

# **Bradford Local Plan**

## **Core Strategy Examination**

### **Matter 7D: Environment**

#### **Further Statement on EN7**

**Date: 30 March  
2015**

**Venue: Victoria Hall, Saltaire**

# **Approach to sequential testing of the strategy set out in the Publication Draft Core Strategy for Bradford**

## **Introduction**

The sequential test is part of the risk based approach to flood management advocated in paras 100-101 of the National Planning Policy Framework and in guidance. The test needs to be undertaken to inform Development Plan Documents.

This paper presents the strategy for the distribution of development set out in the Publication Draft Core Strategy in the context of the flood risk information available at this stage. As a principle new development needs to be steered to areas with the lowest probability of flooding, informed by flood zones.

The paper is in 2 parts, the first summarises the position on overall distribution and broad locations for development and describes the flood risk zones and context within which the strategy has evolved. The second part presents more detailed information relating to flood risk for settlements and regeneration areas based on sites put forward in the SHLAA May 2013 update and provides further information about the overall approach.

The core strategy sets out strategic planning policies and key principles in relation to the approach to flood risk. However it should be noted that only broad locations for growth, through settlement and area based targets, have been identified at this stage and that the core strategy does not include strategic site allocations. Further analysis and testing of individual sites in relation to flood risk will be carried out as part of the Allocations DPD and Area Action Plan DPDs.

## **Part 1**

### **Strategic Core Policies in the Publication Draft**

The broad strategy is outlined in the Strategic Core Policies, in particular Policy SC4 (**Hierarchy of Settlements**) and SC5 (**Location of Development**).

**Strategic Core Policy 4** identifies the **City of Bradford (including Shipley and Lower Baildon)** as the prime focus for housing, employment, shopping, leisure, education, health and cultural facilities.

As **principal towns, Ilkley, Keighley and Bingley** are identified as the main local focus for a range of activities. As sustainable local centres accessible to the Regional City of Bradford, **Queensbury and Thornton** are identified as **Local Growth Centres**. Within Airedale, **Steeton with Eastburn and Silsden** are also identified as sustainable **Local Growth Centres**. The Local Service Centres lie predominantly within the more rural parts of the district and here the emphasis will be on smaller scale developments which meet local needs.

The basic elements in the hierarchy were first identified in the four spatial options presented within the Spatial Vision and Strategy document in 2008. While broadly in line with the approach of the RUDP and the now revoked

RSS, the Core Strategy has introduced a number of changes. Firstly it has added a Principal Town (Bingley) reflecting the town's role in providing homes, jobs, services and cultural activities to the area and its importance within the Airedale Strategy's regeneration proposals. Secondly it has added an additional tier of 'Local Growth Centres' between the Principal Towns and much smaller Local Service Centres. This reflects the land supply constraints in the upper two tiers and the fact that there are significant differences in the characteristics of the settlements below the Principal towns level and their ability to grow in a sustainable way.

**Strategic Core Policies 2 relating to Climate Change and Resource Use and 6 relating to Green Infrastructure** are also important in identifying guiding principles for the overall strategy. In planning for the adaptation and long term resilience to the impacts of climate change in the district, Policy **SC2** commits the Council to working with partner organisations to appraise, reduce and manage all sources of flooding.

**Policy SC6** identifies the **River Corridors of the Aire and Wharfe** as **strategic Green Infrastructure assets**. The text identifies an 'aspiration to create space for both green and blue infrastructure within the city centre, the Canal Road Corridor and elsewhere within the densely developed urban area'. It recognises that 'creating space for water can manage flood risk, improve water quality and access to waterways, support regeneration and provide wetland habitats and landscape enhancement'.

#### **Key policies relating to the scale and distribution of development**

**Policy HO1** identifies the **scale of housing required to 2030** to meet a local plan housing requirement of 42,100.

**Policy HO2** identifies a number of specific area based initiatives to assist in accommodating growth. These include:

The development of an Urban Eco Settlement in the Shipley and Canal Road Corridor,

Bradford City Centre,

SE Bradford, and

Queensbury, Thornton, Silsden and Steeton With Eastburn.

An urban extension at Holme Wood;

Local green belt releases where consistent with the Plan's sustainability principles and where other sources of supply have proved insufficient within the relevant settlement or strategic planning sub area.

It is important to stress that the levels of growth envisaged within these areas varies significantly according to the position in the settlement hierarchy, the size of the settlement and evidence with regards to land supply, regeneration priorities and environmental constraints.

**Policy HO3** focuses on the overall **distribution of the housing requirement** and apportioning this between the different settlements and areas within the District.

### **The Regional City of Bradford (28,650)**

Divided as follows:

Bradford City Centre 3,500 Bradford NE 4,700

Canal Road 3,200 Bradford SW 5,500

Shipley 1,250 Bradford NW 4,500

Bradford SE 6,000

### **The Principal Towns (6,700)**

Divided as follows:

Ilkley 800 Bingley 1,400

Keighley 4,500

### **Local Growth Centres (3,400)**

Divided as follows:

Queensbury 1,000 Steeton With Eastburn 700

Silsden 1,000 Thornton 700

### **Local Service Centres (3,350)**

Divided as follows:

Addingham 200 East Morton 100

Baildon 450 Harden 100

Burley In Wharfedale 200 Haworth 500

Cottingley 200 Menston 400

Cullingworth 350 Oakworth 200

Denholme 350 Oxenhope 100

Wilsden 200

### **The spatial strategy for the distribution of development**

One of the biggest challenges facing the district in the period up to 2030 is how to accommodate the needs of a rapidly growing population whilst also responding to the effects of significant changes in its social and demographic profile.

The strategy seeks to focus investment and the greatest proportion of housing and employment growth within the Regional City of Bradford. This is partly because the key demographic drivers of household growth mean that the greatest level of housing need will be focused within the City and partly because of the regeneration and sustainability benefits of such development.

Focusing development, investment and activity on the Regional City of Bradford, Shipley and Lower Baildon offers the greatest scope to: re-use land and buildings; make the most of existing infrastructure and investment; reduce greenhouse gas emissions and related impacts by reducing the need to travel; maximise accessibility between homes, services and jobs; foster wide-ranging inclusion and, encourage the use of public transport. Approximately 68% of the district's housing development is planned for the Regional City under the proposals of Policy HO3.

The council are currently progressing the development of two Area Action Plan DPD's which will make a significant contribution to meeting housing need, secure regeneration and reduce the need for land in green field and green belt locations. Bradford City Centre where regeneration and investment is expected to stimulate further residential development.

Within the NPPF the Government has acknowledged that the supply of new homes can sometimes be best achieved through planning for extensions to settlements. At Holme Wood comprehensive proposals involving both the more efficient use of existing land by remodelling existing areas of underused land, and linking built and open spaces more successfully is to be combined with proposals for an urban extension.

The Principal Towns within the district are Ilkley, Keighley and Bingley. They vary in size and function but are considered to fulfill a District wide significant role as service, employment and transport hubs for their surrounding areas. As second tier settlements the levels of growth envisaged are significant but much lower than that within the Regional City with approximately 16% of the district wide housing requirement assigned to this group of settlements. Through the Core Strategy process a number of options with regards to levels of growth within this tier have been considered but the ultimate position within the Submission Draft has to an extent been constrained by a number of factors including the need to reduce, manage and mitigate the potential impacts of development on the South Pennines SPA / SAC.

The 4 Local Growth Centres are all locations which have been promoted to the third tier of the settlement hierarchy by virtue of their role, function and accessibility to the larger settlements of Bradford or Keighley. In addition to providing for local need, they have a role in taking some of the development which would otherwise be allocated to either the Regional City or to Keighley. The Core Strategy proposes that the 4 Local Growth Centres accommodate a total of 8% of the district wide housing requirement.

Local Service Centres are the final tier of the settlement hierarchy. These are locations where development will be more restricted and related to meeting local needs for market and affordable housing. The core strategy proposes that the 13 settlements within this tier accommodate a total of just under 8% of the district wide housing requirement.

### **Flood Risk and Sustainability Appraisal**

Bradford District includes the catchment areas of the River Aire and the River Wharfe, the later forming a main river within the River Ouse catchment. Both the Aire and the Ouse play an important role in the future planning of neighbouring authorities, both within the Leeds City Region and beyond.

The work on sustainability appraisal highlighted at a broad strategic level where there could be potential for areas within Flood Zones 2 and 3 having an impact on land that could be identified for development, using the Environment Agency flood zones, dependent of course on which sites are identified for allocation.

The SA indicates that there is limited potential for development that is to be directed towards the north west, south west and south east of Bradford, the Leeds-Bradford corridor and the Holmewood urban extension, having an impact on fluvial flood risk or being at risk from fluvial flooding. However there are small scale higher risk zones associated with beck corridors in south east and south west Bradford. A very small area of land within the settlement

boundary of north east Bradford and a more extensive area of green belt land adjoining the settlement lie within the high risk zones associated with the River Aire.

There is potential for new housing in Bradford city centre to have an effect on flood risk and to be at risk, as parts of the city centre lie within Flood Zones 2 and 3 of the Bradford Beck Corridor. There is also potential for new housing in Shipley and in the Shipley and Canal Road Corridor to have an impact on flood risk and to be at risk as land within Flood Zones 2 and 3 is included within these key regeneration areas.

There is potential for new development in Ilkley, Keighley and Bingley to be at risk from flooding and have an impact on flood risk. Parts of the principal towns and surrounding areas lie within Flood Zones 2 and 3 associated with the Rivers Aire, Worth and Wharfe. Again however whether such impacts would occur would depend on which sites are allocated for development within the Local Plan.

Local Growth Centres vary in relation to the potential impact of future development on flood risk and to be at risk. In Steeton there are areas within the settlement that lie within Flood Zones 2 and 3 and more extensive areas in high risk zones adjoining the settlement boundary, whereas in Silsden only the Beck corridor and land to the south of the settlement are affected. Directing development towards Queensbury and Thornton has a positive impact on resilience to fluvial flood risk, as both these settlements are located at a higher level, well above zones of greatest risk in the valley bottom.

A number of the Local Service Centres are affected by flood risk within relatively narrow beck corridors, which either skirt or run through the settlements. Areas of high flood risk can be identified in certain areas of Haworth, which lie within the relatively narrow River Worth Corridor and the northern part of Cottingley where areas lie within Flood Zones 2 and 3 of the River Aire and eastern parts of Addingham where areas lie within Flood Zones 2 and 3 of the River Wharfe. In Wharfedale, Burley has quite significant areas both adjoining and, to a lesser extent within the settlement area, that lie within Flood Zones 2 and 3, whereas Menston is less affected by flood risk.

In the Publication Draft Document, a relatively high proportion of the development needed within the district is to be focused on the Regional City of Bradford, where a low proportion of the settlement area overall lies within Flood Risk Zones 2 and 3. The identification of an urban extension at Holmewood also assists in steering new development towards areas with a low probability of flooding.

Recognising the fact that there are higher flood risk zones both within and adjoining each of the Principal Towns, the introduction of Local Growth Centres and the distribution of development to additional settlements has allowed a wider choice of potential sites for development. This has reduced the likelihood of land needing to be brought forward in Flood Zones 2 and 3.

Local Service Centres vary in the degree to which land within and beyond the settlement boundaries is affected by flood risk. However, due to the levels of

development identified for Local Service Centres, it is considered that sufficient flexibility in choice of sites exists to avoid high flood risk zones.

The scoping of flood risk through the wider sustainability appraisal process highlighted Shipley, the Shipley and Canal Road Corridor and the City Centre Area as being high regeneration priorities for the Council, but where there was potential for identifying land for future development that might fall within the high flood risk zones. The Council are currently progressing the development of 2 Area Action Plan DPDs for high priority areas for regeneration; the City Centre and the Shipley and Canal Road Corridor.

### **Flood Risk Assessment and policy**

Bradford's Level 1 Strategic Flood Risk Assessment (SFRA) has been prepared by JBA Consulting. The SFRA Level 1 identifies the functional flood plain (Flood Zone 3b), comprising largely of open and undeveloped land where water has to flow or be stored in times of flooding, for the District, other than for the Area Action Plan DPD areas. The Level 1 Assessment also identifies areas naturally vulnerable to surface water flooding and future climate change.

In relation to the 2 Area Action Plan DPDs for the City Centre and the Shipley and Canal Road Corridor, recent work on the Level 2 SFRA supercedes the Level 1 functional floodplain and the flood outlines presented in the Level 2 SFRA will be used for identifying flood risk in these areas.

SFRA work has also identified Flood Zone 3ai, comprising developed land within Flood Zone 3 where water would flow or be stored in times of flooding if not already constrained by development. Identification of zone 3ai allows the Council to assess risk within 3a in more detail showing areas where existing development is likely to be restricting flood flows and water storage. This layer will be used when sequentially testing sites in the site allocations process. Should sites in flood zone 3ai be considered through the allocations process for new or further development then both the risk at the sites and their role in managing flood risk in the surrounding area needs to be carefully considered.

The SFRA provides the framework for the overall appraisal and management of flood risk. The NPPF defines the most important principle as follows: 'The most important principle, in terms of managing risk is that inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk, but where development is necessary, making it safe without increasing flood risk elsewhere.'

Flood risk should be reduced, at a strategic level, by safeguarding land from development that is required for flood water storage and defences and using the opportunities offered by new development to incorporate sustainable urban drainage, green infrastructure for water storage and the re-creation of the functional flood plain.

The River Aire within Bradford District is characterised by a number of swift flowing upland streams which then flow down through the towns along the valley. Periods of heavy rainfall in the uplands can therefore produce high flows in the tributary catchments between Keighley and Bradford.

The majority of urban Bradford lies outside the flood plain and can therefore be considered to have a low to moderate risk of fluvial flooding overall. However, there are locations within the Bradford Beck Corridor where water levels can rise quite quickly. Fluvial flood risk is recognised as an issue in Keighley with a moderate risk of flooding from fluvial sources to the north east of the town.

The channel of Bradford Beck has been heavily modified and while lengths to the west of the city are open, most of its length lies in culvert as it runs through the centre. While serious flooding has occurred in the past, the construction of the flood alleviation tunnel in 1993 reduced the risk of flooding. Recognising the importance of the Bradford Beck Corridor to regeneration of the District and the continuing need to manage flood risk, the Council commissioned new modelled flood event data, which takes into account both the sewer system and the diversion channel. The Bradford Beck Model has been used in SFRA work to identify the functional flood plain.

The River Wharfe skirts the settlements of Addingham, Burley-in-Wharfedale and the central area of Ilkley. It is a fast reacting river with flood flow rapidly passing downstream. As well as flows that come down from the upper Wharfe, there are a number of smaller streams and becks descending from the moors in Wharfedale, which can be a source of flood risk in extreme rainfall events. In Ilkley areas along the Wharfe Corridor and surrounding flood plain to the north of the town are identified as high risk zones.

There is also a risk of surface water flooding in the Bradford urban area and Shipley, in locations where extensive rainfall exceeds the drainage capacity, as happened in a number of locations in the UK in summer 2007. The shape of the landform in Bradford, especially in and around a number of the built-up areas, makes the district potentially prone to flooding caused by direct rainfall, due to the extent of hard surfaces and limitations in sewer capacity.

The SFRA also notes that some built up areas are at risk of flooding from a number of different sources. Shipley is identified as an area at risk from different sources of flooding, as is Keighley which has experienced groundwater and surface water flooding as well as fluvial flooding.

**Policy EN7** in the Environment section of the Publication Draft document relates to **flood risk**. The policy was developed in the context of the information presented in the SFRA. It identifies a range of principles to be applied in managing flood risk within the District. These include integrating sequential testing into plan-making, protecting the functional floodplain, requiring space for the storage of flood water within Flood Risk Zones 3a and 2 and supporting the provision of Sustainable Urban Drainage (SUDS). The emphasis on sequential testing is reinforced by principle 7 in the Housing Site Allocation Principles which states that a flood risk sequential approach will be applied to direct development to areas of lowest flood risk.

Flood risk is also an important issue for the District in developing resilience to climate change, as is recognised in both Policy SC2 and EN7. Policies were developed in the context of predictions that flood risk would increase due to more frequent severe storms bringing higher intensity rainfall and increasing run-off from land and buildings.



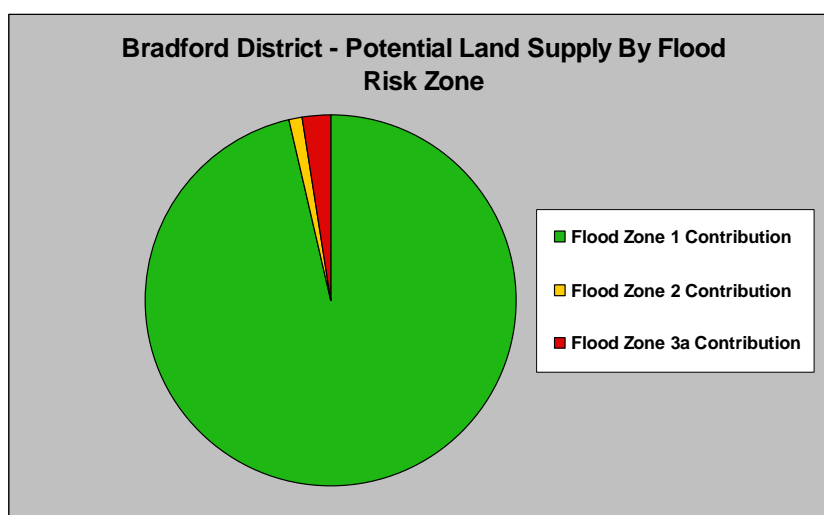
## Part 2 Introduction

The work on sustainability appraisal highlighted at a broad strategic level that there may be a potential for areas within Flood Zones 2 and 3 to be identified for development. Clearly the likelihood of this actually occurring would be dependent on the finalised targets for development in each area, the range of alternative deliverable or developable options for development in those areas of lower flood risk and thus the ultimate choices made within the forthcoming Allocations DPD.

The second part of the paper therefore presents more detailed information about flood risk and sites put forward in the May 2013 SHLAA update. As a principle, planners should steer development to Flood Zone 1, the zone of lowest flood risk, wherever possible. The aim therefore has been to set settlement targets at a level which will allow the site allocations process to steer development to areas designated as flood zone 1.

Based on the housing targets in Policy HO3 it is envisaged that in 24 out of the 27 settlements the housing quantum is capable of being realised without the use of any flood zone 2 or 3a land. However the degree of flexibility in relation to site selection, currently identified in relation to flood risk, as the difference between the publication draft target and SHLAA capacity within flood zone 1, is relatively low in a number of areas. Where sustainability appraisal scoping at an early stage of work on the Allocations DPD indicates that in certain areas higher flood risk zones might need to be considered, flood zone 3ai allows the Council to assess risk within 3a in more detail.

The pie chart below, presented in Appendix 4 of Background Paper 2 – Housing (Part 1): Housing Requirement, Supply and Distribution, highlights the proportion of the potential land supply that lies within flood zone 1.



The SHLAA has built flood risk into its analysis and into the suitability test by ruling sites as unsuitable where they fall within the functional flood plain (zone 3b). The SHLAA provides the appropriate testing mechanism since, of the major uses that the plan will be seeking to accommodate, residential is the key use that falls within the 'more vulnerable' flood risk classification.

The tables relating the land supply identified in the SHLAA2 update to flood risk zones are set out below, sub-divided into the tiers in the hierarchy. This table has been extracted from Appendix 4 of Background Paper 2 – Housing Part 1: Housing Supply and Distribution. The information provides a more detailed response to the key sequential testing question as to whether the housing requirement can be fully accommodated on land with a low probability of flooding.

Additional factors have been noted in the analysis below that might be considered to have an influence on future assessment of flood risk and the sustainability assessment framework. The proportion of SHLAA capacity within Flood Zone 1, an indication of whether there is land within the settlement boundary within 3a, whether, at this stage, there is information about additional sources of flood risk and the need to release land from the green belt have also been considered.

## **Regional City of Bradford**

### **Outer areas of the Regional City**

#### **The Strategy**

The strategy ensures that a significant level of new housing and employment is focused in and around the Regional City of Bradford. This will enable the regeneration of peripheral housing estates in East Bradford and in the Leeds Bradford Corridor and a sustainable urban extension in the South East at Holmewood. It will encourage housing and economic growth in the Shipley and Canal Road Corridor. Focusing growth in and around the Regional City will cater for population growth in the inner city and address high levels of deprivation and poor housing.

The aim is to reinforce the City of Bradford's role as the economic driver of the district and an important destination for business, shopping, leisure and culture. This will help to address labour and housing market disparities. However the strategy also needs to recognise that there are limits to the capacity of the Bradford urban area to accommodate future growth.

## SHLAA Capacity and Flood Zones

	Publication Draft target	Total SHLAA 2 Capacity	SHLAA Capacity Within Flood Zone 1	SHLAA Capacity Within Flood Zone 2	SHLAA Capacity Within Flood Zone 3a	Estimated Flood Zone 1 Contribution To Meet Core Strategy Settlement \Target	Estimated Flood Zone 2 Contribution To Meet Core Strategy Settlement \Target	Estimated Flood Zone 3a Contribution To Meet Core Strategy Settlement \Target
						No.	No.	No.
Settlement								
Bradford NE	4700	5171	5152	19	0	4700	0	0
Bradford SE	6000	6607	6534	45	28	6000	0	0
Bradford SW	5500	6180	6066	51	63	5500	0	0
Bradford NW	4500	4745	4745	0	0	4500	0	0

The table above indicates SHLAA capacity for each flood risk zone in terms of numbers of homes. The table indicates that settlements targets for Bradford North East , South East, South West and North West are at a level which would allow the site allocations process to steer development to areas identified as Flood Zone 1. The proportion of SHLAA capacity within flood zone 1 is above 95% for all areas.

### Future Approach

While fluvial flood risk information indicates relatively low levels of risk in these areas, some account will need to be taken of **pluvial** flood risk when scoping and assessing individual sites linked to work on the Allocations DPD.. The SHLAA capacity tables indicate only a modest degree of flexibility in relation to SHLAA capacity overall and the publication draft target.

It should also be noted that the SHLAA takes a broadly 'local policy off' approach to site assessment meaning that sites within designations such as green belt and urban green space are not ruled out for development at this stage. The acceptability of these sites will need further investigation as part of the Local Plan process and the potential impacts of their development assessed. The SHLAA settlement summaries thus indicate a range of other factors; including the extent of green belt releases needed, potential impacts on open space and the need for infrastructure investment which would need to be assessed in addition to flood risk as part of the next stage of sustainability appraisal linked to the Allocations DPD.

## Bradford City Centre Area Action Plan, Shipley and Canal Road Corridor and Shipley

### SHLAA Capacity and Flood Zones

	Publication Draft target	Total SHLAA 2 Capacity	SHLAA Capacity Within Flood Zone 1	SHLAA Capacity Within Flood Zone 2	SHLAA Capacity Within Flood Zone 3a	Estimated Flood Zone 1 Contribution To Meet Core Strategy Settlement \Target	Estimated Flood Zone 2 Contribution To Meet Core Strategy Settlement \Target	Estimated Flood Zone 3a Contribution To Meet Core Strategy Settlement \Target
						No.	No.	No.
Settlement								
City Centre	3500	2752	1616	228	908	1616	228	908
Canal Rd	3200	3600	3097	280	223	3097	103	0
Shipley	1250	1283	1024	44	215	1024	44	182

The information set out in the table above is largely based on that presented in Appendix 4 of the Housing Background Paper – Part 1. However the Council are taking the opportunity within this paper to correct a number of small errors which occurred in relation to figures presented for the potential contribution from sites within flood zones 2 and 3 to the publication draft target for Shipley and Shipley and the Canal Road Corridor. This occurred due to minor changes in the boundary relating to Shipley and the Shipley and Canal Road Corridor. In the run up to production of the Core Strategy Publication draft the Shipley and Canal Road Corridor AAP boundary was slightly expanded to take in parts of the area previously within the Shipley settlement area.

The information presented in the table above based on data in the SHLAA update of May 2013 indicates that 96% of the publication draft target would be likely to be met from land within flood zone 1 for the Shipley and Canal Road Corridor, 81% in Shipley and 46% within the area of the City Centre Area Action Plan.

### Overall Approach

Allocating additional development to other parts of the regional city, in order to avoid steering development to higher flood risk zones, would mean further increasing the proportion of land needed from the green belt. The council considers that this would be a less sustainable approach overall, when compared to the benefits of locating development within the city. The urban

regeneration benefits of development within the City Centre would also be reduced.

### **Shipley and Canal Road Corridor**

The Council are currently progressing the development of an Area Action Plan for the Shipley and Canal Road Corridor area, as this is a high priority for regeneration. The idea of creating a new area of housing within a high quality environment between the northern edge of Bradford City Centre extending to Shipley Town Centre has been part of the suggested spatial strategy from the Further Issues and Options stage. It is underpinned by a substantial body of work. The Shipley and Canal Road Corridor AAP involves comprehensive urban change incorporating new road and community infrastructure and relocation of existing uses and is being delivered by the Council and partners in the form of a Joint Venture Company.

Further scoping work has taken place in relation to high flood risk zones and potential sites for development for a range of uses, prior to Level 2 work and in the context of the Council's latest modelling work for Bradford Beck. This indicates that only a relatively small number of sites would need to be brought forward within the higher risk zones.

### **Shipley**

For Shipley, it is likely that 81% of the publication draft target could be met from land within flood zone 1. Flood risk is considered to be moderate overall, as there is land within flood zone 3a within the settlement boundary, some potential for sites needing to be brought forward within these areas and potential for additional sources of flood risk, including the Leeds-Liverpool Canal needing to be taken into account.

The settlement summary tables presented in the Housing Background Paper indicate that the target requires a significant Green Belt contribution and that Shipley is a regeneration priority. It is also the case that site selection and delivery will need to be mindful of possible impacts on the setting of the Saltaire World Heritage Site.

The overall approach needs to be one of early scoping work in relation to flood risk and assessment of environmental and heritage factors through sustainability appraisal as part of work on the Allocations DPD. Within both Shipley and the Canal Road Corridor, it is likely that the range of uses to be accommodated and the mix of uses proposed for individual sites should allow potential for residential uses to be steered towards lower risk zones.

### **Bradford City Centre Area Action Plan**

The information presented in the table linking SHLAA capacity to flood zones indicates that within the area of the CCAAP, only 46% of the publication draft target would be likely to be met from land within flood zone 1. The target for this area reflects the status of the City Centre as a driver for the district and key regeneration area. It is intended to support and stimulate prospects for investment and regeneration following delivery of the Westfield shopping centre. The target reflects the need to stimulate interest in investing in vacant units, a desire to retain significant buildings and the potential for accommodating more sensitive uses on upper floors.

## Mitigation Measures

Policies relating to flood risk and green infrastructure in the Core Strategy Publication Draft identify a range of strategic mitigation measures. Policy SC6 relating to Green Infrastructure promotes the wider aspiration to create space for both green and blue (ie water-based) infrastructure within the Regional City. Objectives identified for the Shipley and Canal Road Corridor are to establish innovative means of low carbon living and to create space for water management and sustainable transport routes. The Leeds- Liverpool Canal and the River Aire are identified as green infrastructure corridors. Managing flood risk overall will mean identifying space for water as an integral part of development proposals.

As part of the proposals for Area Action Plans, work is underway on identifying a blue/ green infrastructure corridor to improve connectivity and to reduce flood risk. The aim is to develop an integrated, holistic approach to Green Infrastructure provision along the Bradford Beck corridor to achieve biodiversity enhancement and water quality and flood risk management improvements. However, integrating this work into plan-making will present challenges in relation to feasibility and viability, particularly when there is an acute need to stimulate private sector investment in the Regional City. The two AAP's for these areas are assessing in more detail how flood risk can be minimised or mitigated and will bring forward policies and proposals to this end.

## The Principal Towns

### SHLAA Capacity and Flood Zones

	Publication Draft target	Total SHLAA 2 Capacity	SHLAA Capacity Within Flood Zone 1	SHLAA Capacity Within Flood Zone 2	SHLAA Capacity Within Flood Zone 3a	Estimated Flood Zone 1 Contribution To Meet Core Strategy Settlement \Target	Estimated Flood Zone 2 Contribution To Meet Core Strategy Settlement \Target	Estimated Flood Zone 3a Contribution To Meet Core Strategy Settlement \Target
						No.	No.	No.
Settlement								
Ilkley	800	1789.5	1365.5	59	365	800	0	0
Keighley	4500	5233	4951	46	236	4500	0	0
Bingley	1400	2196	2031	108	57	1400	0	0

All 3 principal towns have land within flood zone 3a within their settlement boundaries, however the information presented in the table above indicates that settlement targets for Ilkley, Keighley and Bingley are at a level which could be achieved without the use of any flood zone 2 or 3a land. The proportion of SHLAA capacity within zone 1 varies from 75% in relation to Ilkley and 95% for Keighley. The figures presented indicate sufficient flexibility to accommodate the growth levels proposed and to steer development away from high risk zones.

### **Overall approach**

From information presented in SHLAA summary tables in the housing background paper, significant green belt releases will be required in all three settlements with the greatest proportional green belt contribution required in Ilkley and the lowest in Bingley. The settlement tables based on SHLAA data indicate a range of factors that have influenced targets include the need for green belt releases, impacts on landscape and setting and work on Habitats Regulations Assessment.

Flood risk information indicates that there are a number of smaller streams and becks descending from the moors in Wharfedale, which can be a source of flood risk in extreme rainfall events. It is noted that Keighley has experienced groundwater and surface water flooding, as well as fluvial flooding. These factors will need to be assessed in flood risk scoping work as part of the Allocations DPD and the wider factors will need to be considered through the sustainability assessment framework.

### **The Local Growth Centres**

#### **Overall Approach**

Development within the Local Growth Centres of Queensbury, Thornton, Silsden and Steeton with Eastburn is envisaged to be of a much smaller scale but still significant in relation to the existing size of these settlements. Queensbury has been identified on the basis of their current and potential land supply, their status as accessible locations close to the Regional City and the fact that all land within the settlements lies within flood zone 1. The targets for Silsden and Steeton will help draw development away from areas such as Keighley and Haworth whose surrounds are constrained by landscape and topography.

## SHLAA Capacity and Flood Zones

	Publication Draft target	Total SHLAA 2 Capacity	SHLAA Capacity Within Flood Zone 1	SHLAA Capacity Within Flood Zone 2	SHLAA Capacity Within Flood Zone 3a	Estimated Flood Zone 1 Contribution To Meet Core Strategy Settlement \Target	Estimated Flood Zone 2 Contribution To Meet Core Strategy Settlement \Target	Estimated Flood Zone 3a Contribution To Meet Core Strategy Settlement \Target
						No.	No.	No.
Settlement								
Queensbury	1000	1747.5	1747.5	0	0	1000	0	0
Silsden	1000	2025.5	1834.5	39	152	1000	0	0
Steeton	700	884.5	713.5	83	88	700	0	0
Thornton	700	863.5	863.5	0	0	700	0	0

There are no sites or areas within the higher flood risk zones in Queensbury or Thornton. Within Silsden and Steeton over 90% of SHLAA capacity overall lies within Flood Zone 1. It would therefore be possible to steer development to Flood Zone 1 within all Local Growth Centres, either because there is no risk of fluvial flooding or because there is sufficient capacity, with a degree of flexibility, to meet the publication draft target from land within Zone 1.

### Local Service Centres

Relating SHLAA data to flood risk zones indicates that settlement targets for all the Local Service Centres would allow the site allocations process to steer development to areas identified as Flood Zone 1. The proportion of overall SHLAA capacity within Flood Zone 1 is over 90% for the vast majority of centres. Baildon and Burley In Wharfedale have a slightly lower proportion, but have a high degree of flexibility when relating the publication draft target to SHLAA capacity.

Local Service Centres vary in the degree to which land within and beyond the settlement boundaries is affected by flood risk. However, due to the levels of development identified for Local Service Centres, it is considered that sufficient flexibility in choice of sites exists to avoid high flood risk zones.

### Conclusions

The information presented in this paper indicates that the overall strategy can be considered to be sequential test compliant. It establishes that the vast majority of future development in the District could be steered away from high flood risk zones.



The only areas where there is potential for sites coming forward within higher flood risk zones are key regeneration areas, where the Council has made the case for development being needed to drive regeneration. However the Core Strategy Publication Draft has a strong commitment to future more detailed sequential testing, and includes a range of strategic mitigation policies, including those relating to flood risk and green infrastructure.