

Moving the British Waterways network in England and Wales into civil society

Impact Assessment (IA)

IA No: DEFRA 1357

Lead department or agency: Defra

Other departments or agencies: British Waterways

Date: February 2012

Stage: Final

Source of intervention: Domestic

Type of measure: Secondary legislation

Contact for enquiries: Robin Healey

Summary: Intervention and Options

RPC opinion N/A

Impact of Preferred (or more likely) Option

Total Net Present Value	Business Net Present Value	Net cost to business per year (EANCB on 2009 prices)	In scope of One-In, One-Out?	Measure qualifies as
+ £519m	£m n/a	£m n/a	No	NA

What is the problem under consideration? Why is government intervention necessary?

Existing commercial income and grant-in-aid are insufficient to prevent deterioration of the two hundred year old waterways network. If British Waterways in England and Wales is retained in the public sector, the proportion of its navigation assets in poor or very poor condition is projected to rise from around 17% currently to over 30% by the middle of the next decade. This would create a major backlog of repairs and safety maintenance and substantial risks to the long-term amenity benefits that the waterways currently bring.

What are the policy objectives and the intended effects?

The Government considers that a transfer of British Waterways' functions and property portfolio in England and Wales to a charity (Canal & River Trust, CRT), on the basis of a long-term funding agreement, will (a) provide new freedoms and strong incentives to bring in new revenue streams available to fund the operation and maintenance of the waterways, (b) enable closer involvement of communities and harness the enthusiasm of those who benefit and use the waterways; (c) provide value to the taxpayer; and therefore be a positive and efficient means of putting the waterways on a sustainable footing. To this end the Government has five key investment objectives:

- (i) reduce dependence of the network on grant and to foster increasing self-reliance;
- (ii) move the long term cost of maintenance from the public sector to civil society
- (iii) support localism and give waterways users and communities greater involvement in the management and long term sustainability of the waterways;
- (iv) safeguard the canals and associated operational infrastructure through a Trust agreement, in perpetuity, for the benefit of the nation; and free pedestrian access to the tow paths
- (v) ensure that the waterways continue to deliver and increase public benefits.

What policy options have been considered, including any alternatives to regulation? Please justify preferred option (further details in Evidence Base)

The Consultation IA assessed business as usual against the charity option with the same funding plus variants on voluntary income. Another option was including EA navigations in the charity – options for this transfer will be reviewed in 2014, subject to affordability and consent of CRT trustees. In this Final IA, the creation of CRT on the basis of the funding agreement is assessed against baseline funding of the network in the public sector. On a cost-benefit basis, the creation of CRT with new funding compares very favourably with the baseline "do nothing" and meets Government's investment objectives.

Note – no RPC opinion is required for this Impact Assessment as the creation of the charity does not require clearance from the Reducing Regulation Committee.

Will the policy be reviewed? It will be reviewed. If applicable, set review date: Month/2021

Does implementation go beyond minimum EU requirements?	N/A				
Are any of these organisations in scope? If Micros not exempted set out reason in Evidence Base.	Micro Yes/No	< 20 Yes/No	Small Yes/No	Medium Yes/No	Large Yes/No
What is the CO ₂ equivalent change in greenhouse gas emissions? (Million tonnes CO ₂ equivalent)	Traded:		Non-traded:		

I have read the Impact Assessment and I am satisfied that (a) it represents a fair and reasonable view of the expected costs, benefits and impact of the policy, and (b) that the benefits justify the costs.

Signed by the responsible Minister:

Richard Benyon Date: 28/02/12

Description: Create CRT on basis of 15 year funding agreement

Price Base Year 2011	PV Base Year 2011	Time Period Years 16	Net Benefit (Present Value (PV)) (£m)		
			Low: 342	High: 687	Best Estimate: 519

COSTS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	1-4	19.6	225
High		23.1	262
Best Estimate		27.5	21.4

Description and scale of key monetised costs by ‘main affected groups’

- Set up and transition costs of charity creation (£3.2m) to British Waterways / CRT
- Transition cost (to Govt) of one-off payments related to pension deficit and loan repayment (£25m)
- Costs of fundraising, recruitment (projected to rise to £5m p.a. by 2021), part of which will depend upon the degree of funds raised.
- Costs of increased functionality (averaging £14-17m p.a. over 15 year period)

Other key non-monetised costs by ‘main affected groups’

- Time / money cost to donors / volunteers assumed to be at least offset by personal benefits to donors and volunteers

BENEFITS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low		53	567
High		88	949
Best Estimate		71	764

Description and scale of key monetised benefits by ‘main affected groups’

The vast majority of the benefit estimates above do not represent realisable financial benefits. Nearly 90% of the quantified benefits reflect the enhanced welfare to individuals using a better maintained waterways network (relative to the baseline) for informal recreational purposes. Whilst these are not financially realisable benefits, they are nevertheless real welfare benefits that are expressed in monetised terms using the concept and evidence of “willingness to pay”, following HM Treasury Green Book Guidance. A small proportion of the total benefits (present value of £65m) represents an attempt to capture in the analysis the specific personal benefits to donors and volunteers who freely choose to give, and which might be considered distinct from the broader “use values” that better waterways create. At the same time, these benefits provide additional financial and human resource to the charity to invest in the waterways to the benefit of all users. A very small proportion of the total benefits (£28m) is estimated to be realised financially through the additional boating that better waterways would bring relative to the baseline. For further explanation see Section 5. The framework for the cost-benefit analysis is depicted in Annex 5.

Other key non-monetised benefits by ‘main affected groups’

An alternative non-monetary proxy of benefits of the policy and funding relate to better maintained waterway assets: proportion of assets in poor / very poor condition projected around 20% in mid 2020s compared to 35% in the baseline.

Other benefits, which may not be fully captured in the monetised estimates:

- Social benefits of increased community engagement
- Possible health benefits and improved public safety
- Property value uplift reflecting amenity benefits of improved / safer waterways relative to baseline.
- Avoidance of additional unpredictable costs to taxpayers (compared to baseline of deteriorating network)

Key assumptions/ sensitivities/ risks**Discount rate (%)**

3.5

- 16 year appraisal (2011/12-26/27) to reflect 15-year funding contract + set up costs in 2011/12.
- **Low / high range** reflects variation around two key assumptions:
 - **Projections of voluntary income** – the low NPV estimate assumes that only 50% of donor projections are met (holding costs constant); the high NPV estimate assumes that donor projections are fully met as projected (but not surpassed). 75% is taken as mid-point. Further variation is explored in the sensitivity analysis in Section 6.
 - **Baseline welfare value of recreational benefits** based on willingness to pay (WTP) estimates per visit.
- Prudent assumptions on how these change in response to increased functionality. Section 6 tests assumptions and robustness of base analysis, including potential visitor displacement and more pessimistic assumptions on voluntary income (in which only 25% of projections are realised with costs unchanged). Sensitivity analysis suggests that the conclusions of the base analysis are robust to some of the key uncertainties.
- Projections of asset condition depend not only on new grant and charitable income but also baseline income streams and outgoings which will reflect broader economic factors.
- Theoretical risk that substantial fund-raising and volunteering could displace some giving to other charities.

BUSINESS ASSESSMENT (Option 2)

Direct impact on business (Equivalent Annual) £m:			In scope of OIOO?	Measure qualifies as
Costs:	Benefits:	Net:	No	NA

Executive Summary: Moving the British Waterways network in England and Wales into civil society – Final Impact Assessment

This Impact Assessment provides the Government's broad assessment of the benefits and costs of transferring the British Waterways network in England and Wales to a national charity, the Canal & River Trust (CRT), based on the Funding Agreement reached in January 2012.

The Case for Change

Existing commercial income and grant-in-aid are insufficient to prevent deterioration of the two hundred year old waterways network. If British Waterways is retained in the public sector, the proportion of its navigation assets in poor or very poor condition is projected to rise from around 17% currently to over 30% by the middle of the next decade. This would create a major backlog of repairs and safety maintenance and substantial risks to the long-term amenity benefits that the waterways bring.

Policy objectives and intended effects

The Government considers that a transfer of British Waterways' functions and property portfolio in England and Wales to a charity, on the basis of a long-term funding agreement, will:

- provide new freedoms and strong incentives to bring in new revenue streams available to fund the operation and maintenance of the waterways,
- enable closer involvement of communities and harness the enthusiasm of those who benefit and use the waterways;
- provide value to the taxpayer; and
- therefore be a positive and efficient means of putting the waterways on a sustainable footing.

In making the transfer and agreeing a long-term funding arrangement, Defra has **five key investment objectives** for the waterways:

- i. To reduce dependence on Government grant and to foster increasing self-reliance.
- ii. To move the long term cost of maintenance and the associated heritage infrastructure from the public sector to civil society.
- iii. To support localism and give waterways users and communities greater involvement in the management and long term sustainability of the waterways.
- iv. To safeguard:
 - a. The canals and associated operational infrastructure through a Trust agreement, in perpetuity, for the benefit of the nation.
 - b. Free pedestrian access to the tow paths.

- v. To ensure that the waterways continue to deliver and increase public benefits.

Funding agreed

Baseline funding is assumed as £39m p.a. flat cash from 2012/13 as set out following the Spending Review. For the Charity, Defra is providing grant funding over a 15-year contract:

- **A core grant from 2012/13, £39m p.a. index linked** on a three-yearly cycle from 2015/16.
- **Conditional funding from 2015/16, £10m p.a. not index-linked** and reduced gradually over the last five years of the contract to a minimum of £4m, and dependent upon the satisfactory completion of three performance measures relating to the condition of principal assets, flood management and towpath condition.
- **Overall funding for the final 5 years of the contract will be capped** at the level of total funding for 2021/22 (core + conditional).
- £6.2m one-off payment by Defra in 2011/12 to enable British Waterways to repay its National Loan Fund debts to HM Treasury.
- £25m one off payment to enable CRT to manage short-term cash-flow challenges related to pension deficit repayments required by the pension fund trustees.

Compared to the baseline assumption, the new funding contract, excluding the one-off payments, is worth on average an additional £15m per annum in cash terms from 2015/16. The full Funding Agreement is described in Annex 1.

The Funding Agreement has been designed in order to provide strong incentives to the CRT to maximise its efficiency, avoid wastage and ensure a strong fundraising effort. It does this in a number of ways through:

- continuing the downward long-term trend in government funding;
- providing a fixed fifteen year contract that enables CRT to plan for the long term taking full responsibility for the network;
- making a portion of grant conditional on meeting clear and challenging targets on asset maintenance, towpath condition and flood risk management.

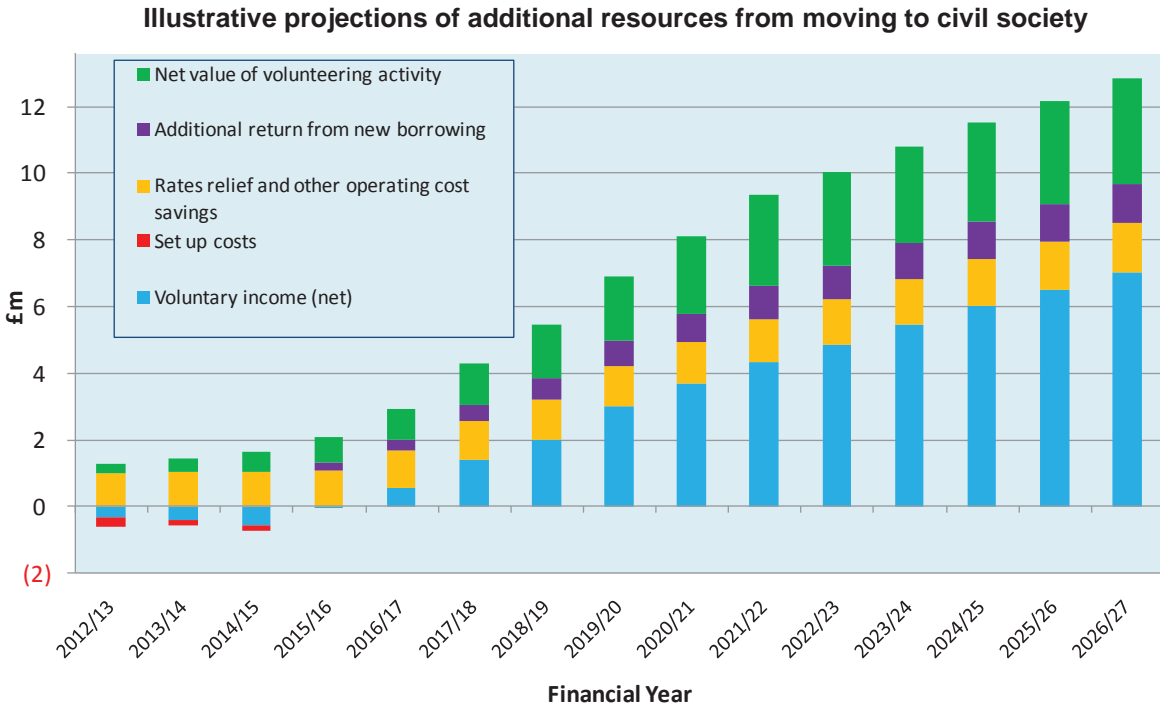
Projections of additional resources obtainable by CRT

In addition to the new funding agreement, additional benefits relative to the baseline are driven by the additional resources which CRT will be in a position to generate outside the public sector. These are explained in the main text, but in summary include:

- *Voluntary income* – regular member donations, appeals, legacies, trusts and major donors. Analysis of fundraising potential has been provided by British Waterways for this Impact Assessment; such projections should be considered hypothetical until the point at which the charity is created and it has the opportunity to fund raise.
- *Rates relief and other operating cost savings* arising from its charitable status;

- *Additional return on capital from new borrowing and investing freedoms* – the charity will not be constrained like British Waterways is in terms of borrowing and investing, and so will have greater freedom and flexibility to generate additional investment income without commensurate increase in risks.
- *Additional volunteering activity* in network maintenance.

In total British Waterways estimate that CRT might achieve net additional resources (in nominal terms) of around £12m per annum by 2026, although significant increases are not expected in the early years of the Charity (see chart below).



Note – See main text for explanation. The negative voluntary income in the early years indicates that expenditure on fundraising exceeds gross donations.

Network viability

According to British Waterways’ modelling, which has been reviewed by Defra, the creation of the charity together with the funding agreement is expected to stabilise network condition. A key indicator of the sustainability of the network is the proportion of principal assets in poorest condition. On the basis of the funding agreement and with the additional resources achievable by CRT, the proportion of principal assets in poor or very poor condition is projected to stabilise around 20% after 2015. This indicator is well within risk tolerance levels which are estimated at around 27%.

Cost benefit analysis

Research in 2011 for Defra by Jacobs, building upon earlier work, confirms that investment in the waterways provides very good public value for money. These results are largely driven by changes in recreational visits (which account in that research for over 80% of measurable benefits) and residential amenity benefits arising in deterioration or improvement in the waterway environment and function. Whilst the research focused on the benefits rather than costs of investment, the level of change in benefits (ranging from £200m to £700m) greatly exceeds any conceivable costs associated with the scenarios that bring those effects about.

A more systematic assessment of the value of creating the charity focuses upon Defra’s final investment objective and is set out in this IA. By applying evidence-based, “willingness-to-pay” estimates of the welfare benefits that people derive from using the waterways, and applying plausible assumptions about potential visitor uplift and increased value per visit, the analysis demonstrates that creating CRT generates net benefits for society and offers good value for money. These benefits arise from the benefits that better and safer waterways would provide as a result of the additional income and resources that CRT, rather than British Waterways with baseline funding, would be able to utilise. The more income the charity can raise, the better and safer will the waterways network be relative to the baseline. In addition to these broad, recreational, use benefits, the analysis considers the additional specific benefits to donors, volunteers and additional boating activity.

The table below summarises the **net present value** (PV) of costs and benefits of the charity with new funding, compared to the do nothing option. Note that the vast majority of the benefit estimates below do not represent realisable financial benefits. Nearly 90% of the quantified benefits reflect the enhanced welfare to individuals using a better maintained waterways network (relative to the baseline) for informal recreational purposes. Whilst these are not financially realisable benefits, they are nevertheless real welfare benefits that are expressed in monetised terms using the concept and evidence of “willingness to pay”, following HM Treasury Green Book Guidance. A framework for the cost-benefit analysis is depicted in Annex 5.

The summary net benefit estimates include a range reflecting:

(a) variation around the baseline willingness to pay assumptions (£0.78 to £1.10 per visit) with the mean value as best estimate;

(b) variation around the extent to which gross fundraising projections are met (50% to 100% of British Waterway projections), with 75% as best estimate.

All figures in £m, to 2027, compared to baseline	PV Costs	PV benefits	Net PV	Benefit Cost Ratio (to 1)
Low (50% fundraising; low WTP assumption)	225	567	342	2.5
Best estimate (75%; mean WTP)	244	764	519	3.1
High (100%; high WTP assumption)	262	949	687	3.6

Sensitivity Analysis

In addition to these ranges, further sensitivity analysis in Section 6 demonstrates that these results are robust to varying some of the key assumptions that underlie them, such as the extent to which voluntary income projections are met, and the degree to which additional visitors might be considered to be displaced from other beneficial activities. Annex 3 shows that the underlying assumptions on the recreational value of visits to waterways err on the conservative side.

Wider impacts

Wider impacts of creating CRT, including social and distributional issues, are explored in qualitative and quantitative terms in Section 7.

Evaluation and Review

The Funding Agreement recognises that the charity's challenge is a long-term one and that it will take time to develop new sources of income and finance. As part of the Agreement, a review will take place in 2021/22 examining afresh the public benefit case for Government funding beyond 2026/2027. This will involve an evidence-based assessment of the extent to which Defra's investment objectives have been realised.

In line with its commitment to move the EA navigations into CRT following the next spending review – subject to affordability and the consent of CRT Trustees at that time, the Government will review the options for this transfer.

Purpose and Scope of this Document

This Impact Assessment (IA) provides a broad assessment of the benefits and costs of transferring the British Waterways network in England and Wales to a national charity, the Canal & River Trust (CRT).

Outline and structure

This IA is structured as follows:

<i>Section 1</i>	<i>explains the strategic and conceptual case for the change in policy, and the policy objectives related to this.</i>
<i>Section 2</i>	<i>describes the baseline and preferred options in further detail, in particular the new funding that has been agreed.</i>
<i>Section 3</i>	<i>sets out current challenges and the costs and risks that are likely to arise if no action is taken.</i>
<i>Section 4</i>	<i>assesses the impact of creating the charity, with particular focus on the additional resource that the charity will be able to generate to invest in the waterways for public benefit.</i>
<i>Section 5</i>	<i>assesses how these additional resources and funding translate into public benefits, the costs involved, and provides an overall cost-benefit summary.</i>
<i>Section 6</i>	<i>undertakes sensitivity analysis of some of the key assumptions involved in the cost-benefit analysis.</i>
<i>Section 7</i>	<i>considers the potential wider impacts of creating the charity which have not been monetized.</i>
<i>Section 8</i>	<i>sets out plans for evaluation and review.</i>
<i>Annex 1</i>	<i>details the funding agreement</i>
<i>Annex 2</i>	<i>summarises latest research for Defra on the value of inland waterways</i>
<i>Annex 3</i>	<i>applies Defra's transfer value guidelines for benefit estimation</i>
<i>Annex 4</i>	<i>summarises evidence of the impact of towpath improvements</i>
<i>Annex 5</i>	<i>provides a visual summary of the cost-benefit framework</i>

Comparison with consultation-stage IA

An IA was published in March 2011 as part of the Government Consultation "A new era for the waterways". The Government response of September 2011 addressed the general issues raised through the consultation, including the purposes, governance, operation, public

engagement and financial sustainability of the Charity. This Final IA is based upon the earlier IA, but differs in a number of respects:

- This document is based upon the Final funding agreement between the Government and CRT made in January 2012. It compares
 - the estimated benefits, costs and impacts that arise under the Funding Agreement between Defra and the CRT together with the additional resources that the charity might secure (Option 2); with
 - the position of British Waterways remaining as a public body in England and Wales, with baseline funding as announced early in 2011 as part of the Spending Review settlement (Option 1, the “do nothing” option).
- The consultation IA compared the public corporation and charity options on the same funding basis. That analysis also considered a third option in which the charity would be enlarged after three years to include operational responsibility for the Environment Agency navigation assets. The Government then decided that these Environment Agency navigations functions would transfer to the new charity in 2015/16 during the next Spending Review, subject to affordability and the agreement of the charity’s Trustees at that time, and that it would review the options for this transfer nearer the time.
- The consultation IA also considered a fourth option or benchmark scenario, in which the new charity would substantially exceed its additional income projections leading to an improving network. With the funding agreement in place, and in the light of consultee concerns about fund-raising potential, this scenario is not considered relevant at present.
- British Waterways has updated its baseline projections of income, and, by extension, its baseline projections of long term asset condition (sections 3 and 5).
- Following the earlier consultation, there are some modest additions and clarifications, including additional material and updates on the risks facing the waterways, the charitable income projections and a wider range of benefit estimates.
- It includes additional evidence relating to the benefits of additional investment in the waterways provided by latest research for Defra by Jacobs consulting.

Business Plan

Whilst this IA considers the potential of the charity to maintain the principal assets of the network and summarises the financial challenges and opportunities facing the waterways, it is not intended to provide a complete business or financial plan for the new charity or a detailed financial analysis. Rather, its objective and focus is an overall social cost benefit analysis.

One in One Out

This IA does not fall under the “One in One Out” rule and does not require an opinion from the Regulatory Policy Committee or clearance from the Reducing Regulation Committee. This is because the creation of CRT and the funding agreement contain no material regulatory measures and so is not expected to impose or reduce costs to businesses or the third sector in

any direct and material way. For example, there is no legislative change which increases or reduces constraints on the level of boater fees (see section 7).

1. Rationale and Objectives

Problem under consideration

British Waterways is a public corporation with a statutory responsibility for operating and maintaining the waterways which has been in place since 1963 under the Transport Act 1962. Its network consists of 2700 km of canals and 500 km of navigable rivers, 1657 locks and 2664 listed buildings. Its waterways received an average of 285 million visits each year in 2007-9. British Waterways is required to maintain the waterways in a suitable condition for craft which use them and this duty is enforceable by the courts.

In recent decades, the importance of the waterways has grown and the network has changed from being largely focused on freight to become a leisure, heritage, environment and regeneration asset. However, existing grant in aid (which is declining) and commercial income (including from British Waterways' property assets) are insufficient to prevent long-term deterioration of the waterways which in turn would undermine benefits and create new risks. At the same time, as a public corporation British Waterways is constrained in the income it can generate and the services it can provide, so that the potential for generating increases in public benefits is also constrained.

Further discussion is provided in the analysis of the baseline option (Section 3).

Rationale for intervention: the value of waterways and market failure

The Government's **White Paper on the Natural Environment**, *The Natural Choice* (June 2011) highlights the risks that arise from taking for granted and undervaluing the benefits that people derive from environmental amenities which do not have a direct market value. It also argues for facilitating greater local action to protect and improve nature, and to strengthen the connections between people and nature. These principles underpin the creation of the new charity.

Defra's **ecosystems services framework** highlights the wide range of public benefits that the waterways network provides. Research for Defra and the Inland Waterways Advisory Council published in 2010¹ identified those public benefits as including recreation and health benefits; amenity (reflected in property value uplift); transport (time and carbon reductions); renewable energy (energy and carbon); water provision; and non-use values such as those relating to industrial and transport heritage (see Table 3 in Section 5).

- The baseline value of informal waterway recreational activity alone, based upon revealed preference studies (used in the present IA - see Annex 3 on benefit transfer), can be conservatively estimated at around £300m p.a., and this excludes any further leisure spending that users make.
- Latest research by Jacobs for Defra² estimates that non-use values that people hold for the heritage of the network (i.e. value derived from knowledge of the existence of the

¹ Jacobs consulting, *The benefits of inland waterways* (March 2010),

² Jacobs consulting, *The value of inland waterways in England and Wales* (August 2011)

whole network rather than for direct personal use) could fall between £20 and £180m per annum.

- That same research for Defra suggested that a radical deterioration of the network could bring about a loss of value of up to £700m p.a. (although that figure includes leisure related expenditure as well as consumer surplus that is not paid for)³
- Using similar sources, and including other types of benefit (such as land drainage, amenity values reflected in property uplift, and other quality of life values), British Waterways in 2009 crudely estimated the annual welfare value of the waterways network to the tune of £600m.

Notwithstanding the uncertainty inherent in all attempts to estimate such benefits, these figures show the very substantial values at stake. These are all real public benefits even though many of them are not in practice “sold” or marketed by British Waterways and have no cash value. Even if it was feasible to exclude non-payers, through for instance, towpath turnstiles, it would be neither efficient nor socially beneficial (because of the costs involved and marginal social benefits foregone), and the various wider benefits would be put at risk.⁴ The value of some commercial recreation can be extracted in the form of payments, fees and licences (e.g. for cruising or fishing), but this only accounts for a small proportion of users and overall benefits. Consequently many of those who value the use or existence of the waterways have few direct opportunities to express that value.

Canals and navigable waterways therefore exhibit the characteristics of a classic example of what economists call a “public good”.⁵ Because of these public good aspects, in economic terms there would, if left to the private sector, be an “under-supply” of the amenities and services that waterways can provide. This is the basic rationale for ongoing public funding. On the other hand, public sector status means that British Waterways is unable to harness the value that many people place on the waterways (“demand”) and benefit from other financial freedoms. The more that the underpinning value of the waterways can be expressed and harnessed, the greater the ability of the waterways operator to “supply” and enhance these benefits through its spending and investment – in other words, creatively expanding the market for the ecosystems services which the canals provide. **A charity, underpinned by a long-term government funding contract, would unlock the potential to improve overall social and economic welfare.**

The policy objectives

An important part of the rationale for establishing CRT is to allow it to take on ownership and responsibility for the waterways and all of its associated infrastructure. The Government considers that all of the property which British Waterways currently holds in England and Wales

³ Jacobs (2011). The research estimated that over 80% of the measurable public benefits of the canals relate to recreation. Monitoring strongly suggests that these benefits are positively related to spending on the “functionality” of the waterways and to the overall condition of the assets (see Annex 2).

⁴ That is why a Trust Settlement will be created alongside the CRT to protect the waterways infrastructure in perpetuity for the benefit of the nation.

⁵ Public goods are those that are “non-rival” or “non-excludable” when used or consumed. “Non-rival” means that the use of the good by one person does not prevent others using that good (e.g. clean air); “non-excludable” means that a public good can only be made available to all (e.g. national defence) This implies that the market sector typically finds it difficult to supply such goods and services.

is necessary for it to carry out the task of running the waterways, either indirectly (through producing commercial income to fund it) or directly (for the operation of the network). The planned transfer of British Waterway's commercial property endowment from the Government to the charity (other than those that will be retained by British Waterways in Scotland) provides a necessary and continuing basis for income generation to manage the network and maximise its financial potential.

In making the transfer of the network, its assets and properties, and agreeing a long-term funding arrangement to put the charity on a sustainable footing, Defra has **five key investment objectives** for the waterways:

- i. To reduce dependence on Government grant and to foster increasing self-reliance.
- ii. To move the long term cost of maintenance and the associated heritage infrastructure from the public sector to civil society.
- iii. To support localism and give waterways users and communities greater involvement in the management and long term sustainability of the waterways.
- iv. To safeguard:
 - a. The canals and associated heritage infrastructure through a Trust agreement, in perpetuity, for the benefit of the nation.
 - b. Free pedestrian access to the tow paths.
- v. To ensure that the waterways continue to deliver and increase public benefits.

This proposal and IA specifically excludes the canals currently managed by British Waterways in **Scotland**. Inland waterways policy and sponsorship in Scotland, as well as grant-in aid, are devolved matters and so British Waterways' activities there are under the oversight and ultimate control of the Scottish Government. The Scottish Government has decided that its canals, and British Waterways Scotland, will remain in the public sector.

The proposal to move British Waterways in England and Wales into civil society will mean that the Government will no longer need the **Inland Waterways Advisory Council** to provide advice for policy development. IWAC was created in April 2007 by the Natural Environment and Rural Communities Act 2006 as successor to the Inland Waterways Amenity Advisory Council (IWAAC) to advise Government, navigation authorities and other interested persons on matters relevant to Britain's inland waterways. The Government therefore announced on 1 February 2012 that IWAC should be abolished, subject to parliamentary consent. It is anticipated that IWAC will be abolished in June 2012. The abolition of IWAC will have no regulatory or other cost impact on business, charities or other bodies. Abolition of IWAC will be cost neutral but savings of around £200,000 per year to Government are expected in respect of the costs of research projects, the Chairman's fees and Council members expenses and the cost of the small secretariat which supports the Council.

2. Description of Options

Baseline (“Option 1”)

A baseline “business as usual” scenario in which British Waterways remains a public corporation, which leads to long-term deterioration in physical assets of the network and missed opportunities for maintaining public benefit. In line with the spending settlement of December 2010, Grant-in-Aid for the waterways in England and Wales is £43.25m for 2011/12 (this includes a subsequent £1.75m in contribution to redundancy costs) representing a 16% cut compared to 2010/11. Annual Grant-in Aid is then £39.0m in cash terms for the rest of the Spending Review period (to 2014/15) and until 2022/23. For the purposes of comparison with the preferred option, this flat cash funding is assumed to apply until 2026/7.

Final Option (“Option 2”) – Create charity on basis of agreed long-term funding

In order to establish the charity successfully, the Government has agreed a 15-year funding arrangement with the CRT trustees. This funding is necessary in order to give the incoming trustees confidence that the waterways have a viable future, and it provides a firm basis on which the CRT can begin to generate its own funding streams, exploit its new freedoms, and increase its self-reliance. The additional resources that CRT could realise are described in Section 4.

The Funding Agreement

The full agreement, including non-funding elements, is set out in Annex 1. In summary the fifteen year funding comprises:

- £6.2m one-off payment by Defra in 2011/12 to enable British Waterways to repay its National Loan Fund debts to HM Treasury.
- £25m one off payment to enable CRT to manage short-term cash-flow challenges related to pension deficit repayments required by the pension fund trustees.

A core grant from 2012/13:

- £39m index linked to the GDP deflator from 2015/16 onwards based upon the last GDP forecast in 2014/15 and set for three years. To be refreshed at the end of each three-year period.
- For years 2013/14 and 2014/15 £3m of the core annual funding will be treated as a conditional grant, subject to the conditions below.

Conditional funding from 2015/16:

- Available from 2015/16 to 2021/22, £10m p.a. not index linked.
- Dependent upon the satisfactory completion of three performance measures relating to the condition of principal assets, flood management and towpath condition. See Annex 1 for the full description of these and the related “warning” and “breach” thresholds.

Overall funding for the final 5 years of the contract will be capped at the level of total funding for 2021/22 (core + conditional).

The grant funding profiled is summarised in Table 1. The indexation mechanism, based on latest available GDP deflator projections, means that we cannot be certain at this stage what core funding will be after 2014/15. For illustration, and for the purposes of the cost-benefit analysis, we assume that the current GDP deflator projection to 2016 (2.5%) is projected until the end of the period.

Table 1 Illustration of grant funding profile

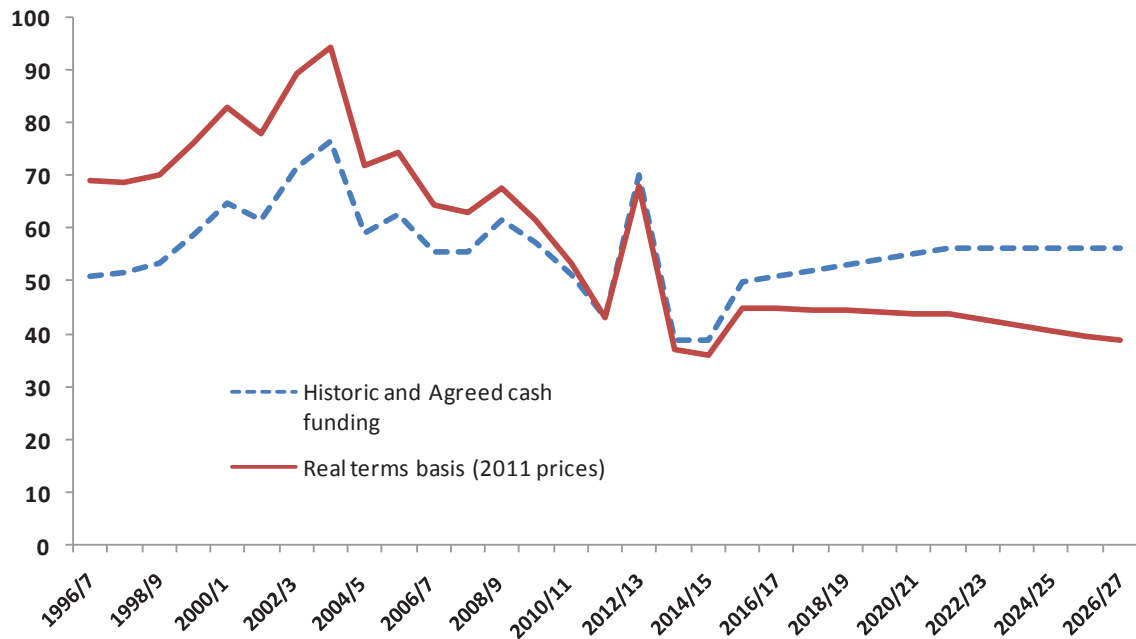
Financial year	Year of funding agreement	Core (illustrated with indexation from year 4 at 2.5% p.a.) £ m	Conditional (subject to performance) £ m	One-off £ m	New grant funding - baseline £m
2011/12		43.25		6.2 (loan repayment); 25.0 (one-off payment)	31.2
2012/13	1	39.0			0
2013/14	2	39.0			0
2014/15	3	39.0			0
2015/16*	4	40.0	10.0		11.0
2016/17	5	41.0	10.0		12.0
2017/18	6	42.0	10.0		13.0
2018/19*	7	43.0	10.0		14.0
2019/20	8	44.1	10.0		15.1
2020/21	9	45.2	10.0		16.2
2021/22*	10	46.4	10.0		17.4
2022/23	11	47.5	8.8		17.4
2023/24	12	48.7	7.7		17.4
2024/25*	13	49.9	6.4		17.4
2025/26	14	51.2	5.2		17.4
2026/27	15	52.5	3.9		17.4

* Indexation of core-funding updated for the following three years, although in year 13 this will be subject to the cap on overall funding as set out in the Funding Agreement.

Compared to the baseline assumption, the new funding contract, excluding the one-off payments, is worth on average an additional £15.5 m p.a. in cash terms from 2015/16.

Seen in an historic perspective, the Funding Agreement continues a trend in declining real terms funding (Figure 1) and addresses one of Defra’s key investment objectives, namely reducing the dependence of the waterways on Government. The funding agreement seeks to provide a firm long-term financial footing for CRT that incentivises new income generation and keeps within within the tight fiscal position set out in the Autumn Statement.

Figure 1 Past and prospective grant funding under January 2012 Funding Agreement (£m)



Note – the spike in 2011/12 relates to the one-off payment of £25m and the national loan fund repayment of £6.2m.

3. Assessment of costs and risks - Business as Usual

The costs and benefits of “business as usual” (the baseline) are not specifically estimated because, by definition, this is the reference against which the preferred option is assessed. It is, however, important to note that the baseline is not static, and is not simply the “status quo” as it has been in recent years for the reasons given below. Here we assess the challenges that arise in the baseline and the implications for the network and public benefits.

British Waterways’ financial challenges

With a shrinking resource base, the ability of British Waterways to maintain the substantial public benefits of the inland waterways and the condition of the capital assets upon which those benefits ultimately depend would be in long-term decline.

British Waterways currently has a number of sources of income, many of which are growing. It generates £35m of income from its portfolio of **non-operational properties** (valued currently at over £460m). This derives largely from property endowments when British Waterways was created and its ability to trade and develop property alongside the waterways for which it is a navigation authority. Effective management of the portfolio has resulted in British Waterways consistently outperforming the Investment Property (IPD) Index over the five years up to 2008 and before the property market downturn. Income arising from this portfolio, along with significant other income from utilities and 35,000 boating licences, is used to help operate and maintain the waterways.

Ministers decided against disposal of the assets as part of the 2010 Spending Review, recognising that this would require a significant increase in grant in aid to replace lost property income or the waterways could no longer be maintained at minimum health and safety levels. Importantly, British Waterways’ ability to leverage its non-operational commercial portfolio to grow this source of income is constrained by a fixed statutory cap of £35m on its borrowing by the 1962 Transport Act.

British Waterways has an added pressure from having to deal with a substantial **pension deficit**. At the date of March 2010 actuarial valuation of the British Waterways Pension Fund (BWPF), the pension deficit was £65.6m. No formal valuation has been prepared since March 2010, although estimated updates have been prepared by the Scheme Actuary for the pension fund Trustees and an update will be made at the end of March 2012. BW is now allocating an additional £7m over a 20 year period to address the increased pension deficit. This additional cost is assumed to apply whether or not the charity is created and it has been factored into BW’s business plans and asset projections.

Taking account of BW’s other sources of income, around 30% of spend on the waterways (core waterways and major works) comes from the government **grant-in-aid**. Yet ongoing pressures on public funding have led to reductions in recent years and as part of meeting the Government’s overall aim to reduce the size of the budget deficit, in 2010 the Government announced funding for British Waterways in England and Wales of £41.5m for 2011/12⁶ (down from £51.3m in 2010) and £39m for the following three years.

⁶ Increased subsequently by £1.75m to contribute to redundancy costs.

The implications and risks for the waterways

Although we increasingly value heritage as time passes, it also becomes increasingly costly to maintain in original condition. According to British Waterways, the present value of the long-term maintenance costs for the canals and heritage infrastructure is estimated at some £4 billion. This estimate comes from a discounted cash flow using “steady state costs” over 60 years (as an approximation of perpetuity) net of income from commercial activity and grant funding.

In the context of the pressures and constraints described, a significant funding gap has emerged in recent years between British Waterways’ income and what is necessary to keep the waterways and network assets (such as reservoirs, locks, bridges, embankments, aqueducts and cuttings) in optimal working order. Unlike other infrastructure operators British Waterways does not have the option of replacement by newer (and lower maintenance) assets due to the heritage nature of the network. Asset management procedures allow British Waterways to prioritise based on risk and consequence of failure of principal assets.

The consequence of the funding gap is that the safe working condition of the network including the towpaths and associated public access opportunities will decline and / or sections will need to be closed to navigation. This would bring into question British Waterways’ ability to meet its statutory responsibilities to maintain the network. British Waterways is already facing difficulties in cost-effective maintenance of waterways in a suitable condition for freight craft under the 1968 Transport Act. Without developing new streams of income, the safety, amenity and functionality of the waterways will significantly deteriorate over coming years.

The condition of British Waterways’ assets clearly demonstrate this. For many years, British Waterways has been carrying risks related to the condition of ageing infrastructure (See Box 1), and as a broad indicator of the sustainability of the network and how associated risks may evolve over the medium term British Waterways models and projects **the proportion of its navigation assets in poor or very poor condition (grades D and E).**

Box 1 - At what level does the poor condition of assets pose a safety risk to the network?

As part of its asset management approach, ten years ago British Waterways developed the idea of “target condition grade”.

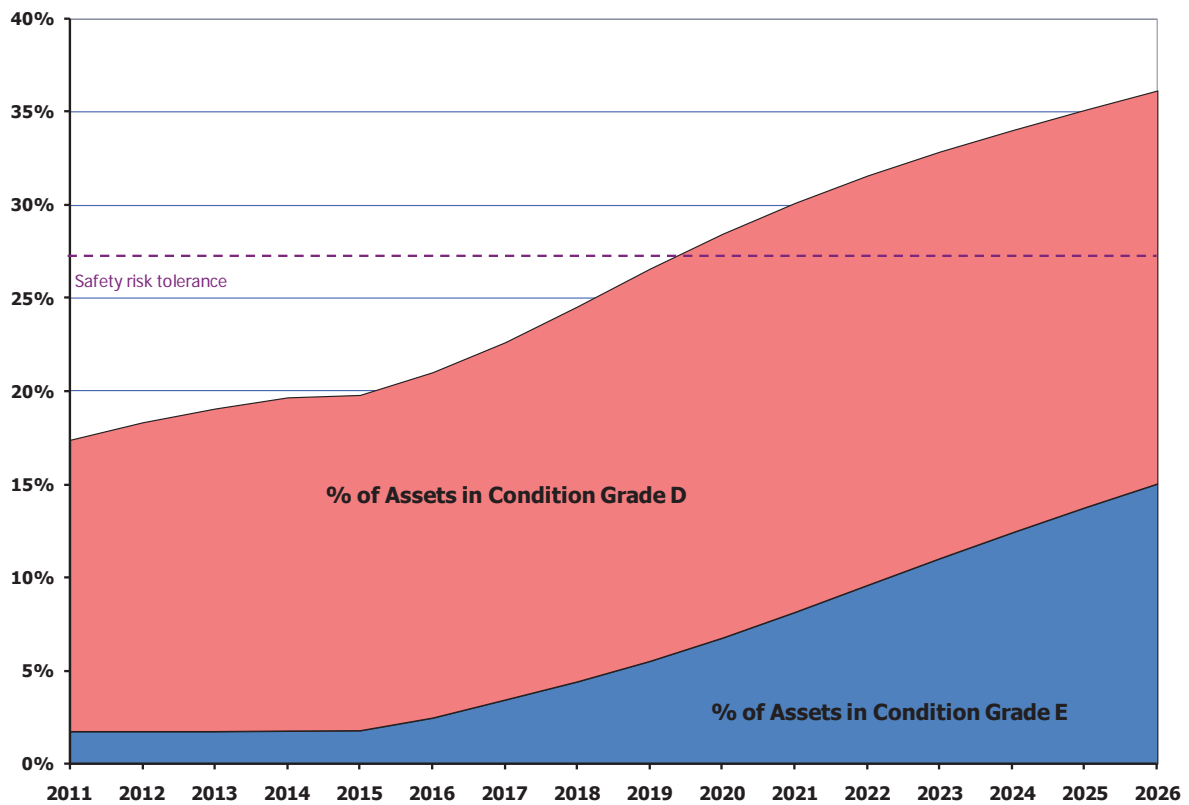
This approach sets a target condition grade for an asset depending on the consequence of its failure. For a principal asset with a consequence of failure of 5, the target condition grade should be no worse than B; for a consequence of failure of 4 it should be no worse than C. In other words no assets with the two highest consequences of failure (4 and 5) should be allowed to drop into the two lowest condition grades (D and E). At the last calculation British Waterways had 2,013 (nearly 20%) Principal Assets of all types and grades below their target condition grade.

It is not possible to be precise about when such risks become unmanageable, so the trends are important. On a day to day basis British Waterways manages risk by focusing on those assets in the poorest conditions with the highest consequences.

This modelling is based upon its projections of income and funds available for maintenance after spending on core waterways. Insufficient resources mean that, over time, assets

deteriorate. And lower grade assets require higher maintenance, which in turn has knock-on impacts on the cost of future funding and repairs. For instance as assets deteriorate into categories D and E, each unit of expenditure “buys less” in terms of improved condition than it would have done if in a better grade of condition. Thus the possibility of a vicious circle arises: deteriorating assets require more maintenance which reduces the scope for asset upgrades and repairs, thus leading to further deterioration of the network, and further pressures on core waterway spending. In recent years, Government has set British Waterways a target to keep the proportion of assets in poorest conditions at no more than 22%. **With business as usual, British Waterways projects that the proportion of its navigation assets in poor or very poor condition (grades D and E) would double from around 17% to over 30% during the next decade** (see Figure 2).

Figure 2 Projected principal assets in poorest condition and associated maintenance costs under Business as Usual



Note – The “safety risk tolerance” line is a benchmark that refers to the proportion of principal assets in condition grades D and E in 2004, after BW cleared a backlog of safety repairs. These curves assume that BW would prioritise spending on the “critical functionality” of the core waterways, which would necessarily leave fewer resources available to maintenance of the principal assets – see section 5 below. The combined curve is compared with the preferred option in section 5.

Such a trajectory would:

- create very substantial and ever-increasing risks to public safety, as well as to the long-term amenity benefits that the waterways bring.

- create ever-growing liabilities and risks for taxpayers and increased reliance on Government as the likelihood and frequency of serious breaches increases and potentially increased flood risk. Every year British Waterways experiences failures of its embankments. A total of 51 breaches or major leakages leading to canal closure were experienced between 2000 and 2009. British Waterways has suffered major failures on its embankments in almost every year. For example, it had to fund £8.5m of repairs to the Monmouthshire and Brecon canal following a serious and unforeseeable breach in 2007.
- represent a very inefficient situation, because as assets deteriorate into the worst categories, each unit of expenditure “buys less” in terms of improved condition than it would have done if in a better grade of condition.

Estimating where a possible “tipping point” lies is very difficult to model, as are the precise risks to health and safety, and is a matter of expert judgement. As a point of reference, the “**safety risk tolerance**” line in the chart refers to a threshold past which British Waterways consider that arrears of maintenance and the risks that pose to public safety become critical. This would inevitably impact upon the accessibility of the towpaths and the quality of the recreational experience as assets become unsightly, towpaths become unsafe and closures and diversions are put in place. Overall visits could decline, particularly if perceptions increased that many waterways had become poorly maintained and unsafe.

Research for Defra (Jacobs, 2011) considered this kind of scenario of underfunding and posited that boating, angling and towpath visitors could all dramatically decline over a period of years in which limited funding was sustained (see Annex 2). Urban towpath visits in particular could suffer as urban waterway locations would become unsightly or unsafe, leading to a “snowball” effect where ever fewer visitors use the towpath: the analysis posited declines in urban visitor numbers of 90% from the baseline by year 15. Overall, such a scenario would lead to very substantial monetized losses, including non-use as well as use values. It is this sort of scenario which the creation of the charity and funding agreement is designed to avoid.

Limited local engagement

As a public corporation, British Waterways has historically had only limited engagement with local communities. In line with the Big Society agenda, the Government believes that it can best nurture the spirit of cooperation by devolving power, assets, money and knowledge to those best placed to find solutions to local needs: elected local representatives, frontline public service professionals, social enterprises, charities, co-operatives, community groups, neighbourhoods and individuals. Over half of the UK population lives within five miles of a canal or navigable river. Retaining the existing Public Corporation management model would not provide a credible avenue for local influence on local funding and planning decisions.

4. Assessing the impact of creating the Canal & River Trust

Annex 5 summarises in diagrammatic form the framework for the social cost benefit analysis. Essentially, there are two stages to assessing the impact of the creation of CRT:

1. Assessing the **additional income** available to the charity (relative to the baseline) i.e.
 - a. new government funding agreed over a 15-year period
 - b. additional income a waterways charity could generate.

NB – these are not in themselves public benefits, but the means by which additional public benefits are generated.

2. Estimating how the additional resources available to the CRT would **deliver additional public benefits**. This can be assessed in two complementary ways, through a physical modelling of assets as proxy; and through monetary valuation of changes in benefits. These need to be set against the various **additional costs** incurred in generating these benefits.

In this section, we consider the first stage. Section 5 details the cost benefit analysis estimates.

Assessing additional resources that the charity could generate

New Government funding through a 15-year funding contract

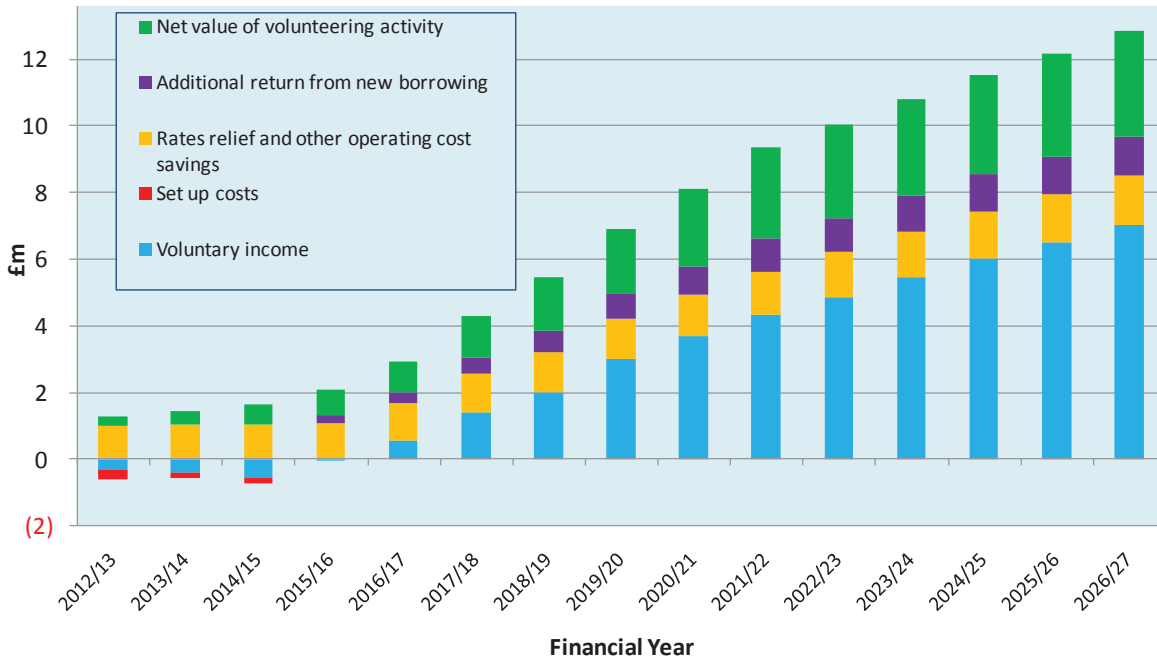
The new funding agreement (summarised in Section 2) is directly predicated on the creation of a charity that is viable in the long term, whilst having regard to budgetary constraints. Compared to the baseline assumption, the new funding contract, excluding the one-off payments, is worth on average an additional £15m per annum in cash terms from 2015/16.

New income and functionality potential for CRT

Analysis of new income potential has been provided by British Waterways for this Impact Assessment. Figure 3 summarises its illustrative projections of additional resources to CRT that are used in the asset curve and benefits modelling. All income figures are net of costs and are in nominal terms. We describe the key elements in turn. Further background to some of these issues can be found in the report produced for British Waterways in 2009, *Setting a New course: British Waterways in the third sector*.⁷

⁷ www.britishwaterways.co.uk/twentytwenty/setting-a-new-course

Figure 3 Illustrative projections of additional resources from moving to civil society



Note – assumes 75% prudence factor (see text). All figures are in nominal terms. Voluntary income figures are net of fundraising costs. The negative voluntary income in the early years indicates that expenditure on fundraising exceeds gross donations.

Fundraising (voluntary income)

It is important to emphasise that **future fundraising projections are hypothetical until the point at which the charity is created and it has the opportunity to fund raise**. They are not actual targets. Over time, the projections will “harden” through research and testing to develop an increasingly robust financial model.

At present, fundraising assumptions are based on three key data points:

- Canal-side research conducted in January and July 2010 which estimated the proportion of visitors who could be stopped for a conversation, and subsequently converted to various forms of financial support for a national waterways charity. This face to face quantitative interview research was carried out at around twenty BW waterway locations by BDRC, an independent market research company. Results from both ‘waves’ of survey were very similar.
- Broad ‘benchmarking’ against The Woodland Trust as an organisation with a scale of fundraising that the new charity could usefully emulate in the first 10 years.
- Discussions with Clive Mattock Fundraising (CMF) to discuss canal-side donor recruitment potential, including a detailed financial model.

Other assumptions are provided by THINK Consulting Solutions based on their knowledge of the UK fundraising sector and marketplace. Additionally, some focus group research (also by BDRC) was conducted in summer 2010 separately amongst boaters, visitors, and those interested in heritage et al.⁸ The researchers estimate that there could be around 1 million

⁸ The modelling of the results’ implications to produce projections for the charity was carried out by Think Consulting, a leading third sector fundraising consultants . The lead consultant was Margaret Bennett, who has over 20 years experience in fundraising including stints as Fundraising Director of WWF and Red Cross.

visitor parties each year with the profile (ABC1 35+) and level of interest in canals to become donors⁹. These data points suggest therefore that the potential for recruiting members/**regular givers** may currently lie between 85,000 and 130,000 for canalside recruitment (Table 2).

Table 2 Estimates of potential committed giving

	All visitor parties ¹⁰	Higher potential visitor parties ¹¹
Potential audience size	5.4 million	1.1 million
Intercept rate	26%	
	1.4 million	
Conversion rate	6%	12%
Likely to become a member or regular donor	85,000	130,000

Source: British Waterways

These figures might be boosted longer-term as the new charity becomes better known, and the need for public funding better understood. Other recruitment channels, especially online, will eventually supplement canalside recruitment but these have not been factored in as they are much more dependent on profile.

In addition to donations from regular givers, cash donations may also be raised from **local appeals**. These appeals may bring new donors on board who might later be converted to regular giving. No assumptions about recruitment or conversion of cash donors have been included in these figures as this work has yet to be fully defined.

Given the uncertainty of these fund-raising projections and the risks of under-achievement, British Waterways has applied a prudence factor which assumes that only 75% of the initially projected resources are generated.

In summary, this research suggests that by year twelve of a sustained investment programme in developing the volunteer and donor base there is the potential for a net contribution of £5.5 m (incorporating the 75% prudence factor) to £7.3 million (no prudence factor) from voluntary sources. It is likely that around 70% of this net contribution would come from regular subscriptions, donations and appeals, and the remainder from a mix of **legacies, companies and trusts**. This includes ad hoc donations, special appeals, regular contributions, legacies and others forms of donation and **partnerships and sponsoring**. Achieving these new income streams will require investment in building up the donor population and in recruitment (all figures are net), but will be aided by growth in volunteer population.

⁹ 13 million annual visitors to waterways (IWVS). Around 60% demonstrate an appreciation and enjoyment of the canal environment: walking, running, rambling, dog-walking, cycling, fishing. The core charity donor segment is ABC19 and people over the age of 45 are the best donors, with 35-44 years olds the next best group of donors. From the visitor profiling we might broadly estimate that 40% of visitors may fall into this core ABC1 35+ segment, equating to around 2.5 million of the 'interested visitors' who match the general profile of a charity donor. At 2.4 people per household this equates to 1 million households with both waterway use and charity donor profile

¹⁰ 11 million visitors divided into parties of 2.2 = 5 million

¹¹ Based on THINK's interested visitor + charity donor profile

It is possible that there could be displacement effects on volunteering and donations to other charities which are not measured here (but see section 7).

Additional income from fewer investment constraints

At present, British Waterways is limited by the 1962 Transport Act to borrowings of £35m. The new charity would have greater freedom to borrow against its assets, and this would allow the charity over the longer term greater flexibility in the management of its property endowment and new opportunities to expand the investment property portfolio using a conservative amount of long term borrowing. BW estimates that this would increase the charity's finances, on average, by up to £ 1m p.a. over ten years (reflecting uncertainties over the investment and the property market). The assumption is that CRT will be able to invest in investment properties that have a higher net yield than the cost of the borrowed funds and thereby generate a net margin on the additional investment.¹²

Business rates charity relief and other cost savings

The new charity is assumed to be eligible for rates relief. Combined with other savings on premises and positive changes in staff attitudes to seek out efficiencies as a working charity, BW project that these savings could amount to £1m p.a.

Note that rates relief represents a transfer from taxpayers to the charity. Therefore whilst this in itself is not the benefit, it is included in both sides of the cost-benefit equation: it represents a cost to the taxpayer which is counted under costs (see section 5 below), but as part of the additional resource that the charity can generate, it also feeds in to the benefits that arise from the waterways' network improvements that the new charity can bring compared to the baseline.

Increased volunteering

Greater efficiencies which come with the model and the greater use of volunteers in network maintenance (based on existing operational spend) are estimated to generate additional charity resources of approaching £3 m a year by 2025 in cash terms.

In modelling the public benefits, we do not model the additional income to the charity itself, rather the recreational benefits that flow as a result of the additional functionality which that additional resource brings. However, we do include direct benefits to volunteers and donors (see Section 5).

Consultation responses

A number of responses to the Government Consultation on the new waterways charity in spring 2011 expressed the view that the projections set out in the Consultation IA, although dating from 2010, appeared optimistic in the light of continuing economic difficulties. The net fundraising projections to 2020 have been refined and revised downwards during 2011, but the key point is that these projections necessarily remain hypothetical until CRT actually starts fundraising. British Waterways has begun the process of appointing a small team of fundraisers to oversee the development and launch of the fundraising programme. Two members of the

¹² The annual estimate of £1m is based on an expectation of borrowing of £100m with a 1% point margin between net income and interest.

team have so far been appointed, including the Head of Fundraising, with the remaining posts expected to be filled by June 2012.

Fundraising performance varies dramatically from charity to charity, especially in the early days when no matter how good the charity's approach, its performance will be dependent on strong fundraising expertise and sustained levels of investment being consistently available. Much depends upon how potential donors view the cause and the offer that is provided.¹³ At the same time, the consultation also elicited a range of suggestions of other ways in which additional income could be raised by the charity. These included:

- Local authority funding for sustainable transport initiatives
- More effective development/use of tourist opportunities: including heritage properties, retail and catering, holiday accommodation and leasing pleasure boat sites.
- The development of renewable energy schemes, primarily hydro-electric generation and social enterprise schemes
- Encouragement of corporate sponsorship of stretches of canal.

Many respondents suggested that more non-paying users of the waterways could be encouraged to donate time and money through effective publicity and information campaigns.

Given the wide range of income generation opportunities not currently open to British Waterways, it is difficult to judge the degree of optimism in the projections. The modelling recognises this uncertainty by adopting a range based on projections being fully and only half-realised, with 75% factor as the mid-point.

The Funding Agreement and Incentives to efficiency

All the analysis assumes that this additional income and resources is devoted to increased spending on the functionality and / or assets of the network. The Funding Agreement has been designed in order to provide strong incentives to the CRT to maximise its efficiency, avoid wastage and ensure a strong fundraising effort. It does this in a number of ways through:

- Continuing a long-term trend in declining government funding.
- providing a fifteen year contract that enables the CRT to plan for the long term taking full responsibility for managing the network (thus minimizing what economists call "moral hazard"); and
- making a portion of grant conditional on meeting clear and challenging targets on asset maintenance, towpath condition and flood risk management.

In the light of this, it is reasonable for the analysis to assume that all additional income and resources will be made available for the waterways.

¹³ For instance, a very successful example of a novel charity campaign is *Help for Heroes*, which was launched in 2007, and has raised £100 million in donations in just four years, fourteen times the highest figure for voluntary income in the CRT projections www.helpforheroes.org.uk/?gclid=CK_a2Y3px6oCFSKJtAodZDxEyw

5. Assessing benefits and costs

Analysing public benefits

A range of research, synthesised by Jacobs for Defra, shows that inland waterways provide a surprisingly wide range of goods and benefits. As a network of ecosystems, they provide a range of “ecosystem services”¹⁴. These are summarised in Table 3 overleaf.

Whilst some of these benefits are only likely to be realised where substantial investment is targeted at particular sites (e.g. a major restoration scheme), an overall increase in the resources available to the network (through improvements in assets, towpaths, access and so on) is likely to enhance these services and the value that they confer. This is also true where the effect of the charity is to *avert* the deterioration that characterises the baseline, rather than secure *new* benefits. Benefits that are most likely to be enhanced from additional funding are shaded in Table 3, with different shading representing potentially high and moderate impacts. On the other hand, any long-term deterioration of the waterways could undermine many of the benefits listed.

We compare the baseline and funding agreement in two distinct but related ways:

1. **Projection of assets in poor condition.**
2. **Monetized changes in recreational benefits** using “willingness to pay” values for recreational benefits that reflect people’s revealed preferences. Only the change relative to the Baseline Scenario is modelled. Because there are reasonably robust valuations of the recreational benefits of waterways (see Annex 2) these form the basis of the quantified benefits in this Impact Assessment. *Note that these are not cash benefits, but are improvements to social welfare that are expressed in measurable monetary terms to facilitate the cost and benefit analysis following HM Treasury Green Book guidance on policy and project appraisal.*¹⁵

Recreational benefits are modelled in relation to the “**functionality**” of the waterways, which relate to general public-facing management and upkeep of the waterways rather than repairs of major capital assets such as locks and so on. Examples of functionality are towpath repairs, access management, vegetation and tree management, boundary maintenance, litter removal, customer services and spot dredging. These will have an impact on leisure (boating) income and public benefit. Functionality spend improves the appearance and usability of the waterways, for example enabling exercise and other outdoor activities and reducing concerns about security and crime. These improvements result in increased visits and increased value per visit. This expenditure is not the same as that which goes on major capital repairs and upkeep (e.g. on locks and bridges).

For the purposes of monetizing benefits, we assume that all additional income is allocated to functionality spend, where there is a more intuitive link with recreational benefits. This will be unlikely to be the case in practice, but it does not affect the logic of the analysis.

¹⁴ using the conceptual framework of the UN Millennium Ecosystems Assessment (2005) and UK National Ecosystem Assessment (2011).

¹⁵ See HM Treasury Green Book, Annex 2, www.hm-treasury.gov.uk/data_greenbook_index.htm

Table 3 Benefits of inland waterways within an ecosystem services framework.

<p>Provisioning Services</p> <p>Provisioning services result in products being provided by the environment (ecosystems), such as food, fibre, fuel and natural medicines. In relation to inland waterways, these relate mainly to the provision of economic benefits such as:</p>	
Creation of business opportunities	Creation of business opportunities (e.g. marinas, restaurants and shops). These are not necessarily welfare benefits given potential for displacement and relocation of activity.
Property premium	Property / land price premium on commercial and domestic property in proximity to inland waterways
Renewable energy	The provision of renewable energy opportunities
Transport	Transport routes (e.g. freight, commuters)
Provision of water	The provision of water for supply for abstraction
Utilities	Laying of cables along towpaths
Volunteering	The availability of volunteers
<p>Regulating Services</p> <p>Regulating services provide benefits obtained from the regulation of ecosystems processes. One reason why regulating services are important is that they provide 'infrastructure' and 'insurance' values. In many cases it is necessary to maintain at least a minimum set of these services in order to ensure a reliable and sustainable flow of the resulting benefits. The regulating benefits identified for inland waterways are:</p>	
Carbon savings (renewable energy and transport)	Climate regulation and carbon savings (e.g. from freight, walking / cycling which displace other more carbon-intensive modes of travel)
Drainage, water conveyance, flood protection and alleviation	Drainage and the conveyance of water away from populated areas, thereby possibly providing flood protection and alleviation benefits along with other benefits
Water regulation and pollution dilution	Water cycling and pollution removal and dilution

Water quality	Water quality improvements		
Cultural Services			
Cultural services provide the non-material benefits people obtain from the environment through spiritual enrichment, cognitive development, reflection, recreation and aesthetic experiences. This category therefore includes both direct non-consumptive uses and non-use values as follows:			
Recreation (all forms)	Land based recreation, including informal users, walking / running / dog walking, cycling, bird watching, events / festivals, visiting heritage sites Water based recreation, including angling, boating (hired and owned), canoeing / kayaking, waterskiing, sailing, rowing and jet skiing		
Visual amenity	Visual amenity of navigable waterways (partly captured by property uplift)		
Education	Social benefits, including community regeneration / capacity building, social enterprise and volunteering. Regeneration may lead to other benefits including reduced crime and vandalism, improved community image and heritage benefits; education and training opportunities and quality of life improvements		
Volunteering			
Community benefits			
Non-use values	Non-use values, including habitat restoration and provision that are not captured elsewhere, and valuation of heritage.		
Supporting Services			
These functions that are necessary for the production of other ecosystem services from which we benefit, such as habitat formation, biodiversity, soil formation and nutrient cycling			
Habitat and biodiversity	Inland waterways provide important wildlife corridors, providing and linking habitats in town and countryside in an increasingly fragmented ecological network (highlighted by the recent Lawton Review, <i>Making Space for Nature</i>). The network currently includes over 70 SSSIs and over 1000 other nature sites.		
Source: adapted from Jacobs (2010).	Key	High impact from charity creation	Moderate impact from charity creation

For purposes of asset condition modelling, we show two variants, in which:

- all additional income is allocated to principal asset maintenance; or
- part of the additional income is allocated to asset maintenance and part to increased spending on the core waterways in order to avoid a growing backlog of disrepair and dredging – this has been termed “full (or 100%) closure of the gap in critical functionality”.¹⁶

In practice there will be a judicious mix of functionality and principal asset expenditure, which in the charity’s judgement, would maximise overall long-term public benefit. In an economic sense, asset maintenance can be considered as the opportunity cost of functionality spending and therefore the two in principle would be of equal value at the margin of trade-off. What is clear is that the condition of assets, recreational enjoyment and wider public benefits of the waterways are closely related:

- Assets in poor condition will affect amenity and heritage benefits of the waterways, increasing actual and perceived health and safety risks.
- Asset failures will affect access through possible towpath, bridge and navigation closures
- A maintenance cost spiral on assets would ultimately lead to a reduction in functionality expenditure. Equally, improving the condition of the assets would ultimately free up more resource for functionality.

Further research – in particular a new primary valuation study on the benefits of the waterways - could help tease out better the linkages between, and relative values of, spending on primary assets and towpath functionality.

1. Projecting asset conditions

Figure 4 shows that the Funding Agreement and creation of the charity will stabilise asset condition and avoid the serious deterioration that would happen in the baseline. It also shows the trade-off between additional spending on functionality after 2015 (“100% functionality gap closure) and maximum spending on the principal assets (“0% functionality gap closure”).¹⁷

British Waterways’ asset modelling applies a 75% “prudence factor”, which assumes that 75% of net fundraising projections are met.¹⁸ In fact, the modelling shows that if this prudence assumption is varied from 50% to 100% the asset condition projections barely vary until 2024, and then only marginally: in 2026, applying this range has the effect of varying the proportion of assets in D&E categories by less than two percentage points. This reflects several factors:

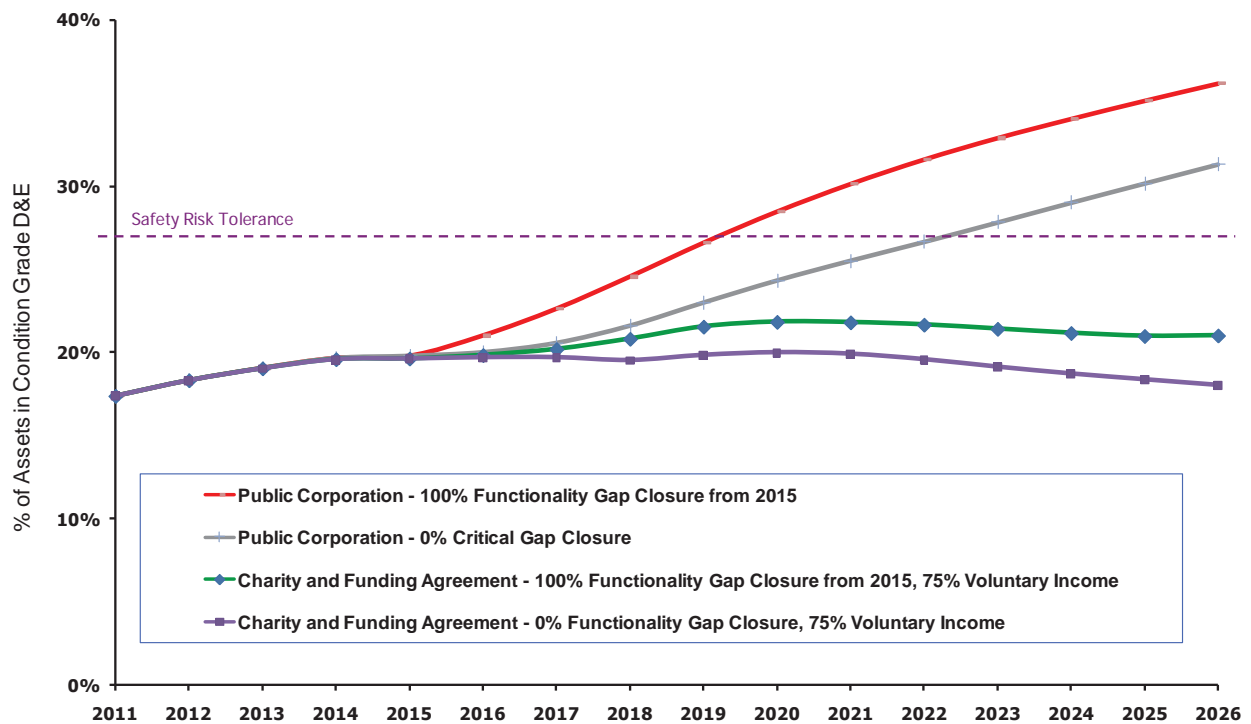
¹⁶ “Critical functionality” has been defined by British Waterways as identifying those elements that if not maintained at “steady state levels” would lead to an escalation in deterioration; these include dredging, tree management and vegetation, towpath management (not funded by enterprise), boundary, car park and mooring maintenance.

¹⁷ Note that in British Waterways’ modelling of the assets, additional volunteering activity is not applied to maintenance of primary assets, but only applied to closing the “functionality gap” (e.g. through voluntary activity assisting towpath management).

¹⁸ This differs from the sensitivity in the cost-benefit analysis which varies gross fundraising by 50%, 75% or 100%. See footnote 23.

- the assumption that the sensitivity only applies to net fundraising income;
- the variation in income only accounts for around half the projected additional charity resources, and a lower proportion still of the total additional resources going to the waterways which includes new money from the Funding Agreement;

Figure 4 Proportion of assets in poor and very poor condition, 2011-26 – comparison of baseline and funding agreement



Also relevant here is the fact that these projections of asset condition depend not just on additional grant and charity income but also on overall cost projections and on the baseline income streams from commercial portfolio which can be sensitive to property market conditions. Defra has reviewed the underlying business projections in the model and is satisfied that the assumptions are prudent and plausible. For the baseline projections to shift significantly would involve a substantial, sustained or exceptional change to BW’s income and expenditure. One notable instance of this has already been factored in, namely updated additional annual commercial income in relation to the disposal of Wood Wharf in London’s Docklands.

This modelling has provided a common evidence base for agreement between Defra and the CRT on the level of performance related targets in the Funding Agreement (See Annex 1). As noted earlier, the “safety risk tolerance” line in Figure 4 refers to a threshold past which British Waterways consider that arrears of maintenance and the risks they pose to public safety become critical.

2. Modelling benefits

The monetized benefits arising from the Funding Agreement is compared to the “Do nothing”. While there are a range of public benefits from charity creation, evidence from the Jacobs

research and analysis by British Waterways show that the most significant impact is on recreation. Because there are reasonably robust valuations of the recreational benefits of waterways, these form the basis of the quantified benefits in this Impact Assessment.

As stated above, these recreational benefits are modelled in relation to the “**functionality**” of the waterways, which relate to general public-facing management and upkeep of the waterways rather than repairs of major capital assets such as locks and so on (although the condition of the latter will also affect public benefits and use). These have an impact on leisure (boating) income and public benefit. Spend on functionality improves the appearance and usability of the waterways, for example enabling exercise and other outdoor activities and reducing concerns about security and crime. Such improvements, as set out in the recent Jacobs research for Defra (Annex 2) are expected to result in increased visits and increased value per visit.

British Waterways and Defra economists have conducted indicative modelling to illustrate potential changes based on how recorded visitor numbers (285 million visits averaged over 2007-9) and willingness to pay per visit to the waterways (£0.78 to £1.10) might reasonably change in response to changes in baseline spending on the waterways. The source and estimation of the baseline willingness to pay values are set out in Annex 3.

To translate these baseline values into marginal values, British Waterways has developed a model prioritising in order the operational activities (other than safety-related activities such as water control) that would be affected incrementally by reference to the scale of expenditure change in each scenario. This modelling sets out how changes in expenditure might feed through to different elements of functionality and then makes plausible assumptions, based on expert judgement, about how this affects visitor numbers and the value of each visit. While evaluation and survey evidences demonstrate that waterway condition has a bearing on both use and public benefit,¹⁹ it is not possible convincingly to link levels of expenditure to public benefit in a robust way, so expert judgement has been used. In the modelling, annual visits, following a three-year lag, are calibrated to increase by around 6% and willingness to pay per visit by 8% for functionality changes of around £10m.²⁰ These appear to be conservative but highly plausible assumptions.

- A visitor monitoring programme at sites in the West Midlands (Stourbridge and Walsall) in the late 1990s demonstrated that towpath visitors increased by 110% over a number of years as a result of towpath and environmental improvements, although the increase may not be fully attributable to those improvements.²¹ See Annex 4 for further detail.
- Latest Jacob research for Defra is based on assumptions of increased (or decreased) value per visit and number of visits as a result of substantial increases or decreases in funding (Annex 2).
- Market research in 2010 for the Environment Agency also confirmed that users of their waterways would visit more if facilities were improved. In contrast, facilities and access

¹⁹ For instance, Jacobs for British Waterways, *Economic Evaluation of the Rochdale and Huddersfield Narrow Canals Restoration* (August 2010)

²⁰ These percentage changes appear precise because they are an interpolation of a calibration which relates a £40m functionality cut to a 30% or 40% reduction in number of visits and value per visit respectively.

²¹ It is worth noting that the number of visits (around 285 million) is much greater than the number of visitors (13 million) to the waterways, which means that many visitors will be frequent users of the waterways (e.g. for jogging, cycling, commuting, dog-walking etc). Regular users will be more likely to notice improvements and may therefore account for a significant share of the additional visits.

were less important for non-users than personal preferences, such as how they wish to spend their leisure time, although improvements could still have some effect in attracting previous non-users.²²

Overall, the increased benefit from greater functionality is calculated as the difference between aggregate willingness to pay under Option 2 and baseline aggregate willingness to pay. The difference will be a product of plausible changes in visitor numbers and in value per visit. We test these assumptions through sensitivity analysis in Section 6.

Summary of key modelling assumptions

- The appraisal period is 16 years, reflecting the length of funding agreement, set up costs in 2011/12, and the long-term nature of the challenges and changes.
- A **low – high range** is generated by varying two key variables:
 - Baseline average willingness to pay (WTP) values per waterways visit (£0.78 to £1.10) - see Annex 3.
 - Extent to which fundraising projections are realised - varying gross fundraising between 50% and 100% of the base British Waterways projections.²³
- All conditional grant is paid.
- Baseline WTP values are fully applied to all additional visits. In the base analysis, no displacement assumption from other leisure activity is applied to additional visits. The issue of displacement is addressed in the sensitivity analysis.
- Voluntary benefits monetised but other benefits not monetized (although Jacobs have attempted to estimate the amenity benefits of waterside living through property value uplift)
- Three-year lag between change in income and change in functionality benefit.
- Response of unit WTP and usage to changes in functionality (for changes of around £10m, annual visits change by around 6% and willingness to pay per visit by 8%), which are derived from previous British Waterways modelling and based upon expert judgement; these are reinforced by latest Jacobs research on benefits of waterways.
- All future costs and benefits measured in 2011 prices (inflation is stripped out), and discounted to the base year of 2011 so that costs and benefits occurring at different times can be measured on a consistent basis. The Treasury recommended discount rate is 3.5% for appraisals up to 30 years. The discount rate implies that costs and benefits are valued less (from the standpoint of the present) the further into the future they are incurred.²⁴

²² Environment Agency, *Valuing waterways* (2010)

²³ This slightly differs from the prudency assumption used in the asset modelling above, which affects net, rather than gross, voluntary income. This is because a more realistic net benefit range can be generated by holding costs fixed and varying fundraising.

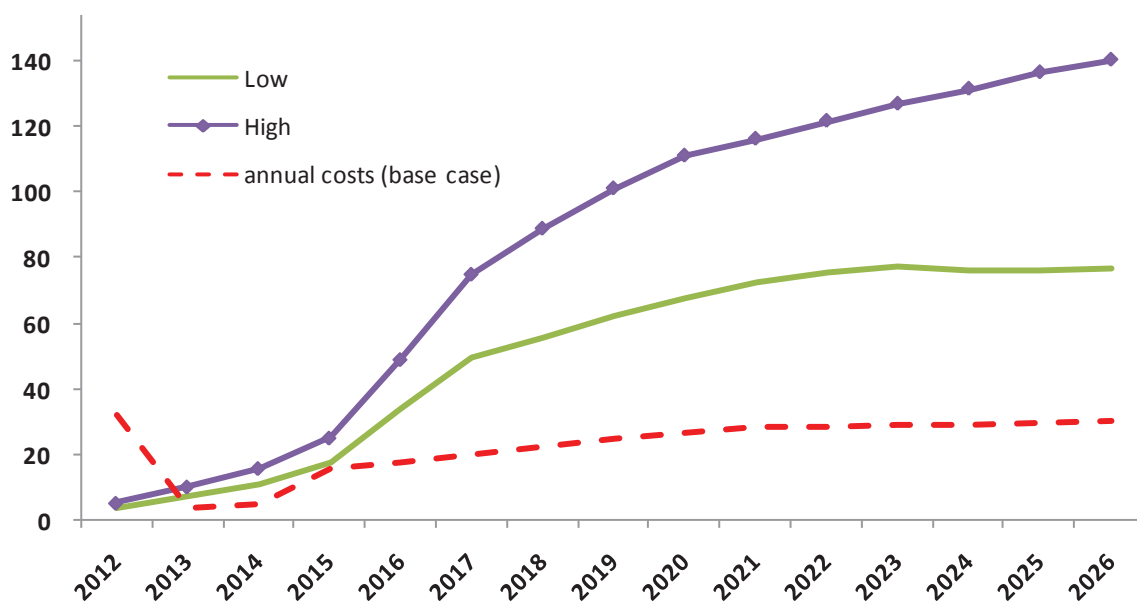
²⁴ This basically reflects future economic growth (as we grow richer we value additional benefits less) and social time preference (other things being equal, we prefer to consume now rather than tomorrow).

- Inflation assumptions are based upon estimates of the GDP Deflator which is a broad economy wide measure of inflation and is published by the Office for Budget Responsibility (recent publication 29 November 2011 for the Autumn Statement):
 - 2012 2.8%
 - 2013 on 2.5%

Summary recreational benefits

Based on the above assumptions, Figure 5 shows the profile of the average recreational benefits over time, together with annual costs which are explained further down. Over the period annual recreational benefits (based on willingness to pay) are estimated to average from £46m (low WTP assumption and 50% fundraising projections realised) to £78m (high WTP assumption and 100% fundraising projections realised). Note that these benefit estimates do not represent realisable financial benefits, rather the enhanced welfare to individuals using a better maintained waterways network (relative to the baseline) for informal recreational purposes.

Figure 5 Profile of annual recreational (wtp) benefits and annual costs relative to baseline (£m)



The present value (in 2011) of these benefits over 16 years is estimated at £672m. These account for nearly 90% of the monetised benefits in the cost-benefit analysis.

Benefits to residents, donors, volunteers and boaters

The modelling above considers only recreational use benefits. It does not include specific **localised amenity benefits**, which would be reflected in changes to property value premia: the 2011 Jacobs research for Defra shows that these are worth around 10% of the total change in

benefits in their scenarios of substantially reduced or increased spending.²⁵ However, owing to the significant uncertainty involved, we have not included any explicit estimates for these values in the cost-benefit analysis.

The recreational benefit estimates focus only on broad recreational use values and do not capture the direct personal, non-use and option values that are likely to be captured through **donations, membership and voluntary service**. Evidence from the Jacobs research suggests there are substantial non-use values people have for the network, its heritage and other values (£24 - £180m per annum), which are very likely to deteriorate in the baseline scenario presented here. In addition, the CRT is likely to seek to find ways to provide direct benefits to regular donors through membership and the engagement and sense of civic ownership that brings.²⁶ Because of these considerations and the voluntary decisions of donors and volunteers, the modelling explicitly estimates additional benefits from donating and volunteering equivalent to their value to CRT. Indeed it is arguable that the benefits of volunteering are likely to exceed the value to CRT to the extent that they generate wider social benefits and examples of community engagement.

In addition, whilst the recreational benefits modelling captures feedback effects through **changes in boating use** and income from increased functionality over the baseline (averaging under £3m p.a. over the appraisal period) it does not itself account for the benefits to boaters of that increase. The same assumption used for volunteers and donors can therefore apply to increased boating income that is modelled as functionality increases – it can be assumed to represent the minimum benefit boaters receive from the improvement.²⁷

Taken together, these benefits are estimated to average £6 - £10m per annum over the appraisal period, depending upon assumptions about fund-raising, with a present value of £92m – around 14% of recreational benefits. However, given the uncertain and imprecise nature of these assumptions, the sensitivity analysis considers the impact of omitting them.

Costs associated with CRT

Averting baseline deterioration of the waterways for public benefit is not costless. For instance, fundraising costs have already been netted off from the projected increase in income to the charity, but in a cost benefit analysis, they represent real opportunity costs which must be set against the public benefits which the charity will bring. British Waterways have identified a number of costs involved in creating a waterways charity which are necessary in order for it to generate the income that leads to public benefits. **All costs should be considered illustrative.** There are three main categories of costs:

²⁵ Jacobs (2011), pp. 96-7.

²⁶ For example, the Woodland Trust's website sets out a range of personal benefits from individual membership. www.woodlandtrust.org.uk/en/support-us/membership/benefits/Pages/welcome-pack.aspx

²⁷ Note that this represents a refinement of the Consultation Impact Assessment, which did not explicitly account for, on the one hand, the costs of increased functionality, and on the other, the benefits to donors, volunteers and boaters which underpins that increased functionality.

Set-up and transition costs

A range of additional activities for British Waterways have been necessary as part of the process of creating the new charity, and further set-up and transition costs will be incurred by CRT after vesting. These costs, amounting to £2.6m are spread across 2011/12 and 2012/13. These include items such as research into fund-raising and associated recruitment, software and training, tax and pensions advice, legal costs, change programme costs and fees relating to council elections. In addition to these costs, once the charity is set up, British Waterways anticipates further transition costs of up to £0.6m over the first three years of the charity, related principally to launch events and activities plus marketing campaigns, net of some IT savings.

Marketing and fund-raising costs

Developing and sustaining contributions of donors and volunteers will require ongoing expenditure on recruitment fees, management, administration and marketing. These are likely to involve costs that are both related to, and independent of, levels of fundraising generated. As fundraising activity ramps up over the coming years, these are estimated to rise to around £5m per annum by 2021.

Costs of additional functionality

The more grant and charitable income the charity has, the more it will spend on the waterways. In real terms, spending on the waterways is estimated to average over the fifteen year period some £17m p.a. greater with the **Funding Agreement** (together with additional charitable income and feedback effects), than in the baseline. These are resource costs which are included explicitly. The question of who funds these additional costs is important in determining benefits. In the case of donors, volunteers and boaters (see section above), there are associated benefits which help to offset these costs; in the case of taxpayers, there is by definition no equivalent voluntary or service benefit. Note that grant funding is not a transfer payment as the additional grant is effectively “buying” a higher quality waterways network. In addition, the charity is expected to claim **rates relief** of up to £1m per year. This would represent a loss of revenue to local authorities / central government and so is included as a cost as well as contributing (via functionality) to public benefit.

In the analysis we also conservatively assume that the **one-off payment of £25m** to protect the charity against the risk of a rising historic pension deficit is effectively a deadweight (but necessary) cost that “buys” no additional corresponding public benefit in terms of additional investment in the waterways. However, it is not clear that this would actually be the case relative to the public sector counterfactual - in which case the additional funding would generate additional net benefits down the line.

Note that in varying the prudence assumption for fund-raising, we assume that CRT fundraising costs remain the same but that the level of funds raised varies. This may not be quite true in practice where costs are directly related to income, for instance through commission fees. However, it does not materially alter the analysis and the main point of this variation is to test the sensitivity of the projections in a prudent way. The effect on costs of varying the prudence assumption is through greater or lesser functionality generated by the difference in voluntary income and through feedback effects on income and functionality of additional boater activity.

Summary of costs

Taking these various costs together, over the fifteen year period of the funding agreement, these average out on an annual basis at between £19 and £23m (varying with the prudency assumption for fundraising projections), with a best estimate of £21.4m. These costs have a net present value of £225 – 262m, with a best estimate of £244m.

Summary of estimated costs and benefits of creating the charity

Table 4 summarises the **net present value** (PV) of costs and benefits (i.e all costs and benefits over the 16 year period adjusted to 2011 present value using a discount factor and summed), including a range reflecting:

(a) variation around the baseline willingness to pay assumptions (£0.78 to £1.10 per visit) with the mean value as best estimate;

(b) variation around the extent to which gross fundraising projections are met (50% to 100% of British Waterway projections), with 75% as best estimate.

Table 4 Summary of costs and benefits compared to baseline (£m)

All figures in £m, to 2027, compared to baseline	PV Costs	PV benefits	Net PV	Benefit Cost Ratio (to 1)
Low (50% fundraising; low WTP assumption)	225	567	342	2.5
Best estimate (75%; mean WTP)	244	764	519	3.1
High (100%; high WTP assumption)	262	949	687	3.6

6. Sensitivity analysis of key assumptions

The principal sensitivities have been captured in the ranges provided above. Here we test other sensitive variables to identify the impact on net benefits and in particular how far they would need to change to reduce benefits below costs.

1. Assumptions on fundraising projections

The impact on the cost-benefit analysis of voluntary income projections substantially failing to meet projections is relatively muted. There are three reasons for this:

- costs would be expected to be lower in a scenario in which fundraising underperformed, either because some of these costs would vary directly with donations, or because campaigns would be scaled back if it was realised that significant donations were not forthcoming;
- other forms of charitable income and resource would be unaffected
- the additional grant funding continues to generate benefits that would otherwise not accrue.

Even if we assume that only 25% of voluntary income projections were realised with costs unchanged, net present value would still be estimated to be between £280m and £450m (depending upon the base WTP assumption used). Indeed, for the reasons given above, there is no “break-even point” for fundraising projections to fall below such that the overall net benefits of the charity go negative, and this would still apply if no additional grant funding was included in the appraisal.

It is also quite possible that CRT fundraising could exceed expectations, a scenario which was included in the consultation stage IA. Were projections to be exceeded by 50% over the next fifteen years, net benefits in present value terms would increase to £490 - £750m (depending upon WTP assumption).

2. Recreational benefits – baseline Willingness to Pay (WTP) estimates

There is inevitable uncertainty around non-market valuation of benefits, particularly where values are transferred from old studies (see Annex 3). However, for the Charity and funding option to become less beneficial than the baseline, average WTP per visit would need to fall to below **£0.22**, from the base-case mid-point of £0.78 – 1.10. This **threshold value** is deemed implausibly low and is not borne out by any empirical evidence. In fact, Annex 3 sets out a number of reasons why the baseline WTP estimates are likely to be *understated*.²⁸

3. How usage and WTP vary with functionality

While it can be demonstrated that waterway condition has a bearing on both use and public benefit, it is not possible convincingly to link levels of expenditure to public benefit in a precise or robust way and expert judgement is needed of plausible nationwide changes in usage and

²⁸ Note that the benefits will also be sensitive to the assumption on baseline annual visits.

willingness to pay. As stated in section 5, British Waterways modelling assumes that, for functionality changes of around £10m, annual visits (following a three-year lag) increase by around 6%. Value per visit is assumed to increase by 8-9%. A more muted response would reduce the beneficial effects of the charity and funding agreement. To become less beneficial than the baseline, the increase in visits and WTP following each £10m change in functionality would need to fall to below 2%. This is considered implausibly low. Indeed, for the reasons given elsewhere in this IA, more substantial changes in towpath usage are far more likely. As for unit values, the original valuation studies show that WTP varies between different quality sites and that people are willing to pay significantly for restoration (Annex 3).

4. Applying WTP estimates to new visits and visitors

Related to the two issues above, our benefits analysis assumes that the unit consumer surplus (willingness to pay) estimates are applied to new visits / visitors to the waterways as a result of increased functionality spend. Yet it is not clear from the original study to what extent these estimates were net of the opportunity costs of alternative recreational activities. The opportunity cost of travel time partly captures this, but it is likely that there is some overstatement for any given assumption about new visits.

We have not directly factored in possible visitor **displacement** into our estimates, partly because there are a range of other reasons why the estimates may be understated (see Annex K); partly because there is no obvious robust assumption to apply. Instead, we can test the robustness of the final estimates of benefits by adopting the extreme assumption that there are either no additional visits, or that the welfare benefit derived from additional visits to the waterways is negligible because visitors have been diverted from nearly equally valuable recreational activities. This is clearly an implausible assumption – by definition, if people choose to make new or additional visits to waterways as a result of towpaths being better and safer, it is because they derive a benefit from doing so. But it serves to expose how sensitive the analysis is to assumptions on visitors.

Latest research for Defra by Jacobs on estimating value of benefits from investing in specific case study sites judges that around 20% of additional visits estimated at case study level would be additional at the national aggregate level, because many visitors will simply switch between waterways.²⁹ This assumption is not directly relevant for the scenario here, which is not based on case study modelling and where conservative assumptions are already made about additional visitors at the aggregate level (addressed above). In any case, even displaced visits from other recreational activities elsewhere (e.g. woods, parks, beaches) would still represent additional welfare benefits simply because the choice of visit has changed.

However, for the purpose of sensitivity testing the analysis, the effect of these moderate and extreme pessimistic assumptions on NPV are summarised in Table 6. Even assuming total displacement, NPV is still significantly positive because of the increased value that can be assumed to accrue to existing visits.

²⁹ This assumption comes from the Huddersfield and Rochdale Economic Evaluation (Jacobs 2010) which in turn is based on the review of a range of economic impact assessment where displacement is considered.

Table 6 Sensitivity analysis on additional visitor benefits

Base assumptions on additional visitors (NPV, £m)	Assuming 20% of new visits are additional (NPV, £m)	Extreme - no increase in visitors / full displacement (NPV, £m)
519	269	216

In view of (a) strong evidence that visits rise with towpath improvements (Annex 4); and (b) reasons to suggest that our base WTP estimates understate preferences, reinforce confidence that the conclusion of substantial net benefits from additional spend on waterways is robust.

5. Assumptions on benefits to volunteers and donors

In the last section we highlighted the issue that, in addition to broad recreation benefits, there were also direct but less tangible benefits, based on non-use values, option values and social values, from donation and membership and volunteering. Together with benefits from additional boating these have a net present value of around £90m. Even if these were completely excluded from the analysis it is evident that this would not materially affect the overall conclusions.

Conclusion

Taken together, this sensitivity analysis suggests that the conclusions of the basic cost benefit analysis of the Funding Agreement and creation of the charity is robust to some of the key uncertainties in the basic analysis. The absence of other non-monetised benefits such as amenity benefits (property value uplift) and wider social benefits (see Section 7) further strengthens the conclusions of the quantitative analysis.

7. Wider impacts

Direct costs and benefits to business and others

The creation of CRT and the funding agreement contain no material regulatory measures and so they are not expected to impose or reduce costs to businesses or civil society in any direct or material way. For example, there is no legislative change which increases or reduces constraints on the level of boater fees. British Waterways currently generates commercial income from users through craft licensing and moorings, and the level of such user fees is not considered to be affected by the creation of the charity per se. Indeed, boating interests will be well represented on the charity's Council and will be able to influence the charity's policies. At the same time, one of the benefits of moving out of the public sector will be that it should enable and encourage more innovation and diversity in the way the new charity grows its income from wider sources.

There is a notional risk that a successful charity might displace a degree of fundraising and volunteering from other third sector organisations. However, this issue was only raised by a very small number of respondents during the 2011 consultation, and in the absence of evidence at this stage, the risk remains a theoretical one, and one to be assessed in future reviews. Whilst the possibility of displacement is potentially a wider issue for the Big Society agenda, a recent Government Green Paper on *Giving* also highlights the overall potential to increase donations and volunteering across society and create a culture change in giving. In other words, there is not necessarily a "fixed amount" of giving to be competed for by civil society organisations, particularly when a longer term view is taken. Exemplars such as the creation of CRT can support this broader agenda.³⁰

Creating CRT is not expected to have any material impacts on competition. That is primarily because waterways recreation is not currently a matter of competition between different suppliers. Towpath and waterway recreational activities are not currently properly priced to reflect their benefits, and the new charity will help to capture some of the value which users and citizens place upon the waterways through subscriptions and volunteering.

Social, spatial and equality analysis

As the benefits analysis indicates, a new charity for the waterways would promote higher quality waterway environments than would otherwise be the case, and better recreational value. Closer local engagement cuts across many of the other benefits – it will help local people recognise what the waterways have to offer in terms of public health, well being and green travel to work, as well as opportunities for enabling regeneration in both inner city and rural areas. British Waterways is currently perceived by some stakeholders as being publically owned and the responsibility of Defra to fund. Civil society status, combined with the long-term funding contract, should improve overall public engagement in governance of the waterways through more willingness to take responsibility and get involved in decisions which affect their future.

³⁰ Cabinet Office, *Giving Green Paper* (December 2011). The consultation runs until 9 March 2012. www.cabinetoffice.gov.uk/news/big-society-plan-new-culture-generosity

The majority of boat owners using the waterways are male (79%), and above 55 years old (62%)³¹ but in terms of overall visitors there is greater diversity, in particular lower socio-economic grades are as prominent as higher grades (Table 7). For all canal visitors, there is a slight under-representation of very old and younger people, of females, of people from ethnic minorities and of people from the C2DE social grades. This reflects the general pattern of visits to the outdoors.

Table 7 Demographic statistics on national inland waterway use, 2007-9 (mean)

Category	% of users
Over 65	19
Male / female	48 / 52
Black Minority Ethnic	8
ABC1	47
C2DE	53

Source: Inland Waterways Day Visitors Survey

It is intended to widen involvement of all sections of society in inland waterways irrespective of age, gender, disability and so on. CRT has the potential to bring benefits for lower income groups, women and those from ethnic minorities who visit waterways less often than the wider population. Geographically, most of British Waterways' canals are found in the Midlands and in the north of England, many of which run through inner cities. "Index of Multiple Deprivation" data analysed by British Waterways shows that **nearly three-quarters of the 10% most deprived areas in England are within 5 km of an inland waterway**. These areas also tend to suffer from limited green space.

Maintaining and enhancing the waterways can also play a role in enhancing social inclusion, for example through:

- Opportunities for access by disabled people. Compared with paths and recreation sites in the wider countryside, waterway towpaths are often flat and level.
- The creation of social capital and educational benefits through the involvement and participation of local communities (including children) in water-related activities and volunteering. Increased local or civic pride in the canals could also be significant. This is a particular opportunity in inner city areas, where public open space is often limited.
- Specific schemes and initiatives to engage with vulnerable groups in society e.g. young offenders.

In contrast a decline in funding for the waterways in the baseline case without the creation of a charity could exacerbate social exclusion, whilst reduced maintenance and asset deterioration could lead to increased anti-social behaviour.

The Jacobs research shows that canals generate more value in urban than rural areas, reflecting differences in towpath density. GIS data suggests that 88% of households within

³¹ Boat-owners views survey

100m of BW's waterways are urban based. However, canals link together urban and rural areas, and urban dwellers visit rural sections of canals. It is not possible at present to assess whether there is likely to be a disproportionate effect on rural areas, although it will be for the CRT and through local engagement to decide how best to spend its limited resources across the network. The latest Jacobs research for Defra (Annex 2) includes a range of urban and rural case studies.

An Equality Impact Assessment screening test was undertaken at the consultation stage and a full Assessment is not required.

Greenhouse Gas Emissions

The Jacobs (2010) review of the benefits of inland waterways addressed the potential benefit of transport related carbon savings associated with the displacement of road freight to water freight. A report in 2008 by the Inland Waterways Advisory Council (IWAC) assessed freight transport by the inland waterways network and how it could be increased, and presented average estimates of the carbon savings of transporting freight by water rather than by road. The Jacobs report summarises this by showing that for every thousand freight tonne transported one kilometre by water rather than road, there is a saving of 0.06 tonnes of carbon. Thus a journey of 10km by a barge carrying 500 tonnes represents a movement of 5000 tonne km and an implied saving of 0.3 tonnes of carbon, which converts to 1.1 tonne of carbon dioxide equivalent, each tonne of which would be valued at £52/t per year (2011 non-traded carbon price).

These baseline GHG benefits are relatively small, and far less than the benefits of recreational use. Moreover, it is important to avoid taking a partial approach to GHG impacts, given there are carbon costs associated with the infrastructure and operation of facilitating freight on the waterways. Clearly a vessel is likely to be carbon beneficial compared to a lorry. However, the road infrastructure is available to lorries and whilst they create the need for maintenance (which will have carbon impacts), maintaining waterways for freight is likely to be more carbon intensive, for example the need for dredging sediment and transporting it by water or road to specialist waste sites (where further drying and treatment may be required, particularly if there is contamination).

In any case, whether there are likely to be benefits will, according to Jacobs' research for Defra, be very site specific and unlikely to be significant. We do not therefore consider marginal reductions in transport or energy related carbon emissions to be robust or significant enough to be quantified.

Impacts on wider environmental services have been summarised in the ecosystems framework in the benefits section. No major environmental impacts are expected, although long-term deterioration of the major assets could undermine the drainage and possible flood alleviation benefits provided by the network.

Health and wellbeing

Improved health and well-being through use and enjoyment of the waterways is one of the motivations behind creation of the charity. Environment is one of the main determinants of

human health alongside education, housing, employment, crime and transport.³² Greater contact with the natural environment can also have beneficial effects on physical activity is a key determinant of health, as recognised by the Natural Environment White Paper and its evidence base.³³ These beneficial impacts will to a large extent be captured by the willingness to pay estimates of benefits for recreational and informal use of the waterways, although they would not include any savings in health treatment costs.

The Funding Agreement will avoid the most significant risks of an underfunded network in which health and safety risks increase as assets deteriorate and are susceptible to failure.

Human rights and justice.

No potential impacts which result directly from the creation of the charity are expected.

Sustainable Development

Overall, **the balance of monetised and non-monetised costs and benefits and the sustainability issues is considered to be strongly positive.** The major costs and benefits of creating a charity are monetized. Monetizing other benefits (e.g. property premia) would increase the benefit-cost balance, as would the non-monetized benefits in terms of local engagement and increased volunteering (although these have been partly monetized). The only significant potential non-monetized cost would be possible displacement effects on the fundraising of other recreationally and environmentally oriented charities. The waterways are multi-functional and provide a range of benefits and services, and whose heritage assets are to some extent irreplaceable.

In short, consideration of sustainable development issues reinforces the case for the funding and the charity.

³²Department for Health, Health Impact Assessment Guidance – screening questions. www.dh.gov.uk/en/Publicationsandstatistics/Legislation/Healthassessment/DH_4093617

³³www.defra.gov.uk/environment/natural/whitepaper/

8. Evaluation and Review

Government expects policies to be evaluated after implementation because such evaluation can yield invaluable insights, in terms of what works, what could be improved, and how others can learn from the approaches used.³⁴

Implementation - realising benefits

The Funding Agreement recognises the importance of realising the benefits set out in the appraisal, by making a portion of grant funding conditional on the satisfactory completion of three KPIs, based on the previous year's performance (Table 8):

Table 8 Performance indicators for conditional funding

Relevant KPI	Applicable Measurement	Warning Threshold	Breach Threshold
(i) Safe Waterways:	Asset management to be in accordance with PAS-55. Percentage of assets in Class D and Class E shall not rise to or above the relevant thresholds.	23% in Classes D & E	25% in Classes D & E
(ii) Towpath condition:	Percentage of towpath at condition A, B or C shall not fall to or below the relevant thresholds.	60% in condition A-C	50% in condition A-C
(iii) Flood management:	Percentage of principal culverts and embankments in class D and E, breach of which would cause more than £2m in damages, shall not rise to or above the relevant thresholds.	4% in Classes D & E	7% in Classes D & E

2021 Review

The Funding Agreement recognises that the charity's challenge is a long-term one and that it will take time to develop new sources of income and finance. As part of the Funding Agreement, a review will take place in 2021/22 examining the public benefit case for Government funding beyond 2026/2027. This will involve an evidence-based assessment of the extent to which Defra's investment objectives have been realised.

³⁴ HM Treasury's Magenta Book provides comprehensive policy and technical guidance on evaluation, www.hm-treasury.gov.uk/data_magentabook_index.htm

Key evaluation questions (as set out by the Government's Magenta Book) that are particularly relevant are:

- To what extent have the success criteria been met?
- To what extent have there been unintended consequences?
- What are the costs and benefits, in hindsight and going forward?
- Is government intervention still required? Or has the market changed as a result of the policy?

Specifically, the review would include:

- evaluate the success of CRT in generating additional income,
- delivery of civil society benefits, including increased community engagement and volunteer support
- assessment and interpretation of key performance data and trends.

Local case studies of increased engagement would also be valuable, as would further research on valuing the benefits of waterways, for instance through a new primary valuation study of the nature and magnitude of the benefits of the waterways (see Annexes 2 and 3).

In assessing various trends and indicators, it is important to note that the baseline is not static, which is a major reason for the policy itself. It will be difficult to attribute changes in visitor numbers or asset condition solely to the change in status, given the significance of a declining baseline trend in grant income, and other extraneous variables affecting the charity's income (such as the property market) and visitor numbers.

Review of options for moving the EA navigations to the CRT

In line with its commitment to move the EA navigations into CRT following the next spending review – subject to affordability and the consent of CRT Trustees at that time, the Government will review the options for this transfer.

Annex 1 The Funding Agreement

The grant element of the agreement on funding is made up of two elements, **Core Grant** and **Conditional Grant** which is tied to performance measures. The other key element of the agreement relates to dealing with CRT pension liabilities inherited from British Waterways.

In summary the funding agreement comprises:

Core Grant

Core grant of **£39m p.a.**

- Payable to CRT in quarterly instalments for **15 years** from 2012/13.
- **Index linked to the GDP deflator** from 2015/16 onwards based upon the last GDP forecast in 2014/15 and set for three years. To be refreshed at the end of each three-year period.
- A review will take place in 2021/22 examining the public benefit case for Government funding beyond 2026/27.
- For years 2013/14 and 2014/15 £3m of the core annual funding will be treated as a conditional grant, subject to the conditions explained below.

Conditional grant – including performance measures

A Conditional grant of **£10m p.a.**, tied to the three performance measures

- From 2015/16 to 2021/22, **not index linked**.
- The overall value of funding paid by Defra for the final 5 years of the contract will be capped at the level of the 2021/22 payment (core + conditional). As the core grant continues to be inflated in each of the last five years, the conditional grant will be reduced by the same amount in each year, such that the total amount of funding (core + conditional) is always the same as the 2021/22 payment (as inflated according the formula set out above).
- In the event that inflation causes the core grant to be increased to a level at which the conditional grant would be lower than £4m (based upon the method of calculation above), an element of core grant will be treated as conditional grant, such that the amount of money subject to the performance measures is never less than £4m.
- A review will take place in 2021/22 examining the public benefit case for Government funding beyond 2026/2027.

In the event that the conditional grant reaches zero,³⁵ the core grant will cease to be inflated, such that the total amount of funding is never greater than the amount paid in 2021/22.

- The Conditional grant is dependent upon the satisfactory completion of the following KPIs (based on previous year’s performance):

Relevant KPI	Applicable Measurement	Warning Threshold	Breach Threshold
(i) Safe Waterways:	Asset management to be in accordance with PAS-55. Percentage of assets in Class D and Class E shall not rise to or above the relevant thresholds.	23% in Classes D & E	25% in Classes D & E
(ii) Towpath condition:	Percentage of towpath at condition A, B or C shall not fall to or below the relevant thresholds.	60% in condition A-C	50% in condition A-C
(iii) Flood management:	Percentage of principal culverts and embankments in class D and E, breach of which would cause more than £2m in damages, shall not rise to or above the relevant thresholds.	4% in Classes D & E	7% in Classes D & E

- In relation to (i), (ii) and (iii) above, there will be two different performance levels indicated in the Grant Agreement, one which acts as an “amber light” indicator (“Warning Threshold”), and one which indicates a clear breach (“Breach Threshold”).
- If the **warning threshold** is triggered, the CRT will have to provide an action plan to remedy the problems and agree it with Defra. If the CRT fails to provide a plan in a form that Defra can agree, and if it fails to implement the plan within the required timescale, Defra will be able to withhold some or all of the conditional grant. If the **breach threshold** is triggered, Defra will be able to withhold some or all of the conditional grant.

National Loan Fund repayment

DEFRA will make a one-off payment on or before the end of the 2011/12 financial year to the British Waterways Board, to enable it to repay its National Loan Fund debts to HM Treasury, of around **£6.2m**, including penalties for early repayment. NLF loans cannot be held by bodies outside the public sector.

Pensions

At the date of the March 2010 actuarial valuation of the British Waterways Pension Fund (BWPF), the pension deficit was £65.6m. No formal valuation has been prepared since March 2010, although estimated updates have been prepared by the Scheme Actuary for the pension fund Trustees.

³⁵ Calculations show that the level of inflation projected by the GDP deflator required for this to occur is 4% for each of the last five years.

Defra and CRT have agreed a deal on the pension's deficit which will enable CRT to meet their business plan and protect historic public sector pensions.

One-off payment

A one off payment of **£25m** in 2011/12.

Due to the manner in which the pension's deficit is calculated, current low gilt yields will increase the rate of deficit repayment required by the pension's trustees. The one-off payment will help CRT manage the ensuing cash-flow challenges.

Pension guarantee

A 'last resort' wrap around guarantee

- This is capped at **£125m** for a **19 year** period at the end of which CRT plan to have repaid the pensions deficit in its entirety.
- This covers the historic public sector pension liabilities within the pension scheme.
- This would only pay out once all of CRTs assets had been exhausted (i.e. the charity has become insolvent).

Public Reporting Requirements

Under the funding agreement CRT is required to publish information on its activities to ensure public and stakeholder accountability. This includes:

- the Network Stewardship Score
- Data on SSSIs based on published EN data, the percentage area of SSSIs under CRT management in good or recovering condition.
- Data on heritage showing the percentage of heritage assets assessed on completion of work as good or adequate, with double weighting given to good assessments;
- Data on housing forecast figures.
- Data on volunteer participation as the number of volunteer days contributed to CRT.
- Data relating to safety as follows:
 - the number of reported incidents involving customers relating to infrastructure failure;
 - the number of reported incidents involving employees related to infrastructure failure; and
 - the data underpinning the [KPIs identified above];
- Data relating to towpaths as follows:
 - the number of towpath visitors (based on annual survey data);
 - the number and duration of unplanned closures; and
 - the data underpinning the KPIs identified above

Transparency - Access to Information

CRT will maintain an information regime that mirrors the Environmental Information Regulations. Subject to Parliamentary consent CRT will be subject to legal obligations under the Freedom of Information Act relating to its statutory functions.

Other performance requirements

Under the terms of a Memorandum of Understanding CRT will have obligations to draw up certain policies.

Localism Strategies

CRT will ensure that its Waterways Partnerships put in place localism strategies which will commit the Partnerships to facilitating local engagement, working with a range of locally based partners throughout the area covered by the Partnership.

Free Public Access

The right to free access to towpaths for pedestrians will be enshrined in the CRT charitable purposes and the Trust Agreement. In addition, CRT will publish a policy on access and leisure on the waterways and their towpaths. The policy will in particular set out how CRT will as a general rule ensure pedestrian access free of charge and the extent of necessary qualifications from the general rule for operational/maintenance purposes and control of access at some tourist sites. It will also deal with the promotion of cycling and partnerships to improve the cycling environment.

Performance monitoring

A Memorandum of Understanding will set out the relationship between Defra and CRT. This will be similar in some respects to the Framework Agreement which currently applies to British Waterways but takes full account of the fact that CRT is a charity independent of Government.

It will set out arrangements to enable Defra to monitor CRT performance including frequency of meetings, information CRT must provide and when that information must be made available.

Annex 2 Latest research for Defra on the value of inland waterways and the impact of funding changes

In 2010, Defra commissioned Jacobs to assess the diverse range of benefits provided by inland waterways in England and Wales and to provide an aggregate picture of the implications of changing funding scenarios on the value of these benefits.³⁶ Previous research in this area, carried out by Jacobs on behalf of Defra and the Inland Waterways Advisory Council, had determined values for the benefits delivered by inland waterways, using a benefits transfer approach. This latest research, finalised in August 2011, sought to apply these values to estimate the change in benefits arising from reduced or increased funding for waterways.

The research looked at two broad and qualitative scenarios related to funds available to the waterways:-

- i). *Substantially reduced funding.* It was assumed that health & safety-related spending would remain, but other spending would be limited. The effect of this would lead to an eventual degradation of the navigation function of the waterways, along with access restrictions to towpaths.
- ii). *Substantially increased funding,* thus enhancing the attractiveness & accessibility of waterways leading to increased use and a greater value placed on visits.

The research investigated the impacts of these scenarios on different categories of waterway – canal/river, urban/rural and degree of boat density. Fourteen waterway case studies were analysed, with aggregation to a national level (for England & Wales) carried out based on the length of waterway in each of the categories. Both the case studies and aggregation related to all waterways in England & Wales (not just those controlled by BW). For aggregation purposes, 80% of the towpath benefits were reduced on the assumption that 20% of the modelled increase in visitor numbers would be new visits (the rest being visits switched from other waterways).

The main benefits considered in the case studies related to use values, in particular informal recreation on towpaths and pathways, boating and angling, but also amenity values (expressed through property value premiums), volunteering and flood protection / alleviation. Non-use values (environment, heritage etc.) were also taken account when the results were aggregated to national level. Sensitivity analysis was carried out on the aggregated figures to look at range of assumptions regarding changes in use of the waterways under the two scenarios. No original research was undertaken in order to derive the benefit estimates. The analysis draws on values

³⁶ Jacobs (for Defra), The value of inland waterways in England and Wales (August 2011) <http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&Completed=0&ProjectID=17647>

obtained from the existing literature, some of which is dated and relates to specific geographical locations. One of these studies has been used in the economic appraisal in this impact assessment (see Annex 3 on value transfer).

It was not possible directly to compare the change in benefits resulting from the two scenarios with the associated changes in cost of waterway management because it proved difficult to disaggregate costs between functions. However the level of change in benefits greatly exceeds any conceivable costs associated with them:

- Under Scenario 1, based on a range of plausible assumptions, the annual reduction in benefits delivered would be in the range £250 - £790 million. In addition there would be some reduction in the level of non-use benefits associated with the waterways, with total non-use estimated at £24 - £180 million per year. Such reduction in benefits is likely to greatly outweigh any cost savings resulting from lower levels of maintenance of the waterways under this Scenario. Loss of benefit is greater for canals than rivers, since it is assumed that rivers would maintain more of their amenity value.
- Under Scenario 2, the increase in benefits, associated with additional investment in the waterways, again based on a range of assumptions, was estimated at £190 - £680 million, with a “best guess” of around £300 million.³⁷
- Over 80% of the loss or gain in benefits comes through use values associated with visits to the waterway towpaths.
- Benefits vary substantially according to location and the nature of the waterway. The case study sites which show the greatest percentage change between the baseline and scenarios are those in urban locations, where it is assumed that towpath visits would change by a greater degree than for rural waterways. Urban waterways also show greater baseline benefits, reflecting towpath densities.

In the analysis, a conservative approach was taken. For example in the reduced funding scenario, the loss in benefits may be less than in reality, since the estimates of amenity value are based on Willingness-to-pay (WTP), rather than Willingness-to-accept loss (WTA) measures. In other studies WTP values have been shown to be generally lower than WTA. Also not all benefits have been covered, due to lack of robust data. So the analysis excludes consideration of some benefits, such as land drainage.

In conclusion, this latest research underlines the very substantial existing benefits of the waterways and the significant values at stake from changes in funding (of whatever source) provides broad corroboration of the aggregate benefit estimation in this assessment, suggesting that the estimates in this impact assessment are conservative.

³⁷ These benefits also incorporate increases in overall leisure expenditure as visitors increase and unit expenditure is assumed constant, so they would tend to overstate the welfare benefits or losses from a national economy perspective, even allowing for the 80% adjustment on displacement.

Annex 3 Applying Defra’s Value Transfer guidelines to estimate recreational benefits of creating CRT

This Annex sets out a series of steps by which we estimate baseline suitable monetary values for the recreational benefits that the waterways bring (£0.78 to £1.10 per visit).¹

The application of the guidelines is set out in the following steps.

Step 1 – establish policy good decision / context

Assessing whether additional benefits will exceed the costs of creating and funding the charity, and how this varies with different scenarios, is the main concern of this Impact Assessment. The creation of a charity increases the income available for the management of the waterways, relative to the alternative of remaining in the public sector, which results in a wide range of public benefits being realised.

Step 2 – Define the policy good and affected population

The good to be valued is the improved quality of informal recreational opportunities alongside waterways relative to a scenario in which the waterways remain in the public sector. Evidence on overall benefits of British waterways, and their public good aspects and positive externalities, is relatively well established. Recent work (Jacobs 2010) has identified those public benefits as including recreation and health benefits, property value uplift; transport (time and carbon reductions); renewable energy (energy and carbon); water provision; and non-use values.

As the improvements would affect the national network broadly, the relevant user population is for England and Wales, although most of the benefits are likely to accrue to those who live near the waterway network, which is concentrated in certain regions of the country (there are few canals in the south west of England for instance). The further afield waterways are to where people live, the more likely that there will be other recreational alternatives.

Step 3 – Define and quantify the change in the provision of the policy good

The most important public benefits of the canals are recreational, and evidence shows that these benefits are positively related to spending on the “**functionality**” of the waterways (for instance, see Annex 3). Examples of functionality are towpath repairs, access management, vegetation and tree management, boundary maintenance, litter removal, customer services and spot dredging. This will have an impact on leisure (boating) income and the real benefits visitor experience. Functionality spend improves the appearance and usability of the waterways, for example enabling exercise and other outdoor activities and reducing concerns about security and crime. These improvements, based on previous experience and studies, can be expected to increase visitor welfare and numbers. Existing users benefit from a better quality of experience; new users benefit from the additional benefits provided by

¹ These “Value Transfer” guidelines can be found at:
archive.defra.gov.uk/environment/policy/natural-enviro/using/valuation/index.htm

waterways over alternative recreational sites. We do not, however, differentiate between these two groups.

There is some uncertainty about how much the recreational quality of waterways would be affected by additional charity income, particularly inasmuch as the baseline is not stable but is itself likely to be declining because of declining sources of income to British Waterways. Annex 2 summarises recent research for Defra on different funding scenarios.

Step 4 – Identify and select monetary valuation evidence

We need broad-brush estimates of typical willingness to pay per visit that capture general benefits from waterway recreation which are likely to be affected by the policy change. Ideally, we need to identify additional consumer surplus for existing users (over and above previous level of consumer surplus) and for new users (over and above alternative recreational opportunities). The 2010 Jacobs study, which reviews all the literature around benefits of the inland waterways, notes two sets of studies on recreational benefits (pp. 64-5, 71): Willis and Garrod (1990, 1991) and Coker et al (1990). The following table summarises the relevance of the studies according to a number of value transfer selection criteria.

Selection Criteria - Similarity between:	Policy site and good	Willis & Garrod 1991	Coker et al
Policy good and study good	General changes in quality of waterway environment, access. Asset condition important.	Baseline assessment of non-market benefits of variety of canal sites. Individual Travel Cost Method (ITC) gives average WTP across all sites of £0.51 per visit in 1989 prices; Contingent Valuation (CV) method gives £0.36.	Specific site – Maidenhead. May not be representative.
Change in provision	Broad improvements to functionality e.g. towpath repairs, access management, vegetation and tree management, boundary maintenance, litter removal, customer services and spot dredging. Changes in asset condition and averting risks of asset collapse.	Baseline assessment only, but suitable as basis for measuring change.	Recreational and amenity benefits from flood alleviation scheme – towpath improvements etc. WTP figures of £0.82 and £1.03 per visit for improvements – but only applies to users. Increased rates method gives values of £13-15 p.a, which may reflect non-use values.
Sites	Variety of sites across the network.	Variety of sites	Just one site

Affected populations	All users of inland waterways affected by change in functionality of NWC	Representative user population	Local Maidenhead population
Number and quality of substitutes	Recreational substitutes will vary by location	Only reflected in terms of opportunity costs of time; may be reflected in some sites over others.	Substitutes captured
Market constructs	Open-access. Concerned with site quality and demand	Open-access. Concerned with site quality and demand	Open-access. Concerned with site quality and demand. Also uses “increased rates” payment method.
Study quality		Reasonably robust overall, sample 1500 - but less robust for individual user-group estimates. Estimates likely to be lower bound.	TC method from 1987 study only looked at 0.5 mile catchment area. CV method, small sample of 111. Relatively high estimates may reflect small sample size and socio-economic characteristics of area.
Assessment		Doesn't directly address change in WTP for improvements or impact of asset condition. But still appropriate for transfer and up-rating of average unit values. A suitable range is provided by the CV (lower) and TCM (higher) estimates. Residual uncertainty over applying these estimates to new visits / visitors.	Not sufficiently robust or representative, but higher valuations suggest that the W&G current benefit values are conservative.

In the Willis and Garrod studies, the range of canal sites studied provide a range of estimates (particularly with the individual travel cost method). These are in the same “ballpark” which provides some reassurance. Very low valuations tend to be for very casual visitors (e.g. those taking short cuts) rather than those whose visit is more dependent upon the waterway itself. Some very high estimates, too, though these are not statistically significant. Using the extreme values is not considered appropriate as these only account for a fraction of the user population or are very site specific. In practice, the lowest values should be of lower priority in terms of increased spend, so should not distort the appraisal analysis. In the nationwide context of this appraisal, it makes sense to take the average of the sites and ranges, and to make use both methods (ITC and CV) which provide two average values

(£0.36 to £0.51 in 1989 prices). These unit values are (when up-rated to current prices – see below) comparable to other work undertaken into recreational and amenity values. For instance, the marginal recreational benefits of woodland have been estimated (in 2003 prices) at between £1.66 and £2.75 for each recreational visit.²

It is not clear if these values are net of substitutes, as these were not explicitly discussed with respondents, although the opportunity cost of travel time, which is factored into the travel cost estimates, may in part capture this. This is addressed in the sensitivity analysis. On the other hand, **the figures are likely to underestimate the true benefits** considering that:

1. The modelling approach uses linear approximation which will understate consumer surplus (something the authors discuss)
2. People's preferences for protecting the environment have considerably strengthened since 1991, and valuation of waterway recreation is likely to have strengthened also. This is probably only partially captured by applying an income elasticity factor (see below). Additionally, over the long term with rising national income we might expect some growth in leisure activities which on the whole are income elastic. However, any increases in preference over the next two decades is not captured.
3. British Waterways have found in other studies that the presence of boating enhances visitors' enjoyment, and the Jacobs study suggests that consumer surplus values for informal visitors could be inflated by 25% for sensitivity testing.
4. These values are unlikely to capture non-use values, such as the value people place upon the existence of a unique nationwide set of industrial heritage assets. Part of this non-use value should be expressed in people's willingness to donate to the new charity.
5. The values are being applied in a scenario in which the baseline is deteriorating. So the effect of the charity, at least in the early years, would be to avert further deterioration of the waterways. Endowment effects suggest that people are willing to pay more to avert a loss than to secure a new gain.
6. The values for improvements (not base values) found in the Coker study are around double those in Willis and Garrod.

In conclusion, the Willis and Garrod studies are the favoured basis of the value transfer, with the average unit value across the various sites and uses providing the most appropriate and robust basis. Values from the Coker study are considered too high as they reflect improvements, not current benefits, and are not sufficiently representative. They provide reassurance however, that the Willis and Garrod figures are likely to be conservative estimates. They have been cited and used in the Jacobs research for Defra. They also suggest that the unit values should increase with the improvements. Thus in the modelling done by British Waterways, unit WTP figures are assumed to increase by 8% for functionality changes of around £10m, although there is inevitably considerable uncertainty around such judgements.

² [www.forestry.gov.uk/pdf/sebreport0703.pdf/\\$file/sebreport0703.pdf](http://www.forestry.gov.uk/pdf/sebreport0703.pdf/$file/sebreport0703.pdf)

Step 5 – Transfer evidence and estimate monetary value

We take the two average WTP values (£0.36, £0.51) in 1989 prices from Willis and Garrod (1991) and use the Office of Budget Responsibility's GDP deflator to translate these to 2011 values. We also apply the recommendation in the Jacobs report (p. 36), following Environment Agency analysis, that values are also adjusted by a factor of 0.7% for each year since the study year to reflect the fact that WTP is positively correlated with income. This gives a transfer unit value range of £0.78 to £1.10.

	Contingent Valuation method	Individual Travel Cost method
Average WTP valuations, 1989 prices	£0.36	£0.51
Adjusting to 2011 prices	£0.67	£0.94
Up-rating for income growth at 0.7% p.a.	£0.78	£1.10

Step 6 – Aggregation

These estimates are multiplied by the baseline number of visitors. As functionality changes, so unit values increase (as noted above) and also visits are assumed to increase. For functionality changes of around £10m, annual visits (following a three-year lag) are assumed in the modelling to increase by around 6%. This appears to be a conservative assumption (see Annex 4).

The increased benefit from greater functionality is calculated as the difference between aggregate willingness to pay under the preferred option and baseline aggregate willingness to pay. The difference will be a product of assumed but plausible changes in visitor numbers and the unit value benefits.

Step 7 – Conduct sensitivity analysis

This is described in section 6 of the IA. The sensitivity analysis demonstrates that the main analysis is reasonably robust.

Annex 4 Evidence of the impact of towpath improvements

British Waterways has long been aware that towpath improvements have strong impacts on the use of canals and on visitor attitudes. Over recent years it has been able to gather increasing data to back up this view, through a combination of pedestrian counters that have been installed along the towpath and a series of annual surveys of towpath visitors.

1. Quantitative impact

There is strong evidence to show that towpath improvements significantly increase visitor numbers, although it is not possible to attribute the whole effect to the improvements. This evidence comes from Birmingham, Scotland and London, where pedestrian counters have been installed along the towpath and have recorded changing patterns of use as improvements are made. Monitoring demonstrates the following levels of growth in numbers:

Site	Visits per annum		
	Before improvement	After improvement	% change
Stourbridge (W.Midlands)	41,500 (1999)	87,500 (2001)	+111%
Walsall (W.Midlands)	71,500 (1999)	154,500 (2001)	+110%
Ratho (Scotland)	56,000 (1998)	111,000 (2003)	+100%
Linlithgow (Scotland)	20,000 (1997)	144,000 (2003)	+343%
Craigmarloch (Scotland)	29,000 (1997)	67,000 (2003)	+90%
Cadder (Scotland)	48,000 (1997)	76,000 (2003)	+ 37%
Edinburgh (Scotland)	89,000 (1998)	112,000 (2003)	+ 26%
Maryhill (Scotland)	60,000 (1997)	71,000 (2003)	+ 21%
Bonnybridge (Scotland)	59,000 (1997)	57,000 (2003)	- 3%
Limehouse Cut (London)	41,000 (2002-05 mean)	92,000 (2006-09 mean)	+124%

Source: British Waterways pedestrian counter estimates

Note that not all towpath users will be making trips to the canal for recreation. Surveys of towpath users in London in 2004, for example, found that 20% of visitors were using the canal as an alternative local transport route. Towpath improvements, therefore, can be expected to have a direct impact on local modes of transport.

2. Qualitative impact

Some of the best evidence of how waterway improvements – including towpath works – can change visitor perceptions has come from Scotland. A series of towpath visitor surveys were carried out by

British Waterways on sites along the Lowlands Canals between 1994 and 2001. Several sites have been surveyed twice, therefore allowing comparison of results over time. This period coincides with the programme of works to restore the Millennium Link between Glasgow and Edinburgh. As part of the survey, visitors were asked how they thought sites had changed over the past year or so in relation to a series of indicators. In the 2000/2001 surveys significant improvement in all indicators has occurred at all sites, as the Millennium Link works have been completed. For example with regard to overall upkeep of the canal, the following percentage of people thought the waterways had improved over the past year:

% specifying improvement

Kirkintilloch (2000)	73%
Linlithgow (2000)	86%
Falkirk (2001)	89%
Clydebank (2001)	73%
Wester Hailes (2001)	80%
Maryhill (2001)	73%

Source: British Waterways, Briefing note, 2009.

Annex 5 Analytical framework for the cost-benefit analysis

The flowchart below describes in stylised form the framework for the cost benefit analysis that is summarised in the summary sheets of this document (using the best estimates for illustration). It identifies the nature of the relevant costs (orange shading) and benefits (green shading) for calculation. These costs and benefits occur throughout the 16-year appraisal period (of which 15 concerns the CRT and funding contract), although not with an even profile (see Figure 5 in Section 5). These are expressed on a discounted present value basis to arrive at a consistent comparison, so enabling a net benefit present value to be estimated. Other linkages in the analysis are referenced here, for example, the links between new voluntary income, the costs associated with fundraising and the benefits to donors (marked by an asterisk *).

