

# **BLACKBURN WITH DARWEN BOROUGH COUNCIL'S CLIMATE CHANGE ADAPTATION STRATEGY & ACTION PLAN**



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# EXECUTIVE SUMMARY

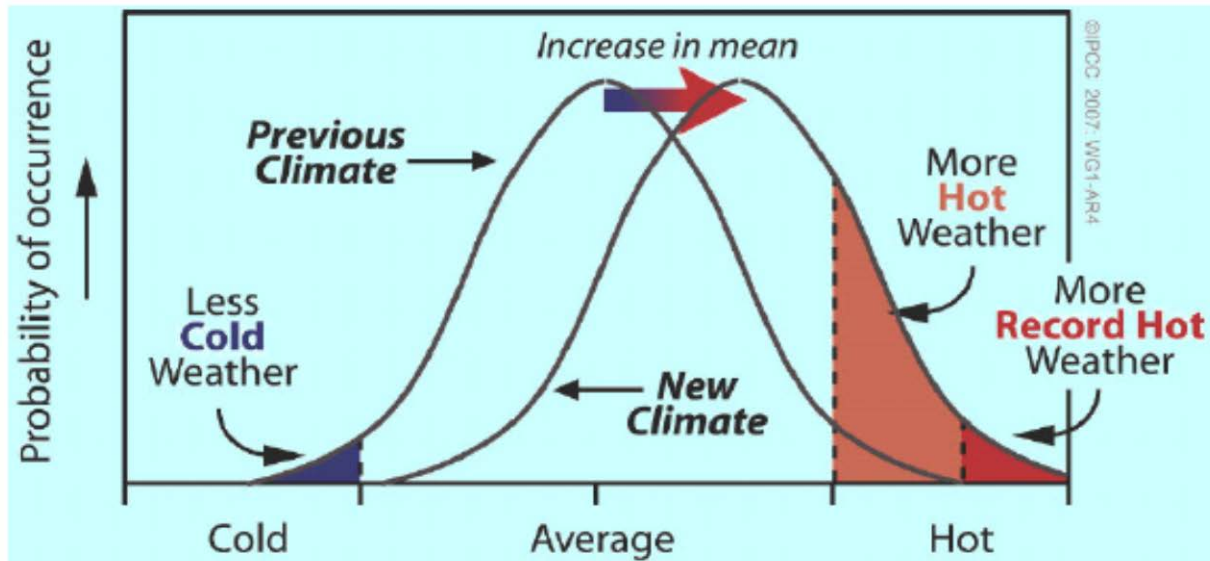
The main objectives of this strategy and action plan are to:

- Assess projected climate change for the North West and Blackburn with Darwen using the latest set of UK Climate scenarios (UKCP09);
- Assess how these changes are likely to impact on Blackburn with Darwen Borough Council's services using the risk assessment process; and
- Identify priorities for actions in order to minimise these risks to the Council.

# 1. INTRODUCTION

1.1 There is substantial evidence to show that our climate is changing. Over the past century global temperatures have risen by some 0.7°C on average. The effects of this can be felt by us all - summer heat waves are occurring more frequently, winters are becoming wetter and we are experiencing more extreme weather events such as floods and storms.

Figure 1: Climate Change Projections – Headlines



(Source: Working Group I Fourth Assessment Report; Intergovernmental Panel on Climate Change, 2007)

1.2 The graph above illustrates the effect a small shift (corresponding to a small change in the average or centre of the distribution) can have on the frequency of extremes of temperature at either end of the distribution. An increase in the frequency of one extreme (e.g. the number of hot days) will often be accompanied by a decline in the opposite extreme (in this case the number of cold days such as frosts).

## What is climate change likely to mean for us?

1.3 The UK Climate Impacts Programme (UKCIP) has established a range of scenarios for future climate change. These scenarios have been set for the 2020s, 2050s and 2080s and project four alternative levels of climate change with low, medium-low, medium-high and high sensitivity to the effects of greenhouse gas emissions. These scenarios suggest that:

- The rate of future warming in the North West varies from 0.1°C to 0.3°C per decade (1 to 3°C per century);
- Annual rainfall will increase for all UKCIP scenarios, by between 3% and 5%;

- Winter rainfall over North West England will increase by between 6% and 14% by the 2050s, whilst a decrease is forecast for summer rainfall varying from 1% to 10%;
- The record-breaking summer of 1995 will, under the UKCIP medium-high scenario, become the norm in the 2050s, while an extreme summer in the 2050s will be 4.7°C higher than the 1961-1990 average;
- Some winters in the 2050s may be up to 3.5°C warmer than the 1961-1990 average;
- The UKCIP scenarios give a potential sea level rise of between 12cm and 67cm by the 2050s, with the medium-high scenario resulting in rates of sea level rise more than double those observed at Liverpool over the last 100 years;
- Days with minimum temperatures below freezing are likely to be reduced by 65% by the 2050s under the medium-high scenario; and
- Days on which the temperature exceeds 25°C will double.

1.4 Similarly, UKCIP predicts that Blackburn with Darwen is likely to experience:

- Wetter, warmer winters, leading to increased flood risk;
- Hotter, drier summers, leading to water scarcity and drought; and
- More frequent extreme weather events, such as heat waves, gales, storms and intense rainfall.

#### **What are the risks associated with a changing climate?**

1.5 Climate change has potential risks for the UK. Most critical of these risks is the frequency and changes in extreme climatic conditions such as hot spells, drought and storms. Average temperatures are expected to increase by between 0.9 and 2.4°C by 2050, whilst precipitation is expected to increase in most areas, particularly in winter and in the northwest of Britain.

1.6 The table below highlights the potential impacts climate change is likely to have on the UK. It emphasises the importance of implementing measures to minimise these impacts.

<b>Potential impacts of climate change in the UK</b>	
<p>Adverse impacts expected most widely include:</p> <ul style="list-style-type: none"> <li>▪ An increase in the risk of floods and erosion</li> <li>▪ Pressure on drainage systems</li> <li>▪ Possible winter storm damage</li> <li>▪ Habitat loss</li> <li>▪ Summer water shortages and low stream flows</li> <li>▪ Increased subsidence risk in subsidence prone areas</li> <li>▪ Increased demand for summer cooling</li> <li>▪ Increasing thermal discomfort in buildings</li> <li>▪ Increases in health problems and heat related illness and incidence of respiratory problems</li> <li>▪ Reduced quality of and yields of some crops due to heat stress, drought, disease and pests</li> </ul>	<p>Commonly perceived benefits include:</p> <ul style="list-style-type: none"> <li>▪ Less winter transport disruption</li> <li>▪ Reduced demand for winter heating</li> <li>▪ Less cold-related illness</li> <li>▪ Increase yields of some crops</li> </ul>
	<p>Opportunities are anticipated:</p> <ul style="list-style-type: none"> <li>▪ Agricultural and horticultural diversification</li> <li>▪ Increased tourism</li> <li>▪ A shift to more outdoor-orientated lifestyles (improve well being)</li> </ul>

*Table adapted from West and Gawith (2005)*

### **Climate change adaptation**

1.7 Adaptation is the term used to describe changing our behaviour so that it is more appropriate to the expected future climate. Stern (2007) highlights that “climate change is a serious and urgent issue” and the need for action is widely acknowledged. As Stern explains: “Adaptation is crucial to deal with the unavoidable impacts of climate change to which the world is already committed.”

1.8 Appropriate adaptation actions will be ones that:

- **Are flexible** – actions can be revised as the level of risk or opportunity increases or decreases;
- **Avoids mal adaptation** – an action that makes it harder for another service area to adapt in the future; and
- **Includes monitoring and review** – to determine if a different set of actions are required.

1.9 We have to accept that some climate change is inevitable. We must act decisively and adapt to this by improving resilience in our natural resource base and our economy, across all sectors in order to minimise the impact the adverse effects highlighted in the table above will bring. The sooner we start to plan and take action, the less severe and costly the changes we will have to make in the future.

1.10 A ‘Mini-Stern’ report for Greater Manchester showed that failure to adapt to future climate change could cost the North West £70 billion over the next decade. This compares with a Gross Value Added figure for the region of £121 billion in 2008 (Atkins, 2010).

#### **What can Blackburn with Darwen Borough Council do?**

1.11 Local authorities have enormous potential to address climate change impacts through their functions as transport and planning authorities and other service delivery such as building control, community care providers, waste, housing, education providers and providers of green space.

1.12 As highlighted by the borough’s Local Climate Impact Profile (LCLIP) (which can be viewed at [www.blackburn.gov.uk/upload/pdf/LCLIP\\_Write\\_up.pdf](http://www.blackburn.gov.uk/upload/pdf/LCLIP_Write_up.pdf)), many of our services are either directly affected or influenced by the climate. The Council and the Local Strategic Partnership (LSP) need to ensure that we are able to continue providing these services in the face of a changing climate and this means integrating adaptation measures into our day to day service provision.

1.13 At Blackburn with Darwen BC we are aiming to minimise the negative effects of climate change on our community and services, while taking advantage of any benefits which may arise from a changing climate such as greater potential for outdoor living as temperatures increase. Being fully adapted to the effects of climate change will ensure we can:

- Maintain the council’s service provision;
- Support vulnerable members of the community;
- Exploit (business) opportunities where they exist;
- Manage risks proportionate to other risks;
- Achieve business continuity for the council and local business;
- Avoid unnecessary expenditure arising from impacts; and
- Manage strategic assets and long-term investment.

- 1.14 However, the challenges of adapting to a changing climate cannot be considered in isolation. Climate change needs to be a routine consideration, factored into the Council's day to day decision making processes rather than a discrete risk to be managed independently.
- 1.15 It is also important to note that adaptation strategies cannot wholly eliminate the risks arising from extreme weather conditions, but instead aim to bring the risks in line with acceptable levels.
- 1.16 This Adaptation Strategy and Action Plan sets out specific actions that the Council and its partners will carry out in order to ensure it fully adapts to the impacts of climate change. This strategy will draw on expertise from all potentially affected areas to identify how we can both build adaptive capacity and deliver actual adaptation.
- 1.17 The Council wishes to ensure that it is resilient and able to ensure business continuity in the medium to long term, and that its policies and projects are fit for purpose given future climatic scenarios. In order to do this, it is crucial that the Council and LSP are aware of, and understand, the possible changes in our future climate, and the risks that this may pose to all its services.
- 1.18 The actions identified in this document will be the responsibility of Blackburn with Darwen Borough Council and its partners to implement. However, there are other partners – communities, businesses and individuals who can also change their behaviour in order to help our borough adapt to climate change. A collective approach across the borough is needed to ensure we are fully adapted to the impacts of a changing climate.



## 2. THE RISK ASSESSMENT PROCESS

- 2.1 Climate change has the potential to significantly affect the services a Council provides; both as threats or opportunities for service delivery. Services are likely to be affected in different ways including the obvious direct effects on physical infrastructure and buildings, but also indirectly through effects on staff.
- 2.2 The UKCIP identified the following extreme weather events were likely to increase in frequency through climate change. These are:
- Extreme rainfall
  - Storms/high winds
  - Snow/ice
  - Heat waves
- 2.3 It was therefore necessary to examine how these events would impact on our services by undertaking a preliminary risk assessment which allowed us to determine the greatest risks climate change would pose to service delivery.
- 2.4 The following sections have been involved in producing this Strategy and Action Plan:
- Transport and Highways
  - Drainage
  - Health and Wellbeing
  - Children's Services
  - Care Trust Plus
  - Business and Economy
  - Cleansing (Environmental Services)
  - Planning and Regeneration
- 2.5 Through the risk assessment process, we were able to assess both the threats and opportunities of a changing climate. The existing guidance from the risk assessment method currently employed by the Council through the Civil Contingency's Local Resilience Forum was used. Each threat and opportunity was assessed using the risk rating matrix (see page 10) taking into consideration the magnitude of the impact the weather event would have on the service and the likelihood that the threat would occur. Scores for likelihood and magnitude were then multiplied to give an overall rating of risk.
- 2.6 For example, the risk assessments asked each service: what is the risk/opportunity that (the event e.g. higher temperatures) could lead to (consequence e.g. a heat wave) resulting in (impact e.g. tarmac melting road surfaces).

- 2.7 When scoring each threat/opportunity, any current climate change adaptation measures which were already included in their service delivery were included as these could potentially reduce the magnitude of the impact the event would have on their service.
- 2.8 The completed risk assessments can be found in Appendix 1 and section 3 summarises the priority actions that came out of the risk assessments process.

**RISK RATING MATRIX**

**Consequence**

Consequence refers to the effect if the identified risk occurs. The inherent risk rate is obtained by using the comparison of Severity/impact and Likelihood in the table below. The rating will be High, Significant, Moderate or Low.

		SEVERITY/IMPACT				
		Insignificant 1	Minor 2	Moderate 3	Significant/Major 4	Catastrophic 5
LIKILHOOD	Almost Certain/Probable 5	5	10	15	20	25
	Likely 4	4	8	12	16	20
	Possible 3	3	6	9	12	15
	Unlikely 2	2	4	6	8	10
	Negligible/Rare1	1	2	3	4	5

Severity (impact) X Likelihood = Consequence

- RISK RATING**
- L LOW RISK 1-3
  - M MODERATE RISK 4-6
  - S SIGNIFICANT RISK 8-12
  - H HIGH RISK 15-25

<b>GREEN</b> <b>LOW RISK 1-3</b>
<b>YELLOW</b> <b>MODERATE RISK 4-6</b>
<b>ORANGE</b> <b>SIGNIFICANT RISK 8-12</b>
<b>RED</b> <b>HIGH RISK 15-25</b>

Example:

Severity **Major** (4) X Likelihood **Possible** (3)  
 = Consequence score (12) (**S**)

### **3. PRIORITY AREAS IDENTIFIED FOR BLACKBURN WITH DARWEN**

- 3.1 This section summarises some of the information collected from the risk based assessments. They identify some of the adaptation work that is already taking place within services, but also highlights other measures that we can implement to enable us to further adapt to a changing climate.
- 3.2 From completing the risk assessment process, three priority areas were identified as posing the most significant risk to service delivery which the Council needs to focus its attention on in order to reduce the impact of future climate change. These were:
- Reducing the risk of flooding in the borough;
  - Reducing the impact of heat waves/high temperatures in the borough; and
  - Reducing the impact of snow/ice.
- 3.3 The risk assessments also highlighted that raising people’s awareness of the impacts extreme weather events could have on the council’s services is essential. This would ensure that people were aware of the impacts a changing climate may have and subsequently could take steps to adapt to climate change themselves.
- 3.4 Additionally some of the suggested adaptation measures were cross-cutting and would be implemented across all Council departments. These have been included under the ‘general adaptation action’ heading in the action plan.
- 3.5 The information gathered from this risk assessment process has informed the production of a comprehensive adaptation action plan which can be found on page 16. This details the adaptive measures Blackburn with Darwen BC will implement in the short, medium and long term to minimise the impact of climate change on service delivery.

#### **1. Reducing the risk of flooding in the borough**

*What is already being done?*

- 4.1 The Drainage department have implemented a range of measures to ensure they are well adapted to face the challenges of extreme rainfall and floods. In addition, the department work closely with planners to help adapt to flooding, for example ensuring measures set out in PPS 25 are implemented in the design of new buildings.
- 4.2 Additionally, the planning department requires all new development to integrate measures to help reduce flood risk in areas. The Core Strategy’s Environmental Strategy policy (CS13) states that development will only be permitted where it creates no unacceptable environmental impact. Examples of unacceptable impacts include development in areas of

high flood risk, while the development can be accommodated elsewhere or while mitigation measures are not available; and development which will exacerbate problems of flooding elsewhere.

*What else needs to be done?*

- There are other measures that have been identified through the risk assessment process that could be implemented into the drainage teams work programme. For example, the possibility of opening up former mill culverted water courses in order to provide more space for water.
- Encourage businesses within the borough to utilise BACLIAT (Business Areas Climate Assessment Tool) which assists businesses to understand the significant consequences climate change is likely to have on their business such as unexpected costs relating to business disruption, reduced productivity and costs of repairing or replacing damaged premises or equipment. Being able to understand these can help them build resilience to weather;
- The planning department will also be starting work on the Strategic Flood Risk Assessment Level 2 which will inform the Site Allocations and Development Management DPD as part of the Local Development Framework. This evidence base can then be used to ensure any new development (including highways) does not take place in areas identified at high risk from flooding without adequate mitigation measures being introduced;
- Developers will be required by the planning department to address climate change risks and adaptation measures as part of their Environmental Impact Assessment (EIA);
- Put into place the requirement for new development to integrate green space/green infrastructure and require that drainage systems in all developments have the capacity to cope with heavier rainfall events expected over their lifetimes, taking account of climate change;
- Identify and map flash flood 'hotspots' based on where floods have been experienced in recent years and identify causes of flooding (e.g. lack of capacity, poor maintenance etc);
- Include appropriate actions into Directorate/service business plans;
- Environment department need to consider which areas are more at risk during periods of heavy rainfall and plan extra capacity.
- Increase sign up to the Floodline Warning Direct and increase capacity of residents to prepare and respond to a flood.

## **2. Reducing the impact of heat waves/high temperatures in the borough**

*What is already being done?*

- Blackburn with Darwen Borough Council has completed its Heat Wave Plan, in partnership with the PCT.
- Additionally, the cleansing department has written its own operating procedures which sets out guidance for employees. One section covers “working in adverse weather conditions” e.g. wearing appropriate PPE clothing, what to do when a service has been suspended etc.
- Residential Design Guide Supplementary Planning Document requires new residential development to be designed so as to maximise solar gain. Fitting shutters and increasing green cover can reduce the effect of overheating.

*What else needs to be done?*

- Identify outside spaces that do not provide sufficient shade for people and investigate possibilities to increase shade in deficient areas;
- Environmental Health Officers to educate owners of food premises on the increased risk of food poisoning in the face of rising temperatures;
- Enhancement to biodiversity across the borough, including increased planting for shade in open spaces as well as green roofs and vertical habitats. Importantly, these are win-win measures – they provide multiple benefits in terms of managing flooding and overheating risks that will intensify with climate change, as well as benefits for biodiversity. The species planted should be adaptable to climate change. Green roofs can also provide benefits by attenuating run-off and improving the quality of run-off;
- By increasing green space and vegetation cover in the borough we can manage and offset rising temperatures (and manage flood risk) e.g. increasing tree cover and green roofs. Increasing Green Infrastructure ties in with de-culverting proposals and also provides opportunities to allow wildlife to move and adapt to the changing climate. Green Infrastructure also has opportunities to deliver additional benefits for health, low carbon lifestyles and for the wider community.

## **3. Reducing the impact of snow/ice**

*What is already being done?*

- Families, Health & Wellbeing service assists in organising school closures if necessary and provide support in snow/ice;

- If bin collection services are suspended because refuse vehicles cannot access homes, Environmental Services (cleansing) will locate skips in accessible strategic sites across the borough to enable residents to drop off their rubbish. If this service is required, it will be advertised in the local newspapers and on the council's website to ensure people are aware of it;
- Staff from environmental services and highways will deploy staff to clear snow and ice from pavements and roads;
- Transport and Highways staff are provided with additional clothing and briefed daily on the health and safety issues that may arise from the snow/ice.

*What else needs to be done?*

- Although the Transport section have invested in a few narrow track vehicles in order to grit more isolated roads and make properties more accessible in these locations, further investment in these types of vehicles is necessary;
- Ensure Highways begin to record the number of defects reported on the borough's road network following severe weather conditions in order to monitor the impact of climate change and to identify where the most damage is occurring.

## 5. CLIMATE CHANGE ADAPTATION ACTION PLAN

- 5.1 This section of the Strategy sets out the priority climate change adaptation actions identified through the risk assessment process. Each of the weather events identified as posing the most significant risks to Council services have been included in the table overleaf and the adaptation measures the Council will introduce in order to minimise the impact these extreme weather events will have on service delivery have been included.
- 5.2 Each action is accompanied by information on the department responsible for implementing the action and the timescales involved. Any cross-cutting actions identified have been included in the “general adaptation action” section of the table.
- 5.3 Some of the actions contained in the document will have financial implications. A ‘traffic light system’ has been used in the Action Plan to highlight whether actions can be delivered within existing budgets. It is acknowledged that the Council is currently going through severe financial pressures and these actions will need to be considered in the balance and prioritised.
- 5.4 Although the Action Plan highlights where there will be budget pressures, at this stage we do not have actual costs of implementing the actions. These will be added to Action Plan in future reviews.



Adaptation Actions	Reasoning	Existing or proposed action?	Responsible department	Partners	Delivered by	Can be delivered within existing budgets? If not, provide details
<b>Managing flood risks</b>						
<b>1. Implement the new duties required of this council as Lead Local Flood Authority under the Floods and Water Management Act 2010 as they become enacted</b>	To satisfy our requirements under legislation	Existing and proposed	Drainage	Environment Agency	Ongoing	No. There will be some financial implications to this work. These are currently being evaluated by the 'Making Space for Water' group
<b>2. Open up former mill culverted water courses in order to make more room for water</b>	Increasing the amount of room for water in order to reduce the likelihood of a flood event	Proposed	Drainage	Environment Agency	Ongoing	No. Would be a capital scheme that would need to be taken out to tender. Financial input would be needed
<b>3. Minimise surface water flows to public sewer from the Corporate property portfolios</b>	Reduce the amount of surface run-off and absorption of flood water following heavy rainfall	Proposed	Drainage/Property		Ongoing	Yes
<b>4. Undertake mapping of existing drainage assets</b>	To reduce the risk of flooding across the borough	Proposed	Drainage		Ongoing	Yes
<b>5. Set up a council wide flood reporting procedure</b>	To make flood risk management team aware of all reported incidents	Proposed	Drainage		Ongoing	Yes

<b>6. Set up formal flood reporting procedure with outside agencies</b>	To make flood risk management team aware of all reported incidents	Proposed	Drainage		Ongoing	Yes
<b>7. Secure funding for gully maintenance</b>	To reduce the risk of flooding across the borough	Proposed	Drainage/Highways		Review March 2013	No. Do have gully budget but is limited and only used when necessary. More proactive maintenance will have financial implications
<b>8. Continue with routine site inspections but seek to include an assessment of climate change risks as part of these over the next year</b>	As above	Proposed	Highways & Drainage		March 2013	Yes. The need would be to identify areas prone to flooding and icing. Only the briefest notes need to be taken by the inspector and passed back to clerical offices for the locations to be recorded. Can be completed within existing budgets
<b>9. Identify 'hotspots' or vulnerable locations of the borough's critical transport infrastructure network where the risks of extreme weather events are greatest and most frequent</b>	To reduce the risk of flooding across the borough's road network	Proposed	Highways		March 2013	No. The 'critical network' needs to be identified and then surveyed for potential problems. This information needs to be recorded and the information acted upon. Costs will arise from the survey but greater finance will be needed to ensure that the gullies and grids are cleared with

						appropriate frequency. Some civils work may be needed to ensure efficient drainage to prevent flooding and icing. The costs of these works would vary considerably with each location
<b>10. Keep up to date with local road closures during periods of flooding and inform relevant contractors and agencies as appropriate</b>	To ensure we are fully prepared for extreme weather events and communicate risks associated with them	Existing	Highways		Ongoing	Yes. Traffic managers to post these on website and email responders and agencies. This additional workload will cause some increase in duties but no additional cost. Regular review of contact lists would minimise the work on the day
<b>11. Proactively apply modifications to existing assets/activities to assist in adapting to climate change e.g. proactively replacing/fitting additional equipment or components, or providing additional provision/capacity to existing assets</b>	To ensure we adapt to the risks of flooding	Proposed	Highways		Ongoing	No. Seek advice from 'Making Space for Water' group. Installation of tanks/storage likely to be expensive
<b>12. Maintain flood contingency planning by</b>	To ensure we are equipped to deal with	Existing	Drainage		Ongoing	Yes

training, exercising and reviewing plans regularly for flood risk	flooding events					
<b>13. Complete Strategic Flood Risk Assessment Stage 2 to identify more specific locations at risk of flooding in the borough</b>	To ensure we are aware of the areas at highest risk of flooding events	Existing	Planning	Capita/Environment Agency	Ongoing	Yes
<b>14. Put in place plans to enhance the quantity, quality and accessibility of green space/green infrastructure in all new developments</b>	To utilise Green Infrastructure as a way of adapting to climate change, especially in terms of reducing/slowing surface run-off	Existing	Planning  Environmental Services (amenities) to assist		Ongoing	Yes
<b>15. Continue to enforce current planning advice and guidance from Government, in addition to the Council's own planning policies regarding development of sites in areas of high flood risk and promote sustainable measures within new developments such as SUDS. Also encourage retrofitting SUDS where feasible.</b>	To ensure our planning policies take account of adaptation and require developers to integrate adaptation measures into their designs to minimise the impact of flooding	Planning  Drainage to assist		Environment Agency can provide guidance for SUDS proposals	Ongoing	Yes

<b>16. Require developers to address climate change risks and adaptation measures as part of their Environmental Statements and Environmental Impact Assessments (EIA)</b>	As above	Proposed	Planning		March 2013	Yes
<b>17. Compile and distribute advice and information to schools on preparing for and dealing with extreme weather events and undertaking risk assessments</b>	To ensure children and young adults are protected from risks associated with climate change and extreme weather events	Proposed	Children's Services		March 2013	Yes. Small additional cost to produce advice information but can be implemented within existing budgets
<b>18. Work with individual schools to ensure awareness and support them where particular risks have been identified such as risk of flooding</b>	As above	Proposed	Children's Services		Ongoing	Yes
<b>Managing heat risks</b>						
<b>19. Investigate the use of different materials on road surfaces to ensure</b>	Ensure all new and existing roads, paths and cycle ways are able	Proposed	Highways		Ongoing	No. Sealing grit is available to spread during hot periods and rocksalt for icy

<b>they are as resilient as possible to projected climate change</b>	to cope with extremes of temperature or subsidence caused by extremes of temperature that may be experienced during their lifespan					conditions. Both are expensive to purchase but the highest costs are the labour that is necessary to spread the materials
<b>20. New buildings to have high water efficiency standards e.g. by meeting Code for Sustainable Homes (CSH) and BREEAM standards</b>	To ensure new homes are water efficient	Existing	Planning/Building Control		Ongoing	Yes
<b>21. Explore the opportunities for provision of covered outdoor play areas and improved social spaces for children and young people</b>	To ensure children and young adults are protected from the risks associated with climate change and extreme weather events	Proposed	Environmental services (amenities)		Ongoing	No. Would require some additional finance to cover play areas
<b>22. Children's Services and Health &amp; Wellbeing venues to look at creating cool rooms/areas within existing buildings wherever possible</b>	As above	Existing	Children's Services Health & Wellbeing		Ongoing	Yes
<b>23. Environmental Health Officers to educate owners of food</b>	To ensure food businesses are fully aware of the impacts of	Proposed	Environmental Health		Ongoing	Yes can be included in their correspondence without additional costs

premises of the increased risk of food poisoning in the face of rising temperatures	heat waves and high temperatures					
<b>24. Maintain heat wave contingency planning by training, exercising and reviewing plans regularly for heat wave risk</b>	To ensure we are equipped to deal with heat wave events and to protect life	Existing	Care Trust Plus Children's Services Health & Wellbeing		Ongoing	Yes
<b>25. Continue to raise awareness about the risks associated with heat waves and prolonged periods of high temperatures by promoting the borough's heat wave plan in care homes, public health centres, chemists, libraries etc and train relevant staff to identify, manage and advise on heat stress risks</b>	Ensure residents of care homes and other adult service users are aware and are protected from the impacts of climate change	Existing	Care Trust Plus Children's Services Health & Wellbeing		Ongoing	Yes
<b>Managing snow/ice</b>						
<b>26. Ensure there is a sufficient supply of grit for snow/ice</b>	To ensure we are fully equipped to deal with extreme weather events	Existing	Highways		Ongoing	No. Current capacity is insufficient to meet recommended levels, alternate storage should be sought which may have cost implications

<b>27. Provision of more narrow track vehicles to make properties more accessible in poor weather conditions</b>	As above	Proposed	Transport		Dependant upon financial implications/budgets	No. Would require additional finance
<b>28. Special winter footwear issued to staff to facilitate safe collections of refuse and recyclables</b>	As above	Existing	Environmental services (cleansing)		Ongoing	Yes
<b>29. Issue of winter tyres for vehicles</b>	As above	Existing	Environmental services (cleansing)		Ongoing	Yes
<b>30. Information sharing with schools and venues on practical issues e.g. sourcing available stocks of salt/grit</b>	As above	Proposed	Children's Services		Ongoing	Yes
<b>31. Production and annual review of a contingency plan for extreme weather events</b>	To ensure critical transportation links can be maintained and to maintain safety levels especially with regard to the most essential services of vulnerable people	Proposed (some existing in place)	Environmental Services/Highways (Children's Services and Health & Wellbeing departments to support)	Care Trust Plus	Annual review every September	Yes
<b>32. Climate change risks to be included in the Highways Asset Management Plan</b>	To ensure the impacts of climate change are considered	Proposed	Highways		March 2013	Yes



<b>33. Begin to record the number of defects reported on roads following severe weather conditions – introduce a monitoring framework to determine where the most damage is taking place on the road network</b>	To monitor the impacts of climate on the road network	Existing	Highways		March 2013	Yes. Roads are inspected for defects on an ongoing basis
<b>General adaptation actions</b>						
<b>34. Advice and support for businesses looking for new economic opportunities</b>	To exploit opportunities for implementing adaptation measures	Proposed	Planning/business support		Ongoing	Yes
<b>35. Encourage businesses to use the BACLIAT tool to assess impacts of climate change on their business</b>	To ensure businesses adapt to climate change	Proposed	Business support		Ongoing	Yes
<b>36. Identify economic advantages for the local area from a changing climate and promote economic development and growth in these sectors</b>	Exploit any benefits/economic development opportunities that arise from a changing climate	Proposed	Economic development/regeneration		Ongoing	Yes

<p><b>37. Awareness raising with staff on climate change threats and opportunities. Keep the LCLIP up to date, adding any new extreme weather events to the records</b></p>	<p>Increase the Council's understanding of climate change and extreme weather impacts</p>	<p>Proposed</p>	<p>All service managers</p>		<p>Ongoing</p>	<p>Yes</p>
<p><b>38. Ensure that contracts specifying new assets or infrastructure require them to be adaptable to the climates that they will experience over their lifetime</b></p>	<p>Ensure the council sets an exemplar standard in climate change adaptation</p>	<p>Existing</p>	<p>Procurement</p>		<p>Ongoing</p>	<p>Yes</p>
<p><b>39. Ensure that the Council's own assets, infrastructure and services set the exemplar standard in adaptation design and management</b></p>	<p>As above</p>	<p>Existing</p>	<p>Planning/Property</p>		<p>Ongoing</p>	<p>No. Retro-fitting adaptation measures to Council's assets will have some financial implications but will, over time, save the Council money</p>
<p><b>40. Introduce a programme of actions to publicise flood protection, heat waves, wintery conditions and other severe weather measures among householders and businesses.</b></p>	<p>To ensure people are fully aware of what they can do to protect themselves and their property from the impacts of flooding</p>	<p>Proposed</p>	<p>Communications</p>		<p>Ongoing</p>	<p>No. Small cost implication</p>

For flooding, for example, this could include promotion of the Environment Agency's 'Floodline' service and flood resilience measures, to minimise damage to people and property during flood events						
41. Introduce a programme of community resilience to assist all people within the borough to become more resilient to changes in climate (especially the more vulnerable members of the community)	As above	Proposed	Communications		Ongoing	No. Small cost implication
42. Introduce a programme of retro-fitting water efficiency measures to existing buildings in addition to incorporating them into new developments (it is estimated that 70% of buildings that will be in use in 2050 are already built and in use now)	To ensure existing buildings in the borough are adapted to shortages in water as a result of climate change	Proposed	Planning		Ongoing	Yes. Can be discussed at the pre-application stage

<b>43. Distribution of severe weather and flood advice messages from the Met Office, Environment Agency and the Flood Forecasting Centre where there is a significant risk of an emergency</b>	To ensure relevant staff are aware of emerging weather risk and that messages suitable for the public can be passed on	Existing	Civil Contingencies		Ongoing	Yes
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## 6. IMPLEMENTING AND MONITORING THE ACTIONS

- 6.1 Through the risk assessment process we have explored potential consequences, both harmful and beneficial to the Council from climate change.
- 6.2 The findings from the risk assessments highlighted that extreme rainfall, snow/ice and heat waves posed the most significant risks to service delivery and the adaptation actions presented in the previous section will help to address the likely impact of these extreme weather events.
- 6.3 Some departments already include adaptation measures in their day to day service delivery, but it is clear from the risk assessments that other measures could be included to ensure service delivery can continue in the face of a changing climate.
- 6.4 This Climate Change Adaptation Strategy and Action Plan will deliver our vision of embedding climate change risks across the Council and sets out the actions departments need to take to ensure we are fully adapted to a changing climate.
- 6.5 Service managers, where appropriate, will be responsible for implementing their service actions and integrating them into their Service Plans.
- 6.6 The main outcomes of this work are that:
  - Climate change risks are understood across sections of the Council and incorporated into their service plans;
  - The Council embed climate change impacts and risks within decision making;
  - Departments begin to implement the appropriate adaptive responses from this Action Plan in all priority areas.

**Appendix 1: Risk Based Assessments**

Service Area: Business and Economy

Risk	What might go wrong, or are there any benefits?  (consider how the various weather events listed above might affect a service) e.g. what are the impacts that might affect service operations, staff, premises)  (t = threat, o = opportunity)	What are we doing about it now?  Are we taking any action at the moment that will affect the likelihood or severity of the impacts occurring?  These are referred to as 'adaptation actions'  Please list all actions already being taken.	Level of Risk (with current measures taken into account)  Use the climate change risk matrix to determine the likelihood and significant of the impact to identify the level of risk.  E.g. minor impact x likely occurrence = uneasy level of risk.	What else could we do?	Risk Owner	Review Date
<b>Extreme rainfall</b>	<ul style="list-style-type: none"> <li>- Flash floods as drainage systems are overwhelmed by heavy downpours, affecting premises (t)</li> <li>- Flash flooding leading to increased risk of injury, disease, mental health problems and potentially death (t)</li> <li>- Flooding could mean business disruption lasting for days e.g. annual flood losses could increase from 0.1 to 0.4 percent of GDP if temperature increases by 3°C or 4°C (t)</li> <li>- Risks to outdoor workers from flood and possible increased storminess (t)</li> </ul>	<ul style="list-style-type: none"> <li>- Civil Contingency section of the council has provided a template for businesses and voluntary organisations in the borough to promote business continuity management in order to build community resilience to disruptive challenges within the Blackburn with Darwen area.</li> </ul>	<b>HIGH RISK</b>	<ul style="list-style-type: none"> <li>- Encourage businesses to use the BACLIAT tool which provides a simple checklist to help businesses assess the potential impacts of climate change on logistics, finance, markets, process, people and premises and to explore management implications.</li> <li>- Guidance for businesses on how climate change will impact on their premises, environment, food and health safety standards.</li> <li>- Identify economic advantages for the local area from a changing climate and promote economic development and growth in these sectors.</li> <li>- Advice and support for businesses looking for new economic opportunities, such as retrofitting existing homes for builders and designers.</li> </ul>	<p>Economic regeneration</p> <p>Economic regeneration</p> <p>Economic regeneration</p> <p>Economic regeneration</p>	<p>Annually</p> <p>Annually</p> <p>Annually</p> <p>Annually</p>
<b>Storms/ high winds</b>	<ul style="list-style-type: none"> <li>- Insurance industry could be exposed to an increased volume of worldwide claims from wind storms, subsidence, heat wave and flood events worldwide (t)</li> </ul>	<ul style="list-style-type: none"> <li>- Not seen as having a major impact on the service</li> </ul>	<b>MODERATE RISK</b>	N/A	N/A	N/A
<b>Snow/ice</b>	<ul style="list-style-type: none"> <li>- Impacts on local businesses as the snow prevents people from leaving their homes – cost implications for these businesses (t)</li> </ul>	<ul style="list-style-type: none"> <li>- Does not have a major impact on the service</li> </ul>	<b>MODERATE RISK</b>	N/A	N/A	N/A

<b>Heat waves</b>	<ul style="list-style-type: none"> <li>- Higher summer temperatures leading to lower productivity levels of workers/health implications (t)</li> <li>- A reduction in salting requirements (o)</li> <li>- May be opportunities for new markets and new jobs; for example in tourism or from making new products to help us cope with these changes such as renewable energy (o)</li> </ul>		<b>SIGNIFICANT RISK</b>	<ul style="list-style-type: none"> <li>- Environmental Health Officers to educate owners of food premises of the increased risk of food poisoning in the face of rising temperatures.</li> <li>- Implement rainwater harvesting systems into both existing and new businesses, which can capture rainfall for toilet flushing etc which does not require the use of potable mains water</li> <li>- The council will run more educational and awareness-raising campaigns for businesses to encourage better management of water resources.</li> </ul>	<p>Environmental Health</p> <p>Economic regeneration</p> <p>Economic regeneration</p>	<p>Annually</p> <p>Annually</p> <p>Annually</p>
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Service Area: Families, Health and Wellbeing

Risk	What might go wrong, or are there any benefits?  (consider how the various weather events listed above might affect a service) e.g. what are the impacts that might affect service operations, staff, premises)  (t = threat, o = opportunity)	What are we doing about it now?  Are we taking any action at the moment that will affect the likelihood or severity of the impacts occurring?  These are referred to as 'adaptation actions'  Please list all actions already being taken.	Level of Risk (with current measures taken into account)  Use the climate change risk matrix to determine the likelihood and significant of the impact to identify the level of risk.  E.g. minor impact x likely occurrence = uneasy level of risk.	What else could we do?	Risk Owner	Review Date
Extreme rainfall	Flash floods as drainage systems are overwhelmed by heavy downpours leading to school closures (t)  Vulnerability of children and youth to physical impacts e.g. from flood and possible increased storminess (t)	Environment Agency Flood plans Strategic Flood Risk Assessment Level 1  The department will help with organising school closures  Provides support if there are any problems with buildings/heating etc.	<b>HIGH RISK</b>	- Advice on how schools and childcare facilities can better prepare and build resilience so any disruption to learning can be minimised, e.g. identifying alternative safer venues or transport options.  - Make use of and adapt existing Business Continuity Plan for climate change issues.  - Use education services and social media as channels to increase awareness of risks and opportunities of climate change among children and youth.	Families, Health & Wellbeing  Families, Health & Wellbeing  Families, Health & Wellbeing	Annually  Annually  Annually
Storms / high winds	School closures due to physical damage to buildings (t)	The department will help with organising school closures  Provides support if there are any problems with buildings/heating etc.	<b>LOW RISK</b>	N/A	N/A	N/A
Snow / ice	Staff unable to access the homes of the most vulnerable due to the snow/ice conditions (t).  School closures due to heavy rainfall (t)	The department will help with organising school closures  Provides support if there are any problems with buildings/heating etc.	<b>LOW RISK</b>	- Information sharing with schools and venues on practical issues, e.g. sourcing available stocks of grit/salt.	Families, Health & Wellbeing	Annually
Heat waves	Increased incidences of heat stress, dehydration, heat-related mortality, skin cancer and eye cataracts in hotter, sunnier summers or outdoor workers and other members of	- Produced a Heat wave Plan for BwDBC, in partnership with NHS Blackburn  - Use of Heat Health warnings from Met Office	<b>SIGNIFICANT RISK</b>	- Implement joint BwDBC and Care Trust Plus Heat Wave Plan.  - Children's Services venues to look at creating	Families, Health & Wellbeing  Families, Health &	Annually  Annually



	<p>society, including the disabled and young children. Health risks to vulnerable population groups in housing that overheats significantly. Risk of death in heat waves (t)</p> <p>Severe water restrictions during droughts which could be put in place under a worst case scenario (e.g. standpipes) could pose access difficulties for vulnerable populations (t)</p> <p>Increase in summer energy costs for cooling (t)</p> <p>Increase in demand for social services supporting community care for vulnerable clients in heat waves (t)</p> <p>Reduced energy costs in winter due to need for less heating (o)</p> <p>Reduction in winter cold-related morbidity and mortality (o)</p> <p>Increased outdoor leisure opportunities such as cycling and walking (o)</p>			<p>cool rooms/areas within existing buildings, where this is possible.</p> <ul style="list-style-type: none"> <li>- Identify those residents most vulnerable to heat stress (the very young and those with existing health problems) and ensure arrangements to check on them are implemented during a heat wave.</li> <li>- Develop guidelines for appropriate care of vulnerable individuals during heat waves in children’s care homes, children’s centres, and other relevant venues.</li> <li>- Train relevant children’s services staff to identify, manage and/or advise on heat stress risks for the young, and children with physical and mental health problems.</li> <li>- Review surge capacity and the need for, and availability of, staff support in the event of a heat wave, especially if it lasts for more than a few days.</li> </ul>	<p>Wellbeing</p> <p>Families, Health &amp; Wellbeing</p> <p>Families, Health &amp; Wellbeing</p> <p>Families, Health &amp; Wellbeing</p> <p>Families, Health &amp; Wellbeing</p>	<p>Annually</p> <p>Annually</p> <p>Annually</p> <p>Annually</p> <p>Annually</p>
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Risk	What might go wrong, or are there any benefits?  (consider how the various weather events listed above might affect a service) e.g. what are the impacts that might affect service operations, staff, premises)  (t = threat, o= opportunity)	What are we doing about it now?  Are we taking any action at the moment that will affect the likelihood or severity of the impacts occurring?  These are referred to as 'adaptation actions'  Please list all actions already being taken.	Level of Risk (with current measures taken into account)  Use the climate change risk matrix to determine the likelihood and significant of the impact to identify the level of risk.  E.g. minor impact x likely occurrence = uneasy level of risk.	What else could we do?	Risk Owner	Review Date
<b>Extreme rainfall</b>	<ul style="list-style-type: none"> <li>- Flash floods as drainage systems are overwhelmed by heavy downpours, affecting assets and infrastructure. Surface water creates more of a problem than fluvial (t).</li> <li>- Flash flooding leading to increased risk of injury, disease, mental health issues such as stress and depression and potentially death (t)</li> <li>- Increase in the number of calls reporting blocked gullies/flooding (t)</li> <li>- Rain on both frozen and baked ground increases surface run-off. Although the frequency of these events are low, when they do occur, they have a major impact for the drainage team (t)</li> </ul>	<ul style="list-style-type: none"> <li>- As part of the BwDBC Flood Plan, details of all actions taken, decisions made and costs incurred are recorded, in addition to the operational logs maintained by all the officers involved in the emergency response and retained for records/monitoring.</li> <li>- In the event of a flood emergency the BwDBC Emergency Operation Centre (EOC) can be utilised.</li> <li>- Strategic Flood Risk Assessment (SFRA) Level 1 has been carried out by the planning department to identify areas within the borough that are at risk of flooding. This will form part of the evidence base for the Local Development Framework to ensure development is not carried out in areas identified as at high risk of flooding (unless appropriate mitigation measures have been integrated into the design).</li> <li>- The Submission Core Strategy includes an Environmental Strategy policy which sets a condition that development will only be permitted where it creates no unacceptable environmental impact. Unacceptable impacts include development in areas of high flood risk and development which will exacerbate problems of flooding elsewhere.</li> <li>- The "Flash Flooding Risk Areas" within the borough are covered by the Environment Agency Flood-Line warnings. The agency aim to give a minimum of a one hour warning of flooding in these locations.</li> <li>- Environment Agency Local Flood Warning Plan containing maps of flood warning areas and held by all partners</li> <li>- Identify contributions to reduction in climate change</li> </ul>	<b>HIGH RISK</b>	<ul style="list-style-type: none"> <li>- Complete Strategic Flood Risk Assessment Level 2 for more specific locations at risk of flooding</li> <li>- Include green infrastructure in new developments – will have an important role in slowing/reducing surface run off, and in absorbing flood water etc following heavy rainfall.</li> <li>- Promote application of rigorous planning control for any new development on floodplains using the principles in PPS25 and encourage the implementation of SuDS.</li> <li>- Identify and map flash flood 'hotspots' based on where floods have been experienced in recent years and identify causes of flooding (e.g. lack of capacity, poor maintenance etc)</li> <li>- Improve flood contingency planning. This should focus on increasing the number of emergency plans for flood risk areas.</li> <li>- Introduce a programme of actions to publicise flood protection measures among householders, including promotion of the Environment Agency's 'Floodline' service and flood resilience measures, to minimise damage to people and property during flood events. This should incorporate letter-drops in flood risk areas, media adverts, and community meetings to advise residents on steps they can take to minimise damage from flooding (especially more vulnerable members of the borough).</li> <li>- Secure funding for gully maintenance</li> <li>- Minimise surface water flows to public sewer from the Corporate property portfolios</li> </ul>	<p>Planning department</p> <p>Planning/Drainage/developers</p> <p>Planning/Drainage</p> <p>Drainage/Environment Agency/other partners</p> <p>Drainage/Emergency Planning</p> <p>Drainage /Communications</p> <p>Drainage</p>	<p>Annually</p> <p>Annually</p> <p>Annually</p> <p>Annually</p> <p>Annually</p> <p>Annually</p>

		<p>(NI 188) has been identified as a key milestone in the Drainage team's Service Plan 2009/10.</p> <ul style="list-style-type: none"> <li>- Regular Lancashire Resilience Forum Flooding Sub group meetings to discuss what we can do to minimise impact of flooding in the region.</li> <li>- On a local scale, Making Space for Water group which is made up of BwD officers and partners to implement flood management in the borough.</li> <li>- Litter maintenance trap in the River Darwen in order to increase capacity.</li> <li>- Developing IT risk based gully maintenance system which will only clean gullies that require cleaning i.e. risk based.</li> <li>- Implementing fleet changes – more modern and therefore more efficient vehicles</li> <li>- Met office severe weather warnings are utilised</li> <li>- Additional resources provided by agencies detailed in Multi Agency Response Plan (MARP). Lancashire Resilience Forum Flooding Sub-Group currently rewriting MARP. The new plan will be called Multi Agency Flooding Plan (MAFP) and have the structure of a generic overarching plan plus annexes with specific details for each flood warning area.</li> <li>- Generic risk assessments have been completed by the Drainage Manager. Dynamic risk assessments will be undertaken as required.</li> <li>- Multi-agency Contingency Plan prepared by Lancashire County Council to protect the health and safety of people.</li> </ul>		<ul style="list-style-type: none"> <li>- Place weather stations in schools</li> <li>- Open up former mill culverted water courses in order to provide more space for water</li> <li>- Should move from the current approach to the development of flood defences, which is primarily reactive, to a more proactive approach which requires better data on flood risk in key catchments.</li> </ul>	<p>Drainage</p> <p>Drainage</p> <p>Drainage</p> <p>Drainage</p>	<p>Annually</p> <p>Annually</p> <p>Annually</p> <p>Annually</p> <p>Annually</p>
<b>Storms/high winds</b>	No major impact on the service	N/A	<b>LOW RISK</b>	N/A	N/A	N/A
<b>Snow/ice</b>	Rain on frozen ground increases run-off (t)	Same response as "extreme rainfall"	<b>SIGNIFICANT RISK</b>	Same response as "extreme rainfall"	Same response as "extreme rainfall"	Same response as "extreme rainfall"

<b>Heat waves</b>	Run off also increases when rain falls on baked ground (t)  Reduced energy costs in winter due to need for less heating (o)	See above	<b>SIGNIFICANT RISK</b>	See above	See above	See above
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Service Area: Environmental Services (Cleansing)

Risk	What might go wrong, or are there any benefits?  (consider how the various weather events listed above might affect a service) e.g. what are the impacts that might affect service operations, staff, premises)  (t = threat, o = opportunity)	What are we doing about it now?  Are we taking any action at the moment that will affect the likelihood or severity of the impacts occurring?  These are referred to as 'adaptation actions'  Please list all actions already being taken.	Level of Risk (with current measures taken into account)  E.g. minor impact x likely occurrence = uneasy level of risk.	What else could we do?	Risk Owner	Review Date
<b>Extreme rainfall</b>	<ul style="list-style-type: none"> <li>- Increased disruption to waste collection and street cleaning services due to greater risk of flooding (t).</li> <li>- Flash flooding leading to increased risk of injury, disease, mental health problems and potentially death (t)</li> <li>- Street cleaning: need for more gully cleaning as debris collected after heavy downpours following extended dry periods (t)</li> <li>- Risks to outdoor workers from flood and possible increased storminess (t)</li> </ul>	<ul style="list-style-type: none"> <li>- If wagons are unable to access waste bins, the route will be rescheduled and if the weather improves later in the day, the wagons will return. If they are still unable to access the waste, residents will be notified the collection service will return another day. Will also provide extra bags to reduce severity of the impact.</li> <li>- Service plans prepare and train for all types of events and the de-brief process following disruption to the service will always consider adaptation and better ways of responding to future incidence.</li> <li>- Monitor the weather from the Met office to determine the likelihood of the weather remaining severe. The service will produce a daily action plan based on the weather predictions to inform residents whether their bin collection will be affected.</li> <li>- Provide additional clothing to workforce and brief them on health and safety issues that may arise from the weather</li> </ul>	<b>SIGNIFICANT RISK</b>	<ul style="list-style-type: none"> <li>- Include appropriate actions into Directorate/service business plans</li> <li>- Need to consider which areas are more at risk during periods of heavy rainfall and plan extra capacity</li> <li>- Keep up to date with local road closures during periods of flooding and inform relevant contractors and agencies as appropriate</li> </ul>	<p>Environmental services</p> <p>Environmental services</p> <p>Environmental services</p>	<p>Annually</p> <p>Annually</p> <p>Annually</p>
<b>Storms/high winds</b>	<ul style="list-style-type: none"> <li>- More litter on streets; rubbish/waste lost from vehicles and during waste collection due to high winds (t)</li> </ul>	<ul style="list-style-type: none"> <li>- Teams directed to appropriate areas to carry out clean up</li> </ul>	<b>MODERATE RISK</b>	<ul style="list-style-type: none"> <li>- Carried out on a reactive basis</li> </ul>	N/A	N/A
<b>Snow/ice</b>	<ul style="list-style-type: none"> <li>- Severe snow and ice conditions may cause suspension of environmental services, e.g. bin collection. Also people may not be able to put their bins out for collection. Increased number of complaints regarding street cleaning issues (t)</li> </ul>	<ul style="list-style-type: none"> <li>- If bin collection services are suspended, skips are located in accessible strategic sites across the borough where residents can drop off their rubbish. If this is needed, it will be advertised in the newspapers and on the council's website to ensure residents are aware that this service is available.</li> <li>- Will temporarily suspend prosecutions for dumping rubbish on streets.</li> </ul>	<b>SIGNIFICANT RISK</b>	<ul style="list-style-type: none"> <li>- Ensure there is a sufficient supply of grit for extreme weather conditions. There was insufficient grit to cope with the recent bad weather and this is an issue we need to address in order to ensure it does not happen again.</li> <li>- Provision of more narrow track vehicles to make properties more accessible.</li> <li>- Explore possibility of extending gritting to side</li> </ul>	<p>Environmental services</p> <p>Environmental services</p> <p>Environmental services</p>	<p>Annually</p> <p>Annually</p>

		<ul style="list-style-type: none"> <li>- Monitor the weather from the Met office to determine the likelihood of the weather remaining severe. The service will produce a daily action plan based on the weather predictions to inform residents whether their bin collection will be affected.</li> <li>- Invested in a few narrow track vehicles to improve access to properties in the borough when weather conditions are bad.</li> <li>- Staff deployed to clear snow and ice from pavements/roads etc.</li> </ul>		roads to facilitate collections safely		Annually
<b>Heat waves</b>	<ul style="list-style-type: none"> <li>- Drought conditions leading to possible increases in the risk of fire in waste awaiting collection (t)</li> <li>- Higher summer temperatures leading to lower productivity levels of workers/staff unable to get to work due to extreme weather conditions (t)</li> <li>- Climate impacts on frontline cleansing services will affect: rotas (e.g. changes to working hours if too hot during the day); equipment (e.g. overheating may necessitate change); suitable clothing (e.g. for coping with temperature requirements etc (t)</li> <li>- Saving for local authority as reduced resources and costs of road maintenance in winter e.g. salting, gritting etc (o)</li> <li>- Reduced energy costs in winter due to need for less heating (o)</li> </ul>	<ul style="list-style-type: none"> <li>- Optional leave requests for staff who struggle to get into work, or adopt a flexible approach when people required to finish a bit earlier to ensure they can get home.</li> <li>- The service has written its own operating procedures which sets out guidelines for employees. One section covers “working in adverse weather conditions” and sets out a series of guidelines for employees to adopt when working in extreme weather conditions. E.g. wear appropriate PPE clothing, what to do when a service has to be suspended etc.</li> <li>- Staff encouraged to wear appropriate clothing - a hat and sunglasses where appropriate, take regular breaks, rehydrate and try to work in the shade.</li> <li>- Optional leave requests for staff who struggle to get into work or adopt a flexible approach when people are required to finish early in order to get home.</li> </ul>	<b>SIGNIFICANT RISK</b>	<ul style="list-style-type: none"> <li>- Supply sun cream and sun protection clothing if appropriate. Ensure regular breaks. Higher temperatures could lead to increased demands from workers.</li> </ul>	Environmental services	Annually

Risk	What might go wrong, or are there any benefits?  (consider how the various weather events listed above might affect a service) e.g. what are the impacts that might affect service operations, staff, premises)  (t = threat, o = opportunity)	What are we doing about it now?  Are we taking any action at the moment that will affect the likelihood or severity of the impacts occurring?  These are referred to as 'adaptation actions'  Please list all actions already being taken.	Level of Risk (with current measures taken into account)  Use the climate change risk matrix to determine the likelihood and significant of the impact to identify the level of risk.  E.g. minor impact x likely occurrence = uneasy level of risk.	What else could we do?	Risk Owner	Review Date
<b>Extreme rainfall</b>	<ul style="list-style-type: none"> <li>- Flash floods as drainage systems are overwhelmed by heavy downpours, affecting assets and infrastructure (t)</li> <li>- Flash flooding leading to increased risk of injury, disease, mental health problems and potentially death (t)</li> <li>- Possible safety issues for officers visiting sites (t)</li> </ul>	<ul style="list-style-type: none"> <li>- All planning authorities are required to deliver planning strategies that manage and reduce the risk of flooding, and to consult with the Environment Agency when preparing planning documents and determining planning applications.</li> <li>- Strategic Flood Risk Assessment (SFRA) Level 1 has been produced for the borough.</li> <li>- Ensure all development complies with PPS 25: Planning and Flood Risk.</li> <li>- Core Strategy includes an Environmental Strategy policy which states that development will only be permitted where it creates no unacceptable environmental impact. Examples of unacceptable impact include development in areas of high flood risk and development which exacerbates the problems of flooding elsewhere.</li> <li>- The Core Strategy also requires LDDs and other proposals to use design standards for new development which requires it to incorporate measures increasing its resistance to the effects of climate change, including extreme weather events, greater extremes of temperature, and flooding.</li> <li>- Residential Design Guide Supplementary Planning Document – incorporating sustainable design in new developments.</li> <li>- Site visits will be delayed if necessary.</li> </ul>	<b>HIGH RISK</b>	<ul style="list-style-type: none"> <li>- Strategic Flood Risk Assessment (SFRA) Level 2 needs to be completed – will be prepared when work begins on the Site Allocation DPD.</li> <li>- Promote application of rigorous planning control for any new development on floodplains using the principles in PPS25 and encourage the implementation of SuDS. Where development must, exceptionally, take place in areas at risk of flooding, we will seek to ensure that floor levels are raised to an appropriate level, flood resilience is incorporated into buildings, and it is demonstrated that safe access and evacuation can be provided during flood events.</li> <li>- Ensure new homes are built to Code for Sustainable Homes Level 4 and above. Ensure Registered Social Landlords (RSLs) build homes to CSH Level 4 and above.</li> <li>- Actively engage with developers to incorporate green roofs and SuDS into new development in the borough.</li> <li>- Request that developers address climate change risks and adaptation measures as part of Environmental Impact Assessments (EIA), explaining that if the EIA does not take account of climate change, the development will not perform as intended over its lifetime. In particular, the risk management measures proposed may not deliver their intended benefits, and damage to the environment could occur as a result.</li> <li>- Put in place plans to enhance the quantity and quality of green space/green infrastructure through measures including master planning, street-level management and parks management.</li> <li>- Optimise use of existing building stock, including encouraging retrofitting for climate adaptation.</li> </ul>	<p>Planning</p> <p>Drainage/Planners</p> <p>Planning</p> <p>Planning</p> <p>Planning</p>	<p>Annually</p> <p>Annually</p> <p>Annually</p> <p>Annually</p> <p>Annually</p>

					Housing support/ Neighbourhood services	Annually
<b>Storms/high winds</b>	<ul style="list-style-type: none"> <li>- Concerns about unsafe trees (t)</li> <li>- Possible safety issues for officers visiting sites (t)</li> </ul>	<ul style="list-style-type: none"> <li>- Inspect trees</li> <li>- Delay site visits if necessary</li> </ul>	<b>MODERATE RISK</b>	None – will review annually.	N/A	N/A
<b>Snow/ice</b>	<ul style="list-style-type: none"> <li>- Possible issues for site safety or officers getting to sites (t)</li> </ul>	<ul style="list-style-type: none"> <li>- Rearrange site visits</li> </ul>	<b>MODERATE RISK</b>	None – will review annually.	N/A	N/A
<b>Heat waves</b>	<ul style="list-style-type: none"> <li>- Risk of subsidence in buildings (t)</li> <li>- Water shortages (t)</li> <li>- Reduced energy costs in winter due to need for less heating (o)</li> <li>- Developing and diversifying a sustainable energy portfolio will lead to greater energy security and help to tackle fuel poverty (o)</li> </ul>	<ul style="list-style-type: none"> <li>- UK National Heatwave Plan introduced by Department of Health.</li> <li>- Blackburn with Darwen adopted a Heatwave Plan for the borough, led by the NHS.</li> </ul>	<b>SIGNIFICANT RISK</b>	<ul style="list-style-type: none"> <li>- Design public spaces with cooling in mind, e.g. by using trees for shading etc.</li> <li>- Ensure the design of new buildings, infrastructure and surface drainage systems take account of extreme summer temperatures, the risk of subsidence in drier summers and autumns.</li> <li>- Explore potential policy scope for a climate change/sustainable building design document that fully integrates mitigation and adaptation measures.</li> <li>- Ensure that new build homes have high water efficiency standards, such as Code for Sustainable Homes.</li> <li>- Should require rainwater harvesting and grey-water recycling, where appropriate, in all developments</li> <li>- Explore possibility of reducing water use in council buildings through the installation of more efficient appliances and management systems (as in Salford council). Measures such as rainwater harvesting for use in toilet flushing and irrigation of lawns and plant beds should be incorporated in new council developments. Should also retrofit existing buildings wherever possible to reduce the requirement for water use.</li> </ul>	<ul style="list-style-type: none"> <li>Planning</li> <li>Planning</li> <li>Planning</li> <li>Planning</li> <li>Property development</li> </ul>	<ul style="list-style-type: none"> <li>Annually</li> <li>Annually</li> <li>Annually</li> <li>Annually</li> <li>Annually</li> </ul>



Risk	What might go wrong, or are there any benefits? (t = threat, o = opportunity)	What are we doing about it now? Are we taking any action at the moment that will affect the likelihood or severity of the impacts occurring?  These are referred to as 'adaptation actions'  Please list all actions already being taken.	Level of Risk (with current measures taken into account)  Use the climate change risk matrix to determine the likelihood and significant of the impact to identify the level of risk.  E.g. minor impact x likely occurrence = uneasy level of risk.	What else could we do?	Risk Owner	Review Date
<b>Extreme rainfall</b>	<ul style="list-style-type: none"> <li>- Flash floods as drainage systems are overwhelmed by heavy downpours, affecting assets and infrastructure and causing transport disruption (t)</li> <li>- Flash flooding leading to increased risk of injury, disease, mental health problems and potentially death (t)</li> <li>- Increased demand for car use (rather than walking and cycling) (t)</li> </ul>	<ul style="list-style-type: none"> <li>- Met office severe weather warnings</li> <li>- Environment Agency Local Flood Warning Plan containing maps of flood warning areas and held by all partners</li> <li>- Additional resources provided by agencies detailed in Multi Agency Response Plan (MARF). Lancashire Resilience Forum Flooding Sub Group rewriting MARF and have the structure of a generic overarching plan plus annexes with specific details for each flood warning area.</li> <li>- Regular Local Resilience Forum Flooding Sub-Group meetings to discuss flooding issues.</li> <li>- Promoting alternative methods of transport such as walking and cycling.</li> </ul>	<b>HIGH RISK</b>	<ul style="list-style-type: none"> <li>- Updating design requirements, including technical standards and specifications to provide additional capacity/functionality.</li> <li>- Proactively applying modifications to existing assets/activities e.g. proactively replacing/fitting additional equipment or components, or providing additional provision/capacity to existing assets. Could be applied everywhere on the network or just at high risk sites.</li> <li>- Monitoring the rate of climate change and/or the subsequent effects on a particular asset/activity to increase confidence in the appropriate adaptation option, or to determine the appropriate point at which to implement some pre-determined action.</li> <li>- Develop zoning of land use on either side of roads to better attenuate flood risk.</li> <li>- Where new roads are proposed routes will need to avoid areas prone to flooding and changes to existing roads in flood prone areas should take account of flood risk</li> <li>- Better signage to direct and warn of roads at high risk.</li> <li>- Identify 'hotspots' or vulnerable locations of the borough's critical transport infrastructure network where the risks of extreme weather events are greatest and most frequent.</li> <li>- Ensure drainage networks are maintained</li> </ul>	<p>Highways</p> <p>Highways</p> <p>Highways</p> <p>Highways/planning</p> <p>Highways/planning</p> <p>Highways</p> <p>Highways</p> <p>Highways/Drainage</p>	<p>Annually</p> <p>Annually</p> <p>Annually</p> <p>Annually</p> <p>Annually</p> <p>Annually</p> <p>Annually</p>

<b>Storms/high winds</b>	<ul style="list-style-type: none"> <li>- Trees/debris blown onto highways causing hazard (t)</li> <li>- Operational constraints at exposed locations e.g. bridges for high-sided vehicles (t)</li> </ul>	<ul style="list-style-type: none"> <li>- Utilise workers from environmental services to help clear the highways.</li> </ul>	<b>MODERATE RISK</b>	<ul style="list-style-type: none"> <li>- Measures already in place are sufficient to deal with the minor impacts caused by storms/high winds on transport and highways.</li> </ul>	N/A	N/A
<b>Snow/ice</b>	<ul style="list-style-type: none"> <li>- Increased risk to construction and maintenance workers and Traffic Officers as a result of climatic change e.g. if need to work on the network more often; if required to work on the network during extreme climatic events or if climate change requires them to perform more 'risky' activities (t)</li> </ul>	<ul style="list-style-type: none"> <li>- Provide additional clothing to workforce and brief them on health and safety issues that may arise from the weather</li> </ul>	<b>SIGNIFICANT RISK</b>	<ul style="list-style-type: none"> <li>- Would be useful to record the number of defects reported on roads following severe weather conditions.</li> </ul>	Highways	Annually
<b>Heat waves</b>	<ul style="list-style-type: none"> <li>- Higher summer temperatures leading to melting or softening tarmac on roads and lower productivity levels of workers. Will lead to an increase in emergency repairs required, increase in claims for damage to vehicles and may lead to emergency road closures. Increased costs for repairs, claims and shift working (t)</li> <li>- Expansion of rails leading to buckling (t)</li> <li>- Increased safety risk due to a reduction in driver/road workers' concentration and adverse driving conditions (including loss of skid resistant surfaces) (t)</li> <li>- Increase in summer energy costs for cooling (t)</li> <li>- Less transport disruption due to bad weather as winter temperatures increase and less precipitation falls as snow (o)</li> <li>- Reduced energy costs in winter due to need for less heating (o)</li> <li>- Opportunities for walking and cycling, due to milder winters and warmer summers (o)</li> <li>- Saving for local authority as reduced resources and costs of road maintenance in winter e.g. salting, gritting etc (o)</li> </ul>	<ul style="list-style-type: none"> <li>- Exploring the use of different materials on road surfaces to withstand variations in weather conditions</li> </ul>	<b>HIGH RISK</b>	<ul style="list-style-type: none"> <li>- Use sustainable construction methods</li> <li>- Use different materials on road surfaces</li> <li>- Climate change risk should be factored into the Highways Asset Management Plan</li> </ul>	Highways Highways	Annually