Valuation of the Historic Environment

The scope for using results of valuation studies in the appraisal and assessment of heritage-related projects and programmes

Final Report

July 2005

eftec, 16 Percy Street, London W1T 1DT; tel: 0207 580 5383;
fax: 0207 580 5385; eftec@eftec.co.uk; www.eftec.co.uk

Final report prepared for:

English Heritage, the Heritage Lottery Fund, the Department for Culture, Media and Sport and the Department for Transport.

by:

Economics for the Environment Consultancy (eftec)
16 Percy St, London, W1T 1DT
Tel: 020 7580 5383
Fax: 020 7580 5385
www.eftec.co.uk

Contributors:

Allan Provins, eftec
Ece Ozdemiroglu, eftec
Helen Johns, eftec
Professor David Pearce, University College London and Imperial College London, eftec associate
Dr. Susana Mourato, Imperial College London, eftec associate
Dr. Peter Chowne, LORD Cultural Resources and Planning Inc.

> Shortly after the completion of this report, David Pearce died suddenly. While David is most recognised for his unparalleled contribution to the advancement of environmental economics and his influential role in bringing sustainable development to the forefront of UK and international environmental policy, he also led efforts to recognise the worth that the concept of economic value and valuation techniques have in ensuring the preservation of cultural heritage and the historic environment. We are forever indebted to David and will miss him deeply.
>
> eftec

Acknowledgements

The authors would like to thank the steering group members for their input to the case study examples and comments on the report: Geoff Dawe (project manager, English Heritage), Gareth Maeer (Heritage Lottery Fund), James Vause (Department for Transport) and Madeleine Clegg (Department for Culture Media and Sport). Thanks also to Ben Cowell and Jenny Frew (English Heritage).

Disclaimer
This report represents the views of the authors, and not necessarily those of the sponsors.

Report should be cited as:
eftec (2005) *Valuation of the Historic Environment - the scope for using results of valuation studies in the appraisal and assessment of heritage-related projects and programmes. Final Report.* Report to English Heritage, the Heritage Lottery Fund, the Department for Culture, Media and Sport and the Department for Transport.

Preface

This study was commissioned because the partners – English Heritage, the Heritage Lottery Fund, the Department for Culture, Media and Sport and the Department for Transport - perceived a joint need for an in-depth review of existing valuation studies concerned with the historic environment. The partners recognise that the results of valuation studies are used to inform decisions in many parts of government. For example in determining highway and other transport investment, health and safety standards in the workplace and elsewhere, air quality and emission standards, priorities in health care, flood protection, the level of the aggregates and landfill taxes and the value of the British Library's output. Moreover, HM Treasury in its guidance on appraisal and evaluation in the public sector (the so-called Green Book) has recommended that the use of valuation techniques should be extended as far as possible. Although the heritage sector has not been as well served by valuation studies as the natural environment, there have been a number of recent heritage-related studies, including the valuation of changes in the level of road traffic intrusion at Stonehenge. The partners were keen that the review should cover not just published studies, but also relevant material in the so-called grey literature.

In addition to the review the partners also required an expert opinion on the scope for transferring values from existing studies to other situations (the so-called 'value transfer' process) where decisions are being made about expenditure or policies which affect heritage assets. The partners recognise that valuation studies are likely to be used as only one of many pieces of information in the decision-making process. Decisions which will lead to major expenditure would probably justify their own valuation studies, so the emphasis of this study is whether decisions on smaller, though still important, projects and programmes might be informed by existing evidence on economic values. The partners decided that the scope for value transfer should be assessed not just on the basis of theoretical considerations but also by reference to practical examples that match heritage valuation studies, with a list of potential examples supplied by the partners.

The partners also required that the assessment of the theoretical and practical possibilities for value transfer should form the basis of recommendations for future work that could increase the potential use of valuation techniques in decision-making. It was recognised at the outset that some of the recommendations might lead to quick gains from the use of existing studies, but also that others imply longer term and more expensive research effort.

The partners drew up a detailed specification of work reflecting these requirements and after a process of competitive tender, selected Economics for the Environment Consultancy (eftec) to undertake the study. This document is a detailed report of that study. A non-technical executive summary has also been produced. The partners and the consultants are also organising other means of disseminating the results of the study, including presentations and articles.

Table of Contents

1. Introduction

1.1 Overview

In the broadest sense, cultural heritage may be defined as a concept which embraces both the man-made and natural historic environment: landscapes, buried archaeology, parks and open spaces, museum and archive collections, artefacts and works of art, and traditions, customs and languages (DCMS, 2005). The UNESCO[1] definition of cultural heritage outlines three main elements:

- Monuments: architectural works, works of monumental sculpture and painting, including cave dwellings and inscriptions, and elements, groups of elements or structures of special value from the point of view of archaeology, history, art or science;
- Groups of buildings: groups of separate or connected buildings which, because of their architecture, their homogeneity or their place in the landscape, are of special value from the point of view of history, art or science; and
- Sites: topographical areas, the combined works of man and of nature, which are of special value by reason of their beauty or their interest from the archaeological, historical, ethnological or anthropological points of view.

Such a characterisation relates to what might typically be termed 'material' cultural heritage, which in turn can generally be 'immoveable', as in buildings and archaeological sites, or 'moveable' as with paintings and sculpture (Pearce and Mourato, 1998).

The conservation and enhancement of the cultural heritage resource is typically viewed as a desirable undertaking. Preservation and study of cultural heritage contributes to overall social wellbeing through understanding and appreciation of the past and its legacy. Recognition of this is found in the UNESCO *Convention Concerning the Protection of the World Cultural and Natural Heritage* (1972), to which the UK is a signatory. The UK is also a signatory to the *European Cultural Convention* (1954), the *Convention on the Protection of the Architectural Heritage of Europe* (1985) and the *European Convention on the Protection of the Archaeological Heritage* (1992). Agencies and organisations which are tasked with protecting and preserving cultural heritage from threats such as urbanisation, population growth, pollution, weather and climate, and even use by the general public, must compete for resources with other socially desirable goals. Given that resources are limited, priorities must be set among competing goals both between sectors and within sectors. The intention of this report is to inform decision-making regarding the appraisal or assessment of programmes, projects or policies related to the historic environment.

1.2 Scope of Study

The term cultural heritage is nebulous; therefore it is important to highlight that this report is explicitly concerned with the decidedly heterogeneous subset of heritage assets that would be associated with the 'historic environment' or the 'built environment', i.e. 'immoveable' heritage. In particular this includes:

[1] The General Conference of UNESCO (United Nations Educational, Scientific and Cultural Organization), Recommendation Concerning the Protection, at National Level, of the Cultural and Natural Heritage (UNESCO 1972).

- Buildings (individually or in association) of architectural or historic significance;
- Areas, such as parks, gardens, other designated landscapes or public spaces with a historic association, remnant historic landscapes and archaeological complexes; and
- Sites (e.g. ancient monuments, places with historical associations such as battlefields, preserved evidence of human effects on the landscape, etc).

Included also is the sense of identity and place which comes from the combination of these aspects of heritage. Notably this report is not concerned with elements of heritage such as art, museum and archive collections and alike ('moveable' heritage), nor notions of tradition and custom. Furthermore the report does not consider the economic spin-off effects of heritage such as employment and tourism, which are covered by heritage dividend literature (see for example English Heritage, 2005).

1.3 Objectives

Currently, appraisal of projects and programmes that impact upon aspects of the historic environment is largely based on weighting and scoring techniques developed by public bodies such as English Heritage and UK Government departments such as the Department for Transport (DfT) and the Department for Culture, Media and Sport (DCMS) (see for example, DCMS, 2004; DfT WebTAG). Appraisal is undertaken on the basis of expert opinion and results in qualitative and quantitative assessments of the issues in hand. More generally though, overall governmental guidance (HM Treasury, 2003) indicates that where possible, effort should be made to directly compare costs of projects and polices with their benefits. Consequently there is the need to consider the potential application of economic valuation within the appraisal of heritage-related projects.

In recognising the appraisal needs of the sector, the Secretary of State for Culture alluded to this issue in a recent essay by asking the question, 'How can we best capture and present evidence for the value of heritage?' (DCMS, 2005). While heritage experts typically determine what is valuable and what is a priority, there is a strong case for broadening the basis for such judgements to include the wider population. Using evidence from economic literature enables the inclusion of the preferences of the wider population in decision-making (subject to the availability of such evidence).

The overall objective of this study is to consider the question, '**What is the the scope for using results of economic valuation studies in the appraisal and assessment of heritage-related projects and programmes?'** In particular, this concerns two main contexts:

- The appraisal or assessment of projects, programmes, and policies within the heritage sector that aim to preserve, conserve or enhance the historic environment as it is defined in Section 1.2; and
- The appraisal of projects, programmes, and policies in other sectors (e.g. transport) which impact upon the historic environment.

Heritage management decisions, which this study can contribute to, include:

- Strategic needs in the heritage sector;
- Determination of research priorities;
- Expenditure on repair and restoration;
- Expenditure on the environment in which heritage is presented and enjoyed;
- Preservation priorities concerning 'recent' heritage; and
- Gathering information on people's preferences concerning heritage assets.

It is not envisaged, however, that the retention of iconic and landmark heritage assets is in question. In particular these assets are protected by designations and planning controls. Therefore, the focus of the study is the expenditure of time and money on heritage assets that bring about relatively marginal, but significant, changes to an asset's fabric, appearance, presentation or surrounding environment.

This report may also be seen as building upon the earlier work by Allison et al. (1996) whose study 'The Value of Conservation?' provided a literature review of the economic and social value of cultural built heritage, which was jointly sponsored by the Royal Institution of Chartered Surveyors, English Heritage and the then Department of National Heritage. In particular the study reviewed a number of methods that may be used to value, or measure, the benefits to society of conserving historic buildings and areas. More recently a paper by Creigh-Tyte and Thomas (2000) and English Heritage's annual 'Heritage Counts: State of the Historic Environment Report' publications (English Heritage 2003; 2004) have considered a number of aspects related to the economic value and benefits associated with heritage assets.

1.4 Outline of Study

The following outlines the content of this report.

Section 2 introduces the concept of economic value and how this concept relates to heritage assets and the historic environment. Developing an understanding of the underlying principles of economic analysis is fundamental to the ability to inform upon the role and scope for use of economic valuation within the appraisal of actions that impact upon heritage assets. Economic value has a precise meaning and is typically formalised in mathematical terms. Whilst it is intended that this report be accessible to a wide audience, some mathematical notation is employed. However this is done with the intention of aiding rather than hindering understanding. After introducing the notion of the economic value of heritage assets, Section 2 goes on to discuss a number of relevant issues, such as potential applications of economic valuation and how economic value relates to other notions of value that may be applied to heritage assets and the historic environment.

Building on the concepts introduced in the previous section, **Section 3** discusses in detail 'value transfer', an approach to economic valuation which uses the results of previous valuation studies in the appraisal and assessment of projects and programmes. Value transfer exercises have been undertaken in a wide range of situations, particularly in relation to the appraisal of actions which impact upon the natural environment. A distinct appeal of this approach to economic valuation is its expediency and value for money properties (in relation to commissioning original valuation studies) which would enable greater use of economic values within decision-making. Section 3 outlines how value transfer may be undertaken and also highlights concerns that have been raised concerning the validity and reliability of value transfer, which casts some doubt on whether it is an appropriate undertaking for the appraisal of heritage-related actions.

Assessing the scope for using the results of economic valuation in heritage-related appraisal also requires that stock is taken of the existing body of relevant economic valuation literature. **Section 4** of this report provides a review of UK and international valuation studies to date, including not only published sources but also 'grey' literature (e.g. working papers, conference proceedings etc).

On the basis of Sections 3 and 4, **Section 5** demonstrates the use of value transfer in a heritage context by providing a number of case studies. This exercise serves to highlight the potential uses of economic valuations provided by the existing body of literature and also the practical

limitations. The findings of the case studies form a key part of the conclusions to be drawn from this report.

Section 6 presents the recommendations and conclusions of the report. These not only answer the central question of interest ('what is the scope for using results of valuation studies in the appraisal and assessment of heritage-related projects and programmes?') but also addresses the study's other findings.

Finally, the **Annex** to the main report provides an annotated bibliography of recent heritage valuation studies that accompanies the literature review in Section 4.

2. The Economic Value of Heritage

2.1 Heritage as an economic good

Heritage assets are economic goods. The term 'economic good' applies to anything that generates flows of human wellbeing, for anyone and for whatever reason. The general presumption is that those flows are positive, i.e. heritage contributes to wellbeing and does not detract from it. In practice, of course, some people may actually dislike a heritage building or site, in which case there are some negative contributions to wellbeing. Arguably, any negative features are confined to 'new' as opposed to 'old' heritage, i.e. to assets now being classified as the heritage of the 20th Century. Few people appear to object to older buildings and other assets[2]. This is much as one would expect: it is more likely that there will be controversy over what current generations would regard as their heritage bequests to future generations than over what the past has bequeathed to us.

Economic goods may or may not have market prices. Even if they do, for example through visitors paying entrance charges to visit a heritage asset, that market price may be a poor indicator of the economic value of the asset. Figure 2.1 shows the simplest construction of a demand curve for a hypothetical asset. Assume it is an asset for which an entrance fee is charged. At very high entrance charges, say P_H, comparatively few people will visit the asset. If entrance is free at P_O many will visit. There is more than ample evidence to suggest that the demand for heritage assets behaves in a manner similar to Figure 2.1. The demand curve in Figure 2.1 is a 'willingness to pay' (WTP) curve. More strictly, it is a *marginal* WTP curve; it shows the WTP of visitors for an 'increment' of the good, where the increment in this case might be thought of as number of repeated visits. At P_H some people are willing to pay that price. But they actually pay the ruling entrance fee, call it P_M. They therefore get something for nothing: an excess of WTP over the actual price. That excess is simply P_H-P_M and is known as their 'consumer surplus' (CS). The exercise can be repeated for all individuals willing to pay some sum in excess of P_M. The individual whose WTP is equal to P_M receives zero consumer surplus. Anyone whose maximum willingness to pay is less than P_M does not visit the site; the costs to them (P_M) outweigh the benefit to them (their WTP). Hence in Figure 2.1, at price P_M, the number of people who visit the site is q.

The *flow* of economic value from the asset is the sum of all the individual CSs in Figure 2.1. This is given by area A. More strictly, A + B is the gross WTP for the visits to the site and, since B is the total price paid (the cost to the visitors), the net WTP is area A. Provided we assume that area B is also the cost of supplying the site to visitors[3], then the values we seek when 'valuing' the asset are either A + B, or A. Notice that if the asset was supplied free, then the gross WTP and consumer surplus would be identical and equal to A+B+C.

The first result of the analysis then is that the economic value of a heritage asset is made up of annual flows of wellbeing, and the value of those flows is given by the WTP for them.

[2] However this is not to say that 'older' heritage assets are not threatened. For example, ancient field systems may be lost due to changes in farming practices. Here then, it is the value of the alternative use of land that is important in determining whether heritage assets are retained.

[3] If the cost is less than this there will be a 'producer's surplus' which also needs to be taken into account. For simplicity we ignore this.

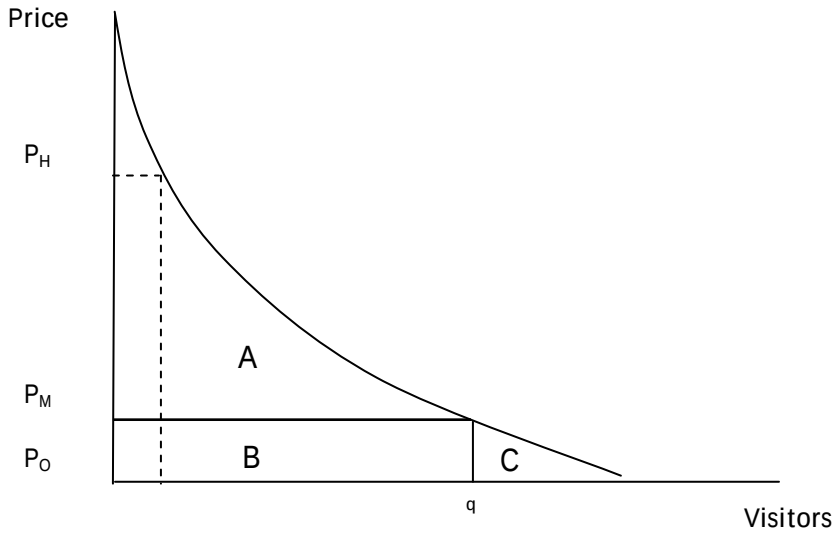

Figure 2.1: Stylised demand curve

2.2 Annual service values and asset values

We now build on this analysis. Firstly, the value or benefits we have identified occur in a given time period, say, a year. The benefits will occur again in a second year, a third year, and so on. We cannot be sure how the benefits will vary with time. Maybe more visitors will visit the site, maybe fewer. Techniques exist to predict the probable number of visitors.

Second, even if the number of visitors stays the same in future years, we may find that each individual has a higher WTP for the asset experience in question as time progresses. There are various reasons why this may happen but the dominant one is that real incomes rise, and as incomes rise we might expect WTP to increase for heritage goods. This is because we have some reason to believe that heritage goods are 'income elastic'. An income elasticity of demand measures the percentage change in the *quantity* of visitors divided by the percentage change of income, where income will usually be measured in real per capita terms. Since much heritage is simply appreciated or valued without necessarily being subject to visits, it is more useful to look at a different income elasticity: the income elasticity of willingness to pay. This is then the percentage change in WTP divided by the percentage change in income. For valuation purposes, the income elasticity of WTP is also the relevant measure when estimating future WTP.

Third, the combination of changes in visitor numbers and changes in their individual WTP will mean that the aggregate WTP will change over time. So, writing the aggregate WTP in year 1 as WTP_1, the aggregate WTP in year 2 as WTP_2, and so on, we have a series of WTP as follows:

$$WTP_1 + WTP_2 + WTP_3 + ... + WTP_T \qquad [2.1]$$

T in equation [2.1] is simply the 'time horizon', the period over which we look when valuing an asset.

Fourth, whereas each WTP in each time period values the *flow* of services or wellbeing from the heritage asset in question, the economic value of the *asset* is given by the sum of the WTPs across people and over time. The value of a heritage asset is its capital value, and heritage assets can be termed heritage capital which, in turn, is part of a wider notion of capital, **cultural capital**.

However, because individuals attach less importance to the future than the present – they 'discount' the future – we cannot simply sum the WTPs as they appear in expression [2.1][4]. We have to sum their discounted values. Expression [2.1] becomes:

$$\text{Value of Heritage Capital} = \frac{WTP_1}{(1+s)} + \frac{WTP_2}{(1+s)^2} + \frac{WTP_3}{(1+s)^3} + \ldots + \frac{WTP_T}{(1+s)^T} \qquad [2.2]$$

In [2.2], s is the social discount rate. In the UK, HM Treasury has an official social discount rate of 3.5%, so $s = 0.035$[5]. The sum in [2.2] is known as the *present value* of the flow of wellbeing from the heritage asset. As noted, this present value is the capital value of the heritage asset. If we can imagine a market in which ownership of the asset is traded, this present value represents the maximum price at which it could be exchanged[6].

Significantly, other things being equal, this present value is the same thing as the asset value of the heritage good. The asset value is equal to the sum of the discounted (net) WTPs for the asset's services, i.e. the flows of wellbeing arising from it.

2.3 Use and non-use values

So far, the analysis has been based on the WTP of individuals to visit the heritage site. These WTPs are **use values** (UVs); they arise from a use that is made of the heritage asset, in this case visiting the site. To estimate this visitor value it is common to use the *travel cost method* (TC). The travel cost here includes any entrance fees that are paid to visit the site, other out of pocket expenses, wear and tear if travelling in one's own car and the economic value of time spent travelling to and from and visiting the site. A comprehensive manual on how such data can be collected and analysed is contained in Ward and Beal (2000).

One can imagine other use values of a less direct nature. Suppose the heritage site is a landmark asset that confers prestige and attraction on the surrounding area. Then, anyone living in that area might derive an amenity benefit from the site and this might show up in the value of their property. The element of the price of the property that is due to the heritage site reflects individuals' WTP to locate in that area because of the heritage site. This element is elicited in practical studies using the *hedonic (property) price method* (HP). HP analyses the property market to estimate the premium fetched by properties which are in clean and peaceful environments and are nearer to desirable features such as heritage sites (or reduction in property price for the opposite case). For a comprehensive account of the HP method see Taylor (2003) and Hidano (2002).

[4] Since economic valuation works with human wellbeing as its 'goal', and since wellbeing is measured by what people want, then discounting has to be adopted since people do discount the future. Arguments for 'zero discounting' can only be entertained if people do not discount the future (and there is overwhelming evidence that they do) or if some judgement is made that positive discounting is 'irrational'. Once this is done, however, the basic value judgements underlying economic valuation are violated and a paternalistic discount rate (zero) is being substituted for individuals' discount rates.

[5] This discount rate applies for the first 30 years of appraisal. Thereafter a lower discount rate is applied.

[6] The *net* present value would include the costs of maintenance etc. as well as benefits.

The sum of the visitor values and the residents' values give the *total use value* (TUV) of the heritage site. Recall that these values need to be estimated into the future to obtain their present value. Rough-and-ready indicators can be obtained by calculating just one year's values. Indeed, this is the norm rather than the exception in valuation studies. But it can be risky: future values can change significantly, not least because the income elasticity of WTP is greater than zero.

There is one other major category of economic value that needs to be considered. Apart from residents and visitors, the general public of the region or nation, or even the international community, may be willing to pay something towards the upkeep of the heritage asset, *regardless of the fact that they may not visit it or be near it*[7]. This form of value is known as **non-use value** (NUV) or *passive use value*. NUV can be substantial and may outweigh UV, especially where goods are unique. This WTP arises from all kinds of motives. One obvious motive is that many people feel the influence of the past and they see themselves as stewards of the nation's heritage. In most respects these motives do not matter much for economic valuation. What matters is that people may be willing to pay to conserve heritage despite having no use value for it. However, to elaborate, non-use value in relation to environmental goods is typically characterised by a number of constituent parts which are also applicable to the historic environment and cultural goods more generally. *Altruistic value* is derived from the knowledge that others may enjoy the historic environment whilst *bequest value* is derived from the desire to conserve heritage assets for future generations[8]. *Existence value* refers to the benefits that arise from the knowledge that our heritage is being conserved *per se*. Non-use value, and in particular existence value, typically reflect the public good element of the historic environment (Pearce et al., 2001). Indeed, without the explicit consideration of the non-use value associated with heritage, the public good[9] argument that often supports public provision of cultural goods is typically less strong for heritage assets, especially where it is possible to charge entry fees and exclude users.

NUV can typically only be valued in economic terms using *stated preference* (SP) *techniques*. These techniques function through the use of questionnaires. In one form of stated preference technique, *contingent valuation*, individuals are asked directly what they are willing to pay for the good to be conserved, or what they are willing to pay for some change in the level of provision of the good. A huge literature has grown up regarding the reliability of the contingent valuation method – for an extensive discussion see Bateman et al. (2002). In another form of stated preference technique, individuals are not asked their WTP directly. Rather they are presented with a limited choice of options, and each option has varied features or characteristics. One of those features will be a price of some kind (e.g. a tax, entrance fee etc). Individuals then choose between the options, i.e. between the 'bundles' of characteristics. This *choice experiment* approach permits the analyst to infer WTP rather than eliciting it directly.

2.4 Total economic value and decision-making

The sum of use and non-use values gives the *total economic value* (TEV) of the heritage good. In other words:

[7] Yet others may be willing to pay to conserve the option of visiting the site or locating near it in the future. This is **option value**. Efforts to estimate this notion of option value have not always been very successful because of the difficulty of separating it out from other notions of WTP. It is ignored here but may be worth keeping in mind.

[8] In so far as the motives derive from altruism there is a debate about the form which the altruism takes. There is a risk of double counting economic values if altruism takes particular forms. Again, in order to keep to the basics, we do not discuss this further.

[9] A pure public good is one that when supplied to one person is supplied to others in such a way that the wellbeing derived by each individual does not detract from the wellbeing obtained by other individuals. Two examples are national defence and clean air. Pure public goods are said to be 'non-rival' and 'non-excludable'.

$$TEV = UV + NUV \qquad [2.3]$$

Once again, note that, ideally, each category of economic value is measured in present value terms.

We can now relate TEV to decision-making contexts. Imagine first that the policy context is one of conserving or not conserving the heritage asset. In the latter case assume that it falls into a state of decay and eventually disappears. The TEV of the asset is therefore lost and the analyst would therefore estimate the present value of the use and non-use values as the costs of non-intervention. In turn, this forgone TEV is the *benefit* that would accrue from a policy of conservation against a baseline of 'doing nothing'. This benefit can be compared to the costs of conservation in a *cost-benefit analysis*.

In countries such as the UK, heritage assets are at some risk: budgets rarely stretch to protecting everything with positive heritage value. But the major 'landmark' assets are protected by designation and planning regulations, as are many non-landmark assets. As such, for many heritage assets the policy context is not one of 'conserve or decay'. Rather the decisions relate to changes in the way the asset might be presented or viewed, changes in visitor facilities, the addition of features, and so on. Another context might be that of 'holding maintenance' – making sure the asset is protected against the worst effects of time and the elements while funds are sought for full restoration. These marginal or discrete changes mean that what is valued is the *change in the TEV*. That is, what needs to be measured is the TEV with and without the package of measures that is under consideration. Once again, note that the change in TEV should be measured across time into the future. We can therefore say that the benefits of introducing the change in the provision of various features of the asset appear as a stream of benefits as follows:

$$\Delta TEV = [TEV_{w,1} - TEV_{w/o,1}] + [TEV_{w,2} - TEV_{w/o,2}] + ... + [TEV_{w,T} - TEV_{w/o,T}] \qquad [2.4]$$

The symbol Δ is simply a convenient way of writing 'change in'. While [2.4] looks slightly daunting, it tells us only that we need to add the difference in the TEV in year 1 with and without the proposed changes, to the difference in the TEV in year 2, and so on. Equation [2.4] shows the undiscounted flow of benefits, so introducing discounting and the notation Σ for 'sum of', *C* for the cost of the measures under consideration, and *t* for time, we have:

$$\sum_t \left[\frac{\Delta TEV_t}{(1+s)^t} \right] - \sum_t \left[\frac{C_t}{(1+s)^t} \right] > 0 \qquad [2.5]$$

as the economic rationale for undertaking the change in provision of the heritage asset. That is, if the present value of benefits less the present value of costs is greater than zero, the project yields a net benefit and would contribute positively to overall wellbeing[10]. If [2.5] is negative (present benefits are less than costs), economics would dictate that the measures are not undertaken.

2.5 Applications of economic valuation

Table 2.1 summarises the various uses of economic valuation and the ways in which values of heritage assets might fit into those uses.

[10] If the costs of a project are met upfront, then a simplified version of equation [2.5] would not require costs to be discounted. In this instance the present value of benefits would be compared to the estimated costs of a project.

Table 2.1: Applications of economic valuation techniques

Context	Comment	Relevance to heritage assets
Cost-benefit analysis: projects and programmes	This is the context in which CBA was originally developed. Usually public investment projects in public or quasi-public goods.	Restoration and maintenance projects
Cost-benefit analysis: policies, including regulations	Regulatory impact assessment (RIA)	Policies on national and local conservation requirements
'Demonstration' of the importance of an issue	Usually used to estimate economic damage from some activity, or the value to the nation of a policy	Could be used to estimate value of the stock of heritage assets in a 'conserve or decay' context
Setting priorities	Ranking allocation of funds for conservation etc	Could be used to prioritise heritage assets or prioritise spending on their restoration and maintenance
Establishing the basis for a tax or charge	Used to estimate the size of the tax or charge reflecting the damage of concern	Setting entrance charges to heritage sites
'Green' national income accounting	National accounts partially adapted for environmental impacts, e.g. DEFRA green agricultural accounts	Not so far applied to heritage assets
Corporate green accounting	A few studies exist of corporations' impacts on environment.	Not so far applied to heritage assets
Legal damage assessment	Possible use under EU Environmental Liability Directive	Could be used to estimate compensation if heritage assets damaged (though not covered by the Liability Directive)

2.6 Are heritage assets special? Non-economic notions of value

The preceding sections show that the notion of economic value has a very precise meaning and moreover that it is an anthropocentric notion. It relates to human wellbeing and changes in that wellbeing are revealed by people's preferences. Basically, if someone prefers A to B, their wellbeing from A is said to be higher than their wellbeing from B[11]. In common with utilitarian philosophy, the notions of costs and benefits and asset values introduced previously relate to the *sum* of these individual economic values. It is assumed therefore that it makes sense to add up the value of an asset which individuals prefer to get some aggregate which defines the *social* value of the asset. Also, an individual's wellbeing is assumed to be measurable through the notion of willingness to pay in the manner shown in Figure 2.1. These assumptions about social value being the sum of individuals' values, and about WTP measuring wellbeing are not arbitrary: an extensive historical literature explains why they are made. A comprehensive explanation of the theory behind the economic approach can be found in Just et al. (2004).

One reason for thinking that heritage assets deserve a different, 'non-standard' treatment is that they embody other notions of value besides economic value. For example, this is the view taken by Throsby (2001) who argues that cultural assets, of which heritage assets are a subset, generate both economic value and *cultural value*. If this is correct, heritage assets are special and different to other goods and services. This is Throsby's view. Thus:

[11] Wellbeing is the term used here. Traditionally economists tend to use terms like 'utility' or 'welfare'.

> '[a heritage project] does not involve a piece of ordinary economic capital for which an assessment of economic costs and benefits could be regarded as a sufficient appraisal. The heritage project is concerned with an item of cultural capital yielding both economic and cultural value. Thus an evaluation of net benefit streams in both economic and cultural terms will be required' (p.77)

According to Throsby, then, equations like [2.4] above are necessary but not sufficient to measure the value of heritage assets. We might classify three approaches to valuing heritage:

(a) The view of many cultural experts: determining cultural value and ignoring economic value;
(b) The 'standard' economic approach: determining economic value and ignoring cultural value; and
(c) Throsby's approach in which an effort is made to determine both economic and cultural values.

For simplicity we call these approaches (a) cultural value only, (b) economic value only and (c) the cultural plus economic approach. We briefly analyse each approach.

(a) Cultural value only

The view that only cultural values matter derives in the main from non-economists who (along with some economists) tend also to take the view that it is 'wrong' to determine the allocation of resources to heritage assets using the economic approach set out above. Throsby (2001) defines cultural value as a multiple set of attributes: aesthetic value, spiritual value, social value (sense of identity and space), historical value, symbolic value and authenticity value (its genuineness).

Clearly, economic value is just *one* concept of value. It attracts many criticisms. To see why, consider a hypothetical piece of heritage that no-one actually likes. Then, according to economic language, the economic value of that asset is zero (in fact, it is not an asset at all, and in so far as it costs money to get rid of it, it is a liability!). Now suppose that there is a handful of experts who have devoted a lot of time to studying the asset, its historical role, what it tells us about previous generations' ideas, and so on. Those experts are likely to value the asset highly, but as they are just a few individuals, 'society' overall (the sum of individuals) may still have a very low average value for the asset. It may therefore still have benefits that are nowhere near the costs of conserving it. Again, economic logic would dictate that it is not conserved for the sake of a few people, whoever they are. Note that the economic value of individual A is just as important as the economic value expressed by individual B, and no-one counts for more than anyone else; experts have no more 'say' than the man on the Clapham omnibus. It is partly this fear (that popular opinion might not favour the conservation or protection of assets that those 'in the know' might) that explains some of the suspicion about the notion of economic value. Sometimes, this argument is summed up by saying that people are 'not informed' enough to express a valid or genuine preference. This is a potentially dangerous argument since it amounts to disenfranchising much of the populace, something that no democracy allows when it comes to political voting for example. Moreover, the conclusion that people's preferences should not count (unless they support that of the expert minority) is not a logical one. If the problem is lack of information then the appropriate policy response is to inform people, not to deny them their view. Here we see a very valid argument for 'heritage education'. What evidence there is tells us that the better informed people are the greater their WTP for the asset in question will be. Difficult issues remain: for example, how much information is 'enough' (especially when information provision is not costless)?

A second category of criticisms would treat heritage rather like human life and argue that it is 'priceless'. Several recent critiques of economics adopt this view – for a recent well written critique along these lines see Ackerman and Heinzerling (2004)[12]. The argument here is rather different to the first one. In the first case those who cared most were in a hypothetical minority, and their WTP might not be sufficient to justify the costs of conservation. In the 'priceless' argument something like heritage cannot be brought into the same commensurate units as WTP[13]. There are several problems with this view.

First, if one cannot compare costs and benefits in commensurate terms, it is hard to know how much to spend on them. If benefits are in some non-monetary units but costs are in monetary terms, then the only techniques available for rational decision-making are (a) leaving it to political judgement and (b) cost-effectiveness analysis[14]. But the reason policy analysts develop procedures like cost-benefit analysis is to 'check' on political judgement. Assuming that political judgement is always 'right' without the need for any such checks makes policy analysis redundant. It is also 'Panglossian' – everything is for the best and political judgements cannot be bettered. Cost-effectiveness analysis is valuable. Indeed, economists would assume that all decisions subsume cost-effectiveness analysis, otherwise one would be wasting resources to achieve a given end. But cost-effectiveness cannot tell us how much conservation to do.

Second, no nation functions by assuming that assets, of whatever kind, are 'priceless'. Nations go to war which means that they judge the ends (benefits) to be worth the loss of life that war entails. No nation spends resources to bring risks to life down to zero, so costs are being traded against life risks. No nation conserves each and every environmental asset or each and every heritage asset. Logically that means that conservation is traded against cost. The impossibility of *not* trading environmental, cultural and life assets against money was pointed out 40 years ago by Thomas (1963). All decisions have costs and hence all decisions to incur that cost imply that benefits exceed costs. All decisions not to incur the costs imply that costs exceed benefits. Economic valuation is always implicit or explicit, it cannot not exist at all.

A third critique of the notion of economic value argues that the values relevant to environmental assets (and hence, by implication, heritage assets as well) are those of the citizen, not the individual. The difference is that when voting as a citizen the individual thinks about the social good in general and not about individual self interest. Citizen preferences are not therefore revealed in the market place, nor even in a hypothetical market place such as that embodied in stated preference techniques. Rather one has to look to the political process for evidence on these preferences. This view is perhaps best associated with Sagoff (1988, 2004). Here again there are problems. The problems with relying on the political process to reveal citizen preferences were noted above. The additional difficulty in this case is that political decisions are invariably the result of 'political welfare functions' which reflect partly what people want but also what special interest groups and lobbies want. One cannot assume that citizens' preferences determine political outcomes at the level of detail that would be required.

Finally, consider the notion of 'intrinsic value' as a value residing in heritage assets: the assets are 'worth' something *in themselves* and independently of the human being who may value them. Philosophers have debated notions of intrinsic value for centuries. Whether it exists or not as a meaningful concept, i.e. whether there can be 'value' independently of a 'valuer', is an issue we do not dwell on here. But it is relevant to ask what the policy implications of such notions are, assuming they are meaningful. As we saw, the attraction of the economists' notion

[12] The sub-title of this book ('*Priceless: On Knowing the Price of Everything and the Value of Nothing')* is interesting since it is intended to be Wilde's quotation about economists. But Wilde was referring to cynics, not economists.
[13] Others use 'priceless' to mean 'extremely high economic value', but if so one would want to see the results of the exercise that elicits this very high value.
[14] In cost-effectiveness analysis costs, C, are compared to effectiveness E. One can write C/E or E/C but one cannot write E-C so it is logically impossible to say how much of anything one should do.

of value is that it is commensurate with costs and costs are unavoidable in the decisions to conserve, enhance, modify and manage heritage assets. Non-monetary notions of value can still fall within the domain of cost-effectiveness analysis and this is an essential requirement for rational policy making. The practical problem with 'intrinsic value' is that it cannot be brought within the domain of a valuer and hence cannot be measured at all. The implication is that intrinsic value fits neither the economic value concept (deliberately so) nor the cost-effectiveness paradigm. It is also unclear exactly what role it could play in decision-making. Decision-making is about priorities and unless one can say that A has 'more' or 'less' intrinsic value than B, no-one can say whether A should have priority over B, or vice versa. The practical issue, therefore, is not whether intrinsic value exists, but what use can be made of it if it does exist. If it exists and cannot be measured, then perhaps the only way in which intrinsic value can influence decisions is through the decision-making discourse. That is, it would be up to those who wish to argue for more resource allocation to particular assets that they have 'high' intrinsic value, without there being any obligation to measure this notion of value.

(b) Economic values only

The 'standard' economic approach would reject notions of cultural value that are different to economic value. However, it is important to understand why. The standard approach does not argue that cultural values are unimportant. What it would argue is that all of Throsby's cultural values are *determinants* of economic value, rather than values in themselves. In the language of economic valuation, they are *motives* for value (Pearce et al., 2001). The critical response to this argument is that something like spiritual values should not be reducible to willingness to pay: the arguments are clearly debatable. All of Throsby's notions of cultural value exist and all will convey meaning to individuals, but neither individually nor collectively do they permit answers to questions about the allocation of resources between heritage assets or questions about how much heritage to conserve. One response might be that decision-makers should do 'all they can' to conserve assets of high intrinsic (and other) value. Even then, issues of prioritisation remain and trade-offs against cost are inescapable.

(c) Cultural and economic values together

The quotation from Throsby (2001) above suggests that it must be possible to set out the stream of economic benefits and a stream of cultural benefits (values) for projects. Throsby outlines a possible approach whereby a conventional cost-benefit analysis is supplemented by what is in effect expert assessment of the aesthetic and other values. Throsby speculates that it may even be possible to 'score' these values using cardinal scales[15], but he offers no examples. He also suggests that the experts could assign weights (measures of relative importance) for the different cultural values. While he does not use the language, what he is in fact doing is 'multi-attribute analysis' or 'multi-criteria analysis' (MCA). The credibility of this approach depends on a number of issues:

- Who assigns the scores and weights: in economic valuation ordinary people, not experts, express their WTP, which subsumes their scoring and weighting;
- How time is treated: many MCAs simply ignore time and discounting (Throsby is clear that it must be included in some way);
- How the 'do nothing' option is evaluated: MCA is akin to cost-effectiveness and cannot usually evaluate the option of doing nothing; and
- How the MCA and the cost-benefit analysis are combined, if at all: Thorsby offers no explanation of this, but seems clear in arguing that both appraisals are required.

[15] An ordinal scale simply ranks values, e.g. A>B>C. A cardinal scale would ascribe absolute magnitudes to the differences between A and B, B and C such that those magnitudes can be compared directly.

2.7 Are heritage assets special? Irreplaceability

A second argument for treating heritage assets differently to other goods and services is that they are irreplaceable in the sense that, once lost, the original cannot be recreated. 'Copies' and replicas can often be made, just as there are replica Norman forts and Saxon villages. The degree of irreplaceability is perhaps more severe for built heritage than it is for environmental assets. Apart from the extinction of species and, say, primary forests, many environmental assets can be recreated with barely discernible differences from the original. The question is whether irreplaceability makes heritage assets special in the sense of making them a challenge for economic valuation (or even incapable of economic valuation).

Irreplaceability and sustainability

Even if a heritage asset is irreplaceable, it does not mean that it has no substitutes. Substitutes may not be perfect, but economic analysis makes no assumption about perfect substitutability between money and conventional goods. Rather, perfect substitution is itself a special case. There are two senses to substitution here. First, one heritage asset may be a partial substitute for another heritage asset. That is, there may be 'within-asset' substitution. Second, any given heritage asset may be substitutable, partly at least, by non-heritage assets. In the sustainable development literature, the notion that environmental and social assets are substitutable by other assets is known as 'weak sustainability'. The notion that the loss of one heritage asset could only be compensated by another heritage asset is known as a 'strong sustainability' constraint. However, since one cannot recreate irreplaceable assets, compensation via the creation of heritage is not possible. Strong sustainability would therefore require that each and every heritage asset be conserved. *Provided a strong sustainability stance is adopted*, the relevance of irreplaceability for valuation is that far stronger pressure exists to conserve all that could be called heritage than in the weak sustainability context. That pressure translates into higher implied values for the marginal heritage asset. In contrast, the weak sustainability paradigm is consistent with the cost-benefit approach in which all kinds of assets are substitutable to some degree. On this paradigm, the values elicited by economic valuation techniques are the relevant ones, i.e. the various WTPs to conserve the assets.

Heterogeneity of heritage assets

The more heterogeneous heritage assets are, the less the degree of substitution between them. Even antique Chippendale chairs of the same design are not the 'same', even though the antique furniture market would treat many of them as 'replaceable'. Non-substitutability, or uniqueness, should elicit higher WTPs than assets with higher degrees of substitution. As such, uniqueness does not pose a special problem for economic valuation, although, as we see below, it may have implications for *which notion of economic value* is measured and for the reliability of 'transferring' economic values from one context to another ('value transfer' - see Section 3).

Irreplaceability and quasi option value

There is a potential implication of irreplaceability for the way in which decisions about heritage assets are made. It is not an issue of valuation as such, but of how valuations are used. It was noted earlier that major unique heritage assets were not likely to be at risk in an advanced economy (but many are in developing and transition countries, and the UK is a contributor to international funds for global heritage conservation). But now suppose lesser heritage assets are at risk because conservation budgets are limited. Suppose further that the assets at risk are not fully documented, in the sense that further information about them could be generated by more surveying, more archaeological investigation, more research, etc. There are opportunities for 'learning', i.e. for generating more information. Then, economic analysis tells us that the combination of uncertainty, the opportunity for learning and irreplaceability

should dictate a more cautious approach to the conservation decision. The value of the information generated by waiting before allowing the asset to decay or be replaced is known as 'quasi option value' (QOV)[16]. What the QOV literature is telling us is that one cannot simply compare costs and benefits of conservation in the manner outlined earlier (deriving a discounted present value based on expectations about future economic values) if the context is one of irreplaceability[17] and uncertainty, and if there is the chance of learning. If everything is known about the asset, then QOV does not effectively arise – being cautious about losing the asset will not generate new information.

Non-substitutability and 'value transfer'

Value transfer refers to a process of using the results of existing economic valuation studies to value similar assets. If, say, a detailed stated preference study exists for several historic houses, value transfer would seek to apply the resulting WTPs (for whatever the policy option is) to other historic houses. The rationale for value transfer is essentially one of resources. Original economic valuation studies can take time and this may not be available for fairly urgent decisions. Such studies can also cost tens of thousands of pounds. While often trivial relative to the economic value of the asset in question, study costs will not be trivial relative to the economic value of other heritage assets. Nor, in reality, is it easy to secure funds for repeated studies. So, value transfer appears to obey the requirements of 'rapid appraisal'. It is very widely used in environmental valuation – indeed it is not always realised that it is the dominant form of valuation – so there appears to be a powerful argument for its use in the heritage context.

Section 3 looks at value transfer in more detail and sets out the (often formidable) requirements for the transfer process to be valid. Here the focus is on the implications of 'within asset' non-substitutability of heritage assets for value transfer. *It should be obvious that the smaller the degree of substitution, the less likely it is that the conditions for value transfer will be met.* The reason is simple: value transfer is only likely to be reliable if one is valuing the *same or similar assets*. Not only that, but the assets need to be in similar contexts: a historic building may be similar to another historic building, but its economic value may be partially determined by its environmental surroundings or human geographical context.

The issue now becomes an empirical one. Some heritage assets are self-evidently non-substitutable within the portfolio of heritage capital. Some will have a degree of substitutability and some will be very substitutable. It appears to be a matter of empirical investigation as to which is which. However, care has to be taken with apparently substitutable assets. As far as non-use value is concerned, the loss of one asset may be partly compensated by transferring attention (and hence the NUV) to another similar asset. This is because NUV has the characteristics of a public good: it does not matter how many people possess NUV for the good in question, each individual's NUV is not at the expense of someone else's NUV. This is not the case with use values. The loss of one asset will result in the visitors transferring their visits to other sites. But this may threaten crowding at the substitute site, and crowding imposes costs on all visitors. As far as use values are concerned, the asset behaves more like a congestion good, or 'club' good, where there is some optimal number of users beyond which congestion costs become significant.

Uniqueness and willingness to pay

Uniqueness may have another implication for economic valuation. So far, it has been assumed that economic value is measured by willingness to pay. The usual reason for this is that individuals are assumed not to have any *property right* to a situation of improved heritage; if

[16] Not to be confused with the earlier notion of option value (OV), although the financial literature uses OV to mean approximately what we are discussing here, i.e. QOV. The terminological confusion is unfortunate.
[17] In the financial and environmental economics literature this is akin to 'irreversibility'.

individuals want a better heritage stock, they should be prepared to pay for it. It is logically possible to adopt a different stance and ask what individuals are willing to accept by way of compensation (WTA) to go without the improvement in the heritage stock. This would be the correct measure if individuals did have a 'right' to the improvement. Finally, consider the fact that heritage assets have to be maintained. Not maintaining them means that they fall into disrepair. If individuals have a right to the *existing state* of the nation's heritage, then WTP to prevent the damage is not the correct measure of economic value. Rather it would be the WTA to tolerate the continuing damage to the stock.

Which measure of economic value we use, WTP or WTA, was once thought to be immaterial because economic theory suggested they could not differ by more than a few percentage points[18]. But the results of quite a number of contingent valuation studies for various kinds of goods suggest the opposite. WTA can exceed WTP by multiples of up to 20. A subsequent literature has sought to explain why this difference emerges. Some economists regard it as an artefact of the contingent valuation methodology, others cite psychological 'loss aversion'[19], and others argue that it is the low degree of substitution in the goods analysed by the valuation studies. It seems fair to say that the issue is not resolved in the literature. However, the debate raises the possibility that heritage assets could be *seriously undervalued* by economic procedures based on willingness to pay. This undervaluation may occur if the following elements are combined: (i) low substitution for the asset; and (ii) a property right to the existing state of the asset if damage is threatened or a property right to the future state of the asset if improved.

Finally, we may note that invoking WTA as the measure of value may go some way to overcoming some of the criticism of the economic approach to valuation. First, WTA is consistent with the notion of heritage as 'birthright'. Second, it is possible that WTA will yield very much larger economic values than the standard economic approach based on WTP[20].

2.8 Conclusions

The central points of this Section can be summarised as follows:

- Heritage assets have economic value, where economic value is defined as the monetary value of the wellbeing that individuals obtain from those assets.
- Economic value accrues as a flow of benefits to individuals.
- Economic value has use and non-use components, the sum of which is total economic value.
- Where an asset is threatened with disappearance, its entire total economic value constitutes the benefit of preventing that disappearance.
- The more likely context for high profile heritage assets is that a change in total economic value is the policy concern.
- Such changes may arise from various resource allocation decisions – maintenance, presentation, augmentation, improvement of surrounding environment, etc.
- The value of these beneficial flows over time will vary according to the number of people using or appreciating the asset, and the way in which their individual values vary with their incomes and other factors. However, without empirical evidence pertaining to factors such

[18] The variation was termed 'Willig's bounds' after Willig (1976).

[19] Loss aversion means that one would want more compensation for losing a unit of an asset than one is willing to pay for a unit gain in it. For an extensive discussion see Pearce (2002).

[20] One widely entertained reason for using WTP rather than WTA is that WTP is 'conservative'. But it is hard to understand why one wants economic valuation to err on the side of understatement. One view is that stated preference techniques tend to exaggerate economic value. If so, WTP might offset some of that exaggeration. But the evidence for this exaggeration is not strong.

as the income elasticity of willingness to pay it is not possible to suggest just how economic values will change overtime.

- The discounted value of those flows makes up the economic value of the asset itself, i.e. its value as heritage capital.
- It can be argued that there exists a category of 'cultural values' which are quite different to economic values. Efforts to measure these cultural values have not, however, so far proved very successful.
- In so far as recommendations have been made about how to measure these cultural values, the approaches adopted are, effectively, multi-criteria analysis.
- Various problems exist with multi-criteria analysis, just as others do with the economic value approach. Most notably, multi-criteria analysis tends not to operate with individuals' preferences, risks arbitrary scoring and weighting, and cannot evaluate 'do nothing' options.
- The usual procedure with the economic value approach is to use willingness to pay as the measure of changed wellbeing.
- But there may be a powerful case for the use of willingness to accept compensation in contexts where the asset has few (or no) substitutes, and where individuals have property rights to the existing state of the asset or a right to its improvement.
- One modification to decision-making procedures, rather than to valuation itself, arises where heritage assets are irreplaceable, as they are (mostly) by definition, and where there is uncertainty about the value of the asset. This involves estimating the 'quasi-option value', i.e. the value of information derived by learning through postponing irreversible decisions.
- Cultural assets tend to be heterogeneous – they are complex combinations of characteristics. This may make value transfer subject to considerable error.

3. Value Transfer in the Heritage Context

3.1 Introduction

The current approach to appraisal of publicly funded projects, programmes and policies is set out in HM Treasury's Green Book (HM Treasury, 2003). This document provides best practice guidance to all central Government departments and executive agencies and recommends that appraisal be undertaken on the basis of cost-benefit analysis (CBA). Directly relating the costs of a project to its benefits, as done in CBA, requires a common unit of comparison; hence the desire to estimate the monetary value of benefits derived from non-market goods such as cultural and heritage assets. Where it is not possible to express either costs or benefits in monetary terms, supplementary techniques such as multi-criteria analysis may be employed. Indeed current appraisal guidance in the heritage context outlines the use of weighting and scoring. See for example the DCMS White Book (DCMS, 2004) and the DfT's WebTAG[21].

Therefore, with a basis for appraisal already set out for projects relating to the heritage sector, the role of this study is to explore the potential for introducing monetary estimates of those costs and benefits that are currently expressed either qualitatively or quantitatively through scoring exercises. As detailed in Section 2, stated preference and revealed preference techniques, which are grounded in the principles of economic theory and its perspective of 'value', may be used to estimate the monetary value of non-market goods. In association with these techniques, the notion of value transfer is, at first glance, an appealing concept. Certainly there is a 'value for money' property of value transfer, in terms of both time and effort spent, particularly in relation to the commissioning of original valuation studies. However, expediency must be traded-off against fundamental questions concerning the reliability of value transfer (see below).

Initially it is useful to consider situations where value transfer exercises might be undertaken. Table 2.1 in the previous section set out a number of contexts in which economic valuations in relation to heritage assets may be sought. On the condition that reliable economic valuations are available from existing valuation studies, value transfer could feasibly serve appraisal requirements in the contexts of cost-benefit analysis, demonstration of importance of an issue, setting priorities and green accounting. The contexts of establishing a basis for taxes and charges or legal damage assessment may require a greater amount of certainty that would perhaps be associated with original and purpose-designed valuation studies rather than the expediency of value transfer. In some cases, CBA applications may also be strengthened by original valuation work rather than the transfer of economic values.

Nevertheless, there is a distinct sub-set of appraisal instances where value transfer may be of use, particularly in relation to marginal changes to heritage assets' fabric, appearance, presentation or surrounding environment. Such changes may arise from actions within the heritage sector, such as restoration projects or ongoing or repetitive maintenance schemes, or from outside of the heritage sector, such as impacts from transport projects[22].

As the above highlights, there are a number of important considerations regarding the use of value transfer for the historic environment, from the appraisal context to questions concerning

[21] See: http://www.webtag.org.uk/

[22] These changes will typically affect the wellbeing of individuals by improving or detracting from a person's enjoyment of the historic environment. Therefore there will be a change in the total economic value (TEV) of a heritage asset, which can be measured by WTP (or WTA) for the marginal change in the status of the heritage asset. Here a value transfer excise may be undertaken.

the reliability and validity of value transfer. These points are variously discussed in the following. However, prior to doing so, it is useful to give a brief overview of the value transfer approach to economic valuation.

3.2 An overview of value transfer

Broadly, value transfer[23] is a process whereby information regarding economic value in one context is applied to a new context for which an economic value is required. In the terminology of value transfer, monetary estimates are transferred from a 'study good', for which original valuation study has taken place, to a target or 'policy good'[24]. The simplest form of value transfer would be to 'borrow' the estimated average (mean) WTP for some study good and apply it to a policy good context. This approach basically implies that the preferences of the average individual for the study good are an adequate description of the preferences of the average individual in the policy site context. Essentially this amounts to the assumption that mean WTP for the policy good is equal to mean WTP for the study good:

$$WTP_{PG} = WTP_{SG} \qquad [3.1]$$

The subscripts *PG* and *SG* denote 'policy good' and 'study good' respectively. This approach may be termed as **mean (or average) value transfer** or **unadjusted unit value transfer**. Having sourced a suitable WTP estimate from existing economic valuation studies, the next step in the process would be to aggregate the WTP value over the appropriate population in order to estimate the change in aggregate TEV for the good in question (see Section 5 for more discussion on aggregation).

However, the simplicity of this approach is subject to a number of caveats. In fact there are a number of reasons why it would be expected that mean WTP will differ between two sites, implying that the transferred value is an inaccurate measure of WTP for the policy good. These include differences in (Bateman et al., 2000) the:

i) Socio-economic characteristics of the relevant populations;
ii) Physical characteristics of the policy and study goods;
iii) Valuation context, i.e. proposed changes in the quality and/or quantity of policy and study goods that are valued; and
iv) Availability of substitutes at each site.

For unadjusted unit value transfer to be a fully valid premise, then, these four conditions would have to be satisfied. In reality, the policy good and the study good are unlikely to be identical. An alternative approach therefore is to adjust the study good WTP estimate in some way to account for the difference with the policy good. For instance, WTP for the study site good may be adjusted such that:

$$WTP_{PG} = \alpha WTP_{SG} \qquad [3.2]$$

Here α is simply some parameter that adjusts for the difference between the original valuation study context and the policy context of interest. Since income is typically a fundamental determinant of WTP and will in most instances vary between policy site population and study

[23] In the relevant literature, the term 'benefits transfer' is typically used rather than that of 'value transfer'. Here the latter term is favoured in the (obvious) recognition that estimates of non-market costs may also be transferred.
[24] Relevant literature may also alternatively use the term 'site' as opposed to 'good'. In environmental and recreational contexts the use of 'site' may typically be more appropriate. Here 'good' is taken to mean a heritage asset, although it is acknowledged that 'site' may also be applicable.

site population, it is common to account for this in the adjustment process. In such a situation, α may be estimated as follows:

$$\alpha = \left(Y_{PS} / Y_{SS}\right)^{e} \qquad [3.3]$$

That is the ratio of average income at the policy site (Y_{PS}) and average income at the study site (Y_{SS}), where *e* is the income elasticity of WTP; i.e. an estimate of how WTP for the good in question varies with changes in income. Without making this adjustment, the WTP for the study good would overestimate the WTP for the policy good in the case where income is higher at the study site.

Although income is the most obvious example, it may also be possible to adjust unit WTP values to account for differences in, for instance, age structure or population density between sites. Where there is the desire to make multiple adjustments to WTP amounts, a **function transfer** approach may be applied. Rather than transferring unit estimates of WTP, the function transfer approach instead transfers information from the study good context to the policy good context regarding the relationship between WTP and a number of explanatory factors. Specifically, a WTP function (or 'bid' function) relates WTP for a change in a non-market good to changes in parameters of interest including the factors relating to (i) the good (e.g. price and characteristics of the good); (ii) the affected population (e.g. socio-economic and demographic characteristics and pattern of use of the good); and (iii) the change (e.g. the quantity and quality of the good available with or without the change of concern). These parameters are factors which economic theory posits as being important in determining the willingness to pay of individuals. With a function transfer approach WTP for the policy good is predicted by transferring a WTP bid function for the study good such as:

$$WTP_{SG} = f\left(A, B, C, Y\right) \qquad [3.4]$$

Here A, B, C and Y are the factors that influence study site WTP (e.g. income, age, gender, education, frequency of visits, availability of substitutes, etc). This information can then be used to calculate WTP at the policy site[25]. In fact, policy site WTP would be estimated by multiplying the average value of the explanatory variables at the policy site (e.g. average income, average age of population, etc) by the function coefficients estimated for the study good:

$$WTP_{PG} = \beta_i + \beta_a A + \beta_b B + \beta_c C + \beta_y Y \qquad [3.5]$$

In the above, the βs are the estimated function coefficients from the study good bid function. They measure the impact of the change in an explanatory variable on WTP. Therefore, to apply the function transfer approach, it is necessary to source a suitable WTP bid function from existing economic valuation studies, and to also have data concerning a number of factors in the policy good context. In practice a single WTP function may be transferred from one study or more sophisticated alternatives may be considered. For example, function transfer may also be facilitated by meta-analysis exercises, which typically take a number of WTP studies in order to derive general relationships between WTP for a particular asset and a number of common explanatory factors. In addition, data concerning the policy site population may be augmented by the use the use of geographical information systems (GIS). This can be particularly useful in accounting for the effect that distance from a particular asset has on both use and non-use values.

[25] The notation *f(…)* simply means 'a function of', i.e. WTP is a function of, or is determined by, the factors expressed within the brackets.

Having computed WTP for the policy good from the transfer function, the next step is again that of aggregation. Compared to unit value transfer (either unadjusted or adjusted), function transfer requires that more information be known about factors that influence WTP in both the policy and study good contexts. A typical supposition is that function transfer is the most conceptually appealing approach to value transfer since it allows for more control of factors that may vary between study site and policy site (Pearce et al. 1994). Therefore policy good WTP values arrived at through this approach may be seen, at least conceptually, as more accurate than those provided by unit value transfer. Empirical tests of the accuracy of value transfer have sought to determine whether this in fact the case. These are discussed in the following.

In summary then, there are broadly two different approaches to value transfer. It may be the case that mean WTP amounts are transferred, and these may be adjusted to account for differences between the study good and the policy good, or that a WTP function is transferred, allowing for more account to be taken of differences between the study and policy good contexts.

Box 3.1: Practical examples of value transfer

Value transfer is widely used as an input to cost-benefit analysis and decision-making. In fact it is the dominant form of economic valuation, although this is not always realised. For instance, the Environment Agency for England and Wales (EA) developed the Benefits Assessment Guidance (BAG) (Environment Agency, 2003) in order to assess water quality and flow improvement schemes arising from the 2004 Periodic Review of the Water Industry (PR04). BAG was used to evaluate environmental and social costs and benefits and covers both use values (such as the value of increased informal recreation due to water quality improvement) and non-use values (for instance, individuals' preferences for improved biodiversity, even though they do not intend to visit the river). In the main, BAG is based on a small number of WTP studies, with typically a single study per benefit category, but in some instances two or three. Mean WTP from the source study is then used to estimate the benefit at the policy site of interest, which is aggregated over the relevant population using a distance decay procedure.

Prior to BAG, water quality and flow schemes were appraised through a multi-attribute technique (MAT), which used a point scoring approach for investments under consideration in the 1999 Periodic Review. However this method was subject to criticism, principally because benefit measures were not based on the preferences of individuals affected (see for example Moran and McMahon (2000)). Although it was introduced to address the perceived shortcomings of the MAT approach, BAG has also faced criticism. Most recently UKWIR (2004) reviewed the use of BAG and its appropriateness for application to the EU Water Framework Directive (WFD), a requirement of which is the need to use economic analysis throughout the implementation process. According to UKWIR (2004), the main problems of BAG stem from its features and the way in which it has been used. Doubts concerning the reliability of value transfer, the small number of source studies, and use of largely subjective distance decay functions are fundamental to the criticisms levelled. Overall it is argued that BAG has resulted in inaccurate estimates and over-stated benefits, suggesting it is unsuitable for application to the WFD. Whether value transfer will feature in the next Periodic Review in 2009 (PR09) and the implementation of the WFD remains to be seen. Collaborative research between the EA, the UK Department for Environment, Food and Rural Affairs, the water industry regulator (Ofwat), the water industry and other stakeholders will determine the path ahead.

A second example of the practical use of value transfer relates to the appraisal of transport schemes. Since 1993 valuation of both fatal and non-fatal casualties has encompassed both human costs and direct economic costs associated with road accident injuries (DfT, 2004). Specifically, the value of a prevented fatality (VPF) has three elements: (i) loss of output due to injury, which is calculated as the present value of the expected loss of earnings plus any non-wage payments paid by the employer (e.g. national insurance contributions); (ii) ambulance costs and the costs of hospital treatment; and (iii) human costs, based on WTP values, which represent pain, grief and suffering to the casualty, relatives and friends and the intrinsic loss of enjoyment of life over and above the consumption of goods and services.

By and large the procedure for estimating human costs, or more appropriately valuing risks to lives (i.e. mortality risks), involves estimating willingness to pay to secure a risk reduction arising from a project or

policy (e.g. road safety measures). Dividing the resultant WTP amount by the change in risk provides a measure of the value of statistical life (VOSL). Note that this is not the 'value of a life', it is a measure of the benefit of the reduction of the risk of fatality to an individual. Various countries adopt single values for the VOSL and use them in policy appraisal. However some concern arises when a VOSL estimated in one context, such as road accidents, is applied to another context, say, air pollution. This 'context' effect is a question of transferability of values. For instance, policies that reduce traffic accidents will likely benefit individuals of a much lower average age than policies that reduce air pollution, which tend to benefit older people. Hence the question arises as to whether someone aged 70 years of age has the same WTP to avoid a mortality risk as someone of 35 years of age (for further discussion see eftec (2004)). Due to such uncertainty recent developments have seen a move away from transferring VPF derived in a transport context to air pollution to undertaking specifically designed economic valuation studies (for example see Chilton et al., 2004; and Markandya et al., 2004).

3.3 Assessments of the validity and reliability of value transfer

While value transfer has been applied in many contexts, particularly in the realm of valuation of environmental goods (see Box 3.1), much debate has focussed on the validity of the approach. Concerns surrounding the application of value transfer approaches have arisen from empirical studies that have sought to determine the reliability of value transfer in different situations. A summary of this literature is provided below. Typically the validity and reliability of value transfer may be tested by carrying out identical economic valuation surveys that focus on the same non-market good either at different locations or points in time and across two or more different sample populations. Subsequent comparison of the results from these surveys across different populations may reveal whether or not any significant differences exist in either average WTP values or estimated bid function coefficients (Brouwer, 2000).

In the case of original economic valuation studies a clear distinction can be made between validity and reliability (see Bateman et al., 2002, for discussion in relation to stated preference techniques). In general validity refers to the degree to which a valuation study measures the intended quantity, i.e. the actual economic value of a good, whilst reliability refers to the degree of replicability of findings over time and over different applications. In the case of value transfer this distinction would appear to be less clear (Brouwer, 2000). The basis for assessing the accuracy of a transferred value at a policy site would be the extent to which it differs from the value that would be estimated if an original valuation study was undertaken at the policy site. Brouwer (2000) offers the distinction that reliability refers to the extent to which transferred policy site WTP values and WTP values that would be derived from an original WTP study differ, whilst validity refers to the extent to which estimated WTP functions and values are transferable from a statistical perspective. In reality, such discussion is likely to be relevant only when considering findings from empirical tests of value transfer – for the purposes of this report terms such as 'reliability', 'validity' and 'accuracy' may be used interchangeably.

A number of studies have investigated the validity of value transfer through empirical testing (see for example: Loomis, 1992; Desvousges et al., 1992; Boyle and Bergstrom, 1992; Parsons and Kelly, 1994; Bergland et al., 1995; Loomis et al., 1995; Downing and Ozuna, 1996; Kirchoff et al., 1997; Brouwer and Spaninks, 1999; Barton, 2002; Brouwer and Bateman, 2003). Of typical interest in these studies is the degree of error that arises when transferring WTP information from the study site valuation context to the policy site valuation context. When considering the transfer of unit values, this transfer error is the difference between observed unit WTP value at the study site and the unit WTP value at the policy site. In relation to function transfer, the transfer error is the difference between the observed unit WTP value at the policy site and the predicted WTP value for the policy site based on the use of policy site variables in the WTP function transferred from the study site.

A survey of a value transfer tests (Brouwer and Spaninks, 1999) finds that transfer errors range from 1% to 475% (in absolute terms). Interestingly, the extremes of this range are both found in the study by Loomis et al. (1995), which tested value transfer in relation to reservoir-based recreation using a function transfer approach (that controlled for travel cost, area size, availability of substitute sites, population size and median age) based on a travel cost model. In Brouwer and Spaninks's own empirical investigation (WTP for conservation of agricultural wildlife in the Netherlands) it is found that in cases where value transfer is statistically valid (i.e. where it is not possible to reject the hypothesis that study site and predicted policy site WTP are equal) the function transfer approach is slightly more robust, resulting in a transfer error of 22%. In contrast, errors associated with the transfer of unadjusted unit values ranged between 27-36%. Similar findings are also reported by Kirchoff et al. (1997). However, in cases where function transfer is found not to be statistically valid, Brouwer and Spaninks find that the resulting transfer errors are higher in percentage terms than those found for invalid transfers of mean and median WTP values.

The annex to this report presents a detailed assessment of the work by Brown (2004), a unique study which was designed specifically to test transferability of values of historical properties across populations. The study focussed on three different (but similar) historical National Trust properties in the UK: Chartwell, in Kent; Upton House in Warwickshire; and Stourhead on the Wiltshire/Dorset border. Overall, transfer errors of the WTP estimates ranged from 3.65% to 110.8%. This range provides some indication for policy-makers about the errors that might be experienced when transferring estimates in relation to the economic value of historical property; in particular, the lower end of this range is likely to be acceptable for most policy applications.

A further point of interest for this study is the question as to whether information concerning WTP for heritage assets obtained in one country can be applied to other countries. As the literature review in Section 4 highlights, only a handful of valuation studies have been carried out in the UK, suggesting that non-UK studies may need to be considered for value transfer exercises. Ready et al. (2004) test the accuracy of value transfer between different countries on the basis of five identical CV surveys carried out in the Netherlands, Norway, Portugal, Spain and the UK. The surveys focussed on WTP to avoid symptoms of respiratory illness. After adjusting mean WTP estimates for different income levels and standards of living (through purchasing power parity indices) an average absolute transfer error of 38% was found. In another paper which considered health-related WTP (specifically WTP to reduce skin cancer risks) in New Zealand, England, Scotland, Greece and Portugal, Brouwer and Bateman (2003) found that socio-economic factors are a necessary but insufficient requirement for accurate function transfer, particularly between different countries. Explanatory variables that describe individuals' attitudes and perceptions of the good are also important aspects in determining WTP in function transfer exercises. Indeed these variables are most likely to vary between countries due to cultural reasons and hence some account of these differences should be made when transferring values from other countries.

The most recent contribution to the debate on the validity of value transfer is provided by Kristofersson and Navrud (2005). Interestingly they pick up on the point that although there was a difference of 27-36% between transferred unit values and policy site-determined unit values in Brouwer and Spaninks (1999), the statistical tests failed to reject the hypothesis that the values were equal. Kristofersson and Navrud go on to argue that *statistical testing* of the validity of value transfer to date has focussed on the wrong question. The approach so far has been to assume that policy site and study site WTP values are equal and then to employ certain statistical tests to ascertain whether this assumption is correct. In actuality though, theory suggests that WTP for non-market goods (such as heritage assets) depends upon prices, income, the nature of the good and the availability of substitute and complementary goods. Conceptually value transfer will only be valid if all of these factors are identical at the policy and study site; in fact, heterogeneity of non-market goods implies that it should not be

expected that all conditions (if any) will be the same at the policy site and study site. Therefore what should be tested is the expectation that WTP at the policy site and study site are different, which implies a different statistical testing procedure. This essentially reverses the burden of proof and does not falsely assume that values are identical. Non-rejection of the hypothesis of non-equality would imply invalid transfer, which Kristofersson and Navrud argue is the result that should be expected from theory and the empirical evidence to date.

Whilst Kristofersson and Navrud focus on empirical testing of value transfer, their discussion also cast doubts on the practical application of value transfer for appraisal exercises. At the core of the issue of the validity of value transfer is the question as to whether 'some number is better than no number'. When considering this point it is worth distinguishing between two questions which are important from the perspective of this study:

i) What is an acceptable level of error in value transfer?
ii) Is it possible to undertake value transfer on the basis of the existing body of heritage valuation literature?

For the first point it is worth noting that in practical value transfer exercises for heritage assets the degree of error will be unknown. Hence perhaps all that may be said is that value transfer is an approach to economic valuation which has some degree of inherent uncertainty and evidence concerning its accuracy is inconclusive. The second point in some sense is more important though – questions of accuracy are a luxury that can be indulged in when there are sufficient and appropriate studies available for value transfer purposes. Fundamentally, value transfer is not a feasible input into appraisal and decision-making if a sufficient body of relevant valuation literature is not available. This study's literature review investigates this question (Section 4).

3.4 Value transfer for heritage assets

Discussion in the previous sub-sections has been fairly abstracted from the practicalities of applying value transfer for the historic environment. The task here, therefore, is to examine the potential application of value transfer in relation to appraisal of projects and programmes that affect heritage assets and impact on the historic environment.

In a practical value transfer exercise, it is necessary to identify a suitable study, or selection of studies from which to source WTP information for application to the policy site. An important consideration to be kept in mind when assessing the merits of different study site values is the expectation that, as noted in Section 3.2, WTP for a particular good will differ between different locations. Therefore, in order to minimise concerns relating to validity and reliability of transferred values, it is important to select the most appropriate WTP estimate from the most appropriate study site or good. Hence, what is needed is a set of criteria for assessing the appropriateness of WTP surveys for transfer purposes. Such criteria include (Bateman et al., 2002):

i) Site/good characteristics should be the same, or differences should be accounted for;
ii) The change in the provision of the good being valued at the two sites should be similar;
iii) Study and policy sites must be similar in terms of population and population characteristics or differences in population must be accounted for;
iv) Studies should contain willingness to pay (WTP) functions showing how WTP varies with explanatory variables;
v) Studies included in the analysis must themselves be sound; and
vi) Property rights should be the same across the sites.

In theory, adhering to these conditions would enable a suitable 'match' to be made between the policy site good to be valued and its associated appraisal context and a suitable existing valuation study from which to source WTP information. While not explicitly mentioned in the above criteria (but embodied within criterion (ii) and (iii)), geographical or spatial location is a particularly important consideration in assessing the appropriateness of a study for transfer purposes. For instance, 'similar' heritage assets may be distinctly different between different countries due to differing cultural and historical associations. In addition socio-economic characteristics typically vary between different countries, most notably when comparing developing countries to more developed countries.

The following considers the above conditions in relation to the application of value transfer within the context of the historical environment. In addition, these conditions form the basis of the review of literature presented in Section 4, the case study applications in Section 5 and the annotated bibliographies of valuation studies presented in the Annex to this report.

Site/good characteristics should be the same, or differences should be accounted for

As Section 2.7 previously highlighted, the typical heterogeneity of heritage assets is an important consideration in relation to the reliability of transferring economic values from one context to another. Of concern is the expectation that economic values associated with the historic environment and heritage assets are likely to be highly site and good-specific. Without a high degree of similarity between the study good and the policy good (in conjunction with a similar change in provision of the good as discussed above) it is unlikely that value transfer will provide an accurate proxy of economic value at the policy site.

From a practical point of view, this implies that if a WTP value is sought for a project that values restoration of some aspect of, say, a cathedral, then studies that have considered the benefits of restoring the similar features of other cathedrals will be the most suitable candidates for value transfer. However, further difficulty can be envisaged since clearly no two cathedrals are identical. This point is particularly pertinent, indeed any given heritage asset is likely to display distinctive features that are unmatched elsewhere, be they in terms of physical characteristics (e.g. an exemplar of a certain architectural style) or in terms of historical association (e.g. the site of an important historical event).

As Noonan (2003) finds in a review of valuation studies covering a broad spectrum of cultural resources, uniform and objective descriptors of disparate goods based on published reports are scarce. This suggests that ability to match suitable study goods to policy goods may be limited. However, in the process of this discussion, it is useful to consider how the characteristics, or features, of heritage assets may be ascribed. Current appraisal guidance, such as the DfT's WebTAG is a particularly useful reference in this respect. In WebTAG, features of heritage assets are outlined in terms of (DfT, 2003):

- Form - refers to aspects of heritage assets such as structure, scale, extent, materials, style, format, layout and pattern.
- Survival – refers to the state of completeness of an asset, i.e. how the characteristics of an asset have survived.
- Condition – this is seen as distinct from survival and refers to the appearance and present management of the heritage asset (e.g. condition is concerned with the current state of a resource which is determined by the prevailing management regime).
- Complexity – refers to the diversity of elements and relationship within a heritage resource and beyond.
- Context – refers to the immediate setting and surrounds of an asset or site.
- Period – refers to the date of origin of the asset and also the duration of its use. This also includes for historical and architectural events and notable figures linked to a site.

In addition characteristics of heritage assets may be described through standard approaches such as designations (e.g. ancient monument classifications), listed building descriptions, and conservation areas. With regards to designations, it should be noted that some sites and monuments may fall into several categories, including those relating to biodiversity and leisure designations. In addition, these characterisations are largely descriptive; quite apart from the physical features of a heritage asset site there is a subjective element which might include local people's feelings about the site, wider landscape setting, and also ecological and wildlife considerations. Similarly, current appraisal guidance also uses judgemental indicators to establish the significance of the heritage asset in question. These indicators relate to each of the WebTAG features categories above, and are:

- Scale (on which the asset matters) – this is the geographical scale at which the feature/attribute matters to policy makers and stakeholders at all levels. It also includes international or national commitments (e.g. UNESCO, Planning Policy Guidance, etc) suggesting the level of importance of a site.
- Rarity – refers to how unique the asset is as an example of its type and incorporates assessments of fragility and vulnerability.
- Significance – while designations suggest level of significance, this indicator is not wholly based on designation, but more generally on the characteristics of a heritage asset that makes it important.

Overall there is an evident complexity associated with heritage goods and their defining characteristics, which is perhaps more so than in the case of environmental goods where value transfer has been most often applied. When considering the application of value transfer to heritage assets, this heterogeneity certainly represents a significant obstacle to the selection of economic values for new policy good contexts that may arise. The implication is, then, that when seeking to employ value transfer, judgement concerning the degree of similarity between the policy good and the study good will be a particularly important influence on the perceived validity and reliability of economic values inputted to the appraisal process.

The change in the provision of the good being valued at the two sites should be similar

Under this criterion, the 'good' is understood to be the heritage asset in question. For example this may be a building or group of buildings of historic interest (castles, cathedrals, churches, listed buildings, etc), a historical site (ancient monuments, buildings, etc) or area of historic interest (landscaped garden, archaeological complex, etc). 'Change in provision' refers to the action which is to be appraised. This could include:

- Expenditure on repair, restoration or maintenance;
- Expenditure on improvements to access;
- Expenditure on improvements to site information and interpretation;
- Expenditure on the environment in which the heritage asset is presented and enjoyed; or
- Impacts arising from development projects outside the heritage sector on the heritage assets (e.g. a transport scheme).

By and large, these actions amount to marginal changes to the current state of the asset. Put another way, they result in marginal changes to the TEV of the asset (as discussed in Section 2.4)[26]. In these cases it is most likely that the appraisal context will be that of cost-benefit analysis (see Table 2.1) where the intention would be to compare the cost of the action to the perceived benefits of the action. For example, it may be a question of whether it is worth spending money on restoration work. If the benefits can be shown to outweigh the cost, then it may be deemed that the restoration work is justified. As an aside, cost-benefit analysis is not

[26] In some appraisal contexts, such as the demonstration of value, it may be more appropriate to consider the total economic value of a heritage asset. However, with the scope of this study more concerned with marginal changes in TEV, discussion is more appropriately pitched in these terms.

only limited to appraisal of marginal changes and a point to be made is that the magnitude or scale of the change is also an important consideration when comparing a study site WTP context to a policy site WTP context.

From a value transfer perspective, the requirement then is that the economic value sourced from a study site estimates the same or similar type and scale of change in TEV that is experienced at the policy site. For instance if the policy site context requires an estimate of the benefit arising due to restoration work, then what is needed from some study site is an estimate of WTP for a similar restoration project. Critically then, some assessment and judgement is needed when undertaking value transfer exercises to determine what is 'similar enough'. Whilst recognising this point here, discussion on this issue is deferred to Section 3.4.

In reviewing the economic valuation literature, particularly stated preference studies, the change in provision of a good is often referred to as the 'valuation scenario'. In an SP study, the valuation scenario presents a respondent with all of the information that is relevant to the hypothetical market that has been created, such as what the good in question is, what the changes to its provision are and what the outcomes of the changes in provision will be. For instance, as can be seen from the literature review and annotated bibliography of valuation studies, economic values may be estimated in terms of:

- WTP for maintenance of a heritage asset in its current state, thus preventing marginal deterioration from the current state; or
- WTP for restoration of a heritage asset, giving a marginal improvement in the asset from a currently degraded state; and so on.

These examples should not be interpreted as definitive, but more as illustrative to demonstrate the terminology that may be applied in relation to marginal changes. With respect to revealed preference studies, the valuation scenario is typically one of assessing the whole asset in its current condition. For example, the travel cost method may be used to estimate use benefits accruing from visits to a historic site, therefore estimating total use value, rather than any marginal changes in use value.

Study and policy sites must be similar in terms of population and population characteristics or differences in population must be accounted for

If the characteristics of the population of interest for the policy good are different from the population affected by the study good, then it is likely that WTP for the heritage asset in question will differ between these two contexts. Therefore when undertaking a value transfer exercise it is important to consider differences that may exist between these populations and how these differences may influence the WTP amount that is transferred to the policy context. One important socio-economic factor is income, as discussed in Section 3.1. Other socio-economic characteristics that could be important include age structure, household size and make-up, education levels and gender.

In addition to the above, some account may need to be made for differences in use characteristics between the study site sample population and the policy good population. If the study site sample population is made up entirely of users of the good in question, then the estimated WTP is likely to be an inappropriate gauge of WTP for non-users of the good in the policy good context. In most instances, unit WTP estimates for users of heritage assets are higher than those for non-users (Pearce et al., 2002). Where estimated WTP values in a study are derived from a mix of users and non-users, then some consideration may need to be taken of how the proportion of users to non-users may affect WTP.

Because it is unlikely that the study and policy site populations will be similar, a function transfer approach is typically promoted over the use of unadjusted, and even adjusted, mean

WTP amounts. A function transfer approach enables a modified WTP value to be estimated for the policy site that will account for differences in population characteristics (provided a suitable WTP bid function is available in the existing literature). However, a caveat to note is that while information concerning socio-economic characteristics of the relevant policy good population should be relatively easy to source (e.g. through census data), and use and visitor behaviour is often recorded by those responsible for the management of heritage assets (e.g. through visitor surveys), information concerning the attitudes of individuals towards heritage, culture and the historic environment in general (which are typically seen to be important influences on WTP) are unlikely to be available for the policy site.

Again it is the case that some judgement will be needed to determine how similar the study sample population and the policy good population are, and whether any differences between these two populations would be expected to lead to significant differences in WTP estimates between the two sites.

Studies should contain willingness to pay (WTP) functions showing how WTP varies with explanatory variables

In undertaking value transfer, it is important to establish that WTP values sourced from a valuation study follow distinguishable patterns which conform to the prior expectations of economic theory. In essence, this is a form of 'quality control' which can assess the validity and reliability of the WTP obtained by a valuation study. One way to do this is to consider empirical (econometric) analysis, i.e. regression analysis of WTP bid functions, presented by the valuation study, which seeks to determine the relationship between WTP and a number of explanatory variables. For a comprehensive discussion concerning such aspects of stated preference studies see Bateman et al. (2002). Similar discussion with regards to the travel cost method is provided by Ward and Beal (2000).

It is typically expected that a number of variables, such as income, socio-economic characteristics, attitudes towards the good and its change in provision, use and distance from the good, will influence an individual's WTP. With regards to income, in most cases, it is expected that wealthier individuals will be more inclined to have higher WTP. Hence in a WTP bid function, the coefficient on income (which measures the impact of the change in income on WTP) should have a positive sign. In the case of a variable such as distance from the heritage good (or entry price, or the number of substitute sites), it would be reasonable to expect a negatively signed coefficient, implying that as distance from the heritage asset (or price, or the number of alternative sites to visit) increases, WTP decreases.

In addition to considering the signs of function coefficients it is also important to consider the statistical significance of these coefficients. Statistical significance tests are applied to see whether a coefficient is statistically different from zero or not. If the coefficient is found not to be statistically different from zero, then the implication is that the variable has no influence on WTP. A change in the variable will not lead to a change in WTP. In contrast, if a coefficient is statistically significant, then it may be concluded that a change in explanatory variable will result in a change in WTP. Again, in the example of income, economic theory posits that income should be a statistically significant factor in determining WTP, indeed respondent income should act to restrain WTP due to budget constraints faced by individuals. Therefore, it would be expected that the coefficient on income would be both positively signed and statistically significant. Where prior expectations from economic theory are not found by empirical analysis in valuation studies, attention should be paid to the explanations offered by the study authors as to possible reasons for the observed inconsistencies.

Aside from considering the influence of individual variables it is also necessary to consider the explanatory power of the whole bid function. This can help establish that WTP estimates for the study good population are not completely random. A parameter known as the R-squared

statistic (or pseudo R-squared depending on the form of the WTP bid function), which is often denoted as R^2, provides a measure of the explanatory power of an estimated bid function. The larger the R^2 statistic, which takes a value between zero and one, the greater the assumed explanatory power of the model. Unfortunately there is no commonly accepted threshold value for the R^2 statistic that denotes a bid function as having an acceptable power of explanation. However, at lower values (perhaps around 0.1) conclusions may be drawn that the WTP values from the sample population show very little in the way of distinguishable patterns (Bateman et al., 2002).

In short, for the purposes of value transfer, transferred WTP information may be seen to be more appropriate if it is sourced from a study that demonstrates robust empirical results, both in terms of the individual variables and WTP values and overall WTP bid functions.

Studies included in the analysis must themselves be sound

The condition that studies considered for value transfer exercises should themselves be sound follows on closely from the previous condition and the robustness of WTP values and functions. For instance, in the case of travel cost surveys, the robustness of results will depend on whether the study incorporated all elements of costs associated with visiting a particular site. With regards to stated preference techniques, this criterion focuses on how the survey instrument (the questionnaire presented to respondents) may influence the responses received from respondents. Specifically, of interest is the 'incentive compatibility' of the survey instrument; an assessment of the extent to which respondents are 'forced' to answer truthfully. Here a number of issues relating to SP studies should be considered:

- Elicitation effects – are concerned with whether or not a respondent will answer truthfully (i.e. state their 'true' WTP amount). Crucially this may depend on the way in which the valuation question is framed. For instance some respondents may 'free-ride' by stating a lower WTP value for a collective good than they actually hold (the incentive being to let others pay for the collective good but to still derive the benefit from its provision). Conversely, some respondents may strategically overstate their WTP in order to improve the prospects of the good in question being provided. Overall, there are four main ways in which a WTP question may be framed (see Bateman et al. 2002):

    - Open-ended (OE) format: respondents are simply asked to state their maximum WTP for the good described in the valuation scenario. This approach is typically prone to strategic behaviour such as free-riding due to low incentive compatibility.

    - Dichotomous choice (DC) format: respondents are asked 'Are you willing to pay £X' for the good described in the valuation scenario (where X is varied across the sample). Several variants of the DC format exist that include follow-up questions with higher or lower bid amounts depending on the respondents' initial response (e.g. double-bounded DC), where more information concerning a respondent's WTP is elicited. The DC question may also be posed as a referendum question, where respondents are asked, 'Would you vote yes to a project if it cost £X?' (Again X is varied across the sample). The DC approach is the most incentive compatible approach, however it may lead to problems such as 'yea-saying' (saying yes in order to please the interviewer) or anchoring, where a respondent's WTP is influenced by the first value presented to them (also know as starting-point bias).

    - Iterative bidding (IB) format: respondents are asked a series of questions bidding up and down from a pre-determined starting point until their maximum WTP is established. This format has been found to be particularly prone to starting-point bias.

  - Payment card (PC) format: respondents are asked to pick a value from a range given on a showcard. Many variants of this approach exist, which can be used to elicit point estimates of WTP or interval estimates. The range of values presented on the card may introduce some bias into respondents' valuations (so called 'range bias').

- Payment vehicle effects – are concerned with the way in which respondents would have to pay for the good which is of interest in the valuation scenario. Typical payment vehicles include donations to charitable bodies, payments to specific trust funds, increases in either national or local taxes, or entry fees. Conceptually, tax payments and entry fees are more incentive compatible (e.g. these payments cannot be avoided), but may typically result in a higher degree of protest votes, in which respondents state a zero WTP because of the payment vehicle, rather than holding no positive value for the good in question. Donations to charity have lower incentive compatibility with the potential for free-rider behaviour, while trust funds may appear to lack credibility, since if not enough money is collected, the good will not be provided.

- Information effects – empirical evidence suggests that as the amount of information provided to respondents increases, so do elicited WTP values. However, it is likely that this relationship applies to all goods, cultural, or otherwise.

- Interviewer and respondent bias – CV studies may also be influenced by aspects relating to the interviewer (e.g. their appearance or accent may cause the respondent to behave in a particular way) or the respondent. For example, in surveys administered by mail, only those with a strong interest in the good may return questionnaires, leading to sample self-selection (sample bias). Whether a survey sample is representative of the population of interest to the good in question is important when aggregating WTP amounts.

In addition to the influence that the survey instrument may have on WTP responses, much debate surrounding CV has centred on whether estimated values are invariant to the magnitude or scope of the good being valued (and therefore in violation of the underlying principles of economic theory on which valuation methodologies are based). This debate concerns 'scope sensitivity', 'embedding' and 'part whole' effects:

- Scope sensitivity - testing for scope involves observing whether WTP increases with the size of the good (i.e. WTP for two historic buildings should be greater than WTP for each building in isolation). Insensitivity to scope is often termed as an 'embedding effect'. A number of the studies reported in the Annex test for scope sensitivity.
- Part-whole effects – are an allied concept to scope insensitivity. Here when a set of goods (the 'parts') are valued individually the sum may exceed that for the same set of goods valued together (the 'whole'). This effect is particularly relevant to the valuation of heritage assets. For example, when considering a number of buildings within a historic area, part-whole effects suggest it may be difficult to extrapolate the value of preserving ten buildings from the value of preserving one.

The existence of the any of the above, from elicitation effects to part-whole effects, may lead to questions concerning the 'soundness' of valuation studies, and hence would bring into question the appropriateness of using WTP information sourced from these studies in value transfer exercises. The literature review in the following section and the annotated bibliography of studies in the Annex to this report pick up on the above points where relevant in relation to specific valuation studies.

Property rights should be the same across the sites

This final condition concerning property rights relates to the change in wellbeing that is to be assessed in the policy good context and how this compares to the change in wellbeing that was considered for the study site good. There are four types of benefit measure that may be estimated by valuation studies:

- WTP to secure a gain (e.g. an improvement in a heritage asset's appearance);
- WTP to avoid a loss (e.g. preventing deterioration of a heritage asset);
- WTA to tolerate a loss (e.g. compensation for experiencing deterioration in a heritage asset); and
- WTA to forego a gain (e.g. compensation for not receiving an improvement in a heritage assets appearance).

In valuation studies the choice of benefit measure may depend on the property rights structure and the type of change from the status quo position. For instance, in the case of a publicly owned heritage asset, it may be viewed that society is entitled to the wellbeing accrued from the asset in its current state. When considering a negative change from the current state of the asset, WTA to tolerate a loss would be the appropriate measure of reduced wellbeing[27]. If however the asset is privately owned, the appropriate measure of reduced wellbeing would be WTP to avoid a loss; the property rights reside with the private owner and not society.

3.5 Discussion and conclusions

The ability to undertake value transfer in a heritage-related appraisal context is tied to the successful application of economic valuation studies which generate a body of literature from which to source suitable WTP information for transfer. Hence, the report so far has focussed on the use of value transfer without explicitly considering if sufficient valuation literature exists to enable value transfer exercises to take place. Indeed the quality and breadth of the existing body of literature will determine whether conditions that relate the matching of a policy good to a study good can be satisfied. A survey of the existing literature is dealt with in Section 4. Here, though, it is useful to pick up on issue of judgement in value transfer as highlighted in several instances in Section 3.4.

Ideally, an application of value transfer will source WTP information from a robust valuation study and will take appropriate steps to ensure that any differences between study and policy goods and the change in their provision and differences between study and policy site population characteristics are minimal. This would imply that doubts concerning the reliability and validity of the value transfer exercise are minimal and that the decision-making process of interest is informed by economic values that are as robust as can be expected (given that value transfer has been used). Therefore the six conditions outlined in Section 3.4 are essentially 'best practice' guidance for those undertaking value transfer exercises.

Yet it seems unrealistic that these conditions can be met simultaneously, a sentiment echoed in a number of instances (see for example Pearce et al., 2002; Noonan, 2003). Indeed only an original and specifically designed valuation study could possibly meet them. Therefore, a trade-off is faced between the ideal circumstances for value transfer and increased doubt over accuracy of the derived WTP estimates. Here then are a series of questions of judgement: 'how similar should the study good and the policy good be?'; 'how similar should the change in provision of the good at the study site be to the change intended at the policy site?'; and so on for all the conditions outlined in Section 3.4. Inputs from experts in both heritage and economics are required to answer these questions. In practice appraisal is typically

[27] However, refer to Section 2.7 for concerns surrounding the choice of WTA measures over WTP measures.

proportional to the scale of project and hence the degree of reliability expected from value transfer exercises would be closely linked to the purpose of the exercise. For example, it is likely that a greater deal of certainty would be required from economic values pertaining to the design of taxes than would be for the assessment of a small scale project. Moreover, and perhaps it is an obvious point, each value transfer application would require such judgements to be made, as uniformly applicable answers to these questions are unlikely to emerge. Hence, with value transfer, it is the case that more subjectivity is evident in the appraisal process than would, say, be the case where an original valuation study is used.

Along with ascertaining the depth of the current body of heritage valuation literature, this issue of judgement in value transfer is inherent to determining what scope there is for using the results of valuation studies in the appraisal of heritage-related projects and programmes. As such, the case study examples presented in Section 5 provide useful insights.

For now, though, to conclude this Section, the central points of the discussion so far may be summarised as follows:

- Value transfer has potential for application in a number of areas related to the appraisal and assessment of heritage-related projects and programmes. Most notably the 'value for money' aspect makes value transfer appealing for use within cost-benefit analysis, demonstration of importance, priority setting and potentially green accounting.
- The scope of this study is mostly concerned with the appraisal of marginal changes to heritage assets' fabric, appearance, presentation or surrounding environment resulting from actions from within or outside of the heritage sector. Here there is certainly the need to explore the use of value transfer.
- Broadly there are two main approaches to value transfer: (i) the transfer of unit WTP values (adjusted or unadjusted); or (ii) the transfer of WTP functions.
- Expectations based on economic theory suggest that more sophisticated approaches to value transfer, such as function transfer, may be more appropriate when transferring WTP information regarding a study good to a policy good context. In the main, this is to account for differences between the study good site and the policy good site which are likely to mean that WTP will differ between the two locations.
- The accuracy, reliability and validity of value transfer and its application is an important issue. Typically notions of accuracy relate to how value transfer estimates of WTP would differ from WTP estimates derived from an original valuation study at the policy site.
- Conceptually, the function transfer approach allows value transfer to control for multiple differences between study good valuation context and policy good valuation context. This is likely to increase the validity of the transfer but could also be infeasible if policy site data required for the function transfer do not exist or are costly and time consuming to collate.
- Empirical assessments of value transfer provide inconclusive findings as to the accuracy of both unit and function transfer approaches. In particular transfer errors reported by various studies range widely and there is no overwhelming evidence to suggest that one approach to value transfer has proved to be more successful than any other.
- Practical experience with value transfer points to the importance of study selection and also the way in which values are adjusted and aggregated, particularly in relation to the definition of the affected population.
- Applications of value transfer in the heritage appraisal context (or indeed any other) should seek to satisfy a number of criteria for matching suitable study good WTP information to the policy good WTP scenario.
- These criteria focus on: (i) matching the study good to the policy good; (ii) matching the change in the study good and the change in the policy good; (iii) matching the characteristics of population at the study good site to the characteristics of the policy good site; and (iv) ensuring the robustness of WTP information transferred from study site to policy site.

- By and large, these criteria appear to be fairly restrictive, making it unlikely that a 'perfect' match can be made between a study site and policy site. In particular, value transfer in relation to the historic environment faces an additional dimension of complexity due to the largely unique nature of heritage assets. A whole host of characteristics and features serve to ensure that two assets are seldom alike. Some of these are perhaps more descriptive (e.g. form, survival, condition, time period, etc as well as designations), while others are of a more subjective nature (e.g. significance).
- Therefore if value transfer exercises are undertaken, judgements concerning how suitable study good WTP information is for transfer will be fundamental to the perceived reliability and validity of the economic values estimated for the policy good context.
- Moreover, the viability of even undertaking a value transfer exercise in the first instance is dependent upon whether the existing body of heritage valuation literature holds suitable examples of study goods that could conceivably be employed. The following section addresses this question.

4. Literature Review

4.1 Overview

Section 3.4 outlined a number of criteria in the context of heritage assets and the historic environment that may be used to 'screen' the usefulness of existing valuation studies for value transfer exercises. The purpose of the literature review undertaken for this study was to assess potential scope for value transfer offered by the existing body of literature.

Application of economic valuation techniques to cultural assets is a relatively new occurrence. The first valuation studies in the field were conducted in the 1980s, whilst around 45% of empirical research in the area of culture has been undertaken since 2000 (Noonan, 2003). In this broader context of cultural heritage, a useful annotated bibliography of studies by Noonan (2002) finds over 100 papers, which cover the whole breadth of the culture and arts sectors including arts, theatre, historical sites, built heritage, archaeological sites, museums, recorded heritage, libraries, broadcasting and sports. Box 4.1 provides a summary of some of the main findings from Noonan (2003), a study which provides a useful insight to the application of stated preference techniques in the cultural resources sector.

Previous surveys of valuation studies in the area of the historic environment have been provided by Pearce and Mourato (1998) and Pearce et al. (2002). The latter article forms part of a compilation of some twelve valuation studies in the area of cultural heritage edited by Navrud and Ready (2002). More recently a special issue of the Journal of Cultural Economics (Volume 27, Number 3-4) showcased a number of recent valuation studies and critiques of the application of stated preference techniques. On the basis of these articles the review here has sought to provide an updated account of the current body of literature, drawing not only from published articles but also from 'grey' literature such as conference and working papers.

The following discussion surveys the principle findings from the valuation literature. In conjunction with the annotated bibliography of recent studies, the intention of this review is to assess the potential scope for value transfer applications in the appraisal of heritage-related programmes and policies. Here it is useful to refer to the value transfer criteria set out in Section 3.4 when evaluating the potential appropriateness of individual studies for this purpose.

Box 4.1: A meta-analysis of the application of contingent valuation to cultural resources (Noonan, 2003)

Although carried out in the wider context of the cultural goods in general, a meta-analytical review of the application of stated preference techniques to the valuation of cultural resources by Noonan (2003) provides some useful insights for the discussion here. Meta-analysis is a form of empirical assessment, which takes the findings from a number of studies in order to analyse them in such a way that variations in WTP may be explained. One potential use of meta-analysis is to take the findings from multiple WTP studies in order to derive a general WTP function, which may then be used for the purposes of value transfer. Note that this differs from the function transfer approach outlined in Section 3.1, which entails the transfer of a bid function from a single study. In meta-analysis, a new function is *derived* from multiple studies.

Noonan's meta-analysis incorporates data from 65 studies and a total of 129 WTP estimates. As the author points out a critical requirement for meta-analysis, particularly with a view to informing value transfer applications, is the presence of consistency among WTP measures and goods analysed. The disparate and varied nature of cultural assets and also applications of SP methods preclude such consistency in Noonan's

analysis[28]. As such the findings of the meta-analysis cannot really be extrapolated for value transfer purposes. That said, the findings do offer a useful insight to the application of stated preference techniques in the field of culture and heritage.

In the analysis undertaken, Noonan finds that the majority of estimates of WTP come from 'intercept' surveys (e.g. respondents are interviewed when entering or exiting a site), and in a quarter of all cases respondents were informed of current or expected costs of provision of the asset/scenario. Overall, reported WTP amounts have a mean value of approximately $43 and a median value of $22 (2002 US $).

A number of meta-analysis regression models are estimated that consider the effects of differing characteristics in survey design and the characteristics of the goods being valued. Firstly, a model that considers survey characteristics, such as payment vehicle, elicitation format and sample size (which are often found to systematically influence WTP values elicited from respondents) is estimated. It is found that WTP estimates derived from dichotomous choice formats are typically higher than estimates derived through other elicitation formats. This result may be driven by 'yea-saying' on the part of respondents. Interviewer and selection biases in studies may also be responsible for the finding that door-to-door surveys typically lead to higher WTP amounts. In addition, Noonan finds an apparent time trend in WTP values, where reported WTP amount is seen to be declining over time. Also larger survey sample sizes have a tendency to result in smaller WTP values. However, survey payment vehicle appears not to influence WTP amounts.

A second regression model focuses on the characteristics of cultural goods, such as sector (e.g. historical site, museum, broadcasting, etc), use or non-use valuations, scale (local, national, etc), cost of provision, or whether the good valued was a specific site or a collection of goods. Here, the analysis finds no statistically significant relationships with WTP estimates. However, the sign of function coefficients would suggest that WTP is positively related to the scale of the good. Specifically, WTP estimates are higher for goods that are of significance at the international level (such as World Heritage Sites) and national level than goods of more regional and local relevance (however, note that this tendency is not found to be statistically significant). An additional indicative finding suggests that reported WTP amounts for archaeological sites do not differ significantly from reported WTP amounts for historical sites.

A third regression model that combines the survey and good characteristics of valuation studies is estimated. Again door-to-door surveys, use of dichotomous choice formats and smaller sizes typically lead to higher WTP amounts. In the combined model it is also found that surveys that seek one-off payments lead to higher WTP amounts, as do surveys which consider a collection of goods (rather than a specific site), while studies which inform respondents of expected costs of the project in question tend to result in lower WTP amounts. However, the time trend and effects of the chosen payment vehicle are not found to be significant.

Source: Noonan, D.S. (2003) 'Contingent Valuation and Cultural Resources: A Meta-Analytic Review of the Literature', Journal of Cultural Economics Volume 27, Number 3-4, 159 – 176.

4.2 Summary of studies

The survey of studies undertaken for this report finds 33 valuation studies which are applicable to the scope of this study and have been reported in publicly accessible formats. Table 4.1 provides a concise summary of economic valuation literature on historical sites and buildings and archaeological sites, while the annotated bibliography in the Annex provides summaries of a number of recent individual studies (as denoted by bold italic highlighting in the discussion below).

Studies that consider economic values associated with historic built heritage are the most represented. Within this group are studies that consider single and easily identifiable heritage

[28] For example in Brouwer et al. (1999), a meta-analysis of the value of wetland ecosystems using 100 estimates of WTP from 30 separate valuation studies, consistency in WTP amounts, which were estimated using different currencies and at different points in time, was achieved by expressing monetary amounts in terms of a countries' 1990 purchasing power parity expressed in units of Special Drawing Rights (SDR). Empirical analysis was then used to determine the factors which influenced WTP across the studies.

assets, such as cathedrals (Bedate et al., 2004; Navrud and Strand, 2002; Pollicino and Maddison, 2002; Willis, 1994), castles or towers (Powe and Willis, 1996; Scarpa et al., 1997; Del Saz Salazaar and Marques, 2005) and individual buildings with significant historical associations (Brown, 2004a,b,c; Chambers et al., 1996; Kling et al., 2004). Studies that consider groups of historic buildings include a group of monasteries (Mourato et al., 2002), unique locations such as a medieval city (Carson et al., 2002) collections of built heritage within cities and towns (Bedate et al., 2004; Cuccia and Signorello, 2002; Garrod et al., 1996; Grosclaude and Soguel, 1994; Pagiola, 2001; Pollicino, 2004) and a city square (Alberini et al., 2003). Also within the built heritage category is a study that considers the heritage value of the canal network in Britain (Adamowicz et al, 1995). Studies that fall within the category of historical and archaeological sites are particularly diverse in nature, covering ancient monuments (Maddison and Mourato, 2002), an ancient citadel (eftec, 1999a), ruins and archaeology (Poor and Smith, 2004; Riganti and Willis, 2002; Boxall et al., 2003), maritime archaeology (Whitehead and Finney, 2003), a historic park (Willis, 2002), a heritage site (Alberini et al., 2004) and recent monuments (Morey et al., 2002). A further study considers the benefits of a publicly provided programme that maintains access to a number of historic buildings and sites (Santagata and Signorello, 2002).

With regards to the location of heritage assets considered by the literature, eleven are from the UK, six from Italy, three from Spain, four from other parts of Europe (Norway, Switzerland, Croatia and Bulgaria), seven from North America (USA, Canada and Mexico) and two elsewhere (Morocco and Peru). In terms of coverage of heritage assets, it is fair to say that the existing group of studies spans a wide range of goods and situations; yet in the context of the overall stock of heritage goods, particularly in the UK, coverage is limited to a handful of assets that are fairly distinct from one another. Notably, few studies consider the benefits associated with the preservation of more recent heritage, such as industrial heritage.

Table 4.1: Overview of Heritage Valuation Studies

Reference	Valuation Scenario	Methodology and WTP Definition	Mean WTP	Sample	% Zero WTP	Year of Data
Adamowicz et al (1995)	Valuing preservation of canals in Great Britain	CV (OE) and CE, WTP per household, tax	£6.80 (sample mean), £8.90 (users), £5.60 (non-users)	758 (national population) (CV – 327; CE – 431)	46% (CV)	1993
Alberini et al (2003)	Valuing regeneration projects for St. Anne's Cathedral Square, Belfast	CE, marginal prices for attributes of regeneration projects	£3 (50% increase in open space), £0.40 (Percentage point increase in retail space at expense of residential space), £7.20 (avoid increase in height of buildings)	244 (residents)	n/a	2001
Alberini et al (2004)	Valuing environmental quality and heritage improvements from a public works programme on the island St. Erasmo, Venice, Italy	CV (DC), WTP per household, one-time tax	€66.60 (overall), €91.20 (users), €36.20 (non-users)	1326 (residents of Venice region)	54%	2002
Bedate et al (2004)	Use value derived from visits to heritage assets in Castilla y León, Spain: 1. Cathedral of Palencia; 2. Walled town of Urena	TC (ZTCM), CS per visit	€3.80 (Cathedral), €2.10 (Urena) (1998 €)	190 (Cathedral), 130 (Urena)	n/a	1998
Beltrán and Rojas (1996)	Valuing visits to and preservation of archaeological sites in Mexico	CV: 1. WTP per visit; 2. WTP per month for conservation	US $4-6 (visits), $1-4.60 (conservation)	3500 (on- & off-site)	-	-
Boxall et al (2002)	Recreational value of pristine and defaced aboriginal rock paintings, Manitoba, Canada	CB, CS per person per trip	Can $177 (one-off trip)	350 (visitors)	58-89%	1995
Brown (2004a)	Valuing congestion at Chartwell House, Kent	CV (PC), CE, WTP to avoid congestion per visit	£3 (CE), £2.80 (CV)	390 (visitors) (CV – 183) (CE – 207)	46%	2001
Brown (2004b)	Valuing conservation of collections at Upton House, Warwickshire	CV (PC), CE, WTP per visit, donation	£3.70 – 6.40	370 (visitors) (CV – 187) (CE – 183)	15%	2001

Reference	Valuation Scenario	Methodology and WTP Definition	Mean WTP	Sample	% Zero WTP	Year of Data
Brown (2000c)	Valuing characteristics of National Trust properties: Chartwell House, Kent; Upton House, Warwickshire, Stourhead House, Wiltshire	CE, Implicit prices for characteristics	£8.70-9 (garden), £2.60-4.80 (house), £2.70-£5.20 (collections), £0.50-£3 (associations), £0.30-1.60 (facilities)	933 (visitors) (Chartwell – 399, Upton – 387, Stourhead – 147)	n/a	2001
Carson et al. (2002)	Non-Moroccan values for rehabilitating the medieval city of Fes Medina, Morocco	CV (SB DC), WTP per person trip, tax	US $70 (Fes visitors), $31 (non-Fes visitors)	471 (tourists), 126 (Moroccan visitors)	17% (Fes visitors), 19% (non-Fes Visitors)	1997
Chambers et al. (1998)	Valuing preservation of St. Genevieve Academy, a historic school building, Missouri, USA	CV (PC), WTP per household, on-time donation	US $5-6.50 (1993 $)	161 (residents)	69%	1993
Del Saz Salazaar and Marques (2005)	Valuing restoration of a medieval Arab tower, Valencia, Spain	CV (DC & OE), WTP per household, donation, two scheduled payments	€53-59 (overall), €32-38 ('low' consumers of cultural goods), €64-88 ('high' consumers of cultural goods)	252 (residents)	-	2002
eftec (1999a)	Valuing visits to the Machu Picchu citadel archaeological site, Peru	CV (DB DC and PC), WTP per person per visit, entry fee	$40-47.60 (all users), $26 (Peruvians), $47 (foreigners)	1014 (visitors)	-	1999
Garrod et al (1996)	Valuing renovation of historical buildings in Grainger Town, Newcastle	CV (OE), WTP per household per year, tax	£10.10-13.80 (1995 £)	217 (residents)	47%	1995
Grosclaude and Soguel (1994)	Valuing damages from traffic-caused air pollution on historical buildings in Neuchâtel, Switzerland	CV (BG), WTP per person per year, donation	US $77-86 (1998 $)	200 (residents)	43%	1992
Kling et al. (2004)	Valuing preservation of the Northern Hotel in Fort Collins, Colorado, USA	CV (DC) and Paired Comparison (WTA), WTP per household, one-time tax	WTP: US $3-121 (low information), $5-353 (high information). Paired comparison: $24-224 (low information), $55-779 (high information)	177 (residents)	15-49%	-

Reference	Valuation Scenario	Methodology and WTP Definition	Mean WTP	Sample	% Zero WTP	Year of Data
Maddison and Mourato (2002)	Valuing impacts of road improvements upon Stonehenge	CV (PC) and CA, WTP per household per year, tax	£12.80 (tunnel scenario), £4.80 (current scenario)	271 (on-site UK residents), 525 (off-site UK residents)	55-65%	1998
Morey et al. (2002)	Valuing acid deposition damage to marble monuments in Washington D.C., USA	CE, WTP per household, one-time payment	$33 (low treatment option), $47 (medium treatment option), $68 (high treatment option) (all weighted mean WTP)	272 (US residents)	8%	1997
Mourato et al. (2002)	Valuing preservation of Bulgarian monasteries	CV (OE), WTP per household per year, tax	US $0.60-1 (1998 US $)	487 (residents)	39%	1997
Navrud and Strand (2002)	Valuing damages from air pollution to Nidaros Cathedral, Trondheim, Norway	CV (OE), WTP per person per year	US $51 (preservation of original features), $45 (restoration of features)	163 (visitors)	-	1992
Pagiola (2001)	Valuing restoration of the historic centre of Split, Croatia	CV (DB DC), WTP per person per visit, tax	US $44 (domestic and foreign tourists), $168 (residents)	173 (tourists), 96 (residents)	-	-
Pollicino and Maddison (2002)	Valuing aesthetic changes to Lincoln Cathedral due to air pollution	CV (DB DC), WTP per household per year, tax	£49.80 (Lincoln residents), £27.70 (Lincolnshire residents) (1998 £)	328 (residents)	21%	1998
Pollicino and Maddison (2004)	Valuing maintenance actions to address air pollution damages to historic buildings in Oxford	CV (PC), WTP per household per year, tax	£20.40-26.70 (cleaning), £20-24.80 (restoration), £29.60-34.40 (preservation)	649 (residents)	34%	2001
Poor and Smith (2004)	Use value derived from visits to St. Mary's Historical City, Maryland, USA	TC (ZTCM), CS per visit	US $6-35	92 (visitors)	n/a	1999-2001
Powe and Willis (1996)	Valuing visitor benefits to Warkworth Castle	CV (OE), WTP per person per visit, entry fee	£0.90-1.20 (1994 £)	201 (visitors)	-	1994
Riganti and Willis (2002)	Valuing conservation of Campi Flegrei archaeological park in Napoli, Italy	CV (SB DC), WTP per person per year, donation over 5 years	US $29	484 & 424 (residents)	18%	1995 & 1997
Santagata and Signorello (2002)	Valuing maintenance of public programme for access to cultural sites in Napoli, Italy	CV (SB DC), WTP per person per year, donation	US $11 (users), $4 (non users)	468 (residents)	48%	1997

Reference	Valuation Scenario	Methodology and WTP Definition	Mean WTP	Sample	% Zero WTP	Year of Data
Scarpa et al. (1997)	Valuing access to Rivoli Castle, Italy	CV (SB DC), WTP per person per year, donation	US $28-33	1323 (visitors)	18%	1995
Signorello and Cuccia (2002)	Valuing visitor conservation of benefits heritage assets in Noto, Sicily, Italy	CV (DB DC & OE), WTP per person per visit, entry fee	ITL Lira 11,500 (2000 ITL Lira)	560 (visitors)	7%	2000
Whitehead and Finney (2003)	Valuing preservation of historic ship wrecks, North Carolina, USA	CV (DC), WTP per household, one-time tax	US $32.80-39	884 (residents)	46%	2001
Willis (1994)	Valuing access to Durham Cathedral,	CV (OE), WTP per person per visit, entry fee	£0.80 (1993 £)	92 (visitors)	36%	1992
Willis (2002)	Determination of the revenue maximising price for the Bosco di Capodimonte, Naples, Italy	CV (IB), entry fee	n/a	494 (visitors)	n/a	1999

Notes:
CV: contingent valuation; CE: choice experiment; CA: conjoint analysis; TC: travel cost; ZTCM: zonal travel cost model
OE: open-ended elicitation format; PC: Payment card elicitation format; IB: iterative bidding elicitation format; BG: bidding game format; DC: dichotomous choice elicitation format; SB DC: single-bound dichotomous choice; DB DC: double-bounded dichotomous choice
n/a: denotes 'not relevant'
'-': denotes not reported by study
Mean WTP is reported as in original study in most cases. In some instances US $ values are reported as by Pearce and Mourato (1998). Where reported by the original study, the currency year is provided if different from the original year of study.

Historic built heritage – Cathedrals, castle and individual buildings

Willis (1994) represents the first heritage contingent valuation study to be undertaken in the UK and values access to Durham Cathedral, which is a World Heritage Site[29]. Survey respondents were asked how much they would be willing to voluntarily pay to enter the cathedral, rather than face the introduction of a compulsory entry fee. Estimated mean WTP was £0.77 per visit (1993 £), although this is based on a sample of just 92 visitors where 36% of respondents were not willing to pay anything. The average number of visits to the cathedral was reported to be 41 per year, suggesting an indicative annual average WTP value of approximately £31.50 per visitor. However, as Pearce and Mourato (1998) point out, it is difficult to differentiate between those who visit as a tourist (perhaps a single visit per year) and those who visit on a regular basis for religious practice, suggesting a certain amount of uncertainty surrounding this estimated annual value. In addition, it is arguable as to whether the study actually does value access *per se*, since even if respondents were not to make a voluntary donation, the alternative scenario of a compulsory entry fee would still enable access to the Cathedral. From information on respondent WTP, Willis constructs a demand curve for access to the cathedral, in order to calculate an entry price which would maximise revenues collected. Willis finds that this price, £0.88, would practically generate the same revenue as voluntary donations.

The two further CV studies of cathedrals consider the economic value of reductions in air pollution damages. ***Pollicino and Maddision (2001; 2002)*** surveyed residents near Lincoln Cathedral in order to elicit their WTP to change the cathedral's exterior cleaning cycle from 40 years to 10 years. The study provided respondents with a well defined valuation scenario which emphasised that only the appearance of the cathedral would change. Mean WTP of Lincoln residents (from a sample of 220 households) was found to be almost £50 per household per year, whilst WTP of residents in nearby towns (108 households) was found to be almost £27 per household per year. Aggregate WTP for improvement in Lincoln Cathedral's appearance was calculated to be £7.3 million per year. One problem highlighted by the study's authors is the apparent presence of starting-point bias, with elicited WTP amounts appearing to be anchored by the bid amount presented to respondents in the dichotomous choice format used.

Navrud and Strand (2002) report the findings of a CV survey carried out in 1991 of national and foreign visitors to Nidaros Cathedral in Norway. The study examined the value of preserving original features of the cathedral at risk from corrosion from air pollution. Two options were presented to respondents: a restoration option, which replaced all original features, and a preservation option, where original features were preserved through the reduction of air pollution. Mean WTP for the restoration option was found to be approximately £24 per person (1991 £) while mean WTP for the preservation option was almost £29 per person. The authors find that these two values were not statistically different from each other, implying that respondents perceived the same benefits from preservation as they did from restoration. The Nidaros Cathedral study also reports findings relating to part-whole bias, i.e. whether elicited values are just for the cathedral or for all historical monuments in Norway. While WTP to protect the Cathedral represented a substantial proportion of WTP to protect all sites in Norway (reported to be around £100 per person), this probably highlights the fact that the cathedral is one of Norway's most important sites. Hence it is concluded that part-whole bias is not a significant effect on respondents' valuations.

A final study that considers cathedrals is that of ***Bedate et al. (2004)***. Whilst the three previous studies employed the contingent valuation method, this study was one of the first in heritage valuation to use the travel cost approach in order to determine use value associated with visits to the Cathedral of Palencia in northern Spain. The use value derived from a single visit was calculated to be €3.75 (1998 €). As previously emphasised, the scope of this report is

[29] The results of this study are also reported in ***Garrod and Willis (2002)***.

to consider the extent to which existing valuation studies can be employed in value transfer exercises to appraise actions that result in marginal changes to the presentation of heritage assets. In this regard, existing travel cost studies are of limited use; while they can demonstrate that positive values are associated with heritage assets, studies such as Bedate et al. do not offer insight into values associated with marginal changes in the characteristics of the sites. That said it is not the case that travel cost studies cannot be designed so as to provide information for such outcomes, it is just that existing literature does not.

To date, two valuation studies have been undertaken in relation to castles. In the UK, Powe and Willis (1996) valued access to Warkworth Castle in Northumbria, whilst ***Scarpa et al. (1997)*** valued maintenance of access to Rivoli Castle in Piedmont, Italy. In the latter study, the value of maintained access was measured by donations over and above the entry fee in order to preserve the current conditions and quality of the castle, where the alternative would be the closure of the castle to the public. In total, 1,323 people were sampled, where annual WTP for maintained access was found to be approximately US $28-$33 per person per year[30].

In Powe and Willis (1996)[31] a sample of 201 visitors were interviewed to value access to Warkworth Castle, where entry fee was used as the payment vehicle. The study found that visitors were willing to pay on average twice as much as the current entry fee in order to enter the castle. Within this, more than half the amount stated was attributed to use value rather than non-use values. In this instance, the findings suggest the importance of making heritage available to the general public, although there is the need to recognise the trade-off between access and conservation (Pearce and Mourato, 1998). In comparison, the benefit derived from access to Warkworth Castle, reported to be approximately £1 per visit (1991 £) would appear to be much lower than the value attributed to access to the Rivoli Castle, particularly in annual terms (given that multiple trips to Warkworth throughout the year were infrequent).

Brown (2004) reports on a series of stated preference studies undertaken in relation to National Trust properties in the UK. In 2001 contingent valuation and choice experiments were undertaken at Chartwell House in Kent (***2004a***), Upton House in Warwickshire (***2004b***) and also Stourhead House in Wiltshire (***2004c***). At Chartwell the study sought the willingness to pay of visitors to avoid congestion via a compulsory surcharge which was also compared to responses regarding the maximum length of time visitors were willing to wait to ensure that there was no congestion when they visited the house. Willingness to pay to avoid congestion was found to be approximately £3 per visit in both the CV approach and the choice experiment approach. Willingness to wait ranged from 59 minutes in the CV survey to 102 minutes in the choice experiment. From the choice experiment WTP to avoid waiting an additional minute was found to be £0.03, implying that willingness to wait to avoid congestion, when translated in monetary terms was £1.75 for the 59 minute wait hypothecated in the CV survey and approximately £3 in the choice experiment. Notably the choice experiment resulted in identical values to avoid congestion (approximately £3) using money and time units while in the contingent valuation treatment significant differences arose between the two approaches, with the time approach resulting in lower estimates of the benefit of avoiding congestion.

The CV survey and choice experiment carried out by Brown (2004b) falls slightly outside the remit of this study, since it focuses on the collection of English and continental old master paintings that are housed at Upton. The valuation scenario in the CV survey elicited WTP to improve the condition of the collection through appropriate cleaning and restoration work. In the choice experiment, respondents were asked to value access to the collection via trade-offs with the collection's condition. The final aspect of Brown's research was an empirical assessment of value transfer for different aspects of the Chartwell, Upton and Stourhead properties (Brown 2004c). The provision of six different attributes were considered: gardens

[30] US $ WTP value as calculated by Pearce and Mourato (1998) from Italian Lira.
[31] Also reported in ***Garrod and Willis (2002)***.

and parklands, architectural style, art collections, historical associations, visitor facilities and time taken to get to the property, which was included as a proxy for price. Overall, transfer errors ranged from 3.5% to 111%, with the comparisons involving Stourhead, which featured a relatively small sample size, explaining the higher range of this interval. Transfer errors were much smaller between the other two properties. This provides some indication for policy-makers about the errors that might be experienced when transferring estimates of the benefits attached to historical properties. The lower end of this range is likely to be acceptable for most policy applications.

A further example that falls within the category of individual buildings is a recent study by ***Del Saz Salazaar and Marques (2005)***, which considered the benefit of restoring an old Arab tower in the Valencia region of Spain. The tower which was completely destroyed during the 1960-70s due to lack of protection would be completely restored by the proposed project. The study found that the mean WTP of respondents with high expenditure on cultural goods was considerably higher than 'low' or 'average' consumers of cultural goods (€53-58 per high expenditure household compared to €33-38 per low expenditure household for two scheduled voluntary payments).

Two US studies consider the economic values associated with unique buildings. In ***Chambers et al. (1996)***, WTP for a trust fund that would purchase and preserve a historic school building (the St. Genevieve Academy, Missouri) was sought. On the basis of a mean WTP amount of approximately $6 per household for a one-off donation (1993 US $), the estimated aggregate WTP amount (around $1 million) was found to be substantially less than potential revenues from the sale of the building. Similarly, ***Kling et al. (2004)*** report WTP for the preservation of the Northern Hotel, Fort Collins, Colorado. While the hotel is not a building of national importance, it is considered to be a local landmark that represents the historic identity of the city. The study highlights a number of interesting points concerning the application of CV surveys in relation to heritage assets. As is typically expected, the provision of information to respondents has a fundamental influence on elicited WTP. In particular demand for preservation of the hotel was found to become more inelastic (less sensitive) as bid level increased when respondents were presented with more information concerning the hotel. In effect, more information serves to highlight the uniqueness of an asset, enhancing the effect that non-substitutability of an asset has upon a respondent's valuation.

Historic built heritage – Groups of buildings

Aside from individual buildings, a number of heritage valuation studies have focussed on groups of historic buildings. In this respect, these studies consider multiple goods with a common association, particularly in terms of geographical location, architectural style and historical or cultural significance. Perhaps most applicable are the two UK studies by Garrod et al. (1996)[32] and Pollicino and Maddison (2004).

Garrod et al. (1996) considered the benefits associated with the renovation of historic buildings in Grainger Town, which is part of the city centre of Newcastle. The area contains mostly early 19th Century buildings, 40% of which are listed, and is considered one of the finest examples of town planning in England. A contingent valuation study was undertaken that sought the WTP of Newcastle residents in terms of a tax increase to pay towards the restoration of buildings. Of the 162 survey sample, only 53% of respondents were willing to pay a positive amount to the restoration programme. Mean WTP per household per year was found to range between £10 and £14 (1995 £). Overall, aggregate WTP for restoration was estimated to be almost £1 million, after adjusting for differences in wealth across the aggregating population. As would be expected, survey respondents who undertook recreational activities in Grainger Town, or who believed that renovation of the buildings should be addressed immediately were found to be

[32] Also reported in ***Garrod and Willis (2002)***.

willing to pay more than those who did not. Also, members of the National Trust, or a local history society, were found to have higher WTP amounts. The Grainger Town study could potentially be useful for value transfer exercises, although a certain amount of information concerning the proposed physical changes to buildings from restoration work is lacking from the study's reporting.

Also in the UK ***Pollicino and Maddison (2004)*** sought willingness to pay of local residents for a number of maintenance actions for buildings in Oxford, where the city centre is designated as a World Heritage Site. The study's valuation scenarios presented three different intervention strategies (cleaning, renovation and preservation) to address air pollution damages, which contrasted the state immediately before and twenty years after the intervention. Mean WTP ranged between £30 - £34 (2000 £) per household per year for the preservation option depending on pollution scenario (high or low) presented to respondents. WTP for the cleaning of buildings ranged from £20 - £26 depending on the pollution scenario, whilst for restoration the associated range was £20 – 25.

Grosclaude and Soguel (1994) estimated the social cost of air pollution damages to historical buildings in Neuchâtel, Switzerland caused by road traffic. Two hundred town residents were asked what they would be willing to pay to a voluntary fund for the maintenance of 16 (limestone) historical buildings. At first glance (and aside from the non-UK context) this study would appear to be potentially suitable for consideration in relation to transport schemes which affect groups of historic buildings (e.g. appraisal of by-pass schemes). However, as Pearce and Mourato (1998) point out, the study is subject to a number of caveats which limit its suitability. Firstly, the study uses a bidding game elicitation format which is now disused in CV studies due to a tendency to introduce starting point bias into respondents' valuations. In addition there is an absence of information on what maintenance works would entail in terms of aesthetic improvements to buildings or future rates of corrosion to materials. Moreover, with an absence of testing for part-whole bias and the elicitation of monthly payments (rather than annual), which tends to result in higher aggregate values, the study appears to result in relatively large value estimates that amount to around 0.2% of per capita gross national product (GNP)[33].

Studies undertaken in relation to built heritage in other European locations include a walled town in Spain (Bedate et al., 2004), the historic centre of Split, Croatia (Pagiola, 2001), and the small city of Noto in Sicily, Italy (Signorello and Cuccia, 2002). In the latter example, ***Signorello and Cuccia*** undertook a CV study to value visitor and conservation benefits derived from buildings in the Baroque style in the historic centre of the city of Noto. Following the example of the Cathedral of Palencia, ***Bedate et al***. undertook a travel cost survey of visitors to the historic town of Ureuna in the Castilla y León region of northern Spain. The use value associated with visits to Ureuna was estimated to be just over €2 per visit, which as the authors note is typically a less well known site than the Cathedral of Palencia, with the implication that the greater use value for the cathedral is unsurprising. However, some bias may be associated with the estimate of use value for the walled town since the survey was sampled at the town's museum, and not all visitors who visit the town may visit the museum.

The historic centre of Split is a designated World Heritage Site and features Roman, Medieval and Baroque architectural styles. The contingent valuation study reported by Pagiola (2001) sought to estimate the benefits to both residents and visitors to the city of a World Bank financed conservation programme that included the restoration and renovation of a Roman Palace and rehabilitation of selected historical buildings. For tourist visitors, the valuation scenario was presented as an additional amount to the existing tourist tax that would be used for site improvements, whilst residents were faced with a hypothetical referendum for establishing an annual tax amount that would be used for conservation purposes. Mean tourist

[33] Pearce and Mourato (1998) also find that other studies such as Pollicino and Maddison (1998), Riganti and Willis (1998) and Willis (1994) have similar outcomes in terms of proportion of GNP.

WTP was found to lie between US $40 and $50 per visit. Correspondingly, tourists from Western Europe or the US were typically willing to pay more. Interestingly, tourists on their first visit to Split were found to have lower WTP amounts than repeat visitors. The author suggests that an element of self-selection is probably apparent for repeat visitors, who are likely to have a greater appreciation for the city. Annual WTP of residents of Split was found to lie between approximately US $140 and $200 per person. Pagiola cites a number of reasons to potentially explain the higher WTP of residents than tourists. Firstly, it is reasonable to expect a higher intensity of preference from residents since it is their own cultural heritage being conserved. In addition, residents will enjoy the benefits of improvement all-year round. Finally, some residents obtain at least part of their income from the tourist industry and are therefore likely to benefit financially from the improvements.

Mourato et al. (2002) report the findings from a study that sought to estimate the value of preserving 164 Christian Orthodox monasteries in Bulgaria (including one monastery which is a World Heritage Site). The authors surveyed a random representative sample of 483 Bulgarian citizens and asked for household WTP for a management programme to protect all monasteries which would be paid for through a tax increase. Annual WTP per household was estimated to be $0.60 - $1 (1996 $) and non-use values were found to be an important determinant of WTP. The study reports that a large proportion of respondents (39%) reported zero WTP. Because of the high number of zero WTP responses, the authors tested to see if there was a sample selection bias in the results. However, it was found that there was insufficient evidence to conclude that self-selection bias was evident.

A further study that considers groups of historical buildings is reported by ***Carson et al. (1997; 2002)***. The study focussed on the Fes Medina, a Moroccan World Heritage Site, which is the oldest part of the city of Fes, dating from as early as the 8th Century. It contains the oldest mosque in North Africa, the oldest university in the world, palaces and many small shops, workshops and traditional houses. The study concentrated on non-Moroccan values for rehabilitating the Medina, sampling 471 tourists. WTP was sought via a compulsory hotel fee that would finance a rehabilitation plan. Estimated mean WTP for those visiting or intending to visit Fes was US $70 per visit. Pagiola (2001) notes that the values found by Carson et al. can be compared to those derived for Split, since both relate to improvements in the two sites. The higher WTP values reported for the Fes Medina are to be expected, since in the case of Split, cultural heritage is not necessarily the primary reason for a visit.

In the current body of literature, only one study has explicitly considered air pollution damages on historic monuments. ***Morey et al. (1997; 2002)*** report a comprehensive valuation study that focussed on acid deposition damages to more than 100 marble monuments and selected historical buildings in Washington D.C. which are mostly related to the history of the American government, such as the Lincoln and Jefferson memorials and a statue of Benjamin Franklin. Air pollution has caused both surface erosion and soiling, although at differing rates of deterioration. Respondents were presented with digitally enhanced photos showing expected levels of damages from air pollution in the present, in 75 years and 150 years. As Pearce and Mourato (1998) note, this study is the first that used digitally enhanced photos to attempt to credibly link changes in the good as perceived by the consumer to the source of damage. Four possible timelines of damages were considered, ranging from no action to treatment options that would lengthen the process of deterioration by 25%, 50% and 100%. Respondents were then asked to choose between different options at different costs. Estimated mean WTP per household for the various active options ranged from US $38 - $82, the lower value relating to a 25% increase in deterioration time and the higher relating to a 100% increase in deterioration time. The authors tested for scope sensitivity and found that WTP increased with the level of preservation, but at a decreasing rate.

A final study which falls into the built heritage category is that by Adamowicz et al. (1995) which investigates the cultural, heritage and environmental values associated with the canal

and inland waterway system in Great Britain[34]. The study considers both use and non-use values and elicits the maximum amount individuals would be willing to pay to preserve the entire network, by contrasting a programme of maintenance and improvement works with a situation where canals would fall into disrepair and dereliction. The study employed both contingent valuation and choice experiment techniques. Willingness to pay estimated from the CV survey range from £9.00 - £5.50 per household per year (1993 £), with higher end of the range associated with users of canals and the lower end corresponding to non-users. Aggregated across the entire population of Great Britain, this suggests total WTP in the region of £115 million to £176 million annually. Interestingly, the authors found that respondents who stated their motivation for being willing to pay was derived from preserving the national heritage aspect of canals reported higher WTP amounts than those who saw recreation and environmental aspects of canals as being more important. In particular WTP of those stating canals were precious or heritage resources ranged between £9 - £7.50 per household per year, whereas WTP of those indicating the recreation and environmental aspect of canals ranged between £6.70 - £5.25 per household per year.

Historical and archaeological sites

This final category of valuation studies that fall within the scope of this study covers an eclectic mix of heritage assets that broadly incorporates historical, cultural and archaeological sites (essentially this category consists of elements of the historic environment that are not individual buildings or groups of buildings). A number of studies focus on ancient monuments, ruins or sites of archaeological interest. These include Stonehenge in the UK (Maddison and Mourato, 2001; 2002), the Campi Flegrei in Naples, Italy (Riganti and Willis, 1998; 2002), historic St. Mary's City in Maryland, US (Poor and Smith, 2004), Nopiming Provincial Park and aboriginal rock paintings in Manitoba, Canada (Boxall et al., 2002; 2003), and the Machu Picchu Citadel and the Inca Trail in Peru (eftec, 1999a). In addition to original valuation studies, Macmillan (2002) investigates the potential for value transfer in assessing the benefits of managing forests to protect archaeological features (see Box 4.2).

Maddison and Mourato (2002) report the findings of a contingent valuation survey and a choice experiment that sought to elicit economic values for the impact of several road options upon the Stonehenge landscape. Stonehenge, which is a World Heritage Site, is closely surrounded by roads which have significant severance, noise and aesthetic impacts upon the stone circle. Respondents were presented with a number of road re-routing and tunnel options and were asked their WTP in taxes, over a period of two years, to affect a change. The proposed changes to the road infrastructure would not affect the stone circle, but would reduce traffic noise and eliminate the sight of traffic at the site. A random representative sample of the UK population (525 respondents), a sample of national visitors (271 respondents) and a sample of foreign visitors (116 respondents) were surveyed. Although a large proportion of respondents were not willing to pay anything, the results indicate the wellbeing of between 35-45% of the sample would be affected by the proposed changes. Annual WTP over two years ranged between approximately £12.50 per household for a tunnel scenario and £5 per household for the current scenario (no change). The no change scenario would enable those driving past the site to still see the stone circle; however, the study was slightly hampered by the fact that some respondents did not find the idea of paying for the 'no change' scenario credible.

The Campi Flegrei is an archaeological park west of Naples containing significant Roman ruins. Using the CV method, ***Riganti and Willis (1998; 2002)*** elicited the benefits to Naples residents provided by a conservation programme for the park, which faces pressure from urban development. In the study, various components of TEV and non-use value were sought by

[34] A number of other studies also apply economic valuation techniques to the benefits derived by canals. See for example Willis and Garrod (1990; 1991), Garrod and Willis (1992; 1994; 1998). However, only Adamaowicz et al. is reported here due to its explicit focus on the heritage aspect of canals.

posing a variety of WTP questions. A further archaeological sites study has been undertaken in Mexico by Beltran and Rojas (1996). Contingent valuation surveys were carried out at three archaeological sites and seven cities. However, as Noonan (2003) points out, the reporting of the study fails to provide essential information concerning the instrument design and sampling method, making it difficult to assess the reliability of the reported WTP values.

Poor and Smith (2004) also focussed on an archaeological site, albeit from more recent times. Historic St. Mary's City in southern Maryland is considered to be one of the most significant archaeological and historic sites in the US. Designated as a National Historic Landmark, it dates from the 17th Century and was the British colonial capital of Maryland. Today the site consists of around 200 excavated and recorded archaeology sites and features reconstructed buildings depicting the original town layout. Poor and Smith use a travel cost approach to estimate demand for visits and subsequent use value benefit derived by visitors. Estimated use value ranged between US $8-19 per visitor, amounting to estimates of total use value benefits of between US $75,000 and $175,000 per year on the basis of reported visitor numbers.

Box 4.2: The value of managing forests to protect archaeology (Macmillan, 2002)

This study investigates the potential for value transfer in assessing the benefits of managing forests to protect archaeological features, which include scheduled ancient monuments such as burial mounds, earthworks, field systems and standing stones. In addition, woodland related archaeological features such as wood-banks, saw-pits and charcoal-burning platforms are also relevant.

The basis for value transfer is developed from two studies (Garrod and Willis, 1995; Hanley et al., 1998) which consider the benefits of the Environmentally Sensitive Area (ESA) programme for agricultural management. Hanley et al. generates WTP for the archaeological component of two Scottish ESAs (Breadalbane and Machair), however no information is provided in either Macmillan (2002) or Hanley et al. (1998) as to what archaeological features are considered. Garrod and Willis also do not specify the form of archaeological management or a specific WTP value, but do estimate WTP for the entire ESA programme in England and Wales, which is a more extensive and geographically representative area.

Macmillan applies an adjusted unit value transfer approach, using WTP values from the two ESA studies to calculate a range of values in the context of forest management. Original values are adjusted in order to account for context and socio-economic differences. Values are adjusted on the basis of:

i) The percentage of households that visit ESAs;
ii) The contribution of archaeological management to total household WTP (6% on the basis of Hanley et al.) and;
iii) The possibility that WTP for archaeology may be diminished due to the forest landscape context.

Macmillan then derives WTP value per hectare of forests for management of archaeological features, which ranges from £0 under the most pessimistic assumptions to £247 under optimistic assumptions (2001 £). The higher value is relevant if it is assumed that WTP is not affected by the landscape context, where benefits are estimated over a relatively small area (less than 250,000 hectares). Lower values are appropriate when aggregating over the entire forest area in cases where WTP is negatively affected by the landscape context.

Source: Macmillan, D. (2002) The Value of Managing Forests to Protect Archaeology, report to Forestry Commission, Centre for Research in Environmental Appraisal and Management, University of Newcastle, March 2002.

A further North American study is provided by ***Boxall et al. (2002; 2003)***, which estimated the benefit derived from aboriginal rock paintings and pictograms situated along wilderness canoe routes in Manitoba. Using a contingent behaviour approach, a sample of 350 recreational visitors were asked how many more trips they would take to canoe in Nopiming Park if the park contained an accessible aboriginal pictograph. This was then compared to their actual trip numbers, and their travel costs used to derive a valuation figure. The use value estimate for visiting Nopiming was found to be $1,007 (Canadian $) per group per trip or $250 per trip per person. The presence of the pictograph was found to generate an average increase in trips of

0.71 per individual. Multiplying this figure by the use value per individual gives a value of $177 per person.

A study that also falls within the historic sites category is that by ***eftec (1999a)***[35], which focussed on the Machu Picchu Historic Sanctuary in Peru. Machu Picchu is considered to be one of the most important archaeological sites in the world and is designated as a World Heritage Site. The sanctuary features the Machu Picchu Citadel, a 14th Century Inca city, and the Inca Trail, a hiking trail which partially follows a former Inca track. A CV survey was conducted in 1999 to estimate the value attached by visitors to access both the citadel and the Inca Trail, with the objective of informing the revision of the pricing policy to control visitor numbers and to raise revenue. Respondents were presented with a hypothetical scenario in which they were asked the maximum entry price they would be willing to pay to visit the sites. Over 1000 interviews were conducted (in English, Spanish and French), with the sample split between those visiting the Citadel only (711 respondents) and those visiting the Inca Trail (303 respondents). Mean WTP for access to the citadel alone was estimated to be approximately US $48 per visitor (1999).

Another interesting heritage site that has been subject to economic valuation is that of the island of St. Erasmo, which is located in the Lagoon of Venice, Italy, a designated World Heritage site (***Alberini et al., 2004***). In contrast to other, better-known islands in the Lagoon, St. Erasmo has very few historical or architectural features. The study undertook a CV exercise to seek respondent WTP for a publicly funded programme to improve environmental quality on and around the island. The programme would include beach nourishment to offset erosion, drainage of inner canals, construction of a wastewater treatment facility, refurbishment of sewage lines and water ducts and restoration of an ancient tower. However it is unclear as to whether the cultural worth of St. Erasmo is captured by the study, since emphasis is placed on the environmental and infrastructural improvements associated with the public works programme.

Further Italian examples are provided by ***Willis (2002)*** and ***Santagata and Signorello*** (2002). Willis seeks to determine the revenue maximising admission price (rather than estimates of TEV) for the Bosco di Capodimonte, a historical park and woodland site in Naples. Also in Naples, Santagata and Signorello consider the benefit derived from a public access programme to historic sites in the city which encompasses 29 churches, 8 palaces, 8 historic squares and a museum in the Roman and Spanish quarters. Willingness to pay of non-users was found to be markedly less (around one-third) than that of users. Moreover 67% of non-users reported valid zero WTP bids. In contrast, 34% of users reported valid zero WTP bids.

To date, the study undertaken by ***Whitehead and Finney (2003)*** represents the only valuation exercise that has been carried in the context of maritime heritage. The study focussed on the coast of North Carolina, USA, which features around 5,000 shipwrecks. A CV study was carried out to estimate the benefits generated from the management of maritime resources through the establishment of a state-run historic shipwreck park. Reported estimates of WTP (in terms of a one-off increase in tax) range between US $33 - $39 (2001), suggesting annual benefit in the region of $1.75 million over a 30 year period from the creation of the park.

Finally, the study by ***Alberini et al. (2003)*** considered the value attached by individuals to the cultural and historic significance of St. Anne's Cathedral Square (SACS) in Belfast, UK. The square is the core of one the oldest areas of Belfast (the Cathedral Quarter), dating from the 19th and early 20th Century, which is characterised by a mixture of historical building styles and interesting street patterns. In the study, the authors employed a choice experiment where respondents chose between different regeneration projects for SACS. In addition, some respondents were presented with transformations of a hypothetical computer generated square

[35] This study is also reported in Mourato et al. (2004).

(the 'abstract' square) which was intended to be identical to SACS in all respects except the historical and cultural association. The study presents a number of interesting findings. In particular respondents were found to prefer regeneration projects which increase open space around SACS, but not the abstract square. Respondents also preferred projects that maintained the current height of buildings. However, in the SACS case, project cost does not lead to the expectation that a lower proportion of respondents will choose more expensive options. Here it may be the case that in the absence of more detailed information, respondents choose more expensive projects since they were perceived to be of better quality.

4.3 Conclusions

A number of points are evident from the review of heritage valuation literature to date:

- A growing number of original valuation studies have been conducted in recent years in relation to the historic environment. However, the total number of studies (33) is decidedly small in relation to the comparable field of valuation of environmental goods, where the number of published studies runs into the thousands.
- Overall, it is generally the case that positive values are attributed to the conservation or restoration of heritage assets. This implies that degradation of the historic environment detracts from the wellbeing of individuals and society in aggregate and that the public is willing to pay to mitigate this damage.
- However it is difficult to assess how this value varies between different aspects of the historic environment. While the existing body of literature varies widely in terms of heritage assets subjected to valuation studies, the nature of and the way in which benefits are evaluated varies widely too. Hence scope for comparison among studies is limited. Where studies do consider similar goods (for example cathedrals) the type of benefit being estimated typically differs, as does the sample frame.
- More specifically valuation studies differ in terms of: (i) the heritage asset in a physical sense, i.e. what it is and where it is; (ii) the historical and cultural associations of the asset (typically this is what makes it important and often unique); (iii) the context of the change being valued, which may be either explicit in terms of incremental improvements in quality (e.g. renovation works) or more implicit (in the case of valuing access over loss of access); (iv) the characteristics of the population relevant to the asset; and (v) methodology (for instance travel cost approaches will not capture non-use values).
- That said some general findings do emerge from the literature review. For example it is widely found that higher income typically leads to a higher WTP for the historic environment, although there is insufficient evidence to suggest in general as to whether this willingness to pay is relatively sensitive or insensitive to changes in income. Although a number of studies suggest that level of education is typically positively related to respondent WTP, the literature does not suggest that concern for conservation of the historic environment is an elitist pursuit. For instance, lower income groups do display positive preferences for preserving heritage assets, but these are typically limited by budget constraints.
- Values held by users of sites (i.e. visitors or nearby residents) are typically higher than those of non-users. Moreover it is also the case that the more trips a given user makes, the more likely they are to have a higher WTP. In addition, many studies find that non-user benefits are positive, particularly in cases where charismatic or unique heritage resources are under consideration.
- While non-use values in unit terms may be lower than use values for heritage assets, the extent of the non-use population may typically be greater, implying that aggregate non-use value is a substantial proportion of total economic value, particularly in the aforementioned case of charismatic or unique heritage resources. However there appears to be no general pattern in studies to suggest that non-use value accounts for X% of TEV.

- The proportion of respondents stating a zero WTP varies greatly between studies (from under 10% up to 90%). As with any economic valuation exercise, some of these instances can be considered as protest against the survey instrument (such as a dislike of paying taxes), which does not reflect a respondent's true preferences. Others, however, reflect genuine zero values which may be attributed to budget constraints or a lack of interest or perceived benefit.
- With regards to scope sensitivity and part-whole bias in relation to the valuation of heritage assets few conclusions can be drawn from the literature. These issues are typically study-specific, depending on the good in question and the perceived change to the good as well as the actual study methodology.
- A number of points are pertinent to the use of value transfer in the appraisal of heritage-related projects. Firstly the quality and reporting of studies and estimated economic values vary greatly. In particular descriptions of the heritage assets and the proposed changes in their provision can be limited, making the task of assessing a study's appropriateness in terms of matching to a policy good difficult. However this may be overcome by seeking alternative sources for descriptions of the asset.
- A tendency to focus on particularly unique assets may also limit the value transfer potential of the literature. Whilst a wide array of goods are considered, there is perhaps a lack of less 'unique' ones, which are also subject to management and conservation decisions.
- In addition to goods studied, the valuation scenarios vary greatly. The typical focus of degradation of heritage assets concerns air pollution, whilst scenarios that consider improvements in heritage assets consider a variety of renovation, restoration and rehabilitation actions that differ considerably in scale.
- In addition to the travel cost studies, a number of stated preference studies also consider the use values from access to certain heritage assets rather than marginal changes in the quality of assets. While these studies can be useful for value transfer exercises that seek to quantity the benefit accruing from a particular heritage asset, they are less useful when analysis seeks to assess the change in TEV that arises from a particular project or programme.

5. Case Studies

5.1 Introduction

In this section of the report a number of case study examples are provided to demonstrate the use of value transfer as an approach to economic valuation of the appraisal of heritage-related projects. The six case study examples are:

- The Denbigh Townscape Heritage Initiative Scheme;
- Restoration of the Kennet and Avon Canal;
- Restoration of Battersea Park;
- Lincoln Cathedral conservation and maintenance;
- Improvements and repairs to Sandal Castle; and
- Transport schemes and the historic environment.

Where relevant, each case study sets out: (i) a description of the heritage asset; (ii) a description of the action that is to be appraised; (iii) the value transfer methodology; and (iv) caveats and cautions relating to the analysis undertaken. Information concerning the description of the heritage asset and the action to be appraised is sourced from proposal documentation submitted to funding authorities. In each case study where applicable, the value transfer methodology section considers the six criteria for selecting WTP information from an existing valuation study for application at a policy site outlined in Section 3:

- The change in the provision of the good being valued at the two sites should be similar;
- Site/good characteristics should be the same, or differences should be accounted for;
- Study and policy sites must be similar in terms of population and population characteristics or differences in population must be accounted for;
- Studies should contain willingness to pay (WTP) functions showing how WTP varies with explanatory variables;
- Studies included in the analysis must themselves be sound; and
- Property rights should be the same across the sites.

5.1 Denbigh Townscape Heritage Initiative Scheme

i) Heritage Asset

Denbigh is a small town in north Wales, which dates from the late 13th Century and features the highest concentration of medieval buildings in the region. The Townscape Heritage Initiative (THI) area includes a number of buildings of national significance, including six Scheduled Ancient Monuments, ten Grade I, sixteen Grade II* and 177 Grade II listed buildings and a Grade II listed public park.

However, long term economic decline in the area (compounded by recent events such as the loss of a major local employer, the BSE and Foot and Mouth crises and changing retail shopping patterns) have resulted in high levels of deprivation and consequent decline in the townscape quality. In particular the poor local economy and low property values have resulted in a backlog of required maintenance and repairs to properties and a lack of incentive for property owners to undertake all but the cheapest and most basic works. The level of disrepair was considered to be at a critical stage, with important buildings expected to be lost in the next few years without urgent works being undertaken.

ii) Action to be Appraised

In May 2000, Denbigh was awarded a grant of £1.25 million for Phase 1 of the THI scheme, which was used towards bringing 1800m^2 of vacant floor space back into use and conversion of a vacant building into a community college, as well as creating employment opportunities.

The proposal for Phase 2 of the scheme focussed on supporting economic regeneration in the town and addressing erosion of townscape quality through grant assistance to commercial and retail premises. Specifically, it sought to:

- Bring historic buildings back into use;
- Repair the fabric and structure of historic buildings; and
- Restore lost architectural detail on buildings, where ten critical projects of commercial and residential properties were identified.

The second phase of the THI covered the main commercial area of Denbigh together with a smaller residential district and a link with the castle. It encompassed the existing conservation area and Phase 1 THI boundary which was to be extended to fit the proposed Phase 2 THI boundary. The heritage merit of the area increased significantly as a result of discoveries made during Phase 1.

iii) Value Transfer

A value transfer exercise in this case study example would seek to estimate the benefit generated by the restoration works proposed for Denbigh's historic buildings (i.e. Phase 2 of the THI), which features three main elements of re-use, repair and restoration outlined above.

The heritage benefits of the scheme could also be added to the regeneration benefits of the scheme, such as the creation of employment and wealth, to give an indication of total benefit. The following however, focuses only on the heritage aspect of the initiative.

Study Selection

The study by Garrod et al. (1996)[36], which considers the benefits of renovating historic buildings in Newcastle's Grainger Town, would appear to be the most appropriate for consideration in the case of the Denbigh THI. In particular:

- Garrod et al. elicit WTP for renovation and restoration of historic buildings, set against a background of decline in the Grainger Town area caused by increased numbers of vacant buildings, changes in shopping patterns and a lack of confidence in the future of the area.
- The WTP question used an open-ended format and asked residents of Newcastle their maximum WTP (per household per year) for renovation and restoration of historic buildings in Grainger Town. The proposed changes included an overall strategy for the development of the area which included measures to identify viable uses for under-utilised buildings. The payment vehicle used in the study was local council tax. In addition, respondents were told that their payment would be matched by external funds.
- In addition to mean WTP, the study also reports truncated WTP values that exclude extreme observations, giving a range of WTP estimates that may be transferred.
- The reporting of the study includes a WTP function that details the main influences on respondent WTP. In addition the model has a good degree of explanatory power (R^2 = 41%) for an opened-ended CV study[37].

[36] See Garrod and Willis (2002) in the report Annex for a summary of this study.
[37] On a technical note, Garrod et al. (1996) use Ordinary Least Squares (OLS) regression analysis to estimate the WTP function. However respondent WTP is elicited via an open-ended question, giving a continuous dependent variable

- Finally the study methodology appears to be robust[38], with no apparent biases that exert significant influences on the estimated WTP values, although it is noted that the study does not report the sampling methodology used.

Overall, it would appear that there is a fairly good match between the investigation by Garrod et al. and the valuation context for the Denbigh THI. One difference that should be highlighted is that the built heritage in Denbigh is older (medieval period) than that of Grainger Town (early 19th Century). Here then some compromise is made between being able to match the good in question and being able to match the change in the provision of the good. It is also noted that Garrod et al. does not fully specify the changes that would take place due to restoration works, so it is necessary to assume that these would have been similar to those undertaken in Denbigh. In addition, the population characteristics of Newcastle and Denbigh are likely to be different; however transferral of the WTP function will enable some differences to be accounted for. Finally, although the WTP function reported in Garrod et al. does not include income as an explanatory variable, a number of variables in the function are related to income, namely whether the respondent is unemployed or economically inactive (a proxy for low income), whether the respondent's household has two or more cars (a proxy for higher income) and also the number of children in a respondent's household (a proxy for disposable income, which should be inversely related to the number of children).

Aside from Garrod et al. (1996), other studies that look at groups of historic buildings include Pagiola (2001) and Grosclaude and Soguel (1994). The former assesses the benefits of restoration of buildings in the historic centre of Spilt, Croatia, whilst the latter considers damages to historical buildings in Neuchâtel, Switzerland caused by road traffic. Given its UK context, Garrod et al. would appear to be the most suitable study for potential value transfer to the Denbigh example. Moreover the study of Split could be discounted on the basis that survey sample was largely tourist based, whereas in this case study the impact upon local residents is of most interest. Section 4.2 also notes some concerns regarding the robustness of the Neuchâtel study. To summarise, Table 5.1 below compares the main features of the Denbigh case study and the Garrod et al. study on the basis of the criteria outlined for value transfer study selection.

Table 5.1: Comparison of Denbigh and Grainger Town study

Selection Criteria	Case Study	Garrod et al (1996)
Good	Denbigh Wales, UK Historic buildings (many listed) in a small town	Grainger Town Newcastle, UK Historic buildings in part of a large urban area
Change in provision of good	Restoration of buildings, including repairs and architectural detail.	Restoration of buildings Increased use of under-utilised buildings
Population	Local residents - Denbigh	Local residents - Newcastle
WTP function	N/A	WTP for restoration of historic buildings, based on socio-economic and attitudinal characteristics of the local population
Soundness of study	N/A	Reporting of the study would suggest that the results are fairly robust.
Property rights	WTP to secure a gain	WTP to secure a gain

which is effectively truncated at the value zero (i.e. there are no negative WTP values). If a significant proportion of observations of the dependent variable are zero, OLS may result in biased and inconsistent coefficient estimates (Maddala, 1983). Therefore it may be appropriate to use a tobit regression model for analysis of open-ended WTP data (Halstead et al., 1993). Garrod et al. report 162 legitimate (non-protest) WTP bids, of which 50 are zero bids and 112 are non-zero bids, giving 31% zero bids, suggesting that a tobit regression model may be more appropriate. However, in spite of this observation, the example here proceeds with the OLS function reported by Garrod et al. in order to demonstrate the function transfer approach to value transfer.

[38] With the exception of the above point.

Adjustments - function transfer approach

Table 5.2 below provides the WTP function from Garrod et al., with descriptions of the explanatory variables and the estimated coefficients. The third column of the table indicates the value of the variable in the case of Denbigh, while the fourth column provides notes on this value. The final column reports the source of data for Denbigh.

Table 5.2: WTP for restoration of historic buildings

Variable	Coefficient	Denbigh Value	Comment	Source
Constant	0.895 (4.92)	N/A	Value as reported by Garrod et al.	N/A
Respondent engages in recreational activities in Grainger Town (dummy)	0.689 (3.41)	1.00	Assume all Denbigh residents visit historic area	N/A
Household has two or more cars	0.345 (1.54)	0.31	Based on Denbighshire	2001 Census[a]
No. children in household	-0.273 (-2.22)	1.80	National average	2003 General household survey[b]
Respondent considers the renovation of Grainger Town to be a problem in need of immediate attention (dummy)	1.065 (5.34)	0.66	Value as reported by Garrod et al.	N/A
Household contains a member of the National Trust	0.633 (2.64)	0.06	Based on National Trust reporting	National Trust[c]
Household contains a member of a local history society	0.927 (2.08)	0.00	N/A	N/A
Respondent is unemployed or otherwise economically inactive (but not retired)	-0.423 (-1.63)	0.22	Based on Denbigh	2001 Census[d]
Summary statistics reported by Garrod et al: n = 162, R^2 = 41.1%				

Notes: t-value reported in brackets for estimated coefficients. Although not reported in the study, it is assumed that t-values (in absolute value) greater than 1.96 are significant at the 5% level. Variables which appear to be insignificant in the Grainger Town study are retained on the basis of the overall explanatory power of the model.
[a] ONS website: http://www.statistics.gov.uk/census2001/profiles/00NG-A.asp
[b] ONS website: http://www.statistics.gov.uk/statbase/Product.asp?vlnk=13341&More=n
[c] National Trust website: http://www.nationaltrust.org.uk/main/nationaltrust/
[d] Denbighshire Council Website:
http://www.denbighshire.gov.uk/EN/EnvDirec.nsf/0/ffaff3534cf522f480256d7a0050aff0?OpenDocument

In transferring the Garrod et al. function to the Denbigh case study a number of assumptions are made in relation to the values of the explanatory variables:

- Constant term – this is not an explanatory variable. In the calculation of WTP the value of the constant is that which is reported by Garrod et al.
- Respondent engages in recreational activities in Grainger Town – here it is assumed that all residents of Denbigh undertake recreational activities in the town, so the value of this variable is set to one (i.e. 100%).
- Household has two or more cars – the value of this variable is based on data for the unitary authority of Denbighshire, since more disaggregated data are not available.

- No. children in household – readily accessible census data for Denbighshire does not report this. The value used here is based on the national average for the number of children in all families with dependent children for 2003.
- Respondent considers the renovation of Grainger Town to be a problem in need of immediate attention – no data are available for the attitudes of the Denbigh population towards restoration of historic buildings, so information from Garrod et al. is used, which reports that almost two-thirds of respondents said they considered renovation to be an urgent and immediate problem.
- Household contains a member of the National Trust – The National Trust covers England, Wales and Northern Ireland and is reported to have over 3 million members. From 2001 Census data the joint population of England and Wales is approximately 52 million[39] and 1.6 million in Northern Ireland[40]. Therefore an estimated 6% of the population are National Trust members.
- Household contains a member of a local history society – this value is set to zero, although a web-search did reveal the existence of the Denbigh Local History Society, no further information could be found.
- Respondent is unemployed or otherwise economically inactive (but not retired) - According to 2001 census data for Denbigh, 166 people were unemployed and 1,747 were under the age of 14. The total population in 2001 was 8,783. Therefore those unemployed or inactive is calculated to be 1,913, representing 22% of the town's population. Note that this calculation does not account for those of working age who are economically inactive other than those who are unemployed.

Based on the function and data reported in Table 5.2, a value of 1.85 is calculated:

$$0.895+(0.689\times 1.00)+(0.345\times 0.31)-(0.273\times 1.80)+(1.065\times 0.66)+(0.633\times 0.06)+(0.927\times 0.00)-(0.426\times 0.22)=1.85$$

Although not reported in Garrod et al. it is assumed here that the regression analysis undertaken in the Grainger Town study used the natural log of WTP as the dependent variable (i.e. *ln(WTP)*)[41]. Hence the value of 1.85 should be adjusted to account for this transformation. This is achieved by raising the exponential to the power of 1.85:

$$WTP = e^{1.85} = 6.23$$

Therefore, WTP for restoration of historic buildings in Denbigh is estimated to be £6.23 per household per year on the basis of function transfer from Garrod et al. For comparison, Garrod et al. report that mean WTP for restoration of historic buildings in Grainger Town is £13.76 per household per year. Removal of the highest and lowest 10% of WTP responses reduced mean WTP to £10.11 per household per year. The estimated WTP value for Denbigh based on the function transfer approach is noticeably lower than the mean WTP values reported for Grainger Town. The difference in values may be attributed to differences in the characteristics between the population of Denbigh and the survey sample in the Garrod et al. study.

Aggregation and appraisal

Aggregation of unit WTP values can be carried out via a number of different approaches. Indeed, the choice of an appropriate method of aggregation is important if resulting estimates of total WTP are to inform decision-making (see Bateman et al., 2002 for more discussion). Conservative estimates of aggregate WTP are typically a sensible option in aggregation; if lower-bound estimates of benefit exceed costs then this provides good evidence that decision-making should support a project. If benefits do not exceed costs then there is still scope to

[39] http://www.statistics.gov.uk/census2001/profiles/727.asp
[40] http://www.nisra.gov.uk/census/Census2001Output/PopulationReport/populationreport1.html
[41] Conversion of the dependent variable (WTP) into log form is a common transformation in econometric analysis.

consider benefits that are not enumerated in analysis, which may also influence decision-making.

A conservative approach to aggregation in this case study would be to multiply WTP per household by the number of households in Denbigh. This would enable the calculation of benefit at the most local level, which is essentially the user population of interest. Alternatively it may be appropriate to consider a wider population, perhaps that of the local council administrative area (e.g. Denbighshire).

Aggregation over administrative area is a fairly crude approach to calculating total WTP (Bateman et al., 2002). For instance, this approach assumes that those outside of the administrative area experience no benefit from the provision of the good in question. Conversely, it assumes that all those within the boundary area do value the good in question and gain benefit from its provision. Therefore no account is made of those within the administrative area who do not value the resource, or those outside of the area who do value the resource. In addition, it is often the case that WTP for a resource tends to decline as distance from the resource increases (so called 'distance decay' effect). This effect is relevant to both use value and non-use value. Simply assuming the same WTP value across the aggregation population will therefore lead to over-estimates of TEV where distance decay effects are important.

With regards to this case study, it is difficult to estimate the extent to which non-local populations, i.e. non-Denbigh residents, value the historic buildings of Denbigh and their upkeep. It is likely that a significant proportion of residents in other parts of Denbighshire and other neighbouring authority areas may also be part of the user population for Denbigh, i.e. they visit for shopping, recreation or historical interest. However, such data are unlikely to be collected; indeed none was found in the research for this case study. In addition, some proportion of the population of Wales or the wider UK may also hold use or non-use value from restoration of historic buildings in Denbigh.

For the purposes of aggregation in this case study, two approaches are applied. Firstly, estimates of unit WTP value are multiplied by the Denbigh local population only (3,655 households). Secondly, unit values are multiplied by the population of Denbighshire (39,891 households)[42]. Table 5.3 reports the aggregated values for WTP. Unit values used in the calculation are estimated WTP from the function transfer exercise and also the mean values reported by Garrod et al. These are transferred without adjustment[43].

Table 5.3: Aggregated WTP for restoration of historic buildings in Denbigh (£)

Value Transfer Approach	WTP/household/ year	Aggregate WTP per year	
		Denbigh	Denbighshire
Function	6.23	22,771	248,521
Unit value (high)	13.76	50,293	584,900
Unit value (low)	10.11	36,952	403,298

Estimates of aggregate WTP per annum for restoration of historic buildings in Denbigh range from approximately £23,000 to £37,000 for Denbigh residents alone and £249,000 to £585,000 for all residents of Denbighshire. As is clear to see, use of the larger population results in over a ten-fold increase in aggregate WTP. In addition using the unit WTP value derived from function transfer results in aggregate WTP estimates that are around 45% of aggregate WTP values derived from the transfer of unadjusted values from the original study.

[42] 2001 Census:
http://www.denbighshire.gov.uk/EN/EnvDirec.nsf/0/ffaff3534cf522f480256d7a0050aff0?OpenDocument

[43] It should be noted that it would typically be the case that unit estimates that are transferred from a study undertaken several years ago would be inflated into current prices. This has not been carried out in this example.

In comparison, Garrod et al. estimated aggregate WTP for restoration of historic buildings in Grainger Town to be approximately £1.2 million, on the basis 121,239 households in Newcastle. In the study, aggregated WTP was calculated through adjusting unit WTP amounts to reflect different council tax bands.

The final step in the aggregation process is to convert the estimate of aggregate benefit derived from the restoration initiative into present value terms. Table 5.4 presents the present value of WTP for each of the six aggregate values reported in Table 5.3. The present value of benefit accruing from the restoration initiative is calculated over 30 years with a 3.5% discount rate as per the HM Treasury guidance (HM Treasury, 2003). A 30 year time horizon is seen as appropriate for this case study; beyond 30 years into the future much uncertainty surrounds the issues such as consumption patterns of households, which would be likely to significantly influence WTP valuations.

Table 5.4: Present value of benefit form restoration of historic buildings in Denbigh (UK £)

Value Transfer Approach	Denbigh		Denbighshire	
	Aggregate WTP/year	Present Value (30yrs, 3.5%)	Aggregate WTP/year	Present value (30yrs, 3.5%)
Function	22,771	433,457	248,521	4,730,787
Unit value (high)	50,293	957,362	584,900	10,448,736
Unit value (low)	36,952	703,411	403,298	7,677,087

As Table 5.4 shows, the estimated present value of benefit derived from the restoration initiative varies considerably depending on the unit values used for aggregation. For Denbigh alone present value of benefit ranges from around £0.4 million to almost £1 million, while over the larger aggregation population of Denbighshire, present value of benefit ranges between £4.7 million and £10.4 million.

Comparison to original appraisal and project costs

The proposal for Phase 2 of the Denbigh THI was submitted to the Heritage Lottery Fund by Denbighshire Council in 2003. No formal attempt to appraise the benefits of the project either through weighting and scoring methods or economic valuation was undertaken. The overall cost of the project was an estimated £9 million, including £4.25 million for building repairs, £2.75 million for reinstatement of architectural detail and £1.75 million for bringing vacant historic floor space into use. Overall Denbighshire Council sought funding from the HLF for £1.75 million of the project's total cost. Of this, the HLF awarded £1.5 million. Approximately £6 million of funding was sought from the Common Fund, which comprises of local authority funding, ERDF Objective 1 or 2, private sector contributions and Regional Development Agency funding.

Clear measurable targets were set in the proposal; among others, these included: buildings offered grant assistance (140); buildings brought back into use (20); commercial floorspace brought back into use (5,000m^2); existing commercial floorspace enhanced (3,000m^2); existing jobs safeguarded (100 full time employment); and new jobs created or accommodated (100 FTE). No information has been found to see if these targets have been achieved.

Assuming that the cost of the restoration initiative in Denbigh is incurred up front, i.e. in the first year, there is no need to convert estimated cost into present value terms. Comparing the estimate of cost to the range of benefit estimates in Table 5.4 suggests that only in the higher benefit estimate case do benefits outweigh costs. Indeed considering the benefit of only Denbigh residents suggests that the project could not be justified; the relevant benefit-cost ratio for the highest estimate of benefit is 0.11 (£1 million / £9 million).

However, it is important to highlight that analysis of benefit has considered only that which is derived from the restoration actions on historic buildings in Denbigh. It is also recognised that

there may be regeneration benefits in terms of employment and increased commercial activity in the town. Estimates of these benefits should also be added to the estimated heritage benefit to give a full estimate of total benefit from the regeneration initiative. However, it should be noted that regeneration benefits within Denbigh may simply arise from transfer of wealth from other areas. Whilst it is correct to count these benefits at the local level, from the overall national perspective there may be no additional wellbeing generated.

iv) Caveats, cautions, etc

Whilst this case study demonstrates the application of the function transfer approach in the appraisal of a heritage-related project, it is important to highlight a number of limitations:

- The value transfer exercise is based on a single study that broadly satisfies the criteria for study selection set out in Section 3 of this report. For value transfer exercises it would be useful to have a number of studies that satisfy the selection criteria in order for analysis to be more comprehensive.
- While there is an apparent good match between the valuation context in the Grainger Town study and the Denbigh case study, i.e. WTP for restoration of historic buildings, information is lacking in the specific details of restoration works proposed in Garrod et al. Also there is a noted difference between the origin of historic buildings in Denbigh (medieval) and Grainger Town (early 19th Century).
- The function transfer process as outlined in Table 5.2 is dependent on a number of assumptions relating to the inputted values of the explanatory variables. These mostly relate to the availability of data; in some instances data at the local level exists which enables the function to reflect the specifics of the population of interest. However in other cases it is necessary to use more aggregated national level data or to transfer information from Garrod et al.'s original study.
- The calculated WTP value of £6.23 per household per year relies on the assumption that the original study applied a log transformation to observed WTP amounts. This assessment appears to be correct, but it has not been possible to verify this from the original study's reporting.
- Aggregation of estimated WTP is based on a simple approach which does not account for subtleties that may influence WTP over a given spatial area. However, in the absence of more information on the relevant population it is not possible to apply an alternative aggregation strategy in this example.
- Notably the largest estimates of WTP are derived from the unadjusted transfer of mean WTP from the Grainger Town study. This approach does not account for differences in the relevant Denbigh and Newcastle populations.
- The assessment of total benefit from the Denbigh THI scheme only considers heritage benefits from the restoration actions. This partial assessment would need to be augmented by an assessment of the benefits that would accrue as a result of improved economic prospects in the town. As such the comparison of the costs and benefits here is limited, although one conclusion that is evident is that heritage conservation benefits to the local population of Denbigh alone are unlikely to be able to justify the total cost of the THI scheme.

5.2 Kennet and Avon Canal Restoration

i) Heritage Asset

The Industrial Revolution in the UK has left a legacy of over 2,000 miles of canals and inland waterways. Where this network initially served to link mines and quarries with factories, mills, markets and ports, today its main function is leisure-based, supporting tourism and informal recreation through opportunities that include boating, fishing, walking and nature conservation.

The Kennet and Avon Canal, which opened in 1810, runs for 87 miles and connects the River Thames at Reading to the River Avon at Bristol. As was the case with all waterways, use of the canal declined in the 20th Century and the Kennet and Avon was eventually closed in 1955. From the 1960s, the Kennet and Avon Canal Trust was involved in campaigning to re-open the canal and in implementing a number of small restoration projects. Over the next 30 years, a partnership of British Waterways, the Trust, the Association of Canal Enterprises and local authorities invested approximately £9.5 million in projects that included rebuilding and restoration of locks and relining of the channel, bridges and aqueducts. These works enabled the canal to be re-opened to through-navigation in 1990. However, there were still a number of significant long-standing structural problems facing the canal, mainly through leakage and embankment stability. Left unaddressed, these problems would have threatened the future use of the Kennet and Avon.

Therefore, in 1996 a partnership of British Waterways, the Canal Trust and local authorities sought funding from the Heritage Lottery Fund to enable completion of the restoration works. The bid was successful and £25 million was made available from the HLF along with a further £4.2 million in match funding from the partnership members. Work on restoration began in 1997 and focused on:

- Ensuring adequate water supply to sections of the canal through Devizes;
- Stabilising the embankment within the Bath Valley;
- Improving access and interpretation; and
- Carrying out nature conservation, heritage and landscaping projects throughout the length of the waterway.

Restoration work was completed by the end of 2002 and the canal was officially re-opened in 2003.

ii) Action to be Evaluated

In contrast to other case studies in this report, the focus here is that of post-project evaluation, rather than pre-project appraisal. The intention is to assess the benefit that has been derived as a result of the Kennet and Avon restoration works from 1997 to 2002. An assessment of the Kennet and Avon Canal restoration project is provided by Maeer and Miller (2004). The benefits of the scheme are identified as:

- Improved informal recreation opportunities along towpaths, both in terms in quantity and quality;
- Benefits to local communities from restoration; and
- Benefits to the waterway-based tourism and leisure industry.

Hence the benefits of the restoration scheme accrue mainly in terms of leisure, recreation and amenity. However it is noted that there is a recognisable link between these benefits and the

heritage legacy of the canal network. In addition the restoration project has led to improvements in environmental quality (particularly wildlife habitats and water quality).

The value transfer application in the case study seeks to identify the value of benefits associated with improved informal recreation opportunities along the Kennet and Avon.

iii) Value Transfer

Study Selection

Although not covered within the built heritage and historic environment scope of the literature review in Section 4 of this report, a number of studies exist that consider the economic value of informal recreation in relation to UK canals[44]. These include: Willis and Garrod (1990; 1991) which undertook a number of travel cost and contingent valuation surveys to estimate the value of recreation along UK canals; Garrod and Willis (1992; 1994) which used the hedonic pricing approach to assess the amenity and recreation value of canals as reflected in property prices; Adamowicz et al. (1995) which considered the value of the entire UK canal network; and Garrod and Willis (1998) which considered the loss of amenity associated with public utility structures (pipe bridges, pylons and cable crossings) along canals.

The studies by Adamowicz et al. (1995) and Garrod and Willis (1998) do not meet the above criteria in this case study context: the former considers WTP to preserve the entire canal system and the latter investigates negative impacts on use values, rather than benefit derived from recreational visits to canals which is the subject of investigation here. Moreover, the hedonic pricing studies (Garrod and Willis, 1992; 1994) assess changes in property values that are attributed to the presence of canals, rather than the visitor benefits or changes in the canal network. Of the two TC and CV papers by Willis and Garrod (1990; 1991), the latter provides a more comprehensive range of WTP estimates and consequently is seen as the most appropriate study for consideration in this case study. To summarise, Table 5.5 below compares the main features of the Kennet and Avon case study and the Willis and Garrod (1991) on the basis of the criteria outlined for value transfer study selection.

Table 5.5: Comparison of the Kennet and Avon to Willis and Garrod (1991)

Selection Criteria	Case Study	Willis and Garrod (1991)
Good	Informal recreation along the Kennet and Avon Canal England, UK	Informal recreation along stretches of twelve canals throughout England (including the Newark, Anderton, Weaver canals and various canals in Gloucester and the Midlands).
Change in provision of good	Value of informal recreation along the canal – both from increased quantity of visitors and an improved quality of visit as well as the protection of a heritage asset and improvements to wildlife.	No change considered. The study estimates the value of informal recreation along canals.
Population	Recreational visitors	Recreational visitors
WTP function	N/A	The study reports travel cost functions but not CV WTP function(s).
Soundness of study	N/A	Reporting of the study would suggest that the results are fairly robust.
Property rights	WTP for an improvement	No change in wellbeing sought

[44] A useful database of economic valuation studies in relation to the environment is provided by EVRI: http://www.evri.ca/

Overall, the study by Willis and Garrod (1991) provides a useful investigation of informal recreation along canals:

- The study surveyed a random sample of recreational users at a range of sites along twelve canals. Respondents included those using the canal for boating, walking and appreciation of the scenery, dog walking, fishing, wildlife appreciation, shopping, drinking and eating and cycling.
- The study reports results for both CV and TC surveys offering a range of estimates of use value of canals for informal recreation. Separate estimates of economic value are provided for the activities listed above.

However, use of the Willis and Garrod study in the context of the Kennet and Avon Canal is limited. Given that values are reported in terms of benefit per visit, it is only possible to calculate the informal recreational benefit new visitors would be willing to pay. Therefore the analysis can only consider benefits that accrue from increased visitor numbers to the canal for recreational purposes. While those who visited the canals prior to restoration may also enjoy increased use value due to increased quality of visit, it is not possible to account for these improvements, since no assessments of WTP for marginal improvements in recreational opportunities in and along canals are available in the relevant literature.

A number of other points should be highlighted in relation to using the Willis and Garrod study for value transfer purposes:

- It is difficult to assess the similarity of the Kennet and Avon to the sites surveyed in the Willis and Garrod study. Hence it is necessary to assume that the recreational opportunities at the Kennet and Avon and the study sites are sufficiently similar.
- It is also necessary to assume that visitor populations at the Kennet and Avon and study sites are similar, in terms of activities undertaken and also socio-economic characteristics.

These points are particularly relevant since the analysis here seeks to transfer unit estimates of WTP to the Kennet and Avon case study. This approach is taken for a number of reasons. Firstly a suitable WTP function is not provided in Willis and Garrod. In addition the socio-economic characteristics of the study site visitor population in Willis and Garrod are not reported, making it difficult to adjust WTP values to account for differences with the Kennet and Avon visitor population in a variable such as income. Finally, while regional data for socio-economic characteristics of residents local to the Kennet and Avon can be collected easily, the characteristics of the actual visitors (the local and non-local proportion of which is not known) cannot be quantified unless a user survey is undertaken.

Adjustments – unit value transfer

Willis and Garrod report a selection of economic values based on both travel cost and contingent valuation methodologies for twelve different sites. For the purposes of this example the average WTP value over all sites is used. These estimates are based on the total sample size of approximately 1500 respondents which covers a broad range of visitors with different uses of canals. Respondent numbers from the individual sites ranged between 42 (Hawkesbury) and 241 (Newark). In some instances observations at individual sites were weighted towards particular user groups.

From the travel cost model, average willingness to pay over all twelve canals for informal recreation was found to be approximately £0.51 per visit. From the contingent valuation survey, average willingness to pay over all twelve canals for informal recreation was found to be approximately £0.36 per visit. Therefore the range £0.36 - £0.51 per visit (which when inflated to present day value corresponds to £0.53 – 0.74 per visit) is transferred as an

indicative estimate of benefit derived from informal recreation visits to the Kennet and Avon Canal[45].

Aggregation and appraisal

Prior to the canal restoration, Kennet and Avon visitor numbers were an estimated 6.67 million visitor days in 1995. In 2002, estimated visitor numbers were 7.70 million visitor days, representing an approximate 15% increase in visits[46]. The estimates cover only visitors to the towpath, i.e. boating is not covered. Assuming that the estimate for 1995 can be used as a proxy for 1997 visits, and that one visitor day equals one visit (i.e. people do not make multiple visits to the canal during one day), the impact of the canal restoration project has been an increase in visits of 1.03 million per year. This assumes that increased visitor numbers are attributed solely to the canal improvements, and are not due to other factors such as increased preference for canal-based recreation.

As Table 5.6 indicates, in 1997 overall benefit derived from informal recreation along the Kennet and Avon Canal is estimated to be between £3.5 million and £4.9 million. In 2002, the estimate of overall benefit increases to between £4.1 million and £5.7 million. Therefore the impact of the restoration project (in terms of increased visits) is estimated to be between £0.55 and £0.76 million per year. Notably this valuation excludes any increases in boat use as a result of the restoration works and therefore is likely to be an under-estimate.

Table 5.6: Change in visit numbers and use benefit of the Kennet and Avon Canal

	1997	**2002**	**Change** (97 – 02)
Visits (No.)	6,670,000	7,700,000	+1,030,000
WTP (£)			
0.53 per visit	£3,535,100	£4,081,000	+£545,900
0.74 per visit	£4,935,800	£5,698,000	+£762,200

Over 30 years with a 3.5% discount rate, the present value of additional benefit is approximately £10.4 million - £14.5 million. This equates to a considerable proportion of the (undiscounted) total project cost of £29.2 million.

As mentioned above the restoration of the Kennet and Avon Canal has also generated economic benefits for the leisure and tourism industry. Work carried out for British Waterways suggests that spending within local economies had risen to £26 million per year by 2002, a 20% increase on 1995. Of this, £21 million is attributed to towpath visits and £5m to boating. In employment terms, the canal is estimated to support around 1,000 tourism and leisure jobs, 180 of which have been created since 1995 (Maeer and Millar, 2004). In considering such economic benefits some attention should be paid to the issue of 'transfers'. The increase in spending in the Kennet and Avon area may simply be as result of reductions in spending elsewhere, and therefore from the perspective of national wealth, there may not be a real increase. However, at the local level, these increases in spending should count towards the evaluation of the project. The point here is that of the boundary of the analysis. If the boundary is defined around the local area then tourism benefits are relevant, but not otherwise unless the nation as a whole experiences a tourism gain. On this note, increased visitor numbers could also be transfers from other recreation sites, and therefore the estimated benefit also does not represent an increase in overall social benefit.

[45] WTP amounts reported by Garrod and Willis (1991) are inflated from 1989 value to 2004 by the HICP/CPI. See www.statistics.gov.uk

[46] Personal communication, Gareth Maeer, May 2005. Visitor numbers for 1997 are likely to be similar to the 1995 figure given that all recent restoration and improvements took place after 1997.

iv) Caveats, cautions, etc

This case study demonstrates the application of the unit value transfer approach to the evaluation of a heritage-related project. It is important to highlight a number of limitations:

- The value transfer exercise is based on a single study that broadly satisfies the criteria for study selection set out in Section 3 of this report. For value transfer exercises it would be useful to have a number of studies that satisfy the selection criteria in order for analysis to be more comprehensive, particularly since the Willis and Garrod study is somewhat dated (the surveys were carried out in 1989).
- In transferring mean values it has been necessary to assume that characteristics of the study sites assessed in Willis and Garrod and the Kennet and Avon are similar, particularly in terms of recreation opportunities, and also in terms of the characteristics of the visitor populations.
- The analysis carried out estimates use value associated with informal recreation on the basis of average values derived from a TC model and CV survey. A typical issue with the TC method is that it may underestimate the true recreational value of sites such as canals, as many users have negligible travel costs since they live only short distances away. In this application though, the TC estimate of WTP is greater than the CV estimate of WTP. This point in itself is interesting, since typically it would be expected that WTP values derived from a CV survey would exceed WTP values derived via a TC model for the same good on the basis that CV may also pick up some elements of non-use value.
- The analysis undertaken is partial in that it can only estimate the benefit accruing from increased visitor numbers. This assumes that increased visits are solely attributable to the restoration work and no other factors and that those who visited the canals before the improvements do not receive any benefits from quality improvements. In fact, monitoring carried out by British Waterways indicates that visit quality has also increased. For instance in site surveys pre- and post-restoration, the percentage of respondents stating they were 'very satisfied' with the overall enjoyment of their visit increased from 36% in 1997 to 78% in 2001. While increased benefit from increased visitor numbers may in actual fact be a transfer from other sites to the Kennet and Avon, the increased quality of visits is a real gain in overall social welfare, which cannot be accounted for in this analysis.
- Overall, given the considerable assumptions involved in analysis presented, the estimates of increased benefit should be viewed as indicative, rather than conclusive. Whether or not the WTP estimate contains an element of heritage value associated with the canals is impossible to comment on. They do however suggest that the restoration project has yielded significant improvement in the informal recreation value of the Kennet and Avon.
- Finally, this case study serves to highlight the typical difference in availability of information prior to a project and after a project. In particular, ex-post evaluation exercises benefit from being able to monitor outcomes that have occurred, for example by recording actual visitor numbers to a site. In contrast, ex-ante appraisal exercises attempt to predict outcome, for example by estimating expected visitor numbers to a site. Ambiguity concerning predicted outcomes, such as visitor numbers, can therefore add to uncertainty that may arise from use of value transfer for economic valuation purposes[47].

[47] Hence this is why sensitivity analysis is an important step in the appraisal process, allowing the effect of changes in key assumptions to be assessed.

5.3 Battersea Park Restoration

i) Heritage Asset

Battersea Park, London, is listed as Grade II on the English Heritage Register of Parks and Gardens. In addition four buildings within the park (the Engine House, the Sun Gate, Queenstown Road Gate and Queen's Circus Gate) are listed as Grade II. The park covers 83 hectares (200 acres). It was laid out in 1845 and incorporated many of the features typical of 19th Century Victorian parks, including a circuit carriage drive around the park's perimeter, a 'rotten-row' horse riding circuit, avenues, a large lake with numerous islands, earthworks and artificial rock features, a sub-tropical garden planted with species sourced from throughout the British Empire, a network of footpaths and large open areas for recreational use (principally cricket).

The layout of the park remained unchanged until the Second World War when much of the open space was turned into allotments. The park also featured a barrage balloon site, an anti-aircraft battery and a dump for bomb debris. Post-war, the park never recovered its initial use or appearance. In 1951, the Festival of Britain Pleasure Gardens was sited in the park – this temporary use of some 37 acres of the park lingered until 1974 with the closure of the fun-fair. Although well received at the time, the Pleasure Gardens compromised the amenity value of the central area of the park, particularly in terms of cheap materials used and poor standard of detailing and design.

ii) Action to be Appraised

The Battersea Park restoration project, which took place between 2000 and 2004, featured a number of elements:

- Repair and enhancement of the Victorian design of the park;
- Repair and enhancement of selected elements of the Festival Gardens and removal of other elements considered of little merit; and
- Improved integration of recreational uses of the park within the Victorian framework.

Aspects of the repair and enhancement of the Victorian design included restoration of planting areas and shrubberies, reinstatement of the original widths of the carriage drives, resurfacing and re-edging of the path and drives network where necessary, complete reinstatement of the lake edges and adjacent features and recreating the sub-tropical garden. A number of other amenity improvements were included in the plan, such as improvement of car parks, park furniture and signs, site irrigation, and reconstruction of a pier to allow for river access to the park from the Thames.

The heritage benefit of the proposed scheme arises from restoring the historic character of the park. However, the scheme also generates benefits in terms of improvements to recreational opportunities and the general amenity value of the park, including some nature conservation benefits. In addition, the park is also situated in the Queenstown Ward of the Borough of Wandsworth. This is the most deprived ward in the borough. Moreover, within the three wards closest to the park, almost 80% of children live in unsuitable accommodation (i.e. shared flats or temporary accommodation) and 44% of households in Wandsworth do not have a car. This suggests both that the local parks have an important role in the provision of recreation, but also that there are competing uses for council funds.

An estimated 3 million plus visitors per year would attend the site on completion of the project[48]. The proposal for the restoration of Battersea Park was submitted to the Heritage Lottery Fund by the London Borough of Wandsworth in 1998. No formal attempt to appraise the benefits of the project quantitatively either through weighting and scoring methods or economic valuation was undertaken. The overall cost of the project was an estimated £11.7 million. The council had secured £3.5 million through partnership funding and sought the remaining £8.2 million from the HLF. The HLF approved a grant for 70% of this cost, which amounted to £6.9 million.

iii) Value Transfer

A value transfer exercise in this case study example would seek to estimate the benefit generated by the restoration works proposed for the park. By and large this features two elements: (i) the restoration of historic features, which is the heritage aspect of the project, and (ii) the improvements to visitor amenity and recreational enjoyment of the park.

Study Selection

The literature review in Sections 4 and the report Annex identified one study that focussed on a historic park, that by Willis (2002) which considers the Bosco di Capodimonte (a former royal woodland park) in Naples. In addition to the unsuitable match between the Battersea Park and the Bosco in terms of economic goods, the Willis study does not report WTP information that could be used for transfer purposes; the study focuses in determining the revenue-maximising entry fee for the Bosco. Therefore it is not a candidate for value transfer.

A review of literature considering the benefits of undeveloped land by eftec and Entec (2002) identified three studies that examined the benefits of public space in urban areas. The first of these, a study by Hanley and Knight (1992), found WTP to preserve the greenbelt around Chester. This is not an appropriate study to use for value transfer as open countryside has very different cultural and amenity benefits to park space. The second study by Breffle et al. (1998) found WTP to prevent an area of undeveloped land providing views of mountains and a wildlife habitat in Boulder, Colorado, from being turned into a housing development. This is also not an appropriate study to use because unlike a park, the space was completely undeveloped and had no facilities of any kind. The benefits it provided were purely environmental and recreational rather than cultural. The third, Lockwood and Tracy (1995), considered the non-market benefits (in particular landscape, recreation and tranquillity value) provided by Centennial Park in Sydney, Australia. This paper is the most appropriate available for use with value transfer principally because:

- The park has a broadly similar historical background to Battersea Park – it dates from the late 19th Century (it was created in 1888 to commemorate 100 years of British settlement in Australia) and contains Victorian features such as a circular carriage drive.
- Both parks have benefits that are not merely environmental or recreational. Like Battersea Park, which has an art gallery and hosts events such as music, food and affordable art festivals, Centennial Park hosts artistic facilities in the form of an outdoor cinema.
- The cities in which the parks are situated are both the largest and most important cities in their respective countries. The affected populations in both cases can be split into (1) residents very close to the park who would perhaps use it on a very regular basis and (2) other residents of the city who might use the park on a more infrequent basis or for special events. For Battersea Park regular users could be assumed to come from surrounding wards in Wandsworth (some of which are relatively deprived) and Kensington and Chelsea (which are amongst the wealthiest in the country).

[48] This estimate of visitor numbers is reported in Wandsworth Borough Council's application to the Heritage Lottery Fund.

However, the match between the two sites is clearly not ideal for value transfer purposes. In particular, the Centennial Park is more an equivalent in terms of scale and importance to Hyde Park in London (or even Central Park in New York)[49]. Furthermore, the Centennial Park study appears to be valuing a general 'bundle' of benefits, i.e. all recreational, environmental and cultural benefits. However, in the context of Battersea Park, while there are recreational and environmental aspects of the proposed plans, it is the cultural benefits which are foremost.

The Centennial Park study did not specify the magnitude of the change to respondents, but merely asked for WTP to contribute towards management. Therefore, it is not clear whether respondents envisaged that without the hypothetical funding the Park would cease to exist, or whether they imagined a deterioration in the quality of facilities.

Lockwood and Tracy present the results of both a travel cost and a contingent valuation study for the Centennial Park. The CV study is possibly less reliable than the TC study, as the sample used is demographically different from that of the whole of Sydney. However, the travel cost study does not give sufficient weight to a very important group of people - those who live near the park (and who indeed may live close by precisely because they like the park so much) and who therefore travel hardly any distance to visit the park. The preferences of these people may instead to some extent be expressed in house prices or rents, but are only measured by travel cost by the study. Table 5.7 compares the Battersea Park case study to Lockwood and Tracy (1995) in terms of the selection criteria for value transfer.

Table 5.7: Comparison of Battersea Park and the Centennial Park study

Selection Criteria	Case Study	Lockwood and Tracy (1995)
Good	Battersea Park London, UK 200 acres Victorian park in an urban setting – historic features and recreational use	Centennial Park Sydney, Australia 540 acres (approx.) Urban parkland – recreational use (incl. ornamental gardens and wetlands)
Change in provision of good	1. Restoration of historic features 2. Improvement of amenity value	None - study estimates the economic value of the park via CV and TC methods, both use value and non-use value.
Population	Projected 3 million plus visitors (1998)	Park: 3 million visits (1992) Sydney: 1.2m households
WTP function	N/A	-
Soundness of study	N/A	Sampling strategy may influence reported WTP values.
Property rights	WTP to secure a gain	No change in wellbeing sought

As Table 5.7 highlights, the Centennial Park study does not compare favourably to the case study of interest. This suggests that given the current coverage of economic valuation literature, it is not possible to assess the benefits of the restoration of Battersea Park through a value transfer exercise. Principally the scale of the Centennial Park is much larger than Battersea Park, both physically and in terms of significance. In addition, Lockwood and Tracy do not value marginal improvements in the quality of the park setting. Hence it would not be possible to estimate the benefit resulting from the Battersea Park restoration programme.

Whilst it is not possible to apply value in this case study, the following discusses a number of points relevant to its application in appraisal contexts. The fact that only a single international valuation study considers the benefit accruing from a large urban park demonstrates that in some cases it may be necessary to consider transferring unit values (or functions) from non-UK

[49] See: http://www.cp.nsw.gov.au/aboutus/centennial.htm for a description of Centennial Park.

contexts. In the case of transferring unit WTP values, study site WTP amounts need to be converted into the equivalent UK sterling value. Adjusting for purchasing power parity (PPP) is a common approach to converting WTP amounts into a different currency. PPP is a concept which relates to exchange rates and inflation indices between countries. Specifically exchange rates between currencies should be in equilibrium when their purchasing power is the same in each country (i.e. when the relevant amount of currency in each country can purchase an identical bundle of goods). This means that the exchange rate between two countries should equal the ratio of the two countries' price level of a fixed basket of goods and services. Thus, PPP adjusts for both price deflators and currency converters, eliminating differences in price levels between countries in the process of conversion. There are various adjusted PPP conversion factors which are appropriate for use in different contexts. PPP GNI per capita (formerly PPP GNP per capita) may be used for conversions of WTP results since it reflects differences in real income per capita and real income is a key determinant of WTP. The adjustment is a simple linear one. For example to convert a WTP estimate from Australian dollars to UK sterling (as would be the case when using WTP estimates from Lockwood and Tracy), the following calculation may be used:

$$WTP_{UK} = WTP_{AUS} \times (\text{PPP GNI per capita}_{UK} / \text{PPP GNI per capita}_{AUS})$$

This calculation would yield an estimate of WTP that could then be aggregated over the population relevant to the appraisal decision.

Conceivably, the values estimated by Lockwood and Tracy (1995) could be used to estimate the total non-market benefit that is derived from Battersea Park. The average travel cost found by Lockwood and Tracy of visiting the Centennial Park was $7.42 (1993 Aus $) while the average WTP per household per year from the CV survey was $25.81. Converting these values to UK sterling and aggregating over the user population (i.e. visitors to the park) for the travel cost value and the relevant user and non-user population for the CV value would provide indicative estimates of the use value and total economic value of Battersea Park. However the robustness of such calculations would be questionable given the concerns highlighted above regarding transfer of values derived in the context of Centennial Park to Battersea Park.

Therefore, in the case of estimating the total use value of Battersea Park, an alternative approach could be considered that could also provide an indication of the benefit. The following is, in a sense, a less formal application of the travel cost technique. Where no suitable valuation studies exist some use can be made of information that can be collated on visitor numbers, on-site and off-site costs of travel and entrance as well as the economic cost of time (such as the opportunity cost of leisure time). For instance, information concerning the cost of public transport travel in London is readily available, which could be added to an estimate of the value of an individual's leisure time (which may be expressed as some percentage of average wage) that is multiplied by the average duration of a visit to the park. This calculation would yield an indication of the minimum benefit derived by an individual per visit to Battersea Park; the rationale being that the benefit derived from visiting the park is at least equal to the costs incurred in visiting the park.

However, considering travel costs alone will likely under-estimate the value that may be attached by households adjacent to heritage and recreation sites such as Battersea Park. In particular travel costs incurred by these individuals are likely to be negligible. Here then, consideration of time spent visiting the park is useful, which can be multiplied by estimates of the value of (leisure) time in order to provide a proxy for the value derived from visits. In addition, an account of any entry-charges and other related on-site costs can also provide information regarding the value derived from sites of interest.

Whilst the outlined approach is also unable to value marginal changes in the quality of a heritage asset, such as those arising from the restoration of Battersea Park, it does

demonstrate that there is potential scope for using information collected from visitor surveys. Indeed, as demonstrated in the Kennet and Avon case study, such information is needed to support value transfer applications, but also in isolation such information can be valuable in formal appraisals. Overall, the validity of such exercises will be dependent upon the assumptions that underpin the analysis.

Finally, the proposal for the restoration of Battersea Park was submitted to the Heritage Lottery Fund by the London Borough of Wandsworth in 1998. No formal attempt to appraise the benefits of the project quantitatively either through weighting and scoring methods or economic valuation was undertaken. The overall cost of the project was an estimated to be £11.7 million. The council had secured £3.5 million through partnership funding and sought the remaining £8.2 million from the HLF. The HLF initially approved a grant for 70% of this cost, which amounted to £6.9 million. However, this was increased to £7.5 million with a later grant uplift.

5.4 Lincoln Cathedral Conservation and Maintenance

i) Heritage Asset

Lincoln Cathedral dates from shortly after the Norman Conquest and for the most part was constructed in the 12th and 13th Centuries. It is one of the major English cathedrals, although unlike Durham and Canterbury, it is not designated as a World Heritage Site. The cathedral, which stands on a chalk cliff, dominates the city of Lincoln and much of the surrounding countryside. Until the construction of the Eiffel Tower in the late 19th Century, Lincoln Cathedral was the tallest building in the world.

ii) Action to be Appraised

Currently, around £1 million per annum is spent on general maintenance and cleaning of Lincoln Cathedral and surrounding buildings[50]. As with many historic buildings, air pollution has caused significant soiling of the Cathedral's exterior fabric (stone, timber, glass and lead). Recent actions include cleaning and conservation of the North West Transept north wall and the Dean's Eye Window (North West Transept rose window). The work done to the north wall included cleaning of stonework and repointing, mortar repairs to replace defective stones, cleaning and conservation of carved work, removal of rusting cramps, resetting of pinnacles and replacing missing finials. In 2000-1 English Heritage approved a grant of £0.46 million to fund the project. Further restoration of the Dean's Eye Window (which is expected to be completed in 2006) has focussed on replacement of the tracery and conservation of masonry and ferramenta. The project included conservation of medieval glass, dismantling of existing tracery, the cutting of new tracery and the conservation and re-use of medieval iron work. In 2001-2 English Heritage provided a grant of £0.79 million to fund restoration of the Dean's Eye Window.

iii) Value Transfer

Study Selection

The Lincoln Cathedral case study is unusual in that an economic valuation study has previously been undertaken for the Cathedral by Pollicino and Maddison (2001; 2002). Details of the study are reported in the Annex to this report. Using the contingent valuation method, Pollicino and Maddison sought WTP for cleaning of the Cathedral's external west front which features a 12th Century Romanesque frieze. Specifically respondents were asked their WTP to change from a

[50] Lincoln Cathedral Website: www.lincolncathedral.com

40-year cleaning cycle to a 10-year cleaning cycle for the cathedral exterior. This was illustrated by the use of photographs showing particular details of the Cathedral (e.g. a statue) both twenty and five years after cleaning, i.e. mid-way through each of the proposed cycles. It was emphasised that only the appearance of the cathedral would be changed, i.e. no other renovation work would take place.

Table 5.8 below compares the study by Pollicino and Maddison to this case study on the basis of the criteria outlined for value transfer study selection.

Table 5.8: Comparison of Lincoln Cathedral to Pollicino and Maddison (2001; 2002)

Selection Criteria	Case Study	Pollicino and Maddison (2001; 2002)
Good	Lincoln Cathedral	Lincoln Cathedral
Change in provision of good	Improvement in the aesthetic quality of the Cathedral though conservation and cleaning work and also general maintenance work	Improvement of the aesthetic quality of the Cathedral's West front through increased frequency of cleaning work, related to air pollution damages only.
Population	Local residents – Lincoln and Lincolnshire	Local residents – Lincoln and Lincolnshire
WTP function	N/A	WTP for cleaning of the Cathedral based on socio-economic characteristics of the local population, distance from the site, bid level and starting point
Soundness of study	N/A	Robust – although the valuation results may be subject to starting point bias in the dichotomous choice elicitation format employed
Property rights	WTP for an improvement	WTP for an improvement

Unsurprisingly the criteria relating to the heritage asset and population as well as property rights are a good match. However, Table 5.8 does highlight the importance of the valuation scenario and the change in the provision of the good. In particular Pollicino and Maddison focus on one element of the conservation of Lincoln Cathedral - that of cleaning the building - rather than general maintenance work, which covers a diverse set of actions. Further consideration of this point is useful. In fact transferring WTP from the Pollicino and Maddison study could potentially lead to an under-estimate of the benefit of Lincoln Cathedral's annual maintenance and cleaning works, since the original valuation study focuses only on cleaning of the Cathedral's exterior in relation to air pollution damages. Of particular relevance to this point is the issue of embedding and whether it is the case that respondents in Pollicino and Maddison's study were valuing the object, i.e. the aesthetic appearance of the Cathedral, or the specific programme applied to it, i.e. cleaning to address air pollution damages.

If the latter case is true, which was the intention of the original study, it should be the case that individuals have separate values for different elements of the maintenance and cleaning of the cathedral (e.g. cleaning, restoration of features, etc) and it should be acknowledged that the transfer of WTP from Pollicino and Maddison to this case study will be likely to under-estimate the extent of benefit derived from both maintenance and cleaning works. However, if it is the case that embedding effects are present, then transferred WTP estimates would be likely to differ little if the original valuation scenario had also included other maintenance actions at Lincoln Cathedral.

With regards to the actual WTP values reported, Pollicino and Maddison find some evidence of starting point bias in the elicitation format used (double-bounded dichotomous choice), where WTP values from some respondents were, in effect, prompted by the bid levels presented to them. Whilst, as the authors admit, this is an undesirable feature of the study, it is a drawback

of the double-bounded dichotomous choice approach and should be kept in mind when considering the study results.

Adjustments

Given the match between the study site population and policy site population the transfer of unadjusted unit values from the original valuation study is acceptable. However, given that WTP estimates reported by Pollicino and Maddison are 1998 sterling value the transferred values should be inflated to present day terms.

Aggregation and appraisal

In Pollicino and Maddison mean WTP to change from a 40-year cleaning cycle to a 10-year cycle for the exterior of Lincoln Cathedral was estimated to be £49.77 per year for households in Lincoln. For households in Lincolnshire outside of Lincoln, mean WTP was £26.77 per year. Aggregated across the relevant populations annual WTP was found to be approximately £7.3 million, as reported in Table 5.9.

Table 5.9: WTP results of the Lincoln Cathedral case study

Population	Mean WTP/household	No. of households	Aggregate WTP
Lincoln residents	£49.77	36,216	£1,802,470
Lincolnshire residents (excl. Lincoln)	£26.77	205,454	£5,500,003
Total			£7,302,473

On the basis of aggregate WTP to change to a 10-year cleaning cycle from a 40-year cycle, an approximate estimate of average WTP to avoid a year's accumulated dirt on the cathedral can be obtained by dividing the figure of £7.3 million by 15 years, which represents the difference between the midpoints of the 10 and 40 year cleaning cycles (20-5 = 15 years). This gives a value of £0.49 million. Inflating this value to present day terms gives a value of £0.53 million for every year of avoided dirt.

Comparison to original appraisal

As noted, approximately £1 million per year is spent on maintaining and cleaning Lincoln Cathedral, with a large proportion of funding sourced from English Heritage grants. Such expenditure on an annual basis can be justified in terms of cost-benefit analysis if it can be demonstrated that the benefits of the maintenance and cleaning actions exceed the cost incurred. The above value transfer application suggests that, on the basis of the study carried out by Pollicino and Maddison, work to preserve the aesthetic quality of Lincoln Cathedral yields significant benefits. Annual benefit was estimated to be approximately £0.5 million.

Three further points are relevant. Firstly, aggregation of WTP is limited to Lincoln and Lincolnshire residents. No account has been taken of individuals outside of the aggregation boundary who may hold positive preferences for the upkeep of Lincoln Cathedral through either use or non-use values. The corollary to this point is to ask what the scope of appraisal should be. For some heritage assets the local resident population may be relevant, but for more significant assets, such as cathedrals, some account may need to be taken of the national population or even the international population, particularly in the case of World Heritage Sites. Confounding this issue is the effect that distance decay may have on WTP values.

The second point relates to the likelihood that aggregate estimates of WTP transferred from Pollicino and Maddison are under-estimates of WTP for conservation and maintenance of Lincoln Cathedral. It is recognised that in the original valuation study WTP was sought only for cleaning exterior fabric to reduce the effects of air pollution on the aesthetic quality of the

Cathedral's appearance. Therefore, it may be the case that WTP for more inclusive conservation and maintenance actions would be greater than the transferred value.

The third point notes that this aggregate WTP is a measure of the difference in benefits between two schemes with imperfect aesthetic results, neither of which keeps the cathedral in a perpetually clean state, i.e. it is a measure of WTP to switch between one cleaning regime to a less bad (but imperfect) cleaning regime. Therefore, the figure of £0.5 million is likely to be an under-estimate of the benefits of a cathedral in a state of high aesthetic quality.

iv) Caveats, cautions, etc

It is important to highlight a number of limitations in relation to this case study:

- The Lincoln Cathedral case study is fairly unusual in that an original valuation study has previously been carried out at the site. Whilst criteria relating to the match between the asset, the policy site, study populations and property rights are satisfied, the case study demonstrates the importance of considering the details of the valuation scenario in value transfer applications. The valuation scenario considered by Pollicino and Maddison is very specific and centred on the cleaning of air pollution damages. The case study appraisal scenario is more general and concerned with a number of actions which maintain or improve the aesthetic quality of Lincoln Cathedral.
- As a consequence of the above point, considering embedding of WTP values is particularly relevant to the application of value transfer in the case study. The extent to which the preferences of individuals towards cleaning air pollution damages to the Cathedral can be taken as a proxy for preferences toward more general actions to maintain or improve the cathedral's appearance is unclear. Depending on the view taken, transferred WTP may potentially under-estimate the value of benefits derived. Alternatively embedding may be prevalent and it may be the case that WTP for the more general and inclusive actions at Lincoln Cathedral would not differ significantly from works specific to air pollution damages. Since the original study by Pollicino and Maddison does not investigate the extent of embedding in the elicit WTP responses, it is difficult to draw conclusions as to the likely extent of embedding.
- As with other case studies, aggregation of WTP across the local population only will likely provide a lower bound estimate of total WTP. For heritage assets such as major cathedrals, non-use, and also use, values held by the wider population could represent a significant proportion of the asset's total economic value. However distance decay is also likely to affect these valuations.

5.5 Sandal Castle Improvements and Repairs

i) Heritage Asset

Sandal Castle near Wakefield in Yorkshire is a 13th Century Grade II* listed Scheduled Ancient Monument built on the site of an 11th Century motte and bailey. The castle is largely ruined and situated on a hill-top overlooking Wakefield, fairly close to the city suburbs. It is accessible free of charge all year round, which, coupled with its effectiveness as a viewpoint, make it a popular site attracting around 70,000 visitors per year.

Sandal castle has many important historical associations. It was the stronghold of Richard, Duke of York (father of Richard III) before the Battle of Wakefield in 1460, one of the major actions of the War of the Roses. It was also a Royalist base in the Civil War and besieged twice by the Parliamentarians. It was fully excavated in the 1960s and 70s, and the artefacts discovered are kept in Wakefield Museum.

ii) Action to be Appraised

A proposal was made in 1998 to provide the following at the site:

- An educational resource centre to provide services for schools and other groups, described in the proposal as "visually unobtrusive". This is to provide an education room, a display space for interpretation and exhibitions (e.g. of artefacts excavated from the castle), a venue for public events and open days, and public toilets. It is felt that a built space is needed as the castle site is often cold and windy and there are no other indoor facilities.
- Conservation measures for the monument, including preventive and remedial stonework conservation.
- Access improvements, including non-slip timber steps and bridging on eroded areas; this would allow visitors (including wheelchair users to some extent) to reach areas previously inaccessible.
- Interpretation boards around the site and in the resource centre.
- A car park extension to allow a space for a coach, more car space and a dedicated disabled space.

As the site is accessed free of charge, it is not possible to obtain funding for these improvements from entrance revenues.

iii) Value Transfer

Study Selection

The literature review presented in Section 4 of this report found two studies relating to castles: Powe and Willis (1996), valuing access to Warkworth Castle in Northumbria, and Scarpa et al. (1997), valuing access to Rivoli Castle in Piedmont, Italy. The latter of these is certainly too different, in terms of site characteristics and social and historical context, to Sandal Castle, to merit consideration as a suitable study site. The former appears on first consideration to have some promise as a similar site. Both Warkworth and Sandal are ruined castles in the north of England built mostly in the 13th century (although Warkworth Castle has some substantial later alterations).

However, the local socio-economic characteristics are different. Wakefield is a city with a population of about 315,000[51], while Warkworth is a village with a population of 1,600. Five out of Wakefield's 21 wards are in the most deprived[52] decile of wards in England; as examples of what this means, Wakefield has higher than national average number of people with no qualifications and health self-described as 'not good'[53]. Warkworth ward, on the other hand, has an average number of people in poor health and a lower than average number of people without qualifications, and is mid-ranking in terms of deprivation. Table 5.10 compares the Warkworth study with Sandal Castle.

As Table 5.10 illustrates, the valuation context for Sandal Castle and the valuation context for Warkworth Castle are markedly dissimilar. This suggests that estimated WTP from Powe and Willis is not appropriate for transfer in this case study example. In particular the Warkworth Castle study values a very different good from that proposed at Sandal Castle; it provides an estimate of WTP to enter the Castle. The result is an under-estimate because it only includes respondents not willing to enter the Castle at its stated ticket price, and hence WTP is bound to be less than the entrance fee. However, at Sandal Castle a range of proposals intended to enhance visitors' enjoyment of the Castle is proposed. These changes are relatively minor and

[51] This is the figure for the population of Wakefield Metropolitan District. Population data from the 2001 Census.
[52] Measured by the UK Government's Overall Index of Multiple Deprivation.
[53] CWMDC 2001 Census 2001 District Profile: Wakefield District http://www.wakefield.org.uk

visitors would still be able to enjoy visiting the Castle without them. Furthermore, there may be an altruistic element of a Sandal valuation (better facilities for schoolchildren, the disabled, community events) as well as bequest value elements (conservation, prevention of erosion) which is not explicitly presented in the Warkworth study, which values only respondents' immediate use of the site.

Table 5.10: Comparison of Sandal Castle and the Warkworth Study

Selection Criteria	Case Study	Powe and Willis (1996)
Good	Sandal Castle, Wakefield, UK 13th Century ruined castle	Warkworth Castle, Northumberland, UK 13th-15th Century ruined castle
Change in provision of good	Construction of educational resource centre, some conservation work, improvements in access, parking and interpretation	None – study estimates WTP for access to the castle. Note that true WTP is under-estimated as only respondents who are not WTP the actual price are interviewed.
Population	Local residents and tourists	Local residents and tourists
WTP function	N/A	-
Soundness of study	N/A	Study does not assess WTP for a change or its determinants, but designed to test stated against revealed preference results.
Property rights	WTP to for a gain, WTP to prevent a loss (improvements/conservation)	No change in wellbeing sought

Hence this case study investigation reaches the same conclusion as in the earlier Battersea Park example. The current coverage of valuation literature does not make it possible to undertake value transfer to assess the benefits derived from improvements and repair to Sandal Castle.

While no monetised assessment of benefit is possible, some quantitative indication of benefit is suggested in the City of Wakefield Metropolitan District Council (CWMDC) application to the Heritage Lottery Fund. Specifically the castle was estimated to attract 70,000 visitors a year in 1998. The improvements were expected to result in a further 20,000 visitors per year. As with the Battersea Park case study, some indicative calculations could be undertaken to suggest a minimum level of benefit derived. Since entry to the castle is free, an 'informal' travel cost exercise would perhaps be more appropriate in order to give a suggestion of the minimum level of use value of Sandal Castle. However this would be likely to require input from a visitor survey in order to provide data on distance and time travelled to the site.

Finally, the proposal for the range of works at Sandal Castle was submitted by CWMDC in 1998. No formal attempt to appraise the benefits of the project quantitatively either through weighting and scoring methods or economic valuation was undertaken. The overall cost of the project was an estimated to be approximately £0.48 million. Funding for 62% of this amount (£0.3 million) was sought from the HLF.

5.6 Transport Schemes and the Historic Environment

The previous case study examples have focussed on the appraisal of projects within the heritage sector that have aimed to preserve, conserve or enhance the historic environment. However the scope of this study also includes the appraisal of projects and programmes in other sectors, such as transport, which may impact both adversely and beneficially on the historic environment. The following considers the transport sector, in particular road transport, and the potential for using the results of economic valuation studies in the appraisal and assessment of projects which impact upon the historic environment.

i) Heritage Asset

In the Department for Transport's New Approach to Appraisal (NATA), impact upon heritage is included as a sub-criteria of the environmental objective (see DfT WebTAG). Current guidance is based upon qualitative assessment and identifies three sub-categories of heritage that may be impacted upon; (i) archaeology, (ii) historic buildings, and (iii) historic landscapes (see WebTAG and the Highways Agency (2005)). Archaeology includes materials created or modified by past human activities such as artefacts and field monuments, both visible and buried. Historic buildings include great houses, churches, relatively modern structures, such as WWII military structures, industrial buildings, and other structures not usually thought of as 'buildings', such as milestones or bridges. Finally 'historic landscapes' recognises that the whole of the UK landscape has been modified by human activities and therefore has historic character. However, not all landscapes are historically significant. Emphasis is placed on landscapes where evidence of the past imparts a benefit. These can be designed landscapes such as gardens and parks, townscapes, or rural landscapes.

ii) Action to be Appraised

Potential impacts on heritage may arise from a number of different stages of a project life-cycle, from initial site investigation, through site clearance and construction to operation and mitigation actions. Table 5.11 lists a number of potential adverse and beneficial impacts that may arise from these activities. Some impacts may be direct in nature, resulting in physical damage (or improvement) to a heritage asset. Other impacts may be more indirect, affecting the setting (visual or aural) or context of a heritage asset.

Table 5.11: Potential adverse and beneficial impacts of transport schemes

Adverse impacts	Beneficial Impacts
o Disturbance of archaeological deposits o Vibration damage to historic monuments and buildings from traffic movement o Dust damage to historic monuments and buildings o Damage to historic monuments and buildings by airborne pollutants o Visual and noise intrusion on setting causing loss of amenity o Severance causing dereliction or neglect of historic monuments and buildings o Damage to historic landscape integrity	o Removal of traffic and associated impacts from sensitive areas o Screening of heritage from roads, etc. through mitigation actions o Improved access to heritage sites

Two recent examples of transport schemes that appraisal has identified as impacting on heritage include the A10 Wadesmill, High Cross and Colliers End bypass in Hertfordshire and the

Carlisle Northern Development route in Cumbria. The following briefly outlines the heritage impacts associated with each of these schemes.

The A10 scheme is intended to provide an alternative route for the approximately 20,000 vehicles that pass through the villages of Wadesmill, High Cross and Colliers End daily. Around 10% of all traffic on the road are heavy goods vehicles (HGVs). In the three villages, the majority of dwellings are adjacent to the existing road and comprise of a significant number of Grade II and III Listed buildings. The bypass would reduce traffic through the villages by an estimated 85%, yielding benefits in terms of reduced vibration and noise pollution experienced by local residents. The beneficial impact on heritage would be the reduced impact upon the listed buildings in the three villages.

Some negative impacts on heritage would also arise from the scheme; the bypass route would affect the setting of the Grade II Listed Youngsbury Park and there would also be an impact on several archaeological sites. The A10 follows the line of Ermine Street, a Roman road linking London to the north. The route of the by-pass would cross land that has been settled since prehistoric times, where documented evidence has included Neolithic/early Bronze Age burial mounds and late Bronze Age/early Iron Age settlements and a further Roman settlement. However, prior to the construction an archaeological investigation was carried out along the route in order to ensure that all surviving remains were fully recorded and preserved for the future.

Overall the appraisal assessment concluded that the A10 Wadesmill, High Cross and Colliers End bypass would result in a moderate adverse impact upon the heritage sub-criteria. The qualitative description from WebTAG guidance indicates that a moderate adverse impact is one which is:

- Out of scale with, or at odds with the scale, pattern or form of the heritage resource;
- Intrusive in the setting (context), and which will adversely affect the appreciation and understanding of the characteristic heritage resource;
- In conflict with local or regional policies for the protection of the heritage;
- Damaging to nationally significant heritage assets, resulting in loss of features such that their integrity is compromised, but not destroyed, and adequate mitigation has been specified; and/or
- A major direct impact on regionally or locally significant heritage, resulting in loss of features such that their integrity is substantially compromised (but adequate mitigation can be specified).

The Carlisle Northern Development route will improve strategic links between West Cumbria, Scotland and the North East of England. The proposal outlines a single carriage road which would bypass northwest of Carlisle linking the A595 with the M6 motorway. The significant heritage impact of the scheme lies in its crossing of the Hadrian's Wall World Heritage Site, running across the line of the wall at a point adjacent to the River Eden. However, at this point there are no features extant above ground. The road would be built upon an embankment over the lie of the Wall in order to safeguard the archaeological value of the area. Prior archaeological investigation of the proposed route has revealed only two stones that may have been part of the wall. The appraisal assessment of the scheme indicates that the route passing through the World Heritage Site would result in a large adverse impact. From WebTAG guidance a large adverse impact is one which:

- Has a major direct impact on nationally significant heritage assets such that they are lost or their integrity is severely damaged;
- Has a moderate direct impact on or compromises the wider setting of multiple nationally or regionally significant heritage assets, such that the cumulative impact would seriously compromise the integrity of a related group or historic landscape;

- Has a major direct impact on regional heritage assets, such that their integrity is lost and no adequate mitigation can be specified;
- Is highly intrusive and would seriously damage the setting of the heritage resource, such that its context is seriously compromised and can no longer be appreciated or understood;
- Is in serious conflict with government policy for the protection of the heritage, as set out in Planning Policy Guidance 15 and Planning Policy Guidance 16; and/or
- Is strongly at variance with the form, scale and pattern of a historic landscape/townscape.

However the impact of the Carlisle Northern Development route could be reduced to that of moderate adverse by appropriate mitigation.

Whilst both examples indicate that the proposed road schemes will likely result in an overall negative impact upon the historic environment it should be noted that heritage impacts form just part of the overall appraisal of transport scheme proposals. Within the environment objective, other sub-criteria assessed alongside heritage are noise, local air quality, greenhouse gas emissions, landscape, townscape, biodiversity, the water environment, physical fitness and journey ambience. Aside from the environment, four other objectives are also considered; safety (accidents and security), economy (transport efficiency, reliability and wider impacts), accessibility (severance and access to the transport system) and integration (transport interchange, land-use policy and other government policy). The decision as to whether a scheme should go ahead is based on the evaluation of all of these objectives[54]. For further information refer to WebTAG literature.

iii) Value Transfer

The above provides some examples of the impacts that road schemes may have on the historic environment. Value transfer and economic valuation techniques would enable impacts that are currently assessed in qualitative terms to be formally monetised and hence made commensurate with other aspects of transport schemes that are traditionally presented in monetary terms, such as time savings and reduced fatalities. However, the current body of heritage valuation literature does not appear to lend itself well to enabling value transfer to take place in order to monetise the impacts of transport schemes.

In Section 4, the literature review indicates that few studies consider heritage-related impacts from transport projects. The most prominent study is that by Maddison and Mourato (2001; 2002) which valued the impact of different road improvement options upon the landscape around the Stonehenge. Whilst impacts upon the setting in which heritage assets are appreciated is an important feature of transport schemes, as demonstrated by the two examples above, the uniqueness of Stonehenge and the associated valuation context implies that the study is unsuited to value transfer applications. Even in the case of impacts to Hadrian's Wall from the Carlisle Northern Development route, it is difficult to envisage any comparison with the Stonehenge study, even though both sites are internationally recognised and designated as World Heritage Sites.

The only other study relating to the historic environment which explicitly considers the transport sector, through road traffic generated air pollution, is Grosclaude and Soguel (1994). This study considers damages to historical buildings in Neuchâtel, Switzerland. To some extent this is similar to the A10 bypass example; a beneficial impact arises from reduced disturbance to Listed Buildings in the three villages from reduced traffic flow. However suitability of the study for consideration for value transfer purposes is reduced by a number of caveats as highlighted in Section 4.2. Aside from questioning the match between the Swiss and UK

[54] Notably the only aspects of the appraisal that are monetised are accident numbers and transport efficiency through travel times. Some sub-categories in the environmental objective are presented in quantitative terms (noise, local air quality, greenhouse gases, physical fitness) while the remainder are appraised qualitatively in a similar fashion to heritage through what is termed as the 'Environmental Capital Approach.'

context, the study's elicitation format (a bidding game) has a tendency to introduce starting point bias into respondents' valuations. Furthermore no information is provided on what maintenance works would entail in terms of aesthetic improvements to buildings or future rates of corrosion to materials. Other studies which also consider the effect or air pollution on historic buildings and monuments are: Morey et al. (2002), Navrud and Strand (2002), Pollicino and Maddison (2002) and Pollicino and Maddison (2004). The appropriateness of these studies in relation to transport schemes is likely to be limited principally due to the heritage assets considered (e.g. cathedrals) or study location (e.g. Norway and the USA in two instances) – See Section 4.2 and the Annex for further details.

Overall, the lack of valuation studies relevant to the impact of transport schemes on the historic environment would appear to be a significant gap. Transport schemes may lead to both positive and negative impacts on archaeology, historic buildings, monuments and also historic landscapes. However, the limited extent of valuation literature suggests that it will not typically be possible to extend the current qualitative assessment approach to appraisal trough the application of value transfer.

6. Recommendations and Conclusions

6.1 The scope for value transfer

Determining whether there is a potential role for using value transfer in the appraisal of heritage-related projects and programmes relies on the assessment of two fundamental issues. Firstly, whether value transfer is deemed to be a reliable approach to economic valuation, and secondly whether there is a sufficient body of economic valuation literature concerning the heritage sector. The two issues are closely linked so that value transfer can be a robust undertaking if an appropriate study, or group of studies, are available from which to source WTP estimates and supporting information.

This study has approached these issues by investigating:

- Conceptual limitations to value transfer applications in the heritage context;
- The scope for value transfer based on the current body of economic valuation literature; and
- Lessons from the practical application of value transfer in the case study examples.

The following discusses each of these points in turn.

Conceptual limitations to value transfer applications in the heritage context

Heritage assets tend to be heterogeneous displaying complex combinations of characteristics. The uniqueness of heritage assets arises not only from their physical characteristics but also from strong historical and cultural associations. On the other hand, the value transfer approach to economic valuation would appear to favour goods and resources which are by and large homogeneous. Hence there is an apparent tension between the suitability of value transfer for heritage assets and the ideal circumstances for value transfer applications. Given the heterogeneity of heritage assets it is likely that only original valuation studies could fully address questions of uniqueness and non-substitutability.

Conceptually valid value transfer also requires that a set of demanding criteria are satisfied. These relate not only to the characteristics of heritage assets but also to the quality of the original WTP study. It is unlikely that all criteria will be met simultaneously or perfectly. Central to all value transfer applications will be subjective assessment of the match between the study good valuation context and the policy good valuation context. Typically uncertainty surrounding the validity of the value transfer exercise will increase where the similarity between study good and policy good is tentative.

Even for study and policy goods that display very close similarities, there will always be some level of uncertainty attached to value transfer. Given that the degree of transfer error will likely remain unknown (unless an original valuation study is commissioned to test this), this uncertainty is inevitable. Therefore, an assessment is required to determine what an acceptable degree of uncertainty is for the purposes of appraisal. In practical terms at least, the key factor in this assessment would be the intended use of valuation results and the purpose of the appraisal. Greater certainty may be sought in some cases, depending on the magnitude of the project, programme or policy. Where a greater degree of certainty is required, there may be scope for an original valuation study rather than value transfer.

The scope for value transfer from the current body of valuation literature

The extent of the existing body of heritage valuation literature plays an important role in determining whether value transfer is a feasible input to a given heritage-related appraisal or evaluation exercise. Overall, a small number of studies focus on built heritage and the historic environment. With regards to the UK there exist just 11 studies, which focus on Durham Cathedral, Warkworth Castle, Grainger Town, Stonehenge, Lincoln Cathedral, St. Anne's Cathedral Square, historic buildings in Oxford and National Trust properties in England. Given this depth of literature it is fair to suggest that there is limited scope for value transfer in the case of UK-wide heritage assets. Consequently some use may be made of valuation studies carried out in other countries. However, it is likely that differences between historical and cultural associations will reduce the suitability of transfers between countries.

Moreover the restricted extent of literature implies that comparisons between studies are limited and that general findings are difficult to ascertain. Inability to identify general tendencies in the application of valuation techniques means it is not possible to provide conclusive insights to issues such as scope sensitivity, part-whole bias and other phenomena that may be exhibited in the preferences of individuals for heritage assets. Furthermore, the limited evidence base makes it difficult to generalise in relation to aspects of valuation such as use and non-use values. In turn, ambiguity in such instances casts further uncertainty over values derived through value transfer exercises.

Finally, whilst theory may promote a function transfer approach over the transfer of unadjusted or adjusted unit WTP values, in practice, the coverage of existing literature will more likely be the determining factor as to which approach can be applied. In some instances suitable WTP functions do not exist, thus transfer of unit values may be the only feasible approach.

Lessons from case study examples

The case study examples in Section 5 demonstrate that it is possible to undertake value transfer in relation to heritage-related actions. However, it is distinctly evident that this transfer is subject to varying degrees of success. Moreover in some instances the recommendation made is that value transfer is not feasible. Where value transfer has been undertaken mainly to demonstrate the approaches, a number of qualifying assumptions accompany the estimated economic values and these should indicate the extent to which uncertainty influences the derived results.

More specific points concerning the case studies include:

- The value transfer applications in each case are based on the findings of a single study. Generally it would be useful to have a number of studies that satisfy the selection criteria. This would enable analysis to be more comprehensive and would also allow for comparisons and further sensitivity analysis in order to test key assumptions.
- The case study examples are also subject to limitations in supporting data, which concern user and non-user populations. This information is also critical to the validity of value transfer estimates, particularly in relation to deriving aggregate values.
- In particular, heritage assets are likely to attract non-use values, yet without suitable indications of non-use value and the population for which this is relevant (and also the extent to which this value may decline with distance from the asset) it is difficult to account appropriately for such value within the case studies.
- In a number of cases it is only possible to undertake a partial assessment of non-market benefits. For instance, in the Kennet and Avon case study it was not possible to account for improvements in visit quality in relation to informal recreation, given the current coverage of valuation literature.

- Where it is not possible to undertake value transfer, some quantitative (if not monetary) assessment of benefit may still be possible in order to support more qualitative arguments. Typically, if collected, use can be made of survey data that assess visitor numbers as well as estimates of off- and on-site costs incurred by visitors (e.g. travel costs, entry fees, etc). Provided such analysis is set within the context of economic valuation, and its limitations are recognised and explicitly stated, appraisal of projects can benefit from such information.
- More generally, appraisal of heritage-related projects, programmes and policies could benefit from appealing to the concept of economic value, even if it is not possible to arrive at quantitative or monetised conclusions. Recognition of non-market benefits and particularly non-use value can aid qualitative arguments for supporting the historic environment. From this basis it is then possible to consider whether quantitative or monetised evidence is available. Hence it is typically a sequential process; first it is necessary to outline the qualitative, or conceptual, argument pertaining to the economic value of heritage assets, before moving to quantitative indicators of value and the potential for monetisation of benefits through value transfer. In some cases however, it may be desirable to extend the analysis further and commission a specifically designed valuation study.

6.2 Conclusion

Given the above summary points, the question to be answered is, **'what is the scope for using results of valuation studies in the appraisal and assessment of heritage-related projects and programmes?'**

Overall there would appear currently to be limited scope for value transfer applications in heritage-related appraisal and evaluation exercises. This is not to say that it is impossible to undertake value transfer, nor that it should not be recommended, but that the circumstances in which effective value transfer exercises are likely to be feasible would appear to be uncommon. Fundamentally, the current extent of heritage valuation literature is a significant constraining factor on the application of value transfer. This finding is expected: in the comparable field of environmental economics the application of value transfer is also subject to some degree of doubt, although the number of valuation studies that have been carried out is in the thousands.

Moreover, a trade-off must be faced between the perceived ideal circumstances for value transfer and increased doubt over accuracy of the derived WTP estimates. The extent to which this trade-off should be made will depend on the purpose of the valuation exercise and the magnitude of the action in question. Here it is noted that UK Government guidance suggests that appraisal should be proportional to the scale of the project (HM Treasury, 2003). This may provide some indication as to when value transfer can be a suitable input to the appraisal and assessment of heritage-related projects and programmes. It is also necessary to recognise that where value transfer exercises are undertaken, judgements concerning how suitable WTP information is for transfer will be fundamental to the perceived reliability and validity of the economic values estimated for the policy good context.

Where greater certainty concerning economic valuation is required for input to decision-making, original valuation work should be favoured over value transfer. In particular where actions are large in magnitude, involving significant financial outlay or significantly affecting heritage assets of national or international importance, and/or where issues of uniqueness or non-substitutability are relevant, then an original valuation study may be a more appropriate undertaking.

6.3 Recommendations

Where value transfer is applied in an appraisal and evaluation context, much emphasis should be placed on satisfying the criteria for identifying suitable WTP information from existing studies. In particular an explicit and transparent account should be made of the key assumptions involved in the analysis. Moreover, value transfer should be supported by other relevant information. Indeed the reliability of value transfer is not only affected by the transfer of WTP values and functions but also from information relating to affected population and their use of the heritage resource. In particular visitor surveys are important in determining the user population of a given resource since information about users could be used both in transferring unit economic values and identifying the affected population for aggregation of values. In the absence of suitable studies for value transfer, information concerning visitor numbers, entry fees and other on-site costs can be useful proxies for the minimum benefit derived from the use of a resource. Even couching qualitative arguments in the terms of economic value, by consideration of these and other factors (such as determining the relevant non-user population), can make appraisal of intended actions more formal and can provide further support for expenditure on heritage-related projects.

With the finding that the existing body of heritage valuation literature is somewhat limited in terms of coverage and applicability to heritage assets found in the UK, it is useful to consider future actions that would benefit future applications of value transfer. While it is desirable to outline a list of recommendations for future work, it should not be forgotten that public bodies tasked with the stewardship of the historical environment are subject to budget constraints.

- **Development of a database of valuation studies relating to the heritage sector.** The Annex to this report provides a basis for such an exercise in relation to the historic environment, which could be augmented by newer studies as they become available. Maintaining a database of studies should not prove to be too arduous a task and would require only periodic action. Given the current size of the literature and its current rate of growth this task could feasibly be managed by this study's steering group partners.

- **Increased collection and availability of data relating to the populations of interest to aid future appraisal and evaluation exercises.** As with any decision-making support, not just pertaining to economic valuation, more detailed information concerning users and non-users of a heritage asset is an important input into analysis. For example, in relation to users of a heritage asset, accurate estimates of visitor numbers, frequency of visits, as well as an understanding of the relevant spatial extent of the user population is vital. An understanding of the scale (local, regional, national or international) on which the asset is relevant is also an important aspect of assessing the non-use value of heritage. The availability of such information is a significant aid to value transfer exercises and can act to reduce uncertainty associated with its application. This task would require coordination among different bodies responsible for the management of the heritage environment.

- **Future valuation work targeted at existing gaps.** Given the apparent lack of coverage of the existing literature, primary research pertaining to the impacts upon heritage from transport schemes may be appropriate, as well as relating to preferences for more recent heritage (e.g. industrial heritage). In addition, an assessment of expenditure on the historic environment by public bodies may also inform where further economic valuation work could be targeted. In particular if significant funds are to be allocated, then some check on the benefits derived is an appropriate undertaking. This area of work could be carried out by private sector consultants and academics and could potentially be funded by heritage sector organisations (including the Steering Group) and the research councils.

- **Beyond the immediate gaps in literature, there is also need for longer term research aimed at increasing the number of high quality original valuation studies considering**

heritage assets. In carrying forward this recommendation there may be a case to seek the support of research councils. Some suggested areas for future work for the heritage sector organisations and research councils to consider are:

- Investigation of the transferability of economic values across similar heritage assets and populations. These would be an extension of the work of Brown (2004) which dealt solely with transferability across populations (and not sites). This could be done for a variety of heritage assets (cathedrals, monuments, historical buildings, historical towns, historical landscapes, museums, etc). In conjunction with this, or separately, there may also be scope to consider the potential for meta-analysis of economic values of heritage assets, which could improve the potential for function transfer within appraisal. This could be undertaken on the basis of the existing body of literature, although without further investigation it is unclear as to whether the existing valuation studies provide sufficient information for a robust meta-analysis to be undertaken.
- Investigation of how prior knowledge of art, culture and history (general and specific) affects people's valuation of heritage and cultural assets. This could be done for a variety of heritage assets (e.g. monuments, historic houses, historical landscapes, etc);
- Examination of how information provision on site (e.g. through visitor centres) affects: (i) the quality and enjoyment of visitors experiences in heritage sites; and (ii) people's valuation of heritage assets;
- Investigation of how income affects heritage and more broadly cultural values. This could be a cross-section study looking at different socio-economic groups in one country; or looking across countries with different levels of wealth and similar heritage assets;
- Investigation of how qualitative assessments (e.g. verbal descriptions) of heritage and cultural values relate to: (i) quantitative assessments of heritage and cultural values as elicited via attitudinal scales (e.g. scores and ratings); and (ii) monetary expressions of heritage and cultural values (e.g. willingness to pay measures);
- Investigation of how the payment mechanism (entry fees, general taxes, local taxes, donations) affect the value people assign to heritage assets; and
- Examination of how visitor congestion in heritage sites relates to the carrying capacity of the site. The carrying capacity of a location describes a threshold of sustainable usage, which if exceeded, results in undesirable degradation of the resource; while visitor congestion can be defined as the deterioration in the perceived quality of a visit experienced by those using a site when the number of visitors increases beyond a certain level. Congestion is not necessarily linked with exceeding available carrying capacity, although in many cases they will occur at the same time. The study could examine how the two concepts relate in a variety of heritage assets.

Finally, an objective of any future original valuation study (whether carried out for public bodies responsible for the management of heritage or for research councils) should be to provide adequate information concerning WTP that can be used in value transfer or meta-analysis exercises. Bateman et al. (2002) note that this may require the introduction of a practice whereby researchers estimate a specific value transfer model that is limited to a number of influencing factors for which information can be easily obtained for the new decision-making context, i.e. basic socio-economic data, plus where a spatial element is important, variables such as distance from asset.

7. References

Ackerman, F. and Heinzerling, L. (2004) *Priceless: On Knowing the Price of Everything and the Value of Nothing,* New York: The New Press.

Adamowicz, W. L., Garrod, G.D. and Willis, K.G. (1995) '*Estimating the Passive Use Benefits of Britain's Inland Waterways'*, Centre for Rural Economy Research Report, University of Newcastle upon Tyne, Newcastle.

Alberini, A., Riganti, P. and Longo, A. (2003) 'Can People Value the Aesthetic and Use Services of Urban Sites? Evidence from a Survey of Belfast Residents', *Journal of Cultural Economics*, Volume 27, Number 3-4, 193 – 213.

Alberini, A., Rosato, P., Longo, A. and Zanatta, V. (2004) 'Information and Willingness to Pay in a Contingent Valuation Study: The Value of the S. Erasmo in the Lagoon of Venice', *FEEM Working Paper Series*, 19.2004.

Allison, G., Ball, S., Cheshire, P., Evans, A. and Stabler, M. (1996) *'The Value of Conservation? A Literature Review of the Economic and Social Value of the Cultural Built Heritage'*, report to the Department of National Heritage, English Heritage and the Royal Institution of Chartered Surveyors.

Barton, D.N. (2002) 'The Transferability of Benefit Transfer: Contingent Valuation of Water Quality Improvements in Costa Rica', *Ecological Economics*, 42: 147-164.

Bateman, I., Carson, R.T. Day, B. Hanemann, M. Hanley, N. Hett, T. Jones-Lee, M. Loomes, G. Mourato, S. Ozdemiroglu, E. Pearce, D.W. Sugden, R. and Swanson, J. (2002) *Economic Valuation with Stated Preference Techniques: A Manual,* Edward Elgar, Cheltenham, UK.

Bateman, I.J., Jones, A.P., Nishikawa, N. and Brouwer, R. (2000) 'Benefits Transfer in Theory and Practice: A Review and Some New Studies', CSERGE and School of Environmental Sciences, University of East Anglia. Available from http://www.uea.ac.uk/~e089/

Beltrán, E. and Rojas, M. (1996) 'Diversified Funding Methods in Mexican Archaeology', *Annals of Tourism Research*, 23 (2): 463-478.

Bedate, A., Herrero, L.C. and Sanz, J.C. (2004) 'Economic valuation of the cultural heritage: application to four case studies in Spain', *Journal of Cultural Heritage*, Volume 5, Number 1, 101-111.

Bergland, O., Magnussen, K. and Navrud, S. (1995) 'Benefit Transfer: Testing for Accuracy and Reliability,' Chapter 7 in: Florax, R.J.G.M., Nijkamp, P. and Willis, K.G. (eds.) (2002) *Comparative Environmental Economic Assessment,* Edward Elgar, Cheltenham, UK.

Bishop, R.C and Romano, D. (eds.) (1998) *Environmental Resource Valuation: Applications of the Contingent Valuation Method in Italy*, Kluwer Academic Publishers, Boston.

Boyle, K.J. and Bergstrom, J.C. (1992) 'Benefit Transfer Studies: Myths, Pragmatism, and Idealism.' *Water Resources Research*, Vol. 28, No. 3: 657-663.

Boxall, P.C., Englin, J. and Adamowicz, W.L. (2002) 'The contribution of aboriginal rock paintings to wilderness recreation values in North America', in Navrud, S. and Ready, R. (eds)

(2002) *Valuing Cultural Heritage: Applying Environmental Valuation Techniques to Historic Buildings, Monuments and Artefacts*, Edward Elgar, Cheltenham, UK.

Boxall, P.C., Englin, J. and Adamowicz, W.L. (2003) 'Valuing aboriginal artifacts: A combined revealed-stated preference approach', *Journal of Environmental Economics and Management*, 45(2): 213-230.

Boyle, K.J., Desvousages, W.H., Johnson, F.R., Dunford, R.W. and Hudson, S.P. (1994) 'An investigation of part-whole biases in contingent valuation studies', *Journal of Environmental Economics and Management*, 27(1): 64-83.

Breffle, W.S., Morey, E.R. and Lodder, T.S. (1998) 'Using contingent valuation to estimate a neighborhood's willingness to pay to preserve undeveloped land', *Urban Studies*, 35 (4), 715-727.

Brown, J. (2004), 'Economic Values and Cultural Heritage Conservation: Assessing the Use of Stated Preference Techniques for Measuring Changes in Visitor Welfare', Ph.D Thesis, Imperial College London.

Brown, J. and Mourato, S. (2002) 'Measuring the Cost of Congestion in Historic Properties: A Stated Preference Approach,' Paper presented at the 2nd World Congress of Environmental and Resource Economists, Monterey, June 24-27th.

Brown, T. and Gregory, R. (1999) 'Why the WTA-WTP disparity matters', *Ecological Economics*, 28, 323-335.

Brouwer, R. (2000) 'The Validity and Reliability of Environmental Benefits Transfer', Ph.D Thesis, University of East Anglia.

Brouwer, R. and Bateman, I.J. (2003) 'How Much Contextual Control is Needed to Make Benefits Transfer a Reliable Alternative Valuation Method? Assessing the Validity and Reliability of Benefits Transfer in a Stepwise Testing Procedure,' mimeo, CSERGE, University of East Anglia.

Brouwer, R., Langford, I.H., Bateman, I.J. and Turner, R.K. (1999) 'A meta-analysis of wetland contingent valuation studies', *Regional Environmental Change*, 1(1), 47-57.

Brouwer, R. and Spaininks, F.A. (1999) 'The Validity of Environmental Benefits Transfer: Further Empirical Testing', *Environmental and Resource Economics*, 14: 95-117.

Carson, R.T., Mitchell, R.C., Conaway, M.B. and Navrud, S. (1997) *'Non-Moroccan Values for Rehabilitating the FES Medina*', Report to the World Bank on the FES Cultural Heritage Rehabilitation Project, August 1997.

Carson, R.T., Mitchell, R.C. and Conaway, M.B. (2002) 'Economic Benefits to Foreigners Visiting Morocco Accruing from Rehabilitating the Fes Medina', in Navrud, S. and Ready, R. (eds) (2002) *Valuing Cultural Heritage: Applying Environmental Valuation Techniques to Historic Buildings, Monuments and Artefacts*, Edward Elgar, Cheltenham, UK.

Chilton, S., Covey, J., Jones-Lee, M., Loomes, G. and Metcalf, H. (2004) *Valuation of Health Benefits Associated with Reductions in Air Pollution*: Final Report. London: Defra.

Creigh-Tyte, S.W. and Thomas, B. (2000) 'Valuing the Historic Environment: Some British Experience', Association for Cultural Economists International, 11th International Biennial Conference May 28-31, 2000.

Cuccia, T. and Signorello, G. (2002) "A Contingent Valuation Study of Willingness to pay for Heritage Visits: Case Study of Noto." in Rizzo, I. and Towse, R (eds) (2002) *The Economics of Heritage: A Study in the Political Economy of Culture in Sicily*, Edward Elgar, Cheltenham, UK.

Del Saz Salazar, S. and Marques, J. (2005) 'Valuing cultural heritage: the social benefits of restoring and old Arab tower', *Journal of Cultural Heritage*, Volume 6, Issue 1, 69 - 77.

Desvousges, W.H., Naughton, M.C. and Parsons, G.R. (1992) 'Benefit Transfer: Conceptual Problems in Estimating Water Quality Benefits Using Existing Studies', *Water Resources Research*, Vol. 28, No. 3: 675-683.

DCMS (2004) *The White Book: DCMS Guidance on Appraisal and Evaluation of Projects, programmes and Policies*, Technical Paper No. 10, Economics Branch, Department for Culture, Media and Sport.

DCMS (2005) 'Better Places to Live: Government, Identity and the Value of the Historic and Built Environment. An Essay on the Historic and Built Environment', Department for Culture, Media and Sport, March 2005, London.

DfT (2003) The Heritage of Historic Resources Sub-Objective, TAG Unit 3.3.9, Department for Transport, Transport Analysis Guidance (TAG).

DfT WebTAG: http://www.webtag.org.uk/

DfT (2004) '2003 Valuation of the Benefits of Prevention of Road Accidents and Casualties', *Highways Economics Note No. 1*, December 2004.

Downing, M. and Ozuna, T. (1996) 'Testing the Reliability of the Benefit Function Transfer Approach', *Journal of Environmental Economics and Management*, 30: 316-322.

eftec (1999a) *The Economic and Financial Sustainability of the Management of the Historic Sanctuary of Machu Picchu*, report to Finnish Forest and Park Service, London.

eftec (1999b) *Valuing Our Recorded Heritage*, Final Report to Re:source, London.

eftec (2004) 'The health benefits of pollution control: a review of the literature on mortality and morbidity effects', paper prepared for UK Department for Environment Food and Rural Affairs workshop on valuation of health benefits of reductions in air pollution and use of values in UK appraisal, June 2004.

eftec and Entec (2002) *Valuing the External Benefits of Undeveloped Land: A Review of the Economic Literature*, report to the Office of the Deputy Prime Minister, London.

English Heritage (2003) *Heritage Counts 2003: The State of England's Historic Environment*, report by the Historic Environment Review Committee, published by English Heritage, London.

English Heritage (2004) *Heritage Counts 2004: The State of England's Historic Environment*, report by the Historic Environment Review Committee, published by English Heritage, London.

English Heritage (2005) *Regeneration and the Historic Environment: Heritage as a Catalyst for better Social and Economic Regeneration*, published by English Heritage, January 2005.

Environment Agency (2003) *Guidance: Assessment of Benefits for Water Quality and Water Resources Schemes in the PR04 Environment Programme*.

Garrod, G.D. and Willis, K.G. (1992) 'Valuing Goods' Characteristics: An Application of the Hedonic Price Method to Environmental Attributes', *Journal of Environmental Management*, 34(1), 59-76.

Garrod, G.D. and Willis, K.G. (1994) 'An Economic Estimate of the Effect of a Waterside Location on Property Values', *Environmental and Resource Economics*, 4, 209-217.

Garrod, G.D. and Willis, K.G. (1995) 'Valuing the benefits of the South Downs Environmentally Sensitive Area', *Journal of Agricultural Economics*, 46(2): 160-173.

Garrod, G.D and Willis, K.G. (1996), 'Estimating the Benefits of Environmental Enhancement: A Case Study of the River Darent', *Journal of Environmental Planning and Management*, 39: 189-203.

Garrod, G.D. and Willis, K.G. (1998) 'Using Contingent Ranking to Estimate the Loss of Amenity Value for Inland Waterways from Public Utility Structures', *Environmental and Resource Economics*, 12, 241-247.

Garrod, G.D., Willis, K.G., Bjarnadottir, H. and Cockbain, P. (1996) 'The Nonpriced Benefits of Renovating Historic Buildings - A Case Study of Newcastle Grainger Town', *Cities* 13(6), 423-430.

Grosclaude, P. and Soguel, N.C. (1994) 'Valuing Damage to Historic Buildings Using a Contingent Market: A Case Study of Road Traffic Externalities', *Journal of Environmental Planning and Management*, Vol. 37, No. 3, 279-287.

Halstead, J.M., Lindsay, B.E. and Brown, C.M. (1991) 'Use of the Tobit Model in Contingent Valuation: Experimental Evidence from the Pemigewasset Wilderness Area', *Journal of Environmental Management*, 33: 79-89.

Hanemann, W.M. (1991) 'Willingness to pay and willingness to accept: how much can they differ?' *American Economic Review*, 81, 635-647.

Hanemann, W.M (1994) 'Valuing the environment through contingent valuation', *Journal of Economic Perspectives*, 8(4): 19-43.

Hanley, N.D. (1989) 'Valuing Rural Recreation Benefits: An Empirical Comparison of Two Approaches', *Journal of Agricultural Economics*, 40(3): 361-374.

Hanley, N. and Knight, J. (1992) 'Valuing the environment: recent UK experience and application to greenbelt land', *Journal of Environmental Planning and Management*, 35 (2), 145-160.

Hanley, N., Macmillan, D., Wright, R.E., Bullock, C., Simpson, I. Parisson, D. and Crabtree, J.R. (1998) 'Contigent valuation versus choice experiments: estimating the beneftis of environmentally sensitive areas in Scotland', *Journal of Agricultural Economics*, 49(1); 1-15.

Hidano, N. (2002) *The Economic Valuation of the Environment and Public Policy: a Hedonic Approach*, Edward Elgar, Cheltenham, UK.

Highways Agency (2005) *Design Manual for Roads and Bridges: Volume 11 Environmental Assessment*, May 2005. See:
http://www.archive2.official-documents.co.uk/document/deps/ha/dmrb/

HM Treasury (2003) *The Green Book, Appraisal and Evaluation in Central Government*, Treasury Guidance, TSO, London.

Just, R., Hueth, D and Schmitz, A. (2004) *The Welfare Economics of Public Policy: A Practical Approach to Project and Policy Evaluation*. Edward Elgar, Cheltenham, UK.

Kirchoff, S., Colby. B.G. and LaFrance, J.T. (1997) 'Evaluating the Performance of Benefit Transfer: An Empirical Inquiry', *Journal of Environmental Economics and Management*, 33: 75-93.

Knetsch, J. (1995) 'Asymmetric valuation of gains and losses and preference order assumptions', *Economic Inquiry*, 33, 134-141.

Kristofersson, D. and Navrud, S. (2005) 'Validity Tests of Benefit Transfer – Are We Performing the Wrong Tests?' *Environmental and Resource Economics*, Vol. 30, No. 3, 279-286.

Lockwood, M. and Tracy, K. (1995) 'Nonmarket economic evaluation of an urban recreation park', *Journal of Leisure Research*, 27 (2), 155-167.

Loomis, J.B. (1992) 'The Evolution of a More Rigorous Approach to Benefit Transfer: Benefit Function Transfer', *Water Resources Research*, Vol. 28, No. 3: 701-705.

Loomis, J.B., Roach, B., Ward, F. and Ready, R.C. (1995) 'Testing Transferability of Recreation Demand Models Across Regions: A Study of Corps of Engineer Reservoirs', *Water Resources Research*, Vol. 31, No. 3, 721-730.

Macmillan, D. (2002) *The value of managing forests to protect archaeology*, report to Forestry Commission, Centre for Research in Environmental Appraisal and Management, University of Newcastle, March 2002.

Maddala, G.S. (1983) *Limited-Dependent and Qualitative Variables in Econometrics*, Cambridge University Press, UK.

Maddison, D., and Mourato, S. (2001) 'Valuing different road options for Stonehenge', *Conservation and Management of Archaeological Sites*, 4(4): 203-212.

Maddison, D. and Mourato, S. (2002) 'Valuing Different Road Options for Stonehenge', in Navrud, S. and Ready, R. (eds) (2002) *Valuing Cultural Heritage: Applying Environmental Valuation Techniques to Historic Buildings, Monuments and Artefacts*, Edward Elgar, Cheltenham, UK.

Maeer, G. and Millar, G. (2004) 'Evaluation of UK waterway regeneration and restoration projects', *Municipal Engineer*, Vol. 157, Issue 2, 01/06/2004.

Markandya, A., Hunt, A., Ortiz, R and Alberini, A. (2004) *EC NewExt Research Project: Mortality Risk Valuation – Final Report – UK,* European Commission, Brussels.

Moran, D. and McMahon, P. (2000) 'The Water Industry in England and Wales: Regulating for Sustainable Development', Chapter 1 in McMahon, P. and Moran, D. (2000) *Economic Valuation of Water Resources: Policy and Practice*, The Chartered Institute of Water and Management, London.

Morey, E., K. Rossmann, L. Chestnut and S. Ragland (1997) *Valuing Acid Deposition Injuries to Cultural Resources*, Report for the National Acid Precipitation Assessment Program.

Morey, E., Rossmann, K. Chestnut, L. and Ragland, S. (2002) 'Valuing Acid Deposition Injuries to Cultural Resources: Marble Monuments in Washington D.C.', in Navrud, S. and Ready, R. (eds) (2002) *Valuing Cultural Heritage: Applying Environmental Valuation Techniques to Historic Buildings, Monuments and Artefacts*, Edward Elgar, Cheltenham, UK.

Morey, E. and Greer Rossmann, K. (2003) 'Using Stated-Preference Questions to Investigate Variations in Willingness to Pay for Preserving Marble Monuments: Classic Heterogeneity, Random Parameters, and Mixture Models', *Journal of Cultural Economics*, Volume 27, Number 3-4, 215 – 229.

Mourato, S., Kontoleon, A. and Danchev, A. (2002) 'Preserving Cultural Heritage in Transition Economies: A Contingent Valuation Study of Bulgarian Monasteries', in Navrud, S. and Ready, R. (eds) (2002) *Valuing Cultural Heritage: Applying Environmental Valuation Techniques to Historic Buildings, Monuments and Artefacts*, Edward Elgar, Cheltenham, UK.

Mourato, S., Pearce, D.W., Ozdemiroglu, E. and Howarth, A.L. (2001) 'Beyond dusty archives: the economic benefits of preserving recorded heritage', *Cultural Trends*, Issue 39, 87-116.

Mourato, S., Ozdemiroglu, E., Hett, T. and Atkinson, G. (2004) 'Pricing Cultural Heritage: A New Approach to Managing Ancient Resources', *World Economics*, Volume 5, Number, 3, 95-113.

Navrud, S. and Ready, R. (eds) (2002*) Valuing Cultural Heritage: Applying Environmental Valuation Techniques to Historic Buildings, Monuments and Artefacts*, Edward Elgar, Cheltenham, UK.

Navrud, S. and Strand, J. (2002) 'Social Costs and Benefits of Preserving and Restoring the Nidaros Cathedral', in Navrud, S. and Ready, R. (eds) (2002) *Valuing Cultural Heritage: Applying Environmental Valuation Techniques to Historic Buildings, Monuments and Artefacts*, Edward Elgar, Cheltenham, UK.

Noonan, D.S. (2002) 'Contingent Valuation Studies in the Arts and Culture: An Annotated Bibliography', *Cultural Policy Centre (University of Chicago) Working Paper No. 11*.

Noonan, D.S. (2003) 'Contingent Valuation and Cultural Resources: A Meta-Analytic Review of the Literature', *Journal of Cultural Economics,* Volume 27, Number 3-4, 159 – 176.

Pagiola, S (2001) 'Valuing the Benefits of Investments in Cultural Heritage: The Historic Core of Split', Paper presented at the International Conference on Economic Valuation of Cultural Heritage, Cagliari, October 19-20, 2001.

Parsons, G.R. and Kelly, M.J. (1994) 'Benefits Transfer in a Random Utility Model of Recreation', *Water Resources Research*, Vol. 30, No. 8, 2477-2484.

Pearce, D.W. (2002) *The Role of 'Property Rights' in Determining Economic Values for Environmental Costs and Benefits*. Bristol: Environment Agency.

Pearce, D.W. and Mourato, S. (1998) *The Economics of Cultural Heritage, World Bank Support to Cultural Heritage Preservation in the MNA Region*, Centre for Social and Economic Research on the Global Environment (CSERGE), University College London, October 1998.

Pearce, D., Atkinson, G. and Mourato, S. (2005) *Cost Benefit Analysis and the Environment: Recent Developments,* OECD, Paris (in press)

Pearce, D.W., Maddison, D. and Pollicino, M. (2001) 'Economics and Cultural Heritage', Paper presented at Conference on the Economic Valuation of Cultural Heritage, University College London, February 2001.

Pearce, D.W., Mourato, S., Navrud, S. and Ready, R. (2002) 'Review of existing studies, their policy use and future research needs', in Navrud, S. and Ready, R. (eds) (2002) *Valuing Cultural Heritage: Applying Environmental Valuation Techniques to Historic Buildings, Monuments and Artefacts*, Edward Elgar, Cheltenham, UK.

Pearce, D.W., Whittington, D. and Georgiou, S. (1994) '*Project and Policy Appraisal: Integrating Economics and Environment',* OECD, Paris.

Pollicino, M. (2002) "An In-Depth Investigation of Preferences Towards Cultural Heritage: The Contingent Valuation Method to Value the Damage from Air Pollution on Oxford Historic Buildings", Paper presented at the 12th Biennial ACEI Conference June 13-15, 2002, Rotterdam, The Netherlands.

Pollicino, M and Maddison D (2001) 'Valuing the Benefits of Cleaning Lincoln Cathedral', *Journal of Cultural Economics*, Volume 25, Number 2, 131–148.

Pollicino, M. and Maddison, D. (2002) 'Valuing the impacts of air pollution on Lincoln Cathedral,' in Navrud, S. and Ready, R. (eds) (2002) *Valuing Cultural Heritage: Applying Environmental Valuation Techniques to Historic Buildings, Monuments and Artefacts*, Edward Elgar, Cheltenham, UK.

Pollicino, M. and Maddison, D. (2004), 'Using Contingent Valuation to Value Maintenance Options for Oxford's Historic Buildings', unpublished paper, Institute of Archaeology, University College London and Institute of Economics, University of Southern Denmark.

Poor, P.J. and Smith, J.M. (2004) 'Travel Cost of a Cultural Heritage Site: the case of historic St Mary's City of Maryland,' *Journal of Cultural Economics*, Vol. 28 No. 3 pp 217-229.

Powe, N. and Willis, K. (1996) "Benefits Received by Visitors to Heritage Sites: A Case Study of Warkworth Castle", *Leisure Studies* 15, 259-275.

Ready, R., Navrud, S., Day, B., Dubourg, R., Machado, F., Mourato, S., Spanninks, F. and Vazquez Rodriquez, M. (2004) 'Benefit transfer in Europe: How reliable are transfers between countries?' *Environmental and Resource Economics*, Vol. 21, No. 1, 67-82.

Riganti, P. and Scarpa, R. (1998) 'Categorical Nesting and Information Effects on WTP Estimates for the Conservation of Cultural Heritage in Campi Flegrei', in Bishop, R.C and Romano, D. (eds.) (1998) *Environmental Resource Valuation: Applications of the Contingent Valuation Method in Italy*, Kluwer Academic Publishers, Boston.

Sagoff, M. (1988) *The Economy of the Earth*. Cambridge: Cambridge University Press.

Sagoff, M. (2004) *Price, Principle and the Environment*. Cambridge: Cambridge University Press.

Santagata W and Signorello G. (2000) 'Contingent valuation of a cultural public good and policy design: the case of Napoli Musei Aperti', *Journal of Cultural Economics*, Volume 24, Number 3, 181-204.

Santagata W and Signorello G. (2002) 'Individual preferences and allocation mechanisms for a Cultural Public Good: Napoli Musei Aperti', in Navrud, S. and Ready, R. (eds) (2002) *Valuing*

Cultural Heritage: Applying Environmental Valuation Techniques to Historic Buildings, Monuments and Artefacts, Edward Elgar, Cheltenham, UK.

Scarpa, R., Sirchia, G. and Bravi, M. (1997) "Kernel vs. Logit Modeling of Single Bounded CV Responses: Valuing Access to Architectural and Visual Arts Heritage in Italy", In Bishop, R. and Romano, D. (eds) (1998) *Environmental Resource Valuation: Applications of the Contingent Valuation Method in Italy,* Kluwer Academic Publishers, Boston.

Shogren, J., Shin, S., Hayes, D. and Kliebenstein, J. (1994) ,Resolving differences in willingness to pay and willingness to accept', *American Economic Review*, 84, 255-270.

Taylor, L. (2003) The hedonic method. In P.Champ, K.Boyle and T Brown (eds). *A Primer in Non-market Valuation*. Dordrecht: Kluwer. 331-394.

Thaler, R. (1980) 'Toward a positive theory of consumer choice', *Journal of Economic Behaviour and Organization*, 1, 39-60.

Thomas, H.A. (1963) 'The animal farm: a mathematical model for the discussion of social standards for control of the environment', *Quarterly Journal of Economics,* 77, 143-148.

Throsby, D. (2001) *Economics and Culture*, Cambridge University Press, UK.

Tversky, A. and Kahneman, D. (1991) 'Loss aversion in riskless choice: a reference-dependent model', *Quarterly Journal of Economics*, 106, 1039-1061.

Ward, F and Beal, D. (2000). *Valuing Nature with Travel Cost Models: a Manual*. Edward Elgar, Cheltenham, UK.

UKWIR (2004) *Environmental Benefit Assessment*, report by UK Water Industry Research, 04/EQ/01/1.

Whitehead, J.C. and Finney, S.S. (2003) 'Willingness to Pay for Submerged Maritime Cultural Resources', *Journal of Cultural Economics,* Volume 27, Number 3-4, 231 – 240.

Willig, R. (1976) Consumers' surplus without apology. *American Economic Review.* 66 (4): 589-597.

Willis, K.G. (1994) 'Paying for Heritage: What Price for Durham Cathedral?' *Journal of Environmental Planning and Management,* Vol. 37, No. 3.

Willis, K.G. (2002) 'Iterative Bid Design in Contingent Valuation and the Estimation of the Revenue Maximising Price for a Cultural Good', *Journal of Cultural Economics*, Volume 26, Issue 4, 307 – 324.

Willis K.G. and Garrod, G.D. (1990) 'The Individual Travel Cost Method and the Value of Recreation: The Case of the Montgomery and Lancaster Canal', *Environment and Planning C: Government and Policy*, 8, 315-326.

Willis, K. G. and Garrod, G.D. (1991) 'Valuing Open Access Recreation on Inland Waterways: On-site Recreation Surveys and Selection Effect', *Regional Studies*, 25(6), 511-524.

If you would like this document in a different format, please contact our Customer Services department:
Telephone: 0870 333 1181
Fax: 01793 414926
Textphone: 01793 414878
E-mail: customers@english-heritage.org.uk