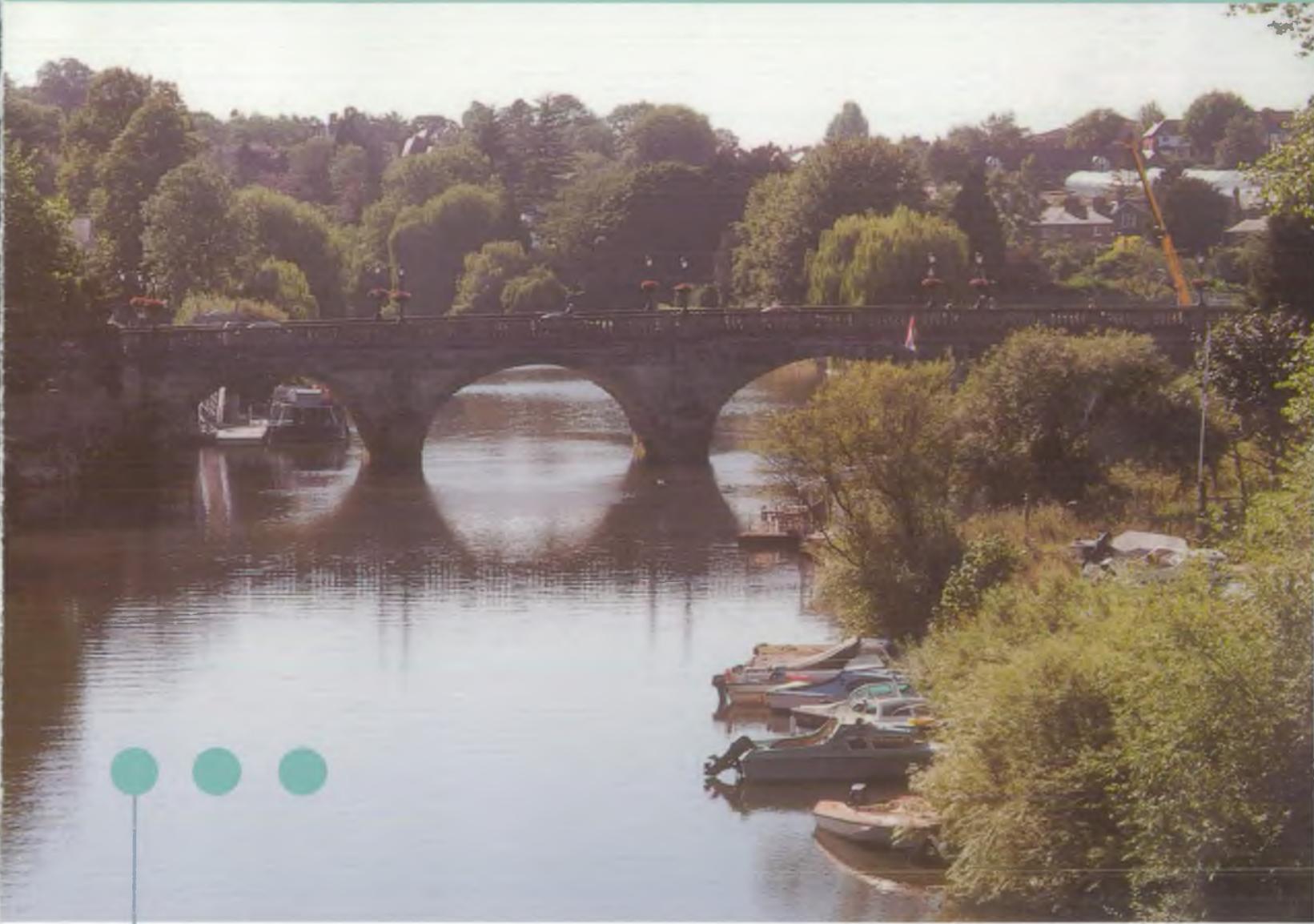




# Shrewsbury flood defences



The next steps



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# SHREWSBURY

Shrewsbury is cradled within a picturesque horseshoe loop of the River Severn. Over centuries, the river has helped to build the town's character and its prosperity. However, it also brings the damaging threat of flooding.

In recent years, flooding has become more frequent with increased severity, and the Environment Agency has been looking at the possibilities for alleviating the effects in Shrewsbury.

## The situation in Shrewsbury

Following the autumn floods of 2000, the government pledged additional funds to allow work to start on defences for Shrewsbury as a priority. The Agency subsequently carried out consultations and began identifying possible solutions to the flooding problem. Whilst dams, dredging and bypass channels were considered and evaluated, it was concluded that hard defences would provide the most economic and practical flood defences within a reasonable timescale and by utilising the innovative demountable barrier system, the visual impact can be minimised.

Site investigations were undertaken throughout Shrewsbury and studies carried out to help establish practical solutions. This work identified that constructing defences to keep out river water was only part of the problem. The groundwater and sewerage system in Shrewsbury is closely linked to the river - and any solution would have to consider the effect of flooding from the drains too. How flood defences could accommodate groundwater and sewerage during a period of flood is a key issue. Severn Trent Water Ltd (STWL), the company responsible for the sewerage system in Shrewsbury, is working closely with the Agency to identify potential solutions.

In addition, a substantial amount of work has been carried out on all aspects of flooding within the Severn catchment as a whole. This work is still continuing as part of the Severn Flood Management Strategy, which is predominately looking at long-term solutions to flooding issues along the length of the River Severn.

*Shrewsbury flooded 2000*



# Rea Brook diversion

It has been suggested that it might be possible to construct a large culvert near the Rea Brook that would divert some of the river flow through the adjacent hill, somewhere between Shrewsbury College and the Shire Hall. The water would rejoin the River Severn

downstream of Shrewsbury. Initial indications are that although this would reduce water levels, it would not be enough to protect all of Shrewsbury from flooding.

It has been estimated that the cost of constructing such a tunnel is similar to that to construct the

entire flood defences in the town. However this diversion would not protect the entire town from flooding and therefore is not economic. At present it is not believed to be a viable option, however we will consult with STWL to establish if there is any benefit to the sewerage system, although it is thought to be unlikely.

## The proposed changes to the rules

Recently the Treasury and DEFRA have been consulting on proposals to revise the economic criteria to reflect the modern cost of flooding with greater accuracy. Currently these revisions are under consultation. It is likely that if the criteria were changed, more schemes would be able to meet the benefit/cost ratio across the country.

Obviously we can't really use these criteria as a realistic guide at present. As a result of the consultation the criteria might be modified, or indeed the government might decide to make no changes at all. However, we have taken a provisional look at what these potential changes might mean for the remaining flood risk areas of Shrewsbury. Unfortunately, we believe that if the rules do change, it is likely that there would probably only be two areas of Shrewsbury that would have a benefit/cost ratio of near one. These would be Abbey Foregate and Underdale Road (No's 111 to 131). We would of course review all of the flood cells once the actual criteria were known.



Marine Terrace & St Julians Friars



Coleham Head



Abbey Foregate

## Sewer flooding in Abbey Foregate

Some properties in Abbey Foregate also suffer from flooding from the sewerage system when the river levels are normal. STWL is planning a project to deal with this, independently from the Agency.



# What happens now?



Under the current economic rules, there is little likelihood of being able to undertake any additional work. We need to wait and see what changes DEFRA make to the economic rules and guidance next year.

However, we will continue to consult with STWL to see if we can identify any potential sewerage improvements that might form the basis of joint projects.

If, and when, the economic rules change, the Agency will consider the viability of other flood cells in Shrewsbury as a high priority. In the longer term, it is hoped that the Severn Flood Management Strategy will identify new ways of reducing flooding along the length of the River Severn, that would in turn, bring benefits to Shrewsbury.

## How flood defences are financed

Flood defences are financed by a number of methods. The Environment Agency has responsibility for many of the main rivers in England and Wales. The country is split up into regions and every region has Regional Flood Defence Committees (RFDC). These committees are responsible for funding major schemes. The RFDC is made up of representatives of local authorities within the region. Funds are raised through levies as part of the local council tax. In addition, DEFRA provides

substantial grants for schemes and few schemes can be built without such grants.

STWL is financed through the sewerage water charges. To allow works on water supply and sewerage schemes to proceed, funding has to be approved and regulated by OFWAT and, in this type of project, the Environment Agency. The programme that is implemented is called AMP<sup>5</sup>. The AMP schemes need to be identified at the start of each five year period. To allow Frankwell to proceed a number of schemes

were removed from the AMP programme. Fortunately these schemes had been evaluated and found not to be necessary after all, thus releasing money which is being used to construct the sewerage elements of the Frankwell scheme. At present, the current AMP has no further flexibility and therefore funding for newly identified sewerage scheme needs has to be identified and considered under the next AMP.

## The economics of flood defences

To allow flood defences to be constructed, national processes must be applied, so that the country's limited funds are spent fairly and to the maximum benefit. Before works can be considered, the cost of the benefits must be established as being greater than the cost of the works. This is called the benefit/cost

ratio, and for a scheme to be viable, it must be greater than one<sup>†</sup>. These rules come from the Treasury and are applicable, in various forms, to all government capital expenditure.

With regard to flood defences, DEFRA has recently introduced a revised priority scoring system

and this places schemes in the national context. Other than the economics, this revised scoring system takes into account the environmental sustainability of the proposal. In addition, social issues are also taken into account. However, economics remains, for the majority of locations, the single most important factor.

<sup>5</sup> AMP stands for the Asset Management Plan. These run for five years and currently we are in AMP3 which runs from 2000 to 2005. AMP4 will run from 2005 to 2010.

<sup>†</sup> In simple terms, if the cost of building a defence is £1M, the recognised economic benefits over the life of the scheme must be greater than £1M. This would give a benefit/cost ratio of greater than one. The life of the scheme is calculated as 50 years, and the cost of damage from any flood likely to take place during this time is added together - the economic benefits being the amount of damages avoided by building the scheme



# Frankwell Flood alleviation works

In conjunction with STWL, the Agency believed it would be possible to provide flood defences for the Frankwell area of the town. This is the area that floods first. For a scheme to succeed, it was also necessary to invest heavily in the sewerage system.

During June 2001, initial designs for the Frankwell flood defence scheme were submitted to Shrewsbury and Atcham Borough Council, and planning permission was subsequently granted. During August 2001, the internal Agency and DEFRA approvals were also granted. This allowed the Agency to approach contractors with preliminary tenders that were returned during September 2001. Detailed design continued, after a contract was let to Dean and Dyball Ltd, and work started on site in January 2002.

With the agreement of STWL, the Department for Environment, Food and Rural Affairs (DEFRA) (formerly MAFF) and the Office of Water Services (OFWAT), funding for the sewerage elements of the works was established. This agreement was reached during October 2001, and was the final element to allow the financing of the scheme to be achieved and subsequently allowing works to proceed.



Frankwell flood defence works



## Defences for Shrewsbury after Frankwell

**Whilst the Agency has been undertaking the Frankwell scheme, the consultation process for options for the remaining areas of Shrewsbury has begun. The scoping document for the Environmental Impact Assessment (EIA) was published in December 2001 with consultation extending into the spring of 2002. The EIA process must be undertaken by law, and makes sure that both positive and negative environmental effects are fully understood before any scheme is built. Negative impacts are minimised and positive opportunities are taken to enhance the quality of the environment wherever possible.**

The areas that flood from the river have been identified and threshold surveys<sup>#</sup> of properties affected have been carried out. The areas are grouped into self-contained areas, termed cells.

The threshold surveys provide us with information that forms the basis of the economic assessment. This is calculated around the statistical likelihood of properties being flooded, the severity of the flooding and the cost of constructing flood defences to protect those properties.

We have not yet fully evaluated the effect of the sewers. In some cases it may be possible to construct some flood defences that are not affected by the sewers. However, where sewers will have an effect on flood defences, the Agency has been working with STWL to identify and evaluate options. This work is still continuing.

Estimating flood defence works is extremely complex, especially when the ground conditions are as difficult as they are in Shrewsbury. However, we do believe our cost calculations are as accurate as they can be at this stage and we have drawn on lessons from the Frankwell scheme for our estimates. For each cell we have identified the types of works that would be necessary to protect from flooding for the 1 in 100\* year flood event. This would provide the same level of protection as at Frankwell.

On analysis of the flood defence cells under consideration (other than Frankwell), our assessment is that they will not meet the benefit/cost criteria. In other words, there is no economic benefit under the current rules in undertaking any further flood defence works in Shrewsbury, so the defences already being constructed in Frankwell would be the only defences built.

<sup>#</sup> Threshold surveys help us to estimate which properties will flood and what level of damage will be done, by calculating the height of each property's front steps in relation to the river.

\* Floods are categorised by their size and the frequency with which they can be expected to occur. A 1 in 5 year flood is one that has a 20% chance of happening in any year, but its effects can be enormous. A 1 in 100 year flood has only a 1% chance of happening in any year, but its effects can be enormous.

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