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Adapting to Coastal Erosion

Evaluation of rollback and leaseback schemes in Coastal Change Pathfinder projects

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**Adapting to Coastal Erosion: Evaluation
of rollback and leaseback schemes in
Coastal Change Pathfinder projects**

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Executive Summary

Objectives of the study

The objectives of this project are:

- A. to provide evidence to Defra and others as to whether rollback and buy/leaseback are feasible and desirable options for Local Authorities affected by coastal change where the Shoreline Management Plan (SMP) recommends a policy of managed realignment of defences or no active intervention
- B. to provide useful evidence on rollback and buy/leaseback for Local Authorities working through their options
- C. to provide Local Authorities with new approaches to adapting to coastal change if rollback and buy/leaseback are found to be feasible and replicable

These objectives reflect that the focus of this study is on evaluating rollback and buy/leaseback, rather than the Pathfinder projects themselves. As such the emphasis is on identifying actions and activities related to rollback and buy/leaseback, including barriers to their uptake, costs and benefits that resulted. To meet these objectives, the project needs to provide answers to six research questions again focusing on rollback and buy/leaseback, see Table 1.

Table 1: The research questions

Research questions
1. Have the “Big Five” Pathfinders proceeded with the rollback schemes they identified in the main phase of the Pathfinder programme?
2. If not, why not? What significant barriers to implementing rollback and buy/leaseback schemes have Local Authorities faced?
3. If schemes have proceeded, what were the objectives of each scheme and have these schemes met their objectives. What are stakeholder and authority views as to the desirability and replicability of schemes? What problems, if any, were encountered and how were these addressed?
4. To what extent have rollback schemes turned out to be financially viable and potentially self-sustaining without public funds, particularly in North Norfolk which involved an innovative approach to creating development rights to enhance viability? What are the financial flows in schemes, between local authorities, homeowners, developers and others?
5. What is the updated view of the economic case of rollback schemes, to “UK plc” and the Exchequer?
6. Has the interim view that “buy/leaseback” schemes are not viable changed, based on any further work on such schemes since 2011?

Aim of this report

The aim of this Report is to provide the overall results of the evaluation and the implications that can be drawn from them. In particular, the report focuses on if, how and where rollback might be feasible, desirable and replicable.

Definition of rollback and leaseback

Rollback is defined as the relocation/replacement of at risk property and infrastructure to areas inland away from the eroding coastline.

Leaseback (or buy to leaseback) is defined as the process of purchasing an at-risk property and leasing it out for the remainder of its economic life.

Overall evaluation of the Pathfinders

Each of the Pathfinder projects considered in this study (East Riding of Yorkshire, North Norfolk, Scarborough, Scratby and Waveney) have investigated rollback as a coastal adaptation option, with this approach having been undertaken in four of the five cases (the fifth being Scratby where the Pathfinder project only intended to investigate rollback). Barriers encountered to undertaking rollback were varied, with some being specific to the Pathfinder area in which they were experienced. The most prevalent were problems associated with selecting land for rollback, a lack of community awareness or understanding of erosion and the rollback process and funding constraints. Although many of the Pathfinder projects are still underway there are already some positive outcomes which contribute to the desirability, replicability and feasibility of future schemes. The overall aim of the projects was to increase communities' capacity to adapt to coastal erosion and one of the most significant ways the Pathfinders' achieved this was through the increased levels of community awareness to coastal erosion issues and adaptation options. In some cases the Pathfinder has enabled the owners of properties at risk of coastal erosion to move on. There is also the advantage of the lessons which can be learned from the Pathfinders' following their completion. The financial viability of these schemes in the future depends on a variety of factors but the lack of funds is seen as a key barrier to enabling rollback. The potential for these schemes to be partially or fully self-funded depends on interest and availability of funds from private investors, the ability of communities to raise the necessary funds and the availability of land.

Within the Pathfinders, buy/leaseback was investigated but was not undertaken due to a number of financial and social issues. However, time and budget constraints prevented full consideration of all potential options, with further investigations into this approach not considered to be worth undertaking. Therefore only rollback is considered in this study.

Taking rollback forwards

Planning and legal issues

The planning policy and associated legal issues identified during the Pathfinder projects were varied, however there were five key issues identified:

1. The need for a 'whole coast' approach to rollback
2. The risk that relaxing planning policy criteria at the national level leads to planning permission being easier to obtain. This would undermine the benefit that rollback enables development where it would otherwise not be permitted
3. Legal issues with enforcing demolition
4. Identification of suitable land
5. The need for a flexible approach for rollback

Through the Pathfinders it has been possible to identify three planning policies which have the potential to enable rollback, these are: allow for conversion of at risk buildings to temporary, alternative use, such as holiday lets; make rollback development an exception to avoid excessive development; and enabling development with clear policies and legal obligations to avoid misuse.

Skills and expertise needed

For each of the Pathfinder projects considered as part of this study a number of key skills have been required in investigating and implementing options for rollback. Many of the skills and expertise required were available within the Local Authorities, but to make best use of them it was vital that the project had the full support of politicians and senior management. Where skills were not available internally, other (outside) expertise was required to undertake aspects of schemes in certain cases, not only to ensure that the appropriate skills were utilised for key areas, but to also increase the credibility of the outputs by providing an unbiased result. This in turn is considered to have enhanced buy-in and acceptance of these schemes and enabled them to progress. The skills and disciplines needed are considered to be:

- Project management and leadership
- Planning
- Legal expertise
- Property market expertise (domestic and commercial)
- Engagement expertise
- Engineering
- Geomorphology
- Social services
- Fundraising expertise

Community issues

The level of a community's interest in and awareness of coastal erosion risks can help make rollback more feasible and desirable. Throughout each of the five Pathfinders considered there was a change in community perception from the beginning of the project to the end, as would be expected from projects with such high levels of community engagement. In many areas there was initial opposition to the ideas of coastal adaptation and several residents were unwilling to entertain the idea, focussing instead on their desire for coastal defences. As the projects progressed and communities were involved in the planning and decision making process, many became more willing to consider adaptation options and the feeling of many communities is more accepting of this approach.

Financial and economic issues

All of the Pathfinder projects found that the ability for property owners to afford to buy land and rebuild was a key barrier to rollback. There may be opportunities for business owners, with commercial operators, eg caravan parks in East Riding, potentially have access to the resources needed to facilitate rollback. The lack of available funds means that some form of financial support is likely to be required to enable rollback schemes to be implemented at the local and national scale. There is concern among the Pathfinder authorities that Flood Defence Grant in Aid (FDGiA) does not offer funding for adaptation initiatives in areas identified as no active intervention in Shoreline Management Plans.

The economic case

An economic analysis has been undertaken to assess whether the benefits are likely to exceed the costs for rollback options. Four rollback options have been assessed based on the approaches taken in the Pathfinder projects. These options are:

- assistance packages: financial assistance provided to help with demolition and relocation. This assistance may include funds to assist with obtaining planning permission and purchase of land and rebuild
- development opportunities: planning policies mean rollback is treated as an exception such that property owners can rebuild in a location that would otherwise be highly unlikely to achieve planning permission. The property owner can choose to sell their at-risk property (eg to a developer) who may be able to take advantage of the development opportunity and rebuild the property inland
- landbanking: the Local Authority obtains land in an area that is not at risk from erosion that is gifted to owners of at-risk properties. The property can then be rebuilt on that land
- property valuation and purchase: properties at-risk are valued based on the life remaining, the market value and a home loss supplement and purchased from the owner enabling them to move out

Each option is assessed against a baseline of 'no rollback', where it is assumed that there is no intervention to help property owners as the risk of erosion of their properties increases. Under the baseline, property owners suffer impacts due to blight and loss of property value, being unable to move and unable to get on with their lives, stress plus demolition and relocation costs when the property is at imminent risk of erosion (some of these costs may be borne by the Local Authority). It is assumed that property owners are unable to afford to buy land and rebuild their property, so there are also impacts on the local community due to a reduction in housing stock and loss of income to the Local Authority from reduced Council Tax and Business Rates (where commercial properties are eroded). Communities can also be impacted due to blight where property owners stop maintaining their homes and due to the perception of erosion risk potentially affecting properties even if they are not in the at-risk areas.

The benefits of the rollback option are based mainly on the opportunities that they offer to property owners in that they can provide financial assistance for relocation (assistance packages), provide land (landbanking), provide financial assistance for rebuilding (assistance packages, property valuation and purchase) or enable value to be realised from the potential for future development in areas where development would not otherwise be permitted (development opportunities). This can reduce stress for property owners, reduce blight as properties are maintained for longer or opportunities to relocate being enhanced with benefits for the community as well as property owners, and help maintain housing stock where properties are rebuilt, again with benefits to the community (where those houses are built within or adjacent to existing communities) and to Local Authorities.

In order to undertake the economic analysis of the Pathfinder schemes and rollback options, it has been necessary to apply a significant number of assumptions which will be different within individual cases. Therefore the results of the analysis can only be considered to be an indication of possible costs and benefits of rollback. Specific economic assessments of potential adaptation options would have to be undertaken where these are being considered as possible methods of coastal change management. Table 2 provides the benefit-cost ratios from the economic analysis, showing where rollback options may be economically worthwhile (benefit-cost ratio is greater than one). A short description of other benefits that could not be monetised is also included in Table 2. These qualitative benefits mean that the overall economic case is likely to be better than suggested by the benefit-cost ratio alone.

Table 2: Summary of economic assessment of the rollback options

Rollback option	Benefit-cost ratios		Key qualitative benefits
	Low	High	
Assistance package	0.6	2.1	Ability to get on with life (reduced uncertainty, enhanced ability to move if desired); reduced health impacts from low quality housing
Property valuation and purchase	-0.6 (damages greater under rollback due to property being demolished much sooner)	0.1 (based on Pathfinder)	Ability to get on with life (reduced uncertainty, mobility); reduced health impacts from increasingly derelict housing; reduced risk of deprivation in local area
Landbanking	1.9 (based on Pathfinder)	2.3	Ability to get on with life (reduced uncertainty, mobility)
Development opportunities	0.5	1.1	Ability to get on with life (reduced uncertainty, mobility); reduced health impacts from increasingly derelict housing; reduced risk of deprivation in local area

Notes: The low and high benefit-cost ratios reflect that the assessment has been based on the approaches used in the Pathfinders and the approaches used in different Pathfinders varied. The range therefore gives an indication of the potential economic case for different approaches rather than an indication of uncertainty over the magnitude of costs and benefits

Conclusions and suggestions

Overall evidence from the Pathfinder projects suggests that rollback, with the right policies and mechanisms in place, is a feasible adaptation option that is desirable from the perspective of the Local Authority and the individuals at imminent risk of coastal erosion. Rollback options may also be cost-beneficial based on the economic assessment. Buy-in at the community level can be more difficult to achieve, but effective communication can increase awareness and understanding of the situation (in terms of the options available in the wider context of coastal erosion issues) and thus increase desirability. The problems encountered in the Pathfinder projects provide valuable lessons for other Local Authorities in terms of expected issues and how to overcome them. The key areas to focus on when identifying the usefulness of rollback include:

- Understanding the make-up and geographical scale of the community, including demographics
- Understanding community expectations
- Investigating community understanding of the inevitability of erosion
- Identifying what the Local Authority can and should provide
- Assessing the specific needs of individuals
- Recognising which skills are needed
- Accepting that rollback is likely to require long-term planning

National issues which, if addressed, would facilitate rollback include the need for a wider 'whole coast' approach to policy, consideration of adaptation options more widely than just rollback, the need for clear policies which allow rollback and minimise the potential for inappropriate development of coastal areas, and the need for additional grants to help fund rollback options given the limitations of the FDGiA. The economic assessment undertaken as part of this study shows that rollback could be economically worthwhile, hence, there should be opportunities for rollback (and adaptation more widely) to be considered for funding under FDGiA.

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1. Introduction

1.1 Background to the study

Between 2009 and 2011, East Riding of Yorkshire Council, North Norfolk District Council, Scarborough Borough Council, Tendring District Council and Waveney District Council received a significant proportion (nearly £8 million) of non-ring fenced funding to develop and implement innovative approaches to planning and coastal management. In addition, funding was also provided to other areas, although a much lower value. One of these areas was Scratby which received £296,000. These Pathfinder projects included investigations of 'rollback' and/or 'buy/leaseback' schemes as potential ways of dealing with coastal change in areas where there are few direct beneficiaries and so decreased opportunities for partnership funding.

In 2011, Regeneris carried out an evaluation of the five biggest Pathfinders, including a value for money assessment. However, in 2011 only 32% of the Pathfinder funding had been spent and many projects were incomplete. Defra consequently commissioned this study to revisit the five big Pathfinders to better understand the feasibility and desirability of rollback and buy/leaseback. Scratby is being considered in place of Tendring as rollback and buy/leaseback were not undertaken in Tendring. Where the Shoreline Management Plan recommends a policy of managed realignment or no active intervention, it is clear that Local Authorities need sustainable approaches to reduce future burdens on coastal communities, remove constraints and blight, reduce the tendency towards negative attitudes and encourage a more positive approach to the issues faced by communities and individuals and look to encourage growth in a sustainable manner.

This study provides an enhanced assessment of outcomes (successful or otherwise) and identifies what can be learnt from the schemes and how this can be used to inform policy at local and national levels. In addition, this study undertakes an economic analysis of the costs and benefits of rollback and buy/leaseback against three potential coastal community scenarios within each of the Pathfinders. The outcomes of the study are used to inform the impacts of the rollback and buy/leaseback for different groups affected by coastal erosion.

1.2 Objective of the study

The objectives of this project are:

- A. to provide evidence to Defra and others as to whether rollback and buy/leaseback are feasible and desirable options for Local Authorities affected

by coastal change where the SMP recommends a policy of managed realignment of defences or no active intervention

- B. to provide useful evidence on rollback and buy/leaseback for Local Authorities working through their options
- C. to provide Local Authorities with new approaches to adapting to coastal change if rollback and buy/leaseback are found to be feasible and replicable.

These objectives reflect that the focus of this study is on evaluating rollback and buy/leaseback, rather than the Pathfinder projects themselves. As such the emphasis is on identifying actions and activities related to rollback and buy/leaseback, including barriers to their uptake, costs and benefits that resulted. To meet these objectives, the project needs to provide answers to six research questions again focusing on rollback and buy/leaseback. Table 1-1 sets out the six questions.

Table 1-1: The research questions

1. Have the “Big Five” Pathfinders proceeded with the rollback schemes they identified in the main phase of the Pathfinder programme?
2. If not, why not? What significant barriers to implementing rollback and buy/leaseback schemes have Local Authorities faced?
3. If schemes have proceeded, what were the objectives of each scheme and have these schemes met their objectives. What are stakeholder and authority views as to the desirability and replicability of schemes? What problems, if any, were encountered and how were these addressed?
4. To what extent have rollback schemes turned out to be financially viable and potentially self-sustaining without public funds, particularly that in North Norfolk which involved an innovative approach to creating development rights to enhance viability? What are the financial flows in schemes, between local authorities, homeowners, developers and others?
5. What is the updated view of the economic case of rollback schemes, to “UK plc” and the Exchequer?
6. Has the interim view that “buy/leaseback” schemes are not viable changed, based on any further work on such schemes since 2011?

1.3 Structure of this report

The aim of the Report is to provide the overall results of the evaluation and the implications that can be drawn from them. In particular, the report focuses on if, how and where rollback might be feasible, desirable and replicable.

The remainder of this Report is structured as follows:

- Section 2 sets out our approach to the study
- Section 3 presents a summary of the Pathfinder projects considered
- Section 4 provides the results of evaluation of the Pathfinder projects considered
- Section 5 identifies issues associated with planning and legal policies that can help enable rollback
- Section 6 considers the skills and expertise that are needed within a Local Authority to help replicate the successes seen from the Pathfinders
- Section 7 discusses how the community's interest in and awareness of coastal erosion risks can help make rollback feasible and desirable
- Section 8 assesses if and how financial barriers could be overcome to help make rollback feasible and desirable at the levels of an individual property owner, Local Authority and UK plc
- Section 9 undertakes an economic analysis of the Pathfinder projects
- Section 10 brings together the evidence from Sections 3 to 9 and describes the factors that affect how rollback could be made feasible, desirable and replicable

The report provides overall messages across all five Pathfinders. Evidence and analysis for each of the individual Pathfinders is provided in Annexes 1 to 5, with Annex 6 providing the technical details behind the economic analysis.

2. Approach to the Study

2.1 Overview

Our approach is designed to collect evidence from reports and documents and from case study investigations for each Pathfinder to support the assessment of the extent to which rollback and buy/leaseback are feasible and desirable. The overall approach forms an evaluation of rollback and buy/leaseback as two possible approaches to adaptation in line with Treasury guidance.

Definition of rollback and leaseback

Rollback is defined as the relocation/replacement of at risk property and infrastructure to areas inland away from the eroding coastline.

Leaseback (or buy to leaseback) is defined as the process of purchasing an at-risk property and leasing it out for the remainder of its economic life.

2.2 Conceptual model for evaluation

The first task involves developing the conceptual model to define the scope and approach to the study. The evaluation approach set out in The Magenta Book, “Guidance for Evaluation”, published by HM Treasury is used as the basis for development of the conceptual model. The evaluation is both summative (identifying how well the Pathfinder projects met their stated goals in terms of outcomes and impacts, focusing specifically on rollback and buy/leaseback) and formative (an iterative process of identifying what works well and what does not, especially important when assessing replicability). The conceptual model itself comprises the following parts:

1. Intervention model (see Figure 2-1)
2. Evaluation matrix, setting out the approach to answering the research questions (see Table 2-1)
3. Method for economic analysis (see Section 2.4 on financial and economic analysis)
4. Agreement on what is meant by ‘feasible’ and ‘desirable’ from Defra’s perspective. The definitions discussed and agreed include:

Figure 2-1: Intervention model

Planned work		Intended results			
Step	Resources/ Input	Activities	Outputs	Intermediate Outcomes	Impacts
Definition	Certain resources are needed to operate a program	If resources are available, then they can be used to accomplish planned activities	If planned activities are accomplished, then hopefully the amount of products and/or services are delivered as intended	If planned activities are accomplished as intended, then participants will benefit in certain ways	If benefits to participants are achieved, then changes in communities or systems might be expected to occur
Programme Logic	£ funding from Defra	Pathfinder projects, including rollback and buy/leaseback options	No. of assets taken out of at-risk area (rollback) Reduction in no. of assets owned privately in at-risk area or individual capital released (buy/ leaseback) * Creates the opportunity for alternative approach to FCERM. Establish a justifiable precedent with broader benefits.	Change in no. of people and businesses affected by uncertainty over their future	Social, environmental and physical (asset) benefits. More sustainable communities and coastline with potential future cost savings (capital, maintenance) Establishing a precedent that cannot be achieved nationwide

Note: * The actual indicator will depend on the data available; Source: based on Magenta Book, tailored to specific needs of this study

Table 2-1: Developing the research questions

Evaluation question (with research question to which it relates, eg RQ1 for research question 1)	Sub-questions/indicators	Source of information/ approach
SUMMATIVE		
<p>Projects</p> <p>Is the Pathfinder complete? Was rollback or buy/leaseback undertaken? (RQ1)</p> <p>What have been the outcomes? Were the project objectives met? (RQ3)</p> <p>What problems were encountered? Did these affect the extent to which the scheme was successful, or the application of different adaptation options? (RQ2)</p> <p>Were the projects seen to be successful from LA perspective (and different perspectives within LA), from stakeholder perspective? (RQ4)</p>	<p>Project outcomes measured against objectives, by number of properties included, approach taken</p> <p>Description of problems encountered and how addressed, or if not addressed how these affected delivery of objectives</p> <p>Success measured as extent to which stakeholders are happy with outcomes (direct: those at risk; indirect: those not at risk but affected by the options)</p>	<p>Pathfinder reports</p> <p>Case study interviews and meetings</p> <p>Economic valuations (costs and benefits)</p>
<p>Lasting impact</p> <p>What are the impacts since the Regeneris report (2011/2012) and what changes have arisen, both positive and negative. How have the projects affected individuals (residents, businesses) and communities? (RQ3)</p> <p>How effective were the options? Is it desirable to continue with them? (RQ3)</p> <p>Have the options been extended beyond the Pathfinder funding? Could they be? What are the constraints if not? (RQ4)</p>	<p>Questions to enable data to be collected to inform value for money assessment (compared with a do-nothing baseline):</p> <p>Property benefits (assets)</p> <p>Social benefits (community)</p> <p>Environmental benefits (location)</p> <p>Other benefits (eg individual)</p> <p>Costs incurred (to deliver options)</p> <p>Costs saved (eg how risk is managed)</p>	<p>Pathfinder reports</p> <p>Case study interviews and meetings</p> <p>Economic valuations (costs and benefits)</p> <p>Qualitative and quantitative information to support</p>

Evaluation question (with research question to which it relates, eg RQ1 for research question 1)	Sub-questions/indicators	Source of information/ approach
<p>How have the Pathfinder projects contributed to relevant local, regional and national strategies or public policy? (RQ5)</p> <p>What is the economic and financial case for these options? Does it stack up locally and/or nationally? Who benefits and by how much? (RQ5)</p>	<p>Changes made to Local Authority policy (eg planning, housing) and approaches, any additional funds or in-kind support as a consequence of Pathfinder funding</p>	<p>monetisation of costs and benefits (where appropriate and sufficiently robust)</p>
FORMATIVE		
<p>Management & structure</p> <p>What skills/expertise were required to enable the adaptation options to proceed? Were these available in-house or were specialists required? (RQ3)</p> <p>Which of these skills/expertise would be needed for the options to be implemented beyond the Pathfinder? (RQ3)</p>	<p>Breakdown of time input/costs by in-house and outside staff, by type of expertise (eg legal, planning, engineering, communications, councillors, consultants and specialists)</p> <p>Implications for future staffing structure/requirements within Local Authorities</p>	<p>Case study interviews and meetings</p> <p>Discussions with project manager/ project staff</p>
<p>Effective delivery</p> <p>Were the projects delivered with benefits that exceeded costs? What was the benefit-cost ratio at the national and local levels? Could the options be self-funding without public funds? (RQ5/RQ5)</p> <p>How were the project outputs disseminated? What outputs were produced? What publicity was used? (RQ3)</p>	<p>Draws on information collected on costs and benefits to produce estimates of NPVs and BCRs</p> <p>Number of applications to participate as a measure of people's interest in the scheme</p> <p>What could be done to make the application process easier?</p> <p>How was the scheme publicised?</p>	<p>Pathfinder reports</p> <p>Case study interviews and meetings</p> <p>Economic valuations (costs and benefits)</p> <p>Media reporting</p>

Evaluation question (with research question to which it relates, eg RQ1 for research question 1)	Sub-questions/indicators	Source of information/ approach
<p>Lessons learnt and recommendations</p> <p>How replicable are the options? Could they be rolled out across other LAs? What are the constraints and opportunities? How were these addressed within the projects? What can this tell us for application in other areas? (RQ3)</p> <p>Has the interim view of buy and leaseback changed since 2011? (RQ6)</p>	<p>How specific were the issues, constraints and solutions?</p> <p>To what extent do the properties included reflect a particular location or are they typical of coastal properties, villages, etc.?</p> <p>Comparison with alternative adaptation options (where available) to identify the opportunity costs of rollback</p>	<p>Case study interviews and meetings</p>

- a) **Value for Money (VFM)** - The financial aspect of rollback is key, including strong cost benefit analysis (CBA). VFM is a relative concept, and comparisons with other options available in Pathfinder areas would be desirable, taking into account that traditional defence options may not be sustainable (feasible, desirable)
- b) **Legal and planning aspects** - are rollback and buy/leaseback possible within the present legal and planning frameworks? (feasible, desirable)
- c) **Wider policy** - is rollback or buy/leaseback possible within other policies? Can it fit as an option into other policies? (desirable)
- d) **Whether the approach is replicable** (desirable)
- e) **Whether there is an appetite at both Local Authority and community level for the approach** (desirable)

2.3 Collection of evidence

The evidence collected includes qualitative and quantitative information on the costs, benefits, damages avoided (physical, psychological, costs of recovering from increased deprivation), wider benefits (social, environmental), future costs avoided (reduction in maintenance and capital costs), and reduction in uncertainty for residents, businesses and communities. It comes from two main sources:

- A review of published and other documents (as available)
- Engagement with organisations and individuals involved with the Pathfinder projects

Desk-based review of documents

The aim of the review of documents is to identify data and evidence that can be drawn from relevant published and other documents and to identify data gaps and issues that need to be addressed during engagement. As such, it forms the initial step in answering all research questions in line with the evaluation matrix as well as providing the basis for structuring our discussions in the case studies.

As well as reviewing documents that provide evidence on the outputs from the Pathfinder projects, our approach also covers planning policy and legal documents relevant to rollback and/or leaseback options and wider projects (Table 2-2 lists the documents reviewed).

Table 2-2: List of documents reviewed

Pathfinder output documents	Planning policy and legal documents
<i>General documents (not specific to one of the big five Pathfinders)</i>	
<p>Regeneris (2011): Evaluation of Coastal Pathfinders</p> <p>Defra (2012): Coastal Change Pathfinder Review</p> <p>Defra (2010): Adapting to Coastal Change – Developing a Policy Framework</p> <p>Environment Agency & Defra (2008): Social Justice in the Context of Flood and Coastal Erosion Risk Management – A Review of Policy and Practice</p> <p>Scratby and California Coastal Pathfinder (2011): Planning Project – Final Report (Annexes). Contains information on other pathfinder schemes</p>	<p>National Planning Policy Framework</p> <p>Department for Communities & Local Government (2010): Planning Policy Statement 25 - Development & Coastal Change (policy statement and practice guide)</p> <p>Department for Communities & Local Government (2009): Planning Policy Statement 25 - Development & Flood Risk (policy statement and practice guide)</p> <p>Homes & Communities Agency (2012): Regulatory Framework for Social Housing in England</p> <p>Homes & Communities Agency (2014): Regulating the Standards</p> <p>Homes & Communities Agency (2014): Land Development and Disposal Plan</p> <p>SQW (2011): Reconciling Regeneration and Coastal Adaptation</p>
<i>East Riding of Yorkshire Pathfinder</i>	
<p>East Riding of Yorkshire Council (2011): East Riding Coastal Change Pathfinder Update</p> <p>East Riding of Yorkshire Council (2013): Coastal Change Adaptation Planning Guidance</p> <p>East Riding of Yorkshire Council (2012): East Riding Coastal Change Pathfinder Feedback Report. Report for Director of Planning and Economic Regeneration to the Cabinet</p> <p>East Riding Council (2011): Pathfinder Feedback Report. Appendix C: Adaptation Case Study</p> <p>East Riding Coastal Change Pathfinder (2010): The Bungalow, Cliff Farm, Waxholme – Options Paper</p> <p>BBC News (2010): Living on the East Yorkshire Edge. 2 February 2010</p> <p>Hull Daily Mail (2011): Don't let us lose</p>	<p>DTA (2003): The Rollback of Caravan and Holiday Home Parks from Eroding East Yorkshire Coastline</p> <p>East Riding of Yorkshire Council (2005): Proposed Roll back Policy for Houses & Farmsteads</p> <p>East Riding of Yorkshire Council (2005): The 'Roll Back' of Residential and Agricultural Dwellings at Risk from Coastal Erosion in the East Riding of Yorkshire</p> <p>East Riding of Yorkshire Council (2010): Preferred Approach Core Strategy</p> <p>East Riding of Yorkshire Council (2012): Coastal Change Pathfinder: Feedback Questions for Officers</p>

Pathfinder output documents	Planning policy and legal documents
<p>another home to coastal erosion. 1 February 2011</p>	
<p><i>North Norfolk Pathfinder</i></p>	
<p>NNDC (2012): North Norfolk Coastal Change Pathfinder Project – Post Project Evaluation</p> <p>NNDC (2010): Property Lease Back Project – Project Initiation Document</p> <p>NNDC (2013): Case Study – Happisburgh ‘Roll Back’ of Nine Residential Properties</p> <p>NNDC (2009): Project A – North Norfolk District Council Coastal Change Adaptation Pathfinder Application Form, North Norfolk District Council.</p> <p>NNDC (2011): Landscape and Visual Impact Assessment for the Pathfinder Project to Re-locate Manor Caravan Park, Happisburgh, North Norfolk Coastal Change Pathfinder.</p> <p>NNDC (2012a): Manor Caravan Site Project, North Norfolk District Council.</p> <p>NNDC (2012b): North Norfolk Coastal Change Pathfinder Project - Post Project Evaluation, North Norfolk District Council.</p> <p>NNDC (2012c): Removal/relocation of dwellings most imminently at risk, North Norfolk District Council.</p> <p>NNDC (2012d): Property Acquisition for ‘Buy and Lease-back’ Project, North Norfolk District Council.</p> <p>NNDC (2012e): Happisburgh Cliff Top Enhancement and Relocation of Threatened Infrastructure Project, North Norfolk District Council.</p> <p>NNDC (2012f): Pilgrim Shelter Project, North Norfolk District Council.</p> <p>NNDC (2012g): Marram’s Path Project, North Norfolk District Council.</p>	<p>NNDC (2008): North Norfolk Core Strategy (Development Control Policies – Policy EN12)</p> <p>NNDC (2009): Development Control Guidance – Development and Coastal Erosion</p> <p>NNDC (2010): Supplementary Report on Acquisition of Properties in Beach Road Happisburgh</p>

Pathfinder output documents	Planning policy and legal documents
Scarborough Pathfinder	
Siddle, R.P., Rowe, S., Moore, R. ICE Coastal Management Conference 2015: Adaptation to Coastal Cliff Instability and Erosion and Property Loss: Case Study into the Knipe Point Cliff Retreat Pathfinder Project	Scarborough Borough Council (2009): Draft Core Strategy (Core Policy ENV3)
Scratby Pathfinder	
The Planning Cooperative (2011): Scratby and California Coastal Pathfinder Planning Project. Recommendations and Final Report RPA Ltd. (2010): Scratby Coastal Pathfinder Project: Adaptation Land/Asset Study. Final Report	
Waveney Pathfinder	
Suffolk Coastal and Waveney District Councils (2013): Draft Coastal Change Pathfinder in Easton Bavents and Reydon Suffolk Coastal and Waveney District Councils (2014): Coastal Change Pathfinder in Corton and Easton Bavents – Project Report	Waveney District Council (2009): Core Strategy Development Plan (Policy CS03) Waveney District Council (2013): Development & Coastal Change - Supplementary Planning Document Waveney District Council (2011): Development Management Policies (Sections 4 and 7)

Engagement with Pathfinder projects

The aim of engagement is to collect data and evidence to fill data gaps from the review of documents and to obtain updates and the latest information and opinions. Discussions with organisations and individuals involved with the Pathfinders also enable our team to explore the research questions in more detail, especially to investigate to the detail of the sub-questions in the evaluation matrix. We have held discussions with Council officers in various departments, residents and businesses benefiting from the Pathfinder activities and community representatives for the wider impacts. Local district, parish and ward councillors involved in the Pathfinder projects have been included to explore governance issues but also as a means of obtaining views from a resident's perspective (especially where the residents themselves are difficult to locate for specific discussions). In addition, we have contacted consultancies and specialists who worked on the pathfinder projects.

Table 2-3: Detailed evaluation questions linked to each research question

Research question	Evaluation stage	Detailed evaluation questions
RQ1: have the Big Five Pathfinders proceeded with the rollback schemes they identified in the main phase of the Pathfinder programme?	Summative: Projects Summative: Projects	Is the Pathfinder complete? Was rollback or buy/leaseback undertaken?
RQ2: If not, why not? What significant barriers to implementing rollback and buy/leaseback have Local Authorities faced?	Summative: Projects Summative: Projects	What problems were encountered? Did these affect the extent to which the scheme was successful, or the application of different adaptation options?
RQ3: If schemes have proceeded, what were the objectives of each scheme and have these schemes met their objectives? What are stakeholder and authority views as to the desirability and replicable of schemes? What problems, if any, were encountered and how were these addressed?	Summative: Projects Summative: Projects Summative: Lasting impact Summative: Lasting impact Summative: Lasting impact Summative: Lasting impact Formative: Management & Structure Formative: Management & Structure Formative: Management & Structure Formative: Effective delivery	What have been the outcomes? Were the project objectives met? What are the impacts since the Regeneris report (2011/2012) and what changes have arisen, both positive and negative. How have the projects affected individuals (residents, businesses) and communities? How effective were the options? Is it desirable to continue with them? What skills/expertise were required to enable the adaptation options to proceed? Were these available in-house or were specialists required? Which of these skills/expertise would be needed for the options to be implemented beyond the Pathfinder? How were the project outputs disseminated?

Research question	Evaluation stage	Detailed evaluation questions
	Formative: Effective delivery Formative: Effective delivery Formative: Lessons learnt and recommendations Formative: Lessons learnt and recommendations Formative: Lessons learnt and recommendations Formative: Lessons learnt and recommendations Formative: Lessons learnt and recommendations	What outputs were produced? What publicity was used? How replicable are the options? Could they be rolled out across other LAs? What are the constraints and opportunities? How were these addressed within the projects? What can this tell us for application in other areas?
RQ4: To what extent have rollback schemes turned out to be financially viable and potentially self-funding without public funds? What are the financial flows in schemes, between local authorities, homeowners, developers and others?	Summative: Projects Summative: Lasting impact Summative: Lasting impact Summative: Lasting impact	Were the projects seen to be successful from LA perspective (and different perspectives within LA), from stakeholder perspective? Have the options been extended beyond the Pathfinder funding? Could they be? What are the constraints if not?

Research question	Evaluation stage	Detailed evaluation questions
<p>RQ5: What is the updated view of the economic case of rollback schemes to UK Plc and the Exchequer</p>	<p>Summative: Lasting impact</p> <p>Summative: Lasting impact</p> <p>Summative: Lasting impact</p> <p>Summative: Lasting impact</p> <p>Formative: Effective delivery</p> <p>Formative: Effective delivery</p> <p>Formative: Effective delivery</p>	<p>How have the Pathfinder projects contributed to relevant local, regional and national strategies or public policy?</p> <p>What is the economic and financial case for these options?</p> <p>Does it stack up locally and/or nationally?</p> <p>Who benefits and by how much?</p> <p>Were the projects delivered with benefits that exceeded costs?</p> <p>What was the benefit-cost ratio at the national and local levels?</p> <p>Could the options be self-funding without public funds?</p>
<p>RQ6: Has the interim view that buy and leaseback schemes are not viable changed, based on any further work on such schemes since 2011?</p>	<p>Formative: Lessons learnt and recommendations</p>	<p>Has the interim view of buy and leaseback changed since 2011?</p>

Each Pathfinder project has its own engagement plan, with specific contacts listed. A record has been kept of all communications with each contact and information collected is collated in a proforma. Table 2-3 links the research questions to the evaluation stage and the detailed evaluation questions (from Table 2-1). This provides a consistent approach across all five Pathfinders, and helps ensure that consistent and, hence, comparable, evidence is collected.

2.4 Financial and economic analysis

Overview

The objective of the economic analysis is to undertake an assessment of the costs and benefits of the no rollback baseline and to compare these against the costs and benefits of rollback. This has been done through building on the method used by Regeneris Consulting (2011) to enable the case for rollback to be assessed.

It is important to note that many of the benefits of rollback and, potentially, the dis-benefits (costs or damages) associated with the baseline may be difficult to monetise. Hence, it is important that qualitative descriptions of the type of impacts and their magnitude (positive or negative) are included as an important part of the analysis. Also important, is identifying that the economic analysis is one element of assessing the potential feasibility, desirability and replicability of rollback.

The economic case for rollback can be considered at four scales:

- Owner of at-risk property
- Community (comprising those at risk, those not at risk and where rollback might be located)
- Local Authority
- UK plc

By identifying who pays and who benefits from each type of cost or damage we can easily identify where there is the risk of double counting and exclude this from totals.

Table 2-4 sets out our proposed approach building on the method developed by Regeneris Consulting (2011). The main differences between the Regeneris Consulting (2011) approach and that used in this study are:

- The different types of costs and benefits that are included, as set out in Table 2-4, this includes assumptions to enable the impact of blight to be captured in monetary terms and inclusion of demolition costs
- The assessment of a baseline that focuses on the 'without rollback' option. For the Pathfinders themselves this is likely to differ from the baseline used in Regeneris, which looked at the situation relevant to each Pathfinder. The

‘without rollback’ option baseline is used in this study so that the benefits of rollback options can be considered in more generic terms; this was considered to be more useful to other Local Authorities as it gives an indication of the economic case for rollback where little or no work has been undertaken on coastal adaptation to date

- The assessment focuses on evaluation of rollback options, rather than the Pathfinders. The rollback options are assessed generically, with the Pathfinders used as the basis for ‘case study’ type assessment, giving an indication of the economic case for rollback in real world examples
- Inclusion of qualitative assessment of impacts where these could not be quantified and/or monetised

Table 2-4: Updated RPA approach compared with Regeneris Consulting (2011) approach for monetisable benefits

Scenario	Regeneris	RPA
<i>Do-nothing</i>		
Benefits	Annual yield until property erodes	No account taken of benefits specifically (this will be inferred from differences in damages)
	Market value of properties once replaced	No replacement of properties under the revised baseline
Damages	No write-off of properties when eroded	Write-off at risk-free market value in projected year of erosion (or use of probability to reflect uncertainty over when this would occur)
	Blight not monetised in terms of reduction in value of neighbouring properties due to presence of poorly maintained and derelict properties	Evidence from estate agents suggests 10% to 15% reduction in market value of neighbouring properties due to blight (could extend to whole parish, but limited to neighbouring streets). This will be included within the monetised assessment of costs with care taken to avoid double counting should changes in amenity be included (qualitatively or quantitatively). Evidence from Happisburgh suggests that owners recognise a forthcoming loss and cease all but necessary maintenance some years before actual loss. Hence there will be some blight from properties which are still occupied.

Scenario	Regeneris	RPA
Costs	Demolition costs not included; no account taken of reduction in amenity due to presence of derelict properties	Demolition costs included in year of predicted erosion (avoids need to take account of reduction in amenity from having eroded properties along frontage, on beach, etc.) Also relocation costs of residents taken into account
	Relocation costs not included	Relocation costs included associated with the need for the Council to re-home residents whose properties have been eroded
	Existing property acquisition costs not incurred	Existing property acquisition costs not incurred
	Land acquisition costs not incurred	Land acquisition costs not incurred
	Build costs included to replace properties that are eroded	Built costs only included where properties are considered to be rebuilt due to, eg planning policy, otherwise residents assumed to move away
	Other costs (fees, etc.) not incurred	Other costs (fees, etc.) not incurred
<i>Rollback and buy/leaseback as adaptation options</i>		
Benefits	Annual yield benefits only for non-residential properties/assets (ie Crag Walk)	No use of annual yield benefits
	Market value of replacement properties/assets in year finished	Risk-free market value benefits once replacement properties/assets are built
Costs	Demolition costs not included	Demolition costs included in year of predicted demolition (linked to Pathfinder option, eg planning permission being granted)
	Existing property acquisition costs assumed to be transfer payment (only for societal costs, included for public costs)	Existing property acquisition costs included only where the property is bought by the Local Authority (public costs)
	Land acquisition costs not included (unless is captured in cost of construction; not clear)	Land acquisition costs included only where the property is bought by the Local Authority (public costs) (dependent on rollback option)

Scenario	Regeneris	RPA
	Build costs included	Build costs included
	Other costs (fees, etc.) included (not clear what these costs actually cover, not specified)	Other costs (fees, etc.) have not been included specifically

The data needs for the financial and economic analysis are the main constraint on what can be valued in monetary terms, hence, engagement was iterative with the desk-based review. Our project team has identified ideal data needs and, where these could not be met, have looked for surrogate data that will enable assumptions to be made, and qualitative and quantitative information to support financial and economic estimates.

Approach to the economic analysis

Types of costs and benefits

The first step in any economic analysis is to define the costs and benefits that are to be considered. The above discussion highlights that there are financial costs that are likely to be incurred by different groups as a result of the risk of coastal erosion with or without rollback. Table 2-5 sets out a range of categories that could be affected, which may result in costs or impacts (both positive as benefits or damages avoided, and negative as damages). This table is theoretical and details of the baseline and rollback options are included in Section 9. In all cases, the time at which each impact occurs will be important. For transparency it is considered important to capture as many of the costs and benefits as possible even where these occur under the baseline and rollback options. However, some costs (eg demolition costs) could occur at different times under the baseline and the rollback options. The effect of discounting means that these costs would not necessarily cancel out.

Table 2-5: Summary of impact categories likely to be affected by rollback and buy/leaseback¹

Category (based on FCERM-AG categories)	Coverage of category	
	Baseline	Rollback option
<i>Economic benefits</i>		
Property value compared with risk-free market value	Risk free (write-off) value in the year the property is expected to be lost (this may need to be adjusted if blight is also included to avoid double counting)	Risk free (write-off) value in the year the property is expected to be lost (this may be partially or totally offset by the rollback option)
Demolition costs	Costs incurred when a property has to be demolished	Costs incurred when a property has to be demolished (see Section 9 for details of specific timings of these)
Relocation costs	Costs incurred when a household has nowhere to move to once property is lost to erosion, most likely rehoming costs incurred by Local Authority or privately	Costs incurred due to rehoming or assistance with rehoming (rather than rebuild) where the rollback option includes this aspect
Rebuild costs	Costs incurred when a household is able to finance their own move to replace their lost property. This has not been included under the baseline as assumed more property owners could not afford to rebuild or would not be able to rebuild, eg without rollback policies being in place	Costs incurred when a property at risk of erosion is relocated inland (will depend on details of rollback option being assessed)

¹ Buy/leaseback is considered here theoretically but not taken further in the economic analysis as it was not undertaken by any of the Pathfinder projects.

Category (based on FCERM-AG categories)	Coverage of category	
	Baseline	Rollback option
Blight	Caused by lack of maintenance of at-risk properties with cost as percentage of risk-free market value that is lost earlier than year of erosion	Any loss of risk-free market value due to residual impacts under rollback options (ie where rollback options do not address all impacts associated with risk of erosion)
Utilities infrastructure (not included in costs due to lack of data therefore is qualitative only)	Costs incurred due to relocation of infrastructure or installation of new infrastructure (eg to new development)	Costs incurred due to relocation of infrastructure or installation of new infrastructure (eg to new development)
Transport infrastructure (not included in costs due to lack of data therefore is qualitative only)	Costs incurred due to relocation of infrastructure or installation of new infrastructure (eg to new development)	Costs incurred due to relocation of infrastructure or installation of new infrastructure (eg to new development)
Agriculture	Not considered significant since the Pathfinders did not include significant areas of agricultural land	No opportunities for rollback of agricultural land <i>Category not considered further in the assessment</i>
Land use	Impacts (may be positive or negative) associated with baseline (in most cases, land use is unlikely to change under the baseline)	Impacts (may be positive or negative) associated with rollback option (redevelopment, regeneration or opening up of land along the coastal edge where properties are demolished prior to erosion period)
Indirect effects on businesses (qualitative information only)	Costs associated with reduced income as residents move away or reduction in spending due to increase in deprivation	Linked to extent to which residents are retained within the community

Category (based on FCERM-AG categories)	Coverage of category	
	Baseline	Rollback option
Environmental benefits		
Ecosystem services	Demolition of properties before they cause an environmental impact should mean there are no significant impacts on ecosystem services (although demolition may have a temporary environmental impact) <i>Category not considered further in the assessment</i>	
Change in status under WFD	As above, environmental impacts should be minimised due to demolition of properties <i>Category not considered further in the assessment</i>	
Historic environment	Impacts (may be positive or negative) on heritage assets in terms of their setting, interrelationship with other assets	Impacts (may be positive or negative) on heritage assets in terms of their setting, interrelationship with other assets
Landscape	Costs due to increasing dereliction of properties up to time of demolition	Impacts (may be positive or negative) on landscape and changes to the landscape
Social benefits		
Way of life	Costs due to people's way of life being interrupted (mainly by uncertainty)	Impacts (may be positive or negative) on how people live, work and interact
Culture	Not considered significant unless there are cultural assets at risk; main impacts are due to impacts on households <i>Category not considered further in the assessment</i>	
Community	Impacts on the cohesion, stability, character of the community etc.	Impacts on the cohesion, stability, character of the community etc.
Political systems	Impacts on people's involvement in decisions affecting their lives	Impacts on people's involvement in decisions affecting their lives
Health and well-being	Costs due to increased stress, potential costs due to impacts on physical health (if quality of property declines)	Impacts on physical, mental, social and spiritual wellbeing

Category (based on FCERM-AG categories)	Coverage of category	
	Baseline	Rollback option
Personal and property rights	Personal economic disadvantage for those owning/living in (and near) at-risk properties	Impacts on personal economic status depending on rollback option
Fears and aspirations	Costs in terms of negative perceptions about safety and fears for the future	Impacts (may be positive or negative) on people's perceptions about their safety and fears for the future
References/information sources	¹ Environmental and social benefits based on Environment Agency (2010)	

Assessing the impacts

The occurrence and magnitude of impacts depends on a number of factors:

- The time before erosion is predicted to occur
- The level of awareness of coastal erosion risk, perception of that risk in terms of chance of occurring and the consequences of the risk, degree of acceptance of the risk and response taken in terms of actions
- The level of community action and interest, and ability to act

These factors are themselves interlinked, for example, community action and interest is likely to be greater where there is a higher level of awareness and greater perception of the risk; awareness and perception are likely to be highest where the predicted time to erosion is shortest. In addition, a change in policy (such as when the Shoreline Management Policies changed or due to reaching the end of an epoch) to managed realignment or no active intervention can both increase awareness and raise the perception amongst the community potentially resulting in increased levels acceptance and consequently action and interest, even where the time before erosion is predicted does not change. The level of action will also depend on an individual's ability to respond in line with their awareness and perception of the risk. This may be affected by financial or personal circumstances.

The result of these factors is that the types of impacts and their magnitude vary over time, with some occurring well before a property is at risk of erosion and others not occurring until a property is at imminent risk of erosion. Some impacts, once they have incurred, stay at the same level while others increase over time as the time to erosion gets shorter. Table 2-6 shows which impacts tend to occur due to an increase in awareness and perception of erosion risk, and which occur when the property is at imminent risk of erosion. This is an important distinction as it the

timing of impacts that has a significant effect on the outcomes of the economic analysis due to the use of discounting.

Table 2-6: Impacts associated with an increase in awareness and perception of risk versus imminent risk of property loss

Impacts associated with an increase in awareness and perception of risk	Impacts associated with an imminent risk of property loss
<ul style="list-style-type: none"> • Loss of property value due to perception of risk or lack of insurance cover and mortgage availability (life less than 60 years) reducing number/range of potential buyers • Blight caused by lack of maintenance due to there being no (perceived) incentive to invest where the residual life of the property is less than the predicted life of any maintenance/repairs • Increase in pressure group activity • Increase in complaints and questions to Local Authority, MP, etc. (for rollback, development of policy to address coastal erosion issues and reduce risk of complaints) • Changes to community (those who can sell do so and move on with their lives; those who cannot have to stay) • Loss of business income as those who can afford to move away do so • Loss of business income as less investment is made with respect of home improvement • Change in way of life as a result of increasing uncertainty over the future • Increase in stress due to increased uncertainty, increased fears and reduced aspirations, also due to feeling of lack of control over future • Blight caused by lack of confidence in local property market, change in community and landscape • Loss of business income due to (perceived) changes in quality of 	<ul style="list-style-type: none"> • Loss of property, loss of home • Loss of financial investment and ability to pay for future care, and increased need for social and healthcare resources (both in terms of care provision and calls on social and healthcare resources). • Demolition costs (to avoid causing environmental and landscape issues) • Relocation costs (rehousing where property owners cannot afford to replace their property; rebuild/purchase where owners can afford to move/rebuild) • Costs of relocating or installing utilities (where eroded or associated with any new builds) • Costs of relocating or installing infrastructure (where eroded or associated with any new builds) • Loss of business income (as people relocate following erosion) • Impacts on heritage (due to erosion), environment and landscape (where not avoided)

Impacts associated with an increase in awareness and perception of risk	Impacts associated with an imminent risk of property loss
landscape <ul style="list-style-type: none"> Request to LA for reduced Council Tax banding 	

In order to assess these impacts it is necessary to consider when they are likely to occur and the magnitude of the impact. As noted above, the timing of the impact is likely to reflect the extent to which individuals are aware of the risk, the importance an individual places on erosion risk when compared against other factors that they are dealing with on a day-to-day basis, and the extent to which an individual is able to take action in response to their awareness and their perception of the importance of the risk. The impacts could occur at any time, depending on an individual's reaction to the risk. Therefore, in order to assess the financial and economic impacts, it is necessary to make some assumptions upon which to base the assessment of when the impacts might occur.

To do this, we have developed three scenarios that reflect different reactions that individuals and communities could have to erosion risk. The scenarios are informed by experiences seen in the Pathfinder communities, but are also intended to enable an assessment of a 'theoretical' community such that the results can be used to assist other Local Authorities who may be considering rollback as an adaptation option. There is an infinite number of scenarios that could be described but we have focused on three that help to explain the variation in response across the five Pathfinders. Using three scenarios also helps to keep the analysis reasonably simple while allowing the variations in reaction to be reflected. Table 2.7 summarises the reaction of the Pathfinder communities to erosion risk under three factors: awareness, perception and response. The variation in reactions is then used to provide the basis for developing scenarios.

Table 2-7: Using the Pathfinders to develop the scenarios

Pathfinder	Awareness	Perception	Response
East Riding	Rapid erosion rates means there are clear indicators of the erosion risk but the risk is considered to be very unpredictable	Perception of risk is related to recent erosion events and so the risk can become more/less important in comparison with other risks (eg health, financial) at different times	Response to risk is mainly linked to imminence of erosion

Pathfinder	Awareness	Perception	Response
North Norfolk	Awareness of risk was raised when SMP changed from a policy of hold the line to managed realignment/no active intervention. In Happisburgh, there have been properties along Beach Road that have in the past been lost as a result of coastal erosion	Change in SMP policy is reported anecdotally to have resulted in an immediate reduction in property values. Property values then recovered for a while in some locations	Generally response has been linked to imminence of erosion, although it is also likely to be linked to the extent to which people are able to sell their properties (especially if purchasers consider these properties to be blighted, or where mortgages are not available)
Scarborough	Risk is related to instability rather than erosion and so is covered by insurance (due to risk being landslides).	Linked to the chance of a landslide and increases as the chance increases, not least because insurance cover may not then be available	Response is mainly linked to the availability of insurance cover and extent to which people are able to move (eg if they can sell their property)
Scratby	SMP raised awareness of the potential risk of erosion even though many in the community considered that the risk was low (no properties had been lost even along the undefended coast)	SMP policy change reduced house prices initially. Some (but limited evidence) that house prices have recovered over time with no loss of properties due to erosion	Linked to perception that risk is significant with many owners expressing a willingness to stay; others though have not been able to sell their properties

Pathfinder	Awareness	Perception	Response
Waveney	<p>Corton: SMP policy is to hold the line until 2025, after which the preferred policy is managed realignment. The change in policy resulted in coastal erosion becoming a high profile risk in the area with some members of the local community becoming involved in discussions on the topic (pre pathfinder). It should be noted that people moving into the area may be not be aware of the erosion risk (and/or engaged in discussions)</p> <p>Easton Bavents: rapid erosion rates means there are clear and highly visible indicators of the erosion risk (such as gardens and properties being lost), this means awareness of the risk is high with residents and the local community</p>	<p>Corton: those moving in to the area may not perceive the risk as being significant (if they are aware of it); some of those who have stayed are concerned about the risk but are campaigning for defences</p> <p>Easton Bavents: since 1998 (SMP) five of the nine properties have been sold for a lot less than the risk-free value but the value has plateaued over time</p>	<p>Corton: many of those most concerned about the risk and who were able to moved out following publication of SMP</p> <p>Easton Bavents: if the Pathfinder project had not happened it is likely that any property within the 5 year line would have been unsellable</p>

The remainder of this report uses the term ‘reaction to coastal erosion risk’ to cover awareness, perception and response. In particular, the response to coastal erosion risk is used to develop scenarios to provide a basis for identifying the timing and magnitude of impacts for the economic analysis. Three scenarios are used in the economic analysis, these are defined as follows:

- **Scenario 1:** where the reaction from the community is low almost up to the point where erosion is predicted to occur within the next 5 years. This is due to perception being low, for example, this is most likely to be due to property

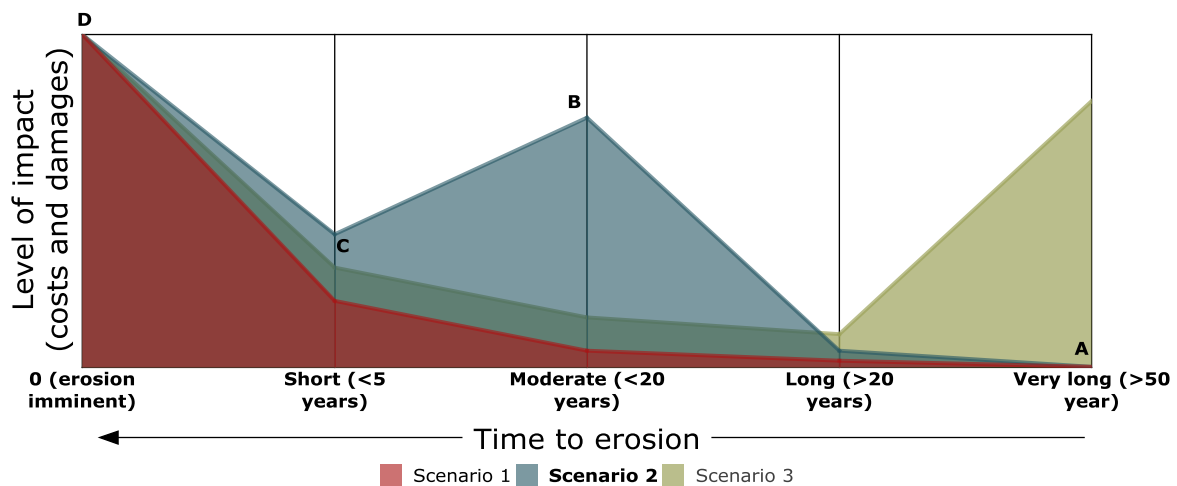
owners and the wider community knowing that there is a risk and either not needing to react to it as the risk is considered to be reasonably predictable or that there is cover available (as in Scarborough).

- **Scenario 2:** where the reaction from the community is low until there is a change in policy or some other cause such as erosion along the coast that raises awareness of erosion risk where the risk was not previously considered to be significant (such as at Scratby where there was no community consensus that erosion is occurring) or where erosion can proceed very quickly with significant loss of land in a short time period such that the risk of erosion can suddenly seem much more significant (and hence perception of the risks) even if it is still some distance from properties (such as at Easton Bavents or East Riding). The result is an immediate reduction in property values due to perception of risk by those responsible for marketing properties or buyers looking for properties identifying a significant concern. Over time, the initial drop in property values decays somewhat when no properties are lost to erosion, but as time to the proposal changes in policy, the importance of the risk increases again and the impacts increase in magnitude.
- **Scenario 3:** a change is identified and published for a policy of managed realignment at some time in the future (50 years from the time when the decision is made). This is a long time ahead of predicted erosion but still results in a significant response from the community due to concerns about future loss of their property (or property value) and blight, in particular where a community has previously been protected by defences (such as at Corton). This can result in an immediate reduction in property prices even in locations that would not be directly eroded due to the perception of a change to the village itself. This could result in many of those who are able to, and want to, sell their properties to move away from the community in question. New property owners may be less aware of the erosion risk since the properties they are purchasing may not be directly at risk such that they would still be able to obtain mortgages. As such, the reduction in property prices is likely to decay over time with no obvious effects from the erosion risk until the time comes that the policy change comes into effect or the defences start to fail and erosion is imminent.

Figure 2.2 provides a visual representation of the scenarios converted to an impact curve to show how the impacts can vary over time. There is no scale shown on the y axis in Figure 2.2, this is because the quantified level of costs and damages itself varies according to a variety of factors, according to the type of costs and benefits as listed in Tables 2.4 and 2.5. The scale on the x axis relates to the time to erosion (with 0 being erosion is imminent and very long meaning that there is 50 years until erosion is predicted). Thus, the change in level of impacts runs from right to left. For

example, under Scenario 2, the level of impact 50 years before erosion is predicted is low (close to zero) since there are limited environmental indicators that physical erosion is imminent and the SMP policy has not been changed and is still hold the line (point **A** on Figure 2-2). When the time to erosion is 20 years, however, (point **B** on Figure 2-2) there is an increase in the perception of risk. This could be due to a change in the SMP policy or a sudden erosion event that results in a large area of the coastline being lost. The community and individual property owners are made aware that the risk is potentially much more significant such that the level of reaction and thus impacts increases. However, there is then no loss of properties such that the perception of risk declines over time (point **C** on Figure 2-2). Once the time to erosion is short (five years or less), the perception increases as it becomes apparent that action needs to be taken by the property owner and, potentially, also by the community. As a result impacts increase again (point **D** on Figure 2-2).

Figure 2.2: Impact curve for Scenarios with no rollback



Two assessments have been undertaken, one based on rollback options as developed in the Pathfinders to assess how those options perform in the Pathfinder locations, and one for an indicative property at risk in 50 years. The three scenarios shown in Figure 2.2 relate to the approach for the indicative property at risk in 50 years. The use of these two assessments allows the rollback options to be assessed using scenarios to see how they perform for both an individual property and in the Pathfinder situations. At any one time a snapshot of the impacts could be very different, depending on which scenario is taken. Therefore, understanding the likely impacts requires knowledge of the reaction to a community to risk and how that risk changes over time. In addition, the uncertainty associated with the timing of erosion can be very different around the coast and may be more predictable in some areas than others. The main economic assessment assumes the time to erosion is 50 years, although a sensitivity test of 20 years is also undertaken to assess the impact on the costs and benefits and benefit-cost ratios of the rollback options. For

the indicative property and a time to erosion of 50 years, discounting means that the damages under Scenario 3 would be considerably higher than those under Scenario 2, which again would be greater than those under Scenario 1. The potential magnitude of the monetised impacts is discussed in Section 9.2 for the baseline while Sections 9.3 and 9.4 consider the rollback options.

Approach to quantifying and monetising the costs and benefits

To enable quantification and monetisation of the costs and benefits, it is important to identify how the impacts under each category are linked to minimise the risk of double counting. This section describes the approach to monetising the costs and benefits. The results of the monetised costs and benefits are presented in Section 9. Table 2-8 sets out the outcomes that result from impacts for each category and highlights where there are links between the categories. Here the categories from Table 2-5 have been reorganised into those that are associated with a change in awareness and those associated with imminence of erosion (based on Table 2-6). Just because there are links between categories does not mean that there is double counting. Some impacts may be cumulative, with the addition of effects resulting in greater impacts. Others though may be capturing the same type of impact and it is these that need to be identified to reduce double counting. The approach taken to estimating costs is the same under the baseline and rollback options, although in many cases, the rollback option should either avoid or reduce the costs (i.e. the damages associated with the risk of erosion will be lower). Table 2-9 brings together the expected/anticipated outcomes (that result from the impacts) and identifies how they could be monetised.

Table 2-8: Identifying outcomes and linkages between categories

Category	Costs/damages	Benefits	Linked to
<i>Categories related to change in awareness</i>			
Property value compared with risk-free market value	Loss of property value compared with risk-free value		Blight
Blight	Loss of some of the risk-free property value before the time of erosion Cost of dealing with complaints, etc. Immobile population (possibly wider than just at-risk)	Savings in reduced maintenance expenditure	Loss of property value

Category	Costs/damages	Benefits	Linked to
	properties)		
Indirect effects on businesses	Loss of income to businesses Risk of businesses closing Knock-on effects increasing deprivation		Way of life (people moving away) Way of life (people moving away) Blight, community, way of life, health and wellbeing
Way of life	Immobile population (possibly wider than just at-risk properties) Cost of dealing with complaints, concerns, etc.		Blight Blight
Community	Reduced community cohesion, reduced community size affecting businesses and services Knock-on effects increasing deprivation		Indirect effect on businesses
Political systems	Setting up of pressure groups Potential increase in community action along with community tension	Increased community cohesion	Way of life, blight, community, health and wellbeing, property rights, fears and aspirations
Health and well-being	Increase in stress Risk of physical health impacts from poor quality housing		Loss of property value, blight, way of life, property rights, fears and aspirations
Personal and property rights	Loss of ownership of property		Loss of property value, way of life, property rights, fears and aspirations
Fears and aspirations	Inability to plan for future or make changes		Way of life, blight, community, health and wellbeing, property rights

Category	Costs/damages	Benefits	Linked to
Categories related to imminence of erosion			
Demolition costs	Payment for demolition of property		
Relocation costs	Cost of rehousing		
Rebuild costs	Cost of buying land, rebuilding house, permissions, fees, etc.		
Utilities infrastructure	Cost of relocating or installing new infrastructure		Demolition costs, rebuild costs
Transport infrastructure	Cost of relocating or installing new infrastructure		Demolition costs, rebuild costs
Land use	Loss of land to development (or opening up of land following demolition)		Demolition costs, rebuild costs
Historic environment	Loss of heritage value		
Landscape	Change in landscape value		Blight

Table 2-9: Approach to monetisation of outcomes (costs and benefits)

Outcome	Categories covered	Who is impacted?	Approach to quantification	Approach to monetisation
Categories related to change in awareness				
Loss of property value	Property value Blight	Individual property owners Community Local Authorities UK plc	Number of properties at-risk Number of properties potentially affected by blight	Comparison of risk-free value versus actual value Loss of Council Tax income Assumed reduction in property value due to blight

Outcome	Categories covered	Who is impacted?	Approach to quantification	Approach to monetisation
Savings in reduced maintenance expenditure	Property value Blight	Individual property owners	Number of properties at-risk	Savings (as % of risk-free property value)
Cost of dealing with complaints, etc. (for rollback, development of policy to minimise complaints)	Property value Blight	Local Authorities	Number of complaints or questions requiring LA response (number of policies required and context)	Officer time needed and hourly rate per response/ per policy
Immobile population (possibly wider than just at-risk properties)	Property value Way of life	Individual property owners Community UK plc	Number of people unable to move for work (linked to demographics)	Lost opportunity cost from not being able to move for work
Loss of income to businesses	Indirect effects on businesses Community	Community Local Authorities	Number of households affected Number and type of businesses, and typical reliance on location and income	GVA approach based on Frontier Economics (2014) [but only where there is a significant number of businesses affected]
Risk of businesses closing	Indirect effects on businesses Community	Community Local Authorities	Linked to above	Reduction in Business Rates

Outcome	Categories covered	Who is impacted?	Approach to quantification	Approach to monetisation
Knock-on effects increasing deprivation	Property value Blight Indirect effects on businesses Way of life Community Personal and property rights Fears and aspirations	Individual property owners Community Local Authorities UK plc	Number of properties and households affected Index of deprivation and likely changes to the assessment of deprivation	Likely to be difficult to monetise
Reduced community size affecting services	Property value Blight Way of life Community Fears and aspirations	Individual property owners Community Local Authorities	Number of properties and households affected Typical size of community required to support services	Likely to be difficult to monetise
Setting up of pressure groups	Way of life Community Political systems Personal and property rights Fears and aspirations	Individual property owners Community Local Authorities	Number of people involved in pressure group, including those in and outside at-risk areas Number and type of campaigns	Likely to be difficult to monetise
Engagement with communities	Community Political systems	Local Authorities	Involvement in Pathfinder, other engagement activities (workshops, drop-ins, etc.) organised	Officer time needed and cost per event (cost per workshop based on Pathfinder costs from Defra, 2012)

Outcome	Categories covered	Who is impacted?	Approach to quantification	Approach to monetisation
Potential increase in community tension	Community Political systems Personal and property rights Fears and aspirations	Individual property owners Community Local Authorities	Difficult to quantify, linked to disagreements within the community	Likely to be difficult to monetise
Increase in stress	Health and wellbeing Fears and aspirations	Individual property owners Community UK plc	Number of people in at-risk and blighted areas Proportion of people suffering from specific conditions	May be increased healthcare costs for NHS (GP, hospital), may be possible to use surrogate value (eg cost of stress to UK economy) based on HSE (2014)
Risk of physical health impacts from poor quality housing	Health and wellbeing	Individual property owners UK plc	Number of people in at-risk and blighted areas Proportion of people suffering from specific conditions	May be increased healthcare costs for NHS (GP, hospital), but may be difficult to monetise without details of additional symptoms caused
Loss of ownership of property	Personal and property rights	Individual property owners UK plc	Number of at-risk properties that are first (not second) homes ²	Likely to be difficult to monetise

² Impacts on second home owners are captured qualitatively only.

Outcome	Categories covered	Who is impacted?	Approach to quantification	Approach to monetisation
Inability to plan for future or make changes	Fears and aspirations	Individual property owners Community UK plc	Number of people in at-risk and blighted areas	Likely to be difficult to monetise
Categories related to imminence of erosion				
Demolition costs	Cost	Individual property owner <u>or</u> local authority UK plc	Number of properties at-risk and predicted time until erosion	Payment for demolition of property
Relocation costs	Cost	Individual property owner <u>or</u> local authority UK plc	Number of properties at-risk and predicted time until erosion	Cost of rehousing (where owner cannot afford to rebuild)
Rebuild costs	Cost	Individual property owner UK plc	Number of properties at-risk and predicted time until erosion	Cost of buying land, rebuilding house, permissions, fees, etc. (only where owner can afford to rebuild)
Utilities infrastructure	Cost	Utilities company (passed on to customers)	Number (or length) of utilities infrastructure at risk	Cost of relocating or installing new infrastructure
Transport infrastructure	Cost	Local authority (or public sector, eg Highways Agency) UK plc	Number (or length) of transport infrastructure at risk	Cost of relocating or installing new infrastructure

Outcome	Categories covered	Who is impacted?	Approach to quantification	Approach to monetisation
Land use	Cost or benefit	Individual property owners Community UK plc	Area of land predicted to be lost (or number of plots)	Loss of land to development (or opening up of land following demolition)
Historic environment	Cost	Community UK plc	Number of heritage sites, type, designations	Loss of heritage value
Landscape	Cost	Community UK plc	Designations and area affected	Change in landscape value

The approach detailed here is mostly consistent with the approach used in the Multi-Coloured Manual (MCM). Differences between this approach and that of the MCM centre around the use of a 15% adjustment to the risk-free market value of a property due to blight. This is based on the value of a house being depressed due to the risk of erosion. The 15% assumption is taken from responses from estate agents in a survey undertaken on the impact of erosion on coastal property prices (based on RPA et al, 2009). A sensitivity test assuming a value of 10% for blight is also undertaken. The results are reported in Annex 6.

3. The Pathfinder projects

3.1 Overview

This study considered the five largest pathfinders (by amount of funding allocated from Defra). The project at Tendring, however, did not undertake either rollback or buy/leaseback, hence, has been replaced by Scratby. Information is provided below on the aims and objectives of each of the Pathfinders, the area and assets at risk, the size and structure of the community, plus descriptions of the activities undertaken.

3.2 East Riding of Yorkshire

East Riding of Yorkshire Council applied for a Pathfinder grant to build on existing best practice, and to develop and test innovative approaches to assist vulnerable and isolated groups in adapting to the pressures caused by coastal change. The Pathfinder project was focused on taking a risk-based approach to providing practical support and guidance, with the ultimate aim of removing those groups and isolated individuals from risk. East Riding of Yorkshire Council received £1,205,609 to achieve this aim.

A large proportion of the East Riding coast is subject to erosion, with the glacial till stretches being the most susceptible; this accounts for 48km of the 85km East Riding coastline, with at least 67 properties at risk (East Riding of Yorkshire Council, 2009). The properties most at risk of coastal erosion are widely dispersed along its length. Therefore a risk-based approach, which could be applied to any number of coastal communities, was adopted instead of an area-specific scheme.

Activities undertaken as part of this Pathfinder include offers of practical support for residents through an Enhanced Assistance Package (EAP) with the package of measures tailored to the individual circumstance. Coastal monitoring data was used to identify and prioritise properties at risk, based on erosion rates and distance of properties from the cliff edge. The assessment of risk is updated on a six-monthly basis. A variety of adaptation options (with set limits), including help with demolition and relocation costs, small hardship payments and buy and leaseback, were offered to residents based on their level of risk (imminent, higher or lower risk). A small grants fund was also launched that allowed the Pathfinder to include support for community groups and businesses in the coastal zone. This element of the Pathfinder was designed to support those within the higher and lower risk categories with long-term adaptation plans. To support the delivery of the Pathfinder project an

internal East Riding Coastal Officers' Working Group was established. A review of East Riding of Yorkshire Council's rollback policy was proposed to investigate how the existing suite of rollback policies for residential properties, caravan parks, and farmsteads, could be expanded to incorporate business properties, and amalgamated into a single multi-faceted Coastal Change Management Policy. To help support the wider communities and provide guidance, the development of an Integrated Coastal Zone Management (ICZM) Adaptation Communications Toolkit was included within the Pathfinder project. The aspiration was to provide a basis for communities to engage in long-term planning for coastal change by providing a central hub for coastal information. This part of the Pathfinder project is still in development.

3.3 North Norfolk

North Norfolk District Council received £3,000,000 of Pathfinder funding to explore planning for and managing adaptation to coastal change for coastal infrastructure and business. The original application included the following objectives:

- Establish the methodology and facilitate the relocation of Manor Caravan Park in Happisburgh
- Establish the methodology and facilitate the relocation of 12 houses along Beach Road in Happisburgh
- Establish 'purchase to lease back' options for properties in Shoreline Management Plan (SMP) epoch 2
- Relocate the cliff top car park at risk of coastal erosion
- Facilitate the rollback of community facilities in short and medium-term erosion risk areas
- Relocate coastal infrastructure important to the viability of coastal communities in locations affected by coastal erosion and flood risk
- Removal of debris and derelict defences from the beaches. This is outside the scope of this study but it did provide a relatively cheap and easy approach that had an immediate visible benefit. The approach was trialled at Happisburgh and Beeston Regis and was considered a success by the communities

These objectives affected the communities of Happisburgh, Trimmingham and Cromer with the majority of projects undertaken in Happisburgh. Within Happisburgh the assets at risk included Manor Caravan Park, 12 properties (based on the first SMP) and the cliff top car Park. Within Trimmingham the Village Hall was at risk and in Cromer the Marram's cliff top path was at risk.

Relocation of the assets at risk within North Norfolk was considered to be important to the communities in which they were situated. The caravan park is thought to play a significant role in the village of Happisburgh, bringing in money and thus providing economic benefits to the community and local businesses. The properties at risk of coastal erosion within this area were suffering from a lack of maintenance and this was having a detrimental impact on the visual amenity of the area. Relocation of the cliff top car park was also to reduce the impact on visual blight as well as to help meet the needs of the local residents and visitors to the area. Trimmingham village hall was considered to be inadequate for many of the uses to which it could be put and was at risk of erosion within 20 to 30 years and Marram's cliff top path was closed in 2007 for safety reasons, with no alternative route available.

Within Happisburgh the overall aim was a 'whole community' approach and so the activities undertaken to address the risks were focussed on relocation of the 'at risk' assets. Relocation of the caravan park is still underway (although the caravan park has been made more resilient to coastal change in the short term), as is the relocation of nine of the 12 properties at risk (although demolition of the properties has taken place) and the car park has been successfully rolled back. Rollback of the car park also included the construction of new beach access, public toilets and cliff top paths. Within Trimmingham the village hall is in the process of being relocated although this is not yet complete. The Pathfinder contributed £200,000 to this project which has stalled due to the time required to obtain additional funds from other sources. In Cromer the cliff top path has been successfully rolled back. Other activities undertaken by the Council in the course of the Pathfinder include development of a methodology for valuing houses at risk of coastal erosion and a property market analysis to determine the possibility of implementing a buy/leaseback scheme on properties with a 20 to 100 year life in Happisburgh.

3.4 Scarborough

Scarborough Borough Council received £1,022,500 to explore planning for, and managing adaptation to coastal change for the Knipe Point community. This Pathfinder was specifically set up to look at bridging the gap between the payments people receive from their insurance companies for the loss of their properties (insurance companies pay-out for landslides but not for coastal erosion) and the lack of cover for the loss of the land that their properties stand on.

The Knipe Point community comprises 56 properties located off the A165 road, in Cayton Bay, near Scarborough. The community has been found to have concerns regarding sustainability due to land instability following ground investigations. Within the year following the Pathfinder, 15 properties were identified at 'probable' risk with a further 26 at 'possible' risk within the community.

The Scarborough Borough Council Pathfinder project was based around the concept of landbanking; providing land that affected residents could then rebuild their properties on using insurance pay-outs. The project involved the sourcing and purchase of land to allow residents at immediate risk of land instability to rebuild their properties through insurance pay-outs at a site not at risk of coastal erosion or land instability. The Pathfinder covered the 15 properties in the Knipe Point community considered to be at immediate risk of being lost through land instability. Outputs included a technical paper on the concept of landbanking and the lessons learned from the Knipe Point Pathfinder, which has been submitted to the 2015 ICE conference by Scarborough Borough Council.

3.5 Scratby

Great Yarmouth Borough Council was given £296,000 in December 2009 to examine how the coastal community of Scratby and California could adapt to their changing coastline within the medium and long-term (50 to 100 years). The overall aim of the Pathfinder was to improve engagement with the local community and to empower the community to consider coastal adaptation options.

The Scratby Pathfinder area comprises one small to medium sized village (around 520 properties) on soft cliffs fronted by low dunes, which is partly protected by a rock berm. The coastline is expected to continue to erode and Great Yarmouth Borough Council has a policy of 'managed realignment' (as indicated in the SMP). The community also includes some holiday lets and retail outlets as well as one public house. Within the next five years, 27 properties are considered to be at risk, however by 2105 this number increases to 251 if those properties affected by loss of roads are included.

The five main activities undertaken within the Scratby Pathfinder to meet the overall aim were:

1. Develop a programme of community education and information
2. Examine and test equity release and equity transfer schemes and opportunities
3. Investigate sources of external and commercial funding
4. Explore rollback options
5. Develop a Community Adaptation Management Plan

3.6 Waveney

Waveney District Council was awarded £1,534,555 to explore planning for and managing adaptation to coastal change for the Easton Bavents and Corton Village

communities. Within Corton the Pathfinder initially set out to engage with local businesses and residents to discuss planning ahead to allow the community to adapt in sufficient time. The initial aim of the rollback scheme at Easton Bavents was to assist residents to relocate to a single site within the village of Reydon (or elsewhere in the district).

It is not clear what area within Corton is at risk over the coming years, however, the SMP indicates that quite a large proportion is likely to be lost due to erosion in the long term (to 2105). Within Easton Bavents there are nine properties considered at risk within the next 12 years.

In Corton the Pathfinder undertook engagement with residents to explore several relocation options including purchasing at risk properties at their rebuild price and providing the owner with a plot of land. New toilet facilities were built working with the Pavilion Committee, which will provide replacement facilities as/when the only other public toilet block in this village is closed due to erosion.

In Easton Bavents a parcel of land was identified for rollback in a nearby village, but was met with resistance from certain groups within the community. This resistance combined with the fact that the work there had taken significantly more of the original budget and time intended, meant the Project Board altered its approach. Assistance packages of up to £15,000 capital funds (to be used in purchasing a relocation plot of land and/or construction costs of a replacement property) for property owners who had purchased their properties prior to 1998 (ie before the first SMP was approved and officially confirmed that there would be no active intervention in managing this part of the coastline) were put in place. A grant was agreed of up to £10,000 non-capital funds (to be used for non-capital aspects including fees for site finding, acquisition, outline planning permission, architects, land searches, and legal conveyance) for both pre and post 1998 property owners. These assistance packages are to be used within 5 years of acceptance and owners can use them to relocate individually to a plot of land within the district. One property has been demolished and Waveney District Council have provided each eligible owner a letter of legitimate expectation that should their property be lost to erosion before the completion of the project they will still benefit from the rollback planning policies. A further property was sold in 2014 and is due to be demolished this year (2015). It was indicated that the new owners are considering relocating using the Pathfinder assistance package.

4. Results of evaluation of the Pathfinders

4.1 Was rollback or buy/leaseback undertaken?

Each of the Pathfinder projects considered in this study have investigated rollback as a coastal adaptation option with this approach having been undertaken in four of the five cases. Table 4-1 provides an overview of progress in relation to rollback and buy/leaseback schemes investigated/undertaken during the Pathfinder Projects.

Table 0-1: Summary of progress in relation to rollback and buy/leaseback schemes undertaken during the Pathfinder Projects

Pathfinder	Rollback	Buy/leaseback
East Riding of Yorkshire	Undertaken (provision and use of an Enhanced Assistance Package to assist residents' to rollback)	Investigated, but not undertaken
North Norfolk	Undertaken (relocation of cliff top car park in Happisburgh, realignment of Marram's foot path in Cromer) Progressing (relocation of nine residential properties and a caravan park in Happisburgh and relocation of Trimingham village hall)	Investigated, but not undertaken
Scarborough	Progressing (relocation of Knipe Point residents to a site not impacted by land instability)	Not considered
Scratby	Investigated, but not undertaken to date	Investigated, but not undertaken
Waveney	Undertaken (relocation of public toilets in Corton) Progressing (provision and acceptance of assistance packages by property owners in Easton Bavents. No properties have been relocated as yet) Investigated, but not undertaken (rollback of residential properties)	Not considered

East Riding of Yorkshire Council adopted a risk-based approach that could be applied to any number of coastal communities instead of an area specific scheme given the wide dispersal of properties at risk of coastal erosion. Practical support for residents was offered through the Enhanced Assistance Package (EAP) with the package of measures tailored to the individual circumstance. For those properties at imminent risk of coastal erosion a relocation package was available to assist

property owners to move away from the at risk area. As part of the Pathfinder project a review of East Riding of Yorkshire Council's rollback policy was also undertaken. The aim of the review was to investigate how the existing suite of rollback policies for residential properties, caravan parks, and farmsteads, could be expanded to incorporate business properties, and amalgamated into a single multi-faceted Coastal Change Management Policy. This is to allow the inclusion of tourism infrastructure which is important for the local economy.

A number of rollback schemes have also been investigated as part of the North Norfolk Pathfinder, with significant progress having been made with regards to the rollback of residential properties, a caravan park and the cliff top car park in Happisburgh, the village hall in Trimmingham and a footpath in Cromer. It should be noted that schemes to roll back the cliff top car park in Happisburgh and the footpath in Cromer have been successfully completed. Nine residential properties in Happisburgh at imminent risk of coastal erosion have been demolished with outline planning permission having been granted for the construction of replacement properties further inland. This scheme can be considered to have reached completion once these properties have been constructed. Considerable progress has been made with regards to relocating the caravan park to an inland location in Happisburgh with a suitable alternative location identified. However, the refusal of planning permission has prevented the scheme from reaching completion to date. The Pathfinder Project has enabled the re-provision of 12 plots which were lost to erosion on an adjacent part of the site which had previously been refused planning consent. Further improvements have also been made to the resilience of the site by adapting the sewerage infrastructure to ensure plots remained viable as the coast erodes. The rollback of Trimmingham village hall has also progressed with a relocation site having been purchased. Fundraising is on-going to raise the necessary amount to enable construction of the new facility to commence.

The Scarborough Pathfinder project involved the sourcing and purchase of land to allow residents of 15 properties at immediate risk of land instability at Knipe Point to rebuild their properties at a site not at risk of coastal erosion or land instability through insurance pay-outs. The scheme was based around the concept of landbanking; providing land which affected residents could then rebuild their properties on using insurance pay-outs. A suitable site has been identified with planning permission granted for year round permanent residency. Completion of the purchase of the site is due in January 2015 and it is anticipated that identified residents will begin to move to the site once insurance pay-outs have been made. It is important to note that the residents at Knipe Point are able to fund the rebuilding of their properties on the land granted to them through insurance pay-outs. This would not be possible if the problem was solely coastal erosion driven, as it is not possible to insure a property against erosion as it is against land instability.

The Scratby Pathfinder is not one of the “Big Five” Pathfinder Projects and received significantly less funding than the other schemes considered in this study. As a result there was not a specific objective to undertake rollback or buy/leaseback within the Scratby Pathfinder project. However, rollback was explored as an option for coastal adaptation, with possible locations for rollback identified and required policies suggested.

The possibility for undertaking rollback as part the Waveney Pathfinder was investigated with a particular focus on the villages of Corton and Easton Bavents. In Corton new toilet facilities have been built with assistance from the Pavilion Committee which will provide replacement facilities as/when the only other public toilet block is closed due to erosion. However, rollback of residential/business assets was not undertaken, this was reported to be due in part to a lack of community capital and complacency from those not at immediate risk (outside the 5-10 year line). Significant work has been undertaken to assist the owners of properties at imminent risk of coastal erosion in Easton Bavents in relocating inland. Initial rollback plans raised objections from sections of the community resulting in the project board altering the approach. The new approach involved providing property owners with an assistance package to relocate. Although no properties have been relocated as of yet, one property has been demolished and a second property has been sold and is due to be demolished in the near future. Waveney District Council have provided each eligible owner with a letter of legitimate expectation that allows them to still benefit from the rollback planning policies should their property be lost to erosion before the project is completed.

The buy/lease back approach was investigated as a potential adaptation option in the East Riding of Yorkshire, North Norfolk and Scratby Pathfinder projects. In the case of the East Riding of Yorkshire, buy/leaseback was offered as an option as part of the EAP for owners of properties projected to be at risk of coastal erosion before 2055. The potential for undertaking buy/lease back was also investigated in Happisburgh as part of the North Norfolk Pathfinder. However, in both cases this approach was not taken forward due a number of financial constraints (in particular the cost associated with bringing the properties up to the Decent Homes Standard). It has been suggested that further investigations would be useful to assess the feasibility of alternative buy/leaseback options (such as the use of properties as holiday lets or other business premises) in the future as funding and time constraints prevented further investigation as part of the Pathfinder Projects. In the case of Scratby, buy/leaseback was initially investigated, but significant community opposition to the concept prevented further consideration.

4.2 What problems were encountered and did this affect success?

Each of the five Pathfinder projects encountered problems and barriers that impacted the success of the projects to varying degrees. It is evident that some problems were common amongst most of the Pathfinders and are likely to be symptomatic of projects that involve significant amounts of community engagement and rollback. Other problems are more specific to the individual Pathfinder projects and have developed through specific actions or issues. Some of the problems could not be overcome and thus inhibited the success of the projects to date. Other problems were able to be addressed and either had minimal impact on the success or required a change in approach to allow rollback to proceed.

There were several problems encountered when selecting land for rollback. In order for a parcel of land to be suitable for a relocation site it needs to be affordable, meet the needs of the community relocating and be agreeable with the wider community. Negotiations with landowners can be difficult with some seeing rollback as a chance to inflate land prices to development land market value. Although this is not considered to have prevented rollback from occurring, it has been raised as a potential issue by East Riding of Yorkshire Council. In Waveney some landowners were unwilling to sell their land or wished to place a reclaim clause based on future disposal value of properties, this was deemed unacceptable and negotiations were abandoned (Waveney District Council, 2014). Once a parcel of land has been located and a price has been agreed, issues can still arise within the community. Finding an appropriate alternative site within Happisburgh for the caravan park that is acceptable to both the owner and the community (NNDC, 2012a; NNDC, 2012b) has been a fundamental constraint for the North Norfolk Pathfinder. In Scarborough there was difficulty in getting consensus from residents about a preferred site for relocation and disagreements arose between the residents and the council over the priorities for the suitability criteria. Although this created significant delays to the Pathfinder project, the issues were overcome through continued engagement. The proposal to relocate nine properties to Rissemere Lane East in Reydon (Waveney) was met with significant resistance from some sections of the community; this, in combination with other factors led to the Waveney pathfinder adopting a different approach that negated the need for the Council to purchase land.

A lack of awareness or understanding of erosion and rollback often results in significant time being spent on engagement and also contributes to other problems. It has the potential to stop a rollback scheme before it has had a chance to start as residents need to know why they are being asked to relocate. This can be difficult for them to understand if there is a limited perception of risk (this is often more prevalent in communities not at imminent risk of erosion). In Corton, the Waveney Pathfinder abandoned rollback in favour of projects that helped to educate the

community about coastal erosion. It was hoped that this approach would enable rollback to be revisited in the future. This engagement is particularly important given that the defences in Corton were refurbished 10-15 years ago with a design life of 20 years, which raised the expectations of the community regarding protection in the longer term. At Scarborough accepting that land instability was a result of natural processes was difficult for many and led to an initial unwillingness to accept that nothing could be done to stop the process. In Scratby the local community wanted as little change as possible and felt there was a lack of evidence supporting the predicted erosion rates set out in the Shoreline Management Plan (SMP).

Usually it is not possible for Local Authorities to fund the whole process of rollback and it is not Government policy to compensate individuals for the loss of their property due to coastal erosion. This means that property owners or communities need to fund part of the schemes themselves and in some cases also manage rebuilds. If there is a lack of capital funds, schemes can slow down significantly or stop completely. At East Riding a significant issue was managing the expectations of the residents as to what support, particularly financial, the Council were able to provide as part of the Pathfinder. In North Norfolk the relocation of Trimmingham village hall has stalled due to the difficulty and length of time required to raise additional funds to enable completion. A Pathfinder grant of £200,000 was provided to the Parish Council, however, this is not sufficient to both purchase an alternative site and construct a new facility. Therefore, fundraising is ongoing, and the hall cannot be rebuilt until sufficient funds are obtained. A predominantly elderly community at Knipe Point were left daunted by the prospect of arranging and managing a property rebuild.

One key aspect of successfully undertaking rollback is having the right skills available (at the individual, community and Local Authority level) to undertake tasks and the right project manager to encourage positive community involvement and drive the scheme forward. At Waveney it was felt that the initial Project Manager did not have the right level of engagement skills as had been hoped. The project started to lose momentum towards late 2011/early 2012, but when a new Project Manager was appointed the project “picked up” again. In addition to this, initial eligibility checks were conducted by an external consultancy; it was suggested that if these had been carried out by a legal firm, it is possible that they would have identified that two properties were not eligible for Pathfinder assistance. This caused delays within the project and led to some members of the wider community losing trust in the project. In North Norfolk, progress with relocating Trimmingham Village Hall has stalled, which is considered to be as a result of the time required to raise the additional funds to enable the project to reach completion. Also, the project is community led and delays have been caused as (in the initial stages at least) there was no single person driving the project forward. This has since been addressed by

the Parish Council with the designation of a management committee to oversee the project.

Encouraging community engagement in the process is essential for rollback schemes. Although engagement had been overall a success in the East Riding of Yorkshire, changes to the communication approach (from arranging public meetings with specific start times to public drop-in sessions spanning several hours) were required to ensure as many local views as possible were captured. One-to-one engagement was also found to be particularly effective, but required greater resource input. Council procurement rules at Waveney meant that engagement tasks were contracted to a large multinational consultancy. The engagement was found to have been inadequate and poorly timed and this may have contributed towards other problems such as negative press. It was suggested that if a smaller local company had been awarded the contract, they would have had a better understanding of the community issues and how to engage with that particular community. At Knipe Point (Scarborough) the engagement was mainly carried out through the existing Residents' Association. Engagement was made challenging as the committee spokesman did not necessarily reflect the feelings of the entire community and there was some fear of social exclusion amongst some residents who disagreed with the committee.

Negative press can have a detrimental impact on a project, stirring up community anxiety and in some cases leading to the spread of misinformation and community division. Negative press and misinformation added to the challenging engagement environment and what some felt to be misguided resistance at Easton Bavents. In Scarborough, negative media coverage turned the wider community against the Knipe Point residents, with them being portrayed as ungrateful. The reporting of properties being demolished added to residents' distress, with the media appearing to be capitalising on the residents' misfortune.

Some problems within the Pathfinder projects were specific to the process of buy/leaseback and meant that this option was not feasible to undertake. These problems included:

1. Residents, particularly those who are retired, have often struggled financially and emotionally with the transition from homeowner to tenant
2. Investigations showed the economics of the process to be marginal and risks to the Local Authority to be high. In particular, the cost of bringing homes up to the Decent Homes Standard
3. There may be substantial breaks in tenancies. If no tenant can be found, then there may be a substantial periodic loss in income received
4. Further legal constraints arise from the Housing Act 1985, which would necessitate leases having a term of at least 21 years. However, this could

create issues in situations in which properties are at risk of coastal erosion before this 21 year period is completed

5. Some homeowners do not see any financial benefit of the leaseback schemes. The purchase price that Local Authorities can offer (once costs for bringing houses up to Decent Homes Standards are taken into account) may be too low to be acceptable to the property owner. Also, if the offer was accepted by the property owner they would receive an initial payment, which would be used in paying the rent eventually leaving them with nothing

Problems have impacted the success of each Pathfinder project to some degree. However, with sufficient time and resources and the use of the right skills (in the context of the individual, community and Local Authority) most issues can be addressed and overcome. The problems that had the greatest impact on rollback success were often the ones that were out of the control of the Local Authorities, such as the make-up of communities and their ability to help themselves. Each Local Authority that considered leaseback found the problems encountered to be too great to justify continuing with the process. The overall financial/economic risks associated with leaseback for the Local Authorities and homeowners reluctance to become tenants were undoubtedly the main problems inhibiting leaseback. It is important to note that time and funding constraints prevented all buy/leaseback options from being fully considered as part of the Pathfinder Projects (such as using the properties as business premises/holiday lets). In North Norfolk some comments were received during the Pathfinder from some members of the community (typically those further inland) who did not want to see properties bought and leased out as holiday lets, as they considered there to be enough in the village already. However, consultation with stakeholders suggests that buy/leaseback may warrant further consideration if such an approach fits with what is considered as a consistent way forward for coastal management nationally.

Although the Pathfinder projects have not succeeded in completing every aim set out in their individual application bids, they have achieved some very successful outcomes in terms of the policies created and providing sustainable solutions that has enabled individuals to consider rollback or retain some asset value and ultimately assist communities in adapting to coastal change. The problems encountered provide valuable lessons for other Local Authorities in terms of what issues to look out for and how to overcome them when undertaking rollback.

4.3 What were the outcomes and how effective were they?

Each of the five Pathfinder projects achieved significantly different results and several are still in the process of achieving results. None of the Pathfinders

assessed has yet fully completed rollback of any residential properties (nine properties at risk of coastal erosion in Happisburgh have been demolished with replacement properties expected to be constructed in the near future); however there are examples of successes in rolling back local amenities. In North Norfolk for example, public toilets, a car park and a public footpath were relocated and in Waveney some public toilets were rolled back. Within East Riding of Yorkshire the provision of the EAP to property owners resulted in the reduction in the number of people living in properties at risk of erosion, removing the risk to life for residents of those properties which were at imminent risk.

An important aspect of the Pathfinders is the expected achievements on completion of the project. Many Pathfinders currently have projects underway to increase the resilience of communities to coastal erosion. In North Norfolk for example Trimingham Village Hall and Manor Park Caravan Park are in the process of being relocated as well as several properties which have already been removed in Happisburgh, with rollback anticipated. In Scarborough, an approach to relocate 15 properties at immediate risk of coastal erosion is underway based on insurance pay-outs (relating to land instability) to cover rebuild costs, with land being granted through the Pathfinder based on the principle of landbanking. Relocation has not yet occurred as residents are awaiting insurance pay-outs and purchase of the site for relocation is expected imminently. In Easton Bavents, Waveney, assistance packages have been accepted by seven property owners, but as yet no properties have been relocated, although one property has been demolished. One property has been sold and it was advertised in the property listing that any prospective purchaser should acquaint themselves with the planning policies allowing for rollback. It is therefore reasonable to assume that the ability to relocate this property with Pathfinder assistance was a key selling point. Waveney District Council also provided each eligible owner with a letter of legitimate expectation that should their property be lost to erosion before the completion of the project they will still benefit from the rollback planning policies. The same approach was also undertaken in North Norfolk to secure the rollback opportunity in case the property is lost.

Despite many of the Pathfinder projects still being underway there are already significant benefits to communities in terms of their sustainability in the context of coastal erosion. These benefits relate primarily to the improved awareness of the coastal communities to coastal processes which have resulted from engagement undertaken within the Pathfinder schemes, the movement of property owners away from at-risk areas and the changes to planning policies put in place as part of the Pathfinders. In the case of North Norfolk, specific changes to the caravan site in Happisburgh facilitated by the Pathfinder Project has increased the resilience of the park to coastal erosion in the short term, with full rollback a possibility in the near future.

The increased awareness of the communities to coastal erosion issues and the options available to them is illustrated by the Scratby Pathfinder. Part of the success of this scheme lies in the improved attitudes of the coastal community to adaptation options brought about through engagement. The community is now better informed as to the changes likely to occur on their coastline and the options available to them. The outputs included a Coastal Change Management Area (CCMA) and a Community Statement setting out community aspirations as to how the challenge of coastal change and the development that it leads to should be handled. This does not necessarily mean that the Scratby community is now sustainable in terms of its approach to coastal adaptation, however, it is clear that the community is now more aware of the risks of coastal change and the options available to them.

It is likely that improved awareness of coastal change in coastal communities is an outcome of all Pathfinders as engagement was a key part of all the schemes. This aspect was specifically identified in Waveney where short term projects such as an information board on coastal erosion built trust within the community and made some members more aware of the issues they will be faced with in the future. In addition several workshops, drop-in sessions and unmanned exhibitions were held in Corton to engage with the community and launch the project. Although these events were reported as having been poorly attended, they did identify what actions the community wanted to take forward (short term options) and therefore will have contributed to community awareness. Community engagement in Happisburgh, North Norfolk, contributed to improving the resilience of the village and raised awareness of potential adaptation options. This increased the confidence of local people (as well as potential investors) in Happisburgh's future. Within East Riding of Yorkshire there was considered to be a positive change in relationships between the Council and residents, with an improved understanding of coastal change and the services the Council is able to provide.

In addition to community awareness, the Pathfinder projects also provided Local Authorities with the means to investigate and explore the opportunities and constraints relating to coastal adaptation and methods to overcome these. The Scratby Pathfinder provides a theoretical background to this work through the development of four proposed policies which would contribute to coastal adaptation. These policies are considered in more detail in Section 5 but can be summarised as:

- Identification of a Coastal Change Management Area (CCMA) and four rollback areas
- Within the CCMA, planning permissions may be granted for essential infrastructure serving the needs of the immediate area or for development that provides significant benefits requiring a sea front location. Planning applications within the CCMA should be accompanied by an assessment of

vulnerability to erosion and are likely to be subject to a time limited condition related to the life expectancy of the site and the nature of the development

- In coastal rollback areas, applications for replacement of existing dwellings and other properties within the CCMA likely to be affected by coastal erosion will be considered favourably subject to a set of criteria (detailed in Section 5)
- Applications for residential development within the rollback area which is not for replacement of a dwelling within the CCMA will be considered favourably only if it facilitates the provision of replacement properties from within the CCMA in the form of land, infrastructure, and/or other financial assistance and if the planning authority is satisfied that there is a demand for replacement dwellings at the time

In other areas the Pathfinder funding available provided the opportunity to make changes. For example in Scarborough planning permission for Saxon Park was changed to allow year round permanent residential occupation instead of holiday accommodation not exceeding one month, making this site suitable as a rollback location. The Pathfinder project also provided a long term plan for the properties immediately affected by land instability at Knipe Point which will simplify the response when properties become at imminent risk of loss and avoid ongoing negative media coverage.

The Waveney Pathfinder provides another example of planning changes made by the councils. The Waveney Pathfinder undertook legal work which outlined the agreement between the owner and the council that rollback would be supported if the property was lost to erosion prior to the closure of the project. This was in response to owners' views expressed at workshops. Another significant outcome was that the Pathfinder contributed towards the development of the Planning and Coastal Change Supplementary Planning Document (SPD), the Relocation and Replacement of Development Affected by Coastal Erosion Policy (DM07) (allows planning proposals to be put forward for the relocation and replacement of community facilities and commercial properties anticipated to be affected by coastal erosion within the next 20 years) and the Housing Development in the Countryside Policy (DM22) (allows for development in the countryside, areas not usually considered for development, where it is the only way to address a particular need in exceptional circumstances, coastal erosion being one of these circumstances) which are all policies considered to enable rollback.

Overall it can be considered that the Pathfinder schemes have all contributed to the sustainability of coastal communities to coastal change, whether through actions already completed or those underway, or through raised awareness or changes to planning policies to facilitate adaptation.

4.4 How do the Pathfinders perform financially?

Overall finances of the Pathfinders and financial flows

Each of the five Pathfinders was allocated funds from Defra to undertake their proposed activities. Table 4-2 sets out the total funding allocated to each project.

Table 4-2 shows that the financial flows varied considerably amongst the Pathfinders. The majority of the money at Scratby (82%) was spent on consultancies, with none spent on consultancies in East Riding. Capital spend on delivering adaptive solutions was greatest at Waveney (63%) but no money was spent on this in Scratby. These differences will reflect the varying objectives and outcomes of each Pathfinder, as well as the amount of funding received. In some cases, the Councils also put in contributions themselves. For Scratby, Great Yarmouth Borough Council provided additional in-kind support of around £20,000.

Assistance Packages, such as those provided by East Riding of Yorkshire Council, provided financial flows to residents living in at-risk properties. Waveney District Council also provided assistance packages. These can be claimed up to five years after acceptance by the Council, or up to ten years where a further five year extension is requested. This provides financial flows to people who own at-risk properties.

In North Norfolk, a significant proportion (over 30%) was spent on the removal or relocation of dwellings at risk. Around 82% of the funds allocated to this element flowed to owners of at-risk properties and 4% spent on external consultants with a large proportion of this used to develop the methodology for valuing and purchasing these properties (it is important to note that if the scheme was undertaken again, on the same basis, these costs would not be required as the principles are already justified). Around 2% of the funds were spent on buy/leaseback investigations. Relocation of the cliff top car park at Happisburgh has generated a new income stream for the Parish Council. Realignment of the Marram's cliff top path is considered to have resulted in benefits for visitors and residents (as well as local businesses) as access between the car park and the beach access to the town centre has been restored. The benefits have not been quantified but any increase in access and recreational opportunities is likely to result in some local financial benefits.

Table 0-2: Funding allocated to each Pathfinder project

Pathfinder project	Funds allocated	Funds spent on	% on each activity
East Riding	£1,205,609	Staff costs – salary and associated costs	8%
		Capital spend on delivering adaptive solutions	28%
		Revenue spend on delivering adaptive solutions	48%
		Workshops, publications and other communications materials	3%
		Small grants	12%
North Norfolk	£3,000,000	Removal/relocation of dwellings at risk ¹	31%
		Relocation of the caravan site	5%
		Relocation of the Trimmingham Village Hall	7%
		Other business support	27%
		Infrastructure	20%
		Other	10%
Scarborough	£1,000,000	Independent valuation of the land on which the properties currently sat at Knipe Point Assessment to identify suitable sites through the Council's Housing Allocation Development Plan Application to vary the planning permission for Saxon Park (undertaken by the residents and not the council) Completion of the purchase of the site (due January 2015)	No detailed breakdown of costs
Scratby	£296,500	Staff costs – salary and associated costs	9%
		Consultancy and professional advice	82%
		Workshops, publications and other communications materials	~0%
		Small grants	1%
		Other costs	8%

Pathfinder project	Funds allocated	Funds spent on	% on each activity
Waveney	£1,534,000	Staff costs – salary and associated costs	11%
		Capital spend on delivering adaptive solutions	63%
		Revenue spend on delivering adaptive solutions	~0%
		Consultancy and professional advice	13%
		Workshops, publications and other communications materials	~0%
		Small grants	2%
		Other costs	9%

Source: based on Defra, 2012 supplemented with evidence collected through discussions with the Pathfinder projects

Notes:

¹ This does not include any potential income from realisation of the development value of the relocated properties.

The focus of the Scratby Pathfinder was on adaptation. Around 53% of the budget was spent on adaptation planning (of which just under half was spent on investigating adaptation options such as rollback and the rest was spent on development of a Coastal Change Management Area (CCMA) with associated policies and proposed rollback areas). Around 45% was spent on community engagement activities. Thus although there were few financial flows directly into the community (other than through the use of local venues for engagement events), the finances were directed towards assisting the community to move forwards.

Potential to be financially viable and self-sustaining

The ability for rollback to be self-funding depends upon:

- The willingness of private investors, landowners and/or developers to be involved in implementing adaptation options
- Whether Council land could be used (as could have been the case at North Norfolk although this was not used as the preference was to enable relocation within Happisburgh) or could be granted through landbanking (as at Scarborough)
- The ability of the local community to help themselves (in many cases communities will not have the funds available to facilitate relocation; therefore, additional fundraising will be needed. Also, many communities may lack the skills and expertise required to effectively undertake rollback, with project

management, consultation/engagement, legal and planning skills required to successfully complete rollback)

- The level of interest from those living in at-risk properties to move out before their property is lost due to coastal change
- The willingness of the community to accept that some change will have to happen

East Riding of Yorkshire Council found that self-funded rollback works successfully for commercial properties such as caravan parks, where they have the resources to finance the move. In Scratby, the Pathfinder showed that allowing developments on small amounts of land could help cover the costs of making plots available for rollback through planning gain³ (Defra, 2012). Legal limitations could restrict this however. The extent to which enabling development can be used to generate funds from the sale of houses to cover the cost of replacement properties was discussed in detail in Waveney and concluded that it would not be lawful. The Waveney Pathfinder did conclude though that there may be potential for rollback to be self-financing where planning permission can be granted for properties to be rebuilt such that the owner would realise the full market value.

Funding is seen as a key barrier to enabling relocation. East Riding of Yorkshire Council provided Enhanced Assistance Packages that were funded directly by the Pathfinder. Once the Pathfinder money has been spent, it is not anticipated that any further packages would be available unless the Council is able to apply for grants from other sources. Assistance packages provided at Waveney were not intended to cover the costs of rebuild, although one at-risk property that has the possibility to obtain planning permission for relocation has been purchased, suggesting that this policy has value that could be utilised by investors. In Scarborough, insurance payouts (related to land instability) could cover the rebuild costs, although this approach will not be available to address property loss due to coastal erosion. In North Norfolk, it was recognised that rollback needs financial support to be implemented at the local and national scale.

The introduction of the rollback planning (EN12) policy by North Norfolk District Council and the development opportunities it provides for an at-risk property, means such a property retains some financial value. This is further strengthened as, even in cases where the owner of a property that is at risk of coastal erosion does not want to move, North Norfolk District Council provides a letter of legitimate

³ Planning gain refers primarily to the increase in the value of land which results from planning permission being granted for that land. This increase in land value mainly accrues to the land owner, but a levy or tax may be applied to divert some of the planning gain to the public sector. In England and Wales, such arrangements are currently negotiated between the developer and the Council, and take place under the terms of Section 106 Agreement.

expectation. This allows the owner the opportunity to rollback for a period of five years should their house be lost within that time. As a result, the rollback planning (EN12) policy allows an economic value to be realised which could attract private sector interest and could lead to substantially reduced costs and risks to the public sector, and therefore the potential for an element of self-funding. To date, there has been limited interest in exploiting the rollback planning policy from private sector developers. This may be due to the perceived risk by the developer heightened by several factors such as:

- the economic climate
- a lack of awareness and the co-ordination time
- the costs associated with implementing this policy
- uncertainties of future planning guidance
- limited examples

Many of the Pathfinders identified that communities often have limited financial resources. In this respect it was considered that some form of support or guidance to assist communities in applying for funding would be beneficial, which suggests that the opportunity for self-funding of schemes where the community has limited opportunity to raise finances would be limited.

Other adaptation options, including buy/leaseback, were considered to be blocked by the requirement for a large initial outlay even though income from renting the property could be recouped over a period of time until the property is lost to coastal erosion. It is difficult for these options to become self-funding for the following reasons:

1. The properties tend to have quite short residual lives
2. Even where the properties have longer residual lives, there is often the need for significant outlay to meet the Decent Homes Standard such that they can be rented (it should be noted that the use of properties as holiday lets and businesses has been recognised by North Norfolk District Council as a potential option, however time and budget constraints prevented further investigation as part of the Pathfinder)
3. Money is needed upfront to buy the property but is only recouped annually. Without an initial source of funding, the money either has to be borrowed (incurring charges) or taken from existing resources. Use of existing resources may not be seen as a good return on investment where there are risks that the outlay may not be recouped due to erosion risk

In addition, the use of standard Treasury discounting rules for the outlay and income means it is difficult to yield a benefit over the expected remaining life of the property. Therefore, economically, it is very unlikely that buy/leaseback would be cost-beneficial to the local authority unless the life of the property was much longer than

originally predicted when it was purchased (yielding income over a longer period) or that the purchase price is very much reduced from the risk-free market value.

The only aspect of the Scratby Pathfinder project which was considered to be self-fundable was the methodological aspect, which would require an initial input from central government to set up, for example, a guide pack for communities.

Communities could then help themselves, potentially reducing the amount of input required (in financial) terms by Local Authorities.

4.5 Is there an economic case for rollback?

The economic case for rollback

The economic case depends upon the extent to which rollback options provide benefits (either as damages avoided or additional positive impacts) compared with the no rollback baseline. Section 9 of this report considers the economic case for rollback, based on the different types of interventions used by the Pathfinders. Here, the discussion focuses on the benefits and costs incurred under each Pathfinder. Table 4-3 provides a brief description of the beneficiaries and types of benefits arising from the Pathfinder projects. This forms the basis for assessing the benefits of rollback more generally.

Table 0-3: Beneficiaries and benefits from Pathfinders

Pathfinder	Beneficiaries			
	Owners of at-risk property	Communities	Local Authority	UK plc
East Riding	19 households received assistance through Relocation Package and 41 households received some financial assistance Four businesses also received financial assistance	Two community groups received financial assistance Indirect benefits from reduction in potential for blight. Restoration of land following demolition of properties has restored land and prevented it from becoming wasteland.	Improved relationships with coastal communities, with benefits for future engagement. Also resulted in better understanding of coastal erosion and constraints that the Council faces. Increased knowledge of	Economic benefit from relocation of properties and reduced risk of blight and deprivation. Foreshore environment protected from pollution. Continued erosion of coastline adding sediment to the system. Sustainability

Pathfinder	Beneficiaries			
	Owners of at-risk property	Communities	Local Authority	UK plc
		Retention of residents within the local area	most vulnerable people (useful in emergency situations)	benefits, avoiding tying future generations into unsustainable and increasingly costly forms of defence.
North Norfolk	<p>Received a value above the 'at risk' value of their properties.</p> <p>Rollback planning (EN12) policy helps property owners to gain planning permission and gives new use value to the development site that can be used to augment the purchase price</p>	<p>Potential economic benefits from relocation of caravan park.</p> <p>Retention of properties and residents within the local area.</p> <p>Indirect benefits from reduction in potential for blight.</p> <p>Improved visitor experience and recreational opportunities.</p> <p>Retention of community facilities</p>	<p>Improved relationships with coastal communities (adaptation is a long term approach, therefore a loss of community trust if engagement occurs but no work is undertaken).</p> <p>Potential tourism benefits in maintaining accommodation stock and sustaining coastal landscape.</p> <p>Improved opportunity for bio-diversity.</p>	<p>Reducing impact on the natural environment and the requirement for compensatory habitat.</p>
Scarborough	Residents given opportunity to relocate	Retention of residents within the local area	<p>Improved relationships with coastal communities.</p> <p>Reduced burden on the Local Authority of having to provide emergency housing.</p> <p>Retention and</p>	

Pathfinder	Beneficiaries			
	Owners of at-risk property	Communities	Local Authority	UK plc
			improvement of local housing stock	
Scratby	Community Adaptation Plan prepared, including Coastal Change Management Area to enable rollback	Increased understanding and awareness of coastal erosion. Community Adaptation Plan prepared to enable rollback within the community, retaining residents and property	Improved relationships with coastal communities	
Waveney	Able to sell their property for a higher value. Opportunity to relocate within Waveney	Retention of residents within local area (although there were objections to relocation sites suggesting this is not a major benefit in Easton Bavents/Reydon)	Benefits from partnership working and establishment of relationships between Council departments, councillors and communities. Reducing impact on the natural environment and the requirement for compensatory habitat	

As well as benefits to the Pathfinder communities, there are also significant lessons learnt from the Pathfinder process (management, engagement) that could have benefits for others looking to undertake rollback, furthering capacity for adaptive benefits as other practices are developed. The benefits can, therefore, be argued to be cumulative, if the Pathfinders provide a catalyst for further adaptive approaches.

In North Norfolk, it was considered that the economic case of rollback schemes to UK plc and the Exchequer are important and provide significant benefits but are not sustainable without funding. Although, there is the possibility that private investors will be interested in investing. Regeneris Consulting (2011) identified that the Waveney Pathfinder scheme had the highest public benefit-cost ratio⁴ (1.9), it also had a societal benefit-cost ratio of 1.3. This compares with a negative benefit-cost ratios for East Riding, and ratios at or below one for the other Pathfinders. Scratby was not considered in Regeneris Consulting (2011).

At the time of the Regeneris Consulting (2011) report only around 32% of the total funds had been spent such that the final outcomes, and hence, the full benefits may not have been realised. Since the Regeneris Consulting (2011) report, the following activities have been carried out:

- East Riding: 43 structures have been demolished (including temporary buildings and caravans), with 16 replaced before March 2012 and three after March 2012
- North Norfolk: nine properties were demolished and the area landscaped in early to mid-2012. Three sites have been identified for housing allocations with an application for outline planning consent prepared and submitted. The development land is soon to be placed on the market, with construction of the replacement properties expected in the near future. A new cliff top car park has been constructed in Happisburgh along with new toilet facilities. The caravan park has been made more resilient to coastal change in the short term with relocation of plots and the sewage system. Planning permission to relocate the caravan park further inland has been rejected with the owner having the right to appeal the decision
- Scarborough: 15 properties expected to be removed following completion of land purchase in January 2015
- Scratby: not included in Regeneris Consulting (2011) but no rollback has taken place to date although a Coastal Change Management Area has been identified through discussions with the local community
- Waveney: one property has been demolished at Easton Bavents. One further property has been sold and is due to be demolished in 2015. The number of properties eligible has decreased from nine to seven

This report does not attempt to update the cost-benefit analysis undertaken by Regeneris Consulting; instead it focuses on what the benefits of a range of rollback

⁴ Regeneris Consulting (2011) calculated the societal benefit-cost ratio (societal benefits ÷ societal costs) and the public benefit-cost ratio (societal Net Present Value ÷ public costs); societal Net Present Value is societal benefits minus societal costs.

options might be. These options are based on approaches implemented by the Pathfinder projects so will give an indication of the economic performance of the Pathfinders themselves. The main aim of this study is to consider the economic case for rollback and this case is presented in Section 9.

Desirability and feasibility of rollback elsewhere

Factors affecting desirability and feasibility include:

- **Availability of funding:** there may be a need to obtain external funds to enable rollback, although this could come from developers as well as the public purse. Development opportunities associated with a property also enable an at-risk property to realise some financial value. In many areas communities often have limited financial resources to facilitate rollback. In this respect it was considered that some form of support or guidance to assist communities in applying for funding would be beneficial, which suggests that the opportunity for self-funding of these schemes would be limited.
- **Interest in rollback:** rollback is continuing beyond the Pathfinder in North Norfolk with an example of a developer seeking to begin the process to obtain planning permission for the relocation of residential properties at risk of coastal erosion in Trimmingham. The plan is expected to involve relocating these properties in the nearby village. Rollback is also continuing in Waveney. One property has been sold recently (2014) and although the Pathfinder project has closed, the owners are still going through the process. East Riding of Yorkshire Council have transferred any leftover Pathfinder funds into the East Riding Coastal Change Fund and is therefore still offering the same EAP to residents that wish to apply for it. It is important to note that budget constraints mean that further funding will be needed if this support is to still be offered to residents once the current fund is used up.
- **Implementation of appropriate policies:** the rollback planning (EN12) policy introduced by North Norfolk allows owners of properties at risk of coastal erosion to apply for planning permission on land not previously designated for development. This assists owners of properties at risk of coastal erosion by allowing them to build an alternative property inland themselves or providing an incentive to developers to purchase their property and relocate this inland.
- **Building on lessons learnt from the Pathfinders:** East Riding is reviewing its rollback policies to include the findings from the evaluation of the Pathfinders. There are also significant lessons learnt from the Pathfinder process (management, engagement, partnership working) that could have

benefits for others looking to undertake rollback. East Riding of Yorkshire Council has retained their Coastal Officers' Working Group, which continues to meet once a quarter. This has enhanced the efficiency of cross-departmental working and standardised the existing process for dealing with coastal change. Scratby identified that rollback areas should be a small scale incremental extension, related to existing built up areas to alleviate community concerns about significant new developments. Waveney, however, identified that rollback has been found to be more feasible where all the properties are relocated to the same place, as using a larger site is better value for money than lots of individual sites.

- **Using experience gained from the Pathfinders:** East Riding of Yorkshire Council has produced a Coastal Change Adaptation Planning Guidance document (funded by Defra) for use by other local authorities. Scratby Pathfinder identified ideas which could be replicated elsewhere. These include use of the facilitation approach which began with identifying what the community wanted and how they wanted to achieve it and the adaptation options developed which could be a useful starting point for future projects. Flexibility is essential to maximise the chances of successful relocation, taking into account the needs of individuals where possible. This would ideally include a variety of plot and dwelling sizes and types to be considered while maintaining the elements of design that retain the character of the area. There should also be flexibility in how the areas of rollback land are designated, with this best done through existing planning policies and documents. Waveney identified that planning departments play an important part in the process; their buy-in to the process is needed to identify suitable sites for relocation and to secure the appropriate planning approvals and that there is a need for strong engagement skills within Local Authorities looking to carry out similar projects.

4.6 Is buy/leaseback viable?

Buy/leaseback was not undertaken within any of the Pathfinders considered within this project however several of them did investigate it as an option. Results from these investigations suggested that it was not viable with reasons relating primarily to funding and legislative restrictions. Financial restrictions related to the cost of bringing the properties up to the Decent Homes Standard to allow the council to rent them out as part of their social housing stock (although in North Norfolk issues were found in relation to the ownership by the Council of social housing as they do not currently own any and no other social housing providers were found to be interested). Many properties eligible were ageing, in need of repairs and not of a standard construction. The cost of bringing these properties up to a rentable

standard would have been deducted from the purchase price, thereby significantly reducing the value to the residents of selling. This was found by the East Riding of Yorkshire Pathfinder, Scratby and North Norfolk. Legislative restrictions were found associated with the length of the lease determined by the Housing Act 1985, which necessitates leases having a term of at least 21 years, which could create issues in situations in which properties are at risk of coastal erosion before this 21 year period is completed.

Buy/leaseback was also restricted by the limitations on which properties it can be applied to and surrounding impacts of erosion. Properties at imminent risk are not considered suitable due to their short life span and the approach was not considered feasible where the access and services to properties are at risk before the property itself.

Specific issues within the Pathfinder Projects identified slightly different restrictions on buy/leaseback. Within East Riding the rapid rate of erosion along the coast led to predicted lifespans of the properties at risk being insufficient for buy/leaseback expenditure to be justified. Within Waveney a slightly different approach was proposed which was to roll residents back and then rent their at risk property for the remainder of its life. This was not pursued due to limited community engagement. This approach may be more feasible where coastlines have a slower rate of erosion. It may also be more appropriate for the properties to be used as holiday lets rather than housing.

East Riding of Yorkshire Pathfinder came up with some alternative approaches to buy/leaseback:

- Buy to demolish: this approach was felt to represent compensation rather than adaptation. It was also already being tested by the North Norfolk Pathfinder
- Realising the rollback value of the property: This approach was felt to provide an incentive for inappropriate acquisition in order to secure relaxation of planning restrictions in other areas by developers. It was also already being tested by the North Norfolk Pathfinder
- Removing residential status of property: this would allow buy/leaseback as a commercial property. This option would provide the resident with some financial assistance and remove the burden of demolition and land restoration costs. However the capital realised from the property would be based on the commercial value of the property/land for temporary use, and would therefore be considerably less than the market value. This approach received approval from the Council's Cabinet in March 2011

There were several applications for the buy/leaseback option, however none of them were successfully completed as the purchase price that could be offered once other costs had been taken into account was not felt to be sufficient by the residents.

As part of the North Norfolk Pathfinder it was not possible to investigate all potential buy/leaseback options during the project given the time and financial constraints. However, it was noted that there may be opportunities to investigate this further in light of the Localism Act and taking into account alternative uses (rental for holiday lets) or funding mechanisms. It is therefore suggested that buy/leaseback may warrant further consideration if such an approach fits with what is considered as a consistent way forward for coastal management nationally.

4.7 Overall assessment of the feasibility, desirability and replicability of rollback

As outlined in the above sections, there are a number of issues identified during the Pathfinder Projects that are fundamental to the future feasibility, desirability and replicability of rollback and buy/leaseback as coastal adaptation options. The main issues relate to the following:

- 1. ...can you get land?** There can be difficulties in obtaining land for relocating the assets at risk of coastal erosion that is deemed suitable and affordable to the asset owner as well agreeable with the wider community. In this instance effective engagement with the property owner and wider community is essential to ensure that all parties understand the situation and the potential implications of undertaking/not undertaking rollback (in the context of the individual and the broader community). Negotiations with landowners can be difficult with some using rollback as an opportunity to inflate land prices to development land market value. This has the potential to make rollback unaffordable in certain situations. One option is to relocate onto land owned by the public sector as this prevents the need for negotiations with private land owners and the possible delays that this can cause. However, this is not always possible, so engagement with private landowners is considered to be the most appropriate solution (particularly in the sense that the land used for rollback is not designated as 'normal' development land – ie the development of this land is typically an exception to the planning policy in place).
- 2. ...can you have consent on that land?** In order for rollback to be a feasible and desirable option to property owners in the future it is vital that planning consent is obtained to allow assets to be relocated inland. In the case of North Norfolk, the rollback planning (EN12) policy gives property owners at imminent risk of coastal erosion the opportunity to roll back onto land

previously not designated for development (which has been used to relocate properties in Happisburgh as part of the Pathfinder). This development opportunity effectively increases the value of an at-risk property and could attract private sector interest leading to substantially reduced costs and risks to the public sector, and therefore the potential for an element of self-funding (note though that private sector interest has not yet been seen).

- 3. ...can you afford to move onto that land?** The ability for individuals and communities to finance the purchase of land and rebuild an asset inland is a key barrier to the future feasibility of rollback. The Pathfinder projects provided individuals and communities with funds to enable them to move away from areas at imminent risk of coastal erosion. However, in the majority of cases additional funds were needed to relocate to an alternative site. Typically, it is not possible for Local Authorities to fund the whole process of rollback and it is not government policy to compensate individuals for the loss of their property due to coastal erosion. The Local Authorities involved in undertaking rollback as part of the Pathfinder Projects consider it desirable to continue with this approach, but due to budget constraints are unable to do so. There is also an important issue in terms of the expectations of the communities and what it is realistic to expect Local Authorities to provide. This was an area of significant discussion in the Waveney Pathfinder, which concluded that the role of the Local Authority was to help people to move on with their lives. This may not, therefore, mean that the Local Authority should be considered as the source of funds to enable rollback. Therefore, property owners or communities are likely to need to fund part (or all) of the schemes themselves and in some cases also manage rebuilds. A lack of capital funds may therefore prevent the uptake of rollback or result in delays when undertaking these schemes. It is important from the outset that engagement with residents and communities is undertaken to ensure that they understand the rollback process and the options available to them. This will increase awareness and help manage expectations, which were identified as a particular issue during the Pathfinder Projects. The importance of additional government funding for the future viability of rollback schemes should be highlighted given the general lack of funds available to individuals and communities to help themselves.
- 4. ...can buy/leaseback be considered a desirable option?** There have been a number of issues highlighted by investigations into the potential of buy/leaseback as a feasible adaptation option. A key issue relates to the costs involved in purchasing properties and in bringing these up to the Decent Homes Standard. The potential return (in the form of rent) from this investment may also be impacted if there are breaks in tenancies, which may result in a periodic loss of income. Also, legal constraints associated with the

length of the lease determined by the Housing Act 1985, which necessitates leases having a term of at least 21 years, could create issues in situations in which properties are at risk of coastal erosion before this 21 year period is completed. Community buy-in to the concept is also vitally important with some individuals concerned that the money received through property purchase would soon be used in paying rent leaving them with nothing. Therefore, based on current research, buy/leaseback is not considered to be a desirable option from the individual and Local Authority perspective. However, discussions with Local Authorities suggest time and funding constraints prevented investigation of all potential options during the Pathfinder process. Therefore, it may be worth undertaking further investigations into the possible feasibility of alternative uses of properties (eg holiday lets or other business uses) if such an approach fits with what is considered a consistent way forward for coastal management nationally.

Overall evidence from the Pathfinder Projects suggests that rollback is a feasible adaptation option that is desirable from the perspective of the Local Authority and the individuals at imminent risk of coastal erosion. Buy-in at the wider community level can be more difficult to achieve, but effective communication can increase awareness and understanding of the situation (in terms of the options available in the wider context of coastal erosion issues) and thus increase desirability. Further detail regarding the specific issues encountered during the Pathfinder Projects and, where possible, the ways in which these can be overcome are provided in Sections 5 to 8.

5. Planning and legal issues

5.1 Overview of rollback planning policies

As the name suggests the term “rollback” was originally coined to describe a process by which development would be allowed on the landward side of a built up area, in order to replace properties and facilities that were subject to the threat of coastal erosion on its seaward side. In practice the rollback policies are more diverse, take several different forms and involve a range of associated policy initiatives.

There are two basic policy approaches to rollback:

1. rollback development is treated as an exception, following the model of rural local needs housing, and is exempt from the other policies
2. replacement accommodation is allowed in a place some distance away from the affected community and usually in a less rural setting in line with general planning policy. In this case it can be argued that the affected settlement is not rolled back so much as divided up

The authorities reviewed have adopted both of the very different options outlined above as well as some intermediate positions. This section provides a review of the policy approaches adopted by the Local Authorities involved in undertaking rollback as part of the Pathfinder.

North Norfolk District Council takes the line that as much as possible should be done to protect communities from the harm that may arise as a result of coastal erosion. This includes the potential loss of employment and services from the community, as well as individual homes. Such losses must be remediated as they reduce the viability of a community, affect its critical mass and can lead to a downward spiral that continues even if the immediate threat posed by the erosion appears to have been met. The effect on the community can be far greater than the relative scale of properties lost or relocated.

The priority of North Norfolk District Council is to provide replacement development as part of the ongoing and evolving community, minimising the adverse effects of coastal erosion as far as possible. The policy response is to treat rollback development as an exception to be used only where necessary, recognising its importance in contributing to the life of the community and allowing it despite its rural location, and in the AONB and the undeveloped coast.

Waveney District Council is at the other end of the policy spectrum. Coastal erosion is a key issue in the Core Strategy and the Council accepts the strategic approach set out in the Shoreline Management Plan. This includes managed retreat around the village of Corton and a policy of no intervention for the sparsely settled coast either side of the village. There are a number of properties identified that are at risk of loss by 2021.

Relocation is being promoted for the occupants of the affected properties. The replacement properties are required to fit in with the settlement strategy for the district as a whole. This directs the bulk of new development to Lowestoft and the identified market towns. Outside these urban areas development is restricted to larger service villages. Priority will be given in these villages to local housing needs and needs arising from relocation.

This approach has positive as well as negative implications. The council emphasises the creation of new habitat and potential for enhanced biodiversity as a result of the retreating coastline. Future flood defence investment can be concentrated on Lowestoft and other key centres of population. The SMP policy is based on a cost / benefit assessment that reflects the relatively small size of the communities affected. The coast is subject to rapid erosion so rollback might prove to be a temporary measure in any event.

East Riding of Yorkshire Council supports the implementation of the SMP which sets strategic policies and actions/inactions for selected areas of the coast. The Council proposes a mix of restrictive and positive policies. These include managing new development in coastal areas to avoid the risk from erosion, and facilitate the relocation/rollback of development from areas between Barmston and Spurn Point.

A Coastal Change Management Plan is proposed in which development will be tightly controlled. Acceptable development is identified as temporary uses that benefit tourism or the local economy and relocation/rollback of development to a suitable coastal location. This is all subject to there being no adverse effects across a wide range of environmental interests including future erosion risk. The abandoned sites must be restored to a natural state and granted public access where possible. The new development also has to have reasonable access to facilities and services.

Relocation is a realistic option in East Riding in terms of planning policy, and there have been cases (mainly involving caravan sites) where this has occurred and of others where rollback initiatives have been opposed by local communities.

Scarborough Borough Council was preparing a Core Strategy Development Plan Document under the former LDF policy regime. It is now preparing a new Local Plan incorporating much of the former material. The emerging Core Strategy included a

blanket policy ENV3 for dealing with environmental risk. It covered both the avoidance of environmental risks through tight development management in identified risk areas and dealing with the consequences of coastal erosion in terms of replacement dwellings and other buildings.

However, the replacement development is to be permitted *“provided that the proposals satisfy the requirements of other policies within the Core Strategy and other Development Plan Documents”*. Under this policy, rollback development would be considered by the Council in the same manner as any other development. The additional clause, identified in italics above, has the effect of negating any support in principle for development proposals arising as a result of threatened coastal erosion. The priority given to meeting such needs over normal market demand is effectively nil.

The internal conflict within this policy was a matter of interest so a check was made on the new (DRAFT) Local Plan. No reference to rollback, replacement dwellings or other response to coastal erosion is to be found in the new draft Local Plan document. Coastal erosion is identified as an issue and discussed, but not addressed in terms of a policy. The reason for this is that the SMP does not anticipate rollback being an issue within the life of the plan (up to 2030/31).

Great Yarmouth Borough Council has submitted its Core Strategy for examination. The Core Strategy identifies coastal erosion as a key issue. The SMP has changed the strategy from defence to managed realignment along much of the coastline and the Council accepts that it must work within that framework. Two strategic policies are included in the Core Strategy, one avoiding areas of risk through development management policies in the affected areas and one for designating Coastal Change Management Areas in the places most affected by the risk of erosion. The CCMA's are to be provided in the Allocations Document and will identify any areas designated for rollback development, with one of these being Scratby/California.

5.2 Issues with planning policies

The Local Authorities involved in the Pathfinder came across planning policies and approaches which they felt were restrictive and presented barriers to rollback. These included the need for a wider ‘whole coast’ approach to policy when considering coastal adaptation and the need for more ‘joined up’ thinking when considering rollback and buy/leaseback schemes, including increased understanding between the various council departments involved. A further issue encountered related to the issue of Government policy considering ‘do nothing’ as a no cost option, which in the case of coastal erosion is not the case.

There is also a broader national issue that may impact the future uptake and viability of rollback in the future. The uptake and potential success of rollback as a coastal management option is dependent on the stringency of current planning policy as it is this stringency that enables rollback to be regarded as an exception policy that imposes a limit on the price of the land required. There is a risk that loosening of planning policy criteria (ie reducing the stringency of planning rules and allowing more widespread development generally) could undermine the operation of a rollback planning policy. This is because the value of land to be developed under rollback policies is only a small proportion of what would result from open market housing. This acts as a strong deterrent to land owners willingness to sell for what they perceive as an unfair price.

Legal issues were less frequently encountered by the Pathfinder Projects; however the Waveney Pathfinder came across some that are likely to be applicable elsewhere. In this area enforced demolition was placed on one property as the cliff edge had receded and the property was at risk of falling onto the beach. After the property was demolished the erosion rate slowed and the owner threatened to take legal action against Waveney District Council. This led to knock-on issues as Building Control at Waveney District Council and other councils (including North Norfolk District Council) then became overcautious about enforcing demolition. This is likely to result in significantly increased costs as demolition becomes much more difficult as the cliff edge gets closer to the property. Another legal issue relates to property ownership and eligibility for Pathfinder money. Initial research into each applicant's entitlement to Pathfinder money failed to identify that in 2010 one applicant's property had been handed over to the Treasury and later The Crown Estate and was not placed with the land registry, thereby making them ineligible for funding. In addition to these issues, within Waveney the use of enabling development (granting of planning permission to a development that would not normally be passed if other planning benefits can be delivered) was considered unlawful despite the potential for it to save the project money (land was offered up to the Pathfinder project for free in return for planning permission to build a house that otherwise would have been unlikely to have been granted).

The problem of identifying suitable land to rollback to was an issue mentioned by all of the Pathfinders investigated here. The issues varied from availability of land (Scarborough), to planning restrictions limiting options (East Riding of Yorkshire – rollback was only permitted to areas with a life of more than 100 years, as determined by an existing policy) to disagreements between residents and councils over proposed sites (Scratby, Scarborough, North Norfolk and Waveney). Disagreement between residents and councils over the proposed relocation sites is the most common problem. The Scratby Pathfinder summed up issues highlighted by residents as residents not wanting changes to the viability and attractiveness of their village.

There is also considered to be a need for a flexible approach in dealing with rollback as part of planning policies that reflect the high levels of uncertainty regarding how things will develop over a long period of sustained change. Some things arguably need to be fixed to give a necessary level of certainty but thereafter flexibility will maximise the chances of solutions being delivered rather than stalling on an unforeseen consequence of a line in an otherwise well-meaning policy.

5.3 Good practice

Despite the planning and policy issues above, several of the Pathfinder schemes provide examples of good practice, such as use of the rollback planning (EN12) policy in North Norfolk. This permits the owner of a house threatened by erosion in the next 20 years to seek planning consent for a new development on land not allocated for housing, providing an incentive for developers to enter into a development agreement. The Waveney Pathfinder contributed towards the development of the planning policies (DM07, DM22 and SPD), which enabled rollback within the district.

As well as the use of policies already in place, there are examples of innovative approaches to facilitating rollback. The concept of 'landbanking' was used in Scarborough. This is based on the provision of land which affected residents can rebuild their properties on using their own resources; in the case of Knipe Point this was through insurance pay-outs. This has not been made into a formal policy, but provides a precedent for similar scenarios in the future. However as insurance pay-outs are only eligible for loss due to land instability and not coastal erosion the feasibility of residents having the resources to fund the rebuild costs is likely to be limited.

An example of good practice is provided by the Waveney Pathfinder, within which legal work was undertaken outlining the agreement between the owner and the council that rollback would be supported if the property was lost to erosion prior to the closure of the project. This was in response to owners' views during workshops.

In addition to examples of good practice already undertaken, the Pathfinders also indicated where improvements to their approach could be implemented or, in the case of Scratby, theoretical best practice. The Scratby Pathfinder included four proposed policies for rollback, as summarised below:

- Identification of a Coastal Change Management Area (CCMA) and four coastal rollback areas. The CCMA should clearly differentiate between CCMA and rollback areas
- Within the CCMA, planning permissions may be granted for essential infrastructure serving the needs of the immediate area or for development that

provides significant benefits requiring a sea front location (accompanied by a vulnerability assessment)

- In coastal rollback areas applications for replacement of existing dwellings and other properties within the CCMA likely to be affected by coastal erosion will be considered favourably subject to specified criteria
- Applications for residential development within the rollback areas which is not for replacement of a dwelling within the CCMA, will be considered favourably under certain conditions. Namely if it facilitates the provision of replacement properties from within the CCMA in the form of land, infrastructure, and/or other financial assistance and if the planning authority is satisfied that there is a demand for replacement dwellings at the time

General issues highlighted in the Pathfinders centred on the time taken to identify available land due to the issues indicated above. Several Pathfinders suggested that in future the process would be much quicker if an area of land for replacement properties was identified before the properties at risk were purchased. It has been suggested that this would also ensure that there is a clearer relationship between the existing properties at risk of coastal erosion and the new site, which would assist in the community's understanding of the process (and help with gaining acceptance of the approach).

To address specific issues found within the projects the Pathfinders proposed potential solutions. Where policy restricts the availability of land for rollback proposed policy changes could be implemented. In East Riding this would result in varying the policy restricting rollback locations so as to allow rollback to sites which have less than 100 years rather than more than 100 years of life in appropriate circumstances. In Scarborough, where landbanking was used for rollback, the Pathfinder indicated that this could be facilitated in future through strategic planning documents, such as the SMPs identifying properties at short, medium and long term risk. This would allow Local Authorities to purchase land as and when it becomes available (if funding is available), thereby allowing landbanking in advance of properties being at immediate risk, making the process simpler and supporting long term planning for coastal risk management.

5.4 Summary

As discussed in this section and previous sections, appropriate funding is considered to be a key constraint to facilitating rollback. From the evidence obtained from the Pathfinder Projects and through additional research there are considered to be three planning policy initiatives that have the potential to facilitate rollback:

1. Temporary alternative uses of the land/buildings at risk of coastal erosion (such as for holiday lets, or sites for caravans) have the potential for

generating income, but as they bring forward the point of relocation they are unlikely to be what most occupiers would be seeking. They may have selective relevance and could be included in the suite of policies on that basis.

2. Making rollback development an exception and not subject to normal planning policy for the location of new housing. This is considered to be an extremely important policy stance and the best way of keeping communities intact while addressing the need for relocation and, in appropriate circumstances, it would be the preferred approach for that reason alone. However, its real importance derives from the indirect effect it can have on development costs. Given the lack of public funding this can be seen as the main element of financial assistance for those seeking to relocate. If replacement dwellings are subject to the general policies for new housing they will have to compete with open market housing in terms of the price paid for suitable land. If they are treated as exceptions, they can be built on land that has no prospect of full market value accruing to it and which can as a result be bought for a price which represents a greater return to the owner than agricultural value, but is a small fraction of full market value. The saving in the cost of the residential plot is passed directly to the costs of the developer building the house, and reflected in the selling price.
3. Enabling development. There is understandable discomfort among planning authorities over the notion of enabling development and a fear of its misuse. However, with carefully drafted policies and robust legal obligations in place there is no reason to believe it could not work in appropriate circumstances. These are considered to be, as a minimum: (i) that the rollback land is extensive, more than that required to replace lost buildings; (ii) it is suitable in physical terms, such as landscape impact, for development, and; (iii) it would attract interest for open market housing. Careful negotiations through Section 106 obligations would be necessary to secure meaningful benefit towards the provision of rollback replacement housing. The involvement of independent third parties, such as a Housing Association, or the Homes and Communities Agency, (or even a locally configured organisation), may help overcome community fears and suspicions relating to such schemes in much the same way as affordable housing schemes on rural exception sites are currently provided.

Table 5-1 provides summary of the issues identified in Section 5 and, where possible, the outcomes to inform feasibility, desirability and replicability of rollback.

Table 0-1: Summary of issues addressed and outcomes to inform feasibility, desirability and replicability

Issue arising in Pathfinder	Actions taken or proposed to address issues	Outcomes or expected outcomes	Implications for feasibility, desirability and replicability
Disjointed approach to coastal adaptation between authorities	Use of a wider 'whole coast' approach and 'joined up thinking' when considering rollback and buy/leaseback	Potential for improved partnership leading to sharing of expertise and funding	Should contribute to a reduction in costs and time taken to implement adaptation actions
Government consideration of 'do nothing' as a no cost option making coastal adaptation appear to be less cost beneficial than it is	This aspect was only mentioned by North Norfolk but would require amendment of Government policy in terms of baseline used for appraisal	These would be expected to relate to the ease with which projects can get funding. If the benefit/cost ratio increases then Government funding may be more available as it can compete with other projects. Rollback is seen as one of a suite of options for coastal management	Potential to contribute to the feasibility and replicability of coastal adaptation options as funding may be more available
Uncertainty around erosion rates leading to enforced demolition of properties earlier than required with the potential for the property owner to sue the council	Use of a clear structure and engagement with residents would mean they are well informed and clear about their rights. Early engagement would also reduce the likelihood of enforced demolition of property as owners are aware in advance and can take appropriate action	Desired outcomes would include well informed, satisfied residents who are able to take appropriate action prior to the need for enforced demolition. A clear framework will ensure residents and the council are aware of their rights	This may contribute to increased desirability for Councils and residents through clearer guidelines. It may also reduce desirability if residents or Council's feel that the proposed guidelines do not benefit them. This should address the issue encountered in Waveney of the council becoming over cautious about enforcing demolition

Issue arising in Pathfinder	Actions taken or proposed to address issues	Outcomes or expected outcomes	Implications for feasibility, desirability and replicability
Residents originally identified as eligible for the Pathfinder money were subsequently found to be ineligible due to property ownership changes not picked up in the initial investigations (encountered in Waveney where one applicant's property had been handed over to the Treasury and later The Crown Estate)	Within Waveney the proposed solution to this problem was to use a legal consultant to undertake investigations of eligibility for Pathfinder money	The aim would be to ensure there are no aspects of eligibility which are not considered fully and to reduce false eligibility being identified, therefore improving community confidence	This may be more costly for councils. However it is likely to save money in the long run as it will avoid potential eligibility issues arising mid-way through the project
Problems of identifying suitable land for rollback to: disagreements over site location	Engagement with residents early on to determine what they want and how they want to achieve this may help communities feel involved in the decision making process	Communities feel more involved in decision making and therefore work together with the councils to identify land available for rollback	This would improve desirability, replicability and feasibility of coastal adaptation options and should reduce disagreements and conflict between authorities and communities

Issue arising in Pathfinder	Actions taken or proposed to address issues	Outcomes or expected outcomes	Implications for feasibility, desirability and replicability
Problems of identifying suitable land for rollback: availability of land	Provision of strategic planning documents that identify risk levels of properties would allow local authorities to purchase land as and when it becomes available thereby making the process simpler and reduces the risk that communities become suspicious over property purchases	The process of rollback would be simpler and would promote confidence within communities as they would already be aware of land available for them to move to when they are at risk	This would improve desirability of rollback to communities as they would feel provided for by the council. This approach should be replicable, although it will depend upon land becoming available prior to the need to rollback
Problems of identifying suitable land for rollback: policy restricts land use	Where policy restricts the land available for rollback (eg to land with an expected life greater than 100 years) the policy is being investigated and amended (eg land with a life of less than 100 years in appropriate circumstances). This may be limited to land with more than 60 years expected life to help ensure that properties can be mortgaged	A greater area of land would be available for consideration of rollback	This may not be a problem in all areas. However if it is then policy amendments will reduce restrictions on potential rollback land and is likely to be desirable from the communities perspective as they are less likely to have to move a significant distance

6. Skills and expertise needed

6.1 Overview

For each of the Pathfinder projects considered as part of this study a number of key skills have been required in investigating and, where deemed appropriate and feasible, implementing options for rollback and buy/leaseback. Many of the skills and expertise required were available within the Local Authorities. However, other (outside) expertise was also required to undertake aspects of schemes in certain cases, not only to ensure that appropriate skills were utilised for key areas, but to also increase the credibility of the outputs by providing an unbiased result. This in turn is considered to have enhanced buy-in and acceptance of these schemes and enabled them to progress.

Further details of the skills and expertise that have been required and considered important during the Pathfinder projects is provided below.

6.2 Disciplines needed

Research undertaken and discussions with relevant stakeholders revealed that there are a number of disciplines required to effectively investigate and undertake rollback and buy/leaseback. Some of these are outlined below (not in order of importance):

- Project management
- Planning
- Legal expertise
- Property market expertise (domestic and commercial)
- Engagement expertise
- Engineering
- Geomorphology
- Social services
- Fundraising expertise

It is clear from the research undertaken that a variety of different disciplines and skill sets are typically required to ensure that rollback (and buy/leaseback) is suitably investigated and successfully implemented. Hence, there is a need for multidisciplinary teams with some or all of the above skills (depending on the specific situation and scheme) to ensure that schemes are progressed in a timely manner. A key element of importance relates to the need for effective communication between all parties involved in the rollback and buy/leaseback process. This not only refers to

the importance of dialogue between the Local Authority/sub-consultants and members of the public that are directly involved in the process, but also between Local Authority departments. It is crucial that all parties that will at some stage be involved in the rollback process have a clear understanding of why a particular scheme is being investigated, who the affected parties are, what the implications are of all possible outcomes (ie if rollback or buy/leaseback does/does not occur) and how these outcomes would impact individuals and the wider community. This should help ensure that all elements of a scheme are appropriately considered and the process is concluded in an efficient and timely manner.

The following sections provide further details of the skills identified as being required in investigating/undertaking rollback and buy/leaseback, when these may be needed and why they are considered important.

Project management

During the discussions with those involved in the Pathfinder projects it was noted that effective leadership and project management skills were essential for ensuring that the rollback schemes progressed. This was recognised as an issue in the case of the Waveney Pathfinder and is considered to have resulted in the loss of momentum part way through the process.

Moving forwards it may be useful to have a designated officer that can act as the key point of contact within the Local Authority with regards to the rollback and buy/leaseback process. This approach was highlighted as being successfully used in the East Riding of Yorkshire and North Norfolk Pathfinder projects, as this has provided residents with a single point of contact and continuity through the process. This has facilitated one-to-one support and visits which have been necessary to ensure affected residents understand the issues and support available to them, and to sensitively deal with the highly emotive and difficult changes the residents are faced with.

It is also important to consider the importance of effective project management at the community level. In the case of the relocation of Trimingham village hall, the initial lack of an individual or key group to drive the project forwards caused delays. A management committee has since been formed to help progress the project. Therefore, the appointment of an individual or group responsible for overseeing community-led rollback projects is considered to be important for ensuring that schemes are completed in a timely manner.

Planning

Planning expertise is fundamental to the rollback process given that permissions are required to allow assets that are at risk of coastal erosion to relocate to an alternative

site. Planning departments therefore have a pivotal role in determining the outcome of rollback schemes through the acceptance or refusal of planning applications. One example of this is the rejection of planning permission for relocating Manor Caravan Park in Happisburgh as part of the North Norfolk Pathfinder.

During discussions with stakeholders as part of this study the importance of planning departments in the rollback process has been highlighted. Their buy-in to the process is needed in the identification of suitable sites for relocation and to secure the appropriate planning approvals. Hence, there is a need for effective communication between Local Authority departments to ensure that the approach to rollback and buy/leaseback is effectively understood. This will help ensure that those involved in the planning process understand the reason for undertaking rollback and the wider benefits in the context of the community as a whole, whilst also considering the needs of the individuals involved. It is also suggested that planning departments should be involved at an early stage to ensure that any planning related legal issues are addressed to minimise the risk of constraints at a later date. The development and use of planning policies that account for rollback may also mean that communities will require advice and assistance with submitting planning applications.

An example of good practice relates to the Coastal Officers' Working Group that was set up internally by East Riding of Yorkshire Council. This has fostered greater understanding of coastal issues across the different council departments and resulted in better cross-department working. Achieving buy-in from other departments (including planning) has been essential in effectively delivering the Pathfinder project with this element having been so successful that the Coastal Officers' Working Group is continuing beyond the end of the Pathfinder project.

Legal expertise

The need for legal expertise was highlighted during discussions with stakeholders involved in the Pathfinder projects. Legal input into the rollback and buy/leaseback process is considered critical, as there are not always precedents to follow, meaning that decisions and processes can be open to challenge. This has been particularly important in the case of the North Norfolk Pathfinder, whereby legal advice was required when the Council purchased a number of properties at risk of coastal erosion. Legal expertise (outsourced by the Council) was also required when investigating the feasibility of buy/leaseback as a coastal management option with a number of legal constraints associated with the Housing Act identified. It may be the case that legal expertise would be required if further investigations into the buy/leaseback option are undertaken.

Legal expertise was also identified by Scarborough Borough Council as an important skill required if undertaking similar landbank projects. Independent solicitors may be

necessary when negotiating the land sale and final agreements with residents to ensure the trust between residents and the council is maintained.

The utilisation of legal expertise was also considered to be an essential element of the Waveney Pathfinder project. This was considered important in accurately assessing the eligibility of those applying for assistance packages (proof of ownership). It was also noted that obtaining legal assistance in the initial stages of any rollback projects may help prevent delays later in the process.

Property market expertise

Expertise in property/land markets is considered to be an important element in undertaking rollback and buy/leaseback projects. In the case of the North Norfolk Pathfinder, consultants were used to develop a methodology for valuing the properties at imminent risk of coastal erosion in Happisburgh. This approach of using external expertise to produce a suite of feasibility and valuation studies is considered to be a key factor in securing buy-in from the majority of property owners and assisted in facilitating the subsequent housing acquisitions. The use of independent consultants would also benefit future projects as they can provide an unbiased and transparent view that may help property owners in understanding the approach and the offers made (ie that they are fair and justifiable). Also as part of the North Norfolk Pathfinder project, an independent property consultant provided key skills in developing a property market analysis and undertaking further investigations into the potential of buy/leaseback as an adaptation option. It is likely that similar expertise would be needed if a suitable approach is to be developed and successfully implemented in the future.

A similar good practice approach was also recognised during the Scarborough Pathfinder project. Conducting formal valuations of the land on which the properties that are impacted by land instability/coastal erosion is an important element of a rollback or buy/leaseback scheme, with independent valuations recommended. This will help to better ensure that the residents are comfortable that they are getting a fair deal. Having independent experts involved in property valuations can also be essential to gaining buy-in from residents and thus can be fundamental in ensuring the successful completion of rollback or buy/leaseback schemes.

Engagement expertise

The importance of effective engagement between council departments, external consultants, communities and individuals is considered a vital skill required in successfully undertaking rollback and buy/leaseback during the Pathfinder projects. As previously discussed, there is a need for buy-in across all levels and departments of the council to ensure that there is full understanding of the rollback and

buy/leaseback process. This contributes towards successful implementation of these approaches. Effective engagement and ultimately buy-in from the Local Authority hierarchy (ie Directors of services/departments, elected members, council leaders etc.) has also been highlighted during the Pathfinder Projects as being important to ensure that the adaptation approach is understood and accepted. In addition, engagement with the insurance industry may also be important if a landbanking scheme (similar to that undertaken as part of the Scarborough Pathfinder project) is considered.

Engaging and involvement with (and within) communities and individuals affected by coastal change is important to ensure that they have an understanding of coastal processes and erosion impacts, as well as the assistance that can be provided by the council and the options available to them. In the case of the Waveney Pathfinder project, engagement with the wider community led by an external consultancy was found to have been inadequate and poorly timed. It appears that despite informing the Parish Council and local media, some members of the community in Reydon did not engage with or felt they were not made aware of the Pathfinder plans to relocate to a parcel of land until 2012 (engagement began in 2010). Some members of the community felt as though planning was being proposed on an AONB with minimal information and when most people would be away or preoccupied. This, combined with the negative press, led to an organised resistance which contributed to the Pathfinder needing to review the process. The method and timing of any community consultation is therefore critical in ensuring as many people as possible are able to contribute and remain informed. In the case of the East Riding of Yorkshire it was found that initial public meetings that were arranged with specific start times tended to be dominated by particular residents. Therefore, in order to obtain a broader view of the community there was a move towards public drop-in sessions spanning several hours, which were well-attended by a wider contingent of the community. The use of workshops in a number of cases has achieved varying results, with those undertaken in Happisburgh (North Norfolk) and the East Riding of Yorkshire well attended and those in Waveney less so. However, workshops can be an important engagement tool as this provides communities with the ability to comment on and provide input to any proposed plans.

A number of alternative engagement methods such as the use of a dedicated website, the provision of newsletters and involvement of Parish Councils have all proven effective ways of keeping individuals and communities informed of the rollback process. As part of the North Norfolk Pathfinder the Parish Councils played an important role in setting up local liaison groups. For example, the group in Happisburgh was considered to be particularly invaluable as a link to the local community and assisted in shaping the direction of the projects.

Engagement with individuals that owned properties/assets at imminent risk of coastal erosion was also a key element of the Pathfinder projects. The use of a dedicated project officer can be instrumental in the success of engagement with residents. This one-to-one support can assist property owners in understanding the rollback or buy/leaseback approach and provide assistance through the process. In the case of the East Riding of Yorkshire the dedicated project officer has provided residents with continuity throughout the process, making it easier for residents to access assistance (eg from other departments as this can be co-ordinated by the project officer) and building trust between the council and residents.

The use of independent consultants in providing support to property owners that are considering rollback or buy/lease back may also assist future projects. In the case of the North Norfolk Pathfinder consultants assisted property owners in understanding the offers made by the council and provided an unbiased and transparent view (ie they provided reassurance that the offers made for their properties were fair and justifiable). The use of one-to-one engagement has been highlighted as an important tool in a number of Pathfinder Projects when undertaking detailed discussions and seeking individual agreements with those involved in the adaptation process.

Another important set of engagement skills required when undertaking rollback and buy/leaseback projects in the future relate to media relations. During East Riding of Yorkshire, Scarborough and Waveney Pathfinder projects negative press was received as the schemes progressed. This may influence both the short and long term success of the coastal adaptation options considered and indeed can have a significant bearing on aspects such as property values. Therefore, the ability to keep the press and public informed whilst managing their expectations is an important skill set that may assist in preventing negative responses and detrimental financial impacts.

The ability to effectively communicate with all involved parties is considered to be an essential skill in ensuring the success of rollback and buy/leaseback schemes in the future.

Engineering

In many cases the rollback of assets away from areas at risk of coastal erosion will require the expertise of engineers. In the first instance engineers will be needed to assess the situation of the existing assets before rollback is undertaken. This is likely to include determining the condition of the asset as well as identifying any potential issues associated with its removal (if approval for relocation is obtained), such as difficulties with accessing/working at the site. Engineers will also be required to design, construct and assist in managing any new developments that result from the relocation of assets from at risk locations. Also, if rollback is used as

part of future realignment projects then there may be an associated engineering element that will require relevant expertise.

The need for engineering expertise is therefore a key element of rollback as an adaptation option with these skills required throughout the process, from initial assessment of existing assets to designing and developing new facilities/infrastructure at an alternative inland site.

Geomorphology

In many cases expertise in geomorphology may be required as there will be a need to understand how aspects of the coastline are predicted to change in the short, medium and longer term (considering the inherent uncertainties associated with coastal change and climate change). Determining the remaining usable life of coastal assets that are at risk of erosion and monitoring the situation as it develops is important for ensuring that appropriate action is taken to safeguard those using the assets.

Social services

Adaption can have major social and health implications with respect to individuals actually affected; the adaptation of a community can actually mean the loss of an individual's assets and investment, their security in old age or a reduction in their ability to move with consequences in terms of work prospects. In different ways this may also impact on their health. Dealing with individuals is, as found at Scarborough, very effort intensive and can place significant pressure on social services. Understanding these issues and incorporating how these issues can be effectively addressed needs to be considered within a project.

Addressing these issues, however, helps build the confidence with individuals and within the community and can be a major factor in gaining ownership and success of a project. Such expert contribution can also lead to a better understanding of the issues of longer term vulnerability and vulnerable groups.

Fundraising expertise

In certain cases, such as community-led rollback projects, there may be a need to raise additional funds to enable a scheme to reach completion. An example from the Pathfinder projects relates to North Norfolk, whereby funding was provided by the council to help in facilitating the relocation of the village hall in Trimingham. It was recognised in the initial stages of the scheme that additional funds would be needed to construct a new facility inland. A number of funding bids have been submitted (eg to the National Lottery), with the initial bid submitted by an independent consultant;

however these have been unsuccessful to date. Community based fundraising activities are ongoing, but it is recognised that Trimingham is a small community with a high proportion of elderly residents situated in a comparatively deprived economic area (in relation to other communities along the coast). Therefore, although fundraising is enthusiastic it is consequently slow, which in part is the reason for the delayed progress. The size and demographic of Trimingham is likely to be relatively comparable to many coastal communities that are or will be at risk of coastal erosion in the future. Consequently the length of time required and the difficulty in raising the necessary funds to undertake a community led rollback project is an important consideration for future schemes.

An important skill that would be particularly beneficial to those involved in community led projects relates to understanding the options and process for obtaining additional funds and the requirements for submitting a successful bid. This is likely to assist communities in progressing with rollback projects and ensure that they are completed in a timely manner. If such assistance is provided it would also be essential to ensure that the community understands the value of such funding advice in order to ensure that the community takes advantage of the opportunity.

6.3 Summary

Table 6-1 provides summary of the issues identified above associated with the skills and expertise that are needed and, where possible, the outcomes to inform feasibility, desirability and replicability of rollback.

Table 0-1: Summary of issues addressed and outcomes to inform feasibility, desirability and replicability

Issue arising in Pathfinder	Actions taken or proposed to address issues	Outcomes or expected outcomes	Implications for feasibility, desirability and replicability
A variety of different disciplines and skill sets are required to ensure rollback and buy/leaseback are suitably investigated and successful	Use of a multidisciplinary team incorporating the key skills mentioned above in the text	Each aspect of the project can be undertaken by a professional in that field to ensure high quality work. This may also increase community confidence in Pathfinders	This approach is replicable throughout the UK and is likely to be highly desirable although expensive where the skills are not available in house

Issue arising in Pathfinder	Actions taken or proposed to address issues	Outcomes or expected outcomes	Implications for feasibility, desirability and replicability
Communication between all parties involved was identified as important to help maintain momentum. Lack of a key point of contact for communication can cause delays	Designation of a project officer to act as the key point of contact. Appointment of a management committee can also provide the communication needed	Provides residents with a point of contact and continuity. Project officer facilitates one-to-one support and visits to ensure affected residents understand the issues and support available to them. Ensures the projects progress in a timely manner	Potential for a community committee will depend on the cohesion of the community however designation of a project officer will be a suitable approach in all areas
Issues identifying suitable land for rollback and securing the necessary planning approvals	This requires buy-in of planning departments needed to identify suitable sites for and secure planning approvals. Creation of a Coastal Officers Working Group can also address this	Fosters greater understanding of coastal issues across different council departments and results in better cross-departmental working. Also involving them early minimises the risk of constraints later	This will be desirable in all Pathfinder areas. Feasibility will depend upon whether the skills are available in house and the funds available
Processes within the adaptation options do not always have a precedent to follow and are therefore open to challenges	Inclusion of legal expertise within the project team	Increased confidence of the community that legal professionals are involved in negotiating a price for the properties. This may also help prevent delays later in the project	This will be desirable in all Pathfinder areas. Feasibility will depend upon whether the skills are available in house and the funds available
Communities not clear about the options available to them	Use of engagement methods such as websites, newsletters, involvement of Parish Councils, etc.	Communities and individuals are kept informed of the rollback process	Desirable in all areas and relatively low cost. May be less important where a community committee is used

Issue arising in Pathfinder	Actions taken or proposed to address issues	Outcomes or expected outcomes	Implications for feasibility, desirability and replicability
Lack of funds available for rollback to be completed	Use of fundraising expertise to access funding sources	Sufficient funds are available for completion of the projects	Where funds are available from the local authority then this will not be required. However, elsewhere it will be worth considering, although more feasible where skills are in house

7. Community issues

7.1 Overview

This section considers how the community's interest in and awareness of coastal erosion risks can help make rollback feasible and desirable. Throughout each of the five Pathfinders considered here there was a change in community perception from the beginning of the project to the end, as would be expected from projects with such high levels of community engagement. In many areas there was initial opposition to the ideas of coastal adaptation and several residents, particularly in Scratby, were unwilling to entertain the idea, focussing instead on their need for coastal defences. As the projects progressed and communities were involved in the planning and decision making process, many were more willing to consider adaptation options and the feeling of many communities is more accepting of this approach.

7.2 Community awareness and interest in coastal erosion risks

When the Pathfinder projects began, responses from the initial consultation exercises indicated that there were both positive and negative impressions of coastal adaptation, with the negative impressions considered to outweigh the positive. Communities in the East Riding of Yorkshire, North Norfolk and Scratby felt that the money for coastal adaptation projects would be better spent on coastal protection and in Scarborough the residents were reluctant to accept the situation and wanted someone to blame. However, in the case of Happisburgh, North Norfolk, there were also some positive reactions towards adaptation, which is considered to stem from the community's past experience of coastal erosion. For example, in the initial stages of the project there was community consensus regarding the rollback of the caravan park and retaining this within Happisburgh. The existence of a community pressure group assisted with engagement through providing a readily identifiable group of people. It was initiating this dialogue and then continuing with it that was key to the community acceptance.

As the Pathfinders progressed, community awareness of coastal adaptation improved, however there were new issues which residents raised when undertaking rollback. Communities were concerned about the impact of building new houses on the attractiveness of the area and in North Norfolk there were community suspicions of the scheme due to the lack of a relocation site prior to purchase of the properties at risk of coastal erosion in Happisburgh.

By the end of the Pathfinder projects, most stakeholders are considered to have an increased awareness of coastal change. In Happisburgh, North Norfolk, there was found to be an increase in community awareness regarding the options for coastal management which is considered to have resulted in the residents feeling more positive about the future of the village. The breadth of community projects undertaken in Happisburgh (from enabling residents of properties at risk to sell their properties and move on to relocating the car park and toilet facilities) is considered to have reversed the spiral of decline within the village caused by coastal erosion, and the negative perception of coastal erosion that has affected the whole parish, resulting in a more positive outlook for the future. However, there are also examples where the Pathfinder projects did not result in significant changes. Within Waveney it was found that council officers and councillors felt that relocation was not undertaken at Corton due in part to financial constraints but also due to reported complacency from the community not considered at immediate risk (outside the 5 to 10 year line).

The activities undertaken to raise community awareness, perception and interest in coastal erosion risks include mainly workshops undertaken throughout the Pathfinder projects. In North Norfolk, for example, in the initial stages of the project consultation with the community was undertaken to explain the erosion risk faced by the caravan park. Other activities included sending letters to property owners (for example, in Scratby letters were sent to 31 'at most risk' properties to invite them to a workshop), holding open meetings (in Waveney open meetings were held for anyone to attend to help address problems), one-to-one engagement (considered very effective in East Riding of Yorkshire and North Norfolk), drop-in sessions, unmanned exhibitions and information boards.

Despite the activities undertaken to raise community awareness of the management options, a facet of many projects was the lack of engagement. In Waveney, engagement workshops were poorly attended and in Scratby only six of the 31 households considered 'at most risk' attended the workshop. It should be noted that although non-attendance to these events could have led to a lack of awareness of coastal management options, it does not necessarily equate to a lack of risk awareness.

In the future East Riding of Yorkshire Council is intending to develop and establish the long-term requirement for a suite of information, which will form the adaptation communication toolkit. This, along with the council's coastal monitoring, coastal change policies and coastal partnership, is anticipated to provide the basis for communities to engage in long-term planning of coastal change.

7.3 Community expectations

Prior to the Pathfinder schemes, community expectations were predominantly for Government funding to provide defences or support for relocation. There was also an expectation that the effects of erosion were not as imminent a risk to the residents as was the case. In North Norfolk, for example, the caravan park owner was thought to have believed that he had more time and that the effects of coastal erosion on the business would not occur as quickly as they did (this demonstrates a high awareness of coastal erosion, but a low level of risk perception). It was also felt that residents expected to receive more money for their properties than was available and to receive plots of land reflecting what they currently owned, which was not always possible. It is clear from the work undertaken that property owners do not always understand/accept that the government is not compensating them for their loss, therefore the expectations of how much they should receive is often driven by what they think the compensation cost should be.

Following the Pathfinders there is the potential problem of expectations having been raised beyond sustainable levels. This was highlighted by East Riding of Yorkshire Council in that the Pathfinder project will result in raised expectations for residents who have not yet received any assistance over what financial support the Council can offer them in the future. If the assistance packages cannot be funded in the longer term this may result in a breakdown of relationships with residents, despite the Council having no statutory obligation to provide this assistance. There is a fear that if there is no further funding available there will be a loss of momentum and a real risk that communities will be unwilling to work with authorities in the future, due to their trust in the local authority having been affected.

There were also suspicions in some communities as to who would benefit from the assistance. For example, some sections of the community at Reydon (near Easton Bavents, Waveney) were concerned that if someone had bought a vulnerable property at a greatly reduced price they would be able to profit from that purchase. The community did not want to encourage speculators.

Efforts were made by the Councils to manage the expectations of the communities and in many cases this was through further engagement. Where property owners felt they were not being offered enough money for their properties (as in North Norfolk) or that the replacement land they were offered was not sufficient (Scarborough) the Council undertook discussions to explain to the residents the reasons for what was offered. In the case of North Norfolk, independent consultants were used to verify the approaches used to value properties and to provide unbiased views that assisted in ensuring resident buy-in to the schemes. East Riding of Yorkshire Council managed expectations through use of a clear and consistent approach due to the Vulnerable Groups Priority Outcome process and Enhanced

Assistance Package. These provided communities with a clear basis on which to base their expectations from the start of the Pathfinder process. Within Waveney engagement with communities enabled community expectations to align more closely with the expectations the Council believed they should have. This can be considered to contribute to residents being able to get on with their lives in areas at risk of coastal erosion as they are aware of the opportunities available to them.

7.4 Community interactions and cohesion

Much of the focus of Pathfinder evaluations relates to the relationships between the Local Authority and the community however, often there are significant impacts of the Pathfinder schemes on interactions within communities. There are examples of individuals having consideration for the wider community, for example the owner of the caravan park in Happisburgh was reluctant to pursue rollback options which might create community tensions. There are many examples of the diversity of opinions within the communities. The differences of opinion are highlighted in several Pathfinder schemes and have the potential to ignite community conflicts. These can be due to disagreements over potential rollback locations (North Norfolk) and disagreements over the fundamental need for coastal adaptation (Scratby). There may also be underlying tensions in communities where the more vocal members are represented rather than the community as a whole (Scarborough, Waveney and North Norfolk). In many coastal communities there is also the long standing conflict between second home owners and residents and the eligibility of the former for rollback. Within Scarborough the original intention had been to exclude second home owners from the rollback scheme however this was revised to reflect the actual composition of the community, based on the fact that traditional, structural coast protection schemes do not differentiate between different types of property owners. It has also to be understood that second home owners may themselves contribute to the sustainability and vitality of a community and that they may be placed in a longer term position of vulnerability, through loss of capital and security in retirement or ability to fund long term care in the future.

There is little mention of how these conflicts were addressed within the Pathfinder projects although in no cases did they specifically lead to schemes stopping, indicating they were resolved throughout the process. A key issue, not fully addressed in the Pathfinders, is that of disassociation of individuals from the process. It is important to note that community opposition to the proposed relocation site for the caravan park in Happisburgh is considered to be an important influencing factor in preventing rollback from commencing. The most likely resolution of disagreements is likely to be through engagement and discussions, allowing each group to voice their opinions and come to an agreement. This is supported by

suggestions that in Waveney problems were addressed by holding open meetings and workshops for everyone to attend and change the approach.

7.5 Eligibility

Three of the Pathfinder projects considered identified clear eligibility criteria. These are presented in Table 7-1.

The Scarborough Pathfinder restricted eligibility based on the length of ownership of the property, only allowing residents who purchased their properties prior to 2009 to participate to avoid profiteering. A similar approach to avoid profiteering was undertaken in the East Riding of Yorkshire where only those properties purchased prior to the start of the Pathfinder were eligible for assistance. As part of the agreements with the residents participating in this Pathfinder project it was intended to place restrictions on the land that would be allocated to residents, such as the planning permission reverting to holiday occupancy only on resale of the property (unless to another affected Knipe Point resident). However, these were subsequently dropped as unfeasible, mainly due to the fact that the residents were contributing a larger proportion of costs towards the rebuild of their properties.

Table 0-1: Eligibility criteria identified in the Pathfinder projects

East Riding of Yorkshire	Scratby	Waveney
<ul style="list-style-type: none"> • Properties were prioritised using the following three categories: <ul style="list-style-type: none"> • Imminent risk (Level 1): households located within the maximum annual loss distance recorded at that location since the Council's monitoring programme began in the 1950s. • Higher risk (Level 2): households outside the maximum annual loss distance recorded for that location, but within the area projected to be lost by 2025 according to the SMP2 cliff line projections. • Lower risk (Level 3): households located between the 2025 and 2055 SMP2 cliff line projections (this category was added in March 2011). • For properties at imminent risk (Level 1) the Relocation Package was available where appropriate: 	<ul style="list-style-type: none"> • Applications for replacement of existing dwellings and other properties within the CCMA likely to be affected by coastal erosion will be considered favourably subject to the following criteria: • Replacements are of a similar size and scale and in keeping with the character and appearance of existing developments in the area. Non-residential forms of development should be of an appropriate form, size and scale in relation to their function and surrounding development • Properties in the CCMA to be replaced in the rollback areas will be subject to restrictions regarding future use and/or demolition by means of planning conditions and/or legal agreements • Rollback areas are to be accessed as indicated on the proposals map and will be developed sequentially from the identified points unless otherwise agreed with the local planning authority 	<ul style="list-style-type: none"> • Houses purchased before the Shoreline Management Plan of 1998 could claim a Capital contribution of up to £15,000 per plot and a non-capital contribution of up to £10,000 per plot for professional fees. The formula of 100% (£10,000) for plot 1 and then 30% (£3,000) for each additional plot was used if someone owned more than one property (Easton Bavents Limited owned three cottages and were offered £16,000 not £30,000) due to economies of scale. • Houses purchased after the Shoreline Management Plan of 1998 could claim a non-capital contribution of up to £10,000 per plot for professional fees • Owners have 5 years to claim the money with the option of extending it by a further 5 years. • Pathfinder assistance can be transferred if the property is sold within the above timescales; however if a pre-1998 owned

East Riding of Yorkshire	Scratby	Waveney
<ul style="list-style-type: none"> • Demolition and site restoration costs of the curtilage • Relocation costs (up to £1,000) • Small hardship payment (up to £200 subject to exception claims process) • Payment of up to 50% of up to a 12-month private tenancy including bond, unless covered by Housing Benefit • Payment of management/agent feeds • Provision of essential furnishings and white goods for the new dwelling through support from the third sector where possible (up to £3,000) • For properties at higher or lower risk (Level 2 and 3) the Adaptation Package was made available: <ul style="list-style-type: none"> • Buy and lease back option • Erosion Assistance Grants, awarded by an ICZM panel to provide financial assistance where residents feel they are able to adapt their living 	<ul style="list-style-type: none"> • Subject to satisfaction of the requirements, applications for replacements will not be considered favourably unless they have been submitted by or on behalf of the owners of existing habitable properties at risk of coastal erosion within a 30 year period • Initial occupation of replacements will be restricted by means of a planning condition and/or legal agreement with the owners and the families of properties to be replaced • Applications to replace properties that have already been rolled back will not be approved • Calculation of the 30 year period should form part of an assessment of vulnerability to be submitted with all applications for replacement properties and will need to be assessed and agreed by the Council's Coastal Erosion Officer 	<p>property was sold, the new owners could only claim up to £10,000 and not £25,000.</p> <ul style="list-style-type: none"> • The Pathfinder decided not to place a reclaim mechanism on the funds (ie if someone was given £25,000 and they built a new house then sold it within xx years, some pathfinder money could be reclaimed) • The properties had to be permanent buildings • The owners do not have to live in Waveney to benefit and thus the property can be a second home. • Funding assistance for demolition was offered to properties at imminent risk (within 10m of cliff edge).

East Riding of Yorkshire	Scratby	Waveney
<p>environment, rather than moving out of the property immediately (up to £2,000). Retrospective applications for completed adaptation works may also be considered, but would be subject to approval by an ICZM Adaptation Panel.</p> <ul style="list-style-type: none"> • Alternatively, at Level 2 or Level 3, a resident could be assessed for eligibility for components A to F of the Relocation Package should they wish to opt for their property to be demolished. 		

7.6 Summary

Table 7-2 provides a summary of the issues identified and discussed in Section 7 associated with community views and expectations and, where possible, the outcomes to inform feasibility, desirability and replicability of rollback.

Table 0-2: Summary of issues addressed and outcomes to inform feasibility, desirability and replicability of rollback

Issue arising in Pathfinder	Actions taken or proposed to address issues	Outcomes or expected outcomes	Implications for feasibility, desirability and replicability
Initial opposition to the ideas of coastal erosion and adaptation	Engagement activities included: workshops, sending letters to property owners, holding open meetings, one-to-one engagement, drop-in sessions, unmanned exhibitions and information boards	Increased awareness led to more positive feelings regarding coastal adaptation options as people were better informed as to what was available to them	This will improve the desirability and replicability of coastal adaptation as people become more aware of what is available
Communities felt the Pathfinder money would be better spent on coastal defence	This issue was not specifically addressed however it could be addressed through engagement activities detailed above	Increased understanding of communities of the costs of various options would encourage their support for adaptation through better understanding of the costs and implications of defences (eg no reduced beach)	Should communities be persuaded that coastal adaptation is preferable to defences then this will significantly increase the desirability of Pathfinder schemes however some individuals are likely to remain strongly in support of defences
Concerns within the community of changes to the attractiveness and viability of the area	Focused engagement to address this issue. Early discussions with residents covered what they wanted to see happen and how they would like it to happen	Proposed rollback areas and policies were put forward largely with public support which reduced the impact on the visual amenity of the area	This would increase the desirability of Pathfinders as communities would feel empowered to contribute to decision making. There is a risk however that in areas where communities were

Issue arising in Pathfinder	Actions taken or proposed to address issues	Outcomes or expected outcomes	Implications for feasibility, desirability and replicability
			unable to put forward a suitable solution and the Council must make a decision that the community will then feel ignored
Communities were suspicious of the scheme due to the lack of a relocation site prior to purchase of properties at risk	It would be beneficial to purchase the rollback site prior to purchasing the at risk properties	Residents would have a clear idea of what to expect and rollback should be a quicker, smoother process	This would increase the desirability of schemes as community confidence would be increased and the time taken to undertake the projects would decrease
Lack of engagement from the community due to complacency	This issue was not specifically addressed in the Pathfinders considered here however it was found that one-on-one engagement was more effective	Greater engagement by communities would increase the opinions received but would also offer the opportunity for the whole community to feel involved and therefore to discuss issues and come to conclusions	Addressing this issue would be desirable from a local authority perspective as it would enable decisions to be taken based on sufficient data. This approach may however lead to increased disagreements as individual's opinions can be significantly different
Expectation by the community of Government to pay for adaptation options	This was raised by several Pathfinders and, although not specifically addressed, should be alleviated through engagement activities mentioned above	Communities will be more aware of what the Government is offering and what they are able to pay for and therefore there will be increased trust	This will contribute to the feasibility and replicability of Pathfinders as communities should be more prepared to accept the options available
Unrealistic expectations of residents regarding the value of their property and the land	Discussions with residents to explain the reasons for what they were being offered. Independent	Communities were aware of how the values they were being offered had been calculated and	This process will encourage increased confidence of the residents in schemes however there may

Issue arising in Pathfinder	Actions taken or proposed to address issues	Outcomes or expected outcomes	Implications for feasibility, desirability and replicability
available for rebuild	consultants verify the approach to property valuation, providing an unbiased view	that the process was fair and transparent	still be issues with residents feeling they are not being offered a fair exchange for their properties
Raised expectations of residents above what is sustainable following the Pathfinder project	Expectations of the community, managed through use of a clear and consistent approach, providing communities with a clear basis on which to base their expectations	Communities' expectations will be better matched to the options available to them. This will reduce the potential for conflicts and enable a smoother, quicker process	This may make Pathfinder projects more feasible as improved community awareness will mean communities are aware early on what is available and whether the options are appropriate
Views of the community as a whole are not presented as there are a few vocal members of the community	One-to-one engagement, although expensive, will provide all members of the community wishing to express themselves to do so	This will encourage the whole community to feel included in decisions relating to adaptation options which may facilitate increased engagement	This will encourage desirability of schemes to residents if they feel their views will be included
Conflict between second home owners and residents	Results of the Pathfinders indicated that the most likely resolution of disagreements is likely to be through engagement and discussion, allowing each group to voice their opinions and come to an agreement	This will encourage the whole community to feel included in decisions relating to adaptation options which may facilitate increased engagement	This potentially represents a long term issue although it did not appear to be so in the Pathfinders considered here. Addressing this issue early on will contribute to the replicability of the schemes as this issue is likely to be significant in many coastal areas

8. Financial and economic issues

8.1 Overview

As outlined in previous sections the Pathfinder funding has enabled the councils involved to investigate and, where deemed appropriate, undertake rollback as a coastal adaptation option. This has therefore provided communities at risk of coastal erosion, but where hard protection measures cannot be justified, an opportunity to relocate which would otherwise not have been possible.

These projects have also highlighted a number of important financial and economic issues that will need to be addressed or considered further if rollback and buy/leaseback are to be used as adaptation options in the future. A significant issue that has been identified in all the Pathfinder projects relates to the funds available at the individual, community and Local Authority levels, which is likely to be a key constraint for the wider roll-out of these coastal adaptation measures. During the discussions it was noted that all adaptation options require some initial funding to initiate them. Over time these costs are considered to reduce as they may be partially self-financing. It is therefore considered necessary that government funding is available for coastal management generally, including adaptation where appropriate, and not just in 'hold the line' situations.

During the research and consultation undertaken as part of this study it was also suggested that it is important for central government to understand that doing nothing in terms of coastal management is not a 'no cost' option. The issue of blight in communities impacted by coastal erosion was also raised in discussions with a number of stakeholders involved in the Pathfinder projects. This was not only in relation to the lack of maintenance of assets along the coastline that are at imminent risk of erosion (affecting the visual amenity of an area), but also in relation to changes in policy (eg the SMP) and the blighting effect that this has on property values in the wider community. These issues can have a potentially significant financial impact on individuals and communities as a whole. It has been suggested that the introduction of an effective coastal adaptation policy (including rollback and potentially buy/leaseback as possible options) would alleviate this blight as communities (and the wider society) would gain confidence in and be aware of the adaptation measures used/available to those at risk of coastal erosion.

Further details relating to the particular financial and economic issues for individuals, communities and Local Authorities that were experienced during the Pathfinder projects are explored in more detail in the following sections.

8.2 Financial barriers for individuals

The research undertaken indicates that in all of the Pathfinder Projects investigated one of the key barriers to facilitating rollback is the ability of property owners at risk of coastal erosion to afford the purchase of land and the costs of constructing a new property. In the East Riding of Yorkshire Pathfinder project the Council offered an Enhanced Assistance Package (EAP) to the owners of properties at risk of coastal erosion. These packages were designed to assist residents to move away from the at-risk area rather than provide funding for the specific purchase of an alternative development site and for rebuilding the property (this was not possible under the Pathfinder Project). However, the EAP had the flexibility to provide supplementary support for particularly vulnerable residents who clearly were unable to help themselves through an exceptional claims process.

East Riding of Yorkshire Council has found that self-funded rollback can proceed successfully for commercial properties such as caravan parks, as commercial operators may have the resources necessary to finance such moves.

In North Norfolk the council developed a methodology for purchasing the properties at risk of coastal erosion along Beach Road in Happisburgh. Although, offers provided to the property owners were fully justified, with nine of the property owners accepting the offers made, they were not necessarily sufficient to purchase an equivalent property further inland. A similar barrier also relates to the amount received for properties at risk of coastal erosion outside of the Pathfinder Project (facilitated through use of the rollback planning (EN12) policy), as this may not be sufficient to purchase land or to construct an equivalent property elsewhere. However, the funds provided to the owners of the Beach Road properties (through the Pathfinder Project) and through the use of the rollback planning policy allows the residents to move away from the at-risk locations.

Scarborough Borough Council utilised the concept of landbanking to address an imbalance within property insurance, as in the case of the Knipe Point residents, land instability prevented the rebuild of properties on the same site. In this case the Pathfinder funds allowed the purchase of an alternative site and insurance pay-outs will be used to fund the rebuild of their properties. However, insurance pay-outs have only been made because the properties have been affected by land instability. The impact of coastal erosion on properties is not insurable, therefore expansion of this concept would be heavily dependent on the residents having the means to finance the rebuild costs themselves, which is likely to restrict the feasibility of this approach in other areas.

During the Pathfinder Projects there have been issues raised regarding the potential for landowners to capitalise on residents trying to roll back from the coast by inflating land prices to development-land market value. Although there is no specific evidence to suggest that this has occurred to the point of preventing rollback from occurring, it is a potential risk if the approach is more widely used in the future. In the East Riding of Yorkshire it has been suggested that this is partly caused by a lack of understanding from

the landowner regarding the rollback policy. In this case it is only rollback applicants that would be able to build on the land, therefore it cannot be considered 'normal' development land that could command higher prices. Therefore, effective dialogue with landowners regarding the rollback policy would enhance understanding of the process and reduce the likelihood of this becoming an issue in the future.

There can also be complications in the situation whereby properties and the land on which these are situated are owned by different people. In this circumstance, the demolition of these properties as part of the rollback process will have financial implications for the landowner through a loss of ground rent.

The future availability of development land can also have knock-on financial implications for those wishing to roll back from the coast. The loosening of planning policy and the subsequent increase in supply of development land may reduce the attractiveness and uptake of rollback planning policies, therefore reducing the value that this policy provides for properties at risk of coastal erosion. This may have implications in relation to the future viability of rollback as a coastal management option and is therefore an important consideration.

Investigations into the possible feasibility of buy/leaseback as a coastal adaptation option raised certain concerns regarding the financial benefit that this provides to property owners. In Happisburgh, North Norfolk, some of the residents approached did not see the financial benefits of the properties being purchased by the council. Although an initial payment would be received, homeowners were concerned that this would be used in paying rent to remain in the property eventually leaving them with nothing. This was also an issue raised in Scratby. However, this is likely to be less of an issue if a new tenant is found (rather than the original property owner).

The ability for rollback to be self-financing is dependent on individuals being able to afford the purchase of land as well as the cost of property rebuild. This is unlikely to be the case for the majority of individuals, therefore, there is considered to be a need for some form of financial support to enable schemes to be implemented on a local and national scale. There are no funding sources available at present, with Flood Defence Grant in Aid not available for adaptation initiatives (including rollback) in areas identified as no active intervention in Shoreline Management Plans.

8.3 Financial barriers for communities

In both the North Norfolk and Waveney Pathfinder Projects, the lack of community capital has been highlighted as a barrier to progressing rollback schemes. In the case of North Norfolk, Trimmingham Parish Council has been provided with a grant to facilitate the relocation of the village hall, which is at risk of coastal erosion within the next 20-30 years. The grant provided under the Pathfinder Project was not sufficient to complete both the purchase of a suitable alternative site and construction of the new facility. Therefore,

additional fundraising has been required to obtain the necessary funds to enable to project to progress. The difficulty in obtaining these funds has been a key constraint that has prevented the scheme from reaching completion. A number of bids to obtain National Lottery support have been unsuccessful to date. It has also been noted that Trimmingham is a small community with a high proportion of elderly residents situated in a comparatively deprived economic area (in relation to other communities along the coast). Therefore, although fundraising is enthusiastic it is consequently slow, which has delayed progress.

This is likely to be a common problem experienced by other communities, particularly given the current economic situation, which further increases the difficulty in obtaining funding. During the stakeholder discussions it has been suggested that it would be useful if further advice/guidance was available to communities regarding the submission of bids to obtain funding for schemes, particularly those involving rollback of coastal assets. This would assist communities that often have no prior experience of bidding for substantial funds and may assist schemes to progress in a timely manner. If such assistance is provided it would also be essential that the community understands the value of such funding advice in order to ensure that the community takes advantage of the opportunity.

8.4 Financial barriers for Local Authorities

The Pathfinder remains the only form of adaptation funding to have been made available to Local Authorities. Many of the schemes investigated during the Pathfinder Projects require initial funding to be provided, which may not be available elsewhere. Therefore, the lack of funding is considered to be a key barrier in the future to initiating similar coastal adaptation schemes.

The current economic climate means that the internal budgets of Local Authorities are under considerable pressure from multiple sources. Therefore, in the vast majority of cases it is unlikely that continued funding of adaptation measures will be able to continue. During discussions with the councils involved in the Pathfinder Projects considered in this assessment, it was noted that budgetary constraints are likely to prevent the continuation of coastal adaptation options. East Riding of Yorkshire Council indicated that if no further funding is forthcoming then the Enhanced Assistance Package (EAP) developed during the Pathfinder Project will no longer be available to residents. However statutory responsibilities such as demolishing dangerous structures will continue. This in turn may have significant implications with regards government/council-community relations because the awareness of coastal adaptation and the associated expectation of individuals for some form of assistance are likely to have increased. The lack of continued assistance is likely to erode people's confidence in Local Authorities and the wider government in appropriately dealing with the consequences of coastal change in the future.

There is agreement amongst the Local Authorities contacted as part of this assessment that, should additional grants be available, it would be desirable to continue with the

rollback schemes undertaken as part of the Pathfinder Projects in the future. It has been suggested by East Riding of Yorkshire Council that a specific ring-fenced fund would allow for long term planning which is preferable to a capital bid system, as future funding could not be assured. Having a strategic overview, which would allow Local Authorities to input the number of properties identified as at risk within set timeframes, could help provide a national approach. This system would also reduce uncertainty for residents. A specific coastal change fund would not only allow for practical assistance for those at risk of coastal erosion but also the education of, and communication with, coastal communities.

The East Riding of Yorkshire Council also suggest that a solution to allow for the continued funding of coastal adaptation measures could be the use of the Partnership Funding approach, which considers the benefits to households, the environment and other whole life benefits. As the rollback process removes people from risk this would contribute to the coastal erosion outcome measure. It would also allow rollback to be considered as an alternative to traditional structural schemes on the same basis. A standard national funding mechanism would remove many of the barriers to the approach.

The Scratby Pathfinder Project identified a variety of potential funding sources for Local Authorities and also the likelihood of these funds being available. These are shown in the table below.

Table 0-1: Potential funding sources for adaptation options identified in the Scratby Pathfinder (Defra, 2012)

Source	Possible fund	Likelihood
Central government	Flood and Coastal Erosion Risk Management Funding	Possible but limited funds available
	Flood and Water Management Act (through Regional Flood and Coastal Committees, RFCCs)	Possible – funds would be raised through levy set by RFCC that would require Council Tax to be raised to cover the costs
	New Homes Bonus	Possible but this may be limited
National Lottery	Lottery grants	Unlikely – the current programmes are not relevant to coastal change
Dredging companies	Money from companies extracting aggregates off the Norfolk coast	Unlikely as it is unlikely companies would be willing to pay as this could be admitting responsibility for erosion
European Commission	Grants	Unlikely as no programmes at present are relevant to coastal
	Structural Funds	

Source	Possible fund	Likelihood
	Financial Instruments	change or adaptation
	Action and Operating Grants for non-governmental organisations	
Holiday Park Tax	Business Rates through Tax Increment Financing	Possible but not clear if it could be used in an area where the value of businesses would not necessarily be increased as a result of the money raised
Local government	Council Tax	Possible but Localism Bill raises opportunity for communities to hold a referendum that could mean that increases in Council Tax are not permitted
	Prudential Borrowing	Unlikely as money can only be borrowed against future increases in income, which is unlikely to occur due to coastal change
	Planning gain	Possible as money could be raised by selling land for development
Community organisations	Not-for-profit organisation	Possible but these would require the community to set up and run the organisation. Financial help may still be needed from other sources
	Trust	
	Community Interest Company or similar	
Private investors	Private landlords	Possible but care will be needed to ensure rents have to remain affordable
	Bond financing	Unlikely as bonds have to be worth more in the future to encourage people to invest in them, this may not be the case with coastal change

Looking more specifically at some of the schemes implemented as part of the Pathfinder Projects it is clear that there are certain financial aspects that have prevented uptake or

restricted progress from the Local Authority perspective. In the case of North Norfolk, the offers made by the council to purchase the properties along Beach Road in Happisburgh were accepted in nine of the 12 cases. It has been suggested that the offers provided were possibly enhanced by the short timescale and the need to purchase the properties in order to facilitate other coastal enhancement projects in Happisburgh. If a similar approach is undertaken in future the use of longer term planning may help reduce the amount offered to the property owners as a potentially lower sum may have been accepted. Therefore, a longer lead time may have reduced the payments made by the council.

The cost of demolishing properties has been found to be higher than anticipated in many cases, with restricted or unsafe access resulting in demolition by hand for some properties, instability of cliff top locations, non-standard construction has required extensive surveys prior to demolition, removal and disposal of hazardous waste ie asbestos, and presence of ex-ministry of defence structures. This is an important consideration when allocating future funding to the demolition of structures at risk of coastal erosion. Discussions with the Waveney Pathfinder team indicated that the Environment Agency Coastal Erosion Assistance Grant Scheme (CEAGS) could be used to help with demolition cost, but this would only apply to properties purchased before June 2009.

In the case of buy/leaseback there were a number of financial barriers that have prevented this from being implemented. In North Norfolk, buy/leaseback of properties in Happisburgh was investigated, but not taken forwards because the economics of the scheme were found to only breakeven, there were considered to be significant costs in bringing the properties up to the decent homes standard and there is the potential for periodic breaks in tenancies, which would reduce the income received. Also, the amount of funding allocated to this approach under the Pathfinder Project would only have enabled the purchase of one or two properties, which is not considered to have been sufficient to allow effective evaluation of the approach. There may however be opportunities to investigate this further in light of the Localism Act and taking into account alternative uses (rental for holiday lets) or funding mechanisms.

8.5 Summary

Table 8-2 provides a summary of the issues identified in Section 8 above on the financial and economic barriers and, where possible, the outcomes to inform feasibility, desirability and replicability of rollback.

Table 0-2: Summary of issues addressed and outcomes to inform feasibility, desirability and replicability of rollback

Issue arising in Pathfinder	Actions taken or proposed to address issues	Outcomes or expected outcomes	Implications for feasibility, desirability and replicability
Impact of blight on property values resulting from a change in SMP	Consideration of adaptation options through the Pathfinder Projects may have helped alleviate the issue in the short term	No specific outcomes identified	The use of adaptation options may help alleviate the issue of blight (in terms of property values) in the short term. Consideration of adaptation as part of a coastal management policy would help alleviate this issue in the longer term
Key barrier to facilitating rollback is the ability of individuals to afford the purchase of land and the costs of constructing a new property	Properties at risk of coastal erosion purchased by the council. The Council offers an Enhanced Assistance Package (EAP) to the owners of properties at risk of coastal erosion. Land is purchased using the Pathfinder fund with insurance pay-outs used to construct new properties	Property owners can move on	The affordability of residents to undertake rollback is considered to be a key constraint which would be reduced (the use of insurance pay-outs to fund construction of new properties will only be possible in cases of land instability as the impacts of coastal erosion are not insurable)
Landowners attempting to capitalise on residents trying to roll back from the coast	Effective engagement and negotiation with the landowners (to ensure that they fully understand the rollback policy and approach)	Land for rollback becomes more readily available to residents	Rollback becomes a more viable option through a more streamlined process

Issue arising in Pathfinder	Actions taken or proposed to address issues	Outcomes or expected outcomes	Implications for feasibility, desirability and replicability
Changes in planning policy resulting in an increase in supply of development land	Careful development of policy to enable rollback as an exception can reduce the risk of landowners holding out for development value	Land for rollback becomes more readily available to residents	Rollback becomes a more viable option through a more streamlined process
Key barrier to undertaking community led projects is a lack of available funds	Use of grant money and fundraising by the community to raise additional funds. Provision of advice/guidance to communities regarding bid applications and other fundraising may help ensure similar schemes are completed in a timely manner	Projects are funded and can continue	Given the current economic climate, the lack of community funds and difficulty in undertaking fundraising make sourcing funds a very desirable feature of a project
Financial/economic constraints prevented uptake of buy/leaseback	Investigations indicated that the scheme in North Norfolk was not taken forwards because the economics of the scheme were found to just breakeven, there were considered to be significant costs in bringing the properties up to the decent homes standard and there is the potential for periodic breaks in tenancies, which would reduce the income received	The financial/economic constraints prevented uptake of this small-scale project	Buy/leaseback appears infeasible and undesirable for residential purposes. There may be potential in leasing land for coastal uses or using properties as holiday lets but this has not been investigated in the Pathfinders

9. Economic analysis

9.1 Overview

This section considers the costs and benefits of rollback at four scales to identify if there is an economic case at any or all of these levels. The four scales are:

- Owner of at-risk property
- Community (comprising those at risk, those not at risk and where rollback might be located)
- Local Authority
- UK plc

The approach is based on consideration of a range of different scenarios, reflecting differences between the five Pathfinder projects evaluated in this study and is detailed in Section 2.4 (summarised below for reference):

1. Scenario 1: where the reaction from the community is low almost up to the point where erosion is predicted to occur within the next 5 years
2. Scenario 2: where the reaction from the community is low until there is a change in policy or some other cause such as erosion along the coast that raises awareness of erosion. The result is an immediate reduction in property values. Over time, the initial drop in property values decays somewhat when no properties are lost to erosion, but as time to the proposal changes in policy, the importance of the risk increases again and the impacts increase in magnitude
3. Scenario 3: change in policy to managed realignment, a long time ahead of predicted erosion, with significant response from the community. Many of those who are able to, and want to, sell their properties to move away from the community in question. New property owners may be less aware of the erosion risk. The reduction in property prices is likely to decay over time with no obvious effects from the erosion risk until the time comes that the policy change comes into effect or the defences start to fail and erosion is imminent

In order to undertake the economic analysis of the Pathfinder schemes and rollback, it has been necessary to apply a significant number of assumptions, which will be different within individual cases. Therefore the results of the analysis can only be considered to be an indication of possible costs and benefits.

Full details of the baseline and assumptions are provided in Annex 6. The Annex also includes the results of sensitivity checking on key assumptions.

9.2 Baseline impacts

The baseline assumes there is no rollback policy and no action is taken to assist property owners. This provides a better measure of the potential benefit for those Local Authorities that have not yet taken any action to deal with coastal erosion.

Table 9-1 below presents the costs per property associated with coastal erosion where there is no rollback option in place and who these costs are paid by.

Table 0-1: Total discounted costs under the baseline based on per property costs (only includes outcomes that could be monetised)

Who pays	Scenario 1	Scenario 2	Scenario 3	Key assumptions
Owners of at-risk property	£33,000 to £44,000 Average: £39,000	£27,000 to £35,000 Average: £31,000	£51,000 to £65,000 Average: £58,000	Scenario 2 has much larger savings from reduced maintenance
Community	£6,900 to £8,400 Average: £7,600	£13,000 to £15,000 Average: £14,000	£29,000 to £35,000 Average: £32,000	Most social costs not monetised
Local Authority	£1,900 to £3,400 Average: £2,400	£2,800 to £4,400 Average: £3,400	£11,000 to £19,000 Average: £14,000	Only includes costs that are monetised; assumes demolition and relocation costs are paid by local Authority
Total discounted costs	£42,000 to £55,000 Average: £49,000	£42,000 to £54,000 Average: £48,000	£91,000 to £120,000 Average: £100,000	Includes demolition and rehousing costs under property owners to avoid double counting

Who pays	Scenario 1	Scenario 2	Scenario 3	Key assumptions
UK plc	£35,000 to £47,000 Average: £41,000	£38,000 to £50,000 Average: £44,000	£77,000 to £100,000 Average: £89,000	Adjusts for VAT, removes transfer payments, only takes into account Government costs (stress)

Table 9-2 below shows how these costs relate to the individual Pathfinders investigated.

Table 0-2: Total discounted costs under the baseline by Pathfinder by who pays (only includes outcomes that could be monetised)

Pathfinder	Owners of at-risk properties	Community	Local Authority	Total costs	UK plc
East Riding	£3,800,000	Social costs not monetised	£110,000 (includes demolition and rehousing costs that may be paid for by property owners)	£4,000,000	£3,600,000
North Norfolk	£1,300,000	£850,000	£49,000 (includes demolition and rehousing costs that may be paid for by property owners)	£2,200,000	£2,000,000
Scarborough	£6,500,000	£180,000	£140,000 (includes demolition and rehousing costs that may be paid for by property owners)	£6,800,000	£6,300,000

Pathfinder	Owners of at-risk properties	Community	Local Authority	Total costs	UK plc
Scratby	£9,200,000	£1,100,000	£480,000 (includes demolition and rehousing costs that may be paid for by property owners)	£11,000,000	£10,000,000
Waveney: Easton Bavents	£830,000	Social costs not monetised	£73,000 (includes demolition and rehousing costs that may be paid for by property owners)	£900,000	£820,000
Waveney: Corton	£1,200,000	£160,000	£270,000 (includes demolition and rehousing costs that may be paid for by property owners)	£1,600,000	£1,600,000 (reduction of £88,000 compared with total costs not shown due to rounding; difference is smaller than for other Pathfinders as adjusted costs all occur towards year 50)

9.3 Assessment of rollback

Rollback should reduce the negative impacts associated with uncertainty over the future by providing options that will enable people to move on with their lives. Rollback does not change the likelihood that a property would be eroded, but it does alter the consequences as it is assumed properties will be rolled back to areas that are either risk free or have more than 100 years to erosion. Therefore, rollback could result in the elimination of impacts that occur due to an increased awareness of or reaction to risk, such as blight. There will always be some residual impacts since rollback cannot address all of the costs and damages. For example, there is always likely to be some reduction in property value even if the property can be rebuilt in a risk-free location. However, the loss in value, such as that associated with a premium for a sea view, may be transferred to properties further

inland when those on the front line are demolished. There may also be residual impacts where rollback results in people moving out of the local community. In addition, the costs and impacts associated with the imminent loss of a property (due to erosion risk but more likely due to demolition) would not be avoided through rollback and in some cases may occur earlier.

A series of possible rollback options has been developed, based on the approaches used in the Pathfinders:

1. Assistance package (similar to East Riding of Yorkshire and Waveney, Easton Bavents)
2. Valuation of property (similar to North Norfolk) for purchase
3. Development rights (similar to Waveney, North Norfolk, East Riding and Scratby)
4. Landbanking (similar to Scarborough)

The costs and benefits of each rollback option, compared against the no rollback baseline, are discussed below for UK plc and are limited to those costs directly related to enabling or undertaking rollback. They exclude costs associated with environmental improvements that may have helped encourage investment into an area as these are not directly associated with rollback and so would give an inflated estimate of the costs of implementing rollback as an adaptation measure. Actual expenditure is used where available. Where not, expenditure set out in Regeneris (2011) is used adjusted for additional expenditure where further activities have been carried out. The original bid applications have also been used to assess the likely level of costs where data on actual expenditure are missing. As these are considered to be incurred by UK plc they do not include VAT.

Full details of the costs and benefits are in Annex 6.

Assistance package

The East Riding and Waveney Pathfinders both investigated and implemented forms of assistance packages. In the case of East Riding, a variety of options were put forward for residents at imminent risk of erosion, with a lower value package available for those properties not at imminent risk (including money to maintain the property). Within Waveney the Pathfinder offered financial support to buy land and rebuild (£15,000), which was available only to property owners who had purchased their property prior to 1998, and a further £10,000 available to all property owners to spend on consultation fees.

The costs and benefits of the East Riding and Waveney Pathfinder schemes have been used to inform a per property assessment of the economic case for rollback for properties considered to be within Scenario 2 (informed by East Riding and Waveney, Easton Bavents) and Scenario 3 (informed by Waveney, Corton). The East Riding Pathfinder contributes specifically to those areas with lower than average property values, while both

the Waveney schemes (Easton Bavents and Corton) inform assessments in areas with average property values.

Scenario 2 assumes an increase in reaction to coastal erosion risk (around 20 years before the properties will be lost) suggesting a level of blight. With an assistance package available, residents may be eligible at this point for maintenance payments or the full assistance package (depending upon whether the approach undertaken in East Riding or Waveney is undertaken). Blight will be reduced as properties will be maintained (either through maintenance payments or through residents knowledge that they will be eligible for the assistance package at a later date) until five years before they are considered to be lost. At this point the resident will not be undertaking maintenance and will be saving in preparation for rolling back.

Scenario 3 assumes early reaction to coastal erosion risk (more than 50 years before properties will be lost). At this point residents may be keen to undertake the rollback option, leading to the demolition and rebuilding of their property. As a result, there would be no blight associated with this Scenario. This is consistent with the baseline assumption that people aware of and concerned by the risk move away but here it is assumed they take advantage of the rollback option to assist that move.

Based on information collected in the Pathfinders a number of assumptions have been made with regards to the assistance package rollback option. These include:

- Within the East Riding of Yorkshire residents will be eligible for a variety of assistance package options. Therefore we have assumed three possible combinations based on the potential situations of applicants:
 1. Demolition & site restoration only (£8,000) (maintenance savings only for last few years)
 2. Demolition & site restoration (£8,000), relocation costs (£1,000), management/agent fees (£100) and second-hand furnishings (£3,000) (reduces the damages and increases the damages avoided but has a higher rollback cost)
 3. Demolition & site restoration (£8,000), relocation costs (£1,000), hardship payment (£200), 50% of 12 month private tenancy and bond (£3,000), management/agent fees (£100) and second-hand furnishings (£3,000) (further reduction in damages and increase in damages avoided, although less than £1,000 in both cases, further increase in rollback costs)
- Stress is considered to be associated with properties within East Riding due to the blight encountered in year 20, which occurs before they are eligible for the full assistance package. This is not the case in Waveney as the property owners are assumed to be able to rebuild
- Property owners take the funds available to them as soon as they are eligible or aware, ie in the case of Scenario 2 properties, the reaction to coastal erosion risk is

high at around 20 years therefore residents are assumed to look into and apply for rollback options at this point

- The Waveney Pathfinder restricted funding for newer residents, offering up to £25,000 for those who purchased their properties prior to 1998 and £10,000 for all other at risk property owners. For the purposes of this study it has been assumed that 50% of properties are eligible for £25,000 (purchased prior to 1998)

Table 9-3 below presents a summary of the economic case for the assistance package for UK plc by scenario on a per property basis. This indicates that on a per property basis it may be cost beneficial to UK plc to use the assistance package approach to facilitate rollback in these scenarios, especially when the benefits that could not be monetised are taken into account.

A key uncertainty with this approach relates to situations where the property must be rebuilt but the owner does not have the funds available to do so. The costs above assume that the property owner has the funds and does not have to borrow money. If property owners in Scenario 2 with average value properties, as in Waveney, have to borrow money the BCR decreases significantly and is no longer cost beneficial, even with an interest rate as low as 2% (based on borrowing the full property value over 25 years).

Table 9-3: Economic case for UK plc by scenario per property (based on Pathfinder application of options by Scenario)

Scenario	Total damages avoided (benefits)	Additional rollback costs	Benefit- Cost ratio (BCR)	Qualitative benefits
Scenario 2, lower than average property prices (combinations based on assistance package options selected above)				
Scenario 2, combination 1	£1,400	£2,300	0.6	Ability to get on with life (reduced uncertainty, enhanced mobility)
Scenario 2, combination 2	£7,100	£3,400	2.1	Ability to get on with life (reduced uncertainty, enhanced mobility);
Scenario 2, combination 3	£8,000	£4,400	1.8	reduced health impacts from increasingly derelict housing; reduced risk of deprivation in local area

Scenario	Total damages avoided (benefits)	Additional rollback costs	Benefit- Cost ratio (BCR)	Qualitative benefits
Scenario 2, average property prices				
Scenario 2	£38,000	£45,000	0.8	Ability to get on with life (reduced uncertainty, enhanced mobility); reduced health impacts from increasingly derelict housing; reduced risk of deprivation in local area
Scenario 3, average property prices				
Scenario 3	£70,000	£65,000	1.1	Ability to get on with life (reduced uncertainty, enhanced mobility); reduced health impacts from low quality housing

Table 9-4 presents the total costs and benefits of the assistance package scheme within the specific Pathfinders. Note that there are no community damages under the rollback options as it is assumed that the availability of the assistance package means that impacts (that can be monetised) on the wider community are assumed to be negligible. The damages avoided are calculated as the difference between damages under the baseline and rollback options. The additional rollback costs are the extra costs incurred under the rollback option compared with those incurred under the baseline.

Table 9-4: Total discounted costs under the assistance packages proposed by Pathfinder

Pathfinder	Damages avoided (benefits)	Additional rollback costs	BCR
East Riding	£28,000	£320,000	0.1
Waveney: Easton Barents	£620,000	£1,600,000	0.4
Waveney: Corton	£1,200,000	£6,500,000	0.2

The benefit-cost ratios vary between the scenario and Pathfinder cases mainly due to the timing. The scenario case assumes the full 50 year time period is available for planning, whereas within the individual Pathfinders there was already less than this available. For example in Scenario 3 areas, such as Corton, those interested in moving away from the area and able to do so may have already left - in East Riding 7 properties are considered

for demolition in five years' time. The lack of time means there are fewer opportunities to save money by reducing maintenance; subsequently the damages avoided are lower for the Pathfinders than for the scenarios. As a result, the benefit-cost ratios are also lower.

Property valuation

Within North Norfolk a property valuation method was developed to determine a 'fair price' to offer residents for their 'at-risk' properties. This work included an adjustment to ensure that those properties at imminent risk were not given a much lower value than those properties at moderate or low risk. The valuation method developed involved considering the 'at risk' value of the property (eg £1,000 of value in the property for every year of life remaining), the cost of planning consent required on the plot, the 'home loss' supplement (10% of the risk free value) and the discounted property value based on the residual life of the property at the time of publication of the SMP (2006). For example, a house worth £150,000 with 50 years of life remaining in 2006 (ie eroded 2056) would have a discounted value of £29,589, compared to £75,385 for the same property with 20 years of life (eroded 2026).

The approach undertaken in North Norfolk has been used to inform Scenario 2 for those areas with average property prices that have been potentially determined using the property valuation method. In this Scenario there are around 20 years before their property is at risk of erosion. At this point it is assumed the Local Authority undertakes property valuation and offers the residents a value for the property. This approach involves the costs of the property purchase and engagement with residents. There is no blight as the property is purchased by the Local Authority and either removed or put to other use as soon as the reaction to erosion risk is high. There are no community costs as there is limited stress associated with this approach.

Table 9-5 presents the economic case for the property valuation approach for UK plc by scenario on a per property basis. The benefit-cost ratio is negative because the damages under the rollback option are greater than those under the baseline. This is due to the property being demolished in year 25 rather than in year 50 under the baseline.

Uncertainties associated with this approach can be considered around when the property owners would take the rollback option as some may prefer to stay in their homes for as long as possible, assuming the rollback package will be available at a later date.

Table 9-5: Economic case for UK plc by scenario per property (based on Pathfinder application of options by scenario)

Scenario	Total damages avoided (benefits)	Additional rollback costs	Benefit- Cost ratio (BCR)	Qualitative benefits
Scenario 2	-£26,000	£43,000	-0.6	Ability to get on with life (reduced uncertainty, enhanced mobility); reduced health impacts from increasingly derelict housing; reduced risk of deprivation in local area

Table 9-6 below presents the total costs and benefits of the property valuation scheme within the North Norfolk.

Table 9-6: Total discounted costs under the property valuation proposed by Pathfinder

Pathfinder	Damages avoided (benefits)	Additional rollback costs	BCR
North Norfolk	£130,000	£1,300,000	0.1

The damages under the baseline are greater than those under the Pathfinder as under the baseline there is blight on the wider community. The benefit-cost ratios are similar between the Pathfinder and the Scenario per property economic assessments. The main difference between the Scenario and the Pathfinder is the timing. In Scenario 2 it is assumed that the properties undertake the property valuation in year 25 (when reaction to erosion risk is high) whereas within the Pathfinder the 12 properties at risk have a life of 10 years and therefore are able to take the assistance package immediately, incurring higher damages, but avoiding significant damages due to the potential for blight.

Development opportunities

The use of development plans and policies was included in the East Riding, North Norfolk, Scratby and Waveney Pathfinders. The approaches and requirements for use of these policies varied significantly between these Pathfinders from those where the policy was already in place, as for the EN12 policy in North Norfolk, to areas where a new set of planning policies were investigated and proposed, as in Scratby. The policies themselves were all also different, although for the purpose of this project we have considered development opportunities to cover the whole spectrum of policies required to enable rollback.

These Pathfinders have been used to inform the development of the rollback option within the Scenarios developed. East Riding, North Norfolk, Scratby and Easton Bavents in

Waveney all contribute to Scenario 2 (East Riding and Scratby represent communities with lower than average property values, while North Norfolk and Easton Bavents in Waveney have average property values). For Scenario 2 the Local Authority undertakes early engagement (45 years to erosion) to ensure residents are aware of the development opportunities available to them. The residents are then thought to prefer to stay in their property for as long as possible, maintaining it up to five years before erosion at which point they are saving in preparation for rolling back. Properties are then demolished and rebuilt elsewhere. Corton in Waveney informs Scenario 3 and represents an area with average property values. In this case the Local Authority undertakes engagement with 50 years to erosion and the residents take the opportunity straight away, demolishing and rebuilding their property elsewhere. In both Scenarios the chance of blight is significantly reduced.

The assumptions made for this option include those surrounding estimates of the cost of developing and implementing a policy. For the Scenarios we have assumed that there are some policies in place to facilitate rollback; however these require reviewing and modifying to accommodate the specific options. Based on information on the cost of incorporating policies into existing legislation, reviewing current policies, and developing new policies as reported in Defra (2012) we have used the following costs:

- £10,000 to modify existing legislation
- £40,000 to review current policies and amend
- £70,000 to develop new policies and incorporate them into legislation

These costs have not been included in the assessment of the economic case for rollback in the table below (Table 9-7) as this is on a per property basis and the costs are more far reaching than individual properties. The costs are included in the assessment by Pathfinder.

Table 9-7: Economic case for UK plc by scenario per property (based on Pathfinder application of options by scenario)

Scenario	Total damages avoided (benefits)	Additional rollback costs	Benefit- Cost ratio (BCR)	Qualitative benefits
Low property values				
Scenario 2	£34,000	£64,000	0.5	Ability to get on with life (reduced uncertainty, enhanced mobility); reduced health impacts from increasingly derelict housing; reduced risk of deprivation in local area

Scenario	Total damages avoided (benefits)	Additional rollback costs	Benefit- Cost ratio (BCR)	Qualitative benefits
Average property values				
Scenario 2	£41,000	£36,000	1.1	Ability to get on with life (reduced uncertainty, enhanced mobility); reduced health impacts from increasingly derelict housing; reduced risk of deprivation in local area
Scenario 3	£74,000	£84,000	0.9	Ability to get on with life (reduced uncertainty, enhanced mobility); reduced health impacts from low quality housing

As for the assistance package rollback option, a key uncertainty with this approach relates to situations where the property must be rebuilt but the owner does not have the funds available to do so. The costs above assume that the property owner has the funds and does not have to borrow money. If they have to borrow money the benefit-cost ratio (BCR) decreases significantly and is no longer cost beneficial, even with an interest rate as low as 0.2% (based on borrowing the full property value over 25 years).

Table 9-8 below presents the total costs and benefits of the development opportunity rollback option within each of the individual Pathfinders.

Table 9-8: Total discounted costs under the development opportunities proposed by Pathfinder

Pathfinder	Damages avoided (benefits)	Additional rollback costs	BCR
East Riding	£3,700,000	£1,500,000	2.4
North Norfolk	£2,000,000	£790,000	2.5
Scratby	£10,000,000	£5,600,000	1.8
Waveney: Easton Barents	£1,200,000	£1,500,000	0.8
Waveney: Corton	£1,200,000	£4,000,000	0.3

Table 9-8 shows that the use of development opportunities within some areas is more cost beneficial than indicated by the scenario assessment. This is linked to the fact that in East

Riding, Scratby and North Norfolk the properties at risk are able to retain significant savings through the lack of maintenance five years prior to rollback and there is no blight, thereby reducing the damages against the baseline. Inclusion of the policy costs in this analysis does not alter the overall analysis as costs of between £10,000 and £70,000 are relatively small when considering the scale at which these Pathfinders work. Both Waveney projects are the only Pathfinders to be considered to be not cost-beneficial. Both of these projects have lower damages avoided than the other schemes as the difference between their total and baseline damages is not as high. This coupled with their relatively high additional rollback costs reduces the benefit-cost ratio to below one.

Landbanking

The Scarborough Pathfinder undertook a novel approach to rollback using the method of landbanking, whereby the Local Authority offered residents land to which they could rollback.

The Scarborough Pathfinder has been used to inform Scenario 1 in which reaction to the erosion risk is low until the risk is imminent. Therefore this Scenario assumes that for the option of landbanking residents reduce maintenance five years before the risk of erosion and then rollback, with no action taken earlier and no blight (although the impact of blight on Scenario 1 baseline is low). The Local Authority undertakes engagement when risk is imminent.

Table 9-9 below shows the economic case for Scenario 3 on a per property basis based on the Scarborough Pathfinder.

Table 9-9: Economic case for UK plc by scenario per property (based on Pathfinder application of options by scenario)

Scenario	Total damages avoided (benefits)	Additional rollback costs	Benefit- Cost ratio (BCR)	Qualitative benefits
Scenario 1	£42,000	£18,000	2.3	Ability to get on with life (reduced uncertainty, enhanced mobility)

The damages are much lower than under the baseline as the property value is not lost after 50 years as it is rebuilt. The rollback costs are higher than the baseline as there is additional land purchase and rebuild costs; however these are not so high as to make this approach prohibitive.

Uncertainties associated with the assessment above relate to situations where the property must be rebuilt but the owner does not have the funds available to do so. The costs above assume that the property owner has the funds and does not have to borrow money. If they have to borrow money the BCR decreases significantly and is no longer

cost beneficial, unless an interest rate of 1.3% is available (based on borrowing the full property value over 25 years). Within Scarborough the situation was unusual in that the property owners were able to fund their rollback through insurance pay-outs. This would not be possible in many cases as insurance is not available against coastal erosion, only land instability, therefore it is likely that in other cases property owners would need to borrow the money, thereby reducing the benefit-cost ratio.

Table 9-10 below presents the total costs and benefits of the landbanking rollback option within Scarborough.

Table 9-10: Total discounted costs under the development opportunities proposed by Pathfinder

Pathfinder	Damages avoided (benefits)	Additional rollback costs	BCR
Scarborough	£6,200,000	£3,200,000	1.9

As mentioned above, the Scenario assessment does not include the damages from a property being demolished and rebuilt whereas within Scarborough, this value is included for the 41 properties that would have been lost to erosion prior to the 50 year time period considered. Local Authority costs were also high for Scarborough as three lots of engagement were required based on the communities at-risk over different time scales. Each engagement activity has associated complaints (community tensions) and is incurred twice, once for demolition and once for rebuild location. These factors contribute to the lower benefit-cost ratio for the Pathfinder compared to the Scenario which is based on it.

9.4 Impacts of rollback

Individual property owners

The impacts on individual property owners can be monetised, as show in the section above and summarised in Table 9-11 below for each rollback option. Figures are only available currently for Scenarios that have been informed by specific Pathfinders.

Table 9-11: Economic damages per property per scenario per rollback option to individual property owners⁵

Scenario	Assistance package	Property valuation	Development opportunities	Landbanking
Scenario 1	-	-	-	-£1,900
Scenario 2	£1,500	£66,000	-£1,400	-
Scenario 3	£10,000	-	£5,700	-

Notes: negative values relate to where there are savings from reduction in maintenance to property owners; positive values are where there are costs (damages) to property owners

The economic figures for per property costs to individual property owners per Pathfinder are available in Table 9-12 below. Note these are not per property and are for the Pathfinders as a whole therefore vary not only by type of package but also by number of properties and situations.

Table 9-12: Economic damages per Pathfinder per rollback option to property owners

Pathfinder	Assistance package	Property valuation	Development opportunities	Landbanking
East Riding of Yorkshire	£3,600,000	-	-£110,000	-
North Norfolk	-	£1,900,000	-£14,000	-
Scarborough	-	-	-	-£18,000
Scratby	-	-	-£220,000	-
Waveney: Easton Barents	£140,000	-	-£430,000	-
Waveney: Corton	£270,000	-	£270,000	-

Notes: negative values relate to where there are savings from reduction in maintenance to property owners; positive values are where there are costs (damages) to property owners

The damages above include lost value of the property due to blight, savings made through lack of maintenance (often a significant determinant in the level of damages) and stress impacts.

The tables above suggest that property owners bear the least damages for the development opportunities and landbanking rollback options although there is limited

⁵ Figure for average property prices given where there is more than one estimate available.

opportunity for a direct comparison as the situations vary between scenarios and rollback options.

There are also additional benefits that are not possible to monetise. Individual property owners are the most obvious direct beneficiaries of rollback as these residents are given the opportunity to relocate, thereby reducing any uncertainty they may have associated with their future. As well as the chance to relocate, the benefits of raised awareness should not be underestimated. In Scratby, for example, the residents were not provided with the opportunity to relocate; however many expressed how grateful they were for the engagement and to have the situation explained to them.

Community

The impacts on the communities within which rollback is undertaken are not appropriate for monetisation on a per property basis and as the figures presented here are for costs to the UK plc, community impacts are not included.

However, community benefits relate primarily to the retention of residents where, in Pathfinders such as North Norfolk, the rollback scheme dictates that the replacement properties be rebuilt within the community. Without rollback these individuals would have been forced to move away from the community if there was no housing available and as the erosion continues the community would diminish.

Within areas such as Happisburgh, one of the most significant benefits to the community of rollback was the removal of blight. This was considered to have knock-on impacts in increasing the appeal of the area and the impression others have of it.

Other benefits to the community of undertaking rollback include raised awareness. A better informed community reduces the level of misunderstanding about the SMP process and coastal change issues more generally, as well as providing information on possible adaptation options and their associated costs. The community may also feel empowered through workshops enabling them to make decisions for themselves about their own futures.

Rollback was found in many cases to require a significant amount of engagement with communities and through this there is also the chance that communities will be more cohesive as they have worked together to solve the problems affecting them all.

Local Authority

The impacts on the Local Authorities can be monetised, as show in the section above and summarised below for each rollback option. Figures are only available currently for Scenarios that have been informed by specific Pathfinders.

Table 9-13: Economic damages per property per scenario per rollback option to local authorities ⁶

Scenario	Assistance package	Property valuation	Development opportunities	Landbanking
Scenario 1	-	-	-	£4,600
Scenario 2	£3,300	£3,000	£3,300	-
Scenario 3	£7,500	-	£7,500	-

The economic figures for per property costs to local authorities per Pathfinder are available below. Note these are not per property and are for the Pathfinders as a whole therefore vary not only by type of package but also by number of properties and situations.

Table 9-14: Economic damages per Pathfinder per rollback option to local authorities

Pathfinder	Assistance package	Property valuation	Development opportunities	Landbanking
East Riding of Yorkshire	£21,000	-	£21,000	-
North Norfolk	-	£14,000	£27,000	-
Scarborough	-	-	-	£98,000
Scratby	-	-	£61,000	-
Waveney: Easton Barents	£54,000	-	£54,000	-
Waveney: Corton	£37,000	-	£37,000	-

The costs above include the costs of undertaking engagement and of dealing with complaints, although this last cost is considered to represent the bigger issue of general community tensions.

The tables above suggest that the Local Authority bears the least damages where the property valuation approach to rollback is undertaken, as for individual property owners, although there is little opportunity for a direct comparison using these figures due to additional variables.

Local Authority benefits mainly relate to avoiding damages that would occur without rollback as they benefit from having residents removed from an area at risk and avoid the burden of having to provide emergency housing for them following the loss of their properties. In addition, the housing stock is not depleted, which is important in an area

⁶ Figure for average property prices used due to the uncertainty surrounding the combinations of assistance packages available in the lower than average assessment.

with a housing shortage such as Scarborough. There is also a significant decrease in the levels of blight in the area which will increase its appeal.

Other benefits of rollback to Local Authorities include the collection of information on the views of communities on coastal change and reduction in the misunderstandings and inconsistencies which exist.

Some of the work undertaken by the Local Authority to inform rollback will benefit other Local Authorities eg research undertaken on the different adaptation options and willingness to pay for rollback, and trialling of methods of engagement to determine the most effective.

UK plc

Costs and benefits of the rollback options to UK plc are more far reaching than for other groups but are also influenced by the impacts on other groups, for example stress impacts on individuals can impact the UK economy if it leads to time off, health care, etc.

Benefits of rollback to UK plc may be felt over a longer time period than other benefits. They include many of the benefits received by other groups as these help to facilitate the process and therefore reduce the costs of rollback. In addition, the UK plc will benefit from improved public opinion as people feel supported rather than abandoned to coastal change.

Others

Within the Scarborough Pathfinder there are several other beneficiaries, which suggests the potential for wider benefits outside the groups mentioned above. For example, the National Trust owns the cliff below the Knipe Point community, which is where the land instability is occurring. They therefore benefit from the Pathfinder project. The Site of Special Scientific Interest (SSSI) designation is dependent on the continuation of natural processes and therefore the avoidance of a traditional structural scheme promotes the continued good condition of the site. The Pathfinder project has therefore also contributed to supporting the environment in this area.

These other beneficiaries, as indicated above, relate mainly to the nature conservation interests that are present in many coastal areas. With the removal of at risk properties through rollback, these areas may be more available for wildlife to use and are therefore of interest to conservation authorities.

10. Overall assessment of feasibility, desirability and replicability of rollback

10.1 Lessons learnt

Overall evidence from the Pathfinder Projects suggests that rollback is a feasible adaptation option that is desirable from the perspective of the Local Authority and the individuals at imminent risk of coastal erosion. Buy-in at the wider community level can be more difficult to achieve, but effective communication can increase awareness and understanding of the situation (in terms of the options available in the wider context of coastal erosion issues) and thus increase desirability. The problems encountered in the Pathfinder projects provide valuable lessons learnt for other Local Authorities in terms of what issues to look out for and how to overcome them. The key areas to focus on when identifying the potential usefulness of rollback include:

1. ***Understanding the community***, including demographics, community representation, likely divisions or conflicts within the community that may be pre-existing or could arise as rollback proceeds. The importance of engagement with communities through appropriately trained and skilled engagement experts cannot be under-estimated. Responses from initial consultation exercises in the Pathfinders indicated that there were both positive and negative impressions of coastal adaptation, with the negative impressions considered to outweigh the positive. Communities in the East Riding of Yorkshire, North Norfolk, Scratby, and Waveney felt that the money for coastal adaptation projects would be better spent on coastal protection and in Scarborough the residents were reluctant to accept the situation and wanted someone to blame. By the end of the Pathfinder projects, most stakeholders are considered to have an increased awareness and acceptance of coastal change. Engagement also needs to be tailored to the specific requirements of the community and it is important that the approaches used to engage enable the views of individuals as well as the wider community to be captured. In the East Riding of Yorkshire it was found that public meetings that were arranged with specific start times tended to be dominated by particular residents. Therefore, to obtain a broader view of the community there was a move towards public drop-in sessions spanning several hours, which were well-attended by a wider contingent of the community.
2. ***Understanding community expectations***, including their ability to help themselves based on the skills they possess and the financial situation they may find themselves in (as with second home owners, or those who purchased properties before/after SMP policy changes). Efforts were made in all Pathfinders

to manage the expectations of the communities and in many cases this was through further engagement. Where property owners questioned the amount offered for their properties (as in North Norfolk) or that the replacement land they were offered was not sufficient (Scarborough) the Councils undertook discussions to explain to the residents the reasons for what was offered. In the case of North Norfolk, independent consultants were used to verify the approaches used to value properties and to provide unbiased views that assisted in ensuring resident buy-in to the schemes. East Riding of Yorkshire Council managed expectations through use of a clear and consistent approach due to the Vulnerable Groups Priority Outcome process and Enhanced Assistance Package. These provided communities with a clear basis on which to base their expectations from the start of the Pathfinder process. Within Waveney, engagement with communities enabled community expectations to align more closely with the expectations the Council believed they should have. This can be considered to contribute to residents being able to get on with their lives in areas at risk of coastal erosion as they are aware of the opportunities available to them.

3. ***Investigating community understanding of the inevitability of erosion*** and the impacts they are likely to face, including external factors that could affect their ability to get on with their lives. This could cover expected life of properties and insurance/mortgage requirements or legal issues over the length of lease agreements. In North Norfolk, the initial stages of consultation with the community were undertaken to explain the erosion risk faced by the caravan park in Happisburgh. Other activities included sending letters to property owners (for example in Scratby letters were sent to 31 'at most risk' properties to invite them to a workshop), holding open meetings (in Waveney and North Norfolk open meetings were held for anyone to attend to help address problems), one-to-one engagement (considered very effective in East Riding of Yorkshire and North Norfolk), drop-in sessions, unmanned exhibitions and information boards. Despite the activities undertaken to raise community awareness, a facet of many projects was the lack of interest and/or engagement from individuals at risk, as well as the wider communities. In Waveney engagement workshops were poorly attended and in Scratby only six of the 31 households considered 'at most risk' attended the workshop.
4. ***Identifying what the Local Authority can and should provide*** and how this may vary from community expectations. This includes the need to agree priorities in terms of the type of support provided to the community as a whole compared with support for specific individuals, and also to those communities with land identified for relocation sites. Waveney District Council determined that their role was to help people living in properties at risk of erosion to get on with their lives. East Riding of Yorkshire Council indicated that if no further funding is forthcoming then the Enhanced Assistance Package (EAP) developed during the Pathfinder Project will

no longer be available to residents, however statutory responsibilities such as demolishing dangerous structures will continue.

5. **Assessing the specific needs of individuals.** This includes the need to enable individuals and communities to take ownership of the problem and the type of solutions that may be appropriate. The solutions offered need to take into consideration what the Local Authority has the capacity to undertake and believes is appropriate to provide, as well as divisions within the community. There are many examples of the diversity of opinions within the communities. These can be due to disagreements over potential rollback locations (North Norfolk and Waveney) and disagreements over the fundamental need for coastal adaptation (Scratby). There may also be underlying tensions in communities where the more vocal members are represented rather than the community as a whole (Scarborough, Waveney and North Norfolk). There are examples of individuals having consideration for the wider community. For example, the owner of the caravan park in Happisburgh was reluctant to pursue rollback options which might create community tensions.

6. **Recognising which skills are needed and which of these can be provided in-house or need to be brought in from outside** (where this may be necessary for perceived objectivity as well as skills gaps within the Local Authority). This may require specific skills to be brought in to provide advice and assistance to communities so they can understand what the issues are and their implications. As part of the North Norfolk Pathfinder the Parish Councils played an important role in setting up local liaison groups. For instance, the group in Happisburgh was considered to be particularly invaluable as a link to the local community and assisted in shaping the direction of the projects. In the East Riding of Yorkshire, the dedicated project officer provided residents with continuity throughout the process, making it easier for residents to access assistance. The approach also built trust between the council and residents. The Coastal Officers' Working Group that was set up internally by East Riding of Yorkshire Council and the identification of the right people to include within the Pathfinder project at Waveney are examples of good practice. This has fostered greater understanding of coastal issues across the different council departments and resulted in better cross-department working. In North Norfolk, consultants assisted property owners in understanding the offers made by the council and provided an unbiased and transparent view (ie they provided reassurance that the offers made for their properties were fair and justifiable). It is also important to recognise that community led projects also require key skills from those living in the area (such as project management, engagement, fundraising skills etc.) to ensure that schemes progress in a timely manner.

7. **Accepting that rollback is likely to require long-term development** and recognition that we are approximately half way through the first SMP epoch. Indeed, some policies may change from Hold the Line to Managed Realignment or

No Active Intervention and that there was an expectation that adaptation measures would be identified prior to those changes. This requires there to be appropriate strategies in place to exit from the defence policy and move into a retreat or other policy.

8. **Accepting that rollback is likely to require long-term planning** and needs to be supported by appropriate planning policies, especially those that enable rollback as an exception as this can help reduce the costs faced by individuals, households and businesses looking to rollback. The policy response that appears to best enable rollback is to treat rollback development as an exception, recognising its importance in contributing to the life of the community and allowing it despite its rural location, as in North Norfolk. Other approaches can also work though, with Waveney District Council including coastal erosion as a key issue in the Core Strategy with replacement properties required to fit in with the settlement strategy for the district as a whole.

10.2 Main barriers to rollback

The lessons learnt above need to be considered in the light of addressing the main barriers to rollback which are:

1. **Availability of land:** There can be difficulties in obtaining land for relocating assets at risk of coastal erosion that is deemed suitable and affordable to the asset owner as well agreeable with the wider community. This has the potential to make rollback unaffordable in certain situations. Landbanking may be a rollback option that could help ensure that land is available. Under Scenario 1 for a property with an expected life of 50 years, the benefit-cost ratio is estimated at 2.3, suggesting that this could be a viable option where property owners have the funds to pay for rebuild. In Scarborough, this was available from insurance pay-outs due to the properties being at risk from land instability (this would not be available for properties at risk of coastal erosion as this is not insurable). If property owners have to borrow money to pay for the rebuild, the option is only cost-beneficial where a borrowing rate of 1.3% or lower can be found.
2. **Obtaining consent to develop that land:** In order for rollback to be a feasible and desirable option to property owners in the future it is vital that planning consent is obtained to allow assets to be relocated inland. Rollback options that encourage development opportunities can be cost-beneficial. The benefit-cost ratios where property values are average or higher are estimated at 1.1 under Scenario 2 and 0.9 under Scenario 3 (the latter being lower as there is less time to prepare for rollback by saving up through reduced expenditure on maintenance). In the Pathfinder projects, the benefit-cost ratios for development opportunities vary from 2.4 for East Riding down to 0.3 for Waveney, Corton. These variations again reflect

the time to save from reduced maintenance costs, with Corton assumed to react with people aware of erosion moving away once they become aware of the risk. The benefit-cost ratio for North Norfolk is estimated at 2.5.

- 3. Finding the funds to enable rollback:** The ability for individuals and communities to finance the purchase of land and rebuild an asset inland is a key barrier to the future feasibility of rollback. Property owners or communities are likely to need to fund part (or all) of the schemes themselves and in some cases also manage rebuilds. A lack of capital funds may therefore prevent the uptake of rollback or result in delays when undertaking these schemes. In North Norfolk, the rollback planning (EN12) policy gives property owners at imminent risk of coastal erosion the opportunity to roll back onto land previously not designated for development (which has been used to relocate properties in Happisburgh as part of the Pathfinder). This development opportunity effectively increases the value of an at-risk property and could attract private sector interest leading to substantially reduced costs and risks to the public sector, and therefore the potential for an element of self-funding (note though that private sector interest has not yet been seen). East Riding of Yorkshire Council has found that self-funded rollback can proceed successfully for commercial properties such as caravan parks, as commercial operators may have the resources necessary to finance such moves. Scarborough Borough Council utilised the concept of landbanking to address an imbalance within property insurance. Rollback options involving property purchase, such as at North Norfolk, show very low benefit-cost ratios (-0.6 for Scenario 2 and 0.1 for the North Norfolk Pathfinder). There may be ways of generating income that could improve the benefit-cost ratios, including temporary alternative uses of the land/buildings at risk of coastal erosion that have the potential for generating income. Assistance packages offer better benefit-cost ratios (potentially as high as 1.8 to 2.1 for packages similar to those offered in East Riding, or between 0.8 and 1.1 if like those offered by Waveney). In both cases, however, the benefit-cost ratios reduce to below one where a property owner has to borrow money to rebuild, with this occurring at a rate exceeding 2% in a case similar to East Riding.

Enabling development could also increase the potential for property purchase to become cost-beneficial. With carefully drafted policies and robust legal obligations in place, enabling development could work in appropriate circumstances. These are considered to be, as a minimum: (i) that the rollback land is extensive, more than that required to replace lost buildings (ii) it is suitable in physical terms, such as landscape impact, for development, and (iii) it would attract interest for open market housing. Careful negotiations through Section 106 obligations would be necessary to secure meaningful benefit towards the provision of rollback replacement housing. The involvement of independent third parties, such as a Housing Association, or the Homes and Communities Agency, (or even a locally configured organisation), may help overcome community fears and suspicions

relating to such schemes in much the same way as affordable housing schemes on rural exceptions sites are currently provided.

4. **Is buy/leaseback a desirable option?** The costs involved in purchasing properties and in bringing these up to the decent homes standard, the potential limitations of returns (in the form of rent), legal constraints associated with the length of the lease determined by the Housing Act 1985, and lack of community buy-in suggest, buy/leaseback is not considered to be a desirable option from the individual and Local Authority perspective. However, discussions with Local Authorities suggest time and funding constraints prevented investigation of all potential options during the Pathfinder process. Therefore, it may be worth undertaking further investigations into the possible feasibility of alternative uses of properties (eg holiday lets or other business uses) if such an approach fits with what is considered as a consistent way forward for coastal management nationally.

10.3 Wider/national issues

The Pathfinders identified a range of options that need to be considered at wider or national level. This includes:

1. The need for a wider 'whole coast' approach to policy when considering coastal adaptation and the need for more 'joined up' thinking when considering rollback and buy/leaseback schemes, including increased understanding between the various council departments involved. This includes the need to liaise with all owners of property and infrastructure, such as utilities companies and organisations responsible for transport infrastructure. A further issue encountered related to the issue of Government policy considering 'do nothing' as a no cost option, which in the case of coastal erosion is not the case. Adaptation needs to be considered as a more holistic option and needs to be supported through the Flood Defence Grant in Aid system in those areas identified as no active intervention within Shoreline Management Plans.
2. The mismatch in timescales of the various planning policy frameworks that govern coastal management, particularly Shoreline Management Plans, local development plans and Marine Plans.
3. The uptake and potential success of rollback as a coastal management option is dependent on the stringency of current planning policy. There is a risk that loosening of planning policy criteria (ie reducing the stringency of planning rules and allowing more widespread development) could undermine the attractiveness of a rollback planning policy to developers as planning permission may be easier to obtain over a wider area. Therefore, the interest in and value attributed to a property with an associated rollback opportunity may reduce.

4. There is agreement amongst the Local Authorities contacted as part of this assessment that, should additional grants be available, it would be desirable to continue with the rollback schemes undertaken as part of the Pathfinder Projects in the future. It has been suggested by East Riding of Yorkshire Council that a specific ring-fenced fund would allow for long term planning which is preferable to a capital bid system as future funding could not be assured. Having a strategic overview which Local Authorities could input the number of properties identified as at risk within set timeframes could help provide a national approach. This system would also reduce uncertainty for residents. A specific coastal change fund would not only allow for practical assistance for those at risk of coastal erosion but also the education of, and communication with, coastal communities.

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Annex 1: East Riding of Yorkshire

Annex 2: North Norfolk

Annex 3: Scarborough

Annex 4: Scratby

Annex 5: Waveney

Annex 6: Economic analysis details

Assessment of the baseline (no rollback)

Outcomes and who pays under the baseline (no rollback)

The baseline assumes there is no rollback policy and no action is taken to assist property owners. This provides a better measure of the potential benefit for those Local Authorities that have not yet taken any action to deal with adaptation to coastal erosion. Table A6-1 identifies how the different groups (individual property owners, the wider community, the Local Authority and UK plc) could be affected by the different outcomes. The timing of the impacts will vary according to which scenario is being considered.

Table A6-1: Outcomes and who pays under the baseline

Outcome	Individual property owner	Community	Local Authority	UK plc
<i>Categories related to reaction to coastal erosion</i>				
Loss of property value	Loss of property value	Potential knock-on effects (perception of risk) causing loss of property value	Loss of Council Tax	Loss of property value (risk-free market value)
Savings in reduced maintenance expenditure	Benefit from less expenditure on property (but may affect quality of life, see also social impacts)	None	None	None
Reduced Council Tax Banding	Lower payments	None	Reduced tax base and income	No overall effect (payments from individuals to councils)
Cost of dealing with complaints, etc.	Effort and unproductivity losses in complaining	Effort and unproductivity losses in complaining	Cost of dealing with complaints, questions and lobbying (for rollback, development of policy to minimise complaints)	None

Outcome	Individual property owner	Community	Local Authority	UK plc
Immobile population (possibly wider than just at-risk properties)	May not be able to move for work, making them economically immobile	Negative publicity may affect ability of others to sell houses and move on, rendering them economically immobile as well	Negative impacts on image	Economic cost associated with people not being able to move (for work, etc.) Increased deprivation
Loss of income to businesses as a consequence of eg reductions in home improvements	None	Loss of local jobs	None	Likely to be picked up by businesses elsewhere
Risk of businesses closing	None	Loss of businesses affecting community cohesion, longer trip to businesses	Reduction in Business Rates	Likely to be picked up by businesses elsewhere
Knock-on effects increasing deprivation	None	Loss of properties could lead to reduction in cohesion and potentially increased deprivation	Increased deprivation may incur additional costs to deal with social problems	Economic cost of deprivation
Reduced community size affecting services	None	Loss of services, longer trip to services	Potential impact on broader scale services, buses along route, shops providing rural services to wider area, etc. Potential issues dealing with squatters, etc.	None

Outcome	Individual property owner	Community	Local Authority	UK plc
Setting up of pressure groups	May be more or less likely to interact, eg may get involved with pressure groups or may find themselves increasingly isolated	May encourage cohesion through setting up of local pressure groups, may also cause divisions in community. Productivity loss	Local Authority may have to interact with local pressure groups, explaining issues, generating additional costs	Some pressure groups may also result in costs at national level, eg working with national pressure groups, lobbying MPs, etc.
Engagement with communities	Disaffection with society, victimisation.	Loss of capacity to address localism issues	Cost of organising workshops, drop-in sessions, to work with communities and pressure groups	None
Potential increase in community tension	None	Likely to be linked to any pressure group, its membership, aims and local tensions that may already exist	None	None
Increase in stress	Stress from uncertainty over future, loss of value and likely eventual loss of property likely to cause mental health issues	May be stress across community as a whole due to uncertainty over what will happen and when	Increased care provision due to loss of investment assets	May be increased healthcare costs for NHS (GP, hospital)
Risk of physical health impacts from poor quality housing	Lack of maintenance of property could result in physical health issues	None	None	May be increased healthcare costs for NHS (GP, hospital)

Outcome	Individual property owner	Community	Local Authority	UK plc
Loss of ownership of property	Loss of much of property value with risk of eventual loss of total property value and of their home, likely to leave many needing to move to rental accommodation	None	Longer term care provision	None
Inability to plan for future or make changes	Uncertainty over future affects all the above social categories and may mean people feel unable to plan for the future	Uncertainty at the community level may also be over the future of the community, what it will look like and how it will function	Not relevant at LA level	Economic cost of future uncertainty which may result in many of the costs described above occurring earlier than the actual time of erosion of the properties
Categories related to imminence of erosion				
Demolition costs ⁷	Cost of demolition (if paid by individuals)	None (maybe benefits once properties are demolished if this opens up space, may be damages if affects community cohesion or ability to support services, but these are picked up in other categories)	Cost of demolition (if paid by Local Authority) (where this is also captured under individuals it is considered only once in totals)	Economic cost of demolition

⁷ Evidence suggests that these costs are paid by the Local Authority although individuals can opt to pay.

Outcome	Individual property owner	Community	Local Authority	UK plc
Relocation costs ⁷	Loss of home (see also social impacts)	Loss of residents (if move out of local community)	Cost of rehoming (if captured under homelessness policies) (where this is also captured under individuals it is considered only once in totals)	Economic cost of rehoming
Rebuild costs	Cost of buying land, obtaining permission, building replacement property, other fees, etc.	Risk of objections (if within community) but would reduce impact on cohesion and services; if outside community, loss of cohesion and numbers to support services	Cost of dealing with ad hoc planning applications to rebuild	Economic cost of rebuild
Coast defence infrastructure	None	None	Reduced or no requirement to continue maintenance	None
Utilities infrastructure	Cost where passed on from utility company	Cost where spread over a number of customers (may go wider than just local community); may also be costs of loss of existing assets (although likely to be replaced by utility company)	Cost of dealing with authorisation for works (where needed)	Transfer payment (utility company to customer(s)) so not included

Outcome	Individual property owner	Community	Local Authority	UK plc
Transport infrastructure	Costs likely to be limited to linking property to existing network	Erosion of existing assets could have access issues for the wider community (with knock-on impacts on other categories)	Cost of relocating transport infrastructure (where their responsibility)	Economic cost of relocating transport (may fall onto Highways Agency as well as being cost incurred by Local Authorities)
Land use	No specific opportunity for relocation or rebuild	No specific opportunity to retain properties within community	No specific plan for dealing with impacts of erosion	Lost opportunity cost of land
Historic environment	Responsibility for maintaining heritage sites lies with the land/property owner so may incur additional costs (but no liability to maintain or rollback the asset)	May be impacts if listed buildings, scheduled monuments, archaeological sites, etc. are at risk of erosion	May incur costs of dealing with heritage issues (eg county archaeology)	Loss of heritage sites and associated social benefits
Landscape	No specific impacts for property owners themselves	Change in landscape may be seen as negative (especially where this is associated with properties becoming more derelict)	May be some increase in complaints, but unlikely to be significant impacts from change in landscape	Economic losses from change in quality of landscape may only be significant in designated areas, eg AONB

Baseline impacts for individual property owners

Impacts for property owners can be estimated on a per property basis based on the scenarios introduced in Section 2.4. The overall impacts across all at-risk properties in an area are the total number of properties multiplied by the costs per property since these are already presented as discounted (ie Present Value) costs, but only where those properties are predicted to be lost to erosion in 50 years. One of the key elements is the time until

the properties are predicted to erode. Table A6-2 provides the estimated discounted costs per property for those outcomes that could be monetised, by scenario and for areas with lower than average, average and higher than average property prices. The totals shown for the 'typical' costs assume a 50 year period before properties are predicted to erode, although reaction to erosion does occur earlier in scenarios 2 and 3. Table A6-3 shows the estimated total discounted damages for each Pathfinder, taking account of the time to erosion, the relevant scenario(s) and the property values most appropriate to that Pathfinder.

Table A6-2: Discounted costs under the baseline for a typical property at risk in 50 years (only includes outcomes that could be monetised)

Outcome	Scenario 1	Scenario 2	Scenario 3 ⁸	Key assumptions
Loss of property value	£31,000 to £41,000 Average: £36,000	£31,000 to £40,000 Average: £36,000	£42,000 to £55,000 Average: £49,000	Risk-free property values range from £135k to £175k based on information from the Housing Price Index for the Pathfinder areas, September 2014 Reduction in value due to blight is 15% Write-off at risk-free value in year 50 (remaining value where 15% has been taken earlier)

⁸ The approach for Scenario 3 has been simplified for the analysis to assume that when the reaction to erosion risk is high all property owners able move whereas in reality this is likely to occur over a number of years.

Outcome	Scenario 1	Scenario 2	Scenario 3 ⁸	Key assumptions
Savings in reduced maintenance expenditure	-£1,500 to -£1,900 Average: -£1,700	-£9,500 to -£12,000 Average: -£11,000	-£1,500 to -£1,900 Average: -£1,700	Assumed annual maintenance of 1% of property value Scenario 3 property maintained in order to sell so only occur within last 5 years of property life (same as Scenario 1)
Increase in stress	£2,200	£4,000	£9,200	Based on economic impact of stress of £9,500 per individual ⁹ (HSE, 2014), assumed per household which may underestimate
Risk of physical health impacts from poor quality housing	Not monetised	Not monetised	Not monetised	No approach identified to enable impacts to be monetised
Demolition costs	£990 to £2,000 Average: £1,600	£990 to £2,000 Average: £1,600	£990 to £2,000 Average: £1,600	Assumed £5k to £10k (average £8k) in year 50
Relocation costs	£200 to £600 Average: £380	£200 to £600 Average: £380	£200 to £600 Average: £380	Assumed £1k to £3 k (average £1.9k) in year 50

⁹ Relates to appraisal costs for work-related illnesses for individuals. Estimated for new cases only, hence only included at the time of onset of stress. The value combines non-financial human cost and financial costs to give a total of £9,100 per case (in 2012 prices). This increases to £9,500 (rounded) when the Consumer Price Index is used to uprate the costs, based on CPI of 127.9 in 2014 and 123 in 2012, ie an increase of 4%.

Outcome	Scenario 1	Scenario 2	Scenario 3 ⁸	Key assumptions
Rebuild costs	No costs	No costs	No costs	Assumed typical owner or at-risk property could not afford to rebuild
Utilities infrastructure	Not monetised	Not monetised	Not monetised	No approach identified to enable impacts to be monetised
Transport infrastructure	Not monetised	Not monetised	Not monetised	No approach identified to enable impacts to be monetised
Land use	Not monetised	Not monetised	Not monetised	No approach identified to enable impacts to be monetised
Total discounted costs per property	£33,000 to £44,000 Average: £39,000	£27,000 to £35,000 Average: £31,000	£51,000 to £65,000 Average: £58,000	Scenario 2 has much larger savings from reduced maintenance

Table A6-3: Discounted costs under the baseline (only includes outcomes that could be monetised)

Pathfinder	Costs due to reaction to erosion	Costs due to imminence of erosion	Total costs	Key assumptions
East Riding	£3,600,000	£160,000 to £340,000 Average: £260,000	£3,800,000	Blight to 29 properties in year 1 (15% of value lost), 11 eroded in year 5, 7 in year 10 and 11 in year 25; blight to further 38 in year 26, eroded in year 50. Maintenance savings between onset of blight and loss. Onset of stress linked to onset of blight

Pathfinder	Costs due to reaction to erosion	Costs due to imminence of erosion	Total costs	Key assumptions
North Norfolk	£1,200,000	£51,000 to £110,000 Average: £84,000	£1,300,000	Blight to 12 properties in year 1 (15% of value lost), all eroded in year 10. Maintenance savings between onset of blight and loss. Onset of stress linked to onset of blight
Scarborough	£6,200,000	£200,000 to £430,000 Average: £330,000	£6,500,000	15 properties at probable risk (assumed year 1) 26 properties at possible risk (assumed year 10) 7 properties at unlikely risk (assumed p=0.5 in year 50). Onset of stress linked to onset of blight
Scratby	£8,500,000	£420,000 to £900,000 Average: £690,000	£9,200,000	Blight to 59 properties in year 1 (15% of value lost), 17 eroded in year 5, 32 in year 10; blight to further 91 in year 16, eroded in year 40. Maintenance savings between onset of blight and loss. Onset of stress linked to onset of blight
Waveney: Easton Barents	£780,000	£31,000 to £67,000 Average: £51,000	£830,000	Blight to 5 properties in year 1, 3 in year 5, 3 in year 8, 1 in year 11, and 1 in year 25 (15% of value lost), 1 eroded in year 5, 3 in year 8, 3 in year 11, 1 in year 30 and 1 in year 50; blight to further 91 in year 16, eroded in year 40. Maintenance savings between onset of blight and loss. Onset of stress linked to onset of blight

Pathfinder	Costs due to reaction to erosion	Costs due to imminence of erosion	Total costs	Key assumptions
Waveney: Corton	£1,100,000	£53,000 to £120,000 Average: £88,000	£1,200,000	Onset of blight in year 1 due to increased reaction to erosion, but no reduction in maintenance at that time as owners look to sell (blight then disappears in year 2 as people sell as risk is forgotten); write-off of remaining risk-free value in year 50. Reduction in maintenance from within 5 years before erosion

Baseline impacts for the community

Community impacts that can be monetised are shown in Table A6-4. These values are for an indicative property only for use in the three Scenarios identified in Section 2.4.

Table A6-4: Discounted costs under the baseline for a community at risk based on per property costs (only includes outcomes that could be monetised)

Outcome	Scenario 1	Scenario 2	Scenario 3	Key assumptions
Loss of property value	£4,800 to £6,200 Average: £5,500	£8,600 to £11,000 Average: £9,800	£20,000 to £25,000 Average: £22,000	Assumed to relate to 15% reduction in value for those properties perceived to be at-risk, value is per property. Other assumptions same as for at-risk property
Immobile population (possibly wider than just at-risk properties)	Not monetised	Not monetised	Not monetised	No approach identified to enable impacts to be monetised
Loss of income to businesses	Not monetised	Not monetised	Not monetised	No approach identified to enable impacts to be monetised

Outcome	Scenario 1	Scenario 2	Scenario 3	Key assumptions
Increase in stress	£2,200	£4,000	£9,200	£9,500 per individual based on HSE (2014) linked to properties that are affected by blight (assumed per household, which may under-estimate)
Land use	Not monetised	Not monetised	Not monetised	No approach identified to enable impacts to be monetised
Historic environment	Not monetised	Not monetised	Not monetised	No approach identified to enable impacts to be monetised
Landscape	Not monetised	Not monetised	Not monetised	No approach identified to enable impacts to be monetised
Total discounted costs per property for the community	£6,900 to £8,400 Average: £7,600	£13,000 to £15,000 Average: £14,000	£29,000 to £35,000 Average: £32,000	Most social costs not monetised

Impacts on the community are likely to vary according to the proportion of the community that is affected, the extent of community cohesion and interaction, and level of empathy between those living in at-risk properties and those living outside the at-risk areas. As a result, the economic analysis needs to consider the likelihood that the community effects would be felt. The Pathfinders provide the basis for assessing the extent to which community impacts could be expected to occur. This can then be linked back to the scenarios and inferred for different types of coastal communities. Table A6-5 sets out the community assessment for the five Pathfinders and the implications drawn from these for the economic analysis of community impacts.

Table A6-5: Community effects under the Pathfinders

Pathfinder	Number of properties at-risk within 50 years	Number of properties within parish/ward	Community impacts identified during the evaluation	Inferences for the economic analysis
East Riding	67 (0.2% of the coastal wards and parishes)	30,081 households in the coastal wards of East Riding 31,099 households in the coastal parishes of East Riding	Some hostility in the wider community viewing it as unfair that residents affected by coastal change are being helped ahead of other priorities for the communities	Stress/ uncertainty Impacts in terms of community tensions
North Norfolk	12 (1.1% of households in the ward of Happisburgh, 3.1% of households in the parish of Happisburgh)	1,084 households in Happisburgh Ward 382 households in Happisburgh Parish	Lack of understanding of erosion and adaptation Community suspicions over where properties might be relocated General belief during the initial stages that funds should be used for coastal protection rather than adaptation. Blight due to lack of maintenance	Formation of pressure groups Stress/ uncertainty Impacts in terms of community tensions
Scarborough	56 (2.9% of households in the ward, 8.7% of households in the parish)	1,944 households in the ward of Cayton 644 households in the parish of Osgodby	Difficulties with the insurance industry (ie the need to provide proof that properties were being impacted by land instability and not coastal erosion) and the fact that some properties could not renew their insurance policies spread to the wider community, with people within a 300m zone of the land instability affected, potentially resulting in blight	Stress/ uncertainty Impacts in terms of community tensions

Pathfinder	Number of properties at-risk within 50 years	Number of properties within parish/ward	Community impacts identified during the evaluation	Inferences for the economic analysis
Scratby	123 (24% of households within the village, 6.7% within the ward, 7.2% within the parish)	520 properties within Scratby and California 1,716 households within Parish of Ormesby St Margaret with Scratby 1,842 households in the ward of Ormesby	Lack of understanding of erosion and adaptation Community preference for coastal protection (rock berm) over adaptation Community concerns over changes to the attractiveness and viability of the village. Blight due to risk of erosion making properties harder to sell	Formation of pressure groups Stress/ uncertainty Potential for community tension
Waveney: Easton Barents	9 (0.5% of households in the ward, 0.8% of households in the parish)	1,847 households in the ward of Southwold and Reydon 1,186 households in the parish of Reydon	Divisions in wider community, some seem to support the relocation, but do not want residents to profit from relocation, some (second homeowners) were opposed to the site identified for relocation (Rissemere Lane East). This created some tension between the community and the Easton Barents residents	Formation of pressure groups Stress/ uncertainty Impacts in terms of community tensions
Waveney: Corton	45 (2.3% of households in the ward, 8.7% of households in the parish)	1,998 households in the ward of Gunton and Corton 517 households in the parish of Corton	Lack of understanding of erosion and adaptation Lack of community capital. Blight when risk becomes known, people aware of the risk may move out	Stress/ uncertainty

Table A6-5 provides an indication of the types of community effects seen in each Pathfinder. When multiplying up across communities, it is important to consider whether

there are particular thresholds over which impacts are seen and under which the same impacts tend not to be seen. Although the Pathfinders do not clearly demonstrate these thresholds, there does seem to be differences between the response of the community and the proportion of properties that are at-risk:

1. At very low proportions at parish level (eg East Riding and Waveney: Easton Bavents), the communities seem to focus on other priorities as much as erosion risk and there seems to be greater tension in terms of relocation sites. This does not hold completely though as there were tensions seen in North Norfolk over where properties and the caravan park might be relocated
2. Where the proportion of properties at-risk is higher there seems to be greater focus on the potential knock-on effects on those properties not at-risk and concern over blight. Again, this seems to be location specific

Using this information would suggest the following assumptions can be made for the wider community effects (over and above impacts on individual properties). These assumptions are generalisations used to enable the community impacts to be assessed across the scenarios, they are not predictions as to how a community may react. The Pathfinders show that communities react in very different ways, and that these reactions can change over time; they can often depend on the individuals involved and, as such, each community will respond differently:

- **Response 1:** Where the proportion of properties at risk from erosion is less than 1% of total households in the parish, there is more likely to be tension in terms of potential relocation sites under rollback. This is more likely to result in stress for communities in areas identified as possible relocation sites than stress from concern over blight affecting property prices. Pressure groups are more likely to be associated with stopping development of relocation sites than assisting those living in at-risk properties, although small pressure groups may also arise formed of those living in at-risk properties. Under the baseline, therefore, engagement costs should be low where rollback could not occur.
- **Response 2:** Where the proportion of properties at risk from erosion is more than 5% of total households in the parish, there is more likely to be concern over blight on property values across the parish as a whole (as has been observed at Happisburgh). To avoid over-estimation, it is assumed that properties nearer to the coastal frontage are more likely to be blighted and 10% of properties is taken as the proportion seeing reductions in property values (rather than the remaining 95%). Community tensions may still occur but generally any pressure groups will be focused on supporting those at erosion risk.
- **Response 3:** Where the proportion of properties at risk is 1% to 5%, there may still be community tensions over relocation under rollback and there may be some blight under the baseline. There may also be pressure groups but these are likely to represent smaller groups within the community rather than the community as a whole.

Table A6-6 brings together the costs of the responses with the costs of the scenarios to provide indicative costs for different communities.

Table A6-6: Discounted costs under the baseline for the community in an area at risk based on per property costs (only includes outcomes that could be monetised)

Combining scenarios and responses	Scenario 1	Scenario 2	Scenario 3
Response 1 (<1%)	No knock-on community blight Low engagement costs Costs: negligible	No knock-on community blight Medium engagement costs Costs: captured under Local Authority costs	No knock-on community blight High engagement costs Costs: captured under Local Authority costs
Response 2 (>5%)	Blight once risk is known Low engagement costs Costs: £8,800 to £12,000 Average: £10,000	Blight seen in wider community Medium engagement costs Costs: £15,000 to £20,000 Average: £17,000	Blight widespread initially but decays as people aware of risk move away High engagement costs Costs: £40,000 to £53,000 Average: £45,000
Response 3 (1% to 5%)	Blight once risk is known Low engagement costs Costs: £8,800 to £12,000 Average: £10,000	Blight seen in wider community Medium engagement costs Costs: £15,000 to £20,000 Average: £17,000	Blight seen in wider community but decays as people aware of risk move away High engagement costs Costs: £40,000 to £53,000 Average: £45,000

Table A6-7 uses the responses identified above to estimate the community impacts for each of the Pathfinders.

Table A6-7: Discounted costs under the baseline on community for each Pathfinder (only includes outcomes that could be monetised)

Pathfinder	Costs due to reaction to erosion	Costs due to imminence of erosion	Total costs	Key assumptions
East Riding (scenario 2; response 1)	Limited blight; community tensions	Not monetised	Social costs not monetised	Social costs not monetised
North Norfolk (scenario 2; response 3)	Costs of £600,000 (no savings from reduced maintenance as owners know they are not at risk), plus stress for those blighted of £250,000	Not monetised	£850,000	Blight of 10% of parish is 38 properties – 12 at-risk = 26 additionally blighted; blight of 15%
Scarborough (scenario 1, response 2)	Costs of £130,000 (no savings from reduced maintenance as owners know they are not at risk), plus stress for those blighted of £48,000	Not monetised	£180,000	Blight of 10% of parish is 64 properties – 56 at-risk = 8 additionally blighted; blight of 15%
Scratby (scenario 2, response 2)	Costs of £900,000 (no savings from reduced maintenance as owners know they are not at risk), plus stress for those blighted of £420,000	Not monetised	£1,300,000	Blight of 10% of parish is 172 properties – 123 at-risk = 49 additionally blighted; blight of 15%
Waveney: Easton Bavents (scenario 2, response 1)	No blight; community tensions	Not monetised	Social costs not monetised	No additional properties to blight; stress for communities in suggested relocation sites

Pathfinder	Costs due to reaction to erosion	Costs due to imminence of erosion	Total costs	Key assumptions
Waveney: Corton (scenario 3, response 2)	Costs of £160,000 (no savings from reduced maintenance as owners know they are not at risk), plus stress for those blighted of £15,000	Not monetised	£170,000	Blight of 10% of parish is 52 properties – 45 at-risk = 7 additionally blighted; blight of 15%

Baseline impacts for the Local Authority

Local Authority impacts that can be monetised are shown in Table A6-8. The costs shown in Table A6-8 relate to an individual property at risk in 50 years.

Table A6-8: Discounted costs under the baseline for the Local Authority in an area at risk based on per property costs (only includes outcomes that could be monetised)

Outcome	Scenario 1	Scenario 2	Scenario 3	Key assumptions
Loss of property value	£460 (annual loss that recurs to give Present Value losses over 50 years)	£1,500 (annual loss that recurs to give Present Value losses over 50 years)	£4,100 (annual loss that recurs to give Present Value losses over 50 years; assumes once band has been reduced in year 1 it stays reduced until property is eroded in year 50)	Loss of proportion (1/9 to assume change of 1 band) of Council Tax assumed at time of onset of blight and all of Council Tax at time of erosion, based on average Council tax per Band D property of £1,468 (DCLG, 2014)

Outcome	Scenario 1	Scenario 2	Scenario 3	Key assumptions
Cost of dealing with complaints, etc.	£70 to £180 Average: £120	£130 to £340 Average: £220	£360 to £960 Average: £630 (assumes complaints at initial onset of blight in year 1; then new complaints in year 45 as new residents react to risk)	Assumed one complaint and one follow-up question per property at onset of blight, assume requires 10 to 20 hours Officer time at £30 to £40 per hour (low to high estimate)
Risk of businesses closing	Not monetised	Not monetised	Not monetised	Loss of proportion of Business Rates assumed at time of onset of blight and rest of Business Rates at time of erosion
Knock-on effects increasing deprivation	Not monetised	Not monetised	Not monetised	Social effects of increased deprivation
Engagement with communities	£1,400 to £2,700 Average: £1,800 (occurs at onset of blight for one year only)	£1,400 to £2,700 Average: £1,800 (occurs at onset of blight for one year only)	£7,200 to £14,000 Average: £9,600 (occurs at onset of blight in year 1 and then again in year 45)	Assumed holding of drop-in session with community and two further meetings at onset of blight at cost of £6,000 to £12,000 at the onset of blight, per community not per property
Demolition costs	£990 to £2,000 Average: £1,600	£990 to £2,000 Average: £1,600	£990 to £2,000 Average: £1,600	Assumed £5k to £10k (average £8k) in year 50 (where Local Authority pays rather than property owner)

Outcome	Scenario 1	Scenario 2	Scenario 3	Key assumptions
Relocation costs	£200 to £590 Average: £380	£200 to £590 Average: £380	£200 to £590 Average: £380	Assumed £1k to £3k (average £1.9k) in year 50 (where Local Authority pays rather than property owner)
Utilities infrastructure	Not monetised	Not monetised	Not monetised	Costs of relocating utilities infrastructure
Transport infrastructure	Not monetised	Not monetised	Not monetised	Costs of relocating transport infrastructure
Historic environment	Not monetised	Not monetised	Not monetised	Costs of relocating assets or loss of heritage value
Total discounted costs per property	£3,100 to £6,000 Average: £4,400	£4,200 to £7,200 Average: £5,500	£13,000 to £22,000 Average: £16,000	

Table A6-9: Discounted costs under the baseline on Local Authority (only includes outcomes that could be monetised)

Pathfinder	Costs due to reaction to erosion	Costs due to imminence of erosion	Total costs	Key assumptions
East Riding	£110,000	£260,000 (where paid for by Local Authority)	£380,000 (includes demolition and rehousing costs that may be paid for by property owners)	Engagement with community occurs each time a new tranche of properties are blighted

Pathfinder	Costs due to reaction to erosion	Costs due to imminence of erosion	Total costs	Key assumptions
North Norfolk	£49,000	£84,000 (where paid for by Local Authority)	£130,000 (includes demolition and rehousing costs that may be paid for by property owners)	Engagement with community occurs each time a new tranche of properties are blighted, high value property there assumes average cost of engagement
Scarborough	£140,000	£330,000 (where paid for by Local Authority)	£460,000 (includes demolition and rehousing costs that may be paid for by property owners)	Engagement with community occurs each time a new tranche of properties are blighted, high value property there assumes high cost of engagement
Scratby	£480,000	£690,000 (where paid for by Local Authority)	£1,200,000 (includes demolition and rehousing costs that may be paid for by property owners)	Engagement with community occurs each time a new tranche of properties are blighted, high value property there assumes low cost of engagement
Waveney: Easton Bavents	£73,000	£51,000 (where paid for by Local Authority)	£120,000 (includes demolition and rehousing costs that may be paid for by property owners)	Engagement with community occurs each time a new tranche of properties are blighted, high value property there assumes average cost of engagement

Pathfinder	Costs due to reaction to erosion	Costs due to imminence of erosion	Total costs	Key assumptions
Waveney: Corton	£270,000	£88,000 (where paid for by Local Authority)	£360,000 (includes demolition and rehousing costs that may be paid for by property owners)	Engagement with community occurs each time a new tranche of properties are blighted, high value property there assumes average cost of engagement

Baseline impacts for UK plc

Costs to UK plc comprise the same costs as for owners of at-risk properties, communities and Local Authorities except where:

- costs represent transfers from one group to another, as with savings in Council Tax
- costs need to be adjusted for taxes (especially VAT), as with demolition costs
- costs reflect specific estimates to UK plc, as with impacts from stress

Table A6-10 presents the changes made to ensure that the cost estimates are relevant at the UK plc level, and the revised cost estimates. The costs shown in Table A6-10 are relevant to per property, with the exception of engagement between Local Authorities and communities; these costs are per community.

It is important to note that analysis of these impacts does not represent an assessment of net impacts to the UK economy.

Table A6-10: Discounted costs under the baseline for a typical property at risk in 50 years for UK plc (only includes outcomes that could be monetised)

Outcome	Scenario 1	Scenario 2	Scenario 3	Applicability to UK plc
<i>Impacts on owners of at-risk properties</i>				
Loss of property value	£27,000 to £36,000 Average: £31,000	£31,000 to £40,000 Average: £36,000	£42,000 to £55,000 Average: £48,000	Cost relevant to UK plc

Outcome	Scenario 1	Scenario 2	Scenario 3	Applicability to UK plc
Savings in reduced maintenance expenditure	-£1,200 to -£1,500 Average: -£1,300	-£7,600 to -£9,800 Average: -£8,700	-£1,200 to -£1,500 Average: -£1,300	Potentially financial cost, adjustment to economic cost by removing VAT (reducing savings by 20%)
Increase in stress	£1,000	£1,900	£4,300	Based on economic impact of stress of £4,400 per individual ¹⁰ (HSE, 2014), assumed per household which may underestimate
Risk of physical health impacts from poor quality housing	Not monetised	Not monetised	Not monetised	Cost relevant to UK plc
Demolition costs	£790 to £1,600 Average: £1,300	£790 to £1,600 Average: £1,300	£790 to £1,600 Average: £1,300	Adjust to economic costs from financial by subtracting VAT
Relocation costs	£200 to £590 Average: £380	£200 to £590 Average: £380	£200 to £590 Average: £380	No VAT associated with rental payments, etc. to assumed relevant at UK plc level

¹⁰ Relates to appraisal costs for work-related illnesses for individuals. Estimated for new cases only, hence only included at the time of onset of stress. The value combines non-financial human cost and financial costs to give a total of £4,200 per case costs to the Government (in 2012 prices). This increases to £4,400 (rounded) when the Consumer Price Index is used to uprate the costs, based on CPI of 127.9 in 2014 and 123 in 2012, ie an increase of 4%.

Outcome	Scenario 1	Scenario 2	Scenario 3	Applicability to UK plc
Rebuild costs	No costs	No costs	No costs	Assumed typical owner or at-risk property could not afford to rebuild
Utilities infrastructure	Not monetised	Not monetised	Not monetised	Costs relevant at UK plc level
Transport infrastructure	Not monetised	Not monetised	Not monetised	Costs relevant at UK plc level
Land use	Not monetised	Not monetised	Not monetised	Costs relevant at UK plc level
Impacts on communities				
Loss of property value	£5,800 to £7,200 Average: £6,500	£10,000 to £13,000 Average: £12,000	£24,000 to £30,000 Average: £27,000	Costs relevant at UK plc level
Immobile population (possibly wider than just at-risk properties)	Not monetised	Not monetised	Not monetised	Costs relevant at UK plc level where affects overall productivity
Loss of income to businesses	Not monetised	Not monetised	Not monetised	Relevant at local level only (transfer payment)

Outcome	Scenario 1	Scenario 2	Scenario 3	Applicability to UK plc
Increase in stress	£1,000	£1,900	£4,300	Based on economic impact of stress of £4,400 per individual ¹¹ (HSE, 2014), assumed per household which may underestimate
Land use	Not monetised	Not monetised	Not monetised	Costs relevant at UK plc level
Historic environment	Not monetised	Not monetised	Not monetised	Costs relevant at UK plc level
Landscape	Not monetised	Not monetised	Not monetised	Costs relevant at UK plc level
Impacts on Local Authorities				
Loss of property value	Transfer payment from owners of at-risk property to Local Authority; not relevant at UK plc level			
Cost of dealing with complaints, etc.	£70 to £180 Average: £120	£130 to £340 Average: £220	£360 to £960 Average: £630 (assumes complaints at initial onset of blight in year 1; then new complaints in year 45 as new residents react to risk)	Relevant at UK plc level as estimated

¹¹ Relates to appraisal costs for work-related illnesses for individuals. Estimated for new cases only, hence only included at the time of onset of stress. The value combines non-financial human cost and financial costs to give a total of £4,200 per case costs to the Government (in 2012 prices). This increases to £4,400 (rounded) when the Consumer Price Index is used to uprate the costs, based on CPI of 127.9 in 2014 and 123 in 2012, ie an increase of 4%.

Outcome	Scenario 1	Scenario 2	Scenario 3	Applicability to UK plc
Risk of businesses closing	Not monetised	Not monetised	Not monetised	Loss of proportion of Business Rates assumed at time of onset of blight and rest of Business Rates at time of erosion
Knock-on effects increasing deprivation	Not monetised	Not monetised	Not monetised	Costs relevant at UK plc level
Engagement with communities	£1,200 to £2,500 Average: £1,600 (occurs at onset of blight for one year only)	£1,200 to £2,500 Average: £1,600 (occurs at onset of blight for one year only)	£6,500 to £13,000 Average: £8,600 (occurs at onset of blight in year 1 and then again in year 45)	Costs of hire of venues, etc. needs to be adjusted for VAT; assumed 50% of costs has VAT; 50% is VAT free
Demolition costs	Captured under owners of at-risk property (but may be paid by Local Authorities)			
Relocation costs	Captured under owners of at-risk property (but may be paid by Local Authorities)			
Utilities infrastructure	Not monetised	Not monetised	Not monetised	Costs relevant at UK plc level
Transport infrastructure	Not monetised	Not monetised	Not monetised	Costs relevant at UK plc level
Historic environment	Not monetised	Not monetised	Not monetised	Costs relevant at UK plc level
Total across all groups	£35,000 to £47,000 Average: £41,000	£38,000 to £50,000 Average: £44,000	£77,000 to £100,000 Average: £89,000	

Assumptions used in the economic analysis

Some general assumptions carried throughout the rollback options include:

- Where a policy is in place to roll a property back it is assumed that for the five years prior to the scheme being implemented the property owner will not be undertaking property maintenance (1% of total property value) as they will be saving to cover rollback costs
- Where a property is demolished and rebuilt it is assumed that the property value is lost and then regained in the following year, therefore incurring some costs through discounting. The property value is considered to be the same, although there is the potential for a decrease through, for example, loss of sea view or an increase, through construction of a new property with modern fixtures and fittings where the 'at-risk' property was potentially old or of a less sound construction
- Where properties are demolished and rebuilt it is assumed that engagement costs and complaint costs (representing community tensions) will be incurred twice, once for the removal of the properties (ie with property owners and their communities), and again when determining a relocation site and rebuilding (ie with community at the rollback site)
- Blight is considered to be formed of two parts – reduction in property value through reaction to erosion risk and reduction in visual amenity through reduced maintenance. Where one of these aspects is not present we have assumed the impact of blight is halved (8% loss of value compared to 15%)
- Any properties which are demolished and rebuilt incur demolition costs (£8,000), land purchase costs (a third of the property price) and rebuild costs (a third of the property price), all adjusted for VAT
- Where property owners cannot afford to rebuild under the baseline, the provision of assistance from the rollback package is considered to provide a sufficient incentive to make it affordable (the cost of borrowing has been considered where the cost of rebuilding is to be covered by the individual)

Sensitivity Analysis

Changing the timescale for the scenario analysis from 50 to 20 years

Economic assessment of baseline over 20 year time horizon

Table A6-11 presents the results under the baseline when the time to erosion of properties is reduced from 50 years (as under the main assessment) to 20 years. Only the costs for the UK plc assessment are given as these form the basis for the estimation of benefit-cost ratios. The costs under the 50 year time horizon are included for comparison. Under

Scenario 1, the property would erode in year 20, with maintenance ceasing five years before erosion. Under Scenario 2, blight incurs in year 1 as reaction to erosion risk increases. After this only essential maintenance is undertaken on the property until it erodes in year 20. Under Scenario 3, blight occurs in year 1 (as in the main assessment). The property is then assumed to be sold to a purchaser who is unaware (or unconcerned) of the risk of erosion, such that maintenance continues until years 15 when the risk of erosion again becomes known.

Table A6-11: Total discounted costs under a 20 year baseline based on per property costs (only includes outcomes that could be monetised)

Who pays	Scenario 1	Scenario 2	Scenario 3	Key assumptions
UK plc (20 year time horizon)	£84,000 to £110,000 Average: £98,000	£92,000 to £120,000 Average: £110,000	£110,000 to £150,000 Average: £130,000	Adjusts for VAT, removes transfer payments, takes only Government costs (stress)
UK plc (50 year time horizon)	£35,000 to £47,000 Average: £41,000	£38,000 to £50,000 Average: £44,000	£77,000 to £100,000 Average: £89,000	Adjusts for VAT, removes transfer payments, takes only Government costs (stress)

Economic assessment of assistance package over 20 year time horizon

Table A6-12 presents the results for the assistance package option, per property. Here, it is assumed that under Scenario 1, the property would be eroded in year 20 with maintenance stopped for 5 years beforehand. Under Scenario 2, blight is assumed to occur in year 1 (around 20 years before the property is eroded). Again, maintenance ceases 5 years before the property is lost. Maintenance continues between years 1 and 15 due the benefits offered by the assistance package. As a result, blight is reduced by half under the rollback option. Under Scenario 3, the properties are still sold and rolled back in year 1, as in the main assessment.

Table A6-12: Economic case for UK plc by scenario per property (based on Pathfinder application of options by Scenario), 20 year time horizon, assistance package (sensitivity analysis)

Scenario	Total damages avoided (benefits compared with baseline) (A)	Costs of rollback option (over and above those incurred under baseline) (B)	Benefit- Cost ratio of rollback option (BCR) (A ÷ B)	
			20 year time horizon	50 year time horizon
Scenario 2, lower than average property prices (combinations based on assistance package options selected above)				
Scenario 2, combination 1	£7,200	£3,700	2.0	0.6
Scenario 2, combination 2	£21,000	£6,300	3.3	2.1
Scenario 2, combination 3	£22,000	£8,400	2.6	1.8
Scenario 2, average property prices				
Scenario 2	£97,000	£100,000	0.9	0.8
Scenario 3, average property prices				
Scenario 3	£110,000	£63,000	1.7	1.1

Table A6-12 shows that the benefit-cost ratios increase compared with the main assessment. This is mainly because impacts on blight are reduced much earlier than under the main assessment such that the discounted benefits are larger.

Economic assessment of property valuation and purchase over 20 year time horizon

Table A6-13 presents the results for the rollback option of property valuation and purchase. Under the sensitivity analysis, it is assumed that the property is at risk of erosion in 20 years, with the property owner taking advantage of the rollback option just before it is lost. The result of the sensitivity is that the benefits of the rollback option are brought forward compared with the main assessment and increase significantly while the costs (which are linked to the life left in the asset) only increase marginally (from £43,000), such that the benefit-cost ratio is also increased. However, this is still less than one.

Table A6-13: Economic case for UK plc by scenario per property (based on Pathfinder application of options by scenario), 20 year time horizon, property purchase and valuation (sensitivity analysis)

Scenario	Total damages avoided (benefits compared with baseline) (A)	Costs of rollback option (over and above those incurred under baseline) (B)	Benefit- Cost ratio of rollback option (BCR) (A ÷ B)	
			20 year time horizon	50 year time horizon
Scenario 2	£22,000	£46,000	0.5	-0.6

Economic assessment of development opportunities over 20 year time horizon

Assuming a 20 year time horizon for the development opportunities results in both costs and benefits being incurred earlier than under the 50 year time horizon. The change is much less under Scenario 3 since the costs are still incurred in year 1. The benefits (mainly savings in maintenance costs) occur much earlier hence are much greater than under the 50 year scenario. The result is that the benefit-cost ratios increase. However, the economic case for development opportunities declines if funds needed to build on the site have to be borrowed. The benefit-cost ratios decline below one on Scenario 2 (low property values) at a borrowing rate of 1.1% or above, at a rate of 2.8% on Scenario 2 (average property value) and at a rate of 1.3% or above for Scenario 3 (average property values).

Table A6-14: Economic case for UK plc by scenario per property (based on Pathfinder application of options by scenario), 20 year time horizon, development opportunities (sensitivity analysis)

Scenario	Total damages avoided (benefits compared with baseline) (A)	Costs of rollback option (over and above those incurred under baseline) (B)	Benefit- Cost ratio of rollback option (BCR) (A ÷ B)	
			20 year time horizon	50 year time horizon
Low property values				
Scenario 2	£87,000	£62,000	1.4	0.5
Average property values				
Scenario 2	£100,000	£41,000	2.5	1.1
Scenario 3	£110,000	£82,000	1.4	0.9

Economic assessment of landbanking over 20 year time horizon

Application of a 20 year time horizon to the landbanking option results in a reduction in the benefit-cost ratio, as shown in Table A6-15, due to the costs being brought forward from year 50 to year 20. Savings are also brought forward, but these have a much smaller effect on the change in damages avoided. The benefit-cost ratio declines to less than one if funds to build on the land have to be borrowed and if the borrowing rate is greater than 4.8%.

Table A6-15: Economic case for UK plc by scenario per property (based on Pathfinder application of options by scenario), 20 year horizon, landbanking (sensitivity analysis)

Scenario	Total damages avoided (benefits compared with baseline) (A)	Costs of rollback option (over and above those incurred under baseline) (B)	Benefit- Cost ratio of rollback option (BCR) (A ÷ B)	
			20 year time horizon	50 year time horizon
Scenario 1	£150,000	£47,000	3.2	2.3

Changing the impacts of blight from 15% of property value to 10%

Economic assessment of baseline with impacts of blight at 10% of property value

Table A6-16 shows the results of the economic analysis for the baseline when the impacts of blight are a loss of property value of 10% rather than 15% (as in the main analysis). Only the costs for the UK plc assessment are given as these form the basis for the estimation of benefit-cost ratios. The costs when blight is 15% are included for comparison. Under Scenario 1 there is no impact of blight as reaction to erosion risk is low almost up to the point where erosion is predicted to occur within the next five years therefore the change in levels of blight predicted does not affect the costs. Under Scenario 2, blight occurs in year 25 and reducing the impact of blight from 15% to 10% reduces the overall costs by 5%. Under Scenario 3, blight occurs in year 1. Reducing the impact of blight from 15% to 10% in this Scenario reduces the overall costs by between 8% and 11% (high property prices compared to low property prices respectively) with reduction in costs for average priced properties of 10%.

Table A6-16: Total discounted costs under the baseline with a reduction in the impact of blight from 15% to 10% based on per property costs (only includes outcomes that could be monetised)

Who pays	Scenario 1	Scenario 2	Scenario 3	Key assumptions
UK plc (blight 10% loss of property value)	£33,000 to £45,000 Average: £39,000	£34,000 to £45,000 Average: £39,000	£65,000 to £88,000 Average: £76,000	Adjusts for VAT, removes transfer payments, takes only Government costs (stress)
UK plc (blight 15% loss of property value)	£35,000 to £47,000 Average: £41,000	£38,000 to £50,000 Average: £44,000	£77,000 to £100,000 Average: £89,000	Adjusts for VAT, removes transfer payments, takes only Government costs (stress)

Economic assessment of assistance package with impacts of blight at 10% of property value

Table A6-17 presents the results by rollback option, per property. Under Scenario 2, blight is assumed to occur in year 25. Maintenance ceases five years before the property is lost however maintenance continues between years 25 and 45 due to the benefits offered by the assistance package. As a result, blight is reduced by half under the rollback option (5%). This leads to an increase in the proportion of the property value lost to erosion.

Table A6-17: Economic case for UK plc by scenario per property (based on Pathfinder application of options by Scenario), impact of blight at 10%, assistance package (sensitivity analysis)

Scenario	Total damages avoided (benefits compared with baseline) (A)	Costs of rollback option (over and above those incurred under baseline) (B)	Benefit- Cost ratio of rollback option (BCR) (A ÷ B)	
			Blight at 10%	Blight at 15%
Scenario 2, lower than average property prices (combinations based on assistance package options selected above)				
Scenario 2, combination 1	-£3,500 (due to reduction in savings in maintenance)	£2,300	-1.6	0.6
Scenario 2, combination 2	£3,900	£3,400	1.1	2.1

Scenario	Total damages avoided (benefits compared with baseline) (A)	Costs of rollback option (over and above those incurred under baseline) (B)	Benefit- Cost ratio of rollback option (BCR) (A ÷ B)	
			Blight at 10%	Blight at 15%
Scenario 2, combination 3	£4,800	£4,400	1.1	1.8
Scenario 2, average property prices				
Scenario 2	£33,000	£45,000	0.7	0.8
Scenario 3, average property prices				
Scenario 3	£56,000	£65,000	0.9	1.1

Table A6-17 shows that the benefit-cost ratios decrease compared with the main assessment when the impacts of blight are considered at 10% rather than 15% of the property value. This is due to the reduction in benefits compared to the baseline as the impact of blight is reduced.

Economic assessment of property valuation and purchase with impacts of blight at 10% of property value

Table A6-18 presents the results of the economic analysis of property valuation and purchase, per property. Under Scenario 2 there is no impact of blight as the whole value of the property is lost in year 25 as it is purchased and demolished under this rollback option.

Table A6-18: Economic case for UK plc by scenario per property (based on Pathfinder application of options by Scenario), impact of blight at 10%, property valuation (sensitivity analysis)

Scenario	Total damages avoided (benefits compared with baseline) (A)	Costs of rollback option (over and above those incurred under baseline) (B)	Benefit- Cost ratio of rollback option (BCR) (A ÷ B)	
			Blight at 10%	Blight at 15%
Average property values				
Scenario 2	-£31,000	£43,000	-0.7	-0.6

Table A6-18 shows that the benefit-cost ratio decreases compared with the main assessment when the impacts of blight are considered at 10% rather than 15% of the property value, although the reduction is small. This is due to the increase in damages under the baseline due to reduction in the impact of blight, therefore reducing the value of damages avoided.

Economic assessment of development opportunities with impacts of blight at 10% of property value

Table A6-19 presents the results of the economic analysis of development opportunities, per property. Under Scenario 2 and 3 there are no impacts of blight as under this rollback option the full property value is lost and regained in year 25 for Scenario 2 and year 1 or 50 for Scenario 3. Blight is not incurred as the properties do not lose value as they are relocated under the development policies.

Table A6-19: Economic case for UK plc by scenario per property (based on Pathfinder application of options by Scenario), impact of blight at 10%, development opportunities (sensitivity analysis)

Scenario	Total damages avoided (benefits compared with baseline) (A)	Costs of rollback option (over and above those incurred under baseline) (B)	Benefit- Cost ratio of rollback option (BCR) (A ÷ B)	
			Blight at 10%	Blight at 15%
Low property values				
Scenario 2	£30,000	£64,000	0.5	0.5
Average property values				
Scenario 2	£36,000	£36,000	1.0	1.1
Scenario 3	£61,000	£84,000	0.7	0.9

Table A6-19 shows that the benefit-cost ratio decreases compared with the main assessment when the impacts of blight are considered at 10% rather than 15% of the property value, although the reduction is small. This is due to the increase in damages under the baseline due to reduction in the impact of blight, therefore reducing the value of damages avoided.

Economic assessment of landbanking with impacts of blight at 10% of property value

Table A6-20 presents the results of the economic analysis of landbanking, per property. Under Scenario 2 and 3 there are no impacts of blight as under this rollback option as the full property value is lost and regained in year 25 for Scenario 2 and year 1 or 50 for

Scenario 3. Blight is not incurred as the properties do not lose value as they are relocated under the development policies.

Table A6-20: Economic case for UK plc by scenario per property (based on Pathfinder application of options by Scenario), impact of blight at 10%, landbanking (sensitivity analysis)

Scenario	Total damages avoided (benefits compared with baseline) (A)	Costs of rollback option (over and above those incurred under baseline) (B)	Benefit- Cost ratio of rollback option (BCR) (A ÷ B)	
			Blight at 10%	Blight at 15%
High property values				
Scenario 1	£43,000	£19,000	2.2	2.3

Table A6-20 shows that the benefit-cost ratio decreases slightly for this rollback option when blight is considered at 10% rather than 15%. This is due to the total damages avoided being lower with the reduced blight due to the increased damages under the baseline.

Detailed economic analysis

Assistance package

Table A6-21: Economic case for UK plc by scenario per property (based on Pathfinder application of options by scenario)

Pathfinder	Damages			Costs						BCR
	Owners of at-risk properties	Community	Local Authority	Total damages (A)	Damages under baseline (B)	Damages avoided (Benefits, B-A)	Total rollback costs (C)	Total baseline costs (D)	Additional rollback costs (C-D)	
Scenario 2, lower than average property prices (combinations based on assistance package options selected above)										
Scenario 2, combination 1	£24,000	£1,800	£4,800	£36,000	£37,000	£1,400	£3,200	£990	£2,300	0.6
Scenario 2, combination 2	£24,000	£1,800	£4,800	£30,000	£37,000	£7,100	£4,400	£990	£3,400	2.1
Scenario 2, combination 3	£23,000	£1,800	£4,800	£29,000	£37,000	£8,000	£5,400	£990	£4,400	1.8
Scenario 2, average property prices										
Scenario 2	£1,500	N/A	£3,300	£4,800	£43,000	£38,000	£47,000	£1,600	£45,000	0.8
Scenario 3, average property prices										
Scenario 3	£10,000	N/A	£7,500	£17,000	£87,000	£70,000	£67,000	£1,600	£65,000	1.1

Table A6-22: Total discounted costs under the assistance packages proposed by Pathfinder

Pathfinder	Damages			Costs					BCR
	Owners of at-risk properties	Local Authority	Total damages (A)	Damages under baseline (B)	Damages avoided (B-A)	Total rollback costs (average) (C)	Total baseline costs (D)	Additional rollback costs (C-D)	
East Riding	£3,600,000	£21,000	£3,600,000	£3,600,000	£28,000	£430,000	£110,000	£320,000	0.1
Waveney: Easton Barents	£140,000	£54,000	£200,000	£820,000	£620,000	£1,700,000	£36,000	£1,600,000	0.4
Waveney: Corton	£270,000	£37,000	£310,000	£1,600,000	£1,200,000	£6,600,000	£62,000	£6,500,000	0.2

Property valuation

Table A6-23: Economic case for UK plc by scenario per property (based on Pathfinder application of options by scenario)

Pathfinder	Damages				Costs					BCR
	Owners of at-risk properties	Community	Local Authority	Total damages (A)	Damages under baseline (B)	Damages avoided (B-A)	Total rollback costs (C)	Total baseline costs (D)	Additional rollback costs (C-D)	
Scenario 2	£66,000	£0	£3,000	£69,000	£43,000	-£26,000	£45,000	£1,600	£43,000	-0.6

Table A6-24: Total discounted costs under the property valuation proposed by Pathfinder (no community impacts)

Pathfinder	Damages			Costs					BCR
	Owners of at-risk properties	Local Authority	Total damages (A)	Damages under baseline (B)	Damages avoided (B-A)	Total rollback costs (average) (C)	Total baseline costs (D)	Additional rollback costs (C-D)	
North Norfolk	£1,900,000	£14,000	£1,900,000	£2,000,000	£130,000	£1,400,000	£60,000	£1,300,000	0.1

Development opportunities

Table A6-25: Economic case for UK plc by scenario per property (based on Pathfinder application of options by scenario)

Pathfinder	Damages						Costs			BCR
	Owners of at-risk properties	Community	Local Authority	Total damages (A)	Damages under baseline (B)	Damages avoided (B-A)	Total rollback costs (C)	Total baseline costs (D)	Additional rollback costs (C-D)	
Low property values										
Scenario 2	-£1,500	£0	£4,800	£3,300	£37,000	£34,000	£65,000	£990	£64,000	0.5
Average property values										
Scenario 2	-£1,400	£0	£3,300	£1,900	£43,000	£41,000	£38,000	£1,600	£36,000	1.1
Scenario 3	£5,700	£0	£7,500	£13,000	£87,000	£74,000	£86,000	£1,600	£84,000	0.9

Table A6-26: Total discounted costs under the development opportunities proposed by Pathfinder (no community impacts)

Pathfinder	Damages			Costs					BCR
	Owners of at-risk properties	Local Authority	Total damages (A)	Damages under baseline (B)	Damages avoided (B-A)	Total rollback costs (average) (C)	Total baseline costs (D)	Additional rollback costs (C-D)	
East Riding	-£110,000	£21,000	-£90,000	£3,600,000	£3,700,000	£1,600,000	£110,000	£1,500,000	2.4
North Norfolk	-£14,000	£27,000	£13,000	£2,000,000	£2,000,000	£850,000	£60,000	£790,000	2.5
Scratby	-£220,000	£61,000	-£160,000	£10,000,000	£10,000,000	£5,900,000	£290,000	£5,600,000	1.8
Waveney: Easton Barents	-£430,000	£54,000	-£380,000	£820,000	£1,200,000	£1,500,000	£36,000	£1,500,000	0.8
Waveney: Corton	£270,000	£37,000	£310,000	£1,600,000	£1,200,000	£4,100,000	£62,000	£4,000,000	0.3

Landbanking

Table A6-27: Economic case for UK plc by scenario per property (based on Pathfinder application of options by scenario)

Pathfinder	Damages					Costs				BCR
	Owners of at-risk properties	Community	Local Authority	Total damages (A)	Damages under baseline (B)	Damages avoided (B-A)	Total rollback costs (C)	Total baseline costs (D)	Additional rollback costs (C-D)	
Scenario 1	-£1,900	£0	£4,600	£2,700	£45,000	£42,000	£20,000	£2,200	£18,000	2.3

Table A6-28: Total discounted costs under the landbanking proposed by Pathfinder

Pathfinder	Damages				Costs				BCR
	Owners of at-risk properties	Local Authority	Total damages (A)	Damages under baseline (B)	Damages avoided (B-A)	Total rollback costs (C)	Total baseline costs (D)	Additional rollback costs (C-D)	
Scarborough	-£18,000	£98,000	£80,000	£6,300,000	£6,200,000	£3,500,000	£310,000	£3,200,000	1.9

