



Assessing and managing flood risk

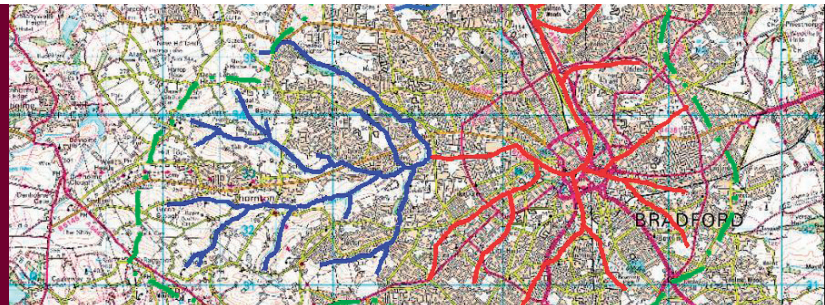
The aims of the flood risk assessment

Regeneration will add hundreds of millions of Euros to the value of property in Bradford city centre, thus increasing the risk from flooding. The construction of the Bradford Beck diversion tunnel did much to reduce the probability of flooding, but climate change and urbanisation are likely to increase the probability. Therefore there is a need to review current and future flood risk to highlight the actions required to maintain the risk within acceptable levels.

Assessing the flood risk

Although a relatively small river system, Bradford Beck is complex, comprising a predominantly rural catchment in the west and a predominantly urban one in the east. This presents significant difficulties in the modelling of flows which are only recently being addressed by the development of integrated river and sewer modelling techniques and the Open MI environment. However, the analysis for UWC took place before these developments and so a simple and robust methodology was developed to confirm the current probability of flooding and to assess future risks and hence direct responses to climate change and urbanisation.

The approach taken used outputs from proven hydrological methodologies and supported by river modelling techniques as inputs to an urban drainage model of the river system. The results of this modelling were adjusted to take account of the sewer system capacity and Government guidelines for the



assessment of climate change impacts. The flows generated by the hydrological approaches were corrected to take account of the operation of the diversion tunnel

The corrected results were then used as inputs to a hydraulic model of Bradford Beck through the city centre to determine the flows and depths for different event probabilities. The flows and depths at which flooding were determined taking the capacity of the trunk sewer system into account. The impact of climate change on flows was also assessed in order to predict current and future levels of flood protection.

The assessment indicated that there is a need to start to prepare for the impacts of climate change within the catchment upstream of Bradford because adding extra conveyance capacity to the system will cause flooding downstream.

Capacity Building

The need to build physical and human capacity into the system has been identified and the City Council is working with developers to introduce flow control and disconnection to new developments. The City Council is also developing core competencies within its planning, regeneration, landscaping and highways teams and recently arranged a study tour to look at good practice being applied by partners in UWC and NORIS. The impressions gained during the tour are also being disseminated to the Environment Agency and Yorkshire Water. Starting with major developments such as the national headquarters for the supermarket chain Morrisons and the Bradford Schools reconstruction project the experience gained will trickle down through the system until good practice becomes normal practice.

Comparison of flows at Inlet, Bradford Beck and diversion tunnel downstream of inlet chambers

