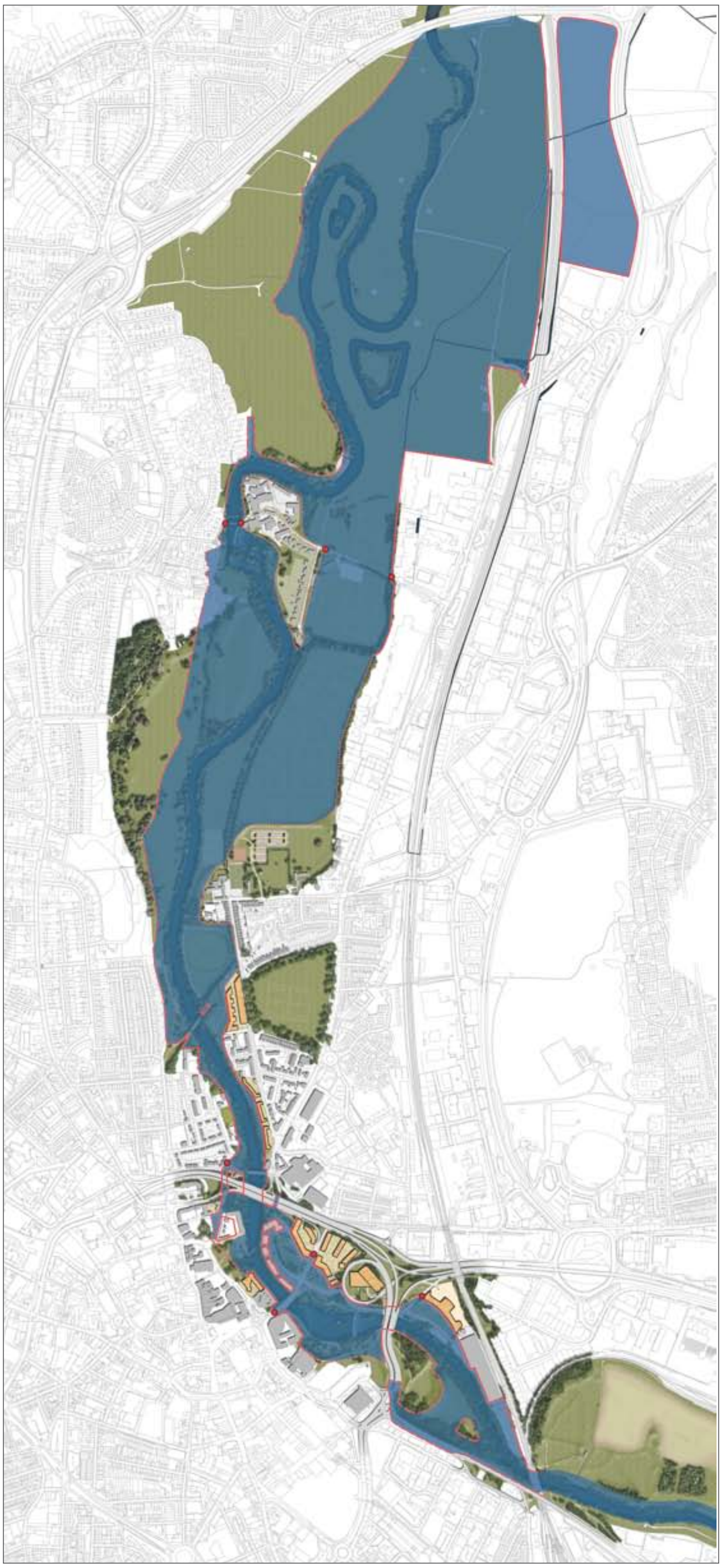


Figure 7.2: City functioning in a flood event

Flood water is now confined to the area between the new defences and the continual alignment of the defences effectively channelling the water through Derby City with areas of parkland and riverside open space delivering increased flood water capacity and enhanced conveyance. A vast amount of property is no longer at risk from flooding and consequently the impacts upon homes and businesses would be minimised. This would be hugely beneficial for a significant number of people.

Major transport infrastructure would now not be affected and following the delivery of the Masterplan the majority of the strategic highway network would be able to remain open and operational during a major flood event. This will enable safe passage for the emergency services and coupled with the proposed escape routes from areas remaining within the flood zone this should significantly reduce risk to life.

Public transport would also be safeguarded and many of the bus routes into the City Centre could continue to operate, the bus station itself would also be protected as will the Park and Ride sites. However, contingency plans would be required for some bus routes. The rail network should also be able to operate normally as the proposed defences should protect the network from flooding. Operation over the Derby Junction Railway Bridge would need to be monitored to ensure that the effects of the flood waters do not affect the structural integrity of the bridge.

All of the main cycle network and pedestrian routes run, for some of their length, in close proximity to the River Derwent. As the green areas would flood in a severe event, these routes would be engulfed by rising flood water and therefore inaccessible and dangerous to attempt to use.

As well as safeguarding the City and its communities, the Masterplan would have removed existing areas of vacant or under used land from flood risk areas and delivered major waterside regeneration. This will transform the City's relationship with the river and support the City Council's long-term economic and social regeneration aspirations. All of this would be achieved in a way that delivers a high quality environment for people and wildlife, whilst also safeguarding key heritage assets and maintaining the integrity of the Derwent Valley Mills World Heritage Site.

A

Appendix A: Review of Requirements for Strategic Environmental Assessment

Appendix A: Review of Requirements for Strategic Environmental Assessment

INTRODUCTION

The Environment Agency's Lower Derwent Flood Risk Management Strategy[1], herein known as the Strategy, produced in 2008 was the subject of a Strategic Environmental Assessment (SEA). An SEA assesses the potential environmental consequences of plans and programmes before they are approved. It is driven by European legislation and implemented in England through the Environmental Assessment of Plans and Programmes Regulations (SI 1633 2004). Although flood risk management strategies do not legally require an SEA, a defra position statement requires that SEA is carried out for all Environment Agency FRM Strategies.

The Strategy takes a wide view of flood risk management, setting ways to reduce flood risk alongside environmental and social opportunities. The strategy also seeks to encourage co-operation and partnerships with key Stakeholders.

The Strategy recommended that within Derby City, (between Darley Abbey Mills and Derby Junction Railway Bridge) a realignment of defences should be implemented. This was decided on the basis that to raise defences on the current alignment would be unacceptable due to the height they would need to be and the resulting impact on townscape and visibility / accessibility of the river Derwent and the fact that other options such a storage of water upstream were not viable in the strategy area.

Following on from the Strategy, Derby City Council (DCC) commissioned this masterplan to take forward the findings and recommendations of the Strategy and to enable the strategy to be implemented within the City in a planned way.

This appendix to the masterplan identifies the relationship between the Strategy, its SEA and the Masterplan. It identifies how the Strategy and its SEA have shaped the masterplan options to implement a flood defence scheme through the city.

It provides detail on the inter-relationship between the issues, highlighted recommendations and mitigation measures within the SEA for the Lower Derwent Strategy and demonstrates where the masterplan has implemented the measures.

REQUIREMENT OF AN SEA AND HOW THIS MASTERPLAN FITS WITH THE STRATEGY

Key guidance on SEA[2] is contained in the ODPM guidance A Practical Guide to the SEA Directive, this states that;

Under Article 2(a), the plans and programmes subject to the Directive are those which are:

- Subject to preparation and/or adoption by an authority at national, regional or local level Or; which are prepared by an authority for adoption, through a legislative procedure by Parliament or Government; and
- Required by legislative, regulatory or administrative provisions.

Characteristics of "administrative provisions" are likely to be that they are publicly available, prepared in a formal way, probably involving consultation with interested parties.

The administrative provision must have sufficient formality such that it counts as a "provision" and it must also use language that plainly requires rather than just encourages a plan or programme to be prepared.

As the masterplan document is not one 'required by legislative, regulatory or administrative provision', and only takes forward the approach set out in the EA's Strategy which was itself subject to SEA, it is considered that a separate SEA for the Masterplan is not required.

The masterplan sets out the implementation stage of the Lower Derwent Strategy through Derby from Darley Abbey to Derby Junction Railway Bridge. The existing SEA has identified impacts associated with the preferred option, and the following sections draw out the impacts and mitigation specified in the SEA and provides a cross-reference to the masterplan.

[1] Lower Derwent Flood Risk Management Strategy, Strategic Environmental Assessment Environmental Report, Environment Agency, September 2008.

[2] A Practical Guide to the Strategic Environmental Assessment Directive, Office of the Deputy Prime Minister (ODPM) September 2005.

OVERARCHING VISION OBJECTIVES

The overarching objectives of the EA's Blue Corridor Vision have been incorporated into the 'our City our River' masterplan. These objectives as set out within the SEA are;

A Better Quality of Life

- Identify opportunities where we can make significant positive quality of life improvements, particularly through regeneration initiatives.
- Develop schemes that take account of landscape character and, where possible make a contribution to the reinforcement or improvement of character.
- Improve access and recreational opportunities within the Derwent corridor.
- Protect and enhance the historic environment, with particular regard to the integrity of the Derwent Valley Mills World Heritage Site.

An Enhanced Environment for Wildlife

- Develop schemes that take into account Biodiversity Action Plan objectives with the aim of creating net improvement in the wildlife value of the Derwent corridor.
- Enhance fish migration through the catchment Restore and Protect Land with Healthier Soils.
- Promote rural and urban land management including soil management by farmers, controlling development in urban areas and promoting sustainable drainage systems.

Improve and Protect Inland and Coastal Waters

- Work with the natural processes of the river and its catchment.
- Ensure water resource and qualities are maintained and improved.

Wiser, Sustainable use of Natural Resources

- Develop schemes, which, through innovative design, use resources efficiently, and through reuse and recycling, minimise waste going to landfill.

Limiting and Adapting to Climate Change

- Reduce carbon emissions and promote the use of renewable energy on the project.

STRATEGY OPTIONS APPRAISAL

Within the Lower Derwent Strategy, the following flood defence options were considered;

- Managing the causes of flooding by changing the way we manage urban and rural land use.
- Storing water during a flood and slowly releasing it afterwards.
- Improving the passage of water down a river system.
- Providing defences to protect developed areas when the river water rises; and
- A combination of the above.

Once initial options assessment and river modelling had been completed the following options taken forward for more detailed assessment for use along the whole Derwent Valley Strategy study area, within the SEA were as follows;

Do Nothing – (as a base case comparison)

Do nothing was not taken further within the strategy as this would result in a stoppage of all flood risk management activities including ceasing flood warning. This does not support the better quality of life objective of the strategy.

Do Minimum – to continue with existing activities

Under this option the following activities would be continued, flood warning service, channel maintenance (where possible), continued maintenance (where defences are currently maintained the EA will continue to do so unless there are special circumstances where the defence would cease to be maintained or removed), development control to continue influencing planning proposals, continued advice on protecting individual properties to increase resilience to flooding.

Land Use Management

This option could only be implemented upstream of Derby and only where there are no significant constraints in terms of potential or existing land use. Measure could include; changes to agricultural land management, afforestation, floodplain woodland, wetland creation and moorland restoration.

Improving Conveyance – Improving capacity of bridges

The SEA identified that there may be opportunities to modify bridges as they reach the end of their design life. Options taken forward for consideration were, opening up the two outer arches of the east midland railway bridge, replace the bridge with a clear span bridge, retain existing bridge and increase the effective opening by constructing a clear span bridge next to it over a flood relief channel.

Provide Flood Defence

The strategy investigated the opportunities to reduce flood risk through the use of permanent defences. Under this option the following methods were given consideration; abandonment, realigning, raising and building new defences.

OUR CITY OUR RIVER MASTERPLAN

As a result of the strategy and its preferred option of flood defence realignment through Derby, the 'our city , our river' masterplan has been produced to provide a way for Derby City Council and partners, alongside the EA to implement a defence scheme that delivers the Blue Corridor Vision set out within the strategy.

The proposals in the masterplan have sought to build upon and refine the option which was identified to be taken forward within the Strategy. Based upon known constraints and consultation with professional teams within the EA and DCC. Some alignment proposals were put forward as part of the strategy but they were all based on the realignment option.

Within the EA's strategy for the whole of the blue corridor the option of Land use management was taken forward for consideration, this would involve changes to agricultural land management, forestation, floodplain woodland, wetland creation and moorland restoration. As a result of the study area for the masterplan being focused on Derby and its city centre, this option is not compatible with the type of land use in the City study area. Therefore it has not been taken forward into this masterplan, it will however be considered by the Environment Agency as they look at their wider blue corridor study area.

The Do nothing and Do minimum options have also not been taken further within the Masterplan. Therefore there has been a focus on the two options of, improving flow through Derby Junction Rail Bridge, and Providing Flood Defence.

A river modelling exercise was undertaken by the EA, this identified at an early stage in the Masterplan process that the defence options available to improve the flow through Derby Junction Rail bridge were not going to provide an' easy win' in terms of reducing flooding. Any positive effect this option would have had on flood levels would only be beneficial for the stretch of river to the next upstream constriction which is Exeter Bridge. Following these results the focus of the Masterplan was directed to the option of providing flood defence identified in the Strategy.

The following Table A.1 is taken from Lower Derwent Flood Risk Management Strategy, Strategic Environmental Assessment Environmental Report, Environment Agency, September 2008. Table 6.2 Assessment of strategy options against environmental objectives it is an extract which identifies each of the options taken forward in the masterplan against the objectives that we set within the strategy.

Table A.2 overleaf is taken from Lower Derwent Flood Risk Management Strategy, Strategic Environmental Assessment Environmental Report, Environment Agency, September 2008 in its Table 6.3 Summary of SEA recommendations. It identifies the significant impacts, and mitigation identified for the providing defences option preferred by the SEA.

Strategy Environmental Objective	Provide flood defence	
	Raise existing defences	**Realign existing defences**
A better quality of life		
Identify opportunities where we can make significant positive quality of life improvements, particularly through regeneration initiatives	Potential for regeneration behind raised defences due to flood risk, however quality of regeneration may be hindered due to visual impact of raised defences	Potential for regeneration behind defences due to increased flood risk. Potential effect on direction of future riverside development within DCC
Develop schemes that take account of landscape character and, where possible make a contribution to the reinforcement or improvement of character	Visual impact of raised defences along riverbank, particularly within conservation areas. This impact could be reduced to an acceptable level through cladding of flood defence walls. The visual impact through Derby would be a major significant negative effect where wall height would have to rise significantly. Also the increased flood risk upstream and downstream in a cumulative visual impact as remedial works may be required.	Benefits to townscape and visual amenity of the river corridor. Opportunities reduced if existing defences are kept in place.
Improve access and recreational opportunities within the Derwent corridor	Existing footpaths to be maintained. Raising defences through Derby may result in a loss of opportunity to improve access to the river	Benefit to the riverside footpath and access to the river. Opportunity reduced if existing defences are left in place
Protect and enhance the historic environment, with particular regard to the integrity of the Derwent Valley Mills World Heritage Site	Reduce flood risk to historic structures and buried assets behind the defences Damage to assets during construction there could be a major impact where there are Scheduled Ancient Monument	Reduce flood risk to historic structures and buried assets behind the defences Damage to assets during construction there could be a major impact where there are SAM
An enhanced environment for wildlife		
Develop schemes that take into account Biodiversity Action Plan objectives with the aim of creating net improvement in the wildlife value of the Derwent Valley corridor.	Damage to existing habitats during construction. Raising the existing defences through Derby may lose the opportunity to improve biodiversity	Overall benefit to ecology if realign defences away from the riverbank. Opportunity to improve the Derwent as a wildlife corridor but this is reduced if existing defences are kept in place.
Restored protected land with healthier soils		
Promote rural and urban land management including soil management by farmers, controlling development in urban areas and promoting sustainable drainage systems	No significant effect	Development would be controlled in parts of the flood plain
Improve and protect inland and coastal waters		
Work with the natural processes of the river and its catchment	Reduction in natural process particularly where defences are on the riverside	Improved natural processes where defences are realigned. Opportunity reduced if existing defences are left in place.
Ensure water resource and qualities are maintained and improved	No significant effect	No significant effect
Wiser sustainable use of natural resources		
Develop schemes, which, through innovative design, use resources efficiently, and through reuse and recycling, minimise waste going to landfill	Construction work will use materials and produce waste. Demolition would generate waste	Construction work will use materials and produce waste. Demolition would generate waste
Adapting to climate change		
Reduce carbon emissions and promote the use of renewable energy on the project.	Construction work will have a carbon footprint. This will be predicted and reduced where possible	Construction work will have a carbon footprint. This will be predicted and reduced where possible

Table A.1: Extract from the SEA assessment of strategy options against environmental objectives

	Strategy Option- Provide Flood Defences			
No	**Significant Impact**	**Mitigation**	**SEA recommendations**	**Strategy Outcomes**
1	Potential effect on future riverside development within Derby City Centre	Close consultation with Derby City Council Realigned defences to be incorporated within the SFRA and LDF to provide guidance for future development	Raise defences is the only feasible solution in some locations. The SEA supports this option if the identified mitigation measures are implemented to reduce environmental impacts The SEA does not support raising existing defences through Derby City Centre; it recommends that a realignment of the defences away from the riverside would be preferable to raising defences along existing riverside alignments. This option fits with the Blue Corridor Vision and has key environmental benefits in terms of opening up the riverside green space, restoring natural banks and where these have been modified, and improving the riverside footpath and cycleway that already exist.	The strategy recommends that defences are raised for some individual communities and realigned through Derby City Centre.
2	Visual impact of new defences, particularly within the Derwent Valley Mills World Heritage site and conservation area.	Produce high quality designs that fit within the townscape and reflect local materials and build styles Embankments will be designed so that they fit into the surrounding area and maximise open floodplain character Schemes will need to be consistent with both the conservation area and world heritage site designations where appropriate		
3	Within the city centre the existing defences would have to be significantly raised if there were to be located on their existing line. This could be up to 2m at St Mary's Bridge. With the addition of the effects of climate change it is likely that defences would need to be even higher.			
4	Raising the defences along their existing line could have significant effects on the townscape, significant effects on the townscape character resulting in permanent change to appearance. Flood risk would increase upstream and downstream resulting in cumulative visual impact as remedial works may be required to raise defences elsewhere.			
5	Adverse effect on riverside habitats. There is the potential to lose a significant number of trees.	Where major groups of trees are identified the impact will be investigated further at specific design stage Where possible tree loss will be avoided by careful selection of alignment routes and where trees are to be retained, protection during construction will be provided. Compensation planting will be undertaken to enhance visual amenity and biodiversity aims.		
6	Damage to buried archaeology during construction. Major impact on Scheduled Ancient Monument. Significant cumulative effect on buried archaeology resource within the study area.	An archaeological mitigation strategy will be produced to reduce the impact of the strategy. This will involve the County Archaeologist and English Heritage; it will include agreeing an alignment through Little Chester Roman Scheduled Monument.		

Table A.2: Extract from the SEA assessment of strategy options against environmental objectives

It is at this point in the process where DCC's masterplan sets out the implementation of the EA's strategy. The iterative process involved in Masterplanning results in a number of different options, all falling under the same Strategy objective of providing defences, being put forward. Out of these options some are discounted whilst some form the preferred option for different locations within the City Centre.

The following two tables identify those options set out under the Strategy objective of providing defences which were discounted Table A.3, and Table A.4 identified those options which were taken forward as the preferred option.

Each table details the connectivity between the Masterplan proposals and the recommendations of the strategy and the SEA.

The strategy recommends that defences are raised for some individual communities and realigned through Derby City Centre.		
Location	**Design options discounted**	**Reason for discounting**
Darley Abbey Mills	Defence level maintained to 1:75 year	Flood defence proposals within other opportunity sites would increase flood risk at Darley Abbey Mills. The minimum requirement therefore would be to undertake works that would maintain the existing Standard of Protection. However at the current Standard the Mills would be limited in their use therefore the masterplan has discounted this option as it does not help meet the economic regeneration aspirations of DCC for the mills complex. See section 1.2.2.
Darley Abbey Playing fields including Little Chester and Parkers Piece Section 1.4.2	Raising the current line of defence	This does not deliver the Strategy recommendation of realignment where possible. The SEA does not support raising existing defences through Derby City Centre; it recommends that a realignment of the defences away from the riverside would be preferable to raising defences along existing riverside alignments.
	Defence wall along the southern boundary of Darley Abbey Playing fields	Discounted as it would be detrimental to the open space and Scheduled Ancient Monument Schemes will need to be consistent with both the conservation area and world heritage site designations where appropriate
	Bisect Parker Piece with a defence wall	Discounted as it would be detrimental to the open space and Scheduled Ancient Monument Schemes will need to be consistent with both the conservation area and world heritage site designations where appropriate
	Raise the existing wall at Parkers Piece along City Road	Discounted due to community separation and environmental issues The SEA does not support raising existing defences through Derby City Centre; it recommends that a realignment of the defences away from the riverside would be preferable to raising defences along existing riverside alignments.

The strategy recommends that defences are raised for some individual communities and realigned through Derby City Centre.		
Location	**Design options discounted**	**Reason for discounting**
Aida Bliss to St Mary's Bridge (City Road)	Retain the defence on the existing line & Setting defence line closer to the river	This is not in line with strategy recommendations and would not contribute to improving the public realm and connectivity along the river. The SEA does not support raising existing defences through Derby City Centre; it recommends that a realignment of the defences away from the riverside would be preferable to raising defences along existing riverside alignments.
	Setting the defence line at the rear of City Road	The Masterplan anticipates that the social impact of a 2-3 metre wall at the road frontage would be too great.
	Redevelopment of some properties in Eturia Gardens	The masterplan considered that the economic and social cost would be too great compared to the benefits in terms of redevelopment potential and flood risk
Duke Street / Strutts Park	Given the flood issues potentially affect a large number of homes directly a number of options are being considered, therefore no option has been discounted. Given the significant implications of the different options upon the local neighbourhood it is hoped that the local community will be involved in exploring options and through consultation a agreed solution will be identified.	
St Mary's Bridge to Holmes Bridge on the western bank	Do nothing	Do nothing has been discounted in the masterplan as other measures upstream would result in increased flood levels downstream and therefore intervention is required to at least maintain existing flood levels, secondly the flooding of the west bank and a substantial part of the city centre core would have an unacceptable impact on the city.
	Improve existing defences	The masterplan considers that increasing the height of existing defences on existing alignments the social impact of this option would be too great.
North Riverside	Setting defence line back to St Alkmunds Way	The masterplan considers that this option would have a substantial impact on property and make future investment unviable creating a un usable hostile environment.
	Setting the defence line along the banks of the river	This option has been discounted as it does not comply with the Strategy, it also would not be socially acceptable in terms of the height of the wall required. The SEA does not support raising existing defences through Derby City Centre; it recommends that a realignment of the defences away from the riverside would be preferable to raising defences along existing riverside alignments.
	Removal of properties on Stuart Street to enhance a conveyance corridor	The masterplan considers that as the Stuart Street properties have been built to accommodate flood water and contain acceptable ground floor uses there is substantial unacceptable cost to this option.
	Creation of a conveyance corridor from Phoenix street to St Alkmunds Way	This would create an island development around Stuart street and provide difficulties managing flood water around Darwin Place.

The strategy recommends that defences are raised for some individual communities and realigned through Derby City Centre.		
Location	**Design options discounted**	**Reason for discounting**
Meadow Lane to Castle Ward	Do nothing	Flood water would penetrate the bus depot and pass under the elevated railway. Meadow lane also needs to form a defence to protect the A52 corridor
	Flood wall around the whole area	Detrimental impact on the townscape, require flood gates on the bus depot access the flood wall would also need to be extended over Meadow Lane which is not a practical solution.
	Setting defences back to the railway embankment	The bus depot cannot be protected in this scenario, and the preferred options elsewhere would worsen the situation at the bus depot

Table A.3: Design options arising from the Masterplan which have been discounted

Location Preferred design option take forward	Justification for preferred option taken forward & relevant SEA impacts identified/ mitigation proposed
Darley Abbey Mills Preferred option would be to provide a 1:100 year defence level by raising existing defence; and gates/bund on Haslams Lane. See section 1.3	**Reason for Design** The Environment Agency would need mitigation works to be undertaken at Darley Abbey Mills to offset the increase in flood levels that would be created by implementing the scheme in downstream areas and to maintain the current standard of protection. Therefore the opportunity is available to allow the existing defence level to be raised to provide protection to 1:100 levels. This would assist Derby City's regeneration aspirations for the Mills. **SEA impacts identified & proposed mitigation** A better quality of Life- visual impact of new defences, particularly within the WHS (2) Development of the scheme around these historic assets would be carried out with the benefit of advice from English Heritage Derby City Council's Conservation Officer, the County Archaeologist and Derwent Valley World Heritage Site Partnership. Elements of the scheme likely to have heritage impacts include: any mitigation measures to St Mary's Bridge to facilitate conveyance; changes to the setting of designated heritage assets; and changes to the character of the Little Chester, Strutt's Park, Darley Abbey and the City Centre Conservation Areas. It is considered probable that any local adverse impacts would be mitigated through the detailed design process. Any development of the scheme around these historic assets would be carried out with the benefit of advice from English Heritage, residual negative impacts are unlikely to outweigh the potentially major benefits that the scheme could bring for the heritage of Derby and the Derwent Valley Mills World Heritage Site through safeguarding historic buildings and enabling viable long-term uses at Darley Abbey Mills. An enhanced Environment for Wildlife- Adverse effect on riverside Habitats (5) Potential mitigation that could be introduced are as follows, • Provide otter ledges at bridge and weir at Darley Abbey and fish passes at the weir; • Explore use of islands to create artificial otter holts and/or provide habitat for other species (e.g. kingfisher nest boxes/dead wood piles etc.); • Where existing trees are present along banks and at top of banks, introduce additional rows of native shrubs/trees (in particular fruit bearing and flowering shrubs) behind these to 'widen' the bankside margin where appropriate and provide more shelter and opportunities for flora; • Provide wildflower meadow grassland strips (width of at least 2-5 m if practical) along the length of the bank through Darley Park and Darley Fields – these should be mown once a year to provide shelter for a range of fauna and to encourage more invertebrates which will in turn provide foraging opportunities for birds and small mammals; • Where possible widen the wildflower meadow grassland strips and introduce informal mown paths through these; Provide educational signage at specific vantage points alongside the river to provide information regarding fauna and flora that may be seen by users of the park and fields.
Darley Abbey Playing fields including Little Chester and Parkers Piece Utilisation of a soft solution to deliver defences Section 1.4.3	**Reason for design** Given the recreational value of the area and its sensitivities soft defence options will be utilised, this could be in the form of an earth bund and utilising local topography. **SEA Impacts identified & proposed mitigation** It is considered that at this location a realignment using soft solutions is suitable this is because the current situation provides a suitable defence level and the open nature of the park land would be significantly altered if a flood structure was constructed.

Location Preferred design option take forward	Justification for preferred option taken forward & relevant SEA impacts identified/ mitigation proposed
Aida Bliss to St Mary's Bridge (City Road) New development to provide the flood defence with alignment to run through the Aida Bliss site Section 1.5.3	**Reason for design** This alignment allows a reduction in the visual and social impact of the defence. Realignment would bring part of the site into developable area as currently the flood risk limits its development potential. **SEA Impacts identified & proposed mitigation** Potential effect on future riverside development within Derby city centre (1) • landscape mitigation and enhancement which could be included are; • new riverside path connecting Parker's Piece and Darley Playing Fields to the North Riverside; • loss of public car park on disused railway line, Little Chester, which would be integrated into proposed new development (compensated by addition of new larger car park to Darley Playing Fields, Little Chester); • new pedestrian crossings at the junction of Mansfield Road, St. Alkmund's Way (A601), Phoenix Street and St Mary's Bridge to facilitate access to the North Riverside; and • possible new footpath route adjacent to river under St. Alkmund's Way. Visual impact of new defences within the WHS and conservation areas (2) Whilst the building frontage at the Aida Bliss site is locally valued, It is considered probable that any local adverse impacts would be far outweighed by the potentially major benefits that the scheme could bring for the heritage of Derby and the Derwent Valley Mills World Heritage Site. The treatment of any locally valued building/conservation area will be considered in detail at the detailed design stage, and within the planning process. Visual impact of the new defences (2) raising the defences would need to be significantly raised if remaining on their existing defence line (4) Defences will be where possible incorporated into the redevelopment of the sites and as such will not be distinguishable as a flood defence, rather than a wall with planting/ surface treatment that blends into the townscape. Therefore the height of the defence will be 'lost' within the development reducing and removing the social impact of a 2 to 3 metre wall. Adverse Effect on riverside habitats (5) • Explore soft engineering options along the waterside edge of river banks to widen margin if appropriate and provide emergent vegetation which in turn will offer opportunities to fauna for foraging and shelter; • Consider thinning of tree cover on this side of the river if appropriate to allow bank-side vegetation to develop.
Duke Street / Strutts Park New defence provided between river and Duke Street, including demolition of Britainnia Court, and utilisation of Sowter Road underpass to convey flood water around St Mary's Bridge.	**Reason for design** This alignment balances the need to make space for flood water whilst minimising any adverse impacts on people's homes and ensuring that a perceived and real safe design can be delivered. **SEA impacts identified & proposed mitigation** Visual impact of defences: • On the ground floor residential properties at St Mary's Court and Waterside House. A solution with appropriate mitigation still needs to be developed; • On and setting of Bath Street Mills which is part of the Derwent Valley Mills World Heritage Site and within Strutt's Park conservation area. However, delivery of new flood defences will facilitate regeneration of the Mills from their current derelict state to ensure a sustainable use of the Mills to preserve their long term future. Sensitive design required to blend defences into the local environment; • On the setting of St Mary's Bridge which is a Scheduled Monument and Listed Building. A wider riverside footpath with retention of the existing tree-lined bank and removal of the existing defences should facilitate biodiversity improvements. Landscape mitigation and enhancement will include: • The derelict Britannia Court will be demolished and new sustainable use found. • Wider and more open riverside footpath with new access points through the site of Britannia Court. • Bath Street Mills will be redeveloped from its current derelict state. Safe access between the river and community needs to be maintained with appropriate gradients and/or flood gates, natural surveillance, and appropriate lighting and materials.

Location Preferred design option take forward	Justification for preferred option taken forward & relevant SEA impacts identified/ mitigation proposed
St Mary's Bridge to Holmes Bridge west bank, North Riverside, Meadow Lane to Castleward From this point onwards the land use is constrained by central city centre activities, therefore a suite of defence options, which are in line with the Strategy are presented. Realignment of defences back from the existing line for example river lights Raise defences where set back is not possible for example Meadow Road Where possible incorporate defences into buildings for example the Council House Flood gates along roads where closure other defences are not possible for example Exeter Bridge See sections 1.7.3, 1.8.3, 1.9.3 for detailed options which fall under the preferred option of realigning defences	**Reason for design** The realignment of defences is in line with the Strategy, consideration also needs to be given to the constraints of existing land use activities and where realignment is not possible alternative defence options have been identified wherever possible to minimise the raising of floodwalls on their existing line to a height which is not socially acceptable. **SEA Impacts identified & proposed mitigation** Potential effect on future riverside development within Derby city centre (1) Landscape mitigation and enhancement will include; The city centre land uses within this area are predominately office and recreational with some residential. There are also a number of formal riverside open spaces on the right bank of the river. With the proposed regeneration opportunities cited within the Masterplan for this area it creates the opportunity to open up the riverside corridor on the left bank (North Riverside) to create a new civic park. This would all be subject to the final regeneration development brief for this area, which could include new: • informal and formal play space; • civic plaza, which would be predominately hard surfaced with cafe spill out, sitting areas etc.; • formal park (green open space) to centre of area adjacent to proposed building regeneration; • informal riverside park edge (with formal viewing points connecting to formal park); • riverside path(s) connecting the proposed City Road riverside path to Meadow Lane; • road calming and crossings to Derwent Street, Stuart Street, Exeter Place and Phoenix Street; • arts scheme to Holmes Bridge underpass and St. Alkmund's Way Road Bridge underpass to enhance the existing environment for the pedestrian footpath. Visual impact of new defences within the WHS and conservation areas (2) New flood defence measures incorporated within the proposed redevelopment of the former Police Station and Magistrates Court. Appropriate ground floor uses would also be needed to provide activity and encourage engagement along the River's edge; New automatic flood gate between the Magistrates Court and the Council House to provide a continuous flood defence along the western bank. The final design and form of this gate would be developed remains to be determined but in broad terms the following principles will apply: 1) the gate will be automatic and permanent to prevent increased flood risk associated with the use of temporary gates stored off-site; 2) the gate system will be unobtrusive and fully integrated into a rejuvenated urban realm between the buildings that marks the entrance into the city centre; and 3) the gate and associated public realm works will maintain and improve access to the riverside. Flood resilience measures will be incorporated into the refurbishment of Council House by the City Council; Flood defence measures will be provided within the Riverlights development. These would be delivered as part of the scheme by the private sector developer. It is also important that the Riverlights scheme provides an attractive façade that overlooks the river and engages with the public realm allowing the river front. Within the City centre existing defences would need to be significantly raised if they were to be left on their existing alignment (3) High quality design of the schemes will be undertaken at detailed design, however all options identified enable a design which fits within the current townscape and reflects the local environment, whilst for the majority of the city centre allowing a flood defence to be implemented which is not simply a increase in size of the existing flood wall.

Location Preferred design option take forward	Justification for preferred option taken forward & relevant SEA impacts identified/ mitigation proposed
	Adverse effects on riverside Habitats (5) • Ecological mitigation measures and enhancement opportunities are identified as; • Work with landowners to where practical eradicate invasive plant species or where more appropriate discuss methods for controlling and limiting their spread; • Explore soft engineering options along the waterside edge of river banks (particularly those with existing stone or piled banks and where there are limited opportunities for adjacent habitat enhancement or creation e.g. where buildings contain the narrow riverside path) to provide emergent vegetation along the edge of the river which in turn will offer opportunities to fauna for foraging and shelter; • Remove large areas of concrete e.g. the steps in front of council house (if appropriate) and provide soft engineering solutions; • Soften existing margins through widening existing tree lines along banks and bank tops – if possible create a more continuous shrub/tree line along at least one side of the river; • Where amenity grassland runs adjacent to waters edge or bank tops create an unmown strip alongside the river to soften the margin and discourage disturbance; • Consider use of informal mown footpaths in certain areas rather than tarmac paths through mown amenity grassland; • Provide otter ledges under bridges and fish/otter passes at weir; • Explore use of islands to create provide habitat for fauna e.g. dead wood piles; • Provide educational signage along river and vantage points/benches at appropriate locations (selected to minimise fragmentation of riverside habitat). **Meadow Lane Area** • Work with landowners to where practical eradicate invasive plant species or where more appropriate discuss methods for controlling and limiting their spread; • Where possible widen the existing tree cover which is currently restricted to banks themselves to soften margin; • Explore soft engineering options along the waterside edge of river banks (particularly those with existing stone or piled banks and where there are limited opportunities for adjacent habitat enhancement or creation e.g. where car parks and buildings lie adjacent to bank tops) to provide emergent vegetation along the edge of the river which in turn will offer opportunities to fauna for foraging and shelter. **Bass Recreation Ground** Explore options to make the habitats adjacent to the river through this section less formal – widen existing tree lines and/or provide strips of unmown grassland. Damage to buried archaeology during construction (6) As all proposals are based on existing disturbed ground it is unlikely that damage would be caused within the stretch of the scheme.

Table A.4: Preferred design options taken forward in the Masterplan. Please note the numbers in brackets relate to the impacts identified within the SEA presented in Table A.2 above.

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