FLOOD RESILIENCE COMMUNITY PATHFINDER PROJECT – 17420: Final Report

Name of council: Buckinghamshire County Council
Project area: Chesham, Buckinghamshire
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1. Introduction

The Department for Environment, Food and Rural Affairs (Defra) created the Flood Resilience Community Pathfinder programme to look at innovative and community-based responses to flood risk. From 2013 to 2015, thirteen projects within the UK were part-funded; one of these was in Chesham, Buckinghamshire.

The Chesham Pathfinder project was publicly named FloodSmart, and was managed by Buckinghamshire County Council, working in partnership with the Environment Agency, Chiltern District Council, Chesham Town Council and the National Flood Forum.

This report presents a summary of the FloodSmart project, including its principal highlights, what it was able to achieve against the objectives it set itself, the lessons that were learned during its implementation, and the planned legacy of the project.

Chesham’s watercourses

Chesham is a town of approximately 21,000 inhabitants located within the Chiltern District in the south of Buckinghamshire. The River Chess originates in Chesham: it is a chalk stream that flows for 11 miles from Pednorned End in Chesham to its confluence with the River Colne, which itself is a tributary of the River Thames.

Apart from some small sections upstream of Pednorned End, the River Chess is classed as a main river. An important tributary of the River Chess is the Vale Brook, which is piped or culverted for most of its length through town. The Vale Brook is particularly important in relation to flooding in Chesham, since it performs a major urban drainage function.

In terms of flooding, the three main zones of concern are Pednorned End, near the source of the Chess, the area from Market Square along the High Street north to The Broadway and finally the area around Broad Street, as mapped in Figure 2 (next page).
Figure 2: FloodSmart’s flood risk map

- **Broad Street area**
- **High Street area**
- **Pednормead End**
- **Old Town**
2. Project highlights

The Chesham Pathfinder project (known publicly as FloodSmart) ran from 2013 to 2015. Among the highlights of the project were: the formation of and work with the Chesham Flood Action Group; awareness-raising with residents, businesses and schools; offering free flood surveys and a grant towards runoff reduction measures; drainage improvements around the Vale Brook; better understanding of planning and, last but not least, excellent partnership working between the agencies involved in the project.

One of the principal highlights of the project has been the formation and consolidation of the Chesham Flood Action Group (CFLAG). Formed in December 2013, the group has a Chair and a Secretary and is affiliated to the National Flood Forum. CFLAG has around 15 core members and at least 40 residents on its mailing/call list.

The group typically meets on a monthly basis to discuss flood-related issues and work through its action plan. This plan has also formed the basis of discussions during several Multi-Agency Meetings between the Chesham Flood Action Group (CLFAG) and relevant agencies. CFLAG ran a number of events, including one at the Chesham Mosque in November 2014.

A number of awareness-raising activities were undertaken. The project emphasised marketing and branding to focus attention on the project and the issues raised; this started with naming it FloodSmart.

Supported by FloodSmart-branded leaflets, banners, a gazebo and other materials, the project ran a number of events over the lifetime of the project. These included the official project launch event in October 2013, stands in local supermarkets and the street market, as well as an exhibition of Chesham flooding photographs over the years, which took place in November 2013.

FloodSmart interacted with schools, running several flood-themed assemblies in local schools. In addition to events aimed at local residents, the project also focused on local
businesses, by running an information event and offering free flood surveys to impacted business as well as residential properties.

To help alleviate flooding in the town, FloodSmart focused on the upper Vale Brook, an ordinary watercourse serving an important urban drainage function. The project aimed to reduce peak flows entering the culverted watercourse, whose limited capacity regularly leads to a backing up of water and flooding of properties. Through CCTV surveying, modelling and the upcoming installation of a flood alleviation scheme (a roadside swale in a known problem area providing additional capacity during peak events), FloodSmart contributed to ongoing improvements in that catchment.

FloodSmart sought to examine the role of planning in decision making regarding flood alleviation schemes, using Chesham as an example but producing conclusions that are applicable in the whole of Chiltern District as well as on a national level.

Finally, the partnership work that took place as part of FloodSmart between Buckinghamshire County Council, Chiltern District Council, Chesham Town Council, the National Flood Forum and the Environment Agency has helped build stronger bonds between these agencies and will contribute to enhanced partnership working going forward.

Throughout the report, references are made to the project’s work packages (detailed in Appendix 1):

- Work package 1: awareness-raising activities with residents, schools and businesses.
- Work package 2: improvements, mostly to highway drainage, centred on the Vale Brook.
- Work package 3: work to understand the planning-related constraints and opportunities for flood management.
3. FloodSmart: part of a wider scheme

To provide some context about the Flood Resilience Community Pathfinder scheme, the Department for Environment, Food and Rural Affairs (Defra) has asked all the projects to include this message in their final report:

“Defra is working across a range of technical areas including planning, land management, flood defences, sustainable water management, to improve flood resilience in England.

Community resilience – the response of people at risk of flooding - is an important aspect of this system. Quite often, simple actions by individual householders and communities can significantly reduce local vulnerability and the level of any resulting damages from flood events. The Flood Resilience Community Pathfinder scheme is a demonstration pilot, whose outputs and outcomes will help us understand better the contribution that actions by individuals and communities can make to better manage their flood risk.

The scheme operated between 2013 and 2015 and we expect that the overall investment in this scheme to be around £5.2m of which, Defra will have provided £4m. The first output from the scheme was published in February 2014 – a study reviewing the best research evidence about communities and resilience [The report http://goo.gl/jf0N9G]. Its findings underscored the complexity the relationship between awareness and action but noted that interventions based on engagement, dialogue and learning seem to provide promise, in terms of improving resilience to flood risk at the community level. This will form part of the base line for the overall evaluation of the scheme.

Authorities in: Blackburn, Buckinghamshire, Calderdale, Cornwall, Devon, Liverpool, Northamptonshire, Rochdale, Slough, Southampton, Swindon, Warwickshire and West Sussex, all implemented practical projects with local communities. Many are partnerships, with the authority working with a range of national and local organizations to deliver the aims of their project. The local audience for each project varies considerably across the country and they deployed a range of approaches to engage local people. We hope that the results help authorities work with other local communities in their area and that by sharing their learning and experience from their projects, they can inspire neighbouring authorities to engage their communities in similar ways.

Defra will be evaluating the results from all 13 projects during the summer of 2015. By reviewing the work of all the pathfinder we hope to capturing the key practical and policy learning points to better inform our policy making and that of other flood risk management authorities.”
4. Project activities and achievements
This section presents the FloodSmart’s achievements against the objectives determined during the bid stage of the project.

Project objectives

“Chesham will be more aware, resilient and prepared for the effects of flooding. The town will benefit from an active, thriving, community-led flood action group lobbying for flood management solutions and actively identifying, reporting and/or maintaining flood assets. Individuals will be more aware of their flood risk and of options to protect their property and how to react in times of flood. Residents will be armed with the most relevant information to enable them to access insurance and decrease household water runoff.

Flood storage opportunities within new developments or redevelopments and highway drainage will have been taken advantage of, thereby increasing the town’s protection from flooding. Partner organisations will have closer working relationships with an increased focus on flood risk management and wider sustainability improvements. The project will provide a template for strategic flood management that could be disseminated across other parts of Buckinghamshire.”

“Chesham will be more aware, resilient and prepared for the effects of flooding” & “Individuals will be more aware of their flood risk and of options to protect their property and how to react in times of flood.”

Previous work done in Chesham revealed that awareness of flood risk among the town’s residents was low, as was willingness to take action to reduce flood risk. The FloodSmart project therefore set out to increase awareness of flooding in Chesham.

FloodSmart’s awareness-raising activities took place via its website, events and press activities. The website went live in October 2013; the project was also present on social media, via twitter and facebook (see Appendix 6). FloodSmart was present in the press, as shown in Appendix 5, for example via bi-monthly articles in Your Chesham, reaching over 11,000 homes. These articles covered topics such as flood insurance, how and why Chesham floods, runoff reduction grants and the Chesham Flood Action Group. Articles about FloodSmart also appeared in local and county newspapers.

Figure 6: FloodSmart homepage screenshot
Anecdotal evidence has shown that the Your Chesham articles are widely read; residents got in touch with both the project managers and the Flood Action Group as a result of some of the articles, and 9 out of 20 survey respondents reported having learned of FloodSmart through Your Chesham.

FloodSmart hired a marketing company to support its awareness-raising activities. The intended outcome was that this expert input would improve engagement and marketing initiatives, something which the project steering group felt was indeed the case.

To support events, a set of FloodSmart-branded marketing collateral was created, including a general project leaflet, two banners, a gazebo and a tablecloth. This professionally-designed material has proved popular with event attendees and helped attract audiences. For example, one schoolgirl recognised the FloodSmart stand at a supermarket event, having previously seen it as part of a FloodSmart-led assembly at her school.

In some instances, project messages were delivered indirectly, as part of other activities. For example, residents in the north of Chesham were posted a “notice to frontages” informing them of the upcoming FloodSmart CCTV work, as part of the Buckinghamshire County Council highways team’s standard practice. This notice mentioned the work was being done as part of FloodSmart, asking residents to help the project by not parking over gullies. Another example is the project’s baseline and end of project surveys, where FloodSmart added a question asking if respondents wanted to be contacted for more information and potential volunteering with the Flood Action Group.

FloodSmart also commissioned an awareness-raising animated video explaining how and why Chesham floods, which has been viewed 474 times to date and was also shown to over 200 children at a school assembly.

A FloodSmart interpretation board with map and text was installed in Chesham’s Market Square, a pedestrian area with high footfall (see Appendix 7).

Businesses in Chesham are primarily located in the most high-risk areas, along Market Square, the High Street and Broad Street. FloodSmart raised awareness with businesses both directly and indirectly (for example by putting up FloodSmart photo exhibition posters
in shop windows and having subsequent conversations with shop owners/tenants). Direct engagement took place via FloodSmart’s two presentations to the Chiltern Chamber and an event held targeted at businesses in October 2014. Finally, Buckinghamshire County Council went door-to-door to obtain information for the investigation into the 20 September 2014 flooding, which in many instances led to conversations about the FloodSmart project.

The project was able to raise awareness within schools, leading whole school assemblies of around 200 pupils in two different primary schools: Thomas Harding School and Little Spring School. The presentations used photos and an interactive question and answer format to cover some basic facts about flooding (sources of flooding, major floods versus ponding); photos of recognisable parts of Chesham were particularly popular: “The children were still buzzing about seeing pictures of Chesham when they left the assembly” (A. Dale, Thomas Harding School).

Awareness-raising events held by the project – for example stands in supermarkets and street markets – attracted a total audience of at least 800 people, and the November 2013 FloodSmart photo exhibition was seen by many more.

**Example of an awareness-raising event**

On 07 November 2014, the Chesham Flood Action Group (CFLAG) and National Flood Forum held a flood awareness-raising event at the Chesham Mosque, to talk to local residents attending Friday prayers. Approximately 60 residents took leaflets, many stopping to talk enthusiastically about their local knowledge and concerns, and to look at the FloodSmart visualisation tool.

Several residents took up the opportunity to join the Chesham Flood Action Group mailing list, and to apply for FloodSmart visualisation tool interviews, flood surveys, and rainfall runoff reduction opportunities. Chesham’s Mayor, Councillor Mohammad Fayyaz was invited, and enjoyed supporting the event and helping with language translation.
“Residents will be armed with the most relevant information to enable them to access insurance and decrease household water runoff (and reduce water use).”

FloodSmart provided information on insurance on its website, included information on insurance as part of all awareness-raising events, and also published an article on flood insurance in the May 2014 issue of Your Chesham. Many people were directed to the National Flood Forum’s telephone helpline, dealing with all flood issues, including insurance.

FloodSmart created a runoff reduction leaflet for distribution around Chesham, summarising the main options available to residents: installing water butts, planting trees, creating raingardens, reducing water-resistant surfaces and growing green roofs.

The leaflet was accompanied by a dedicated web page on the FloodSmart website providing links and further information about each option. A runoff reduction grant was also set up, whereby residents would match-fund the installation of chosen measures on their property. Few residents expressed initial interest in the grant, and seven residents ended up installing runoff reduction measures on their property: water butts and one permeable paving option.

Permeable paving reduces runoff from a Chesham property

Permeable paving was installed on one property in Chesham, on a hilly road leading down to a flood-prone area.

The property owner was match-funded to replace the driveway with low-maintenance gravel over a stabilising base (made of hexagonal cellular plastic). The new driveway allows water to drain away over the entire drive surface and has stopped runoff.

The property owner explained the benefits of the driveway: “We’re really pleased with the result; we feel we’ve helped the community and the environment and we’ve got a driveway which is now a lovely and has much improved the frontage of the house.”
“The town will benefit from an active, thriving, community-led flood action group lobbying for flood management solutions and actively identifying, reporting and/or maintaining flood assets.”

Chesham’s Flood Action Group was formed in December 2013, and has now been formalised, with a Chair, a Secretary and formal affiliation with the National Flood Forum. There are also plans to appoint a Treasurer and set up a bank account, in order to be able to take advantage of community grants. The group is composed of around 15 ‘core’ members who participate in most meetings and other members who occasionally attend meetings and receive information by email or by phone.

The group is very active, having so far had at least 14 internal meetings, organised three multi-agency meetings and participated in a number of activities around Chesham. These have included: a review of highway drainage assets in the Hivings Hill area with Transport for Buckinghamshire; a site visit with the Environment Agency to better understand the layout of watercourses in the Pednornead area; helping the Environment Agency speak to business property tenants and owners about the Vale Brook culvert; the organisation of an event aimed at demonstrating flood protection products to residents. The Chesham Flood Action Group has also set up a system of ‘area reps,’ with a group member taking charge of a particular neighbourhood in terms of reporting any problems, speaking to residents etc. The group has created a map pinpointing known flood problems, which has been shared with agencies.

The Chesham Flood Action Group (CFLAG) has written a proposal relating to flood risk, involving the creation of an additional channel for the River Chess through Wright’s Meadow. CFLAG presented the proposal at a meeting of Chesham’s Town Council’s Development Control Committee in March 2015; the group is continuing to work on the proposal to progress it further and obtain funding.

The Chesham Flood Action Group organised its own event for residents relating to Property Level Protection product demonstration. The group has also helped FloodSmart deliver a number of events, as detailed in previous pages.

The Chesham Flood Action Group (CLFAG) has built strong links with existing community groups within Chesham, such as the River Chess Association and the Chesham Environmental Group, with some members of CFLAG also being part of these other groups. This has led to a sharing of knowledge and contacts, and a growing understanding of the interconnected nature of water-related issues. CFLAG has helped shape the FloodSmart project; the Chair has been a member of the project steering group since September 2014,
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representing CFLAG’s point of view and bringing relevant project information back to the residents’ group.

The FloodSmart steering group decided in June 2014 that the Chesham Flood Action Group (CFLAG) should decide what to spend a portion of the project budget on.

CFLAG felt that better mapping of the highway drainage network was vital for understanding and reducing flood risk in the town. As a result, part of the FloodSmart budget was used to undertake a detailed survey of highway drainage in the Pednormead End area of town in March 2015.

CFLAG provided valuable support, allowing the initial gully jetting work and CCTV survey to proceed. The group helped by placing traffic cones, supporting the moving of vehicles and by placing leaflets advising parked vehicles of the upcoming road closure and parking restrictions.

“Flood storage opportunities within new developments or redevelopments and highway drainage will have been taken advantage of, thereby increasing the town’s protection from flooding.”

FloodSmart did a lot of work relating to highway drainage into and around the piped Vale Brook (its ordinary watercourse section, north of Townsend Road). The main surface water flood risk areas in Chesham are located in this part of town. Once the Vale Brook becomes a ‘main river’ (from Townsend road to the point where it enters the River Chess), its capacity is limited and intense rainfall events can lead to overflows from the culvert. It was therefore considered important to create additional capacity further downstream by delaying peak flows into the culvert upstream.

The project’s first step was to get a better understanding of the highway drainage assets in the area, through a CCTV survey of the Vale Brook pipe and highway drainage flowing into it. This survey revealed the pipe to be in broadly good condition, and mapped out its exact route. The results of the survey were incorporated into an existing local flood risk model to make it more precise.
FloodSmart is in the process of installing flood alleviation scheme on Vale Road, creating a 130m long swale in the highway verge with a perforated pipe of restricted diameter that will cause water to back up and be stored within the swale.

FloodSmart has also commissioned a concept communication tool, which will involve doing the outline design of two schemes within the Vale Brook catchment, and creating a visual report to be used in discussions with the local community in the coming years, with the view of eventually applying for funding to install these two schemes. This concept communication tool will use ‘before and after’ photomontages to help residents and site users understand the planned size, style and use implications of the proposed schemes. Design will only be at outline level only, allowing feedback from the community to feed into any detailed design done if the schemes are then installed.

FloodSmart’s work on flood storage opportunities within the planning system was done by way of the project’s third work package, dedicated to understanding planning-related constraints and opportunities. This work is described in case study 1 within Section 6.

The FloodSmart project partnership soon came to the conclusion that it would be important to undertake some activities in the wider catchment linked to water and sediment runoff, which is a particular problem in Chesham. FloodSmart was able to link to the work being done by the Chilterns Conservation Board on their free farm advisory visits within the Chilterns AONB, adding flood management to the list of topics discussed during the visits.

“Partner organisations will have closer working relationships with an increased focus on flood risk management and wider sustainability improvements.”

FloodSmart was a partnership between: Buckinghamshire County Council, Chesham Town Council, Chiltern District Council, the Environment Agency and the National Flood Forum. Each partnership organisation sent one or more representatives to quarterly steering group meetings; as of September 2014, the chair of the Chesham Flood Action Group also became part of the steering group. A working group for each of the three work packages was also formed, with work package 1 having the most regular contact, in the form of monthly teleconferences.

To understand what partnership organisations thought about the project, focus groups were held towards the end of the project, both with the steering group and the work package 3 working group. Within both, the importance of the partnership working that took place as a result of FloodSmart was highlighted as one of the project’s key successes; the question ‘does this working partnership have to end?’ sums up the general feeling of enthusiasm that was expressed. All steering group participants confirmed that the targeted focus of building successful relationships between the partners was instrumental to the key success of the steering group. One partner expressed that they felt included in FloodSmart whereas they often feel excluded in other projects.
“The project will provide a template for strategic flood management that could be disseminated across other parts of Buckinghamshire.”

FloodSmart has already had a positive impact on ways of working within Buckinghamshire County Council’s Strategic Flood Management team, and will continue to do so. This is particularly the case for the activities relating to work with communities at risk of flooding; more information about the project’s legacy is provided in Section 8 of this report.
5. What has changed as a result of FloodSmart?

This section details some specific outcomes from activities implemented by the FloodSmart project. Changes relating to partnership working have been described in Section 4.

**Awareness-raising activities**

It was intended that the outcomes of the awareness-raising activities described in Section 4 would be interest from the media, as well as engagement and interest from stakeholders (Chesham residents and businesses), as evidenced by the recruitment of volunteers for a flood action group. Numerous articles in local and county press show that there was media interest in the project (Appendix 5).

The existence of the Chesham Flood Action Group (CFLAG), with its core membership of residents but also some occasional meeting attendees and a healthy mailing list, is evidence of the success of activities aimed at attracting membership to and interest in the group. Examples of activities that successfully increased CFLAG’s membership were the project launch event in October 2013 and the FloodSmart baseline survey which asked respondents to express their interest. Many respondents to the final project survey questionnaire had heard of FloodSmart before, although it may have been a self-selecting sample (i.e. respondents willing to fill in the survey precisely because the project was familiar to them).

**Flood risk visualisation and surveys**

One of the main awareness-related issues in Chesham, as demonstrated in previous projects, was a lack of understanding on the part of individual residents about the flood risk affecting them and their property. FloodSmart therefore created a flood risk visualisation tool, which was delivered to residents via one-to-one conversations. More detail about this given in the case study in case study 2 within Section 6.

FloodSmart also offered free flood surveys to a number of properties in Chesham. Twenty-two properties (13 residential and 9 businesses) have signed up for flood surveys, with the vast majority having been completed at the point of writing. Insufficient time has passed to evaluate how recipients have understood and taken on board the survey reports.

**The Chesham Flood Action Group**

Section 4 has highlighted many of the activities undertaken by the Chesham Flood Action Group (CFLAG). At the start of the project, the planned medium-term outcome relating to CFLAG was that the group was to increase Chesham’s capacity to deal with flooding.

Participation in the Chesham Flood Action Group (CFLAG) has had a positive impact in terms of the individuals directly involved. According to discussions held during CFLAG’s focus group, it has provided a really helpful place for people to support one another and to solve problems through engaging practically with agencies and working together. Membership in
the group has provided a better understanding of agencies’ and individuals’ responsibilities and limitations. CFLAG members mainly joined the group in response to issues in their own immediate neighbourhoods: the group has enabled them to address these, but also to start broadening their views to consider town-wide issues.

Thirteen out of 47 final survey respondents had heard of the Chesham Flood Action Group (CFLAG). CFLAG has so far only been able to influence the wider community to a limited extent, for a number of reasons. Some of these were highlighted during CFLAG’s focus group, and included the fact that CFLAG is covering a bigger area than most flood action groups, which usually have a single focus rather than a more complex situation like in Chesham, as well as the time taken to form and then formally constitute the group. It has also taken some time for the group to go beyond highly localised issues raised by members and start addressing broader problems. One member said “it feels like we are just getting going.”

The Chesham Flood Action Group (CFLAG) could not identify any evidence of preparedness outside their group at this stage. However, CFLAG’s activities during FloodSmart’s lifetime will hopefully only be the start of things, and the project managers feel that much has been accomplished by CFLAG already, given that the group only started in December 2013 and was constituted in June 2014. As one CFLAG member put it, “the group now has the potential to empower residents, because we understand more how things work and who to go to.” The FloodSmart steering group mentioned during its focus group that public awareness has now started and that CFLAG are a good point of interest should local residents need questions answered.

Runoff reduction

The aim of the runoff reduction guide (which was a leaflet and accompanying web page) and grant was to make residents aware of possible runoff reduction measures and of their role in preventing floods. FloodSmart had planned to evidence this outcome by looking at the number of residents installing (or wanting to install) runoff reduction measures. As shown in Section 4, FloodSmart encountered limited success with its runoff reduction grant. However, some of the residents who expressed interest and others spoken to in town expressed an understanding of the impact of urbanisation and the multiplication of impermeable surfaces in terms of flooding.

Improvements to highway drainage relating to the Vale Brook

Activities within the project’s second work package delivered a number of outcomes. A CCTV survey of the piped Vale Brook and highway connections into it enabled accurate mapping of the drainage system, and a report including the location and condition of pipes was delivered to Buckinghamshire County Council (BCC). This data in turn allowed the existing hydraulic model of the town to be improved through the inclusion of new
information. Analysis using the updated model was used to establish a list of possible locations and types of improvements, both short-term and more long-term, was created. BCC plans to use this information to implement further improvements to highway drainage beyond the life of FloodSmart, as explained in Section 8. Although this work has not yet started, progress has been made through the setting up of new lines of communication with the BCC highways team, and the regular review of the Local Flood Risk Management Strategy action plan.

Although the building of the planned swale along Vale Road has not yet been completed, the outcome of this activity will be a reduction of flow volumes within the Vale Brook culvert of the order of 18m$^3$. This is a relatively small storage volume, but will contribute to improving the situation in Chesham, and makes sense particularly in the context of the limited availability of flood storage sites in the town. It will help contribute to the wider package of work included in the Chesham Flood Alleviation Scheme described in Section 8. In addition, the concept communications work described in Section 4 will hopefully lead to a bid for two further schemes which, if funded, will also contribute to reducing high frequency ‘nuisance’ flooding in Chesham.

The ‘Aquaprint’ report on constraints and opportunities of the planning system

More detail about the work on Aquaprint is given in case study 1 within Section 6.
6. Case studies

Case study 1: Constraints and opportunities of the planning process for flood risk management – an ‘Aquaprint’ for Chesham

The 2011 Chesham Surface Water Management Plan established the potential benefit (in situ and downstream) of providing flood storage in an area north of Chesham’s town centre. This storage area could be taken advantage of if redevelopment opportunities arose in the future, but the presence of and need to preserve existing businesses complicated things. Project partners recognised that the planning system is complex and such opportunities for betterment of flood risk are not always developed to an extent that they can be implemented when opportunities arise. This prompted the idea for a FloodSmart activity centred on planning, the ‘Aquaprint’ concept, work on which took place from August 2013 to March 2015.

Activities

Partners realised that the particular site identified in the Surface Water Management Plan would not be redeveloped for decades – having been identified as a key employment area needing preservation – so it was decided to develop a more generic Aquaprint not based solely on this site. The activity looked at constraints and opportunities within the planning system for the delivery of flood alleviation schemes. Delivery of the activity was steered by the work package 3 working group, composed of staff from the Local Planning Authority (Chiltern District Council), the Environment Agency and Buckinghamshire County Council. Actual delivery of the Aquaprint report was contracted out. The target audience for Aquaprint is primarily Chiltern District Council’s planning department, though it is hoped the outputs will be of interest both to other Local Planning Authorities within Buckinghamshire as well as nationally.

Objectives

FloodSmart aimed to identify the main planning-related constraints and opportunities for the establishment of flood alleviation schemes, to inform future planning and flood management decision making.

Outputs and outcomes

The outputs consisted of an internal report to Chiltern District Council, with references to specific project sites identified within the Surface Water Management Plan, and a publicly-available report generalising the conclusions without reference to specific sites.

The work on Aquaprint, due to the exploratory nature of the topic, evolved as the project went along, and it took some time for the work package 3 working group to reach consensus on how the work should be tackled. It is therefore a bit early to review the outcomes of this activity; however, discussions during the focus group for work package 3’s working group provide some insight.

Focus group participants mentioned that Aquaprint raised a number of important issues related to flood risk that will be of particular benefit to Chiltern District Council as they prepare their Local Plan, and that the work provided ready-made evidence that can be used in gathering information for the Local Plan. It was mentioned that the Aquaprint work has been fed into Supplementary Planning Documents on sustainability which have now been adopted by Chiltern District Council.
The work done as part of FloodSmart forms part of the evidence base that will be used in planning decisions. It was felt that some of Aquaprint’s concepts could help with site applications going forward and that it could be useful for a similar approach to be adopted at other sites within Chiltern District.

Some of the officers involved reported that the Aquaprint work had helped them on a personal level, for example because they gained a better understanding of the flood risks and solutions in Chesham. Another commented that as a non-planner, they can now appreciate the difficulties planners have in coming up with policy and have gained a better understanding of the processes thanks to the project.

Lessons learned

For project evaluation, a focus group involving the Chiltern District Council and Environment Agency working group members was convened; a number of useful points were raised by participants.

Some staff members were involved in putting the project bid together and were able to influence the thinking behind the work package early on. One of the main positive aspects of the work package was the ongoing open dialogue and partnership working that evolved: “a very strong line of communications between the partners involved has been developed, which will no doubt extend beyond the project.” Participants also felt Chiltern District Council’s involvement in the project is going to lead to a strong and locally-specific flood risk policy emerging in the forthcoming Local Plan.

The fact that the Aquaprint activities weren’t fixed from the start proved to be both a challenge and an opportunity, in that it allowed the group to shape the direction of the project but also meant progress was quite slow. Another challenge related to staffing changes within Buckinghamshire County Council, which created a gap in decision making until August 2013, at which point the Aquaprint activities got started. This, combined with the fact that activities were initially planned to slot in after some work package 2 work had been completed, compressed the timescales available to do work on Aquaprint.

Conclusions

FloodSmart hopes other public bodies will find the Aquaprint documentation relevant to their areas. There is scope to expand this work, for example through further research into specific constraints and opportunities, or via case studies of Aquaprint’s real world applicability.
Case study 2: Influencing perceptions of flood risk using the FloodSmart flood risk visualisation tool

Previous work in Chesham had identified a lack of awareness of and interest in flood risk as a barrier to flood-related work and community engagement. The FloodSmart project aimed to influence residents’ perceptions of flood risk through many different activities, including the creation and dissemination of a flood risk visualisation tool. Work on the tool itself was initiated in May 2014 and completed in September 2014, while demonstration of the tool to residents took place from September 2014 to March 2015.

Activities

This case study covers two related activities: the creation of the tool (as part of work package 2) and the delivery of personal conversations with residents to demonstrate the tool (work package 1). The actual production of the tool was contracted out to a consultancy, but the FloodSmart partnership and the Chesham Flood Action Group were closely involved in designing the tool, providing feedback on initial options as well as the draft version. The tool is based on the use of GIS layers to present information.

![Figure 17: Screenshot of the flood risk visualisation tool](image)

It includes: several options for the base map (aerial photography, a street map and a historical OS map); layers showing the different flood depths for surface water and fluvial flooding as well as flood velocities on roads; locations of completed flood alleviation schemes; plotted photographs of actual flooding in Chesham, both past and present.

Once the tool was ready, a training session on how to use the tool was organised for the National Flood Forum (NFF) and the Chesham Flood Action Group. The NFF was tasked with organising and delivering the one-to-one conversations with residents; drumming up interest was done by way of events with community groups, a leaflet in the local printed press and small posters placed in the neighbourhoods at highest risk.

Objectives

The activity’s objective was to create an easy-to-use flood risk visualisation tool as well as to improve Chesham residents’ understanding of flood risk by holding conversations with them using the tool.

Outputs and outcomes

This activity’s outputs were on one hand the creation of the visualisation tool, uploaded to a tablet (as well as that of an additional ‘fly-through’ video showing an aerial view of what Chesham would look like during a 1 in 1000 year event), and on the other the delivery of around 40 in-depth conversations with residents using the tool and the securing of further involvement from four of these residents, in the shape of surveys (3) or interest in the runoff reduction grant (1). The tool was used during several awareness-raising events and was also presented to the Chesham Environmental Group, creating further opportunities for discussions.

In terms of outcomes, the residents who benefited from the personal conversations reported an improved
Understanding of their property’s flood risk, as well as Chesham’s flood risk and how it might affect them (e.g. by making roads they use impassable).

Participants valued the personal conversations using the visualisation tool because they offered the chance to discuss their personal concerns (about flooding on the wider scale but also and particularly on the individual property scale) with an individual knowledgeable about flooding at the national, strategic level, but also locally to Chesham.

Residents valued the personal tailoring, by being able to direct the conversation as to their interests, but also having someone to help them to navigate through the tool as best suited them. Some of the participants do not have access to a computer, so didn’t feel confident at first using the interactive tablet format, but support and explanation helped this.

Several residents said that they valued the fact that they were able to receive further guidance beyond the scope of the visualisation tool, such as Property Level Protection advice and demonstration, insurance advice, discussion of local flood projects and leaflets to keep.

Examples of feedback received: “It’s so important that people are aware of and understand their flood risk, we have flooded many times, so we know. This tool is very helpful.” “It has been really useful to see photographs with the maps, I’ve only been in the area since 2011 and I didn’t realise there were these issues, or how high the water can get in Berkhamstead Road” (Personal conversation recipients, 2014/5).

Lessons learned

Feedback received from FloodSmart partners and the Chesham Flood Action Group about the tool during the draft tool presentation session and the tool use training session was positive, in terms of how information was presented and the ease of use of the tool. In addition, feedback about the tool from residents following the one to one sessions was positive, and they responded particularly well to the interactive nature of the tool, the photos showing past flooding in town and the ability to manipulate layers using the tablet functions.

The main challenge related to the one-to-one conversations, specifically the difficulty encountered in setting up the sessions themselves. Once sessions were held, the feedback was positive, and a high proportion of interviewees took follow-up action, but very few residents replied to the National Flood Forum’s repeated and varied efforts to organise the sessions in the first place. After promotion through a well-read local publication generated no interest, the NFF implemented some alternative ideas, which fared better but still generated little interest. Although this demonstrates the difficulties of engaging with communities at risk, a possible partial solution would be to put the tool online to allow residents to access it independently, as detailed below.

Conclusions

The tool itself is an important and useful resource for communicating flood risk, and can easily be replicated in other areas. The tool was designed to be used offline, on the tablet or on laptops using a memory stick. However, it was built with the ability to be easily transferred to online use, and Buckinghamshire County Council is currently commissioning this work. Although careful thought will be given to the scale of the maps, the sensitivity of information presented and the need to signpost to further resources, this could be an excellent way of reaching people via smartphones, tablets and PCs. This would also help overcome the reticence of residents to and adverse practical implications (in terms of staff time) of the one-to-one conversations. If the online “self-service” version of this tool generates positive feedback, this option will be recommended to others.
7. Lessons from the FloodSmart project

Although each activity undertaken as part of FloodSmart generated multiple learning points, some common themes emerged; these are listed below.

**Partnership working: delivering benefits beyond the project**

The partnership working that took place as a result of FloodSmart generated a number of interesting learning points. Wide-ranging and inter-disciplinary awareness of other organisations’ activities is essential in order to take advantage of opportunities. For example, FloodSmart was able to deliver awareness-raising messages via the Chiltern Conservation Board’s existing free farm visits project. As explained in Section 8, the FloodSmart partners hope to continue this beyond the life of the project, through the creation of a committee covering all water-related issues in Chesham.

In terms of partnership working between agencies and the Chesham Flood Action Group (CFLAG), this took place during multi-agency meetings, ad-hock site visits and via the CFLAG Chair’s membership of the FloodSmart steering group. One limitation was the time available to community flood groups (whose members are primarily employed full-time) as well as agency staff. It is important for agencies and flood groups to reach agreement on levels of and timescales for involvement, taking into account their respective constraints.

**Engaging with people: challenging and time-consuming, but rewarding**

FloodSmart highlighted the need to build in a lot of time for activities relating to engagement with people, be they residents, businesses or farmers. Within agencies, support at an organisational and senior level is essential, and enables staff to dedicate time to resilience-building activities. The short effective timespan of the Pathfinder programme was insufficient to create widespread community engagement, and certainly made measuring progress and successes challenging.

Conclusions from FloodSmart support national-level research that, even in communities affected by flood risk, repeated experiences of flooding are often required for residents to take action. For instance, despite a September 2014 flood event having internally flooded 29 businesses primarily along Chesham’s High Street, only 4 businesses subsequently attended a business event held in October, and only 9 agreed to receive a free flood survey. Although there were other mitigating factors (e.g. the date and time of the event; the fact that several shops felt covered by their national-level headquarters), this still demonstrates a certain lack of interest.

Another example was the lack of success FloodSmart experienced in organising free flood visualisation one-to-one conversations with residents. Again, although there could be other mitigating factors (e.g. preference for different methods of communication), this again demonstrated the difficulty in communicating flood risk to communities. Once the
conversations took place, feedback about the tool and the information provided was positive. BCC is planning to extend use of the tool by putting it online.

The Chesham Flood Action Group (CFLAG) also experienced some difficulties in communicating flood risk to other residents. CFLAG members noted considerable antipathy from local residents against publicising flood risk in Chesham, particularly in relation to the available flood risk mapping and the FloodSmart visualisation tool, because these emphasise the reality of the situation, but at the same time have limitations in terms of how they incorporate local topography, e.g. walls, steps, etc. CFLAG noted that the high turnover of home ownership in Chesham has played a part, since there is significant minority of residents who expect to sell soon and want to suppress the suggestion of flood risk; it has also suppressed the level of flood reporting.

The issue of land ownership should not be underestimated in relation to the installation of flood alleviation schemes; substantial time should always be built in for negotiations with landowners and alternative possibilities sketched out. For FloodSmart, a six month period was spent trying to obtain agreement from a landowner for the installation of a field bund; when this was refused, the timescales for the implementation of an alternative scheme were very tight.

FloodSmart also encountered limited success in its efforts to engage with farmers and landowners via the Chilterns Conservation Board’s free farm advisory visits project. This activity had little response, despite offering free visits and even the possibility of financial assistance. This may have been a combination of erroneous details in the database and the high prevalence of smaller grazing-only holdings; anecdotal evidence further showed some farmers may have feared that a visit would lead to unwanted regulatory attention.

The Chesham Flood Action Group: just getting started

As highlighted in Section 5, the Chesham Flood Action Group (CFLAG) expressed during its focus group the feeling that it was only just getting started, having spent a lot of time establishing the group: attracting volunteers, constituting itself more formally and allowing enough time for members to discuss local issues of most pressing concern to them. In terms of FloodSmart’s lifetime, CFLAG’s main milestones happened quite some time after the official start of the project: formal constitution and election of Chair in June 2014, and the Chair joining the steering group in September 2014.

The project partnership had initially planned some other activities centred on the Chesham Flood Action Group (CFLAG); they were: producing a flood plan and running a flood response training exercise. CFLAG preferred not to undertake these activities during the lifetime of the project, feeling they were still at a more initial group-building stage. This demonstrates the need to build in significant amounts of time for flood action group establishment and strengthening before starting major activities.
How to reach residents: explore all avenues

FloodSmart used a wide variety of different ways to reach its target audience, partly because respondents to the baseline survey reported wanting to receive information from wide-ranging sources (e.g. a website, local press, events etc.). Some approaches were more successful than others.

Local printed press (e.g. Your Chesham) remained an effective way of reaching audiences. This was evidenced by response to calls for action, e.g. the runoff reduction grant expression of interest or the article encouraging residents to contact or join the Chesham Flood Action Group, as a result of which at least two enquiries were sent to the group’s Chair. In terms of events, invitation-based face-to-face events did not generate many attendees but those that came tended to stay for some time, while opportunistic face-to-face events (e.g. supermarket stall) did reach many more people.

Although response rates to the end of project survey questionnaire were too low to draw real conclusions from, they do give an approximate indication of which approaches are more successful than others.

![Figure 19: Answers to the survey question “If had heard of FloodSmart, how did you hear about it”](image)

Funding pots for households: to be designed carefully

Very substantial amounts of time are needed for the creation of match-funded grants for techniques whose prices vary greatly based on area covered, location and other factors, time which FloodSmart lacked for its runoff reduction grant. A “chicken and egg” situation was created, whereby information about specific properties was needed in order to obtain quotes for the work, but whereby residents were unwilling to express interest without having an understanding of how much money they might be asked to contribute to the installation. This generated a big time burden for the project manager, and many residents who had expressed interest dropped out once they found out the price. If such a scheme
was attempted in future, a solution might be to work closely with contractors to come up with very approximate prices for different runoff measures, though this approach was not taken here precisely because of the very wide variation in prices depending on site specificities.

FloodSmart’s steering group made the decision to cancel an activity linked to the funding of Property-Level Protection, based on the fact that the small budget allocated to the activity would not have covered a sufficient number of properties. It was decided however to retain the activity linked to the provision of free flood surveys, but this source of funding was not without problems. Several residents turned down the surveys, saying they already understood their flood risk, didn’t want to take the time out or spend council resources needlessly, or could not afford Property-Level Protection. Coordinated and well-funded programmes of combined flood surveys and Property-Level Protection provision may avoid similar responses in other areas.

**Drainage assets: find out what is there**

Many Lead Local Flood Authorities nationwide are facing challenges in terms of the information they hold about flood-related assets – particularly highway drainage – in their area. Buckinghamshire is no exception, and this was picked up in relation to Chesham as part of the FloodSmart project. FloodSmart reinforced knowledge of the need, but also of the expense and time-consuming nature, of surveying and mapping drainage assets.

Although there was prior awareness of the lack of comprehensive drainage asset mapping, CCTV surveys conducted as part of FloodSmart confirmed and increased this. Newly-discovered pipe routes and sizes, for example, helped inform the design and location of flood alleviation projects. The paucity of asset data is something agencies, particularly Buckinghamshire County Council, are very aware of, but the Chesham Flood Action Group also listed it as one of their main areas of concern.

**The impact of flooding (or lack of)**

The box below highlights some of the impacts of the flooding that happened during the FloodSmart project. Also important however was the flooding that did not happen in those two years. The area around Vale Road, though heavily impacted during the winter of 2000/1, has not experienced flooding recently, possibly partly as a result of highway drainage improvements made following 2000/1. This has made it more difficult for the Chesham Flood Action Group and FloodSmart to raise awareness among residents in this area.

In addition, the short length of the FloodSmart project limited the extent to which understanding about the Vale Brook was developed, particularly understanding of the factors influencing flows in this watercourse, which some groups such as the River Chess Association feel are too low.
Flooding in Chesham 2013-2015

Chesham experienced significant flooding during the lifetime of the FloodSmart project. During the winter of 2013/4, at least seven properties were reported to have flooded internally in Chesham. The flooding was long-lasting, with several properties experiencing repeated flooding and having to install semi-permanent sandbag barriers next to their properties. For those living in affected areas, the impact of the flooding was significant. The Chesham Flood Action Group (CFLAG) gained a new member as a result of the flooding, as well as many opportunities to gather photographic evidence of problem areas. The flooding also provided the impetus for CFLAG’s Wright’s Meadow proposal (mentioned on page 11).

Anecdotal evidence suggests that the winter 2013/4 flooding did not necessarily positively impact general flood risk awareness in town, partly because residents felt the impact was small compared to what they saw in the news in other parts of the county and country. The FloodSmart project was however affected indirectly because of the big increase in workload for all partner organisations as a result of the widespread flooding.

Another significant flood event happened on 20 September 2014, when extreme overnight rainfall caused surface water and fluvial flooding. At least 34 properties, mostly businesses along the High Street and Market Square, were flooded internally. FloodSmart was able to interact with some of the flood-affected residents and businesses via awareness-raising events, flood surveys and flood visualisation interviews, as detailed in this report.
8. Project legacy
FloodSmart has set the groundwork for continued improvements in the management of Chesham’s flood risk in collaboration with Chesham’s residents, via the Chesham Flood Action Group. The project has also positively influenced the delivery of local flood risk management within Buckinghamshire as a whole.

To help facilitate the dissemination of FloodSmart’s legacy, Buckinghamshire County Council will be producing a summarised print version of this report to distribute widely within Buckinghamshire.

The Chesham Flood Action Group

The Chesham Flood Action Group (CFLAG), formed as part of this project, is by now well-established, with a Chair, a Secretary, regular internal meetings, a large mailing list, an up-to-date action plan and appointed neighbourhood representatives. Some support will be available to the group going forward thanks to its affiliation to the National Flood Forum, and agencies have expressed their support by attending multi-agency meetings organised by CFLAG.

Local flood risk management in Chesham has been profoundly altered by the existence of the Chesham Flood Action Group (CFLAG), and will ideally continue to be, since it is hoped that CFLAG will continue representing Chesham’s residents on flood-related issues well into the future.

There have been productive interactions between flood management agencies and the Chesham Flood Action Group (CFLAG) not only via regular multi-agency meetings, but also in relation to specific sites (e.g. site visits to Hivings Hill and Pednornead End) or tasks (e.g. CFLAG helping the Environment Agency speak to riparian owners about the Vale Brook culvert). Thanks to these interactions, both agencies and CFLAG have a better understanding of each other’s opportunities and constraints; one example is the issue of parked cars blocking access to the highways gully jetting machine, which CFLAG have now started assisting Transport for Buckinghamshire with.

Figure 20: CFLAG reports road flooding on Hivings Hill and Ashley Green Road, 2014/5 (Photos courtesy of CFLAG)
Partnership working

The success of partnership working as part of FloodSmart has been one of the project’s main highlights. This has been achieved through a variety of means, including a steering group as well as working groups for each work package including representatives from all the partner agencies and organisations. These groups held regular meetings aimed at updating on progress, sharing knowledge, making decisions on activities going forward and gathering lessons learned for continual improvement as well as legacy learning.

The Chair of the Chesham Flood Action Group (CFLAG) was a member of the project steering group starting from September 2014. Partnership working with CFLAG was also built during the three multi-agency meetings held during 2014/5, as well as during several events involving the group.

Buckinghamshire County Council and the Environment Agency are currently in the process of setting up a committee to cover all water-related activities (relating to flood management, low flows and water quality) in Chesham, since there is often overlap between these themes. The aim of this group would be to make sure that knowledge is shared, that activities to improve one aspect don’t worsen another and that opportunities for multiple benefits are considered in all projects. Membership of the Chesham Flood Action Group to this committee is envisaged.

Continued impact of FloodSmart activities

Several activities set up as part of FloodSmart will continue to be delivered beyond the life of the project. For example, FloodSmart has commissioned a “concept communications” tool for two potential flood alleviation schemes within Chesham. This tool will be put online and used in discussions with the local community in the coming years, and will hopefully enable the creation of two schemes that will contribute to reduce local flood risk in the town.

The Aquaprint strategy created as part of FloodSmart, looking at the opportunities and constraints of the planning system for flood risk management, will help shape the local planning authority’s (Chiltern District Council) decisions on development management, not only within the town but also within the district as a whole, as detailed in case study 1 of Section 6. The Aquaprint report itself will be disseminated within Chiltern District Council, Buckinghamshire as a whole and more widely via the Environment Agency’s contact network and the Flownet community of practice.

Through its runoff reduction leaflet, web page and the promotion of the runoff reduction grant, FloodSmart has started work on making understanding of the factors contributing to flooding more comprehensive and widespread. The Chesham Flood Action Group has listed the multiplication of impermeable surfaces as one of its areas of concern, and will work to promote behaviour change and report enforceable cases in this arena.
The FloodSmart flood risk visualisation tool (see case study 2 in Section 6) will be put online for wider sharing. It could also be applied to other areas with minimal effort and expenditure, and Buckinghamshire County Council envisages further development and use of this tool going forward. The FloodSmart website will remain active for at least one year following the end of the project.

As a final example, FloodSmart has worked to include identified drainage improvement schemes within Transport for Buckinghamshire’s longer-term capital works programme, and this activity will be pursued by the Buckinghamshire County Council Strategic Flood Management Team; if implemented, the schemes will further help alleviate flooding in the town.

**FloodSmart’s impact on how Buckinghamshire County Council operates**

The project will influence the delivery of local flood risk management by Buckinghamshire County Council (BCC) in a number of ways. As a result of FloodSmart, BCC has put community engagement and resilience at the core of its work county-wide, while recognising the limitations placed by time resource constraints on what can be a very time-consuming process. Since the start of FloodSmart, several other flood action groups have been set up within Buckinghamshire, and it is a trend BCC will continue to encourage.

On a limited basis, FloodSmart sought to address some of the wider catchment problems having an influence on the town’s flood risk, by working with the Chilterns Conservation Board on the delivery of free farm advisory visits. This initial work done as part of FloodSmart has helped stimulate further work by Buckinghamshire County Council on land management and its influence on flooding, including efforts to obtain funding for further related projects.

On a practical level, the investigation work done into highway drainage around the Vale Brook and Pednornead End areas as part of FloodSmart has provided much-needed and useful information about existing highway drainage and other assets, which will help better inform future maintenance work undertaken by Transport for Buckinghamshire. Finally, the positive impact of the use of marketing concepts and material has been shown as part of FloodSmart, and it is something Buckinghamshire County Council will seek to replicate (depending on available budgets) in other projects and areas.
What would have happened without FloodSmart?

Prior to the start of FloodSmart, Buckinghamshire County Council (BCC) obtained funding to undertake various flood alleviation schemes, using evidence gathered as part of the 2011 Chesham Surface Water Management Plan. These projects would have gone ahead even without FloodSmart. Since the start of FloodSmart, BCC has worked on a number of projects in Chesham funded from unrelated sources, which would also have proceeded without FloodSmart. These include a natural flood management project on the River Chess in Pednornead End, a feasibility study on temporary defence deployment and BCC’s partnership role in the ongoing EA-led Chesham Flood Alleviation Scheme, which aims to take a holistic and coordinated approach to flood management in the town.

In addition, Chesham would have benefited from a number of activities Buckinghamshire County Council is undertaking county-wide, for example linked to prioritising Transport for Buckinghamshire activities using a risk-based approach.

It is not known whether a flood action group would have formed in Chesham without the influence of FloodSmart, and the helpful availability of staff resources dedicated to help establish the Flood Action Group. Although the town contained many committed residents as well as active existing environmental groups, it is possible that the comparatively small impact of flooding in the winter of 2013/4 and the mainly business-related flooding of September 2014 would not have provided the required impetus.

Overall, although several other projects would have been planned and delivered in Chesham even if FloodSmart had not happened, the details of activities and groups presented in this report show that the town’s flood management would be significantly less successful without the project.
## Appendix 1 – Project Framework

**Table 1: Updated project framework**

<table>
<thead>
<tr>
<th>Work package</th>
<th>Activity number</th>
<th>Short activity description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WP1</strong> Change for Chesham</td>
<td>1.1</td>
<td>Tender for marketing support</td>
</tr>
<tr>
<td></td>
<td>1.2</td>
<td>Develop engagement strategy</td>
</tr>
<tr>
<td></td>
<td>1.3</td>
<td>Produce and deliver marketing and awareness-raising materials &amp; activities</td>
</tr>
<tr>
<td></td>
<td>1.4</td>
<td>Deliver launch event</td>
</tr>
<tr>
<td></td>
<td>1.5</td>
<td>Produce property runoff reduction guide</td>
</tr>
<tr>
<td></td>
<td>1.6</td>
<td>Set up and conduct FloodSmart personal interviews</td>
</tr>
<tr>
<td></td>
<td>1.7</td>
<td>Undertake property surveys</td>
</tr>
<tr>
<td></td>
<td>1.9</td>
<td>Run flood response training exercise</td>
</tr>
<tr>
<td></td>
<td>1.10</td>
<td>Establish Chesham Flood Action Group</td>
</tr>
<tr>
<td></td>
<td>1.11</td>
<td>Produce Chesham Flood Plan</td>
</tr>
<tr>
<td></td>
<td>1.12</td>
<td>Engagement with schools</td>
</tr>
<tr>
<td></td>
<td>1.13</td>
<td>Engagement with businesses</td>
</tr>
<tr>
<td><strong>WP2</strong> Increase surface water capacity</td>
<td>2.1</td>
<td>Survey highway drainage into the Vale Brook culvert</td>
</tr>
<tr>
<td></td>
<td>2.2</td>
<td>Update hydraulic modelling of Chesham</td>
</tr>
<tr>
<td></td>
<td>2.3</td>
<td>Design highway drainage improvements</td>
</tr>
<tr>
<td></td>
<td>2.4</td>
<td>Visualise flood model results / maps</td>
</tr>
<tr>
<td></td>
<td>2.5</td>
<td>Implement 'quick win' highway drainage improvement schemes</td>
</tr>
<tr>
<td></td>
<td>2.6</td>
<td>Schedule longer-term highway drainage improvements</td>
</tr>
<tr>
<td></td>
<td>2.7</td>
<td>Create runoff reduction grant scheme for residents</td>
</tr>
<tr>
<td></td>
<td>2.8</td>
<td>Engagement with farmers</td>
</tr>
<tr>
<td><strong>WP3</strong> Aquaprint</td>
<td>3.1</td>
<td>Establish planning requirements for safeguarding identified area</td>
</tr>
<tr>
<td></td>
<td>3.3</td>
<td>Develop Aquaprint strategy</td>
</tr>
<tr>
<td></td>
<td>3.4</td>
<td>Chiltern District Council adopts Aquaprint</td>
</tr>
</tbody>
</table>
Appendix 2 – Economic benefits

The main economic benefits of the Chesham community-based flood resilience project, FloodSmart, are:

- Avoided flood damage to house properties – low
- Avoided flood damage to businesses, including business continuity – low
- Savings to local authorities (including those relating to time saved through improved partnership working) – low

However, it is our opinion that the main overall benefits of the project are non-economic, and so intangible. FloodSmart suggests that these are:

- Social or community capacity building, community cohesion – high
- Establishing networks – high

The low/medium/high assessments made here are qualitative, as defined by the FloodSmart project managers based on observations. The nature of the activities delivered as part of FloodSmart has made an economic evaluation difficult. For example, estimates can be found to show how many houses can be said to have been protected from flooding by the existence of a flood warden; in the case of Chesham, the Chesham Flood Action Group has not yet created such roles. Its area representatives cover larger neighbourhoods than would be typical of a flood warden, and have so far rather been investigating and reporting issues rather than taking on the role of warning other residents of flooding. Another example relates to the CCTV information gathered as part of FloodSmart. Although its usefulness has already been confirmed, it would not make sense to estimate the flood protection value the information has provided, not until action to protect properties is taken as a result.
Appendix 3 – Grant allocation and other funding

Table 2: Financial and in-kind inputs to the project, 2013-2015

<table>
<thead>
<tr>
<th>Source</th>
<th>Type</th>
<th>Amount / Further details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Defra</td>
<td>Financial</td>
<td>£300,000</td>
</tr>
<tr>
<td>Buckinghamshire County Council</td>
<td>Financial</td>
<td>£61,605</td>
</tr>
<tr>
<td></td>
<td>In kind</td>
<td>Staff time; meeting rooms; marketing collateral storage and transport; business support staff time for delivering evaluation activities.</td>
</tr>
<tr>
<td>Chesham Town Council</td>
<td>In kind</td>
<td>Staff time</td>
</tr>
<tr>
<td>Chiltern District Council</td>
<td>In kind</td>
<td>Staff time</td>
</tr>
<tr>
<td>Environment Agency</td>
<td>In kind</td>
<td>Staff time</td>
</tr>
<tr>
<td>Chesham Flood Action Group</td>
<td>In kind</td>
<td>CFLAG member time to: feedback on project outputs; help deliver awareness-raising events; take part in the project steering group.</td>
</tr>
<tr>
<td>Chesham residents</td>
<td>Financial</td>
<td>£1,000 (match-funding for runoff reduction grant)</td>
</tr>
<tr>
<td></td>
<td>In kind</td>
<td>Installation of water butts provided by runoff reduction grant</td>
</tr>
</tbody>
</table>

Table 3: Expenditure per project activity, all sources included, 2013-2015

<table>
<thead>
<tr>
<th>WP</th>
<th>Activity</th>
<th>Spend on activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>WP1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WP1.1</td>
<td></td>
<td>Staff time</td>
</tr>
<tr>
<td>WP1.2</td>
<td></td>
<td>Costs in 1.3 + staff time</td>
</tr>
<tr>
<td>WP1.3</td>
<td></td>
<td>£45,693 + Staff time</td>
</tr>
<tr>
<td>WP1.4</td>
<td></td>
<td>Costs in 1.3 + staff time</td>
</tr>
<tr>
<td>WP1.5</td>
<td></td>
<td>Costs in 1.3 + staff time</td>
</tr>
<tr>
<td>WP1.6</td>
<td></td>
<td>Staff time</td>
</tr>
<tr>
<td>WP1.7</td>
<td></td>
<td>£9,995 + Staff time</td>
</tr>
<tr>
<td>WP1.9</td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td>WP1.10</td>
<td></td>
<td>£50,000 + Staff time</td>
</tr>
<tr>
<td>WP1.11</td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td>WP1.12</td>
<td></td>
<td>Staff time</td>
</tr>
<tr>
<td>WP1.13</td>
<td></td>
<td>£820 + Staff time</td>
</tr>
<tr>
<td>WP2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WP2.1</td>
<td></td>
<td>£39,127 + Staff time</td>
</tr>
<tr>
<td>WP2.2</td>
<td></td>
<td>£11,032 Staff time</td>
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<tr>
<td>WP2.3</td>
<td></td>
<td>Costs in 2.5 + Staff time</td>
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<tr>
<td>WP2.4</td>
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<td>£13,514 + Staff time</td>
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<td>WP2.5</td>
<td></td>
<td>£135,250 + Staff time</td>
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<td>WP2.6</td>
<td></td>
<td>Staff time</td>
</tr>
<tr>
<td>WP2.7</td>
<td></td>
<td>£1,582 + Staff time</td>
</tr>
<tr>
<td>WP2.8</td>
<td></td>
<td>Staff time</td>
</tr>
<tr>
<td>WP3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WP3.1</td>
<td></td>
<td>Staff time</td>
</tr>
<tr>
<td>WP3.3</td>
<td></td>
<td>£23,659 + Staff time</td>
</tr>
<tr>
<td>WP3.4</td>
<td></td>
<td>Staff time</td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expenditure on evaluation activities</td>
<td></td>
<td>£4,398 + Staff time</td>
</tr>
<tr>
<td>Expenses (BCC contribution)</td>
<td></td>
<td>£450</td>
</tr>
<tr>
<td>Amount whose use CFLAG determined</td>
<td></td>
<td>£17,690 + Staff time</td>
</tr>
<tr>
<td>Putting the visualisation tool online</td>
<td></td>
<td>£8,395 + Staff time</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>£361,605</td>
</tr>
</tbody>
</table>
Appendix 4 – “How to” recommendations

This section presents three “how to” recommendations that other organisations are able to adopt.

Table 4: “How to” recommendation 1

<table>
<thead>
<tr>
<th>Activity (obj)</th>
<th>How to maximise the reach and effectiveness of awareness-raising messages using marketing tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Audience</td>
<td>Awareness-raising messages are aimed at local residents in the area under consideration. They will also likely reach other people, including visitors to the area (who may see interpretation boards, posters, leaflets, exhibitions etc.) or ‘accidental’ audiences who will come across information without having searched for it (e.g. through wider area press coverage, or resulting from an internet search). The FloodSmart project also ended up raising awareness as far afield as Canada, when ex-residents of Chesham who emigrated there were able to interact with the project via social media channels.</td>
</tr>
<tr>
<td>Who can deliver</td>
<td>This activity is modular: one can implement any number of options as dictated by budget and time constraints. It is open to a wide range of agencies and organisations (e.g. Parish Councils, District Councils, resident flood groups, the Environment Agency etc) who wish to undertake awareness-raising activities.</td>
</tr>
</tbody>
</table>
| What          | One of the project’s first steps was to create a name (FloodSmart) and an associated logo. This helps create uniformity of messaging as well as brand recognition. Following this, awareness-raising can use a number of different methods. FloodSmart used the following:  
  - A website – [www.buckinghamshirepartnership.gov.uk/floodsmart](http://www.buckinghamshirepartnership.gov.uk/floodsmart)  
  - Marketing collateral: the FloodSmart project produced three different branded leaflets, as well as branded banners, a tablecloth and a gazebo.  
  - Social media: a Facebook page and a twitter hashtag  
  - Press presence: bi-monthly article in a local print newsletter (Your Chesham) as well as promotion of the project via county-wide newspapers.  
  - Video: the project created an animated video to explain flooding processes and history in the town. |
| Method        | FloodSmart chose to hire a marketing company to create and deliver the project’s marketing engagement strategy. However, depending on the in-house resources of the organisation wishing to implement this, it would be possible to do most of the work in-house. We would advise for the first step to be the choosing of a project name and the creating of a simple logo, which may require specialist graphic design skills. The project also decided to associate branding of a previous (and successful) Chesham-based project within FloodSmart, to perpetuate brand awareness. |
| Resources     | The FloodSmart website’s hosting was very inexpensive, as it came under the umbrella of Buckinghamshire County Council’s partnerships projects page. For social media, given how much time and effort is required to build up a substantial following, FloodSmart chose to build on the project partners’ existing social media channels, for example promoting events and publications using the #FloodSmart hashtag and posting this on partner accounts. |
Although FloodSmart chose to guarantee column space in Your Chesham by buying a regular slot, other organisations would be able to promote projects regularly using similar local press.

The animated FloodSmart video did involve a cost, but it is easy with basic software (and a photo camera) to create non-animated videos (e.g. https://www.youtube.com/watch?v=wWFoo4CGELU&index=16&list=UUHQXRB2Nq-WErVupeO6YpHg

Outcome

Outcomes depend on the options chosen, but could be in terms of website hits, social media following and participation, number of event attendees and quality of feedback received about these; press coverage, etc. See Section 7.

| Risk Table |
|---|---|---|---|
| Potential risks | Likelihood | Impact | Mitigation |
| A negative article in the press could create a lasting negative impact on the project | The likelihood of this happening without a reason is low | High | Use your organisation’s media team to sense-check all press communications |
| A wrongly-chosen project name or logo could have negative consequences | Low | Medium | Use a project partnership group, or internal colleagues, to feedback on suggested names and logos. Also do basic internet searches to find out if the name is already in use. |
| Comments about social media postings cannot be controlled, and can “go viral” | High – particularly in flood-related projects where media and public interest in the topic can be very high in times of flooding | Medium | Where possible within time constraints, use your organisation’s media team to sense-check social media communications. Otherwise, establish a social media ‘code of conduct’ for the project partnership – rules to follow based on common sense. |
Table 5: “How to” recommendation 2 from the National Flood Forum

<table>
<thead>
<tr>
<th>Activity (obj)</th>
<th>How agencies can support community Flood Action Group activities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Audience</strong></td>
<td>Representatives from flood risk management agencies, such as local authorities, local Environment Agency staff, utility companies, highways, etc., intending to adopt a grass-roots approach.</td>
</tr>
<tr>
<td><strong>Who can deliver</strong></td>
<td>Staff members who are committed to support and build long-term relationships with Flood Action Groups. Individuals need to be committed to encourage the groups to take the lead and drive forward their own collective aspirations. They will need to provide support by facilitating the group’s aims to reduce flood risk for the area whilst providing information and understanding of local flood risk management.</td>
</tr>
<tr>
<td><strong>What</strong></td>
<td>Supporting community Flood Action Groups in their activities. Potential activities are wide ranging, from private multi-agency meetings as organised by the National Flood Forum to address local Flood Action Group concerns, through to accompanying group members on site visits, or providing information as to funding opportunities, to enable group-led projects.</td>
</tr>
<tr>
<td><strong>Method</strong></td>
<td>Creating partnership work that forms trust and understanding with all, to gain openness and honesty in discussion. Communication skills are essential, in a facilitating, supporting and listening capacity, this is not a leadership role. Appreciation of Flood Action Group knowledge and local expertise is key, with technical and organisational expertise delivered in a way that is suitable for all to understand. Continually forthcoming with offers of support and information for progressing group aims.</td>
</tr>
<tr>
<td><strong>Resources</strong></td>
<td>Each Flood Action Group will be different, making it difficult to quantify resource requirements. Time resources are foremost, including the likely requirement to work outside of office hours, and the need to travel to Flood Action Group areas. In National Flood Forum experience, groups have asked for, and agencies have subsequently provided, support in technical ways, for example carrying out site visits and research requested by the group.</td>
</tr>
<tr>
<td><strong>Outcome</strong></td>
<td>Community ownership of potential solutions to flood risk, endorsed by partnership working and engagement in the long term. Flood Action Group members feel supported, listened to, and engaged with. Collaborative working delivers multiple rewards for agencies, including:</td>
</tr>
<tr>
<td></td>
<td>• links into the community for consultation and advice, for example for proposed or ongoing schemes and monitoring (e.g. Flood Alleviation Scheme proposals, flood warning river level trigger points),</td>
</tr>
<tr>
<td></td>
<td>• access to detailed local knowledge of flooding issues and assets information often on a historical time scale (e.g. culvert locations),</td>
</tr>
<tr>
<td></td>
<td>• support in routine works and maintenance (e.g. support in clearing parked cars before drain de-silting),</td>
</tr>
<tr>
<td></td>
<td>• ideas of sustainable flood risk management solutions for individual communities,</td>
</tr>
<tr>
<td></td>
<td>• trust and relationship building between staff and communities, for long-term mutual benefits,</td>
</tr>
<tr>
<td></td>
<td>• engaged, informed, risk-accepting residents willing to work with agencies in times of flood incidents</td>
</tr>
<tr>
<td>Potential risks</td>
<td>Likelihood</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>Sustainability of the flood action group is challenged by various means</td>
<td>Possible</td>
</tr>
<tr>
<td>Agency staff reluctant to commit to attending meetings with Flood Action Groups.</td>
<td>Possible</td>
</tr>
<tr>
<td>External demands and pressures are placed upon the Flood Action Group.</td>
<td>Possible in time-constrained projects and/or towards the end of the financial year.</td>
</tr>
</tbody>
</table>
### Table 6: "How to" recommendation 3

<table>
<thead>
<tr>
<th>Activity (obj)</th>
<th>How to create a photo exhibition about flooding</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Audience</strong></td>
<td>The exhibition should primarily be aimed at local residents in the area under consideration. I will also likely reach other people, including visitors to the area.</td>
</tr>
<tr>
<td><strong>Who can deliver</strong></td>
<td>A photo exhibition can be organised by any agency, local group or project partnership.</td>
</tr>
<tr>
<td><strong>What</strong></td>
<td>Photo exhibitions can be a great way to raise awareness, particularly in areas where flooding doesn’t happen very often or where a more transient population might mean residents have not personally experienced flooding. When faced with real photos, it is harder for people to argue that “[My area] doesn’t flood!”</td>
</tr>
<tr>
<td><strong>Method</strong></td>
<td>Photos can be sourced from historical records (via museums, libraries, historical societies, photography societies, etc.), risk management agencies (local councils or the Environment Agency) or residents. Detail the area you are covering, the time period and the type of images you need, and send requests via email, in person or via social media. Be open to receiving other non-photographic records to complete the exhibit. Also include a map, maybe showing the locations of the photos and some major landmarks; organise the pictures geographically or using a timeline, whichever is most suitable. ‘Then and now’ pairs of photos can help people recognise particular locations, particularly if the ‘then’ photo is much older. Organise a suitable venue, ideally one that can host the exhibition for a substantial amount of time (e.g. 1 month), has enough wall space for your needs and has substantial through traffic; libraries are ideal. Promote the exhibition: choose one or two of the best images (old ones are usually popular) and create a professional flyer which can also be put up as a poster in local shop windows for example. Also promote the event via social media. An opening event, maybe inaugurated by a local dignitary, can provide a good focus for the exhibition and attract media attention (see Appendix 5). Schools can be an ideal audience for such a visual exhibition: make sure all of the schools within your target area are aware of the exhibition, and maybe organise some school visits with staff present for a Q&amp;A.</td>
</tr>
</tbody>
</table>

| Resources       | Photo exhibitions can range from the very high-end to a more “homemade” look; a simple exhibition can be organised at a low financial cost (a bit for photo printing, lamination or framing, and perhaps poster design and printing), but any type of exhibition will require significant staff time to source material, book a venue, organise promotion and maybe an opening event. Plan in a minimum of 2 weeks FTE spread out over a period of at least 3 months. Most likely, it will not be possible to spare staff time to be present during opening hours, except at the opening event. Captions and explanatory text therefore needs to be very clear and self-explanatory. |

| Outcome         | The exhibition will ideally raise awareness about the occurrence, locations, depths and impacts of flooding. It can be difficult to monitor the success of such an activity, particularly if it lasts too long for staff presence to be possible. Some ideas are: A feedback form and box located near the exhibition |
Monitoring of the opening event: attendance level and comments made

<table>
<thead>
<tr>
<th>Potential risks</th>
<th>Likelihood</th>
<th>Impact</th>
<th>Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not enough photos can be obtained</td>
<td>Medium</td>
<td>High</td>
<td>Source photos before organising a venue and/or promoting the exhibition. Also, complete photos with other documents (maps, quotes from written records, newspaper articles, etc.)</td>
</tr>
<tr>
<td>The audience size doesn’t justify the effort of organisation</td>
<td>Medium</td>
<td>Medium</td>
<td>Choose the venue carefully (accessibility, through traffic), leave the exhibition up long enough &amp; complement it through other means (e.g. facebook page with teaser photos)</td>
</tr>
<tr>
<td>Messages are misinterpreted by the audience</td>
<td>Medium</td>
<td>High</td>
<td>If staff presence cannot be arranged, write photo captions and accompanying text carefully</td>
</tr>
</tbody>
</table>
Appendix 5 – Examples of FloodSmart in the printed and online press

Figure 21: Bucks Free Press, 14th October 2013

Figure 22: Bucks Examiner, 10 December 2013

Figure 23: Your Chesham, Jan-Feb 2015

Figure 24: Bucks Free Press, 14 June 2014
Appendix 6 – FloodSmart on social media

Figure 25: Emily

Figure 26: FloodSmart event promoted on Buckinghamshire County Council’s Twitter account

Figure 27: FloodSmart’s Facebook page
Appendix 7 – Interpretation board

Flooding in Chesham
Why and where it happens

Sources of flooding
Chesham is at risk of flooding from several different sources. The River Chess and Vale Brook are the town’s main watercourses and can cause flooding. However, many parts of Chesham are also at risk from groundwater and surface water flooding. It’s a complex situation, and often the different kinds of flooding can happen at the same time.

Chesham’s risk
Up to 2,000 properties could be at risk of flooding in Chesham. Roads and pavements can also be affected by flooding, which can be both inconvenient and dangerous. Climate change predictions suggest that Chesham will receive more intense rainfall, putting more people and places at risk in the future.

Prepare yourself
There are plenty of things you can do to prepare for flooding:
- Understand whether your property is at risk of flooding or not.
- Make sure you have flood insurance.
- Protect your property.
- Learn about what your local community is doing to be more resilient against flooding.

Find out how to do this on the FloodSmart website.

Underground rivers
In the past, rivers were often viewed as an inconvenience and many were changed or put in pipes underground. The Vale Brook was one of these; it is piped most of the way through town down to where it joins the River Chess.

Putting rivers underground can increase flood risk. It’s also harder to see problems and to fix them when something goes wrong. The Environment Agency made emergency repairs in the culvert underneath Market Square in 2014.

Working in partnership
Agencies are working together and with the community to reduce flooding and its impacts in Chesham through projects like FloodSmart. We’re also working to improve water quality and to make sure there is enough water flowing in the River Chess.

Figure 28: Interpretation board installed in Chesham’s Market Square