YORKSHIRE AND HUMBER CLIMATE CHANGE ADAPTATION STUDY

LOCAL AREA REPORT

LEEDS METROPOLITAN DISTRICT

Location	
Description of District	Leeds is a significantly urban district, notably dominated by urban sprawl and the conglomeration with Bradford. However a large proportion of the district remains greenbelt with a number of distinct villages and towns.
Future Climate Projections	The results of the modelling carried out for the Yorkshire and Humber Regional Climate Change Adaptation Study suggest that the following changes are likely by 2050: • Annual average temperatures are set to increase by 1.9˚C (and by up to 2.4˚C in summer); • Extreme cold temperatures are expected to increase by 1.7˚C but remain below 0˚C in winter; • Annual average rainfall will decrease by 30mm although winter rainfall will increase; and • The number of frost days will reduce from 58 to 33 (43%). These figures relate to the nearest modelled cell, which was Leeds.

Key Impacts and Adaptation Actions

Although principally a regional / sub-regional study, there are a range of issues that are of particular relevance to the Leeds Metropolitan District. These are set out below, using the same 'sector' headings as the main report. These points are not the only issues for consideration, however, as sub-regional and regional reports, as well as the thematic or sectoral areas of the website, do cover other issues relevant to this local authority area.

Flooding

Key Impacts

- Greater rainfall intensity, and volume in winter months, leading to increasing and more frequent flood problems, including traffic impacts on main routes;
- Increased watercourse blockages and siltation reducing channel capacity and requiring greater maintenance; and
- Increased surface water flooding in urbanised catchments and areas.

Key Adaptations

- Continue river flow monitoring for fluvial flood events to provide advanced flood warning to critical risk areas;
- Improve local flood defences, and concentrate flood management on protecting and maintaining critical infrastructure assets and services; and
- Improve current drainage design standards to address future climate, and strategically plan and implement system improvements across the drainage, and wider water management, network.

Business and Economy

Key Impacts

- The financial services sector is expected to experience greater surges in consumer demand, due to an increase in weather-related damage, but will also experience building-related impacts in common with many other industries;
- Higher summer temperatures are expected to increase demand for leisure and tourism, and especially rural and outdoor amenity, over an extended season. This could place significant strain on existing attractions and infrastructure;
- Sports and other venues will be affected by changing temperatures and rainfall/storm patterns, affecting grounds management and buildings. Crowd management strategies may need adaptation to limit climate impacts on health and wellbeing, and festivals and events may become

more susceptible to disruption or cancellation;
- Digital industries will be particularly vulnerable to effects on telecommunications infrastructure, and to the effects of increased flooding on data storage and electrical services; and
- Impacts of climate change on the built environment will have a significant effect on employee and customer wellbeing. In particular in Leeds the impacts of storminess and increased windspeeds are expected to be enhanced.

Key Adaptations

- Climate change should be built into future resource planning for many industries, but in particular responsive service industries such as insurance and financial services;
- Long-term changes in the tourism industry, including visitor levels, should be built into visitor management strategies and infrastructure plans. These should focus on ensuring that whilst the industry benefits from greater visitor numbers there are not negative effects on natural environments and community structures;
- Increased use of shade trees in urban areas will have positive effects on temperatures, limiting the heat island effect through shading and evaporative cooling. Their adoption in new developments and inclusion in redevelopment or renovation schemes would be a proactive adaptation, but care is required to ensure that they will not increase the incidence of wind-blown damage to buildings, or subsidence; and
- Raise awareness of the impacts of climate change among the digital industries, and other sectors heavily reliant on data transmission and storage, and ensure that networks and transmission infrastructure is resilient.

Public and Voluntary Services

Key Impacts

- Indoor air temperatures are likely to rise in the summer in schools and public buildings, particularly in urban areas, with impacts on indoor air quality also; and
- Greater pressure on public and voluntary sector services to provide community support during periods of disruption (eg floods and storms).

Key Adaptations

- A set-aside maintenance and repair budget for school buildings and public service offices, developed through adapting current budgetary mechanisms, would ease the costs of any damage that is incurred as a result of climate impacts; and

- Ensure development of and participation in regional resilience forums and regional flood groups, and undertake precautionary as well as adaptive measures.

Infrastructure and Utilities

Key Impacts

- Occasional reductions in water volume in reservoirs;
- Increased number of traffic delays on major highways caused by increased winter rainfall and winter average wind speeds;
- Increased frequency of flooding from urban drainage and sewer systems in Leeds, especially in winter;
- Increased blockage of drains, culverts and gullies from eg storm debris;
- Increased slippages in road or rail embankments or cuttings; and
- Mechanical operations within the water distribution grid could be affected by climate-related disruption to power supplies.

Key Adaptations

- Balance water supply from other local sources or from the Yorkshire Grid at times of individual reservoir deficits;
- Weather and travel warnings issued to users of principal roads during storm events, and anticipate increased resource requirements for emergency responses;
- Capital programs should consider and build in improved sewer and drainage capacity;
- Re-evaluate resources and approaches for inspection and clearance of drain, culvert and gulley blockages;
- Increased resources for inspection and maintenance of embankments and slopes; and
- Increased awareness of inter-dependencies between critical infrastructures.

Biodiversity

Key Impacts

- Blanket bog is located mostly on flat moorland which means that it is prone to the impact of drought, especially where there is already shrinkage caused by current pressures;
- Chalk and limestone grassland may be prone to further loss as climate change compounds existing pressures. These habitats are already vulnerable and sensitive to change and contain rare species;
- There is likely to be a change in some locations from wet to dry types of habitat; and
- Arable fields may come under increasing pressure if land productivity declines.

Key Adaptations

- Wherever possible allow natural processes to continue, and therefore adaptation to change to occur naturally;
- Strategically plan an overall expansion in habitat types currently suffering from isolation or fragmentation. The overall connectivity of existing and newly created habitats needs to be enhanced to enable species to migrate and disperse easily; and
- Maximise the potential for different habitats and species to help sustain each other. New habitats may take on functional roles such as buffering natural hazards such as wind, flooding and drought.

Health and Welfare

Key Impacts

- Increasing temperatures resulting in mental and physical health problems; and
- Growing numbers of cases of respiratory illnesses due to increasing number and intensity of air pollution episodes.

Key Adaptations

- Urban design to minimise heat island effect as much as possible; and
- Raising awareness, educating and building community resilience to climate change and its likely impacts. Continuing to tackle social and economic inequalities throughout the area will greatly reduce vulnerability to the impacts of climate change.