To: **City Executive Board**

Date: **18th February 2008** **Item No:**

Report of: **Head of Environmental Development**

Title of Report: Building flood resilience in domestic properties

Summary and Recommendations

Purpose of report: This report advises members on the cost of improving the resilience of individual households to ground, surface and fluvial flooding of their homes, and the options for increasing uptake of these measures.

Key decision? No

Executive lead member: Councillor Colin Cook

Report Approved by:
Finance: Andy Collet, Group Accountant
Legal: Jeremy Thomas, Head of Legal & Democratic Services

Policy Framework: Corporate Plan 2008-2011 priority to "tackle climate change and promote environmental resource management", by March 2009 invest £50,000 in flooding prevention activities such as pumps & barriers", and "by March 2011 be better prepared for the future impacts of climate change (e.g. … floods) …"

Recommendation(s)

City Executive Board is RECOMMENDED to:

1. Note that although more than 120 houses flooded in 2000 and 2003 and 170 flooded in 2007, more than 3,500 properties in Oxford are currently at risk of flooding more than once in 75 years.
2. Note the increasing difficulty home owners have in obtaining flood insurance cover for properties with that level of risk and which the Association of British Insurers refers to as "significant".
3. Note that DEFRA's current £5million fund for property-level flood resilience is targeted at areas with no prospect of flood defence schemes, so Oxford is not eligible.
4. Note that only 30 per cent of homes that can sign up to the Environment Agency's Floodline Warnings Direct service have signed up
5. Approve the use of Council resources to encourage local residents to sign up to the Floodline Warnings Direct service and to compile and distribute basic information and a list of contacts for use by people interested in installing property-level flood resistance and resilience measures, as described in Option One.
6. Request a further report on the implications for property-level flood resilience once the prospects are known for the Environment Agency's flood strategy for Oxford .

Introduction

1. In July 2007, in addition to the businesses and transport systems affected, more than 170 houses were flooded In Oxford by a 1 in 25 year flood event, caused by intense rainfall on saturated ground in the Thames catchment:
   - 95 in the Botley Rd / Binsey Road area
   - 41 on Osney Island
   - 34 in the Abingdon Road area
   - 2 houses in other areas

2. Flood risks for many of these properties are being marginally reduced by the 'short-term measures' undertaken by member organisations of the Oxford Area Flood Partnership. Unless the Environment Agency's planned flood strategy is completed for Oxford they will remain at high risk and more than 3,000 other houses in Oxford will remain at significant risk of flooding (more than 1 in 75 years).

3. In June 2008, heavy rainfall over the city showed that other houses are at risk from surface water run-off.

4. This report sets out the costs of a range of options for increasing the uptake of property-level flood resilience in order to reduce such consequences of flooding. All options would need further work if they were to be adopted and the more costly options are also outlined in order to describe the scale of the problem, although they appear to be unaffordable at present.

5. Property-level options come within a wider range of flood risk measures, which are described in Appendix 1. They are in two broad categories:
   - Resistance – preventing floodwater getting in.
   - Resilience – minimising the disruption caused when it does.

6. Resistance can enable continuing occupation, whilst property-level flood resilience can cut the time that residents are displaced from their homes (typically to as little as 2-4 weeks) so cutting financial, social and health costs.

7. The range of property-level options described in Appendix 2, covers protection of irreplaceable documents (at zero cost) to comprehensive flood resistance (at up to £30,000).

8. Appendix 8 sets out indicative costs and benefits of installing a range of flood resilient measures in a terraced house. Some costs would be higher for a semi-detached house. Other measures not listed there (such as a concrete bottom step on staircases) and other flood resistance measures could result in total costs in the range of £20,000 to £30,000 per house.

Council obligations

9. The Council has an obligation to arrange temporary accommodation for people made homeless by flooding if they have no other resources. For those renting, further accommodation can normally be found, with difficulty. Owners can often arrange alternative accommodation through relatives, friends or insurance.

However the Council has a residual obligation to provide accommodation over longer periods for owners of homes made uninhabitable by flooding, if they have neither insurance nor other resources to repair them, or to house themselves.

10. In 2007, such residual obligations were not called upon. However, this could be an issue for the Council at the next flood if owners have been unable to afford the increased premiums and excess costs for insurance.

11. If homes are seriously inundated this may give rise to a series of hazards which if assessed as Category 1 will require that the Council takes action under the Housing Health and Safety Rating System (HHSRS).

12. Discretionary renovation grants could also be made available for qualifying works, subject to a test of the occupier's financial resources and the demands of the existing capital programme.

Insurance position

13. Appendix 3 includes the Association of British Insurers (ABI) 'Revised Statement of Principles on the Provision of Flood Insurance'.

14. Until 30th June 2013, members of the Association of British Insurers (ABI) have committed to continue to make flood insurance available as a feature of standard household policies if the flood risk is not "significant" (i.e. no worse than a 1 in 75 annual probability of flooding).

15. They have also committed to offer flood cover to existing domestic property at "significant" flood risk until that date, providing the Environment Agency has announced plans and notified the ABI of its intention to reduce the risk for those customers below "significant" within five years (of the insurance application). Subject to satisfactory information about a new owner, the commitment to offer cover will extend to a new owner.

16. After 1st July 2013, they will provide cover to the vast majority of households without the specific commitments. Where the flood risk is "significant" and there are no public plans in place to defend the property they will work with existing customers to explore insurance options. However, the premiums charged and the policy terms will reflect the level of risk presented.

17. The Environment Agency's proposed flood scheme for Oxford cannot be in place before 2015, even if it gains approval from the EA's National Group and Board this year and then Treasury approves funding of the £100 million scheme. It will be open to 12 weeks public consultation from 18th February 2009.

18. Up to 3,500 properties in Oxford are at a "significant" risk of flooding and with recent experiences it is clear that about 150 properties in Oxford are at risk of a 1 in 15 year flood. Up to 50 remain at risk from floods of 1 in 10 year probability, possibly with no insurance cover, or with cover offered only at an unaffordable cost. That will increase the Council's risk of incurring costs after the next flood.

19. Many of the properties flooded in July 2007 needed to be stripped out, dried for a long period and then repaired. Many were not re-occupied after six months and 10% of affected households had still not returned home after twelve months. The

need to use temporary accommodation forms a significant part of the total financial cost, and a major part of the associated health and social costs.

20. The ABI has published a guide that indicates that its members will work with customers who wish to repair their home to a flood-resilient standard following damage. If the cost is greater than a standard repair (like-for-like), then insurers will only provide funds up to the cost of the standard repair.

21. We understand from the ABI that, in the short-term, the costs of insurance are unlikely to be reduced by flood-resilient repair, but that installing such measures in a house at high flood risk could make the difference between flood insurance being obtainable or not. However, in addition to the additional costs that will be avoided with each flood after the resilient repair, insurance costs should reduce in the longer term as the level of claims reduces.

The national picture

22. Outline
    - About 400,000 houses are at significant flood risk (over 1 in 75 years)
    - The Environment Agency's long-term strategy will provide flood protection (up to 1 in 75 years) to about half of those.
    - About 10,000 of the remaining 200,000 are at high flood risk (over 1 in 10 years). For them, the benefits of adopting property-level measures would outweigh the costs over 20 years between five and ten-fold.
    - 55,000 houses flooded in 2007. There is little evidence that any have been repaired to flood-resilient standards.
    - The Flood Protection Association (a manufacturer's body) reports that less than 5,000 homes have acquired approved resistance measures

23. DEFRA is providing £5 million to encourage property-level flood measures and will channel this to local authorities through the Environment Agency (EA). Oxford is not eligible for those grants, as they are targeted at homes that have no prospect of protection by flood defence schemes. The DEFRA fund will have been spent before the EA's proposed strategy is submitted for approval. However, the DEFRA consultation paper has provided much useful information as outlined in Appendix 4.

24. Appendix 5 outlines the findings of the DEFRA pilot projects and schemes undertaken by three other local authorities

The Oxford picture

25. Scope of the problem
    - According to the Environment Agency 5,491 properties are at risk of flooding from a 1 in 100 year flood event in Oxford, where the minimum standard of protection is around 20% (or 1 in 5 years).
    - 160 properties flooded in December 2000. 123 flooded again in January 2003 (both assessed as 1 in 15 year events) and again in July 2007 when 178 houses flooded above floor level (also described as a "low order event").
    - At least 18 (10%) of those that flooded in July 2007 were still empty 12 months later.

- We estimate that a further 600 houses flooded below their habitable floor level in July 2007.
- Many of the houses flooded in 2007 were inundated by rising groundwater, so could not be protected by property-level barriers or street-level defences. Such properties will remain susceptible to groundwater flooding until completion of the EA strategy. Meanwhile, the only effective prevention options for householders appear to be installing a pump, in an attempt to pump out the inflow, or replacing suspended floors with solid concrete with a sump pump to remove any leakage.
- We know of a few houses in Oxford that had flood-resilient repairs after the 2007 flood (rather than "like for like" reinstatement) but no comprehensive information yet on the measures taken.
- Other houses in Oxford are susceptible to surface water flooding that will occur increasingly often as climate change causes local rainstorms to become more intense. The owners could benefit from similar advice to that needed by those susceptible to river and groundwater flooding.
- Sewer flooding has added to the problems caused by other flooding, but has not been a major priority so far. It is a separate issue that is not addressed by this report, but could occur more often as a result of climate change.

26. Environment Agency Flood Strategy for Oxford

The Environment Agency has assessed over 50 options for relieving flooding in Oxford. These included storing more water on the floodplains upstream of the city and diversion of flood flows around the developed areas with a channel through the western part of Oxford's floodplain.

We understand that the proposed strategy is based on a "western conveyance" for flood water that would provide protection against floods of at least a 1 in 75 year event, if not 1 in 100 year event. The scope of the strategy will be clearer from 18th February 2009, but a detailed design has not yet been done and the proposed line of the channel remains undecided.

Funding approval for the scheme will be in competition with maintenance commitments and other flood relief schemes.

It seems likely that the adopted strategy would include other works similar to the "short-term measures" that are currently in progress.

Options for increasing uptake of property-level flood resilience

27. Encouraging the uptake of flood resilience can be approached in four ways:

- **Information and advice**
  To provide education about flood risk and flood-protection measures, promotion of services targeted at the high-risk areas and providing impartial advice to owners of houses at risk.
- **Free property surveys and reports**
  To provide house owners with the information they need to decide on appropriate works.

- **Grants for practical measures**
  These could be means tested or require a householder contribution and could be combined with a maximum level of grant. These would be separate from any means-tested renovation grants. We would need to maintain a grants register, so that any future funding could take account of grants provided. (Administration costs have yet to be assessed).
- **Repayable loans for practical measures**
  As for grants, above, but repayable in instalments or on the sale of the property.

28. Property-level flood protection can be tackled at three levels:

- **Survey** (at £500-£1,000 /house)
  To establish risks and what measures are appropriate
- **Flood resistance works** (at up to £4,000 / house)
  Door and airbrick protection, pump/sump and non-return drain valve
  Some suppliers provide substantial discounts for bulk orders through local authorities, so costs could be significantly lower than this.
- **Flood resilience works** (at up to £30,000 / house)
  Flood resistance works as above, plus changes to electrics, kitchen, plaster and installing solid ground floors.

29. The full cost implications of such an approach could be considered to be unaffordable at present, so options based on these are listed in Appendix 7 for comparison purposes, with only the recommended option given here.

30. <u>Option One – Provide comprehensive advice</u>

Appendix 6 outlines the barriers to adoption of flood resilience measures that apply, regardless of the option chosen.

Among these, lack of a) information, b) impartial advice, c) understanding of the nature of risk and d) confidence are significant barriers to householders adopting property-level flood resistance and flood-resilience measures.

Information, advice and descriptions of the nature of flood risk are freely available to those with the ability to find them through the Internet.

Many householders will be unable to discover appropriate sources of information for themselves. For those that do, the volume of information available could well be a barrier in itself.

Officers propose that the Council could provide a useful service to those whose homes are at risk of flooding, by researching and collating a representative sample of the information available and providing guidance on how to access it.

For those without access to the Internet, the Council could provide an information pack with guidance on coping with flood risk, examples of suitable products and a comprehensive list of supplier contact details.

This advice would be compiled in a co-ordinated approach with other members of the Oxford Area Flood Partnership.

We have not yet assessed the cost of this option, which would require only input of officer time and some support costs.

Risk management

31. This report outlines the costs of managing some aspects of flood risk in Oxford, where the minimum level of protection is currently against 1 in 5 year floods.

32. If the Environment Agency's planned flood strategy goes ahead in 2012, the minimum level of protection should rise to at least 1 in 75 year floods by 2015.

33. DEFRA has assessed that property-level flood resilience measures are cost effective for properties at risk of flooding more often than 1 in 10 years.

34. In Oxford, about 150 houses have flooded 3 times in the last 8 years from floods assessed as about 1 in 15 year return period. It seems that flood resilience measures might be beneficial for these premises, or at least increase residents' peace of mind. These properties remain at risk of further flooding until completion of the Environment Agency strategy.

35. The Council's risks from flooding of domestic properties arise …

    a) Directly – from those such as at Bulstake Close, which Oxford City Homes owns and already has flood response plans for.

    b) Indirectly – both due to its obligation to arrange temporary accommodation for people made homeless and to its obligation to act under HHSRS (the Household Health & Safety Rating System) if premises become uninhabitable.

    c) Long-term – if the Environment Agency strategy does not go ahead as soon as planned. If parts of the city become blighted due to ongoing flood risk, or extra housing stock is needed to replace that lost due to flood damage.

36. The Council has no statutory responsibility for the improvement of resistance or resilience of flooding to premises. In taking any action under the provisions of the Local Government Act, the Council would have to be careful not to create any duty of care or warranty.

37. For householders in vulnerable areas, the risk of a "1 in 15 year" flood is about 7% in any one year. The risk of such a flood recurring in the 7 years until the earliest possible completion of the Environment Agency's proposed scheme in 2015 is about 33%. The cost of protection, potentially as little as £2,000 per house can be considered alongside the potential £10 - £20,000 cost of damage to an unprotected property. This approach to risk and the responsibilities of property ownership needs to be understood by homeowners.

Equalities implications

38. Households that suffer flooding can experience:
    a) Significant reduction in income due to the additional financial costs, both immediate and long term;
    b) Poor housing, at least for a period, but long-term if unable to fund repairs;

c) Bad health, due to the stress of the event, living with the risk and problems arising from damp living conditions;
d) Social stress, including family breakdown, due to the disruption caused.

Unless other factors apply, areas of housing susceptible to flooding could become less attractive to owner-occupiers, so tending to reduce community cohesiveness, although a temporary community spirit can become evident when floods occur.

39. The Council is working in the Oxford Area Flood Partnership with other agencies to tackle flooding problems at several levels, and involving local people in this.

Climate change implications

40. Climate change is likely to result in wetter winters, drier summers and greater extremes in weather.

41. If the planned Environment Agency strategy is not funded, the risks of flooding of houses from rivers and groundwater will tend to get worse in winter, although already unacceptable in several parts of Oxford.

42. Greater extremes in weather are likely to include more intense rainfall (including summer thunderstorms) that would cause both sewage overflows (due to lack of capacity in combined sewers) and surface water flooding (due to run-off from saturated ground in winter and paved surfaces at any time of year). This report has not assessed the risk due to such flooding.

Conclusions

43. The major flood defence strategy planned by the Environment Agency, if adopted, would protect against floods of at least 1 in 75 year return period. However, the strategy has to compete for national funding, in the current financial circumstances, with major projects in other areas of high flood risk. We will not know the final proposals until public consultation in Spring 2009. The Environment Agency plans to then submit the strategy for internal approval later in 2009.

44. If successful, the strategy could not be effective until 2015 at the earliest, leaving the most vulnerable houses at risk of flooding until then, except for the minor improvements achieved by the EA's "short-term measures".

45. If unsuccessful, the most vulnerable properties would remain at risk indefinitely,

46. The existence of the proposed strategy means:
    Firstly, that Oxford is not eligible through the proposed DEFRA scheme for grants to encourage uptake of property-level flood resilience; and
    Secondly, that any property-level flood protection installed now will only be used if another flood occurs before the EA strategy work is completed. The recognised cost-effectiveness of such measures is then apparently reduced. Nevertheless, individual owners might want the increased reassurance of installing such measures meanwhile.

47. High costs may deter many owners from installing full property-level flood-resilience measures, and the total cost of potential grants or loans clearly exceeds

what the Council can afford. However, given appropriate advice, owners might want to install some measures in order to achieve some additional protection.

48. The above Options address the risks faced by fewer than 200 properties – those that flooded in 2000, 2003 and 2007 – because they appear to be the homes most at risk of flooding, where property resilience measures are likely to be the most cost-effective. They do not address the (more than 3,500) other properties that the Environment Agency assesses to be at risk from a 1 in 100 year flood event in Oxford.

Recommendations

City Executive Board is recommended to …

a) Note that although more than 120 houses flooded in 2000 and 2003 and more than 170 flooded in 2007, more than 3,500 properties in Oxford are currently at risk of flooding more than once in 75 years

b) Note the increasing difficulty home owners have in obtaining flood insurance cover for properties with that level of risk, and which the Association of British Insurers refers to as "significant"

c) Note that DEFRA's current £5million fund for property-level flood resilience is targeted at areas with no prospect of flood defence schemes, so Oxford is not eligible.

d) Note that only 30 per cent of homes that can sign up to the Environment Agency's Floodline Warnings Direct service have signed up.

e) Approve the use of Council resources to encourage local residents to sign up to the Floodline Warnings Direct service and to compile and distribute basic information and a list of contacts for use by people interested in installing property-level flood resistance and resilience measures, as described in Option One.

f) Request a further report on the implications for property-level flood resilience once the prospects for the Environment Agency's flood strategy for Oxford are known.

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Background papers:

DEFRA "Consultation on promoting property-level flood protection and resilience" 2008
DEFRA briefing on "Resilience Grants Pilot Projects"
DEFRA "Flood Resistant and Resilient Solutions, an R&D scoping study"
Association of British Insurers / National Flood Forum – "Flood Resilient Homes"

APPENDIX 1 – Flood management options

A flood defence scheme - The Environment Agency (EA) proposes a £100 million flood relief channel for Oxford that is designed to defend against floods with a return period of at least 1 in 75 years. However, even if approved, that scheme cannot be effective before 2015. So properties that flooded three times in the last eight years, will be at similar risk of flooding for a further seven years.

Flood defence "short-term measures" – Oxford City Homes plans to build a wall that will keep floods (of up to a 1 in 10 year event) from the Botley Road. Meanwhile it will deploy pumps and sandbags for this.

The EA now keeps temporary barriers to deploy when floods threaten Osney Island and the Vicarage Lane area. It has also started a £1.8 million programme in the South and West areas of Oxford to increase watercourse capacities.

Flood response – City Works how has a flood response unit with large and small pumps and sandbag stockpiles. It can also draw on its other equipment and staff as needed.

Flood resistance – property level barriers to flooding

Flood resilience - property-level improvements which enable rapid re-occupation once a flood has receded.

APPENDIX 2 – Resistance v Resilience at property level

Resistance measures can be either:

- Temporary (manually installed door guards and airbrick covers)
  Deployment depends on the equipment remaining available and undamaged between uses (despite changes in home ownership or tenancy) and on occupants being aware, available and able to fit it.
- Permanent (flood-tight doors, automatically-closing airbricks)
  These measures are more expensive but, as they need no intervention, are potentially more reliable. However, the equipment has not been tested to Kitemark standards and such testing is no longer available. Permanent resistance may also include external waterproof rendering or repointing of brickwork.

In order to be effective, both approaches also need remedial works to seal water entry points (possibly including non-return valves on drains) with sumps and (possibly automatic) pumps to remove any leakage that bypasses the resistance measures.

Typical cost	**Resistance measure** (Assumes a terraced house) (Indicative costs including installation) (*supply costs could be substantially lower through bulk purchase)
£0	Store irreplaceable documents and items above flood level
£10	Make up a “flood plan” with a “flood kit”
£860	4 airbrick covers (~ £ 80 each) and 2 door guards (~£270* each)
£3,400	4 automatic airbricks (~£ 100 each) and 2 waterproof doors (~£1,500 each)
£4,200	Ditto PLUS one-way drain valve in chamber (~£800 each)
£4,600	Ditto PLUS one-way drain valve in chamber (~£800 each) PLUS pump (~£400 each)
varies	Brickwork repointing

Resilience measures include: resilient plaster (up to 1m), lightweight internal doors on lift-off hinges, kitchen units in metal or other resilient material, plastic skirting boards, raised appliances and raised electric circuits. Resilient flooring can be:

- Omitted
  (If floors are not already solid, or in order to defer a significant part of the resilient repair costs), or
- Included
  Concrete/sealed floors are a necessary resistance measure where flooding is due to groundwater. Installing such floors prevents the cost and waste of repeated “like-for-like” replacement of suspended flooring.

(Appendix 8 lists indicative costs and benefits of installing resilience measures)

APPENDIX 3 – Association of British Insurers

REVISED STATEMENT OF PRINCIPLES ON THE PROVISION OF FLOOD INSURANCE

The Government and the insurance industry have agreed that the conditions should be in place to enable the insurance market to be able to provide flood insurance to the vast majority of households and small businesses efficiently and without the specific commitments below from 1st July 2013. Thereafter, the industry will continue to work with existing customers to explore insurance options for domestic property and small business customers where the flood risk is significant and no public plans are in place to defend the property.

Until 30th June 2013, ABI members commit to:

- Continue to make flood insurance for domestic properties and small businesses available as a feature of standard household and small business policies if the flood risk is not significant (this is generally defined as no worse than a 1.3% or 1 in 75 annual probability of flooding).

- Continue to offer flood cover to existing domestic property and small business customers at significant flood risk providing the Environment Agency has announced plans and notified the ABI of its intention to reduce the risk for those customers below significant within five years. The commitment to offer cover will extend to the new owner of any applicable property subject to satisfactory information about the new owner.

It is important to note that:

- The premiums charged and policy terms will reflect the level of risk presented and are not affected by this commitment.

- This commitment does not apply to any new property built after 1st January 2009: the ABI encourages developers and customers purchasing a property in a new development to ensure that it is insurable for flooding. The ABI intends to publish guidance on insurance for new developments in autumn 2008.

This commitment is subject to annual review that will consider progress in resolving the areas of continuing work and implementing the Government's commitments and to additional review in the event of any significant external shocks, such as a reduction in the availability of flood reinsurance or major changes in the UK insurance market.

July 2008

APPENDIX 4 - Outline of DEFRA proposals for property-level flood protection and resilience

DEFRA has commissioned studies into various aspects of property-level flood resistance and flood resilience. It has also funded pilot schemes in six areas of UK to assess practicalities.

At the end of October 2008, consultation closed on policy options for promoting property-level measures, based on that earlier work. Proposals recognised that action is needed to "kick-start" uptake of these measures, so included providing £5 million in grants for protecting properties at high risk of flooding. It sought views on whether grants should be used for:

- Option 1 - To pay only for individual home surveys (in order to provide independent guidance on appropriate measures), or
- Option 2 – To pay for surveys and for purchase and installation of flood resistance and resilience equipment.

Option 1 – Free surveys only

Surveys can cost about £1,000 each. However, if commissioned in bulk this can reduce to about £500 each, enabling 10,000 homes nationally to be surveyed for £5 million.

However, only 1 in 3 households (3,300 homes) are likely to act on those surveys as, without benefit of the further discounts potentially available through Option 2, householders would have to pay for flood measures themselves.

Option 2 – Free surveys with equipment grants

The minimum cost of providing basic protection to a home at high risk is about £4,000 (or £4,500 with survey costs). So DEFRA proposes that £4,500 should be the maximum grant available under Option 2. The larger grant would result in increased take-up rates, but fewer households (about 1,100 nationally) would then benefit.

Grants would go further if householders had to make a minimum contribution to equipment costs. With 25% contributions, up to 1,400 households might benefit, and some could use the grant to part-fund much more comprehensive resilience measures.

Funding proposal

DEFRA proposes to channel the funding through the EA, which would identify those areas with a significant risk of flooding where no flood defence investment is planned and apportion the funds to local authorities, which might then supplement those grants with funds from other sources.

APPENDIX 5 – Findings of DEFRA pilot projects and schemes by other local authorities

DEFRA pilot projects

Grants limited to £5,000 each. 240 properties considered eligible.

199 properties (83%) took up the grant at an average of £2,900.

Installation costs ranged from £300 to £13,000 (with owner funding)

Protecting a semi-detached house typically costs £3,500: airbrick covers (£1,500) anti-flood valve (£500) flood gates (£750 per door).

Carlisle City Council Flood Resilience Pilot Scheme (2005)

Initial estimate: £3,000 each on 50-60 properties (£180,000).

Final estimate: £3,750 each on 75-80 properties (£300,000).

Cheltenham Borough Council (Dec 2007)

Approved £50,000 for flood resilience grants up to £500 each to the properties worst affected by the 2007 floods.

Cotswold District Council

Approved £200,000 for grant funding up to £10,000 per parish for parish flood resilience and planning for emergencies.

APPENDIX 6 - Barriers to adoption of resilience measures

The Jacob report to DEFRA revealed that there are numerous barriers to uptake of property-level resistance and resilience measures by householders. (In contrast, managers of small businesses appear to recognise the benefits).

Those barriers include:

- Denial: Ignoring the fact that flooding will recur.
- Poor understanding: of what flood risk means.
- Lack of information: on strategies and products available.
- Uncertainty: about the effectiveness of available products and their value for money.
- Cost: concern about the cost of flood resistance and resilience measures.
- Lack of impartial advice: Appropriate measures are likely to be different for each property, but there is a wide range of strategies and products to choose from. An appropriate solution is likely to need products from different sources, but advice is normally only available from manufacturers keen to sell their own product.
- Lack of confidence: in being able to make the right choice.
- Short-term residence: Expecting to have moved within a short time
- Unrealistic discounting: Undervaluing the present day value of future savings made possible by current spending.
- Missing signals: Mapped areas of "greater than 1% "(100:1) flood risk are not subdivided to indicate the areas of greatest risk. However, the insurance industry is thought to be attempting this for its own purposes.
  The benefits of undertaking costly resilience work on properties banded at 10% risk (10:1) are much greater than for those at 4% risk (25:1) or 2% risk (50:1). Ideally these differences would be reflected in insurance premiums and home owners would be guaranteed a significant reduction in premium (and excess payment applicable) commensurate with the flood-resistance and flood-resilience of their property, to take account not only of the reduced costs of subsequent flood repairs, but also the cost of the much-reduced period of alternative accommodation needed.
- Perceived effect on house appearance: concern that permanent fixtures, such as permanent frames for temporary flood boards, will detract from the appearance of the property
- Perceived effect on house value or future sale price: flood resistance and resilience measures will protect the property, which would be a selling point if insurance premiums reflected flood risk accurately and buyers and sellers understood risk. However, such measures give a clear indication that the property is at risk of flooding, which may detract from the property's sale value.

- Lack of a "critical mass" of properties with flood-resistant and flood-resilient measures: Once a reasonable proportion of houses have been adapted, these measures will tend to become accepted as normal – like home insulation. There is an opportunity for the Council to assist this by promoting these measures as a climate change issue – as it does with energy-saving measures.

APPENDIX 7 – Other options

(See the body of the report for descriptions of Options One and Two)

- Option One [the recommended option] - Provide comprehensive advice

Pros	Cons
• Inexpensive • Information is readily available to the Council • Would tend to inspire confidence in adopting resilient measures, and remove some of the obstacles to flood risk management for householders	• May not result in a high level of uptake
Issues	
We would need to address the equal opportunities issues related to ability to use the internet, language barriers and other matters.	

- Option Two - Commission sample surveys

Pros	Cons
• A relatively inexpensive way of providing many households at risk of flooding with an indication of the risks that they face and the options open to them • Potentially much more cost-effective than Option One • Gives the Council an element of preparedness for any future scheme that might be needed	• Survey reports might cost £500 to £1,000 each • Householders cannot legally rely on a report provided for a neighbouring property
Issues	

- Option Three – Free surveys

  For £40,000 the Council could block-commission up to 80 surveys. However, as about 70 of the houses most at risk are adjacent terraced properties with similar threshold levels one report might suit for several, so reducing unit costs.

  It could cost about £80,000 to £120,000 to survey all houses that flooded in 2007.

  However, DEFRA experience indicates that as few as 1 in 3 owners provided with a report might actually install flood resistance measures. So the cost-effectiveness of this approach could be low.

  There is a risk that effective measures might not be affordable by owners of the most vulnerable properties unless grants are available.

Pros	Cons
• Makes the risks clearer • Raises the profile of flood resistance and resilience • Provides specific information to the maximum number of owners of houses at risk • Would provide a proper assessment of the required/recommended measures for individual households to assist in planning works & in negotiations with their insurers	• Of very limited cost-effectiveness due to the low level of uptake of flood protection measures • Cold result in no actual physical improvements to houses at risk.
Issues	
• Need for clarity on ownership of report information and liability for acting on it. e.g. if report (or measures taken) pass to a subsequent owner of the property. • No practical help for homes subject to groundwater flooding	

- Option Four – Negotiate discounts for multiple purchases

  In order to encourage installation of flood resistance measures, some of the householders' prospective costs might be reduced by the Council negotiating discounts with suppliers for multiple orders, provided owners were willing to accept a limited choice of equipment.

  Assuming the average house is terraced and would need to install a non-return valve (£800), flood boards at two doorways (£270 each) protection for four airbricks (£100 each) and a pump and sump (£1,400 to £2,000) the cost would be about £3,200 to £3,800 per property.

  Such resistance measures would protect some of the houses flooded in 2007, but only reduce the severity of the next flood in the most vulnerable houses, so acting as a first stage towards resilient repairs. For Oxford's 180 houses at risk, the total cost is potentially £700,000. Assuming 33% uptake, total product cost would be about £150,000, so negotiating discounts appears to be feasible.

  Surveys indicate that householders would appreciate the certainty introduced by the Council effectively endorsing certain products. However, the Council would need to first be assured of the suitability of those products.

  We have not yet assessed the cost of this option, which would require only input of officer time and some support costs.

Pros	Cons
• Might result in limited installation of flood-resistant measures • Greater potential for raising awareness than Option one. • Marginally more cost-effective than Option One	• Some budget would (probably) have to be diverted from flood-surveys into setting up the scheme
Issues	
• No practical help for homes subject to groundwater flooding. However, a few owners of those houses might obtain flood-resistance equipment and reduce problems by installing pumps	

- Option Five (for comparison only) – Full resistant and resilient repairs

  Assuming that about half of the properties flooded in 2007 would benefit from full resilient repair, and for the remainder flood-resistance measures would suffice, this could cost up to:

  Flood resistance: 90 x £5,000 = £450,000
  Flood resilience: 90 x £25,000 (average) = £2,250,000
  Total: £2,700,000

  The most vulnerable houses in Oxford are currently at risk simultaneously from both river and groundwater flooding. So, for adequate property-level protection, these properties appear to need significant flood resilience measures to act as flood resistance, in the form of solid flooring at a total cost of up to £30,000 each. Some of the vulnerable properties may already have solid ground floors or other resilient features, so reducing the total cost of works needed to make them flood-resilient.

Pros	**Cons**
• Comprehensive protection and resilience that would enable house to be re-occupied within as little as 2-4 weeks of a flood.	• Cost • Would be superseded by about 2015 by the protection provided by the EA's planned strategy, if that is approved.
Issues	
Such a scheme would have to be in place before the next flood, so that resilient repairs could be undertaken once properties were already being repaired. Practical benefits would not begin to accrue until the flood after that, although insurance premiums should eventually reduce in view of the decreased risk.	

APPENDIX 8 – Typical costs of flood resilience measures

Indicative Costs (£) for a Two-Bedroom Terrace House

Measure	Cost of restoration without flood resilience	Extra cost of installing flood resilience	Costs saved each deep flood (to 1m)	Costs saved each shallow flood (to 5cm)
FLOORS				
1 Replace sand-cement screeds on solid concrete slabs	450	90	300	300
2 Replace chipboard flooring with treated timber floorboards	360	390	285	285
3 Replace floor including joists with treated timber to make it water resistant	2430	405	2145	2145
4 Replace timber floor with solid concrete	2430	5170	1780	1780
5 Raise floor above most likely flood level	17200	11000	13250	11700
WALLS				
6 Replace mineral insulation within walls with closed cell insulation	385	235	320	320
7 Replace gypsum plaster with water resistant material, such as lime plaster	3525	2725	3050	3050
8 Install chemical damp-proof course below joist level	2430	2655	1905	2175
9 Replace doors, windows, frames with water-resistant alternatives	4400	3710	3870	2080
INTERIORS				
10 Mount boilers on wall	850	150	700	700
11 Move washing machine to first floor	400	200	400	400
12 Replace ovens with raised, built-under type	450	200	350	350
13 Move electrics well above likely flood level	450	250	350	None
14 Move service meters well above likely flood level	1000	500	850	300
15 Replace chipboard kitchen/bathroom units with plastic units	2430	2655	1905	1905