GREEN PILGRIMAGE: A REPORT ON METHODOLOGIES TO MEASURE THE ECONOMIC, SOCIAL AND ENVIRONMENTAL IMPACT OF PILGRIMAGE

Produced by: Matthew Agarwala, Rosalind Bark, Amy Bowen, Tomas Badura, Silvia Ferrini, Matthew Hayward, John Jones, Imogen Shapland, Niki Taigel, Kerry Turner, Charlotte Watts

December 2019

Green Pilgrimage
Interreg Europe

University of East Anglia
CSERGE

European Union
European Regional Development Fund

Contents

Acronyms

CSERGE - The Centre for Social and Economic Research on the Global Environment

BCR – Benefit Cost Ratio

DMO – Destination Management Organisation (tourism)

NCC - Norfolk County Council

ROI – Return on Investment

UEA – University of East Anglia

1. Executive summary

This report is produced as part of the Interreg Green Pilgrimage project involving partners from Norway, Sweden, Italy, Romania, as well as partners in the UK – Kent County Council, the Diocese of Canterbury and Norfolk County Council Environment Team (NCC). The project is concerned with the potential of pilgrimage as a growing form of low impact tourism to protect natural and cultural assets.

The report is a key project contribution from the NCC Environment Team, who have a strong track record of collecting data to demonstrate value, and has been undertaken in collaboration with their academic partners at the University of East Anglia (UEA) drawing on their expertise in environmental economics.

Purpose of review and report

The purpose of the work undertaken by NCC and the UEA is to find a common methodology to value a pilgrimage route examining the economic, social and environmental value and impact of pilgrimage. This report is a culmination of work undertaken over the last three years to meet this objective.

As work has progressed NCC has had to reconsider the premise that a single methodology can capture all value in this complex area and instead consider how to manage a suite of methodologies. Consulting with partners throughout this period has also brought into focus the real issues they face in undertaking valuation, and therefore the need to present any recommendations in an accessible format.

The aims of this report are therefore to:

- simplify this complex area
- to demonstrate through example what data to collect and how it can be used
- to show the value of collecting and using data
- guide anyone considering doing this through a process to incrementally increase their use of data.

Approach, Work undertaken

Work undertaken involved:

- understanding the level of knowledge and current data collection in this area
- understanding the pilgrim context and drawing up a framework to understand the elements of value to be captured
- reviewing literature on existing relevant research studies
- reviewing methodologies and making recommendations on relevance and usability of approaches
- pilot testing methodologies

What are we valuing

Capturing financial spend of pilgrims whilst on a route or at a destination is relatively straightforward and can provide some indicative value for a pilgrim visit. Where money is exchanged for a product, service or experience we can attribute a clear ‘market value’ – where people choose to spend their money is indicative of what they value. Actual spend also provides tangible figures of the financial benefit of visitors to the economy.

In the case however of accessing natural and cultural assets (with the exception of entrance fees e.g. to heritage sites) there is no fee or 'price' therefore it is more complex to attribute the value that people place on this experience based on their choice. Furthermore much of the whole value that a pilgrim might gain from a visit, for example health and wellbeing benefits, takes place 'outside of the market'.

The review of methods therefore considers primarily non-market valuation methods – how to value something that does not have a market price.

Recommended valuation methods

Valuing a pilgrimage route involves a number of components. Existing research on methods to value these is aligned into two key areas:

1. valuing the use of a path by recreational visitors (e.g. walking/cycling)
2. the added value of pilgrimage activity (e.g. wellbeing)

Initial valuation methods considered were drawn from an increasing number of studies that seek to place value on path for walking and cycling. These studies provide some useful values that can provide estimated figures through the 'benefit transfer' method and tools such as ORVal which utilises MENE survey, i.e. it relies on established large datasets of daily visit to natural sites. However this existing work valuing green infrastructure is not comprehensive, i.e. it does not capture the complete unique value of pilgrimage routes. Given lack of research in this area, primary data collection was therefore deemed necessary.

Key research questions were established – we sought to know:

1. What is the profile of pilgrims (distinct to visitors), what do they spend money on, what activities and values do they hold
2. what value do pilgrims (distinct to visitors) place on their experience
3. what health and social benefits does pilgrimage bring
4. what value would extensions to a pilgrimage route have
5. what value would other types of improvements bring.

Primary data collection (i.e. a survey) integrates the following methods:

- travel cost method as a way to estimate the value of #2 – this methods calculates the distance travelled and uses other characteristics about the person to estimate the value of their visit.
- wellbeing ONS4 standard questions compare a respondent answers to a national dataset to provide a value for #3
- contingent valuation method as a way to estimate the value of #4 – hypothetical questions ask participants to state their willingness to pay for changes

Although visitor spend can be captured, and using tools (such as MENE) estimated, this is financial rather than economic value. The input/output method is one of the recommended methods to calculate the wider indirect economic benefits of pilgrimage to the local and regional economy. However, this method requires a body, typically national governments, to update input-output tables on a regular basis (in the UK it is updated every 5 years) and to be useful at the sub-national scale regional input-output tables are needed. Given the considerable resource and technical expertise required input-output analysis is therefore outside the scope of this study.

A literature review was also undertaken to review sustainability indicators that could be used to assess pilgrim routes and sites; this included a review of the Green Pilgrimage Network

Handbook for Faith leaders, cities, towns and pilgrims. Reviewing the handbook revealed a large range of indicators that could be organised into 3 broad categories. Recommendations are made for partners to select the areas that are most relevant to their particular context.

Testing

A survey was developed using the recommended methodologies through an iterative process. This design process is comprehensively explored in section 7.4.3.

Pre-analysis has been carried out on 24 pilot responses and results produced in section 8.1 to illustrate the types of policy statements that can be produced using the methodology. Detailed calculations and technical notes are provided in the appendices (see appendix 5), and guidance on planning a research study is given in section 9.

Further research and next steps

This report represents findings from work undertaken on valuing a pilgrim route in Phase 1 of the Green Pilgrimage Project (2017-2019).

In Phase 2 of the Green Pilgrimage project (2020-2021), NCC plan to complete data collection with the minimum number of recommended responses to provide publishable results. The aim is to work with other projects to test the methodology, build a baseline of data and create a free-to-access online evaluation tool that will make evaluation accessible. More work is planned on valuing the wider indirect benefits to the local economy.

2. Introduction

2.1 Green Pilgrimage Project

Green Pilgrimage is an Interreg Europe project funding partners from Norway, Sweden, Italy, Romania, as well as partners in the UK – Kent County Council, the Diocese of Canterbury, and Norfolk County Council.

2.1.1 What do we mean by Green Pilgrimage

Green Pilgrimage brings together the concept of 'sustainability' with 'pilgrimage'.

Pilgrimage is recognised as being engaged in by both religious groups and by others in a secular context. Over the course of the project an understanding of 'green pilgrimage' has developed as the undertaking of meaningful journeys via sustainable means (for example via walking or cycling).

Assessing the 'green' nature of pilgrimage however requires examination of practices wider than methods of transportation, including but not limited to: the contribution of pilgrims to a local economy and their impact of a community (average expenditure, length of stay and seasonality of visits), and environmental practices (food miles, energy usage, waste disposable) engaged in by pilgrim services provided on route.

The use of sustainability indicators can structure improvements in the sustainability of pilgrimage routes resulting in positive effects for the environment and local communities. This, together with valuing the economic and social value of pilgrimage provides the evidence to show the valuable contribution pilgrimage can make as a form of low impact tourism.

2.1.2 Aims of the Green Pilgrimage project

Green Growth and Pilgrimage

The continued fragility of Europe's economy means that growth and development policies often take precedence over environmental policies, threatening our cultural and natural heritage assets. The Green Pilgrimage (GP) project will show how growth and development policies can economically exploit *and* protect natural and cultural heritage. Key to this is our focus on the power of pilgrimage, recognised today as one of the fastest growing segments of the travel industry (UNWTO, 2015) with more than 300 million pilgrims every year.

The Power of Pilgrimage

Ancient pilgrim routes such as The Way of St. James to Santiago de Compostela, Spain report an annual 10% increase in numbers, particularly among the non-religious. Harnessing this increased popularity to protect natural and cultural heritage is a common challenge faced by those responsible for Europe's major pilgrimage routes. GP will show policy makers how to protect natural and cultural heritage whilst creating jobs and growth along pilgrim routes through developing low impact tourism, digitalization, pilgrim accommodation and strengthening local traditions. This reconnects pilgrims with their environment, landscape and culture[1].

[1] Green Pilgrimage Interreg - https://www.interregeurope.eu/greenpilgrimage/ (Accessed Dec 12 2019)

2.1.3 The role of Norfolk County Council (NCC)

As outlined above, the phenomenon of pilgrimage shows great potential as a form of low impact tourism, but in order to understand its impact we need to be able to measure its economic, social and environmental impact in order to showcase its value and identify where improvements can be made.

The key contribution of NCC Environment Team as partner in the Green Pilgrimage Project is to recommend a methodology to measure value and impact. The NCC Environment Team has led the way on data collection to demonstrate value by prioritising investment in surveying on their path network over the past decade. The team is therefore well placed to drive the direction of the development of this methodology.

This report is a summary of work undertaken by NCC, working with their academic partner, the UEA, on a methodology for measuring the economic, social and environmental impact of pilgrimage, including a recommendation of sustainability indicators for best practice.

2.2 Current partner situation

2.2.1 Partner projects

The Green Pilgrimage partnership consists of partners across five countries in Europe, including state organisations such as county councils and research departments, and non-governmental organisations such as pilgrim centres and faith partners.

Although all have the common theme of pilgrimage and are committed to a sustainability agenda, the local contexts including scale of pilgrimage operation, governance setup, funding opportunities and therefore operational challenges are different. Partners are also at different stages in the journey towards undertaking greater levels of evaluation, although the majority remain in the initial stages of this journey.

The tables below compares partner projects:

- Table 1 compares the characteristics of the route, its management and funding, as well as the focus of development work
- Table 2 compares partner's current situations regarding collection of data against areas recommended in this report – broadly demographic, visitor numbers, financial spend, social and health, sustainability, and economic.

Section 2.2.2 analyses data from the tables and draws out key points that will guide the design of the valuation methodology.

Table 1 - Overview of routes and areas overseen by partners						
Partner	**Norfolk**	**Puglia Region, Italy**	**Norway**	**Romania**	**Sweden**	**Kent**
Name of route	Walsingham Way	Via Francigena (new section south of Rome)	St. Olav Ways	Via Mariae	St Birgitta Way	North Downs Way National Trail
Visitor numbers	30,000 approx. to Pilgrim Way. 300,000 approx. to Walsingham	No data available	2018: 1100 (last 120km) 2018: 524 (full length) 2017: 483 (full length) 2016: 394 (full length)	2018:5000 2017:4500 2016:4000 2015:3500 2014:3000	5000 walking pilgrims annually approx. arrive in Vadstena 400,000 other modes of transport	No data available
Length of route	1 miles (30 miles planned)	400km	643 km	1800km (800km is planned)	1600km	153 Miles
Owned / managed by	Private landowners / Parish / Norfolk County Council	Puglia Region?	National Pilgrim Centre	Local NGOs and organisations	Cooperation among several organisations	Managed by North Downs Way Trail Partnership & Surrey & Kent County Councils
Officially open since:	Permissive path	In development?	1997	2010	Several parts since1990, All together since 2020	1978
Received public funds?	No	No data available	Yes	Yes	Yes a small part	
If Yes/ amount / over what time	Application prepared for Rural Development fund	No data available	€ 590,660 Annually	€15,000 Since 2011 maps, indicators, paints, conferences	Approx:€200000 + Annually money for maintenance	€100,800 Last 5 years Funded for last 40 years – although

						funding reduced by 30% in last 10 years
Rationale for public funds being spent on pilgrimage / long-distance walking at the time:	Local government, access to countryside remit – health benefits and preservation of environment	No data available	It is part of the National Strategy for development of cultural tourism.	In Harghita County sacred tourism is very important, therefor the pilgrimage is financial supported	Creating the new trail ready from Vadstena to Omberg (from Region) The Green Pilgrimage management (From Interreg project and Region) To develop a framework for pilgrim routes in Sweden (Funds from Swedish Board of Agriculture)	UK government invests in National Trails for Recreation, health & wellbeing & rural tourism since the 1960's Recent resurgence of Pilgrimage and sustainable "experiential" tourism has created new interest as an alternative tourism offer
Has the route received any other financial investment? From whom?	Not yet	No data available	Yes National Lottery Fund	Yes Bethlen Gábor Alap (Hungary)	Östergötland Region Linköping Diocese Vadstena Municipality	Yes Local Landscape Schemes/ Arts Council/ HLF and Interreg
If Yes/ amount / over what time/ for what?	N/A	No data available	€ 196,785 / 2017 / signposting	€5,000 for maps and promotion, conference	Cooperation to create a sustainable pilgrim route	Last 4 years (previously unknown)

Table 2 – Overview of data situation for partners

What are we valuing	**Data needed**	**Example – what is Norfolk using?** **(Primary methods in bold)** (*Alternative methods**)**	**Have you got this data?** Green = yes Amber = somewhat Red = no					
		Partner	**Norfolk**	**Puglia**	**Norway**	**Romania**	**Sweden**	**Kent**
Demographic information		**Survey questions** **Status: pilgrims/visitor** **Age, employment, wage, religion**			All registered as pilgrims. Figs for full length & last 120km.	No registration necessary currently. All pilgrims. Data from about 20-50% of pilgrims like age, gender, or transportation	.	Some data from Canterbury Cathedral on pilgrims
Expenditure Value (Direct)	Average visitor spend	**Survey (question – how much would you spend)** *Also average spend value available from MENE (Monitor Engagement with Natural Environment) – very approximate as focuses only on recreational activity not added 'pilgrimage value'. But used in EU.						Data from DMO Visit Kent
	Number of people	**People counter data** **Passport data** **Overnight stays**			Counters on the trail, registered accommodation, statistics over	Overnight stays at national level only.	No of pilgrims registered by reg. tourism org	No reliable data. No split to recognise

		*ORVal Tool (statistical modelling of route on map provides estimated visits)			pilgrims arriving Trondheim.			visitor/ pilgrim.
Physical Health	How long walked for/level of activity	**Survey (question – how many minutes exercise**) or use an app such as Better Points + HEAT (Health Economic Assessment Tool) EU wide WHO tool which provides value of exercise						
Wellbeing	Four questions based on one point in time: • Life satisfaction • Life is worthwhile • Happiness • Anxiety	**Survey (4 standard wellbeing questions** from UK Office National Statistics – now attuned to European Survey on Income and Social conditions)			National databases			
	Rating of visit/pilgrimage on feeling 'calm and peaceful'	**Survey (2 questions)**			some testimonials			
Economic Welfare/ Social value (Indirect)	No of volunteering hours	Collect data from local organisations			Needs to be organised			Needs to be organised
	No of school visits	Collect data from local organisations			Needs to be organised			No schools programme
	£ figure for proposed route	**Survey (question based on choice experiment/contingent valuation)** * ORVal Tool (statistical modelling of route on map provides 'Welfare value')						

	Similar studies that value: • £ per access to site • £ per km For activities & habitats.	**Survey (question based on travel cost)** *Benefit Transfer			Statistics Norway Transport and Tourism			
	Cost visitor would pay for visit	**Survey (question based on revealed preference)**						
Sustainability	Various indicators	Survey or data from stakeholders		Overnight stays by season		Overnight stays counted locally only in peak.		
Multiplier value	How much money into local economy – spend and jobs created	*Regional Input/Output table recommended *Lighter version feasible using national data co-efficients						

Norfolk County Council (NCC)

In the region of Norfolk sits Walsingham, one of the UK's most significant and visited sites of pilgrimage for over 1000 years. Most people arrive as pilgrims by transport rather than walking, and many in large groups as parts of events organised by the Anglican Shrine, Catholic Shrine and Walsingham Abbey to visit the small village of approx. 600 residents. A footpath 'the Pilgrim Way' utilises a disused railway line from the Catholic Shrine northwards into the village to Walsingham where the Anglican Shrine and Walsingham Abbey are located.

NCC and local stakeholders are keen to develop an extension of this footpath, from the southern end of the Pilgrim Way, along the disused railway line to the nearest town of Fakenham 8km to the south. There is also interest to develop a trail route from the historically significant port town of King's Lynn, 40km to the west of Walsingham, to reach Fakenham. These new routes are seen as adding value to the west of the county which although economically deprived has great natural and cultural assets.

Data collection is a priority. As part of NCC trails team, a people counter has been installed to monitor numbers of users of the existing Pilgrim Way. A survey box housing a paper based survey has also gathered basic data on visitor activity and spend. Work within this Green Pilgrimage project has enabled further development of this survey to collect data to value a path extension. Current valuation work is around understanding better the demographic of pilgrim visitors, how they travel to Walsingham, and the economic and social benefits of creating a path extension.

Puglia Region, Italy

Puglia region in the South-east of Italy is located on the Mediterranean sea. The area's location as a cross roads of Euro-Mediterranean routes for pilgrims, merchants and soldiers has influenced its rich cultural offerings and natural landscape. Puglia region has a rapidly growing tourist economy with thematic offerings such as: sea and beaches, rituals and traditions, spirituality, nature, art and culture, gastronomy. Regional tourism strategy that is concerned with diversifying and extending the tourism season fits well with a focus on developing pilgrimage.

Walking and cycling, as well as pilgrimage have not been widely promoted in regional tourism. Puglia region is currently applying for an extension of the 'Via Francigena' (a Cultural Route of the Council of Europe) south from Rome. A multi-million hostel development project to provide pilgrim style accommodation (in a similar style to that on the St. James Way) has been invested in, and work is under way to track and sign the 400km with the region financing this part, and to support local actors in providing accommodation. Regional policy identifies that despite the highly valuable and widespread historical cultural heritage in Puglia, cultural tourist demand is still low and there is therefore great potential.

Current data collection is low but given the focus by regional policy 'Puglia365' on seasonality, collecting data that can feed into sustainability indicators will help the region benchmark against other initiatives. With a new route extension there is also scope to set up systems to record pilgrim data, and work with new accommodation providers to record numbers of visitors, and provide guidance on sustainable environmental practices.

National Pilgrim Centre, Norway

Pilgrimage towards Trondheim in the central west of the country has been taking place for around 1000 years. Visitors to the city number around 400,000 per year, with pilgrims

arriving via non-motorised means counted in the high hundreds and increasing by approx.. 20% per year. The Saint Olav Ways are eight pilgrim routes all leading to Trondheim that total around 2000km of paths. Hiking, cycling and pilgrimage routes, through the rich landscape to Trondheim are promoted through the Norwegian national tourism website, and there is overall support for pilgrimage as shown by the creation of a dedicated national pilgrim strategy with county councils seeing the potential for cultural tourism.

Pilgrim routes are managed by a cooperation between state authorities, regions and municipalities working under the National Pilgrim Strategy. It has so far mainly been the Directorate for Cultural Heritage that has been in charge through the National Pilgrim Centre with the Nidaros Cathedral Restoration Workshop. Although the routes are promoted nationally, in order to market the Pilgrim's Route as a national and international tourism asset, it needs to be a continuous route of quality.

Current data collection is limited to collection of people counter data and statistics from registered accommodation. 2019 sees the publication of the national Pilgrimage Development Strategy by the Ministry of Culture. The National Pilgrim Centre has recommended incorporate statistical tools to measure the amount of pilgrims, their impact on the environment, health benefits, financial benefits etc. to document the effect of national investment.

National Institute of Research and Development in Tourism, Romania

Romania has a wealth of natural and cultural assets. Forest covers a quarter of the country and there is rich fauna including bears, deer, lynx, chamois and wolves. 30% of the country is covered by the Transylvanian Alps. There are a considerable number of churches, over a quarter of which are historical monuments and 24 UNESCO world heritage sites. Pilgrimage history, mainly of Christian origin has strong roots in Romania, and pilgrimage exists today to a number of key monasteries. Development policy is focused primarily on restoration of heritage sites, and although natural assets are included, funding is not allocated.

Development of walking pilgrimage routes centres on two key routes, data provided here refers only to the Via Mariae – 1800km of routes of which 800km is planned for development. In Romania the legal framework only covers the signposting of mountain tourist routes as opposed to thematic, long distance routes, which makes marking and certification of pilgrimage walking routes complicated. Work will be undertaken to influence policy makers, amend the law, and development strategy to create routes and services, and promote those routes.

Currently data collection is low with numbers of pilgrims estimated, however some data is collected on under half of pilgrims – age, gender and transportation method. With the development of pilgrimage infrastructure there is opportunity to guide the collection of more data through these channels. With little walking and cycling infrastructure, data that can provide evidence of the benefits of this for economy will help make the case for investment in infrastructure.

Region Östergötland, Sweden

In the Östergötland region, pilgrimage traditions are linked with the town of Vadstena, an important site since the Middle Ages. This is a key pilgrimage destination and also a stop on route for pilgrims travelling on the St. Olav Way (Cultural Route of the Council of Europe). Pilgrims visit the St. Birgitta church and monastery and are accommodated at the Pilgrim Centre in Vadstena.

Nature tourism, taking advantage of 1200km of hiking trails and 90 bike routes, is mentioned in national tourism strategy and promoted widely .However there is no overall strategy for pilgrimage. Decision makers will need to be informed about the opportunities of pilgrimage.

As a sparsely populated country where most live close to nature, Sweden is a leader in sustainable development, and the tourism sector has developed with the increasingly stringent demands of customers. Concentration needs to be less on environmental sustainability and instead focus on economic and social elements of sustainability – for example introducing local cultural heritage, food and products into tourism packages. St. Birgitta Way has a strong web presence domestically, and is now seeking to meet criteria as a leading pilgrim experience destination for international export.

Data collection is currently low, however there is strong interest in Region Östergötland to develop a plan to monitor information about pilgrim spend (divided by day/multiday visitor), seasonality, as well as assessing carrying capacity of routes and feedback from pilgrims on their experience.

Kent County Council (KCC), Kent

Kent with the cathedral city Canterbury at its heart is steeped in pilgrimage tradition. As a county it is known as the 'Garden of England' with an abundance of productive fruit orchards and bounteous natural assets. The national trail the North Downs Way runs through the county along the line of historical pilgrim routes to Canterbury. As evidenced by visitor books in churches, the North Downs Way is used by pilgrims, as well as the St. Augustine Way. The Via Francigena, the UK's only walking European cultural route also starts from Canterbury bound for Rome. As such there is a wide range of cultural activity connected to pilgrimage in Canterbury such as a pilgrim festivals including poetry workshops, and film showings and local interest in developing pilgrim routes linked to the North Downs Way and Via Francigena.

The Confraternity of Pilgrims to Rome, a Kent based Charity, also wish to re-establish an attractive route from London to Canterbury made famous by Chaucer in Canterbury Tales. Health and wellbeing benefits of pilgrimage and long-distance walking are recognised by many of Kent's stakeholders, as well as the opportunity to develop modern experiential tourism experiences through 'journeys with meaning'.

Data collection and collaboration with local organisations to source data is currently low, however KCC has prioritised people counters within their forward action plan and surveying to measure benefits from investment in improvements on the Via Francigena. In realising its ambition to develop a strategic masterplan, KCC can also benefit from valuation methods to predict the cost-benefit of proposed measures and set targets.

2.2.2 Comparison of partner projects and their data journey

Summary

The pilgrimage routes, directly or indirectly managed by the Green Pilgrimage partners contain far more differences that similarities. For example there are:

- a wide range of lengths
- varying levels of investment and type of funders
- some routes well established but with many in stages of development and expansion
- varying strategic focus according to regional context - for example, environmental sustainability in some cases (Sweden) is well integrated, and in other areas (Romania) yet to be prioritised above other factors such as preservation of cultural assets

The majority of the partner projects however, include both established routes and also pilgrim destinations, only a few are focused at least currently, on pilgrim destinations (e.g. Walsingham, Norfolk). What is also apparent is that in all regions there are multiple actors involved in setting up, managing and maintaining routes and pilgrims services, particularly when as route covers a great distance. In this respect all partners face a similar challenge in development work and in collecting data.

Sourcing and collecting data is shown to be universally challenging, although not impossible. Partners vary in their capacity to undertake this work themselves, needing to draw on often a dispersed network of organisations. Although levels of data collection and, more critically, use of data is currently low, partners have evidenced through their action plans and through consultation that data is important and there is a move to prioritise using data.

Implications of partner situations for methodology design

The implications of the described diverse partnership for creating a methodology is that any methodologies need to be flexible enough to accommodate the varying needs of partners according to the area they wish to research and evidence.

In consultation partners suggested to NCC that a ‘tick list’ approach could work, whereby a list of research questions (along with the methodology to research these) be made available to select according to individual partner priorities.

Despite the context being extremely varied across countries, the partners consulted by NCC also showed common factors which would influence the design of the valuation:

- data was recognised as expensive and time consuming to gather therefore evaluation work not a priority
- data sharing between organisations and across boundaries is problematic
- experience with collecting data is low and partners felt unsure what data to prioritise collecting or how to use this
- key interest was in economic valuation and evidencing health benefits.

Work undertaken by NCC and the UEA would therefore need to:

- showcase the benefits of primary research, whilst providing economically viable alternatives
- provide a suite of methodologies to tailor to partner situation
- explain complex methodologies clearly e.g. using practical examples
- demonstrate the case for collecting data

2.3 Scope of study

2.3.1 Aims of study

The main aim of this All Partner Review is to provide a recommendation of a common methodology (or suite of methodologies) that enables all partners with varying situations to consistently measure the economic, social and environmental value and impact of pilgrimage in their regions, enabling data to be comparable across sites.

The focus of the study is twofold: firstly on valuation – to provide quantifiable figures, and secondly – to provide a suite of sustainability indicators that can measure progress towards sustainability goals. Outside of the scope of this study is a review of technical quality standards for development of routes or pilgrim experience, although this knowledge is available through the Green Pilgrimage partnership.

The report will provide partners, who currently have limited experience in the area of evaluation, guidance to start to plan research, move forward with the collection of data and use this to build an evidence base to show the value and impact of their routes.

2.3.2 A framework for valuing Green Pilgrimage

Partners within the Green Pilgrimage consortium are concerned with valuing the activity of pilgrimage where pilgrimage is undertaken by means of sustainable transport (walking, cycling and also, but to a lesser degree, horseback).

In essence there are two intersecting areas within a valuation of this mode of pilgrimage (See Fig. 1). Firstly, understanding the value of people using trails or medium to long distance routes – what economic, social (including health) and sustainability value does this have. Secondly we need to consider what makes pilgrimage unique and how we can capture this value.

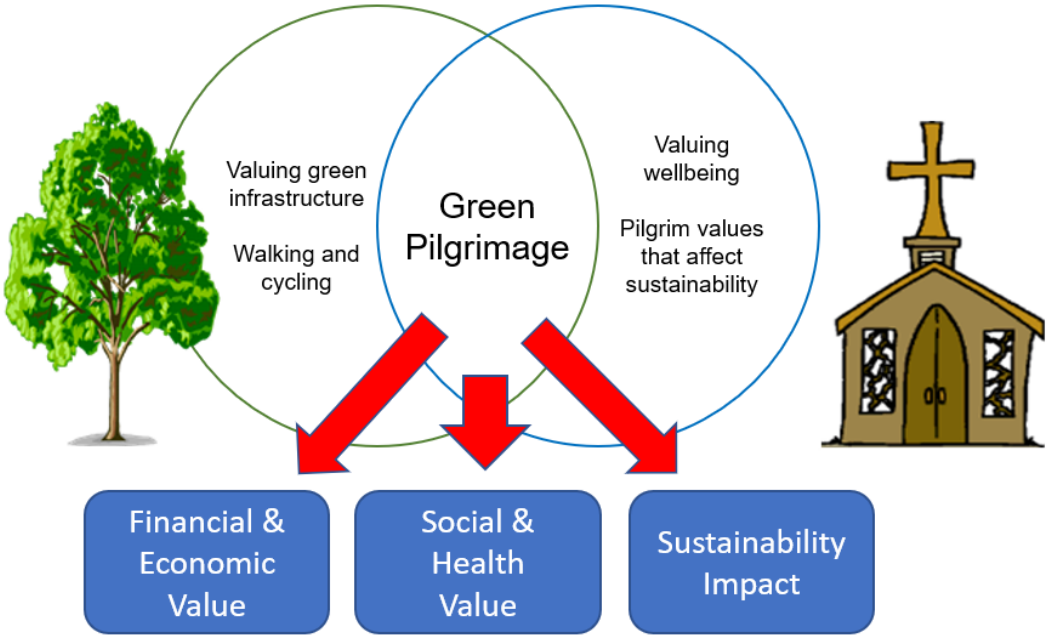


Fig 1 – Framework for valuing green pilgrimage

Methods borrowed from Green Infrastructure Valuation

For considering this first part (the value of people using trails or medium to long distance routes) we can look to an increasing body of work that seeks to value Green Infrastructure.

> Green infrastructure is defined as "a network of multi-functional green space and other green features, urban and rural, which can deliver quality of life and environmental benefit for communities".[2] Valuing green infrastructure is increasingly important in the drive for more sustainable development which can be defined as "meeting the needs of the present without compromising the ability of future generations to meet their own needs".[3]

Green infrastructure provides us with a range of Ecosystem services. Natural England's Natural Capital Account of the National Nature Reserves managed by Natural England (2018)[4] uses a Natural Capital Accounting approach to produce value. Services include raw materials such as timber, water quality, air quality, flood protection, climate regulation, as well as anthropogenic services for example cultural appreciation of nature, recreation, tourism and volunteering, and scientific and educational visits. In turn these 'services' provide us with benefits and value for example food, plentiful water, clean air, biodiversity, equable climate as well as health, and cultural wellbeing.

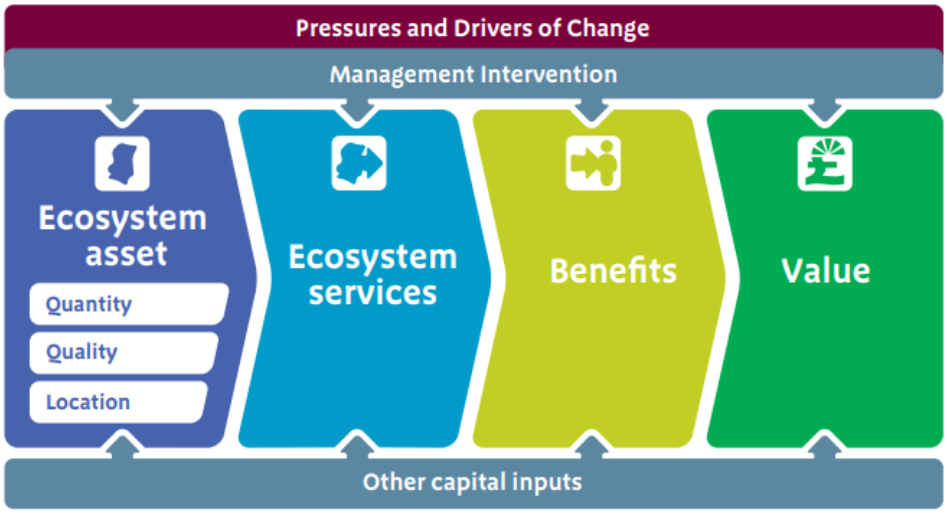


Fig 2 – Natural capital log chain illustrating assets through to value.

In Section 3 we will summarise the research to date that has come from the valuation of paths for the activity of recreation and tourism.

[2] HM Government. "National Planning Policy Framework." London, UK. 2018 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/740441/National_Planning_Policy_Framework_web_accessible_version.pdf (Accessed Dec 12 2019)
[3] UN General Assembly, *Implementation of General Assembly resolutions 42/186 and 42/187 : resolution / adopted by the General Assembly*, 22 December 1989, A/RES/44/227, available at: https://www.refworld.org/docid/3b00f2220.html (Accessed Dec 9 2019)
[4] Natural England, 'Accounting for National Nature Reserves: A Natural Capital Account of the National Nature Reserves managed by Natural England (NERR078)', available at: http://publications.naturalengland.org.uk/publication/4535403835293696 (Accessed Dec 10 2019)

Methods required to value the uniqueness of pilgrimage

In considering the value of pilgrimage, here defined as journeys of meaning by sustainable means, we can look to methods taken from the valuation of green infrastructure to value walking and cycling – the effect on physical health, and visitor spend. However valuation methods extracted from this area do not capture the second part of our framework (see Fig. 1) – the aspects that make pilgrimage unique.

The valuation of pilgrimage is a widely unexplored area in research. NCC have worked with the UEA to consider how to capture this unique value. Work has been undertaken to develop methods that focus on capturing:

- People's appreciation for a place of pilgrimage (for which they may have a long term relationship, and value not only for themselves but for those they know or future generations)
- The transformative potential of pilgrimage to positively affect wellbeing
- The positive impact pilgrims can have on economic, social and environmental sustainability compared to domestic tourists

This research needs to be specific to pilgrims/long distance walkers rather than all users of a path (who may be commuters), or visitors to a place (who may have different values and spending patterns).

2.3.3 Wider impact of the new valuation

Although the work that this report summarises has been undertaken to value specifically green pilgrimage, its recommendations on methods and indicators can be used in valuation of trails and long distance walking and for assessing sustainability in broader tourism contexts. Two key areas are:

1. Measuring wellbeing
   Physical and mental health is a priority area in health policy. The assessment of mental wellbeing is complex and as such a developing area. An added outcome of the evaluation work undertaken by the UEA will be enabling those undertaking the valuation of trails or long distance walking and cycling to better evaluate the wellbeing effect of recreational activities.
2. Broadening indicators for sustainability
   The work undertaken in this study goes beyond current sustainability indicators and the value of trails tourism to local communities – this has primarily focused on visitor spend and the finding that walking/cycling visitors spend more on average than regular tourists who travel by car, shop in supermarkets and stay in hotel accommodation[5]. The UEA have undertaken a literature review of alternative sustainability indicators (economic, social and environmental impact) that can be used to determine the impact pilgrims are having on destinations, and guide improvements in the area of sustainability. These can be used for all tourism destinations.

[5] European Parliament, 'The European Cycle Route Network Eurovelo Study' *European Cyclists Federation*, , 2012. Available at: https://ecf.com/sites/ecf.com/files/EP%20study%20on%20EuroVelo%20network.pdf (Accessed Dec 12, 2019)

2.3.4 Approach to methodology study

This report summarises work undertaken during Phase 1 of the Green Pilgrimage project from 2017-2019 on a methodology to measure the economic, social and environmental impact of pilgrimage. The following lays out the work undertaken to complete this.

Choosing academic partners

NCC reviewed options for working with academic partners and selected the UEA due to the NCC Environment Team having existing close links with a numbers of their key academics working in valuation of the natural environment. The particular consultancy wing CSERGE (Centre for Social and Economic Research on the Global Environment) is highly experienced in environmental economics and the use of non-market valuation methods.

In contracting with the UEA we drew up a Cooperation Agreement as opposed to a traditional consultancy contract. This was designed to facilitate an ongoing working relationship and the interchange of knowledge and experience. NCC would share existing data and contacts, and the UEA where possible would upskill NCC Project Officers in understanding the underlying methodologies and how to train volunteers to undertake data collection.

Establishing the brief

The brief was established in consultation with the project partners to reflect and include their situations (see 2.2.1 for details of partner projects). As detailed above, the brief would seek to measure the economic, social (health) and environmental value and impact of pilgrimage for partner routes. Methods would primarily be drawn from work on the valuation of green infrastructure for recreational benefits, but would also need to find how best to capture the unique aspects of pilgrimage.

Tasks undertaken by NCC and the UEA for the valuation work:

1. A review of methods for valuing trails including reviewing existing studies and making recommendations on the best methods to use to value pilgrimage walking
2. A review of methods to value the unique wellbeing aspects of pilgrimage
3. A review of sustainability indicators that help a pilgrim route and destination to measure level of sustainability and identify areas for improvements
4. Testing of a pilot survey in Walsingham (Norfolk's key pilgrim destination) incorporating recommended methods

Meeting the aims of the study

Partners have been updated throughout the process, and consulted on their understanding around data collection. This process has identified a low level of knowledge in this area and current data collection is minimal. Given this, this structure of the report is designed to:

Section 3	**Outline key existing research** - Bring together and highlight relevant studies that partners can use in the first instance to show estimated benefits
Section 4	**Review of sustainability indicators** – Bring together latest studies and report on indicators, including accreditation systems
Section 5	**Review of methodologies** - Understand better what can be measured and what tools can be used to get this data depending on the resources available
Section 6	**Show an example of NCC and stages of data collection** - Gain insight into how data can be used and simple ways to start collecting data

Section 7 **Show an example of data collection** – Explain the local context of Walsingham, reasoning for methods chosen and how we undertook methods

Section 8 **Show how data collected can produce tangible results** – Show through the example of Walsingham we see the process of research questions, through to analysis and producing useful statements for documents such as funding bids

Section 9 **Help to plan a study** – A checklist to move forward data collection

Section 10 **Conclusion** – Summarise work undertaken, recommendations for partners, and future plans for measuring the impact of Green Pilgrimage.

3. Existing research and datasets

Research already undertaken can provide a valuable starting point, particularly where primary data collection is not operationally practical. This research may take the form of reports evidencing the results of a particular study, or massive datasets in the forms of tools that can be used to generate estimated figures.

In this section we signpost to useful existing studies and datasets that provide figures for:

- the financial and economic benefit of people's activity accessing the countryside
- the effect of physical activity on health
- the effect of visitors on sustainability (economic, social and environmental)

3.1 Financial and economic

3.1.1 Financial

The financial value of using Green Infrastructure is often gathered through the direct cost of access for example visiting a wildlife reserve or car park costs, or the spend by the visitors at local shops or cafes. The information typically can be gathered directly from the attraction or through a visitor survey. However if it is not possible to directly gather the information or a forecast figure is required, datasets are available that can produce an estimated figure for an area. For example:

The Monitor of Engagement with the Natural Environment (MENE) report[6] has been published since 2009 as a partnership between DEFRA (Department for Environment, Food & Rural Affairs, UK) and Natural England. Data is provided from nearly 500,000 respondents across England and provides a wide range of information about visitors including:

- Frequency of visits
- Barriers to visiting the Natural Environment
- Types of places visited
- Transport details
- Motivation for the visit
- Visitor spend and profile
- Environmental attitudes of visitors

From the spend data from all visitors an average day visitor spend per visit to the countryside is calculated at £6.78 for England. It is possible to filter this information just for visits to Norfolk and this provides an average visitor spend of £11.32 (*note variation exists, for example, primary research conducted by NCC Norfolk Trails have produced a higher figure of £22.76).

[6] Natural England, 'Monitoring Engagement in the Natural Environment Survey (2009 - 2019)' Available at: https://defra.maps.arcgis.com/apps/MapSeries/index.html?appid=2f24d6c942d44e81821c3ed2d4ab2ada (Accessed Dec 2, 2019)

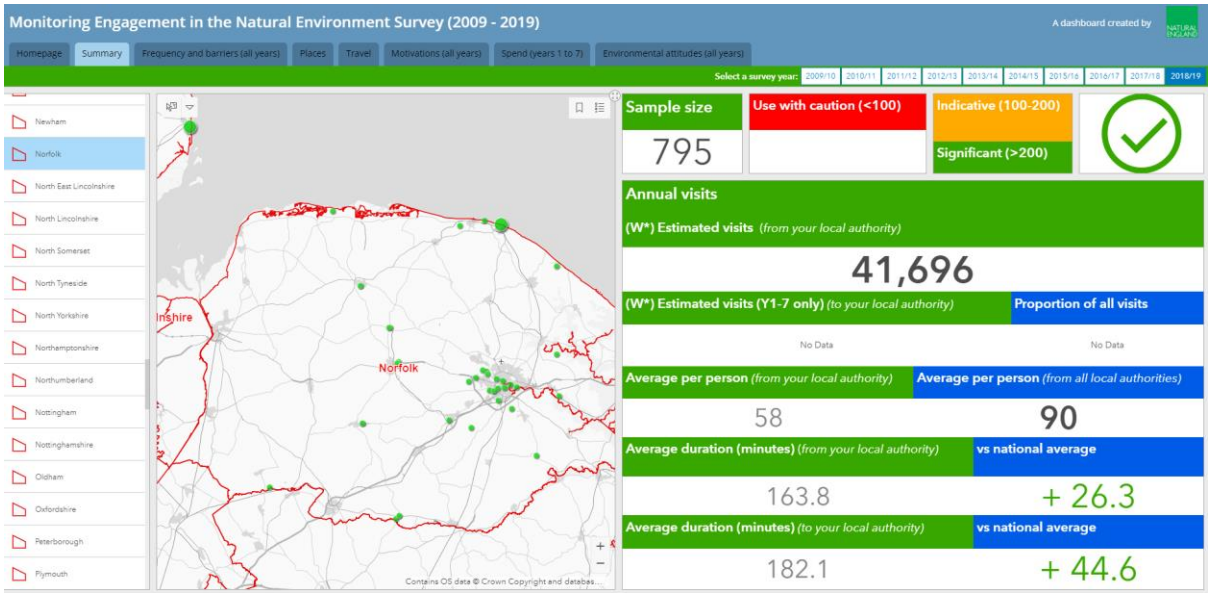


Fig 3 - MENE data dashboard

Tourism surveys will often record visitor numbers, type of visitors, activities undertaken and spend in different regions. For example:

Research specifically into the financial value of tourism, where walking is the main activity or a component activity, is undertaken as part of The UK Tourism Survey. The UK Tourism Survey (2001) estimates that there were 3.4 million tourist day trips which had walking as the main activity. The calculation of total expenditure of tourists on trips that include walking as activity is as follows:

> *the volume of walking trips x by average nightly expenditure per trip (£49)*

An estimation of £3.3 billion is given for total expenditure by UK tourists on holiday trips (that included walking as an activity). Of this, £2.3 billion was associated with short walks (under 2 miles) and £0.9 billion with spending on long walks[7].

Benefit Cost Ratios (BCR) for walking and cycling are provided through the UK government report 'Investing in Cycling and Walking: The Economic Case for Action'[8]. For walking, BCRs are typically underestimated due to the small number of potential benefits being monetised.

- The BCRs for walking found range between 0.1:1 and 37:1; suggesting that very high returns are possible for well-targeted schemes.
- BCR for cycling (as an alternative form of transport for commuters) tend to be better evidenced with more consistent figures. See the report for more in depth examples and how to undertake BCR calculation through the WEBTAG tool.

When developing new infrastructure or looking to improve existing infrastructure the MENE report provides a robust dataset, and other similar studies can provide figures to carry out a Benefit Transfer to a policy site (see sections 5.3.3 and 7.4.2).

[7] M. Christie and J. Matthews, *The Economic and Social Value of Walking in Rural England*, report for the Ramblers Association, 2003.
[8] Department for Transport UK, 'Cycling and walking: the economic case for action', 2015. Available at: https://www.gov.uk/government/publications/cycling-and-walking-the-economic-case-for-action (Accessed Dec 2, 2019)

3.1.2 Economic

Whilst direct spend can be calculated from visitor surveys, the benefit of particular types of visitor to a local economy requires deeper analysis. The use of multiplier analysis can indicate value of spending to a local economy, and the effect of spending on employment generation.

An example of research with a particular focus on the economic impact of pilgrims is the 2018 INTERREG study by Galicia Tourism and University of Santiago de Compostela at Galicia[9]. This study looks at the differences of a pilgrim visit compared to conventional tourists on a range of different expenditures including; travel, spend, local support and employment support. The presence of these expenditures within the local economy stimulates an increase in the level of economic activity that, in turn, will generate additional income and employment to the area.

> *Multiplier analysis can be used to measure the size of these impacts. Multiplier theory suggests that direct expenditure injected into a local economy is then integrated few various local transactions (rather than money leaving the area) and wealth of local residents increased as does their spending. The resulting multiplier coefficient represents changes in 'output', income or employment in the local economy.*

B&Bs tend to produce higher multipliers than chain hotel chains[10], as do remote rural locations where there is less chance of 'leakage' of money from a local economy.

Research undertaken by the University of Santiago used government input/output tables at a regional level to calculate that the economic impact generated by each pilgrim.is equivalent to 2.3 standard (non-pilgrim) tourists. This is due to the propensity of pilgrims to spend more locally.

A review of UK multiplier sites undertaken by RSPB[11] found reasonably consistent findings. Typically, £1.00 of visitor expenditure generates between £0.24 – £0.45 income within the local economy (0.24 and 0.45 range would therefore be used as multiplier coefficients).

The same study also found that one fulltime equivalent (FTE) local job is created per £15,000 – £25,000 of visitor expenditure.

3.2 Social & Health

A wide range of statistics are produced every year by government health bodies on prevalence of disease and the cost to the economy. Furthermore many statistics already exist of the benefits (economic) of increasing physical activity for physical and mental health, with walking being a prime target for its ease of access.

Below we provide a sample of the type of statistics that are available:

[9] Turismo de Galicia and University of Santiago, 'Socio-economic study of the St. James Way', Available at: http://www.turgalicia.es/aei/portal/docs/documentacion_vinculada/ir3487.pdf (Accessed Nov 29, 2019)
[10] B. Slee , H. Farr and Snowdon, 'The economic impact of alternative types of rural tourism'. *Journal of Agricultural Economics* 48(2), 1997, p.179-192
[11] M. Rayment. Nature conservation, employment and local economics: A literature review. RSPB: Sandy, 1995.

- The World Health Organisation predicts that 3.3% of all global deaths is due to the physical inactivity[12].
- Health services in each of the 152 Primary Care Trust areas in England spend an average of £5 million a year dealing with the consequences of physical inactivity[13].
- £1 spent on a health walk scheme will save the local National Health Service £7[14].

In the UK, The National Institute for Health and Care Excellence (NICE) produces guidelines for national and local authorities to adopt into their policies. A key NICE recommendation is to promote active travel - walking and cycling - to increase physical activity. Public Heath England also have produced a wide range of research on the benefits of Active Travel including the report "Working Together to Promote Active Travel"[15].

The Department of Health (UK) have produced the table below which summarises the relationship between physical activity and health benefits.

Table 3 - Summary of the relationship between physical activity and health.

Health topic	Evidence of the effect of physical activity	Strength of evidence
Overall death rate	Approximately 30% risk reduction for the most active compared with the least active	Strong
Cardiovascular health	20% to 35% lower risk of cardiovascular disease, coronary heart disease and stroke	Strong
Metabolic health	30% to 40% lower risk of type 2 diabetes in at least moderately active people compared with those who are sedentary.	Strong
Musculo-skeletal health	36% to 68% risk reduction of hip fracture at the highest level of physical activity.	Moderate
Falls	Older adults who participate in regular physical activity have an approximately 30% lower risk of falls	Strong
Cancer	Approximately 30% lower risk of colon cancer and 20% lower risk of breast cancer for adults participating in daily physical activity	Strong
Mental health	Apporoximately 20% to 30% lower risk for depression and dementia for adults participating in daily physical activity.	Strong

Source: Department of Health, 2011 Start Active, Stay Active: A report on physical activity from the four home countries' Chief Medical Officers. London: DH (Table 1, adapted from work by the US Department of Health and Human Services)

A key social benefit that can be quantified for developing a new walking and cycling route, especially when close to an area of employment, is the absenteeism benefit due to the

[12] WHO. Health and sustainable development: urban green spaces, 2019. Available at: https://www.who.int/sustainable-development/cities/health-risks/urban-green-space/en/ (Accessed Dec 10, 2019)
[13] HM Government. Be Active Be Healthy: A plan for getting the nation moving. 2008. Available at: http://www.laterlifetraining.co.uk/wp-content/uploads/2011/12/DoH-Be-Active-Be-Healthy-2009.pdf (Accessed Dec 12, 2019)
[14] C. Heron and G. Bradshaw. Walk This Way: Recognising Value in Active Health Prevention/. 2010, Natural England.
[15] Department for Public Health. Working Together to Promote Active Travel: A briefing for local authorities. 2016. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/523460/Working_Together_to_Promote_Active_Travel_A_briefing_for_local_authorities.pdf (Accessed Dec 9 2019)

people in employment taking less time off with illness when achieving their recommended weekly physical activity levels.

The NICE (National Institute of Health & Clinical Excellence) guidelines show that physical activity programmes can reduce absenteeism by 20%[16] and using the average wage for an employee this reduction shows a monetary benefit. This is an example of the calculation that can be undertaken using this figure.

No. of users x (average daily wage x average no. of days of absenteeism/year) = Total value lost to economy/year

Total value lost to economy/year x 0.2 [the reduction in absenteeism] = Total saving to economy year.

The WebTAG tool detailed in section 5.2.2 can generate figures of health value related to absenteeism as well as other indicators of health such as air quality.

3.2.1 Welfare value

The welfare value of a path or site can be estimated using a number of non-market valuation methods which estimate the Willingness to Pay (see section 5.3.1 for details). For example, primary data collection might use visitor surveys to determine how much visitors value a visit.

The survey developed by UEA and NCC for Walsingham includes questions to determine the value of a visit to Walsingham using the Travel Cost Method and other non-market valuation approaches (e.g. contingent valuation). The welfare value (broadly a 'social value') calculated takes into account that visitors could have chosen to visit another place or undertake another activity. The welfare value is represented as a £ figure as an estimate of the benefits that can then be used in a cost-benefit analysis. However before designing primary data collection that is time and cost intensive, a systematic literature review was conducted. This background research is included in this section on existing research.

The UEA undertook a review of literature of relevant studies that estimate the welfare value for accessing the different types of countryside (seaside, woodland etc.) whilst doing different activities (hiking, cycling etc.). Values were collated from three different sources that were then used in a Benefit Transfer:

1. *The Recreation Use Values Database*[17] *(RUVD)* - a North America database, which comprises 421 use value studies of recreation in the period 1958 to 2015.
2. *Environmental Value Look-Up (EVL) Tool*[18] - The DEFRA (Department for Environment, Food & Rural Affairs - GOV.UK) tool gives indicative values based on a review of over 350 UK-focused studies, from 2000 to 2015.
3. *A review of recent UK recreation studies* - 19 primary studies that provide 44 estimates from studies using travel cost, contingent valuation and choice experiment methodologies.

[16] NICE. Public Health Guidance PH13. 2008 Available at: https://www.nice.org.uk/guidance/ph13 (Accessed Dec 8, 2019)
[17] College of Forestry, Oregon State University. Recreation Use Values Database. Available at: http://recvaluation.forestry.oregonstate.edu/ (Accessed Dec 30, 2019)
[18] Department for Environment, Food and Rural Affairs (DEFRA). Research Database. Available at: http://sciencesearch.defra.gov.uk

Values provided by BT review undertaken

Table 4 - Values provided by welfare literature review undertaken

Estimated values provided	**Mean Values**	**Source**	**Comments**
£ value per person per visit for different activities	• Backpacking: £13.16 • Leisure Bicycling: £35.53 • Hiking: £58.00 • General recreation: £44.35 • Other recreation: £35.21	RUVD	Limitation Data from North America
£ value per person per visit for type of user, in specified habitat (e.g. These figures are for woodland)	• General user/ informal recreation: £2-6 • Nature watchers: £10 • Specialist User e.g. cyclists, horseriders: £19	EVL	Limitations • No indication of duration of visit or size of the recreational site • whilst they distinguish between general and specialist users, they do not distinguish between trail users and other types of woodland recreation
£ value per person for type of user expressed as: • £ per access • £ per kilometre	Per access: • Backpacking: £2.86 • Leisure bicycling:£14.27 • Hiking: £4.83 Per km: • Leisure bicycling: £1.05	UK studies review	Benefit Potentially more accurate that values extracted from RUVD and EVL Limitations The value of green trails for pilgrims cannot be determined
£ value per person for different habitats expressed as: • £ per access • £ per kilometre	Per access: • Countryside: £4.98 • Seaside: £17.40 • Town/city: £5.27 • Woodland: £1.18 Per km • Countryside: £0.86 • Seaside: £1.47	UK studies review	

(Bennett, Tranter et al., 1995), (Bennett, Tranter et al., 2003), (Bryan, Jones, et al., 2011), (Buckley, van Rensburg et al., 2009), (Buckley, van Rensburg, et al. 2008), (Carson, Flores, et al., 2001), (Christie and Matthews, 2003), (Ferrini, Schaafsma and Bateman, 2014)., (Hopkinson and Wardman, 1996), (Hynes , Buckley and Rensburg, 2007), (Johnston et al., 2015), (Laird , Page and Shen, 2013), (Lanz and Provins, 2013), (Manton, Hynes and Clifford, 2016), (McGurk, Hynes at al. 2019), (Midmore, 2000), (Morris, Colombo, et al., 2008), (SQW, 2015), (Turner, 1995).

3.3 Sustainability

As outlined in the following Section 4, sustainability in reference to tourism refers not only to the environmental impact of visitors but also the potential social impact of visitors on communities. In this section we lay out the some of the pertinent themes relating to sustainability and low impact tourism, including references to ecotourism and experiential tourism.

3.3.1 Carbon footprint

Work in the area of carbon emissions (the effects and how to mitigate these effects) is a broad and growing area of study. Below we pull out evidence of the problem in relation to tourism, the potential support for change, and how to plan and measure change.

Research evidences both the significant impact tourism has on carbon emissions, and also the potential of a sustainable travel market.

> EU data tells us that tourism is one of the primary causes of carbon dioxide production in Europe, and that over 20% of polluting emissions are associated with accommodations (hotels, etc)[19].
>
> The Global Sustainable Travel Report reveals that 87% of travellers want to travel sustainably, but only 4 in 10 (39%) confirm that they often or always manage to do so[20]. Almost 40% of people therefore, when given the option would make a more sustainable choice.

Two key areas are exposed in relation to carbon usage in tourism. Firstly – transportation, and secondly – energy usage in accommodation.

1) There are many studies being produced on cycling and walking as alternative modes of transport and the benefit for the environment of reduced carbon emissions. For example:

   Cycling saves emissions equalling more than 16 million tons of CO2 equivalents per year in the EU. This corresponds to the total yearly CO2 emissions of a whole country like Croatia. Value of savings: 600 to 5,630 million euros (depending on the figure used for the Social Cost of Carbon)[21]. More studies are available for cycling than walking resulting is less robust estimates for walking.

2) Saving energy is a key priority in accommodations:

   Guidelines are produced by the European Commission (2017)[22] on reducing energy usage in accommodation. These guidelines outline where most energy is used in accommodation and which interventions are most cost efficient and effective in saving energy.

[19] Eco BnB. The economic benefits of Sustainable Tourism. 2016. Available at: https://ecobnb.com/blog/2016/10/economic-benefits-sustainable-tourism/ (Accessed Dec 13, 2019)
[20] Booking.com. Where Sustainable Travel is Headed in 2018. 2018. Available at: https://globalnews.booking.com/where-sustainable-travel-is-headed-in-2018/ (Accessed Dec 2, 2019)
[21] ECF. The Benefits of Cycling: Unlocking their potential for Europe. 2018. Available at: www.ecf.com (Accessed Dec 8, 2019)
[22] European Commission. Best Environmental Management Practice in the Tourism Sector. 2018. Available at: https://ec.europa.eu/environment/emas/takeagreenstep/pdf/BEMP-7-FINAL.pdf (Accessed Dec 4, 2019)

How to calculate carbon emissions

Estimating current carbon emissions and the effect proposed changes might have can be carried out using a carbon calculator. There are a number of calculators available that can estimate carbon emissions for different forms of transport. *MapMyEmissions*[23] is one such basic calculator that draws on data from: the U.S. Environmental Protection Agency; the U.S. Department of Energy; the UK Vehicle Certification Agency; the Australian Department of Environment; and the World Resources Institute.

Advice on the cost of carbon emissions is suggested as EUR 25 per tonne of CO_{2e} in 2010 and then assuming a gradual increase to EUR 45 per tonne of CO_{2e} until 2030 (n.b. prices are reported for 2006 and would need to be price adjusted to be up to date)[24].

3.3.2 Social effects of sustainable tourism

As outlined in the next section (see section 4) on sustainability indicators, the breadth of sustainability extends beyond environmental impact to the communities that surround them.

The study undertaken by the University of Santiago on the economic impact of the St. James Way (mentioned in section 3.1.2) found that pilgrims provide more economic benefit than domestic tourists on the Camino. This is because pilgrims following a route and adhering to pilgrimage traditions tend to stay in local hostel accommodation, and money spent stays within the local economy. Good practice in sustainable tourism however reaches beyond only positive economic impact making explicit that visitors should not create negative effects (e.g. through increased waste, noise, traffic) and, where possible, be given the opportunity to positively affect the local community. Perception studies on the Spanish Camino found a very positive overall assessment. Economic benefits were seen to have an impact on perception but critically only where this was seen to benefit the majority.

In a study of the effect of ecotourism on a rural community in Mexico, Monterrubio and Rodriguez-Munoz[25] found that development in tourism resulted in positive impacts on the local population. These include the employment generation, additional income, the development in skills, community empowerment, and a multiplier effect on the local economy. Not only this but ecotourism had the effect of increasing community organising and equality between actors to earn a living. Best practice on developing experiential tourism[26] suggests that developing experiences around a theme that leads tourists to multiple points in a community can promote tourists to spend more, engage more and potentially extend their stay.

There are multiple examples of destinations that have developed experiences to attract return visitors. The Enchanted Forest[27] celebrates the natural and cultural resources of Highland Perthshire using a different theme each year. In 2017 ‘Oir an Uisge’ (Edge of

[23] Map My Emissions. Carbon Calculator. Available at: https://mapmyemissions.com/about
[24] European Commission. Guide to Cost-Benefit Analysis of Investment Projects. 2014. Available at https://ec.europa.eu/regional_policy/sources/docgener/studies/pdf/cba_guide.pdf (Accessed Dec 10, 2019)
[25] C. Monterrubio, G. Rodrigues-Munoz. Social benefit of ecotourism: The Monarch Butterfly Reserve in Mexico. 2013. Available at: https://www.researchgate.net/publication/291344670_Social_benefits_of_ecotourism_The_Monarch_Butterfly_Reserve_in_Mexico (Accessed Dec 10, 2019)
[26] Northern Irish Tourist Board. A practical guide to experiential tourism in Northern Ireland. Available at: www.insights-practical-guide-to-experiential-tourism.pdf (Accessed Dec 12, 2019)
[27] The Enchanted Forest. https://www.enchantedforest.org.uk/ (Accessed Dec 12, 2019)

Water) used Gaelic culture to attract 73,000 visitors to outdoor woodland attractions in Oct-Nov. In 2018 ‘Of the Wild’ used local nature to increase visitors by 9%. Strong online marketing uses itineraries and imagery to help visitors chose how to extend their stay (55.6% stay overnight). All woodland pathways have been resurfaced to accommodate disabled visitors. A free shuttle bus creates a last mile service from a nearby town. Using local suppliers and producers delivers £7.6m to the local economy.

4. Sustainability Indicators and Environmental Impact Assessment

4.1 Sustainability indicators

What is sustainability?

Whilst it's true that a key component of tourism is environmental impact given that travel necessarily defines tourism, the breadth of sustainability goes much further. UNTWO defines sustainable tourism as:

> "Tourism that takes full account of its current and future economic, social and environmental impacts, addressing the needs of visitors, the industry, the environment and host communities"[28].

Tourism needs to avoid having a negative impact and enhance opportunities for positive impact.

A negative environmental impact may be increased traffic, increased litter and energy usage. Negative social impacts are when, for example, residents feel community facilities are set up for tourists rather than to meet community needs, or economic impacts driven by the seasonality of tourism that leaves communities without basic services and employment in off season months.

Tourism done sustainably however has the potential to increase jobs, keep tourism spending local, promote cultural exchange, and raise awareness of the environmental issues and how people can reduce their impact as tourists, and back home as citizens.

Why do we need sustainability indicators?

Indicators can be used for comparative analysis, i.e. to rank, for instance sustainability between tourism regions (Carrillo and Jorge, 2017[29]) or to assess progress towards a set of goals.

A review of sustainability indicators

The Green Pilgrimage Network (GPN) guidance on sustainability fall into three key areas:

- A - Greening the pilgrimage experience
- B - Undertaking direct conservation activities on faith land
- C - Indirectly contributing to greater awareness of sustainability issues through education, volunteering and partnerships, i.e. with local businesses (ARC, 2014)[30].

[28] UN World Tourism Organization. Indicators of Sustainable Development for Tourism Destinations - A Guidebook, Madrid, Spain. World Tourism Organization. 2004.
[29] M. Carrillo and J.M. Jorge. Multidimensional analysis of regional tourism sustainability in Spain. Ecological Economics, 140. 2017. p. 89-98.
[30] ARC. Green Pilgrimage Network. A handbook for faith leaders, cities, towns and pilgrims: "Pilgrims Leaving a Positive Footprint on the Earth". Alliance of Religions and Conservation, 2014. Available at: http://www.arcworld.org/downloads/Green_Pilgrimage_Network_Handbook.pdf (Accessed Nov 15, 2019)

In the text below we have combined this guidance with sustainability indicators that have been developed for tourism more generally (UNTWO, 2004; Carrillo and Jorge, 2017; Zuzana and Zuzana, 2005; de Cunha Lemos et al., 2001; Viljoen, 2007)[31].

In so doing we suggest a set of actionable green pilgrimage sustainability indicators that green pilgrimage sites may wish to track. Deciding where to begin, and therefore what data to collect, will depend on the pilgrimage context, i.e. in those instances where most pilgrims walk the need to collect data on transportation (A.5.) is less critical. For sites, like Walsingham where a significant percentage of pilgrims reside on-site (at least at the Anglican Shrine), collecting data on the environmental sustainability of the residential and catering options (A.1. and A.7.) might be key areas to target first.

Below we organise the ten sustainability indicator areas from ARC into our three key areas and suggest the type of data from the general tourism literature that could be collected for each.

Table 5 - Summary of sustainability indicators from ARC and literature review

GPN key 3 areas	**Sustainability areas**	**Sustainability Indicators**
A. Greening the Pilgrimage Experience (including green infrastructure, buildings, and energy efficiency and transport).	1. Greening buildings - For all faith buildings not used for accommodation, i.e. offices, pilgrim centres	• seasonal and annual energy use • % of energy consumption from renewable resources • % of buildings participating in energy conservation programmes • record the energy performance rating on all buildings, e.g. in the UK there is the Energy Performance Certificate (EPC) rating scheme.
	2. Greening pilgrim accommodation	• energy use per pilgrim per day • water use per pilgrim per day • adoption rates of fluorescent compact light buildings • adoption rates of new technologies such as light sensors and timers • % of dual flush toilets • % of shared accommodation • average stay length (indicator of washing requirements) etc.
	3. Waste management	• solid waste produced per day • % of waste recycled/composted • of coffees sold in take away cups in on-site cafes • % recycled products used • adoption of safe disposal of old appliances/electrical waste and electronic equipment/ batteries, etc.
	4. Energy efficiency	• the energy efficiency rating of all white goods including boilers – this will provide data on the

[31] A.D. de Cunha Lemos, Â.D and A. Giacomucci. Green procurement activities: some environmental indicators and practical actions taken by industry and tourism. International Journal of Environment and Sustainable Development, 1(1). 2002.p. 59-72.
F. Viljoen. Sustainability indicators for monitoring tourism route development in Africa. Master's Thesis, University of Stellenbosch, 2007.
J. Zuzana and L. Zuzana. Monitoring system of sustainable development in cultural and mountain tourism destinations. Journal of Competitiveness, 7(1). 2015. p.35-52.

		energy consumption per load of laundry, refrigerator running costs • % of new white goods purchased with A+++/A++/A+/A/B/C/D energy efficiency ratings, etc.
	5. Transport infrastructure	• % of pilgrims using different transport modes to arrive at pilgrimage site • % of same day tourists using different transport modes to arrive at pilgrimage site; visitor/pilgrim arrivals over the year, i.e. to identify time periods with potential issues around traffic/parking • efforts to reduce unnecessary transport trips, e.g. between sites within a pilgrimage site; etc.
	6. Greening water resources	• the water efficiency rating of all white goods – this will provide data on the water consumption per load of laundry/dishwasher load • % of new white goods purchased with A+++/A++/A+/A/B/C/D energy efficiency ratings • adoption of conservation measures, e.g. for irrigation, rainwater collection; etc.
	7. Having greener, kinder food	• % of meals eaten on-site • % of food wasted • % of ingredients that are fair trade/fresh/local/organic • % of meals that are vegetarian/vegan, etc.
	8. Green celebrations and festivals	• adoption of green catering standards for conferences and other events • adoption of greener relics and gifts, etc.
B. Undertaking Direct Conservation on Faith land	9. Conserving land, biodiversity & wild places	• the land-use composition of faith land, e.g. woods, grasslands, gardens • how faith land is managed • rubbish volumes/weight collected • % of trail and margins degraded • % of degraded land • length of trails managed • perceptions of quality of faith land; etc.
C. Undertaking or Supporting Indirect Action	10. Indirectly contributing to greater awareness of sustainability issues through education, volunteering and partnerships	• engagement with local schools, the Scouts, the Girl Guides, etc • numbers of volunteers for sustainability events, e.g. tree planting or trail maintenance • number of pilgrims volunteering for faith or local projects • adoption of guidance to encourage pilgrims to walk or cycle or take public transport and otherwise reduce their impact.

Finally, it should be noted that the ARC report begins and ends with discussion on: the importance of working in partnership with others through the faith-led network, local

businesses, secular groups and government; having a vision; assessing what is already being done; and strategically planning next steps.

What is missing?

In reviewing the literature, a gap in the ARC report (ARC, 2014) is data collected to address the economic and social impacts of pilgrimage.

For economic impacts other data could be collected in concert with tourism bodies on:

- the seasonality ratio
- the average occupancy rate
- % of local residents employed
- % of FT jobs
- ratio of tourists/pilgrims to local on average and peak days (all suggested indicators from UN WTO, 2004).

Social data could be collected through questionnaires, e.g. using Likert scales:

- local satisfaction with tourism (UN WTO, 2004)
- % of local residents who believe they benefit from the pilgrimage site (see Zuzana and Zuzana, 2014)
- % of visitors/pilgrims satisfied with the transportation options (see Zuzana and Zuzana, 2014)
- overall opinion of pilgrimage in the community (see Viljoen, 2007)
- the average expenditure per tourist;
- % of attractions that are accessible (see Zuzana and Zuzana, 2014)
- % of return tourists/pilgrims (see UN WTO, 2004) – this data might be available directly from pilgrim accommodation
- identification of potentially contentious issues through open-ended questions, e.g. parking.

Sustainability Indicator Toolkits

Of note there is an older, but still relevant tourism indicator toolkit – the ETIS (European Tourism Indicator System) aimed at helping destinations monitor and measure their sustainable tourism performance. The toolkit outlines 27 core indicators and 40 optional indicators – one of which covers social and cultural impact[32].

The Interreg project MITOMED+ has also produced a toolkit 'Sustainable Tourism Indicators - Manual of Transfer of Best Practices'[33]. This contains a series of short and varied case studies on how destinations have selected indicators, used indicators and benefited from gathering data. Advice includes:

- start small and avoid long lists of indicators
- select something specific

[32] European Commission. The European Tourism Indicator System ETIS toolkit for sustainable destination management. 2016. Available at: https://ec.europa.eu/growth/sectors/tourism/offer/sustainable/indicators_en (Accessed DEc9, 2019)

[33] Interreg MED (2018), Sustainable Tourism Indicators: Manual of Transfer of Best Practices,, (Marseille, France), Interreg MED Available at: https://mitomed-plus.interreg-med.eu/what-we-achieve/deliverable-library/detail/?tx_elibrary_pi1%5blivrable%5d=5921&tx_elibrary_pi1%5baction%5d=show&tx_elibrary_pi1%5bcontroller%5d=Frontend\Livrable&cHash=219225a31fbfdd0a43b77b897bf92ed4 (Accessed Dec 9, 2019)

- choose some indicators that can be comparable with other destinations so you can benchmark
- only collect data that you will use
- accept 'good enough' data.

Sustainability accreditation

Accreditation or certification can be used by pilgrimage sites to demonstrate that they have achieved voluntary sustainability standards. In so doing they can signal this to pilgrims and tourists through displaying their membership and/or achievement awards.

The European Green Pilgrimage Network

The European Green Pilgrimage Network is an example of a membership-based award. There are eight members – four in the UK Canterbury, Norwich, St Albans and Luss, plus Vadstena, Sweden, Trondheim, Norway, Etchmiadzin, Armenia, and Santiago de Compostela - with a dual objective that "pilgrims leave a positive footprint on the earth, and that pilgrim places become models of care for the environment" (

Other accreditation schemes

If a green pilgrimage achievement award were to be developed it could learn from other green tourism certification schemes.

For instance, the UK has a Green Tourism certification scheme[34] with three Award levels (Bronze, Silver, Gold). Annual membership fees apply and are based on the type of business and the number of FTE. The organisation also offers advice on eight areas: 'reducing energy use, saving water, efficient & eco-friendly waste disposal, ethical buying, staying local & seasonal, minimising food miles, promoting biodiversity and adopting a smart, sustainable outlook from top to bottom.

There are other green tourism schemes that go beyond greening businesses to incorporating local and community elements, for instance, the Peak District Environmental Quality Mark[35]. (This award is "presented by the Peak District National Park Authority to organisations that: support the local economy; protect the global environment; enhance the local environment; invest in people and communities; celebrate what's special about the Peak District National Park. When you buy a product or service that has been awarded the Environmental Quality Mark, you can be confident that you will be helping to look after the Peak District environment, as well as local people and communities."

International Accreditation schemes include the Global Sustainable Tourism Council's (GTSC) – Green Destinations Standard[36]. This covers: Nature and Scenery, Environment and Climate, Culture and Tradition, Social Wellbeing as well as Business Development. GTSC is an independent non-profit organisation whose standard is in line with UN protocols. The organisations also runs awards aligned with their accreditation process.

4.2 Environmental Impact Assessment

Environmental assessments are required for new developments in the UK to enable the Local Planning Authority to understand any environmental impacts of the development. Not

[34] Green Tourism. Available at: https://www.green-tourism.com/about-us
[35] Peak District Environmental Quality Mark Available at: https://www.peakdistrict.gov.uk/looking-after/eqm
[36] Green Destinations Standard. Available at: https://greendestinations.org/green-destinations-standard/

all developments require a full Environmental Impact Assessment (as defined under the *Town & Country Planning (Environmental Impact Assessment) Regulations 2017*, however any developments located close to statutory designated sites for nature conservation e.g. Special Areas of Conservation (SAC), or Sites of Special Scientific Interest will require adequate assessment to avoid any significant adverse effects on biodiversity.

Currently, any project close to an international, European or UK designated site requires consultation with Natural England. A local authority must carry out a screening exercise in accordance with the *Conservation of Habitats and Species Regulations 2017 ('the Habitats Regulations')* for any projects or developments close to European designated sites. The local authority would also be able to consult with Natural England and other statutory conservation bodies regarding proposed projects.

A typical report would contain details on

- Protected areas on a site
- Details of non-designated/ non-classified areas which are important or sensitive.
- Use of the site by sensitive species of flora or fauna (e.g. for breeding, nesting, foraging, resting over-wintering, or migration)

The scale and type of the development dictates the level of survey and consultation required. The appropriate level of assessment can then be undertaken according to the relevant legislation.

For smaller scale projects it would be deemed more suitable for a Preliminary Ecological Assessment to be undertaken. This would identify any habitats or species that need to be considered and identify any further assessments, mitigation and monitoring required.

More information can be found at the UK Government website[37].

[37]HM Gov. Environmental Impact Assessment. Available at: https://www.gov.uk/guidance/environmental-impact-assessment

5. Relevant tools and methodologies

This section is included to provide deeper understanding of relevant tools and methods available that are commonly used in valuation.

Section 5.1 explains non-market valuation, and why this is relevant in regarding to measuring value for example of concepts such as ‘nature’, ‘pilgrimage’ and ‘wellbeing’ that have no fixed market ‘price’ – for example there is no ticket entry to going outside an experiencing nature.

Section 5.2 provides information of the values can be gained through existing integrated tools. These can be used to provide estimated values where primary data collection is not viable. Tools can be used with instruction (this if often available online through toolkits).

Section 5.3 provides a summary of key methods related to three areas:

- **Methods that lie behind the design of surveys** (wellbeing measures, revealed preference – travel cost method, and stated preference – contingent valuation method). These will need some level of expertise to integrate into surveys.
- **The Benefit Transfer method** that transfers values from existing studies to provide an estimate of value without carrying out further primary data collection. Undertaking benefit transfer can range from very simple (where an established figure is already available that is relevant to your site) to requiring expert assistance where a wide literature review of previous studies is required.
- **Input-Output method** identifies economic benefit to a local community, this requires that data has been collected at the national/regional level and economic expertise to undertake the analysis.

Text in this section has been extracted from the *CSERGE-NCC FINAL REPORT; Review of methods, data, and next steps for valuing Norfolk’s trails*. To see the full version of this report please see appendix 1.

Practical examples using a range of these methods can be found in sections 7 and 8 where the case of Walsingham is used as an example for using methods to collect and analyse data.

5.1.Market and Non-market Values

Even the simplest of green infrastructure investments can generate a wide variety of environmental goods and services. For example, an unpaved woodland walking path can provide recreational opportunities, health benefits, habitat for wild species, air quality improvements, increase property values, reduced traffic congestion (especially if used by commuters), or support local businesses by attracting eco-tourists.

This section introduces core practical foundations necessary for valuing green infrastructure. It begins with a review of how economists think about prices and values, and shows how these concepts relate to the challenges of valuing green infrastructure.

5.1.1 Economists often use the market to capture value

Some impacts of green infrastructure are readily observable in a market e.g. the impact of the walking path on local business may be identifiable through surveys of pubs and cafes near trail heads that find our visitor spend. Market prices therefore can serve as a guide to

understanding the value generated by the path. This is however only the financial value and many of the benefits of multi-use paths cannot be captured in this way.

5.1.2 Economists also need to capture non- market values

Unlike market transactions such as spending in cafes, impacts such as recreational pursuits, human health, wild habitats, and biodiversity are not readily 'for sale' (or as economists would say 'traded in markets') and so there is no guiding market price. However, these benefits clearly have value, and ignoring them would systematically understate the value of the path.

Pilgrimage – travelling to sites/s of significance by means such as walking, experiencing nature in contemplation with the associated wellbeing benefits, is one such example where examination of non-market value is key to capturing the whole value.

In everyday usage, the words 'value' and 'price' are often considered interchangeable. But for environmental economists, the distinction between them is a fundamental concept. Market prices refer simply to the amount for which goods and services are traded in a market setting (e.g. a shop or café).

> For instance, visiting a private garden with a ticket price of £5.00. Such market prices have several features worth noting:
>
> - The higher the market price, the greater contribution each visitor makes to the market economy.
> - The higher the market price, the less likely it is that an individual will choose to visit the site.
> - There must be a market in which the good or service is traded, and this must be observable by the analyst.
> - Any good, service, or impact that is not formally traded in a market is implicitly assigned a market price of £0.

In contrast, economic valuation goes well beyond mere observations of traded market activity. Economic valuation is grounded in the idea that market prices do not fully capture the impact of economic activity. These non-market impacts are known as 'externalities' and can be positive (e.g. if visitors enjoy viewing wildlife or picking berries along a footpath) or negative (e.g. if local residents object to traffic or a loss of privacy).

5.1.3 Combining methods

Environmental economists have developed a range of methods for capturing these non-market benefits and reflecting their value in monetary terms. The variety of available methods means that it is now possible to capture a wide range of non-market impacts, thus better reflecting the myriad benefits of green infrastructure. This variety however can also complicate the valuation process because there is no single method that can be applied across all elements of green infrastructure, and which captures all the value streams (health, tourism, recreation, carbon emissions, etc). Fortunately, many real-world policy questions justify focusing on just one or a few of the potential value streams.

To provide a complete picture, any economic analysis must incorporate these non-market impacts. Dog walking, cycling, running, and horseback riding along multi-use paths generate substantial economic value, even though the market price for such activities is often £0. The non-market valuation methods described in section 5.1 directly address this issue and are the result of nearly 50 years of economic research and innovation. Whereas market prices consider contributions to market activity, non-market values consider contributions to human wellbeing. Some features of non-market values worth considering are:

- A site or path may generate high value, even if the market price of access is £0.

- The higher the value, the more likely it is that an individual will choose to visit the site.
- Non-market valuation methods enable us to value impacts and activities even where there is no formal market or observable price.
- Does not implicitly assume that non-market impacts have a value of £0.

We further discuss the wider considerations of which methods to use in Section 5.4 where we outline the expertise and resources needed for each method.

5.2 Existing Integrated Tools

There are available some existing integrated tools that can provide indicative estimates of value. These tools are based on existing large datasets and therefore might not be context specific to your pilgrimage site. However, estimated values can be produced without large resource implications, unlike carrying out primary data collection or sourcing this from other organisations. Tools such as these therefore can be very useful to provide an estimate of value where resources are not available to undertake new research. They can also be used to triangulate between values estimated in the wider literature and, if undertaken, your new value estimate for your site.

5.2.1 ORVal

What is ORVal and what does it provide?

ORVal is a tool based on a background map layer using OpenStreetMap, and additional spatial datasets to estimate:

- visitor numbers
- welfare value of visiting a site (space or path)
- number of people arriving by mode of transport (car, or other e.g. walking)
- how many of the visits are 'new' visitors

This tool does not require expert skills to use and there are clear user guides as to how to use it, and how the statistical modelling behind the tool works provided on the ORVal website (developed and supported by the University of Exeter, UK).

Visitor numbers

The statistical model behind ORVal predicts how likely it is that an individual will take a trip to a particular greenspace on a particular day. ORVal can therefore estimate visitor numbers. The likelihood that an individual would choose the site is affected by:

- the socioeconomic characteristics of the person
- the attributes and proximity of the greenspace
- the attributes and proximity of alternative recreational greenspaces

Welfare value

The 'Welfare value' refers to the monetary equivalent of the welfare enjoyed by individuals as a result of having access to a greenspace with particular attributes (e.g. the extent of woodland, the presence of a children's playground). The model behind this includes a calculation of the travel cost (costs incurred in travelling the greenspace) and subtracts this from the gain estimated in welfare value. This cost-benefit calculation provides us with an 'exchange rate' that we can estimate the relative value of any changes we make and how this affects people's choice to travel the amended site.

5.2.2 WebTAG

What is WebTAG and what does it provide?

WebTAG is the UK Department of Transport's (DFT) transport economic appraisal guidance used for all transport projects. The Active Mode Appraisal Toolkit[38] was developed to specifically appraise investment in cycling and walking routes.

The toolkit calculates a range of private and societal benefits including:

- journey quality
- health
- accident reduction
- decongestion and air quality improvements

As well as any disbenefits due to reduced tax revenue, from investments that encourage more walking or cycling.

A project's benefits can then be compared to project costs to determine if the investment passes a cost benefit analysis. Project costs comprise revenue and total capital costs and tax revenue dis-benefits. All benefits and disbenefits are provided in £.

Limitations

There are several limitations with the WebTAG toolkit:

- it is best suited to value urban transport design
- the active travel toolkit only values the costs and benefits of cycle and walking commuters and does not value increases in active tourism
- it does not account for other wider environmental benefits, e.g. biodiversity

5.2.3 HEAT (Health Economic Assessment Tool)

What is HEAT and what does it provide?

The WHO Health Economic Assessment Tool (HEAT)[39] for cycling (and walking) enables policy makers at the local, regional and national levels to estimate the economic value of the health benefits of increased cycling (and/or walking).

HEAT not only takes into accord the economic benefits of reduction in disease burden but also takes into account reduction of air pollution and accidents of proposed schemes. Given this, the tool can also estimate the reduction in carbon emission through any increase in cycling or walking.

When applying the tool, users are able to change some default values, e.g.

- uptake period
- trip or step length
- speeds
- mortality rate
- air pollution concentration

[38] HM Gov. WebTAG Active Mode Appraisal Tool. Available at: https://www.gov.uk/government/publications/webtag-tag-unit-a5-1-active-mode-appraisal-may-2018. (Accessed Dec 12, 2019)
[39] WHO. European Health Economic Assessment Tool. Available at: http://old.heatwalkingcycling.org/ (Accessed Dec 10, 2019)

- user type (if measure is likely to affect mostly older or younger people)

It effectively enables users to answer the following question:

> *If X people regularly walk or cycle an amount of Y, what is the economic value of the health benefits that occur as a result of the reduction in mortality due to their physical activity?*

The tool can be used to estimate the economic value of existing levels of cycling, the economic value of changes over time and to support the economic evaluation of new or existing projects, including the estimation of benefit-cost ratios.

5.3 Valuation Methods

For the Green Pilgrimage Valuation Toolkit, the most appropriate methodologies are laid out in the middle row of the diagram below.

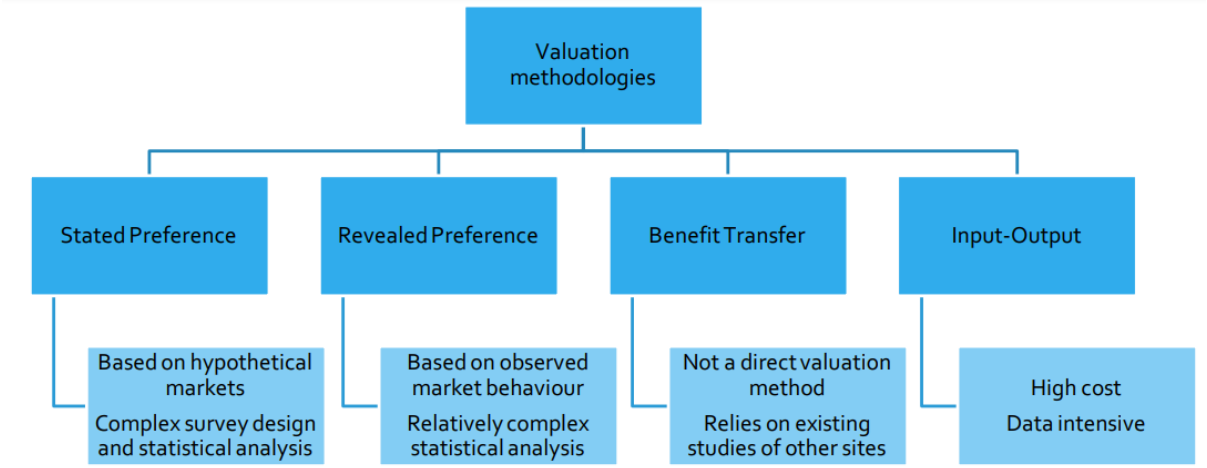


Figure 4 - Valuation methods

For each methodology we outline how NCC have used the method followed by:

- What is the method
- How does the method work
- Why you might use it
- What data is required
- Advantages
- Limitations

5.3.1 Stated preference: Contingent Valuation method (CV)

Stated preference refers to type of method where a person states their preference for something (as opposed to it being observed by their behaviour).

NCC have used CV method to ask visitors to Walsingham how much they would donate to a fund to maintain the Pilgrim Way footpath. An average of the figures given by respondents provides an indicative value – that mirrors what people think about how much they value they path.

What is the method	This approach generates a hypothetical market (in the case of NCC an imaginary 'fund' that people can donate to') through which survey respondents are asked to state their 'willingness to pay' for provision of, or

	changes to the environmental good[40]. In the case of the NCC Walsingham survey, this environmental good is the path.
How does the method works	The CV method elicits individuals' willingness to pay values *contingent* on there being a (hypothetical) market within which those values can be stated (Badura et al. 2016)[41]. The hypothetical market needs to be credible to survey respondents. In the case of NCC Walsingham survey, the hypothetical market is a 'fund to support the maintenance' (rather than simply asking people how much they would give to visit the path – which is not realistic and therefore not credible).
Why you might use it	Where you want to value what people would do, rather than what they are doing this alternative approach is needed. This could be around situations which have not yet occurred, for instance when the policy case is interested in a 'what if' scenario, e.g. if the trail quality were to improve / if the trail were to be extended what would happen to use of the trail
What data is required	A survey with a description of potential intervention(s) and questions to determine value. (Minimum 200 survey respondents). See appendix 3 for the Walsingham survey.
Advantages	This method has been widely applied worldwide over many years to many different 'what if' scenarios. It is therefore very adaptable. There are guidelines for best practice that include the crucial role of good survey design and implementation.
Limitations	It is site specific. If the location and 'what if' scenario are similar the survey can remain the same - however when conditions change adjustments are needed. Design and substantial testing of a survey (with the expertise need to this) is needed to provide credible values.

5.3.2 Revealed preference: Travel Cost method (TC)

Revealed preference refers to the type of method where a person's behaviour is observed and value calculation is based on assumptions from their observed behaviour.

NCC have used the TC method within the Walsingham visitor survey. The objective of using the travel cost method is to examine the reason for travelling and the factors that influence the frequency of this. Question categories required:

- Postcode and demographic information (age, income, employment status)
- How many times did you visit Walsingham in the last 12 months?
- Which is the main reason for visiting? (this question helps to identify whether alternative sites exist)
- How did you travel to Walsingham? How many days? How many people are travelling with you?

[40]K.J. Boyle. Contingent Valuation in Practice. In P. A. Champ, K. J. Boyle, & T. C. Brown (Eds.), A Primer on Nonmarket Valuation (2nd ed., pp. 83–132). Dordrecht, The Netherlands: Springer, 2017. Available at: https://doi.org/10.1007/978-94-007-0826-6_5 (Accessed 2018).
[41] T. Badura, I. Bateman, M. Agarwala and A. Binner. Valuing preferences for ecosystem-related goods and services. 2016. pp 228-242 in Routledge Handbook of Ecosystem Services, Routledge.

From this a 'willingness to pay' value can be gained for different type of visitors.

What is the method	The travel cost method is a commonly used approach for valuing recreational benefits. It relies on the premise that values of recreation benefits are implicitly shown in people's behaviour in travel markets[42]. People experience costs (e.g. petrol, ticket, time) in travelling to an activity in a location and these costs against how far they are prepared to travel provides an indicative value.
How does the method works	Through analysis of travel expenses in terms of actual travel costs, time costs and other costs incurred, it is possible to generate a demand curve for travel and then to assess the implicit price of travel to, for example, a recreational, historical, or pilgrimage site(s).
Why you might use it	To estimate the value of a particular trail or pilgrimage site (for different types of visitors)
What data is required	• Origin • visitation numbers + • survey to establish: size of party, mode of transport, length of stay, starting point to travel, home postcode, costs incurred on travel and other expenses, other sites visited, main activity, household income.
Advantages	provides a robust estimate to value recreational benefit
Limitations	• Site specific • This method is not appropriate for valuing trails that are mostly used by local residents for dog walking and recreation as they do not incur travel costs. • day and multi-day visitors need to be treated differently • technical knowledge needed to include all the relevant data to estimate value, i.e. access value for the site, as problem of multicollinearity might exist and undermine the validity of results.
Further information on how to calculate travel cost and welfare value are included in appendix 5.	

5.3.3 Benefit Transfer (BT)

NCC uses BT values in combination with visitation numbers and visitor surveys on certain Norfolk trails to estimate the value of the trail or using the BT value to apply where the value of a new path needs to be estimated for a funding bid.

The UEA also undertook a more complex literature review to provide mean values of the value of recreational activities. You can see an overview of the results of this in section 3.2.1. This provided a value of trail generic usage e.g. hiking or cycling activity but the studies on which this was based were not specific to pilgrimage. If we believe that pilgrimage includes other values then it is unlikely that BT based on hiking will incorporate the full value

[42] G.R. Parsons. Travel Cost Methods. In P. A. Champ, K. J. Boyle, & T. C. Brown (Eds.), A Primer on Nonmarket Valuation (2nd ed., 2017. pp. 187–234). Dordrecht, The Netherlands: Springer. Available at: https://doi.org/10.1007/978-94-007-0826-6_9 (Accessed 2018)

of pilgrimage. It is for this reason that a decision was made to undertake primary research to value pilgrimage sites and pilgrimage walking.

BT however can be very useful and practical to use where there are relevant studies, providing a readily available option compared to undertaking new research.

What is the method	Benefit Transfer is not a valuation method per se, as it is based on results from previous valuation studies. In essence you transfer the benefits calculated from one similar site to another 'policy' site. It is a pragmatic approach, recognising that it is not possible (or necessary) to value all environmental goods in those cases where there are existing studies from which values can be robustly extrapolated to 'policy' site/s.
How does the method works	Benefit transfer takes information from previously assessed 'study' sites and utilises this value to estimate values for some alternative 'policy' site, or for different changes at the same 'study' site (Badura et al. 2016). <u>Benefit transfer for similar sites</u> When transferring between similar sets of sites benefit transfer can be a simple transfer of adjusted mean values (univariate transfer). In its simplest form willingness to pay values from the study site (or a pool of such studies) are transferred to the policy site(s). <u>Benefit transfer for heterogenous sites</u> In contrast to a simple transfer of adjusted mean values, a value function transfer approach employs statistical methods to estimate a relationship between the policy site characteristics and willingness to pay values (previously) estimated[43]. The derived function is then used to predict values for the policy site(s).
Why you might use it	To estimate the value of particular trail, pilgrimage site, or for 'what if' scenarios, including creation of a new trail or pilgrimage route. In cases where the costs to undertake primary research are not available or justifiable against net gain, or where an initial value is required, benefit transfer can be a cost efficient alternative.
What data is required	• review of existing valuation studies on the topic, e.g. on walking and cycling on trails or on valuing pilgrimage.
Advantages	• There is no need to do an original travel cost or contingent valuation study. • Depending whether a simple or more complex BT is necessary, BT is accessible for non-experts.
Limitations	• Benefit transfer relies on there being sufficient existing good quality studies to draw on. This is a particular problem for pilgrimage. • It would be possible to use existing studies on walking to estimate the value of green pilgrimage, however, studies of walking are unlikely to

[43] Bateman, I.J., Brouwer, R et al. Making benefit transfers work: Deriving and testing principles for value transfer for similar and dissimilar sites using a case study of the non-market benefits of water quality improvement across Europe. *Environmental and Resource Economics*, 50(3). 2011. pp 365-387.

	capture the mental and spiritual wellbeing aspects of pilgrimage walking.

5.3.4 Input-Output (IO)

Methods such as the Input-Output method can ascertain the wider, indirect economic benefits of pilgrimage such as jobs created, workplace opportunities for the younger population and multiplier impact of the visitor spend. However, this method requires considerable technical expertise and resource and testing of this method is therefore outside the scope of this study.

What is the method	Economists have long recognised the importance of indirect, knock-on effects of direct spending. The formal method for calculating the summed economic impact is known as input-output (IO) analysis and is regularly used for macro-economic modelling at the global, national, and state level[44]. Such models are often used to calculate 'multiplier' effects, or to model the general equilibrium effect (economy-wide) of a change in demand or supply within a specific sector. In our example (below), the multiplier effect is 1.4925, meaning that every £1 spent on hotel stays induces a total market impact of £1.4925.
How does the method works	Imagine a Norfolk village that is in a state of economic equilibrium. Overall, the village economy is relatively stable and the demand for goods and services is more or less matched by the supply. Local businesses buy and sell goods and services from each other, and sell them to local residents (many of whom work at those businesses). Whatever is not produced or consumed by the village is imported or exported. Now imagine that a family from out of town comes to visit for a weekend – perhaps on pilgrimage, or to visit a local heritage site. The family pays £100 for a bed and breakfast (B&B - small family hotel), with a direct economic impact of £100. But this visit sets off a chain reaction of related economic activity, known as the 'indirect effect'. The B&B pays cleaning and catering staff for an extra hour of labour to prepare the room (£15). They purchase extra pastries from the local baker to serve at breakfast (£5) and sausages and eggs from the local butcher (£10). These are transported by a local delivery service (£4). The butcher and baker in turn need to purchase flour, meat, and eggs from local farmers (£6.25), all of which need to be transported by the delivery service (£4), who now needs extra fuel and labour (£5). Thus, the sum of the indirect effects is £49.25 (£15 + £5 + £10 + £4 + £6.25 + £4 + £5). In this highly simplified scenario, the total market impact of the hotel stay is £149.25. Focusing only on the direct effect of daily expenditure by the family would understate this, significantly.
Why you might use it	• To estimate the multiplier effect for a specific industry/sector

[44] R.E. Miller and P.D. Blair. Input-output analysis: foundations and extensions. Cambridge University Press, 2009.

	• To demonstrate the economy-wide impact of a change in supply or demand in a specific sector • To estimate the economy wide effect of a change in average daily expenditure by tourists.
What data is required	• Detailed 'supply and use' tables • Leontief matrix • Survey data of daily tourist expenditure
Advantages	Captures the full market impact (direct + indirect effects) of market activity.
Limitations	Requires considerable technical ability, prohibitively high data requirements, cannot be reliably used at a small (local) scale (e.g. specific to green pilgrimage in Walsingham), only captures market impacts (not economic value) which means it would miss most of the key benefits e.g. wellbeing.

5.3.5 Wellbeing Measures

Non-market valuation is a powerful tool for identifying, analysing, and interpreting the myriad ways in which green infrastructure impacts people. It can help decision-makers understand the benefits of green infrastructure investments, and facilitates 'apples to apples' comparisons against other areas of public spending.

However, some impacts of green infrastructure remain difficult to value directly in monetary terms, and are best captured via complementary methods. In particular, green infrastructure can enhance components of wellbeing – physical and mental health, a bond with nature, spiritual health, interpersonal relationships (community cycle events, running clubs, friends exercising, etc) – that may not be fully reflected in a valuation exercise. If the policy question of interest relates to these types of wellbeing enhancements, a valuation exercise could be greatly enhanced by including a wellbeing specific survey.

Interpretations of wellbeing

There is no universally accepted definition or measure of wellbeing, but several interpretations have proved useful in the research literature (MacKerron 2011; Agarwala et al. 2014):

1. *Preference satisfaction:* wellbeing is determined by one's ability to meet personal wants (e.g. are you able to satisfy your daily wants?);
2. *Objective lists:* wellbeing entails fulfilling externally defined material, social, and psychological needs (the researcher defines and lists the constituents of wellbeing and asks respondents whether these are fulfilled – e.g. are you married, do you have children, do you own your own home, do you exercise enough, etc);
3. *Eudaimonic/capabilities:* wellbeing entails meeting one's full potential in various domains of life (e.g. how satisfied are you with your life in general?)
4. *Hedonic:* wellbeing is defined in terms of dominant moods and feelings (e.g. on a scale of 1-10, how happy are you?)
5. *Evaluative:* in which individuals report self-evaluations of their own wellbeing.

How to choose a wellbeing measure?

Surveys can be designed that focus on only one of these wellbeing interpretations, or that combine elements of several within the same study. In some cases, it is adequate simply to know how respondents rate their wellbeing on a 1-10 scale, and it is not necessary to

investigate the specific constituents of wellbeing and how they come together to make up that score.

The benefit of this self-reported approach is that the identification and relative weighting of wellbeing constituents is left to the respondent and can differ across individuals. For instance, families that return to the same campgrounds and coastal walks for generations might derive substantial wellbeing from it, whereas other respondents may green focus may focus on the ability to cycle commute so the wellbeing indicators capture different domains of life satisfaction.. Self-reporting on a common scale allows each respondent to determine such factors for themselves. This approach enables us to understand the overall wellbeing impact of infrastructure, but not its effect on specific constituents of wellbeing. Such a survey might only require one or two simple questions:

1. How happy do you feel today? (scale, 1-10)
2. How happy do you feel with your life in general? (scale, 1-10)

In some cases it may be necessary to focus on specific constituents of wellbeing. For instance, if our policy question relates to the health impacts of green infrastructure, it would be reasonable to tailor the survey questions to include health-based information. In this approach, the researcher would specify which constituents of wellbeing they wanted to assess, but allow the respondents to make their own subjective evaluations. Relevant questions for such a survey might include:

1. How happy do you feel today? (scale, 1-10)
2. How happy do you feel with your life in general? (scale, 1-10)
3. How do you rate your mental health nowadays? (5 point scale, ‘excellent’ to ‘very poor’)
4. How do you rate your physical health nowadays? (5 point scale, ‘excellent’ to ‘very poor’)
5. How often do you feel lonely? (5 point scale, ‘most days to ‘hardly ever’)

Options for wellbeing measures

Wellbeing measure - ONS4

In the NCC Walsingham survey we used the UK government’s Office of National Statistics Personal Well-being questions. There are four measures of subjective well-being, often called ONS4. These capture three types of well-being: evaluative, eudemonic and affective experience, see below. These 4 questions need to be integrated verbatim – the advantage of this is that survey responses can be compared to the national average.

Table 6 - ONS Four measures of personal well-being

Next I would like to ask you four questions about your feelings on aspects of your life. There are no right or wrong answers. For each of these questions I’d like you to give an answer on a scale of 0 to 10, where 0 is “not at all” and 10 is “completely”.	
Measure	**Question**
Life Satisfaction	Overall, how satisfied are you with your life nowadays?
Worthwhile	Overall, to what extent do you feel that the things you do in your life are worthwhile?
Happiness	Overall, how happy did you feel yesterday?
Anxiety	On a scale where 0 is “not at all anxious” and 10 is “completely anxious”, overall, how anxious did you feel yesterday?

Source: Office for National Statistics

EU Wellbeing measures

Alternative wellbeing measures have been developed and a possible good choice for the EU is the self-reported EuroQol Visual Analogue Scale (EQ-VAS). EQ-VAS is a part of EQ-5D, a standardised instrument to measure health-related quality of life. The advantage of using such a quantitative measure is that it has been statistically linked to the Quality-Adjusted Life Year (QALY) measure, which in turn can be valued monetarily for use in cost-benefit analysis (CBA).

To develop such measures for the NCC Walsingham case, a survey instrument could test whether walkers in general, and pilgrims specifically, self-report higher levels of wellbeing than the general public (for which there is national data). The self-reported values could then be converted to QALYs and used in a CBA.

5.4 Summary of recommendations

Below is a summary of recommended methods and tools for valuing green pilgrimage

5.4.1 Table of recommendations

Table 7 – Summary of recommended methods.

What to value	Data needed	Options to get data			Rating 1 = Very few barriers 2 = ok 3= difficult
		Gather primary data	**Alternative tool**	**Data from elsewhere/expert analysis needed**	
Expenditure Value (Direct)	Average visitor spend	**Survey** question – How much have your spent on your visit?	Average spend value available from MENE (Monitor Engagement with Natural Environment). Note: This is just for recreational activity and does not included added value of pilgrimage.		1
	Number of people	**1) People counter data** **2) Surveyors counting**	ORVal Tool (statistical modelling of route on map provides estimated visits)		1
Physical Health	How long walked for/level of activity	1) **Survey** question - How many minutes exercise have your done today? 2) **App** such as Better Points	HEAT (Health Economic Assessment Tool) EU wide WHO tool which provides value of exercise		1
Wellbeing	Four questions based on one point in time:	**Survey** - 4 standard wellbeing questions from UK Office National Statistics.			1

	• Life satisfaction • Life is worthwhile • Happiness • Anxiety	Note: this is now attuned to European Survey on Income and Social conditions.			
	Rating of visit/pilgrimage	**Survey** question – how often have you felt calm and peaceful: 1) in the last 4 weeks 2) during your visit/pilgrimage			2
Economic Welfare/ Social value (Indirect)	No of volunteering hours			Request data from local organisations	1/2
	No of school visits			Request data from local organisations	1/2
	£ figure for proposed route	**Survey** question based on choice experiment or contingent valuation.	ORVal Tool (statistical modelling of route on map provides 'Welfare value'		2
	Similar studies that value: • £ per access to site • £ per km For activities & habitats.			**Benefit Transfer** to be carried out by expert	2
	Cost visitor would pay for visit	**Survey** question based on revealed preference.		Expert analysis required	2
Multiplier value	How much money into local economy – spend and jobs created			**Regional Input/Output table** recommended however these are not always available. Undertaking a **'**Lighter version' is feasible using national data co-efficients but will be less accurate.	3
Environment	Various	Environmental sustainability indicators (see section 4.1) can be incorporated into surveys or existing data requested from		Academic institutions are working on valuing natural capital. Experts are needed in this area.	3

		stakeholders/businesses.			

5.4.2 Choosing methods and tools

Although the prime consideration for selecting methods and tools will be guided specific objectives and research questions (see section 7 'Planning your study'), it is logical to also consider the enablers and barriers attached to certain methods, and the ease with which you can undertake them.

In the table above, the far right column indicates the level of difficulty from 1-3 (where 1 indicates the easiest), and the rows of value areas are organised in order of difficulty from easy to difficult.

Section 6 (a case study of data collection in NCC Environment team) outlines in more detail the journey the team has been on, starting with some of the simplest data collection, and working towards using and combining more involved methods.

Below however we outline some of the key factors that can affect data collection using the different methods and possible solutions to barriers.

5.4.3. Resources and expertise

The rating scale aims to help you rationalise what you can do with your current resources, and identify 'quick wins' where resource requirement is low.

Collection of primary data inherently has resource implications – in terms of any expertise that may be required to design a survey and analyse data, and people required to undertake data collection.

Options for low resources may be to:

- review what data does exist before deciding on designing primary data collection (this could be from existing studies, data held by partner organisations)
- use the alternative tools suggested to generate estimated figures
- consider recruiting volunteers to undertake data collection
- consider online surveys or using an app like 'betterpoints' where people are incentivised to provide you with data.
- utilising 'masters' level students to undertake some data analysis

5.4.4 EU substitutes for tools and data sets

A number of examples given in this review refer to UK based tools or datasets. The table below outlines existing known options of equivalents that can be used as substitutes.

UK tool or dataset	**Recommendation for EU partners**
MENE (Monitor of Engagement with the Natural Environment) – see section 3.1.1	There are no known free to access available tools equivalent to MENE. However, the MENE dashboard can be used in country mode (as opposed to regions of England) to give average

	figures. Furthermore MENE data can be used by experts by designing functions to adapt to new EU contexts[45].
ORVal – (Outdoor Recreation Valuation) using MENE data– see section 5.2.1	No EU equivalent developed yet.
HEAT (Health Economic Assessment Tool) – see section 5.2.3	HEAT as a tool is used in the EU.
ONS4 Wellbeing Indicators – see section 5.3.5	EuroQol Visual Analogue Scale (EQ-VAS). EQ-VAS is a part of EQ-5D, a standardised instrument to measure health-related quality of life.
Tourist figures for UK	Government departments and municipalities will produce their own tourist figures. EU countries holds regional I-O tables and this can provide tourist figures and multipliers e.g. Spain and Italy have regional I-O and National ONS can provide tourist figures by regions

[45] S. Vallecilloa, A. LaNottea, G. Zulian, S. Ferrini, and J. Maesa. Ecosystem services accounts: Valuing the actual flow of nature-based recreation from ecosystems to people. *Ecol Modell.*Vol. 392. 2019. pp.196-211.

6. Case study: Norfolk County Council ‘using data for impact’

This section provides information about the NCC Environment team, what they have done to start collecting data and how they are using this.

6.1 Context for NCC Environment team

Norfolk County Council is the top tier local government authority across the Norfolk Area and has a range of statutory duties including the highways authority including administration of public roads and public rights of way (PROW). Within NCC the Environment Team has a wide range of responsibilities including the promotion of the 3,900km of Public Rights of Way across Norfolk. These include 13 long distance paths branded Norfolk Trails[46] which includes two national trails; the Peddars Way, and the Norfolk Coast Path.

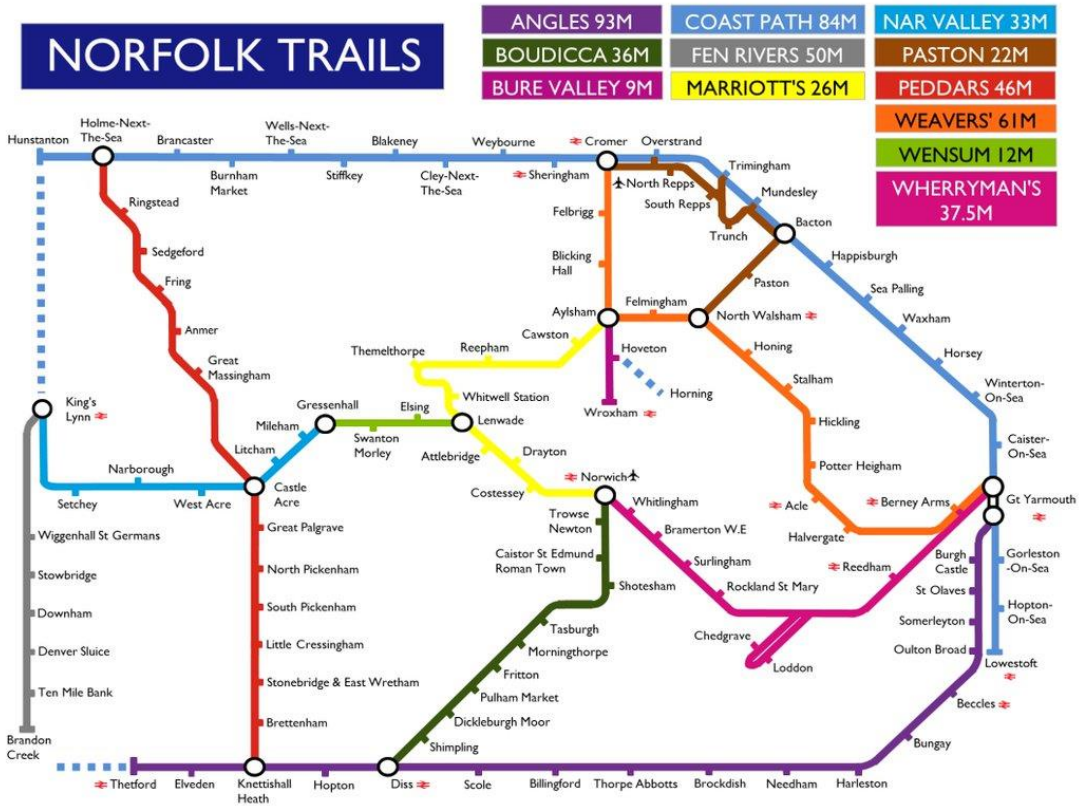


Fig 5 - Map of the Norfolk Trails Network

These long-distance trails have been developed to link in key communities across Norfolk and are promoted with a consistent look and feel of promotional material.

A key element of the development of the Norfolk Trails Network has been incorporating data counters and survey boxes across the network. This has allowed the creation of annual trails reports to view trends in use and comments from users to support the valuation of the path and prioritise further investment.

6.2 What tools/methods do we use, and what data have we collected

[46] Norfolk County Council. Out and About in Norfolk. Available at: https://www.norfolk.gov.uk/out-and-about-in-norfolk/norfolk-trails/long-distance-trails

Currently the Norfolk Trails Network has over 39 counters across the county, some are fixed while some are moveable if shorter term count data is required. Initial counters used were people counters we have moved to use number counters that distinguish between walkers, cyclists and horse riders and also determine the users direction.

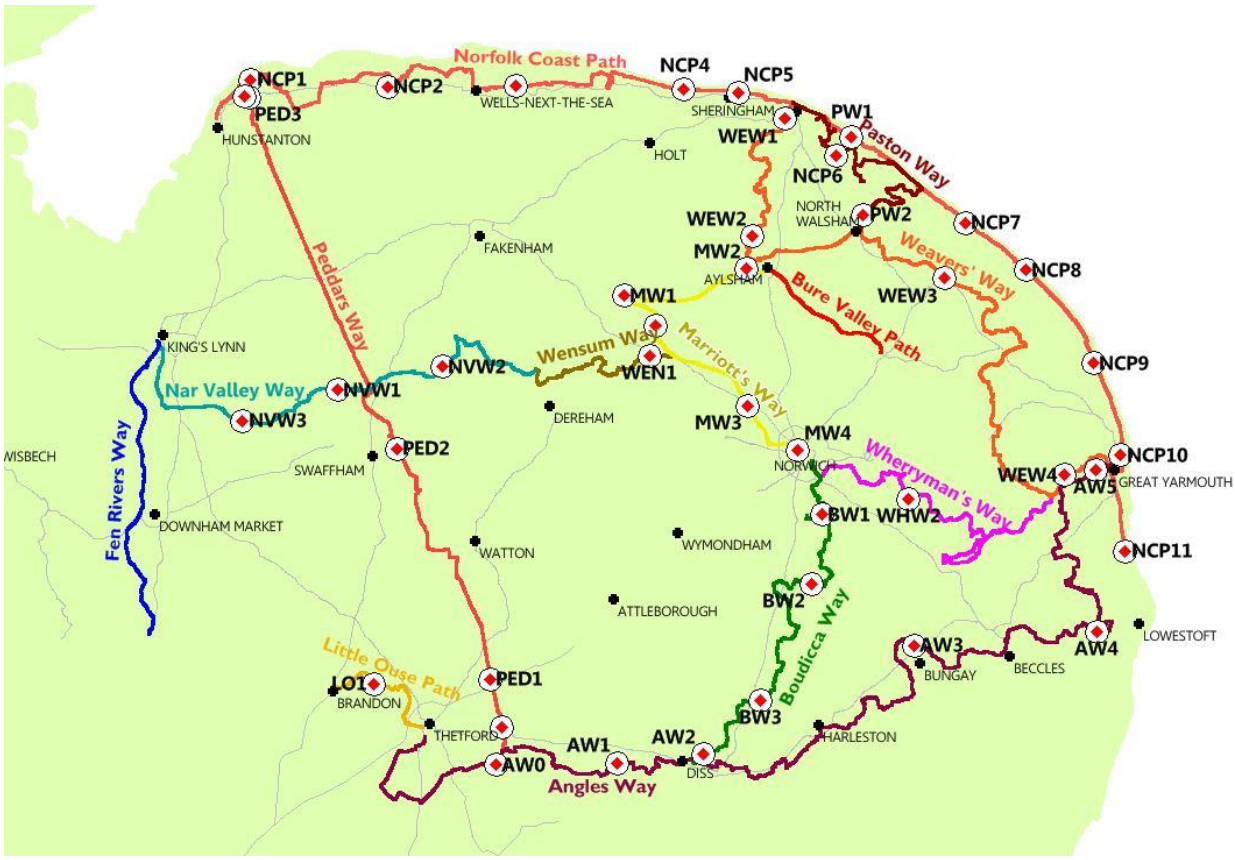


Fig 6 - Map of the location of data counters and survey boxes in Norfolk

The trails network uses a visitor survey (see appendix 2) and has recently also commissioned additional survey work through consultancies to gain specific information on the financial benefit and public perceptions of the newly opened sections of the coast path and also on the Weavers' Way in advance of improvement works.

More recently we have used the Betterpoints App[47] in Norwich and Great Yarmouth- this is an activity tracking app which rewards users for active travel. This app is focused on behaviour change and is available across the UK and Europe. As well as incentivising active travel the app provides Norfolk County Council with anonymised information so we can observe where people are walking and additional useful information including average speed, average length of journey and time of journeys. This information is useful for planning of new walking and cycling routes as well as demonstrating the use of new infrastructure. This information also provides a dataset for creating a baseline for average walking and cycling journeys when forecasting the benefits for future routes.

We are also prioritising gathering information on community assets as part of our Greenways feasibility work, looking to develop a new trails network, we are including community assets as part of the information collected as part of the route audit work. This can help identify the benefits the routes can provide for local communities including business and schools. We have also identified other facilities e.g. transport links and accommodation. This allows the

[47]Betterpoints. Available at: https://www.betterpoints.ltd/

report to look at the infrastructure e.g. resurfacing required for the routes and key attractors for the route e.g. heritage sites and key ecological sites. This information allows NCC to be focused on the specific benefits the new or improved infrastructure will bring.

6.3 Why we collect data / What data has enabled us to do

Being able to collect the data from the counters and through trail surveys has primarily provided NCC with a useful baseline to see the usage numbers improve following improvements and promotion of a route. This can also then used to forecast the potential benefit for future schemes enabling NCC to make evidenced based decisions and supporting funding applications. For example following feedback from the trail surveys we know that circular walks, using our linear routes are very popular. Therefore as part of the recent successful funding application for improvements on two of the trails, the Weavers' Way and the National Coast Path, we included circular walks as part of our circular walk application, this request being evidenced through the surveys.

This data has been successfully useful in funding applications to gain external funding for improvements across the network. The successful applications for the Weavers' Way and Holkham path have brought in over £1,000,000 and we have used the collected data to show current usage and potential uplift in usage following the completion. A valuation completed schemes was included in the application and detail on this in shown section 5.4 below. We have also been able to show how we are able to quantify the benefits to our funders and how these improvements support the wider funding outcomes.

This data also allows us to get wider buy in from local stakeholders including Small Medium Enterprises (SMEs). An example of this has been the business engagement workshops held to support the Coastal Treasures[48] circular walks. These workshops provided an opportunity for the businesses to learn more about the project and how they can benefit from it, and also, in turn, the businesses will help promote the walking routes. We were able to show current usage number for routes to clearly demonstrate the businesses potential and had additional supporting information; for example average daily spend of users on a day trip vs average daily spend of users on a multi-day trip. A toolkit is available as a follow on from the related COOL tourism project[49].

6.4 Identifying Return on Investment

As more data based evidence is required for funding bids it is increasingly important to have accurate baseline data and to be able to forecast the benefit through assumptions based on relevant data. As we continue to improve and expand the Norfolk Trails network the data we have gathered over the last 10 years, and we continue to gather, becomes more and more important.

For the current data counters we know that the Weavers' Way, in 2016/17 had 51,768 users. Using the average visitor spend from the MENE data we can estimate this brought in a spend of £1,799,456 to the local economy. With the improvement to the route we have estimated to grow the yearly visitor number to 219,257 by the time the project is complete in 2023. Based on the increased yearly visitor numbers we can see that an additional

[48] Norfolk County Council. Coastal Treasures walks. Available at: https://www.norfolk.gov.uk/out-and-about-in-norfolk/norfolk-trails/coastal-treasures

[49] Norfolk County Council. COOL Rural Tourism Business Toolkit. Available at: https://www.norfolk.gov.uk/business/business-services/cool-rural-tourism-business-toolkit

£13,662,553 will be spent by the project end. Against a project budget of £899,723 it provides a Return of Investment value of 15 to 1.

6.5 What we have learned to shape future collection

For future data collection we need to look at how we can increase the visits to our network without causing any impact on the biodiversity on the trails. This may include promoting routes with a higher carrying capacity (for example with less key species that may be disturbed by walkers/ dogs and a wider path width to prevent enhancement of the habitat).

We also are looking to gain additional information on the wellbeing and mental health benefits of the physical activity on users. This can help Norfolk County Council target areas where social isolation is a problem by providing community volunteering opportunities or community led activities like led walks.

It can also help target areas with a high number of people living with dementia. Increasing physical activity (150 mins per week) can reduce the risk of developing Alzheimer's disease by 21.8%[50] and also physical activity can reduce cognitive decline. Continuing the data collection, both though counters and surveys can provide important information to support the value these interventions bring.

For future studies we are looking at recent Waterford Greenway study[51] as an example of the type of reporting we can complete following the delivery of new infrastructure. This was an Intercept Survey of users linked with automatic cycle and pedestrian counters which were installed at keys points along the extend of the route. 1,177 survey responses were completed across 4 days with eight hour periods (11am to 7pm) between August and October.

The results of the study provided results on

- How the users had heard of the Greenway
- How the user had travelled to the Greenway
- What the purpose of the trip was
- Visitor spend as part of the trip
- Number of nights stayed for tourists
- Perception of the Greenway

This level of detail, once new infrastructure is in place, is very useful and will help support future infrastructure opportunities. For future new infrastructure projects we would look to conduct surveys with a similar level or details as the Greenway Intercept study to gain a large response close to the opening of the new infrastructure and also detailed count data as well. We are currently working on feasibility for a number of similar, large scale, Green Infrastructure process and the detailed intercept study will to be included in the project delivery plans.

[50]National Health Service. 'Exercise may help prevent Alzheimer's disease'. 2014. Available at: https://www.nhs.uk/news/lifestyle-and-exercise/exercise-may-help-prevent-alzheimers-disease/ (Accessed Dec 12, 2019)

[51] AECOM. Waterford Greenway Intercept Survey 2017: Baseline Survey Report. Available at: http://www.waterfordcouncil.ie/media/greenway/WaterfordGreenway-BaselineSurveyReport-Jan2018.pdf (Accessed Dec 14, 2019)

7. Case study: collecting data in Walsingham

7.1 Context

7.1.1 Walsingham

Walsingham, located in Norfolk, UK is a site of national importance for pilgrimage, representing over 1000 years of history. Walsingham Abbey which contains that site of the original shrine is now joined by the Anglican Shrine in Little Walsingham village, as well as the Catholic Shrine in the nearby village of Houghton St. Giles.

Fig 7 – Map of Norfolk showing location of Walsingham

Walsingham Estate provides a tourist information facility as well as a range of year round events at the Abbey. There is a village pub in the market place, as well as the Walsingham Light railway. Little Walsingham village has a few gift shops, cafes and a number of shops that make and sell religious souvenirs. There is however much potential to develop improved visitor attractions.

The population of Little and Great Walsingham is approximately 800 people, visitors (including pilgrims) annually approx. 300,000. Through its activities, Walsingham has an extended visitor season to some extent, however many visitors arrive in large groups for key events in the religious calendar meaning there is a large impact a certain times of the year on the roads in and surrounding the village.

Few visitors arrive on foot, there is an hourly bus service between Wells and Fakenham but the majority arrive by coach, minibus or car.

Currently there is a 1 mile ‘permissive path’ across land privately owned by the Walsingham Estate from Walsingham village south to the Catholic National Shrine at Houghton St. Giles. The path known as ‘Pilgrim Way’ is walked by locals, pilgrims and other visitors to Walsingham.

Fig 8 – Image of Pilgrim Way

7.1.2 Challenges and opportunities in Walsingham

Through the ‘Green Pilgrimage’ project, working with local stakeholders, NCC has been able to gain a better understanding of the benefits and opportunities that pilgrimage can offer to pilgrims and also pilgrimage routes and destinations.

NCC has taken a closer look at pilgrimage in Norfolk and identified Walsingham as a unique pilgrimage destination, which draws high numbers of visitors each year (estimated 300,000). In relation to its population size this presents a numbers of challenges. In consultation with parts of the Walsingham community and the surrounding area we have taken a closer look at the benefits and issues that being such a renowned destination can bring.

Although a small number of individuals and groups choose to walk to Walsingham, the majority of visitors travel by coach or car, sometimes causing congestion and disruption in this small medieval village and surrounding area.

The high number of visitors brings some economic benefit to the area, mainly via employment at the Anglican and Roman Catholic Shrines. However it is recognised that as the majority of visitors are only present for part of one day, this limits spend in the locality affecting local businesses.

Through analysis undertaken so far, NCC believe that it is possible for this beautiful part of Norfolk to become more sustainable, both environmentally and economically. Through partnership working with the local community, we aim to carefully consider the options for walking and cycling infrastructure which would benefit locals and encourage a small proportion of visitors to take a lower-impact travel option to visit this unique destination.

This links with NCC's wider plans and considerations for development of paths, access to the countryside and reducing the effect of disease burden on public health.

7.1.3 The case for development of Greenways in Walsingham

Public Rights of Way in Norfolk provide 3,863km of access (of which 700km is on Norfolk Trails managed to National Trail standards[52]). However, whilst the network is relatively dense in some districts such as South Norfolk, it is sparse in others. In the Norfolk Access Improvement Plan (NAIP)[53], which sets out priorities for increasing public use and enjoyment of Norfolk's public rights of way network, it is also identified that:

- The Sport England Active People Survey[54] results have consistently shown that some groups are under-represented in terms of participation. This includes women, disabled people, some black and minority ethnic (BAME) groups, those from certain socio-economic groups and older people (over 75).
- MENE results also show that those who are less likely to have taken a visit to the natural environment were those of BAME, those aged 65 and over, those with a long-term illness or disability and those in certain social grades[55].

NCC have a statutory remit to enable access to the countryside, particularly with the view to meeting the UK government's health target for people to be active for at least 150 minutes per week[56].

Norfolk Insight (2017) Health and Wellbeing Profile[57] reports obesity in adults for the town Fakenham as being 'significantly worse than the average for England. Work to meet the government target for daily physical activity is therefore particularly relevant in this area.

In sum, there is a strong case for prioritising spending on developing access to the countryside for local people in the Fakenham and Walsingham area, with the co-benefits described in section 7.1.4 below.

7.1.4 Opportunities for development in Walsingham

Development of a 6 mile route from Fakenham to Walsingham would provide the following benefits:

- Reducing traffic on the roads around Walsingham for visitors to the shrines
- Provide options for off road commuting between Fakenham and Walsingham

[52] Natural England. The New deal; Management of National Trails in England from April 2013 (NE426). Available at: http://publications.naturalengland.org.uk/publication/6238141 (Accessed Dec 12, 2019)
[53] Norfolk County Council. Norfolk Access Improvement Plan. Available at: https://www.norfolk.gov.uk/out-and-about-in-norfolk/public-rights-of-way/norfolk-access-improvement-plan. (Accessed Dec 10, 2019)
[54] Sport England. Active People Interactive. Available at: https://activepeople.sportengland.org/ (Accessed Dec 10, 2019)
[55] HM Gov. Monitor of Engagement with the Natural Environment: Headline report and technical reports 2018 to 2019. Available at: https://www.gov.uk/government/statistics/monitor-of-engagement-with-the-natural-environment-headline-report-and-technical-reports-2018-to-2019 (Accessed Dec 12, 2019)
[56] Department for Public Health. Health matters: getting every adult active every day. 2016. Available at https://www.gov.uk/government/publications/health-matters-getting-every-adult-active-every-day/health-matters-getting-every-adult-active-every-day (Accessed Dec 9, 2019)
[57] Norfolk Insight. Health and Wellbeing Profiles. Available at: http://www.norfolkinsight.org.uk/jsna/document-library/health-and-wellbeing-profiles/ (Accessed Dec 9, 2019)

- Provide an enhanced pilgrimage experience (walking the last distance to Walsingham), lengthening itineraries and potential spend in the local area
- Improve connectivity between Fakenham and the North Norfolk Coast, enhancing tourism itineraries
- Health of local people

7.2 What are we seeking to value and why

As part of the Green Pilgrimage project NCC has focused its research and stakeholder development on understanding the challenges and opportunities for Walsingham (as key pilgrimage centre) and its surrounds.

NCC's key deliverable has been to develop, in collaboration with our local academic partners, a methodology to measure the economic, social and environmental impact of pilgrimage.

A core focus of this valuation work, that crosscuts with NCC Environment team's work of access to the countryside, has been to value walking routes and the activity of walking, however the 'green pilgrimage' aspect has guided the methods used to also capture the additive wellbeing effects of pilgrimage walking (above just walking) and the environmental sustainability of this type of visitor to a community.

eAlthough the survey developed is specific to Walsingham, themes above are universal, and the scenarios investigated – an extension of a path or making an improvement can be adapted by partners as needed for their scenarios.

Hypotheses:

- Walsingham provides greater recreational value for pilgrims than visitors
- Walking has a significant wellbeing value
- Pilgrimage walking has greater wellbeing value than for other types of walkers
- Pilgrims support and would use a path extension

7.3 Methods/Tools we are using

- People counters
- Estimated values
    - ORVal – average visitor numbers predicted for path extension
    - Benefit transfer
- Survey incorporating Travel Cost method, Contingent Valuation, Contingent Behaviour, Wellbeing, sustainability indicators

We are also have access to previous data:

- Data provided by Shrines (visitor numbers)
- Accommodation capacity around Walsingham
- Norfolk trails data (average spend)
- Visit Norfolk (DMO – destination management organisation)

7.3.1 Summary table of tools and methods used to value Walsingham

Table 8 – Summary of methods used to value Walsingham

What to value	Data needed	Options to get data			Rating 1 = Very few barriers 2 = ok 3= difficult
		Gather primary data	**Alternative tool**	**Data from elsewhere/expert analysis needed**	
Expenditure Value (Direct)	Average visitor spend	**Survey** question – How much have your spent on your visit?	Average spend value available from MENE (Monitor Engagement with Natural Environment). Note: This is just for recreational activity and does not included added value of pilgrimage.		1
	Number of people	**3) People counter data** **4) Surveyors counting**	ORVal Tool (statistical modelling of route on map provides estimated visits)		1
Physical Health	How long walked for/level of activity	3) **Survey** question - How many minutes exercise have your done today? 4) **App** such as Better Points	HEAT (Health Economic Assessment Tool) EU wide WHO tool which provides value of exercise		1
Wellbeing	Four questions based on one point in time: • Life satisfaction • Life is worthwhile • Happiness • Anxiety	**Survey** - 4 standard wellbeing questions from UK Office National Statistics. Note: this is now attuned to European Survey on Income and Social conditions.			1
	Rating of visit/pilgrimage	**Survey** question – how often have you felt calm and peaceful: 3) in the last 4 weeks 4) during your visit/pilgrimage			2

Economic Welfare/ Social value (Indirect)	No of volunteering hours			Request data from local organisations	1/2
	No of school visits			Request data from local organisations	1/2
	£ figure for proposed route	**Survey** question based on choice experiment or contingent valuation.	ORVal Tool (statistical modelling of route on map provides 'Welfare value'		2
	Similar studies that value: • £ per access to site • £ per km For activities & habitats.			**Benefit Transfer** to be carried out by expert	2
	Cost visitor would pay for visit	**Survey** question based on revealed preference.		Expert analysis required	2
Environment	Various	Environmental sustainability indicators (see section 4.1.4) can be incorporated into surveys or existing data requested from stakeholders/businesses.		Academic institutions are working on valuing natural capital. Experts are needed in this area.	3

7.4 How we undertook methods

7.4.1 People counters and trail boxes

In 2017 we received permission to place a people counter on the permissive 'Pilgrim Way' path to measure footfall and bicycle use. Also placed nearby on the side of the path is a wooden box – the top of which contains paper surveys for people to complete and post in the padlocked box below.

Both the people counter and survey box are managed by the NCC Trails team who visit the site on a rotating basis to download data from the people counter using a smartphone (this is then uploaded to software programme once in range of internet), and also empty and restock the survey box.

> *People counter data is easy to download in the form of spreadsheets according to the months and separates data for walkers and cyclists.*
>
> *Analysis of people counter data can be carried out by a non-expert (using good practice of discounting any unusually high readings that can be generated occasionally by animals on the track).*

In 2017 we stocked the survey box using the Norfolk Trails survey (see appendix 2). This is used across the network of trail with the objective understanding visitor usage and potential spend. Simple data analysis does not require an expert.

Fig 9 – People Counter location

Fig 10 – Trails Survey Box

7.4.2 Estimated values

ORVal

ORVal is a tool based on a background map layer using OpenStreetMap, and additional spatial datasets to estimate:

- visitor numbers
- welfare value of visiting a site (space or path)
- number of people arriving by mode of transport (car, or other e.g. walking)

- how many of the visits are 'new' visitors.

This tool does not require expert skills to use and there are clear user guides[58] as to how to use it, and how the statistical modelling behind the tool works provided on the ORVal website (developed and supported by the University of Exeter, UK).

Visitor numbers

The statistical model behind ORVal predicts how likely it is that an individual will take a trip to a particular greenspace on a particular day. ORVal can therefore estimate visitor numbers. The likelihood that an individual would choose the site is affected by:

- the socioeconomic characteristics of the person
- the attributes and proximity of the greenspace
- the attributes and proximity of alternative recreational greenspaces.

Welfare value

The 'Welfare value' refers to the monetary equivalent of the welfare enjoyed by individuals as a result of having access to a greenspace with particular attributes (e.g. the extent of woodland, the presence of a children's playground). The model also includes a calculation of the travel cost (costs incurred in travelling the greenspace) and subtracts this from the gain estimated in welfare value. This cost-benefit calculation provides us with an 'exchange rate' that we can estimate the relative value of any changes we make and how this affects people's choice to travel the amended site.

How we used ORVal

We were interested in using the tool to test the impact of 'what if' scenarios covering changes or improvements to 3 paths in Norfolk against the value of a well-established path:

1. *Marriott's Way* – existing well-established trail
2. *Bure Valley* – improvements to make path more accessible
3. *Broadland Way* – new path
4. *Walsingham Way* – an extension of 6 miles to the nearest town of Fakenham

In order to carry out more substantial calculation of annual visitation and welfare figures our partners at the University of East Anglia undertook using ORVal to produce us with a report. They undertook this work in the following way:

Step A – To select an existing path on the map (path 1) or drawing new paths (2-4)

Step B – Enter percentages of types of landcover (to provide the attributes of the recreational space or path)

Step C – ORVal generates the defined figures as:

- Total welfare
- Total estimated visits
- Total for each socioeconomic groups (see table below based on UK Office of National Statistics Social Grades A, B, C1, C2, D, E)

[58] University of Exeter. ORVal - The Outdoor Recreational Valuation Tool. User Guide, Reports and Case Study Documents. Available at: https://www.leep.exeter.ac.uk/orval/documents (Accessed Dec 9, 2019)

Table 9 - Social Grade descriptors

Social Grade	Description	% HRP population (UK)
AB	Higher & intermediate managerial, administrative, professional occupations	22.17
C1	Supervisory, clerical & junior managerial, administrative, professional occupations	30.84
C2	Skilled manual occupations	20.94
DE	Semi-skilled & unskilled manual occupations, Unemployed and lowest grade occupations	26.05

Step D – Figures were tabulated for the different routes (see below).

Table 10 - ORVal results for different results - visitor numbers

Path	**Number of annual visitors**							**Number of new annual visitors**				
	Total	**Income group**				**Car**	**Walk**	**Total**	**Income group**			
		A and B	**C1**	**C2**	**D and E**				**A and B**	**C1**	**C2**	**D and E**
Marriott's Way	631,635	160,232	212,091	133,259	126,052	173,441	458,194	163,379	39,217	54,160	35,893	34,109
Broadland Way	107,735	31,308	35,744	23,129	17,554	16,883	90,852	23,069	6,264	7,576	5,141	4,088
Bure Valley Path	130,536	32,542	42,255	32,104	23,634	68,781	61,754	38,994	9,122	12,460	9,857	7,556
Walsingham to Fakenham	31,407	6,139	7,863	9,917	7,488	5,722	25.685	6,962	1,288	1,733	2,215	1,726

Table 11 - ORVal results for different results - welfare values

Path	**Welfare value / £**				
	Total	**Income group A and B**	**Income group C1**	**Income group C2**	**Income group D and E**
Marriott's Way	1,755,566	446,604	587,138	374,425	347,399
Broadland Way	252,717	72,383	83,633	54,482	42,218
Bure Valley Path	427,711	106,533	138,153	104,775	78,251
Walsingham to Fakenham	74,652	14,751	18,960	23,241	17,700

Limitations of ORVal

ORVal does not account for tourism or commuting. Notably, Walsingham is an important pilgrimage site so may encounter more visitors at certain times of the year and if the trail is developed it is also anticipated that it will be used as a commuting route. Development planned in the Fakenham area will also likely raise the estimated visits. Likewise, the estimates for Broadland Way do not account for the significant developments in the vicinity, which would likely increase visitor numbers.

Benefit Transfer

Summary of Benefit Transfer (BT) method

Site-specific valuation studies can be costly and time consuming, and in these circumstances a BT approach can be a reliable alternative valuation method.

A BT approach is a desk based exercise that reviews existing studies (where primary data has been collected) and generates an average figure that can be used to applied to the policy site. The studies are selected based on similarity of research question to the policy site, and use of appropriate valuation methods.

Guidelines for good practice BT requires that the good or service valued is similar to the policy site, with a similar socio-economic context and environmental characteristics. If trails in Norfolk are not atypical, previous studies can therefore provide a reasonable estimate of the benefits that are provided by existing Norfolk trails.

As BT is a quick and inexpensive approach a degree of error exists in the estimates provided, therefore a range of values is presented.

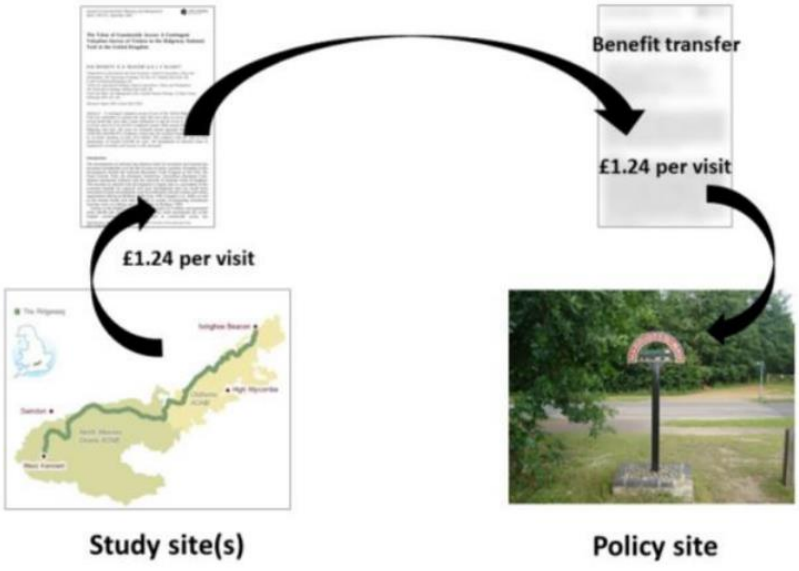


Figure 11 –Illustration of benefit transfer

Focus of BT work undertaken

A greenway or trail provides a wide range of social and economic benefits. Multi-use trails (e.g. for bicycles and pedestrians) can contribute to mobility and access, reliability, social

equity, and ultimately to the quality of life in a community. Different habitats such as forests, the countryside, seaside, and town/city areas become accessible through green trails.

As discussed in section xx which explains market and non-market valuation, access to greenways is generally free, hence it is not possible to construct a conventional demand curve for greenways recreation based on price and visitation data. However, there are revealed and stated preference environmental economics valuation methods that can assess these benefits.

A review of studies that value trails based on access to different habitat/land use and used revealed and stated preference methods (see section 3.2.1 for terms) was undertaken.

Studies and databases selected

The University of East Anglia undertook a review of literature. Benefit transfer estimates were collated from three different sources:

4. *The Recreation Use Values Database*[59] *(RUVD)* - a North America database, which comprises 421 use value studies of recreation in the period 1958 to 2015
5. *Environmental Value Look-Up (EVL) Tool*[60] - The DEFRA (Department for Environment, Food & Rural Affairs - GOV.UK) tool gives indicative values based on a review of over 350 UK-focused studies, from 2000 to 2015
6. *A review of recent UK recreation studies* - 19 primary studies that provide 44 estimates from studies using travel cost, contingent valuation and choice experiment methodologies

Values provided by BT review undertaken

Table 12 - Values provided by BT review undertaken

Estimated values provided	**Source**	**Comments**
£ value per person per visit for different activities	RUVD	Limitation Data from North America
£ value per person per visit for type of user, in specified habitat (e.g. woodland)	EVL	Limitations • No indication of duration of visit or size of the recreational site • whilst they distinguish between general and specialist users, they do not distinguish between trail users and other types of woodland recreation
£ value per person for type of user expressed as: • £ per access • £ per kilometre	UK studies review	Benefit Potentially more accurate that values extracted from RUVD and EVL

[59] College of Forestry, Oregon State University. Recreation Use Values Database. Available at: http://recvaluation.forestry.oregonstate.edu/ (Accessed Dec 30, 2019)
[60] Department for Environment, Food and Rural Affairs (DEFRA). Research Database. Available at: http://sciencesearch.defra.gov.uk

£ value per person for different habitats expressed as: • £ per access • £ per kilometre	UK studies review	

WebTAG

To support the Green Pilgrimage we have completed a high level WebTAG, Active Mode Appraisal Tool (AMAT) to provide an indicative Benefit to Cost Ratio (BCR) of a new route being created. See more about WebTAG in section 5.2.2.

The assumptions used were:

- 82- current average number of daily users (from current count data)
- 246- proposed update on daily usage follow the new route (using growth seen from other existing schemes in Norfolk)
- Appraisal Period- 20 year- standard assumption for new capital infrastructure
- Cost of £500,000 – cost based on similar schemes or similar length

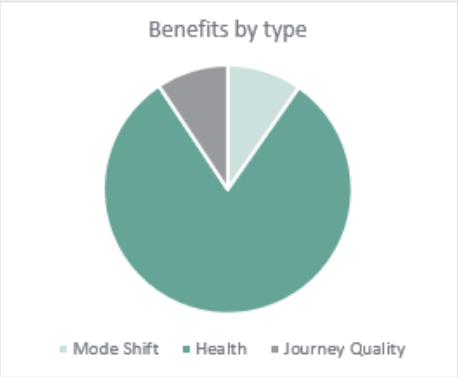
Using these assumptions, the WebTAG provided a BCR or 4.64

Analysis of Monetised Costs and Benefits (in £'000s)

Congestion benefit	180.20
Infrastructure	4.67
Accident	41.99
Local Air Quality	1.36
Noise	6.00
Greenhouse Gases	20.15
Reduced risk of premature death	735.01
Absenteeism	785.02
Journey Ambience	175.22
Indirect Taxation	-72.18
Government costs	408.28
Private contribution	0.00
PVB	1872.78
PVC	403.61
BCR	**4.64**

Benefits by type:

Mode Shift	182.20	9.7%
Health	1520.03	81.0%
Journey Quality	175.22	9.3%



The illustrative case study in WebTAG unit A5.1 uses slightly different assumptions on the valuation of decongestion benefits which result in a higher estimated benefit there. This is due to the specfic nature of the case study and to fully replicate this approach here would have increased the complexity of this tool with no apparent benefit.

Fig 11 – List of benefits produced by WebTAG tool for Walsingham.

The Benefits table shows that most of the benefits are Health benefits (81%) 9.7% of the benefits are due to people walking on a route that previously would be been a car journey and 9.3% of the benefits are due to the improved journey quality due to the improved infrastructure and the use of a segregated route.

7.4.3 Survey

Rationale for survey

As described above, initial work was done to provide estimated value of paths according to recreation activity and scenery. The estimated values provided by ORVal and a BT approach are limited by the statistical modelling, and by set generic recreational activities. Although walking is included the unique aspects of value added by pilgrimage walking are not captured, for example wellbeing aspects, additional economic benefits of pilgrim visitors, or the aspect of cultural visits along the way.

As described in section 9 (planning your study) the undertaking of primary data collection is considered only after a review of any data available through existing tools and databases, as primary data collection has resource implications. However the initial review by UEA established a survey was necessary to provide better measures of the economic, social and environmental impact of pilgrimage – providing this missing data.

Summary of Process for developing a quality survey

The following describes how we designed, reviewed and tested the survey using the design process:

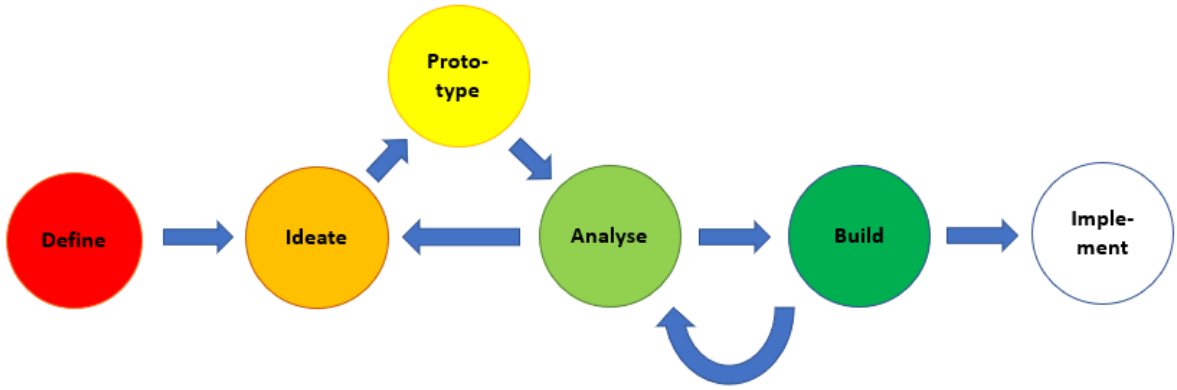


Figure 12 - Design process

Although this process works from start (define) to finish (implementation), it retains flexibility to encourage constant testing (prototyping), analysing the results of feedback from different people and making improvements based on this feedback (ideating). This is core to producing a quality questionnaire that:

- has identified and removed ambiguities improving data quality
- is easy and quick to answer
- is supported by all stakeholders including where possible their joint interests
- provides data that answers the research questions

It cannot be understated the importance of testing a questionnaire multiple times. During the development of the online questionnaire we produced over 30 versions, and tested with multiple audiences at different stages of development, each time

Summarised in the table below are the core activities we carried out using the design, build and implementation process. This is somewhat simplified – during the later stages of development, we used any related event opportunity to get feedback (GP partner events, volunteer training etc). This provided extremely valuable feedback.

Table 13 - Design process for survey development

Stage	Activity carried out	By whom
Define	• Define research questions • Review existing questionnaires available • Review methods	UEA/NCC UEA UEA
Ideate	• Suggest methods • Discuss research topic and potential questions	UEA UEA/NCC
Prototype	• Draft questionnaire • Test questionnaire with dummy participants	UEA UEA
Analyse	• Review if questionnaire provides all data needed to answer research questions	UEA/NCC
Ideate	• Draft questionnaire (multiple iterations)	UEA/NCC
Prototype	• Test questionnaire with stakeholders (Walsingham, Green Pilgrimage partners Sept event)	NCC
Analyse	• Review if questionnaire provides all data needed to answer research questions • Review question phrasing, order, question type	NCC UEA
Ideate	• Draft questionnaire (multiple iterations)	
Prototype	• Test questionnaires in situ	NCC
Analyse	• Review if any questions misunderstood • Final amends question phrasing, order, question type	NCC UEA/NCC
Build	• Review and decide on appropriate online surveying software • Enter questionnaire into online software	NCC NCC
Analyse	• Review questionnaire to check logic flow works for all scenarios • Input dummy data to test exported results are in useful format for analysis	NCC NCC/UEA
Implement	• Draw together induction pack for volunteers • Recruit volunteers • Brief volunteers • Provide research equipment and packs for volunteers	NCC/UEA NCC NCC/UEA NCC

Defining our Research Questions

The visitor survey was needed build on previous knowledge the NCC already had access to about:

- direct financial value of visitors to Norfolk trails
- the welfare value of trails for greenspaces and paths taking into account generic recreational activities and habitats (scenery) along path (available per visit and per km)

The main objectives of the survey are to provide insight, not currently available, into the impact of pilgrims/visitors on a community and the impact of Walsingham on them, as well as finding out the value of making changes in provisions for walking & cycling. The survey would:

- understand the financial and economic impact of pilgrims/visitors to Walsingham
- the wellbeing value for different pilgrims/visitors
- understand who use the Pilgrim Way, and the value of proposed changes
- give insight into the sustainability of different pilgrims/visitors

In order to do this, questions were generated around the following 7 areas of enquiry:

Profile and activities of visitors to Walsingham

- What is the demographic of visitors to Walsingham?
- When are people visiting Walsingham?
- How many people are visiting Walsingham?
- What are people doing in Walsingham?

Financial impact of visitors to Walsingham

- How much money are different types of visitors spending?

Economic impact of visitors to Walsingham

- What is the value of a visit to Walsingham

Wellbeing value of visit to Walsingham, pilgrimage, and walking

- What benefits do different types of visitors identify from walking the Pilgrim Way'?
- What impact does a visit to Walsingham have on the wellbeing of different types of visitors, taking part in different activities?
- Can we capture a transformative effect of a pilgrimage visit to Walsingham
- What level of physical activity do different types of visitors engage in whilst in Walsingham?
- What is economic benefit on reducing disease burden?

Usage of the 'Pilgrim Way' footpath

- What is the demographic of users of the footpath?
- What types of users are using the footpath?
- How many people are using footpath? Is this growing over time? How does this vary over the year?
- To what extent is the footpath being used by those on pilgrimage?
- How aware are different types of visitors of the footpath?

Valuing change to 'Pilgrim Way' footpath

- What improvements to the path are priority?
- What is the potential value of these improvements?
- What is the level of support for an extended footpath by different types of users?

- Who might use the extended footpath, and how much?
- What is the value of extending the footpath?

Sustainability

- How do different types of visitors travel to Walsingham?
- How far do different types of visitors travel to Walsingham?
- What is the carbon value of trips made to Walsingham by different modes of transport?
- How long are people visiting Walsingham for? Is it part of a longer trip?
- To what degree are different types of visitors buying local products/services?
- To what degree are pilgrimage visitors supporting the local economy?
- What do visitors think about Walsingham? Do they think it's crowded?

Ideating to create a questionnaire

Incorporating Travel Cost

The objective of using the travel cost method is to examine the reason for travelling and the factors that influence the frequency of this. Question categories required:

- How many times did you visit Walsingham in the last 12 months?
- Which is the main reason for visiting? (this question helps to identify whether alternative sites exist)
- How did you travel to Walsingham? How many days? How many people are travelling with you?

Incorporating Contingent Valuation

The objective the contingent valuation method is to understand what people would like – regarding improvements and how they value something. Question categories required:

- In your opinion what improvements would make the path more attractive?
- Walsingham is popular with visitors and pilgrims. The footpath requires constant maintenance to satisfy demand of users. If a dedicated fund were established to collect donations would you be willing to donate?
- How much would you be willing to donate?
- Do you already contribte to any nature or heritage organisations?

Incorporating Contingent Behaviour

The objective of the contingent behaviour method is to understand people's hypothetical behaviour – for example what would they do given the choice – this is sometime referred to a choice experiments. Question categories required:

- NCC is planning to extend the footpath for about 5 miles towards Fakenham, are you in favour of this?
- Would you use the path?
- How many times per year might you use it?

Incorporating Wellbeing

A range of different wellbeing measures were considered (see section 5.3.5).

It was decided to use the standard 4 wellbeing questions asked by the UK Office of National Statistics (ONS). Use of these, in their exact form would mean that data from the questionnaire could be compared to national statistics. The ONS wellbeing measures are in

line with those being used in Europe. These four questions ask respondents to respond using a likert scale:

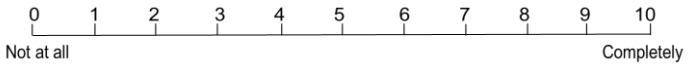


Fig 13 - Likert scale used in wellbeing

The four questions ask:

1. Overall, how satisfied are you with your life nowadays?
2. Overall, to what extent do you feel that the things you do in your life are worthwhile?
3. Overall, how happy did you feel during the past 4 weeks?
4. Overall, how anxious did you feel during the past 4 weeks?

In feedback with stakeholders from the shrines in Walsingham, however it was felt that the ONS measures (which need to be used in exact form), would not be able to capture any transformative effect of the experience of visiting Walsingham/going on pilgrimage. A further two questions were therefore developed that asked respondents to rate on a scale from 'None of the time' to 'All of the time'. The answers to the following two questions would be compared:

How much of the time, during the past 4 weeks have you felt calm and peaceful?

How much of the time, during this visit to Walshingham have you felt calm and peaceful?

To see how the different types of questions fit into the survey please see appendix 3 to see a final version of the survey and an annotated version (appendix 4) of the survey.

Question types

To make the questionnaire clear and quick the answer we:

- Limited the number of different question types to reduce cognitive load
- Avoided open field questions, using multiple choice where possible
- Ordered questions logically, with similar themes together

Ethics

Ethical practice requires that all participants give consent to take part in research.

Questionnaires developed by university researchers also require approval from an ethics committee, this covers best practice guidelines. Recommendations would therefore be to check:

- There is rationale behind asking all questions being asked, especially where data is asked about protected characteristics (e.g. age, disability, gender reassignment, race, religion or belief, sex, sexual orientation, marital status
- Participants are not vulnerable, and if they are what steps will be taken to protect them
- Required statements are present on questionnaires that state how data will be used, if it is anonymous, and where and how long data will be stored for.

For the surveys developed for use in Walsingham the direction was that no participants under the age of 18 could be interviewed (this was included in enumerator training).

Prototyping and testing

Building prototype surveys and testing them is an iterative process, requiring many versions to produce a quality product that is both user friendly and produces data that answers the set research questions.

NCC and UEA collaborated closely to review and produce multiple versions of the survey initially on paper, before progressing to programme the survey into online surveying software.

Types of testing

Testing can take place with different levels of formality at different stages of the process depending on the aim of the testing. For example:

Table 14 - Testing task against who to be involved

Purpose of testing	**How/With whom**
To check formatting, consistency and language	Anyone available
To check survey questions cover all research questions	Colleagues involved in project/ research team
To check with that language used is appropriate and relevant to local people	Stakeholders
To check that content of questions is representative of range of interests, and in line with values of stakeholders	Stakeholders
To understand how straightforward the survey is to answer	Initially anyone available, working towards pilot testing in situ with real participants
To check once the survey is programmed into online software that the question order and logic pathways work for all scenarios	Anyone available
Testing that the online survey data export gives information in format useful for analyst	Analyst

Experience of testing

Testing took place over 6 months, before data collection commenced.

Undertaking pilot testing with participants in situ helped to refine questions and understand which questions were confusing. Here for example respondents did not know what 'gadgets' were:

During your visit to Walsingham, how much do you expect you and your dependents will spend? *Please state the amount corresponding to each item or leave it blank*

Accommodation [£]
Food and drink [£]
Local transport [£]
Gadgets [£]
Other activities/expenses [£]

Testing also showed us where the multiple choice questions needed extra options. Here for example we found that 'minibus' came up a number of times as a response so we added this:

> ***How did you get here today?*** *Car [ ] Cycle [ ] Coach [ ] Motorbike [ ] Public transport [ ] Walk [ ] Other [ ] (specify) _____*

Feedback from stakeholders outside of NCC and the UEA research group was particularly valuable in identifying language that was inaccurate – for example the word 'spiritual' was suggested by the Shrine personnel rather than 'religious services':

> ***Which of these activities do you do when visiting Walsingham?***
>
> *[ ] Relax [ ] Walking [ ] Sightseeing [ ] Religious services [ ] Other (specify) _____*

Feedback from stakeholders also raised interesting discussion about the focus of the research being around walking/cycling and infrastructure improvement, rather than capturing the 'value of pilgrimage' as an experience to pilgrims, and also the sustainable impact of pilgrimage visitors to Walsingham. This was very useful feedback. The survey recognisably did have the focus identified by the stakeholders as the methodology was being developed by NCC and UEA to be adaptable for other environmental impact projects, and therefore there was appreciable rationale for doing this. However, following this feedback we refocused on the aspects need specifically for the Green Pilgrimage valuation tool, and made the following changes:

- Added sustainability indicators e.g. what spend did visitors attribute to local products, what was their perception of Walsingham clean, crowded etc.)
- Added a 'transformation' aspect to the methodology to capture change through experienced from before to after pilgrimage
- Added 'religious affinity' to the demographic questions

Building

Online survey research software can be an efficient way to gather data, reducing the need to do the data entry necessary with completed paper surveys. Online surveys, are often more engaging for people to complete, being faster and easier.

How to choose online survey software

There are numerous research software options available. Key points to check are:

- Will the survey software company hold your data securely?
- Can you use the survey offline (key when collecting data in remote geographic areas with no connection to internet)?
- Do you want to brand your survey? Is it important to you that the survey appears without any advertising?
- Is the interface used to input the questions easy to use, and let you move questions around in the editing stage?
- Does the software allow standard good practice functionality: skip logic (so respondents can skip questions), and randomisation (data quality can be affected by the order of a question set or set of answers to a particular question. To avoid this issue, your software should be able to randomize the order of specific questions or answers automatically)?

Online survey software examples

In producing the NCC/UEA survey we utilised SmartSurvey[61]. This requires a licence fee, but has the advantage that the survey data is held securely in line with European GDPR (General Data Protection Regulations), the survey can be branded with appropriate logos, and avoids distracting advertising. It is also ways to use and has the required functionality to be available offline, to set up question logic, and exports data in a format that analysts can use to interpret the data.

Other software that we considered was: Qualtrics[62], Google Forms[63], Survey Monkey[64] (paid version). Google Forms and Survey Monkey were not deemed to meet strict UK GDPR conditions (as data is held in servers outside of the EU). Qualtrics is a viable, albeit with a licence fee, software with excellent functionality and offline version.

Implementing

Benefits of working with volunteers

Working with volunteers to collect data can make a really positive contribution to research projects where resources are minimal. Undertaking data collection is time intensive, but only requires a person to have basic skills that can be topped up with appropriate training. It is therefore an ideal role for someone who wants to gain experience (students/early career starters) or those who are time rich and want to give back (retired people).

Despite the contribution volunteers can bring to resources in terms of their time, the following considerations should be taken into account when working with volunteers:

- Health and safety – you may need to have organisational liability insurance, and you'll need to undertake a risk assessment before sending volunteers out.
- Travel – you may need to consider how volunteers will get to survey locations
- Covering expenses – you may need to pay travel expenses and food
- Time to train and support volunteers – there will be some investment in time to train and support volunteers
- Equipment – for example tablets, clipboards, noticeboards

Recruiting volunteers

We produced a short advert that could be emailed to related local organisations. This asked for people to fill in a short form indicating their details, availability, and any relevant experience. Volunteers were invited to attend one of several dates for a 2 hour training session.

What do volunteers need to know

Our training briefing covered:

- Background to the project, purpose of the survey
- Opportunity to complete the survey and query any tricky questions
- Tips for approaching people to ask the survey
- Preparation before the day, on day, and after day
- Data handling and data protection

[61] Smart Survey. Available at: https://www.smartsurvey.co.uk/
[62] Qualtrics. Available at: https://www.qualtrics.com/uk/
[63] Google Forms. Available at: https://gsuite.google.com/products/forms/
[64] Survey Monkey. Available at: https://www.surveymonkey.com/

- Logging survey sessions and reporting issues

Good practice covered with volunteers included:

- Check your respondent is over 18, if in doubt. We can only collect data from people over the age of 18 years old.
- Be careful to remain neutral. Surveyors can wish to please researchers and stimulate positive responses; however we need to know people's genuine view and values. [ask what this might sound like/how this might happen]. Therefore avoid lead respondents to a particular answer.
- Try to remain unbiased. We want to include the diverse views of respondents. Try not to gravitate to stopping people that look more approachable or for whom you might have something in common! In the face of respondents being cautious about answering certain questions, highlight the following:
    - It is important for the research to fill out all parts of the questionnaire
    - All responses are anonymous and it's impossible to identify anyone
- Check for consent, and all questions answered.
- Remember to thank people!

NCC learnings working with volunteers

We used the Green Pilgrimage project as an opportunity to develop the volunteer surveyor role, with a view to using volunteers to work on a number of projects across the Environment team. We therefore kept the recruitment general so that volunteers could work on multiple projects over the course of their availability (e.g. up to an academic year for students).

From initial recruitment to local organisations including the UEA, we had approximately 10 people interested, a number of whom were students and several retired people with a range of surveying experience. The feedback was positive from the volunteers on the training and induction packs that we provided.

Challenges however that we experienced were:

Issue	**Lesson learnt**
Not all volunteers could come to training dates	Run a number a training dates at different times, or run a webinar
A number of volunteers didn't schedule a date to do data collection for quite a while	Having lots of flexibility and long period to collect data not always helpful. Be specific, and follow up often with volunteers.
Not always easy to pick up and drop off equipment to volunteers	Encourage volunteers to use own equipment, or accompany volunteers
Technical issues the software didn't work offline with iPhone 8+	Get all volunteers to test software thoroughly on their equipment before going on site.
Recruiting enough volunteers	It can be time consuming to advertise for volunteers, recruit, train and induct – to get enough volunteers we need to put more time into this process.
Difficult to collect responses after October	Seasonality is a key issue, although some data collection should take place every month, we should reasonably expect low levels of data collection in winter months.

Other options for data collection

Stakeholder organisations may be invested to collect data on your behalf. This could be an efficient route to your target audience. Care must however be taken with briefing anyone conducting surveys to remain unbiased.

7.5 Learnings and next steps

7.5.1 Learnings

The result of NCC and UEA working together in collaboration and combining their expertise, has been a positive one. With the academic rigour of the UEA and the experience of NCC in collecting environmental data we have produced a survey combining the relevant methodologies to further research in an area that lacks research.

However the experience has shown us that this is a complex area and that producing a survey of quality can be a considerable process. The survey development has taken a number of months, longer than anticipated, and data collection has necessarily been set back. There is therefore more work to do to gather a complete the target of a minimum of 200 surveys responses. Furthermore, the report outlines other research that could be undertaken to give a full picture of the impact of pilgrimage, above and beyond data collected through this visitor survey.

Areas that are particularly problematic to survey are getting people to answer demographic questions on ‘average earnings’ – this is necessary to the travel cost method that generates the ‘value of a visit’. However people are resistance and enumerators need to reiterate that data in anonymous.

7.5.2 Further data to collect

Involving business

A potential next stage would be to run workshops with the Walsingham stakeholder group and local businesses. This would cover initial results indicating impact of tourism and pilgrimage and how sustainability indicators could help them to set some initial goals for making improvements, and shape the type of data they might collect to evidence their journey.

Involving the community

A key part of sustainability that is currently not captured by the Green Pilgrimage Network, and is demonstrated well in the work of the University of Santiago is the social impact of tourism/pilgrimage on the community. More work to understand perception would be a useful piece of research to add to understanding the impact of pilgrimage on Walsingham.

Economic Analysis

Current data (input/output tables) are not available on the local economic impact of tourism/pilgrimage activity in Norfolk. As part of understanding the economic impact we will seek ways around this.

7.5.3 Next steps

In 2020 we will take the learnings from this report to further our work in Walsingham and Norfolk. We will:

- collect a minimum of 200 responses to the survey (from January to June)

- run a workshop with Walsingham stakeholders on sustainability indicators
- develop further a tool to streamline undertaking research using the combination on methods suggested in this report.

8. Case study: data interpretation from Walsingham

As part of the development of a methodology to measure the economic, social and environmental impact of pilgrimage, NCC in collaboration with UEA have undertaken:

- A benefit transfer study for 4 paths in Norfolk (including Walsingham)
- An analysis of ORVal values for 4 paths in Norfolk
- The development and pilot of a visitor survey incorporating travel cost and contingent valuation methods

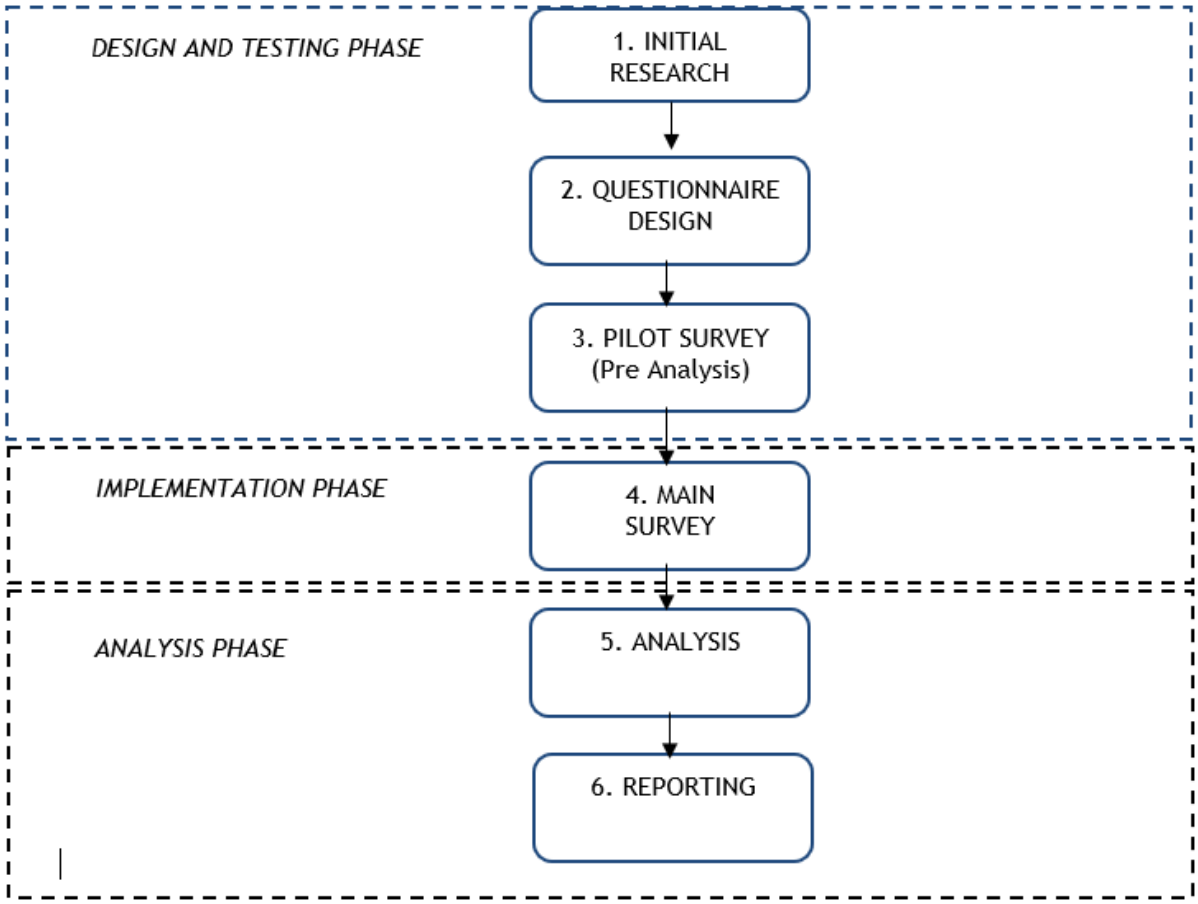


Figure 14 – Survey implementation phases

The analysis in Section 6.5.1 below refers to the step 3 (see figure above) where 24 pilot data are analysed. Data were collected between October-December with face to face and inbox responses. Enumerators went on the field twice and collected 12 respondents, surveys in the box were partially completed and the quality of the data is higher, as we expected, in personal interview. The location of the majority of surveys were conducted on the Pilgrim way (63%), the rest in the centre of Walsingham village.

The next step (4) will be to full implement the survey to capture a minimum of 200 responses to able to do full analysis (step 5) and report our findings (step 6). The analysis therefore provides only an example of the type of results that can be produced using the selected methods. In the next section we use these to demonstrate how data can be turned into useful statements for a funding context

8.1 Example: Walsingham Valuation – tunring data into funding documents

In this section we outline in more detail:

- the questions that we sought to find through undertaking research
- the methods, tools and data sets we have used to research these questions
- the types of results that can be produced from the type of research undertaken
- examples of how these results can be applied to guiding strategy and for funding bids

Table 15 - 'Data Interpretation'

What do we want to find out?	**Method/Analysis (see Appendix 5 for detailed method calculations)**	**Potential examples that could be extrapolated from data captured from methods chosen (note: more data collection is required before we can produce publishable results – figures shown are only examples from pilot data)**	**Example: Implications and recommendations**
Profile and activities of visitors to Walsingham			
• What is the demographic of visitors to Walsingham? • When are people visiting Walsingham? • How many people are visiting Walsingham?	• Visitor survey (age, employment status, socioeconomic status, type of visitor) - comparing data across categories. • Data on visitor numbers from shrines and Walsingham Estate • Data from Visit Norfolk	• 80% of visitors are above the age of 50. They represent low and middle socioeconomic (income) band. • Female respondents are predominant (in the pilot data sample). • The majority of respondents classified themselves as Anglican believers. • 40% are employed. • The majority of people visit Walsingham in a small group and 25% (of the sample) visit in a larger group. Pilgrims are most likely to be in group.	Recommendations can be used to support new and existing businesses to diversify and provide user-centric products and services and products. • *Many year round visitors are older and provisions need to be made for them.* • *Discussion with stakeholders about how to encourage individuals.* • *Support business (including Shrines) networking to integrate tourism businesses e.g. railway*
• What are people doing in Walsingham?	• Visitor survey (activities comparing against demographic information & visitor type)	• 60% (of the sample) selected 'participating in religious activities' as their main activity (on the day of the survey). (n.b. This percentage can reflect the season of the survey more than the representativeness of the visitors of Walsingham). • The majority of people (in the sample) visited at least two places while in Walsingham. The most popular places are the village and Anglican Shrine.	

		• Only 21% (of the sample) reported visiting the Wells and Walsingham Railway.	
Financial impact of visitors to Walsingham			
• How much money are different types of visitors spending?	• Visitor survey (spend on visit, type of visitor, activities) • Data from Norfolk Trails (average spend)	• Average daily spend was £74. This is higher than average spend on the Norfolk Coast £22.76[65]. • Pilgrims on average spend more than other visitors; day visitors spend around £20 which is considerably less than multi day visitors who daily spent is £100 per day. (*n.b. This result might be influenced by the lodging costs. Also noted a few respondents report considerably high overall expenditures (more than £500) and this can impact the current average spend figure.*	Can be used to support the economic impact case for investing in pilgrimage as sustainable tourism. As all spending local this can be reported as sustainable tourism.
Economic impact of visitors to Walsingham			
• What is the value of a visit to Walsingham	• Visitor survey (postcode, demographic information, activities to analyse Travel Cost method).	• *The average value of a visit to Walsingham is xx. This compares to other studies xx as higher than average. [further date needed]* • *The value is higher for those on pilgrimage than day visitors, and higher for those using the footpath as part of their visit. [further data needed]*	Show the wider economic case for investing in pilgrimage, and where to direct investment.
Wellbeing value of visit to Walsingham, pilgrimage, and walking			
• What benefits do different types of visitors identify from walking the Pilgrim Way'? • What impact does a visit to Walsingham have on the wellbeing of different types of visitors, taking part in	• Visitor survey (perceived benefits of walking) compared to age, employment status, socioeconomic status, type of visitor • Visitor survey (Office of National Statistics wellbeing questions) compared to age, employment status, socioeconomic status, type of visitor	• Those on pilgrimage were more likely to report higher level of subjective wellbeing indicators (n.b. statistical tests are strongly significant due to limited sample size). • The sample scored quite high on wellbeing questions with average score on happiness and wellbeing above 8. (higher than the latest UK ONS average 7.6). The sample also reports higher level of anxiety (average 4.6) compared to national stats that are lower than 3.	*Evidence can be used in case for health benefits of investing in walking.* *More research needed on wellbeing of pilgrims (as could attract people that have overall lower wellbeing).*

[65] Insight Track. User Research to Inform Decision-Making Research findings for Norfolk Trails. 2018. Available at: shorturl.at/ilq57 . (Accessed Dec 6, 2019)

different activities?	• Socioeconomic data from Norfolk Insight for local area around Walsingham	• The most important reason for using the footpath is for mental wellbeing (scored more than 8) and being with others (scored more than 6). • *Younger people were more likely to.. [further data needed]* • *Those with lower socioeconomic background were.. [further data needed]*	
• Can we capture a transformative effect of a pilgrimage visit to Walsingham?	• Visitor survey (question on feeling 'calm and peaceful') compared to age, employment status, socioeconomic status, type of visitor • National trails data	• 70% of the sample reports that during the visit they felt calmer and more relaxed than 4 weeks ago. So people benefit from a sense of peace after the visit. (n.b. sample size cannot support any statistical significant conclusions between day and multiday visitors).	
• What level of physical activity do different types of visitors engage in whilst in Walsingham? • What is economic benefit on reducing disease burden?	• Visitor survey (question how many mins walking today) compared to age, employment status, socioeconomic status, type of visitor • HEAT (Health Economic Assessment Tool) for analysis	• Local people were the most active group, followed by day visitors. Pilgrims were as active as the rest of the visitors. • The majority of visitors consider walking on average 60 minutes during their visit to Walsingham. A visit to Walsingham encourages people to walk for at least one hour per day that is nearly half of the weekly recommended time by WHO per week • *The (health) economic value for pilgrims was xx, for day visitors was xx, for multiday visitors was xxx [further data needed].*	Visiting a site with footpaths has a possible impact on how far people walk – positively impacting people's physical health.
Understanding usage of the 'Pilgrim Way' footpath			
• What is the demographic of users of the footpath? • What types of users are using the footpath? • How many people are using footpath? Is this growing over time? How does this vary over the year?	• Visitor survey (age, employment status, socioeconomic status, type of visitor, identify as on pilgrimage) • People counter data 2017-2019, analysis for trends	• *Over 50% of regular users* of the footpath (excluding peak events) are local. • Excluding locals, pilgrims and visitors *use the footpath similarly in this pilot sample.* • Annually there are approx.. 48,386 walkers and 5,507 cyclists using the path (August 2017-July 2018 data). • The numbers of cyclists is constant over time (data from August 2017-August 2019),	There is an appetite for people to walk the Pilgrim Way footpath – this can be used in case for investment in signage, as many did not know about it. *Further amends to survey questions needed as data inconsistent in response to number of times visited Walsingham and*

• To what extent is the footpath being used by those on pilgrimage? • How aware are different types of visitors of the footpath?		and stays more constant through the seasons. • The number of walkers peaks in May, July and August. • More of those using the footpath than those not using the footpath identified as on pilgrimage. • 70% of the sample had already walked the footpath and 50% of the remaining respondents were determined to walk the footpath during that visit.	*no. of times walked footpath.*
Understanding and valuing change to 'Pilgrim Way' footpath			
• What improvements to the path are priority?	• Visitor survey – 'improvements - compared with - age, employment status, socioeconomic status, type of visitor)	• When asking how to improve the footpath people report mainly that natural environment, benches, and boards are the most important features to attract them to a footpath. • *The older the respondent, the more likely it was that they would view 'benches/place to sit' as important [further data needed to attribute to demographic]*	Test this statement against other research (see benefit transfer below) on perceived values for improvements.
• What is the potential value of these improvements	• Benefit transfer from studies recording usage after improvements[66]. CB	• *Improvements to surface could over the period of x years increase usage of the path by xx% [further review of literature needed]*	
• What is the level of support for an extended footpath by different types of users? • Who might use the extended footpath, and how much? • What is the value of extending the footpath?	• Visitor survey (choice experiment based on hypothetical donation to analyse Contingent Valuation) • Visitor survey CV value analysed(?) • ORVal values • Benefit transfer values	• 75% of the sample is keen to contribute financially and this implies that they receive a benefits in using the footpath. • The extension of the footpath is welcome by 95% of the sample and on average people will use it 1.7 days per year, slightly more than the current use of the Pilgrim Way footpath. This suggests that the extension will provide welfare benefits to the current visitors of Walsingham • Pilgrims are statistically more supportive of paying for the	Support for footpath could be used to support application for funding for footpath extension, and evidence of support for landowners.

[66] J. Morris, S. Colombo et al. Eliciting public preferences for managing the public rights of way. *Landscape and Urban Planning* 93 (2009) 83–91

		footpath than the other (£28 to compared to £10). (n.b. This needs re assessment but differences between the two groups appear quite consistent across the different type of questions in the survey).	
Sustainability			
• How do different types of visitors travel to Walsingham? • How far do different types of visitors travel to Walsingham? • What is the carbon value of trips made to Walsingham by different modes of transport	• Visitor survey (mode of transport comparing against type of visitor) • Visitor data from shrines • Calculation using standard carbon value/kg	• Visitors mainly come from East Anglia but a few (of the sample) are from as far as Wales, Midlands, Kent • 46% of the sample classifies as pilgrim and they consistently come from afar compared to from other type of visitors • 66% of the sample reached Walsingham by car • Day pilgrims were most likely to arrive in coaches or minibuses (with coaches being the majority) • Day visitors primarily arrived by car • Public transport use by multiday visitors was 6% • The current carbon value total for visitors (300,000) to Walsingham is 1500 kg/CO2e.	Pilgrim visitors more often travel from afar. A footpath in itself would not reduce long distance travel. However evidence show car usage is also high for regional day visitors. If alternative local travel options were supported, reductions in travel by local visitors along could reduce CO_{2e}.
• How long are people visiting Walsingham for? Is it part of a longer trip?	• Data from Visit Norfolk	• Most (of the sample) are multi-day visitors. (excluding outliers) the average length of stay is 3.9 days. • The average no. of visits per person in the last 12 months is 1.5 (excluding outliers). Pilgrims visit on average 1 time per year whereas the visitors seem to make more visits per year. • *xx% of pilgrims go to Walsingham between Apr – Sept, compared to xx% of visitors. This compares to the average Norfolk average for seasonality. [further data needed]*	*If evidence can be shown that pilgrims visits are spread more evenly across the year than visitors, this could be useful evidence to show pilgrimage as a form of low impact tourism.*
• To what degree are different types of visitors buying local	• Visitor survey – 'category of spend - compared with - age, employment status,	• The average spent on local products is £7 (n.b. we cannot identify any difference across types of respondents).	Although the questionnaire shows only £7 of spend (of average £74) is local, as all businesses are local,

products/services ? • To what degree are pilgrimage visitors supporting the local economy?	socioeconomic status, type of visitor)		there is argument to say that spending in Walsingham is contributing to sustainable tourism.
• What do visitors think about Walsingham? Do they think it's crowded?	• Visitor survey questions based on perception	• 70% of visitors rated Walsingham as clean • Opinion was divided on whether Walsingham was crowded. (n.b. Sample was not at peak season) • More than 80% reported that Walsingham is an historical-well maintained place.	Testimonials could be used for tourism purposes. *Further research needed on perception of locals*.

This initial data analysis has shown that a well-designed survey has the potential to produce the types of results/figures fundamental to impactful funding bids for investment in walking/cycling and producing evidence that can shape decision making on infrastructure and tourism services.

As would be expected with a small sample size (24 responses for this pilot), there is a large standard deviation on figures such as 'no. of minutes walked on the day', and 'total spending'. We therefore reiterated extreme caution with the figures in Table 12. These will need to be checked following further data collection (a minimum sample of 200 responses is suggested).

With a larger sample the data can be cross-tabulated against demographic characteristics producing potentially interesting insights into behaviour and preferences according to age and socioeconomic status, as well as for pilgrims vs visitors and day visitors vs multi-day visitors.

The area of health and wellbeing showed some interesting early results, comparing the ONS4 wellbeing questions with UK national ONS4 data. There appeared no difference in impact on wellbeing with length of stay and this is a point to be tested closely.

Once a large sample is collected, across 6 months (covering the off peak and peak season, on all days of the week ideally), we can analyse the results against such data as:

- visitor numbers and visitation patterns from data collected by the shrines
- HEAT analysis
- National trails data on wellbeing, and visitor spend

We can also triangulate against the results from ORVal and Benefit Transfer study undertaken to check the validity of the welfare value gained (through the Travel Cost method) of £10.04.

8.2 Calculations explained

As outlined in that table above the Walsingham survey incorporates several methods. To understand more about data analysis and calculation of the Travel Cost value estimate please refer to appendix 5 where the formula for calculating the welfare value using the

travel cost method is worked through step by step. This will be relevant to those undertaking data analysis.

9. Planning your study

9.1 Setting your objectives

As outlined in section 2.2 within the Green Pilgrimage partnership there are a variety of different situations for example, paths in different stages of development, with differing governance and with a variety of local priorities.

This report has been designed to provide options and guidance for undertaking research in the context of a number of these. Section 5 of this report a selection of key methods, tools, and sustainability indicators have been reviewed to cover a range of different scenarios relevant to partners situations these include:

- Understanding the profile of visitors, demographic and behaviour
- Understanding the welfare value of pilgrimage as an activity
- Valuing a footpath, and extension to a footpath
- Identifying and valuing improvements to a place or path
- Identifying sustainability – the economic, social and environmental impact of pilgrimage in a location or series of locations

We provide examples of applying methods to different situations:

- Section 6 shows where NCC Environment team started in their data journey, giving an example of the types of research objectives that you might start with, and the type of data that is easier the gather.
- Section 7 outlines what NCC are seeking to value and why, specifically around the pilgrimage site of Walsingham, to meet the research objectives.

Step 1 in planning your study is to identify the purpose of your research. It might be helpful to consider:

- What are you seeking to value and why?
- What evidence would be most useful to you?
- What would you ideally value if resource were no object?

9.2 Reviewing existing data

During the course of the Green Pilgrimage project NCC asked partners to complete an activity to identify their current status regarding data collection. The results of which are shown in section 2.2.1. This activity asked partners to report for each of the recommended methods, a rating of their current access to data, and how easy they anticipated it would be to gather any data they currently didn't have access to.

This auditing process (see appendix 6 for template) is core to identifying data gaps, and the need for primary data.

The diagram below outlines a decision tree that can be used to help plan data collection. Minor gaps can be filled average values (generated from tools using large datasets) and transferred to study site using benefit transfer. Where major gaps appear in data i.e. the study site or situation is significantly different to existing studies from which data could be extracted, a field study (primary data gathering) is best employed.

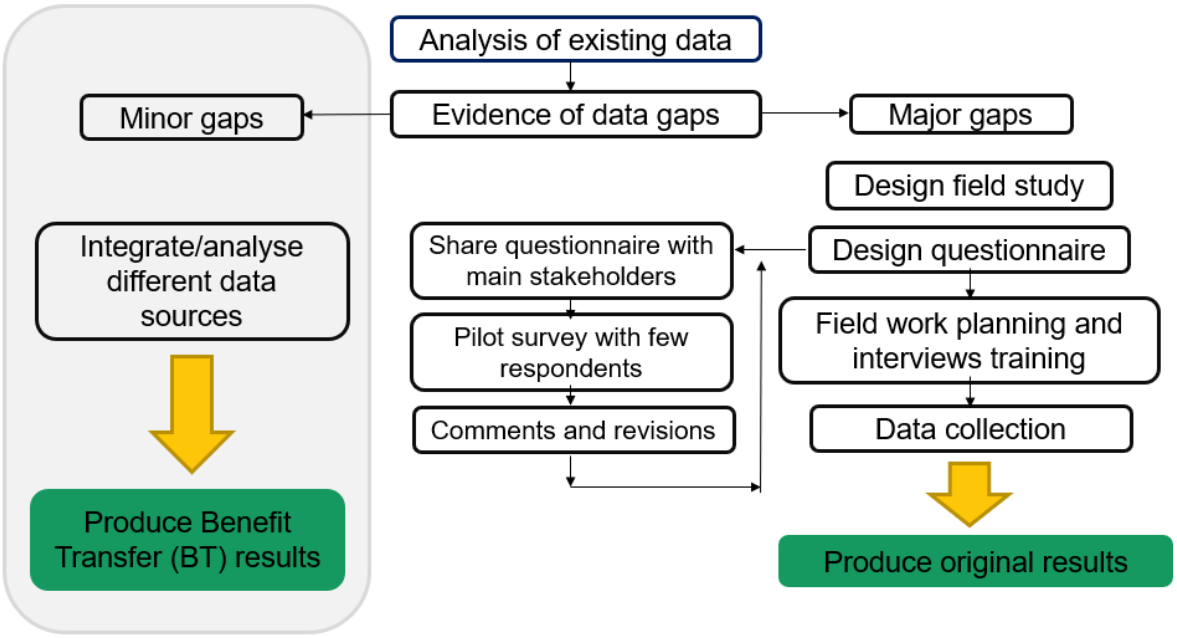


Fig 15 - Decision making flowchart to decide whether to undertake primary research

Step 2 in planning your study is to identify what data you have. It might be helpful to consider:

- Where might any data be held? Who can contribute to your datasets?
- How significant are the gaps in data for your research objective?
- What limitations you might have to primary data collection?

9.3 Selecting methods and tools

To select tools and methods for your research you may find it helpful to refer back to the summary of recommended methods outlined in section 5. This outlines:

- the different elements of pilgrimage to value
- data needed to value this element
- alternative tools that can provide average values (e.g. ORVal and HEAT)
- methods (e.g. Travel Cost and Contingent Valuation) that can be integrated into primary data collection

Section 5.4.1 shows an example of how these tools and methods can be combined to collect and analyse data to produce answers to research objectives.

Step 3 in planning your study is to identify tools and methods that meet your research objectives. It might be helpful to consider:

- What questions do you want answered by your research?
- Can any average data be used?
- If undertaking primary data collection, with whom? Over what time scale?

9.4 Undertaking research and analysis

9.4.1 Expertise/Advice

As outlined in Section 5 – summary of methods, depending on the research you are seeking to undertake you will need varying degrees of expertise.

- Most of the tools outlined in Section 5.2 (integrated tools) have toolkits on how to use these, and can be used without expert knowledge.
- Designing a survey integrating travel cost method, or contingent valuation require the expertise of a researcher statistician to make sure all data is collected necessary for the calculations, and for undertaking the actual analysis of results.
- A study using input/output tables to understand economic impact in a localised area will require the expertise of an economist.

9.4.2 Operational/Volunteers

Engaging volunteers can be a key way of increasing capacity to undertake primary research that can be time intensive and place pressure on resources.

Volunteers do require induction and management, 7.4.3 outlines the considerations for working with volunteers and NCC learnings from recruiting and working with volunteers to do data collection.

Step 4 in planning your study is to partners to work with. It might be helpful to consider:

- Links with local universities and recommendations for consultancies
- Local sources of volunteers and recruitment platforms
- Who is available to induct and manage volunteers

9.5 Final thoughts in planning your study

This report has outlined a range of methods and tools that can be employed in researching Green Pilgrimage depending on the partner's objectives. Such an extensive range of options can appear daunting at the start. However, as emphasised in Section 5 (a case study about NCC making evidenced based decisions) data collection is a journey and the key is to start.

This section has therefore detailed key questions to consider in the process of planning your own study, encouraging you to:

- Prioritise research objectives
- Review any existing data
- Identify where average values can be used
- Identify initial 'quick wins' with data collection
- Identify research and analysis you can undertake without expertise
- Identify further ambitions for your data collection journey

10. Conclusion

10.1 Work undertaken as part of this report

NCC in collaboration with their academic partner the UEA have consulted with partners from the Green Pilgrimage project to understand the situations of different regions and requirements for a methodology to measure the economic, social and environmental impact of pilgrimage as a form of low impact tourism.

Work undertaken involved an initial literature review to assess the relevance of different methodologies to measure primarily non-market values, a review of sustainability indicators, and pilot testing of selected methodologies.

Summary of the review

Methodologies were drawn primarily from the area of green infrastructure, whereby the environment can be valued according to habitat and activity taking place in it. In reviewing these methods, some were discounted early on, such as hedonic propriety method, due to being less relevance for valuing paths, and the amount of technical knowledge and data needed to carry it out. Other methods such as Input Output table analysis were recognised as both valuable and complex giving specific local economic impact of set activities. Given the low level of current data collection and valuation knowledge identified in consultation, an assessment of how easy methods would be to use, and communicating this clearly to project partners was a key component in the design of this report.

In undertaking the review, there appeared strong methods for valuing walking and cycling as an activity in different habitat settings. For example, existing integrated tools such as ORVal and HEAT that could provide estimated values through background datasets and benefit transfer using existing studies valuing green infrastructure. Such recognised tools provide and methods provide a useful starting point, and with minimal resource expenditure. The report highlights that these are viable options bearing in mind their limitations.

The review however exposed gaps in valuing the unique aspects of pilgrimage – the wellbeing benefits from undertaking a ’journey of meaning’ to a ‘place of significance’. Recommendations from the UEA concluded that there is a lack of existing research in this field, providing a strong case that only primary research would be able to provide insight into the unique value of pilgrims walking a path, or visiting a place – both for a value to the individual in terms of wellbeing, and valuing the wider financial and social impact. Recommended methods of travel cost method, contingent valuation and behaviour would be incorporated within questions on a survey to be carried out for a minimum of 200 responses.

A literature review was also undertaken to review sustainability indicators that could be used to assess pilgrim routes and sites; this included a review of the Green Pilgrimage Network Handbook for Faith leaders, cities, towns and pilgrims. Reviewing the handbook revealed a large range of indicators that could be organised into 3 broad categories: Greening the pilgrimage experience; Undertaking direct conservation activities on faith land; Indirectly contributing to greater awareness of sustainability issues through education, volunteering and partnerships, i.e. with local businesses.

Although much is covered in the three categories, the review of sustainability indicators exposed a gap – the economic and social impact of pilgrims - that can be covered by the remaining studies in the literature review. In sum, there exists a suite of indicators that can be incorporated by partners depending on their specific area of concern. Deciding where to

begin, and therefore what data to collect, will depend on the pilgrimage context, i.e. in those instances where most pilgrims walk the need to collect data on transportation is less critical. For sites, like Walsingham where many pilgrims reside on-site, collecting data on the environmental sustainability of the residential and catering options might be key areas to prioritise.

Examples are also given of green tourism accreditation schemes which have narrower preselected groups of sustainability indicators, usually working businesses through a series of three levels to achieve different levels of certification. The benefit of such a marketed scheme is the recognition by customer and B2B marketing, and the support such an accreditation organisation can provide in advising a business. The disadvantage is that the focus of the scheme (and its indicators) will likely be generic rather than for a specific situation.

Summary of testing

Both ORVal and Benefit transfer were tested on 4 paths in Norfolk. Results give estimated but statistically proven figures for visitor numbers, welfare values as well as figure for value of path per km, and per access depending on the habitat and chosen activity. It is recognised however that these do not capture wellbeing benefits of walking/cycling and any wellbeing and social benefit related to pilgrimage.

A survey was therefore developed based on research questions that sought to capture these, plus provide the functionality to value extensions to paths and other changes that partners might wish to make to a path or site – in order to make decisions over prioritisation of spending.

The survey was developed through a comprehensive iterative process together with local stakeholders. Pre-analysis was undertaken using 24 survey responses to further test the survey is fit for purpose and to demonstrate explicitly for partners to policy statements that can be produced from the methods recommended within this report, providing a strong case for prioritising spending on data collection. Results shown in section 6.5 ‘data interpretation’ are therefore preliminary, requiring more data collection before results can be published.

10.2 Recommendations for partners

Partners are recommended to review section 9 in considering their next steps to planning any evaluation work, and to first start by considering their research questions which may be value related, or assessing sustainability.

In reviewing Section 5.4.1 (summary of methods organised by level of ease to undertake), and Section 6 (the journey NCC took in starting to collect data), partners are recommended to identify simple quick wins in initial data collection, or identifying partners who may be able to share data.

As reiterated throughout the report, there are alternatives to primary data collection – a range of existing integrated tools and existing studies exist particularly in providing evidence to support walking and cycling. However depending on what you specifically want to measure, primary data collection may become key.

10.3 Future plans for Green Pilgrimage impact research

The recommended methodologies collated with the UEA can be applied to capture both financial benefit and benefit to physical/mental health, and used as indicators to determine value/sustainable practice. Work by University of Santiago also explored options for more representative measurements, broadening scope from direct financial benefit of pilgrimage alone to deepen understanding of wider indirect benefits to the local economy.

This research used government input/output tables at a regional level to calculate that the economic impact generated by each pilgrim is equivalent to 2.3 standard (non-pilgrim) tourists. This is due to the propensity of pilgrims to spend more locally. Given that understanding the impact of visitors on local communities is a key indicator of sustainability, this is a key component of further valuation work which although remained out of reach in Phase 1, we aim to explore in Phase 2.

Learnings from Phase 1 – a review of valuation methodologies demonstrated that:

- Capturing the value of pilgrimage as a unique travel experience requires understanding of motivations and perceptions. This is complex and multifaceted.
- This complexity leads to a lack of understanding in what and how to measure, and therefore currently very little data is collected apart from simple visitor numbers.
- Data collected is not in a consistent format which makes meaningful analysis and comparison difficult.

The most suitable valuation methodology as recommended by this report will undergo initial testing on sites across Norfolk this year. We aim to gather 200 data points via this NCC-funded study, before expanding this.

The NCC action plan for Phase 2 highlights two key ambitions in connection with further valuation work:

1. To test the recommended methodology more widely with GP partners at pilgrimage routes and destinations across the project area
2. Create an accessible, free-to-use, online digital tool to enable data collection, sharing and analysis in order to initiate a green pilgrimage database and inform wider stakeholders

Based on the work undertaken in Phase 1, NCC will be in a unique position to test and guide development of such a tool and oversee its dissemination and maintenance. This work will (contingent on funding) involve three phases.

<u>Testing</u>

- Working the University of Santiago and an internal project steering group (including UEA) NCC will test the methodology recommended in Phase 1 more widely than Norfolk. NCC will collaborate with and receive feedback from GP partners including Sweden and Romania, as well as partners from wider Interreg projects linked to walking & cycling routes and the visitor economy e.g. EXPERIENCE.
- This will be an iterative process with adaptations to the methodology made to account for regional variations following partner feedback. This will ensure the final evaluation tool will be suitable for use in different contexts in order to meet demand outlined in Phase 1.

<u>Building a digital evaluation tool</u>

- NCC will create an accessible, online tool that can be widely used to value the economic, social and environmental impact of green pilgrimage and walking/cycling routes more widely across the GP project area and further afield.

Tool release and maintenance

- Tourism projects involving different forms of walking and cycling activities will be able to gather baseline data in a uniform way using the online tool. This information can be added to a central database (populated during the testing stage) to provide comparative values.
- All further use of the tool will contribute to this database, creating a databank that can be used by other sites unable to undertake in depth research, through the use of 'benefit transfer'.
- This means that data will be available for wider evaluation of routes. Through collaboration NCC would look to gather data from a significant sample size c. 4000 responses to surveys across a minimum of 10 projects.
- This tool will provide a baseline measure of the green pilgrimage value of all recognised routes across the entire Interreg Europe Programme Area. This as an important contribution to measuring change in the future and the challenge of climate emergency.

For further information please contact the Green Pilgrimage Project contact at Norfolk County Council.

11.Appendices

Appendix 1 – CSERGE Report – Review of methodologies

Centre for Social and Economic Research on the Global Environment (CSERGE)

CSERGE-NCC FINAL REPORT

REVIEW OF METHODS, DATA, AND NEXT STEPS FOR VALUING NORFOLK'S TRAILS

Produced by: Matthew Agarwala, Rosalind Bark, Amy Bowen, Tomas Badura, Matthew Hayward, John Jones, Kerry Turner, Charlotte Watts

Monday, December 3, 2018

University of East Anglia

Table of Contents

Green Infrastructure Valuation Toolkit

The Norfolk County Council (NCC) and the Centre for Social and Economic Research on the Global Environment (CSERGE) are developing a toolkit, to use alongside existing processes, to create a standardised valuation methodology for new Green Infrastructure developments for The Environment Team. Green Infrastructure refers to “a network of multi-functional green space, urban and rural, which is capable of delivering a wide range of environmental and quality of life benefits for local communities” (HM Government 2018)

NCC Environment Team are aware of, and have used in the past, a number of different valuation tools, e.g. MENE, ORVal, STEAM and HEAT to estimate the value of green infrastructure. To date, use of these methods has not supplied a comprehensive valuation accounting for the key areas outlined below.

The new toolkit will provide the following benefits:

- A consistent process to use across the team
- A simple and efficient process
- An externally verified methodology
- Aligned to funding opportunities to support funding bids
- Help to create more informed discussion within the team
- Make better use of data to drive more insight from it to use within the team and identify areas of opportunity
- Money saving as feasibility studies can be done quicker with less bespoke processes created

The toolkit will bring together methodologies identified by joint working between NCC and UEA to create a way to value new green infrastructure programmes.

NCC will be able to reproduce this within the team and it will be flexible to look at the range of Green Infrastructure programmes within the team and also to focus on different areas of value.

How does this link into NCC’s key principles?

- It will allow the team to work efficiently, create a more business-like output utilising digital technology
- Make better use of our data to make informed decisions
- Enables the Environment Team to meet the three values for the plan on a page:
    - Evidence based: thanks to UEA as external research partner the tool gives credibility to our future projects
    - Collaborative: working across projects/teams within Environment but also with other teams in NCC, this tool can help give value to projects
    - Innovative: the tool will showcase the value for money of our work and will set NCC in good stead when applying for funding for opportunities including the Shared Prosperity Fund.

Ultimately, this will support applications to external sources of money for green infrastructure which will bring value to Norfolk within the post-Brexit funding environment.

The methodology, when developed will be tested on 3 initial case studies, the first being the Walsingham area (linked to the EU Green Pilgrimage project). The remaining two will consist of an existing trail which is due to be improved and another trail which is not yet in existence.

Initially it was agreed that the Weavers Way and the Kings Lynn to Hunstanton route would be good examples. However, new plans for a Green Loop in Norwich consisting of the Marriott's Way, Bure Valley Way and also the new Broadland Way, potentially make this a better test as the Broadland Way is identified for construction in the North-east Norwich Growth Triangle Area Action Plan.

Practical Foundations for Valuing Green Infrastructure

This section introduces core practical foundations necessary for valuing green infrastructure. It begins with a review of how economists think about prices and values, and shows how these concepts relate to the challenges of valuing green infrastructure. Even the simplest of green infrastructure investments can generate a wide variety of environmental goods and services. For example, an unpaved woodland walking path can provide recreational opportunities, health benefits, habitat for wild species, air quality improvements, increase property values, reduce traffic congestion (especially if used by commuters), or support local businesses by attracting eco-tourists.

Some of these impacts are readily observable in existing markets: surveys of pubs and cafes near trail heads may clearly identify the impact of the walking path on local business. Other market impacts may be more difficult to identify: the walking path may improve local property values, but isolating the precise value requires expert analysis. In these instances market prices may serve as a guide to understanding the value generated by the path.

However, many of the benefits of multi-use paths accrue outside of formal markets. Recreational opportunities, human health, wild habitats, and biodiversity are not traded in markets and so there is no guiding market price. But these benefits clearly have value, and ignoring it would systematically understate the value of the path.

Environmental economists have developed a range of methods for capturing these non-market benefits and reflecting their value in monetary terms. The variety of available methods means that it is now possible to capture a wide range of non-market impacts, thus better reflecting the myriad benefits of green infrastructure. But this variety can also complicate the valuation process because there is no single method that can be applied across all elements of green infrastructure, and which captures all the value streams (health, tourism, recreation, carbon emissions, etc). Fortunately, many real-world policy questions justify focusing on just one or a few of the potential value streams.

In conventional usage, the words 'value' and 'price' may be considered interchangeable. But for environmental economists, the distinction between them is a fundamental concept. Market prices refer simply to the amount for which goods and services are traded in a market setting. For instance, visiting a private garden with a ticket price of £5.00. Such market prices have several features worth noting:

- The higher the market price, the greater contribution each visitor makes to the market economy.
- The higher the market price, the less likely it is that an individual will choose to visit the site.
- There must be a market in which the good or service is traded, and this must be observable by the analyst.
- Any good, service, or impact that is not formally traded in a market is implicitly assigned a market price of £0.

In contrast, economic valuation goes well beyond mere observations of market activity. It is grounded in the idea that market prices do not fully capture the impact of economic activity. These non-market impacts are known as externalities, and can be positive (e.g. if visitors enjoy viewing wildlife or picking berries along the Marriot's Way) or negative (e.g. if local residents object to traffic or a loss of privacy).

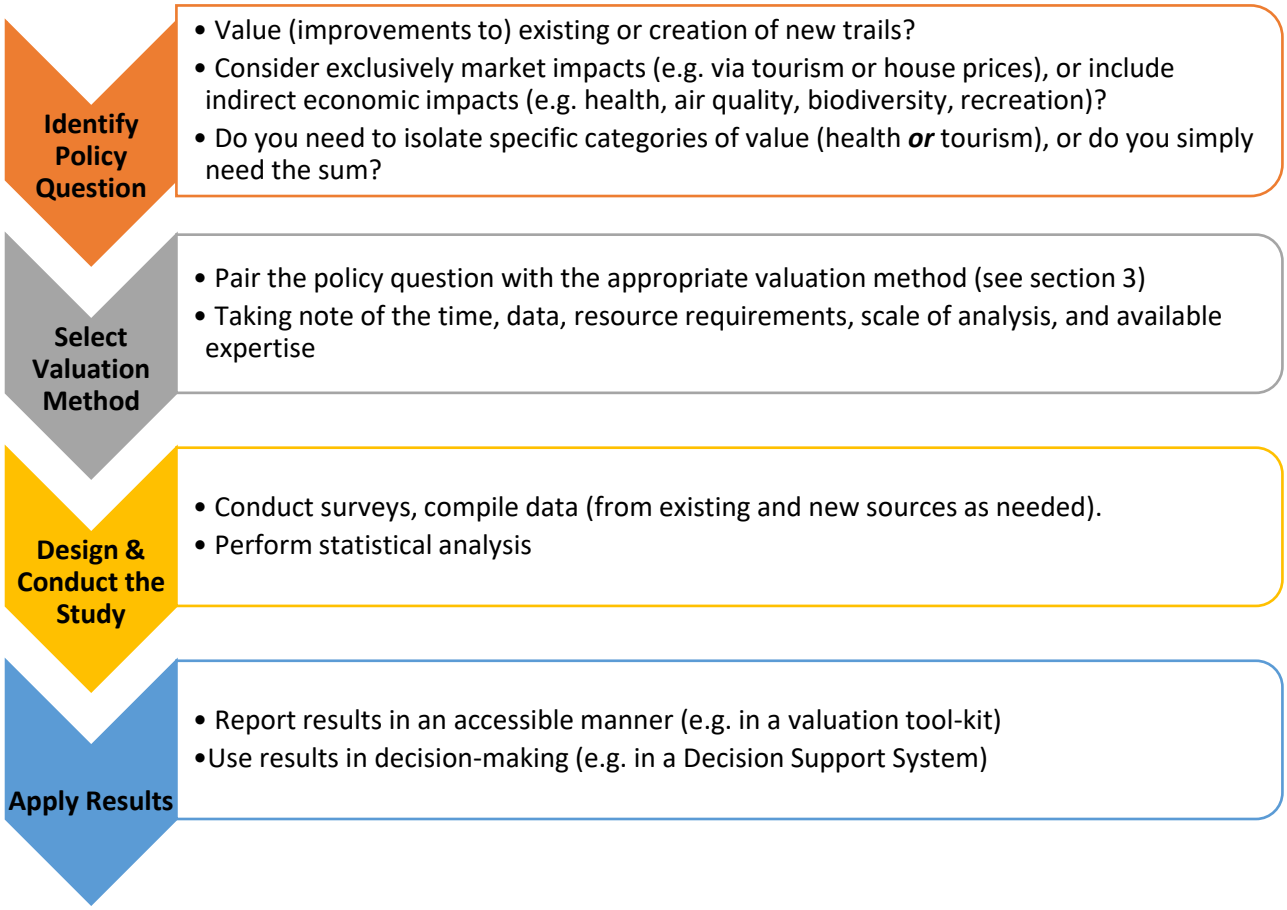
To provide a complete picture, any economic analysis must incorporate these non-market impacts. Dog walking, cycling, running, and horseback riding along Norfolk's multi-use paths generate substantial economic value, even though the market price for such activities is often £0. The non-market valuation methods described below directly address this issue, and are the result of nearly 50 years of economic research and innovation. Whereas market prices consider contributions to market activity, non-market values consider contributions to human wellbeing. Some features of non-market values worth considering are:

- A site or path may generate high value, even if the market price of access is £0.
- The higher the value, the more likely it is that an individual will choose to visit the site.
- Non-market valuation methods enable us to value impacts and activities even where there is no formal market or observable price.
- Does not implicitly assume that non-market impacts have a value of £0.

The expertise and resources required for non-market valuation can vary significantly. For instance, valuing the carbon implications of a given project merely requires analysts to multiply the change in emissions by a predetermined carbon value (typically the government's official carbon price). But other elements of green infrastructure can be more complicated due to the variety of impacts and the range of available methods for valuing them.

Figure 1 outlines the key steps in the environmental valuation process, with emphasis on capturing the benefits of green infrastructure. The process is largely sequential, in that each stage depends upon the outcome of those previous. But it is not necessarily linear. For instance, if it is revealed in Stage 2 that the appropriate valuation method requires more resources than are available to conduct the study, it may be necessary to return to Stage 1 and refine the policy question. In practice, policy questions are often revisited and refined several times in the early stages of a valuation exercise. Whilst, a certain amount of back-tracking is inevitable, careful consideration at each stage helps identify potential pitfalls early in the process, saving time and resources in the long-run.

FIGURE 1: THE ENVIRONMENTAL VALUATION PROCESS



Stage 1: Identifying the Policy Question

First and foremost, the policy question must be clearly identified. This is often more difficult than expected, but getting this part right pays dividends in the long run. For instance, imagine if our policy question was 'What is the value of Norfolk's trail system?' We would soon encounter a range of problems:

- Value to whom? Local businesses, homeowners, residents, farmers, and tourists might all experience different value streams from the same set of trails.
- What is the geographic scope? Norfolk is home to several globally unique ecosystems. Are we interested in the global willingness to pay to protect rare species habitats? Or does the real policy interest lie closer to home?
- Which sources of value are most important? If the objective is to use the valuation to justify funding, it may be necessary to focus on specific types of values. For instance, if funding is available for investments in public health, it may be appropriate to focus the valuation exercise around impacts on physical and mental health, exercise, and air quality. But if funding is available for mitigating carbon emissions, the valuation exercise could be tailored to focus on cycle commuting, reduced traffic congestion, and avoided vehicle emissions.

- Are we really interested in the sum of values or are marginal values more important? Headline numbers extolling the substantial value of large-scale environmental assets are 'attention getters' and can raise awareness. For instance, the annual sum of all the flows of benefits generated by Norfolk's trails is likely to be extremely large and this total could be useful in communicating both the magnitude of the impact and the return on investment in green infrastructure. But in terms of project level decision making, such sums may be less useful. Instead, it is often more important to know whether investing in the next trail is worth the cost, i.e. the marginal value. In this instance, it is preferable to focus on the specific area of trail rather than attempt to value the entire network.

Stage 2: Selecting the Valuation Method

The analyst must keep two things in mind when selecting the valuation method: (i) matching the change(s) or impact(s) to be valued with the appropriate method(s), and (ii) weighing the resource requirements of conducting the study against the usefulness of the information that the study can generate.

Once the policy question has been sufficiently refined the analyst can identify the appropriate valuation method. These are described in greater detail in the next section. The variety of methods reflects the broad range of values generated by ecosystems and green infrastructure. Some take advantage of observed behaviour – how people engage with the environment – to estimate value, whereas others make use of surveys of target populations to elicit willingness to pay for environmental changes.

Several 'off-the-shelf' valuation tools exist for these situations. Examples such as benefit transfer, ORVal, and WebTag are described in greater detail in the next section. Appendices II & III provide decision trees to help identify when a valuation study is required, and which valuation methods should be used. These are general and can be applied to any element of green infrastructure.

Stage 3: Designing and Conducting the Study

In some decision-making contexts, the resources available to support valuation are limited and it is not possible to conduct a new valuation exercise from scratch. In such cases, an off-the-shelf valuation tool might be available and appropriate. These include, a Benefit Transfer (BT) function combined with an Excel tool, an online software programme like ORVal, using an established Input-Output (IO) model (perhaps combined with an original expenditure survey), or one of the tools from the WebTag suite.

In other instances, the policy question or available funding may require a primary valuation study. These can range in complexity and it may be necessary to seek outside expertise. However, even when this is required, NCC's in-house capacity would still provide an important contribution. Primary valuation studies benefit from a detailed understanding of the context and some form of survey. NCC's staff, network and manpower could be useful in helping to get the questions right and to generate a good survey response rate.

Depending on the valuation method chosen, it may be possible for NCC to develop a survey in-house, though we would suggest getting input from a trained survey design expert. Once surveys have been pilot-tested, revised, distributed, collected, and coded, a statistician or economist can analyse the data and report results.

Stage 4: Apply the Results

The final stage of the valuation process is one of the most important. Empirical results need to be reported in a way that clearly expresses the main results and any corresponding caveats. In addition to central estimates, it is important to report the results of sensitivity analyses and explain how this should affect the way decision-makers interpret the numbers.

Economic valuation exercises are an indispensable tool in decision-making, but they will not provide the full picture. Other non-economic criteria can, should, and inevitably will impact decision-making alongside the results of any economic analysis. CSERGE has developed a decision support tool known as The Balance Sheet Approach to ensure that economic and other types of evidence are considered together in a systematic and consistent framework. The Balance Sheet Approach is described in greater detail in a later section.

The final stage of reporting and applying valuation results is to ensure they are disseminated among the appropriate stakeholders and catalogued and recorded in a way that makes them easy to access and understand when future projects arise. It may be that results from a study conducted some years ago are relevant to a new piece of research, but the individuals involved have moved on.

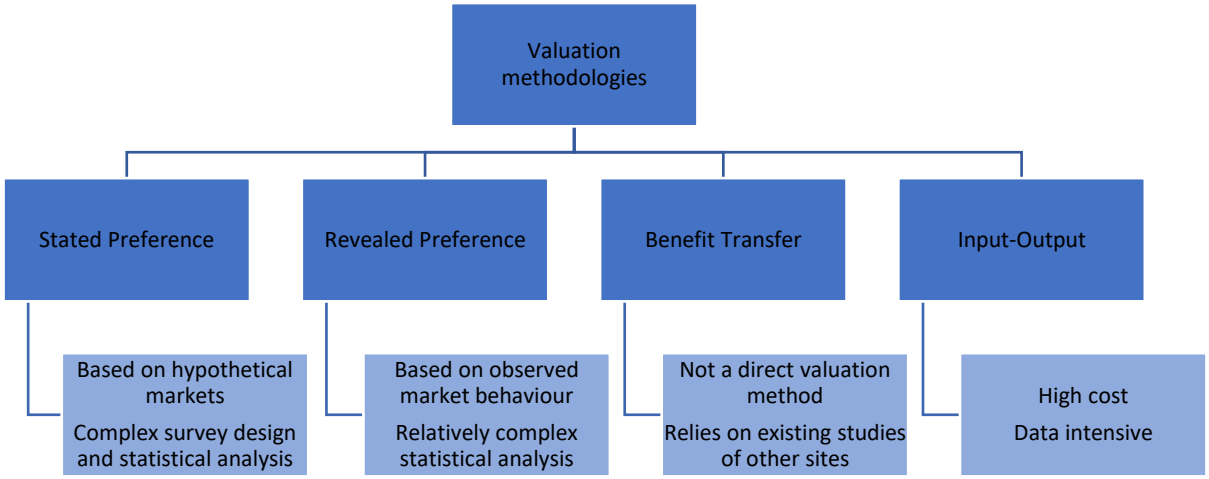
Valuation Methods

METHODS FOR VALUING ENVIRONMENTAL GOODS, e.g. trails, greenspace

There are several methods available for estimating the value of environmental goods that arise outside market contexts, e.g. trails, including green pilgrimage, see Figure 2. For the NCC valuation toolkit, the most appropriate valuation methods are:

- REVEALED PREFERENCE METHODS, where analysis of the purchase of market priced goods is used to indicate the implicit value of strongly related non-market goods, e.g. the travel costs to walk the England Coast Path or the property price premium to live near greenspace.
- STATED PREFERENCE METHODS, where hypothetical markets are developed and survey respondents state their willingness to pay, e.g. for extending a trail.
- BENEFIT TRANSFER (BT), where values from one or more existing studies are used to transfer willingness to pay values to a new, similar study site, e.g. transferring willingness to pay values from the Ridgeway National Trail to a similar or proposed National Trail in East Anglia.
- INPUT-OUTPUT (IO), where interdependencies between sectors and regions in an economy are used to calculate the multiplier effect of changes in supply and demand for goods and services (the difference between the *initial direct impact* and the *total impact* once a change has rippled through the economy).

FIGURE 2. VALUATION METHODOLOGIES



Revealed preference: travel cost method

Many environmental goods are associated with non-market, unpriced goods. Revealed preference methods rely on either directly observed behaviour or indirectly observed behaviour occurring in extant markets. The travel cost method is a commonly used approach for valuing recreational benefits. It relies on the premise that values of recreation benefits are implicitly shown in people's behaviour in travel markets (Parsons 2003). Through analysis of travel expenses in terms of actual travel costs, time costs and other costs incurred, it is possible to generate a demand curve for travel and then to assess the implicit price of travel to, for example, a recreational, historical, or pilgrimage site(s). Consequently, this method is not appropriate for valuing trails that are mostly used by local residents for dog walking and recreation as they do not incur travel costs.

Policy questions it can be used for: to estimate the value of a particular trail or pilgrimage site.
Data requirements: visitation numbers + survey to establish: size of party, mode of transport, length of stay, starting point to travel, home postcode, costs incurred on travel and other expenses, other sites visited, household income.
Advantages: provides a robust estimate of the value of trail recreation or green pilgrimage.
Limitations: site specific, day and multi-day visitors need to be treated differently, technical knowledge needed to use all the data to estimate value, i.e. willingness to pay.

Revealed preference: hedonic property method

The other revealed preference method, the hedonic property method relies on the variation in residential property values. Less frequently economists use residential rental values. Using regression analysis significant variations in house prices can be attributed to nearby amenities, e.g. greenspace or proximity to multi-use trails, or to environmental quality, e.g. the quality of nearby parks (Taylor 2003). The method can estimate the value of these environmental attributes.

Policy questions it can be used for: to estimate the value of different types, sizes, quality of greenspace.
Data requirements: a time series of spatially explicit residential property sales data inclusive of property characteristics, e.g. number of bedrooms, property type and GIS environmental,

neighbourhood and demographic data and environmental attribute data specific to the research question, e.g. on park quality
Advantages: provides a robust estimate of the value of environmental attributes.
Limitations: requires a lot of data and technical knowledge needed to use all the data to estimate value, i.e. implicit value of the non-marketed good, e.g. the environmental attribute.

Stated preference: contingent valuation method

Where it is not possible to observe behaviour an alternative approach is needed. This could be around situations which have not yet occurred, for instance when the policy case is interested in a 'what if' scenario, e.g. if the trail quality were to improve / if the trail were to be extended what would happen to use / access. This approach generates a hypothetical market through which survey respondents are asked to state their willingness to pay for changes in the provision of the environmental good (Boyle 2003). The contingent valuation method elicits individuals' willingness to pay values *contingent* on there being a (hypothetical) market within which those values can be stated (Badura et al. 2016). The hypothetical market needs to be credible to survey respondents. This method has been widely applied worldwide over many years to many different 'what if' scenarios. There are guidelines for best practice that include the crucial role of good survey design and implementation.

Policy questions it can be used for: to estimate the value of 'what if' scenarios, e.g. extending Pilgrims' Way to Fakenham, recycling a disused railway to connect King's Lynn and Hunstanton, converting a linear path to a circular path, lighting a previously unlit trail.
Data requirements: a survey with a description of potential intervention(s) and questions to determine value. Minimum 200 survey respondents.
Advantages: provides a robust estimate of the value of 'what if' scenarios.
Limitations: site specific, design and testing of survey, much technical knowledge needed to provide an estimate of willingness to pay.

Benefit transfer

In many cases the costs of undertaking high quality valuation assessments is vastly outweighed by the net benefits generated from the improved decision-making and in many cases the financial resources and expertise necessary for such studies are unavailable. In such instances benefit transfer can be a good option (Johnston et al. 2015).

Benefit transfer takes information from previously assessed 'study' sites and utilises this value to estimate values for some alternative 'policy' site, or for different changes at the same 'study' site (Badura et al. 2016). It is not a valuation method per se, as it is based on results from previous valuation studies. It is a pragmatic approach, recognising that it is not possible (or necessary) to value all environmental goods in those cases where there are existing studies from which values can be robustly extrapolated to 'policy' site(s).

Best practice benefit transfer recognises that precise matches between study and policy sites are unlikely and therefore that any differences are understood, quantified and incorporated within the transfer process. Common adjustments are for differences in standards of living and population size between the study and policy sites, different spatial configurations and substitute availability, e.g. linear vs coastal vs circular trail, or different levels of provision change, e.g. an additional 5km vs additional 20km of trail. The general aim of adjusting for the differences between the study and policy sites when using benefit transfer is to minimise the 'transfer errors' (the difference between the transferred values and the 'actual' values which a particular site or change generates).

Benefit transfer can be a simple transfer of adjusted mean values (univariate transfer) or involve value functions (multivariate transfer) specifically developed for transfer purposes. In its simplest form willingness to pay values from the study site (or a pool of such studies) are transferred to the policy site(s). The willingness to pay value transferred is either (adjusted) means or a unit value. It is important to note that poor or incomplete adjustments can result in larger errors than simple mean transfers.

The value function transfer approach, in contrast, employs statistical methods to estimate a relationship between the policy site characteristics and willingness to pay values (previously) estimated (Bateman et al. 2011). The derived function is then used to predict values for the policy site(s). This method explicitly incorporates the difference between the sites, as the actual characteristics of the policy site determine the final willingness to pay value obtained from the function. Clearly, identifying the most appropriate variables and specifications for such value functions is a central issue. Potential approaches include meta-analyses of the extant valuation literature or using statistical methods to identify relevant variables. Research suggests that for a heterogeneous set of sites, value function transfer results in lower transfer errors than using mean value transfer. In contrast, when transferring between similar sets of sites, mean value transfer performs better.

Despite its promise, benefit transfer is necessarily constrained by the availability of primary valuation studies. A range of initiatives aim to collate already existing valuation evidence and organise it in searchable database form, e.g. the Environmental Valuation Reference Inventory (EVRI, http://www.evri.ca). Such databases can be a useful tool for initial screening for value transfer purposes and can help to systematise the available evidence.

Policy questions it can be used for: estimate the value of particular trail, pilgrimage site, or for 'what if' scenarios, including creation of a new trail or pilgrimage route.
Data requirements: review of existing valuation studies on the topic, e.g. on walking and cycling on trails or on valuing pilgrimage.
Advantages: no need to do an original travel cost or contingent valuation study. There is a need to decide on whether to use a unit value or value function transfer approach. Once this unit value or value function are established, it would be simple for NCC staff to use this value.
Limitations: relies on there being sufficient existing good quality studies to draw on. This is a particular problem for pilgrimage. It would be possible to use existing studies on walking to estimate the value of green pilgrimage, however, studies of walking are unlikely to capture the mental and spiritual wellbeing aspects of pilgrimage walking.

Input-Output (price multiplier approaches)

Imagine a Norfolk village that is in a state of economic equilibrium. Overall, the village economy is relatively stable and the demand for goods and services is more or less matched by the supply. Local businesses buy and sell goods and services from each other, and sell them to local residents (many of whom work at those businesses). Whatever is not produced or consumed by the village is imported or exported.

Now imagine that a family from out of town comes to visit for a weekend – perhaps on pilgrimage, or to visit a local heritage site. The family pays £100 for a bed and breakfast, with a direct economic impact of £100. But this visit sets off a chain reaction of related economic activity, known as the 'indirect effect'.

The B&B pays cleaning and catering staff for an extra hour of labour to prepare the room (£15). They purchase extra pastries from the local baker to serve at breakfast (£5) and sausages and eggs from the local butcher (£10). These are transported by a local delivery service (£4). The butcher and baker in turn need to purchase flour, meat, and eggs from local farmers (£6.25), all of which need to be transported by the delivery service (£4), who now needs extra fuel and labour (£5). Thus, the sum of the indirect effects is £49.25 (£15 + £5 + £10 + £4 + £6.25 + £4 + £5). In this highly simplified scenario, the total market impact of the hotel stay is £149.25. Focusing only on the direct effect of daily expenditure by the family would understate this, significantly.

Economists have recognised the importance of these indirect, knock-on effects since at least the 1750s, and in the 1930s, Wassily Leontief developed a formal method for calculating their summed economic impact (a feat which earned him the Nobel Prize in Economics). The approach is known as input-output (IO) analysis and is regularly used for macro-economic modelling at the global, national, and state level (Miller and Blair 2009). Such models are often used to calculate 'multiplier' effects, or to model the general equilibrium effect (economy-wide) of a change in demand or supply within a specific sector. In our example, the multiplier effect is 1.4925, meaning that every £1 spent on hotel stays induces a total market impact of £1.4925.

The basis of an IO model is the Leontief matrix, which describes all the market interactions taking place between sectors of an economy (Miller and Blair 2009). As such, the IO approach requires a tremendous amount of data collection and revision. The time and resource investment required to develop a Leontief matrix is so prohibitive that national governments typically only create a new matrix at the national level, and often only once every few years. The data-intensive nature of IO analysis makes it difficult to use at smaller, sub-national scales. However, there are ways to adjust national models for use at smaller scale. Cambridge Econometrics, for instance, have developed a model for East Anglia, which could potentially be used to measure the market impact of tourism.

Beyond the intensive data requirements, there are a number of limitations which make it difficult to use IO to assess the economic impact of Norfolk Trails and/or green pilgrimage. First, one must recall the difference between a market impact analysis (of the kind supported by IO) and an economic valuation. IO models are dependent on observed market activity, with monetary exchanges taking place in formal markets. But as described above, most of the benefits derived from using Norfolk's trails accrue outside formal markets, and would therefore not show up in an IO analysis.

Policy questions it can be used for: estimate the multiplier effect for a specific industry/sector, demonstrate the economy-wide impact of a change in supply or demand in a specific sector, estimate the economy wide effect of a change in average daily expenditure by tourists.
Data requirements: Detailed make and use tables, Leontief matrix, survey data of daily tourist expenditure.
Advantages: Captures the full market impact (direct + indirect effects) of market activity.
Limitations: Requires considerable technical ability, prohibitively high data requirements, cannot be reliably used at a small scale (e.g. specific to green pilgrimage in Walsingham), only captures market impacts (not economic value) which means it would miss most of the key benefits of green infrastructure.

Wellbeing measures

Non-market valuation is a powerful tool for identifying, analysing, and interpreting the myriad ways in which green infrastructure impacts people. It can help decision-makers understand

the benefits of green infrastructure investments, and facilitates 'apples to apples' comparisons against other areas of public spending. However, some impacts of green infrastructure remain difficult to value directly in monetary terms, and are best captured via complementary methods. In particular, green infrastructure can enhance components of wellbeing – physical and mental health, a bond with nature, spiritual health, interpersonal relationships (community cycle events, running clubs, friends exercising, etc) – that may not be fully reflected in a valuation exercise. If the policy question of interest relates to these types of wellbeing enhancements, a valuation exercise could be greatly enhanced by including a wellbeing specific survey.

There is no universally accepted definition or measure of wellbeing, but several interpretations have proved useful in the research literature (MacKerron 2011; Agarwala et al. 2014):

6. *Preference satisfaction:* wellbeing is determined by one's ability to meet personal wants (e.g. are you able to satisfy your daily wants?);
7. *Objective lists:* wellbeing entails fulfilling externally defined material, social, and psychological needs (the researcher defines and lists the constituents of wellbeing and asks respondents whether these are fulfilled – e.g. are you married, do you have children, do you own your own home, do you exercise enough, etc);
8. *Eudaimonic/capabilities:* wellbeing entails meeting one's full potential in various domains of life (e.g. how satisfied are you with your life in general?)
9. *Hedonic:* wellbeing is defined in terms of dominant moods and feelings (e.g. on a scale of 1-100, how happy are you?)
10. *Evaluative:* in which individuals report self-evaluations of their own wellbeing.

Surveys can be designed that focus on only one of these wellbeing interpretations, or that combine elements of several within the same study. In some cases, it is adequate simply to know how respondents rate their wellbeing on a 1-100 scale, and it is not necessary to investigate the specific constituents of wellbeing and how they come together to make up that score. The benefit of this self-reported approach is that the identification and relative weighting of wellbeing constituents is left to the respondent and can differ across individuals. For instance, families that return to the same campgrounds and coastal walks for generations might derive substantial wellbeing from it, whereas other respondents may focus on different domains of life, such as being able to cycle commute. Self-reporting on a common scale allows each respondent to determine such factors for themselves. This approach enables us to understand the overall wellbeing impact of green infrastructure, but not its effect on specific constituents of wellbeing. Such a survey might only require one or two simple questions:

3. How happy do you feel today? (scale, 1-100)
4. How happy do you feel with your life in general? (scale, 1-100)

In some cases it may be necessary to focus on specific constituents of wellbeing. For instance, if our policy question relates to the health impacts of green infrastructure, it would be reasonable to tailor the survey questions to include health-based information. In this approach, the researcher would specify which constituents of wellbeing they wanted to assess, but allow the respondents to make their own subjective evaluations. Relevant questions for such a survey might include:

7. How happy do you feel today? (scale, 1-100)
8. How happy do you feel with your life in general? (scale, 1-100)
9. How do you rate your mental health nowadays? (5 point scale, 'excellent' to 'very poor')

10. How do you rate your physical health nowadays? (5 point scale, ‘excellent’ to ‘very poor’)
11. How often do you feel lonely? (5 point scale, ‘most days to ‘hardly ever’)

We noted that benefit transfer might be a good approach to valuing investment in trails. However, we also noted that as there are few valuation studies on pilgrimage walking benefit transfer would only capture valuing associated with walking that is unlikely to include value related to spiritual benefits and spiritual heritage. Wellbeing measures have been developed and a possible good choice is the self-reported EuroQol Visual Analogue Scale (EQ-VAS). EQ-VAS is a part of EQ-5D, a standardised instrument to measure health-related quality of life. The advantage of using such a quantitative measure is that it has been statistically linked to the Quality-Adjusted Life Year (QALY) measure, which in turn can be valued monetarily for use in cost-benefit analysis (CBA). To develop such measures for Norfolk a survey instrument could test whether walkers in general and pilgrims specifically, self-report higher levels of wellbeing than the general public (for which there is data). The self-reported values could then be converted to QALYs and used in a CBA.

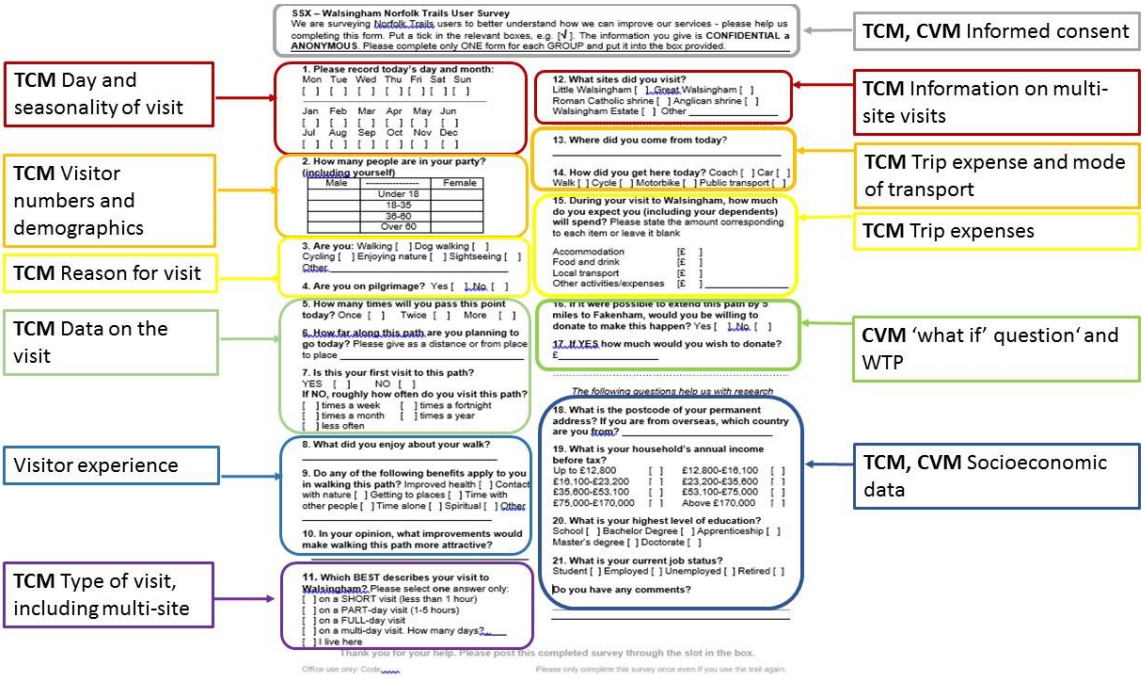
Data collection and surveys

Norfolk County Council-collected counter data is essential data for implementing the travel cost method. Ideally, such data will be collected over multiple years and will differentiate between different user types, e.g. equestrian, cyclists, walkers. Counter data needs to be supplemented with survey data to down-weight the counts for return journeys, with postcode data to know journey origins, as well as information on group size, household income, visit length, other sites visited and daily spend. Survey data can also be used to collect data on wellbeing measures and to answer ‘what if’ questions, e.g. for the contingent valuation method. Some principles for survey data collection are:

- For statistically significant results a minimum 100 surveys is needed and more is better
- Consistency across surveys
- Signage to better identify survey points
- More frequent collection and refilling of survey points
- Consider volunteers to undertake a targeted, large survey campaign

For the survey instrument itself an example is provided in the Appendix and Figure 3 annotates the survey instrument, describing the purpose of each question.

FIGURE 3: ANNOTATED SURVEY



*where **TCM**=travel cost method, **CVM**=contingent valuation method

Existing Integrated Tools for Valuing Multi-Use Paths

In a real-world context, relevant policy questions and valuation exercises often span multiple environmental-economic goods and services. For instance, one might wish to know the current value of walking along an existing path, *and* the value of (i) extending that path to a new location, or (ii) improving the path by paving it or adding lighting.

This poses a unique challenge for valuation. As described above, a key step in the process is to match the policy question (or good or service to be considered) to the appropriate valuation method. But when there are multiple policy questions, goods, and services, they may each require a different valuation method.

In such cases it is common to combine valuation methods. For example, we might use the travel cost method to value an existing path, combined with a contingent valuation survey to value extending, say the Pilgrims' Way to Fakenham.

When combining multiple valuation methods, a chief concern is to avoid 'double counting,' which would overstate the resulting value and undermine the legitimacy of the results. Other considerations include: the potential increase in research time and resources that may be necessary, the potential for 'over-thinking', and the increase in data requirements. However, with good study design, these concerns can be minimised and the benefits of combining valuation methods (especially in terms of answering the policy question more completely) are high.

Monitor of Engagement with the Natural Environment (MENE)

The UK Monitor of Engagement with the Natural Environment (MENE) is a globally unique dataset based on a national survey of over 45,000 households to understand how people engage with the natural environment, such as visiting the countryside, enjoying urban greenspace, wildlife watching, and exercising. It is not a valuation tool or method. However,

the MENE dataset is extremely useful for conducting travel cost valuation and underpins the economic analysis behind the ORVal valuation tool described below (Day and Smith 2016, 2017).

The MENE survey asks respondents about their expenditure whilst on a recreational visit. The results of this are included in Table 1 below. This table offers a national average of daily expenditure during visits to various types of green space. The NCC could adopt these as indicative of daily expenditure during visits in Norfolk, but it would be worth 'spot-checking' with an independent survey conducted by NCC to determine whether these national figures are representative of Norfolk.

TABLE 1: POSSIBLE APPROACHES FOR NCC VALUATION

	Towns & Cities	Countryside	Coast
Total	£6.42	£5.60	£18.28
By item:			
Food and drink	£3.78	£2.86	£9.38
Fuel	£0.65	£0.90	£3.20
Admission fees	£0.54	£0.76	£1.49
Gifts/Souvenirs	£0.42	£0.26	£1.24
Other items	£0.43	£0.33	£1.21
Car parking	£0.13	£0.11	£0.58
Bus/Train/Ferry fares	£0.33	£0.11	£0.58
Equipment purchases	£0.08	£0.20	£0.41
Equipment rental	£0.05	£0.06	£0.16
Maps/Guidebooks, etc	£0.01	£0.01	£0.03

Source: Natural England (2016). Values in 2014 GBP

ORVal

The ORVal tool is an example of combining valuation methods (Day and Smith 2016, 2017). ORVal is a freely accessible web-based tool that predicts the number of visits to existing and new greenspaces in England and Wales, and estimates the welfare value of those visits in monetary terms. It is based on an econometric model of recreational demand derived from the Monitor of Engagement with the Natural Environment (MENE) survey data. It uses MENE data to conduct a travel cost valuation of outdoor recreation sites in England and Wales, and then combines this valuation with a benefit transfer function so that these values can be extrapolated anywhere in England and Wales. Although these results are based on England-wide surveys, the ORVal tool allows users to customise results based on local socioeconomic and environmental contexts. Users can examine the recreational value of existing green space and test how the number of visits and the value of these visits might change if the land cover was changed. 'What if' scenarios can also be tested, for instance, the value of a newly created greenspace or trail. Results can be grouped by local authority area or catchment, and can be split by socio-economic group. Due to the detail in the underlying models, some training will likely be required for NCC to use ORVal reliably in-house.

WebTAG

WebTAG is the Department of Transport's (DFT) transport economic appraisal guidance used for all transport projects. The Active Mode Appraisal Toolkit was developed to specifically appraise investment in cycling and walking routes. The toolkit calculates a range of private and societal benefits – journey quality, health, accident, decongestion and air quality improvements – as well as any disbenefits due to reduced tax revenue, from investments that encourage more walking or cycling. All benefits and disbenefits are provided in £. A project's benefits can then be compared to project costs to determine if the investment passes a cost benefit analysis. Project costs comprise revenue and total capital costs and tax revenue dis-benefits.

There are several limitations with the WebTAG toolkit. Firstly, it is best suited to value urban transport design. Second, the active travel toolkit only values the costs and benefits of cycle and walking commuters and does not value increases in active tourism. Finally, it does not account for other wider environmental benefits, e.g. biodiversity. Therefore, to fully appraise the NCC's green infrastructure other tools are required.

Propensity to Cycle Tool (PCT)

The Propensity to Cycle is a DFT toolkit. It uses Census 2011 Data on commuters that cycle. It can be used to understand current cycling commuter patterns and to assess future patterns. The PCT has four scenarios, which provide different levels of commuter cycling penetration. The four scenarios are:

1. Government Target - Based on a DFT plan to double cycling in England between 2013 to 2025
2. Gender Equality - Where female propensity to cycle rises to match male propensity
3. Go Dutch - Where English and Welsh commuters are as likely as the Dutch to cycle given distance and hilliness
4. E-bikes - Models the additional increase in cycling that would be achieved through the widespread uptake of electric cycles ('e-bikes')

Baseline and scenario results can be mapped at either a Lower Super Output Area or Middle Super Output Area. The PCT is used in project development to provide planners with information about potential commuter trips – origins and destinations – and how such potential could be realised through active travel interventions, e.g. lighting, separation of cyclists from the road, etc. The PCT can be used to generate growth estimates for commuter cyclists that can then be fed into the WebTAG toolkit.

Health Economic Assessment Tool (HEAT)

The World Health Organization's Health Economic Assessment Tool (Kahlmeier et al. 2017) for walking and cycling values the impact of changes in the number of people walking and cycling over time. Values are calculated on the basis of mortality risks (affected by physical exercise, exposure to air pollution, risk of crashes when cycling) and the value of avoided carbon emissions. Changes in mortality risk are monetized via value of statistical life, and avoided emissions are valued by the carbon price.

HEAT provides a simple online tool which requires users to input data and select options describing the scenario to be evaluated. Users input data describing the amount of walking/cycling, the population (numbers, age), average cycling speeds and distances, the

extent to which changes in walking/cycling rates are offset by changes in other types of exercise, the discount rate, ambient air quality, and VSL. The HEAT model is underpinned by systematic reviews, meta-analyses, and benefit transfers which dictate how these inputs are combined to create an overall value. These are largely based on international urban valuation studies, include some UK based studies, and are probably a good base for valuation of walking and cycling infrastructure in Norwich. However, it is likely that the underlying studies behind HEAT are biased towards an urban setting and may not be appropriate for capturing values of long distance paths, coastal walks, or cycling on rural roads. It also excludes horseback riding and running, which are important uses of Norfolk's Trails.

Furthermore, HEAT does not capture recreation values, property premiums, biodiversity, mental health, water quality, or indeed any other types of ecosystem services beyond the value of physical exercise, exposure to air pollution, risk of crashes while cycling, and the value of avoided carbon emissions. As such, it is most appropriate for valuing urban green infrastructure when time and resources do not permit a primary study, or when the policy question does not require it.

The STEAM Tourism Model

The STEAM model is a proprietary Excel-based tool produced by Global Tourism Solutions (GTS). GTS (2009) writes that STEAM is a spreadsheet model which requires user inputs and provides a basis for monitoring tourism trends, but reports that STEAM is not "a statistically robust measurement of tourism".

As the model's fundamentals constitute private intellectual property and have not been submitted for academic peer review, it is not possible to comment on the relevance, validity, or reliability of STEAM as a valuation tool. However, it is possible to state that the set of required inputs listed in STEAM's documentation is not appropriate for valuing green infrastructure. STEAM inputs would describe the capacity to supply tourism services, and include accommodation capacity, employment in tourist accommodation, estimated numbers of day visitors, rates of daily expenditure, and economic multipliers. It seems reasonable to think that if NCC invested in collecting this information, they might also be able to collect the rest of the information required to conduct a valuation study or use one of the benefit transfer tools available to them. Moreover, there is no indication that STEAM relates to green infrastructure.

Comparison of tools

Table 2 below compares the valuation approaches at NCC's disposal for inclusion in the valuation toolkit. Value-based approaches in column 2 reflect the non-market benefits people derive from green infrastrucutre. Price-based approaches (column 3) focus exclusively on market expenditure, omitting non-market impacts. Economic approaches have the benefit of being underpinned by established economic methods and techniques. The most customisable option is clearly to conduct primary valuation studies, but this may not always be necessary or possible. Benefit transfer options, which include WebTAG and HEAT can vary in terms of customisability. For example, a new benefit transfer function can be estimated that specifically focuses on particular types of value (e.g. health or property). But this degree of customisation is not possible with the HEAT tool.

TABLE 2: POSSIBLE APPROACHES FOR NCC VALUATION

Approach	*Value-based*	*Price-based*	*Economic Approach*	*Customisable*	*NCC format*
ORVal	✔		✔	🟡	Online tool, requires training
Primary Valuation	✔		✔	🟢	Hire external consultants
*Benefit Transfer**	✔*		✔	🟢	Excel tool, can use in house
*WebTAG**	✔*		✔	🟡	Is an example of benefit transfer
Input-Output		✔	✔	🔴	Hire external consultants
MENE		✔		🔴	Single number
*HEAT**	✔		✔	🔴	Is an example of benefit transfer
*STEAM***					Proprietary model

* Not strictly speaking a valuation method, but rather a way of synthesizing existing literature.
** Unable to comment due to proprietary nature of the model.

Decision Support Systems: The Balance Sheet Approach (BSA)

Making policy choices across a range of alternative options, or merely deciding to invest scarce resources in a particular project policy or course of action, requires some sorts of decision making criteria and an evidence base of relevant data and information. Decision support systems (DSS) are frameworks that are designed to aid decision makers and are generally composed of a process and a set of tools. Environmental policy appraisal and ecosystem services thinking imposes further requirements in terms of flexibility and the need for an adaptive management strategy.

The Need for a New Format for Decision Support Systems

Current, more or less centralised, decision making struggles to adequately cope with the discovery, transmission and aggregation of ecosystem knowledge. A robust DSS should still contain a strategic decision making capability with its effectiveness dependent on the presence of both hierarchies and networks. The interplay between the hierarchy and the networks is important and needs to be continuously bolstered by transparent information feedback loops.

CBA and related methods have been part of the public policy DSS toolbox for many decades, although their actual impact on policy decisions has been much debated. The BSA proposes a different perspective, which retains CBA as one tool combined with others, which are then embedded in a more flexible and comprehensive evidence gathering, collating and interrogating process. The BSA is as much about investigating the policy issues and questions as it is about finding answers.

If CBA or related methods are to continue to play a role in the policy process, then a more explicit focus on distributional and fairness issues, i.e. who gains and who loses from

environmental change and consequent policy responses is required. The spread of costs and benefits across different affected individuals and groups in society needs to be accounted for and a weighting procedure applied. Project appraisals funded by economic development agencies have routinely included distributional weights but this practice has not been commonplace in other public sector applications. As a minimum, the way in which the CBA 'accounts' are set out and formatted needs to change to incorporate and highlight financial transfers and the distributional impact of costs and benefits across stakeholders. A format, for example, which disaggregates the benefits and costs of a project or policy among stakeholders and records all inter-stakeholder financial transfers, can also serve to illuminate key issues such as the level of aggregation adopted and the project/policy accounting boundary. Changing the accounts format is a necessary first step, but some analysts have gone further and proposed a 'hierarchy of options approach' in which explicit distributional weighting is applied, based on a rule that requires higher weights on all costs and benefits accruing to socially disadvantaged or below average income groups. We look at a particular way of formatting appraisal data and findings within the BSA.

The Balance Sheet Approach

The Balance Sheet Approach (Turner 2016) can represent one such DSS for environmental policy formation and evaluation. The distinct features of the BSA are firstly, its focus on fairness and equity concerns and distribution of these across space and social groups, while also explicitly considering compensation mechanisms between the major stakeholders that are impacted by a given policy. In conventional economic analyses a solution is deemed feasible when it passes a hypothetical compensation test, (e.g. could the 'winners' *hypothetically* compensate the 'losers' for their losses?). But because such compensation is purely hypothetical, this criterion is unlikely to find much public support in the real world. Therefore, the BSA extends this analysis with an added emphasis on *actual* compensation, equity, fairness and inequality i.e. who gains and who loses.

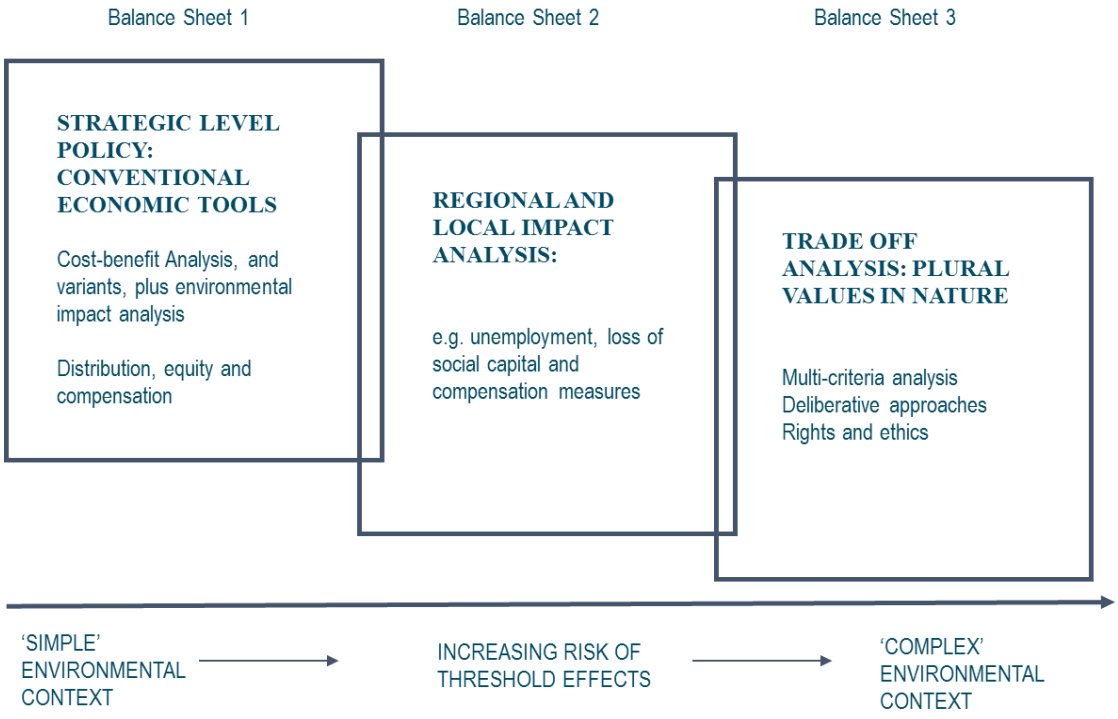
Second, the BSA provides a framework for the incorporation of different valuation concepts and methods into sequential stages of the decision making process and their application domains. In the BSA three complementary and interlinked stages of analyses – or three overlapping balance sheets – are followed which progressively focus on the increased complexity of environmental decisions and contested contexts that might arise in policy implementation (see Figure 3 & 4). Each stage provides complementary components that offer comparable sets of findings with overlaps and linkages (Turner 2017). The three stages provide further evidence and detailed understanding of the spatial distribution of impacts and the groups these impacts concern. As degree of complexity and degree of controversy increases, the need for a range of value concepts and valuation methods increases. This range includes increased use of non-monetary deliberative methods both for assessment and (potential) conflict resolution. The overall objective is to allocate resources across projects, policies or courses of action that maximise the use of scare resources and reduce the social conflicts that might hamper implementation of the concerned policy solution.

For ease of exposition the BSA is set out below in sequential fashion, but the process and related tools involved can be utilised in a piecemeal way e.g. it may be that a project at the regional scale is under analysis and policymakers just want an indication of who gains and losses in that localised context and so the focus can be directed straight to balance sheet 2. So flexibility is a key characteristic of the BSA.

The balance sheets encompass a process for collating, interrogating and presenting data/evidence across different policy situations and can be applied to a single project or set of projects in a policy programme. Any DSS that is put in place to assist in evaluating the gains

and losses involved in environmental policy choices will need to encompass a wide diversity of consequences and different stakeholder perspectives. The BSA (see Figure 3) comprises three complementary components (balance sheets) which can be seen as 'roughly comparable' sets of findings with overlaps and linkages. In using them, the aim would therefore be to determine the 'best' combination of data, methods and analysis, depending on the actual activity and context under appraisal. Conventional national/strategic policy appraisal relies heavily on standard economic and environmental impact analysis represented by Sheet 1, but our environment, economy and society are all changing at an increasingly rapid rate, and in more complex ways. This may mean that a more comprehensive and spatially explicit appraisal process involving Sheets 2 and 3 will be required.

FIGURE 3: BALANCE SHEET APPROACH



The move across Figure 3 from left to right, from one stylised polar position to another, illustrates the risk transition from relatively slow and well understood environmental change, towards very dynamic and/or longer term change with more uncertainty. The information in the BSA progressively encompasses more data and findings depending on the complexity of, and uncertainty around, the policy context under consideration. Sheet 1 evidence is drawn from conventional economic and environmental impact analysis but with added emphasis on equity and fairness considerations. The information on who gains and who loses in project/policy decision making, and what, if any, compensation should be paid to recompense 'losers', also needs to be highlighted and included. Compensation can take a number of forms and is not restricted to financial payments. This distribution and equity focus then forms a key link to evidence presented in Sheet 2, and in conceptual terms the DSS process begins to add reflexive learning and knowledge to the instrumental knowledge gathered in Sheet 1.

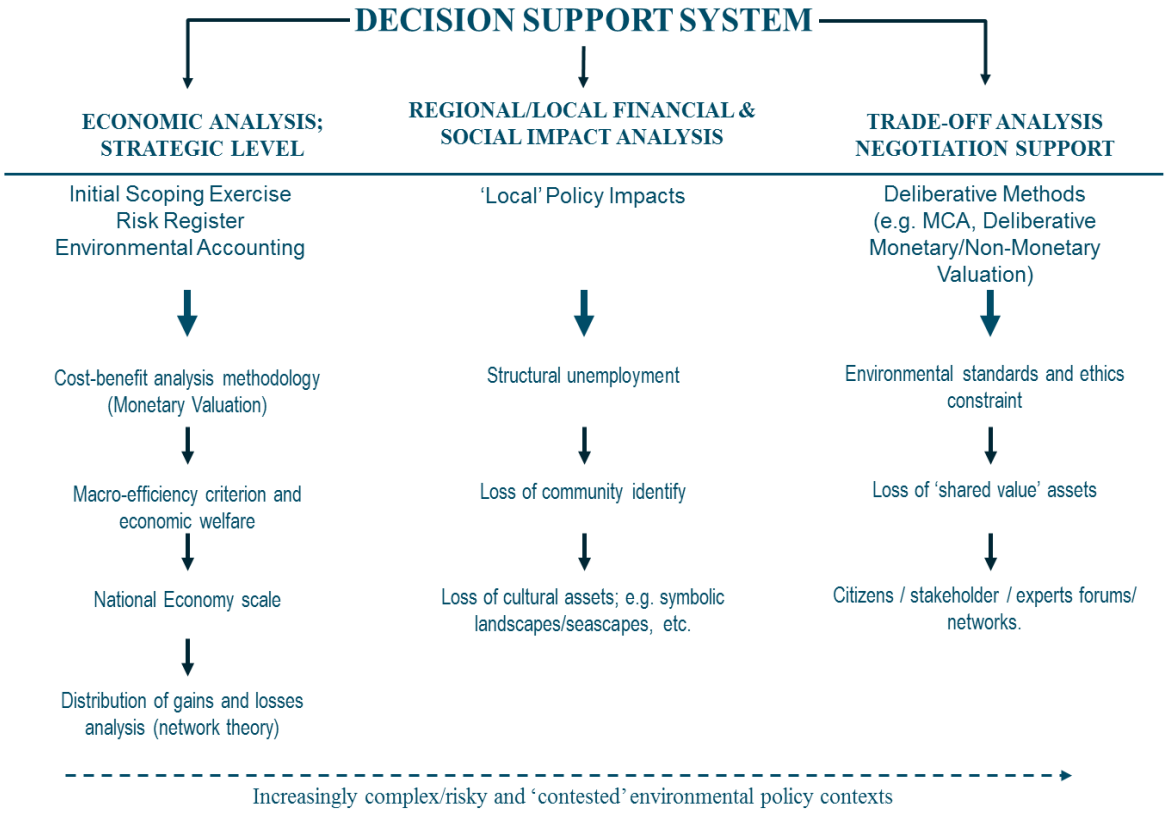
Sheet 2 should contain the results of collecting and drilling into the information on the spatial and socio-economic characteristics of 'winners' and 'losers' down to regional and local scales and the implications for different policy contexts. A novel feature is an up-front review of feasible compensation measures for the 'losers', rather than ad hoc responses to stakeholder reactions and political pressure after a decision has been announced. Using this sheet to

interrogate regional and local project/policy impacts may reveal not just competing users for an ecosystem service(s) but 'contesting' groups with profoundly different moral/ethical positions, attitudes to risk and cultural heritages. In such situations the formulation of overarching policy or a delivery plan is much more difficult.

The evidence in Sheet 3 should therefore specifically address these more 'contested' contexts. Other tools might be used such as multi-criteria analysis methods and group-based deliberative methods (ranging from deliberative monetary valuation exercises to cultural ecosystem mapping) which encourage discussion and debate (negotiation and arbitration) among relevant participants.

In the BSA, therefore, the three types of complementary assessments (balance sheets) propose guidelines for steering a more objective course through 'contested' policy contexts with associated appraisal tools, see Figure 4.

FIGURE 4: DECISION SUPPORT SYSTEM



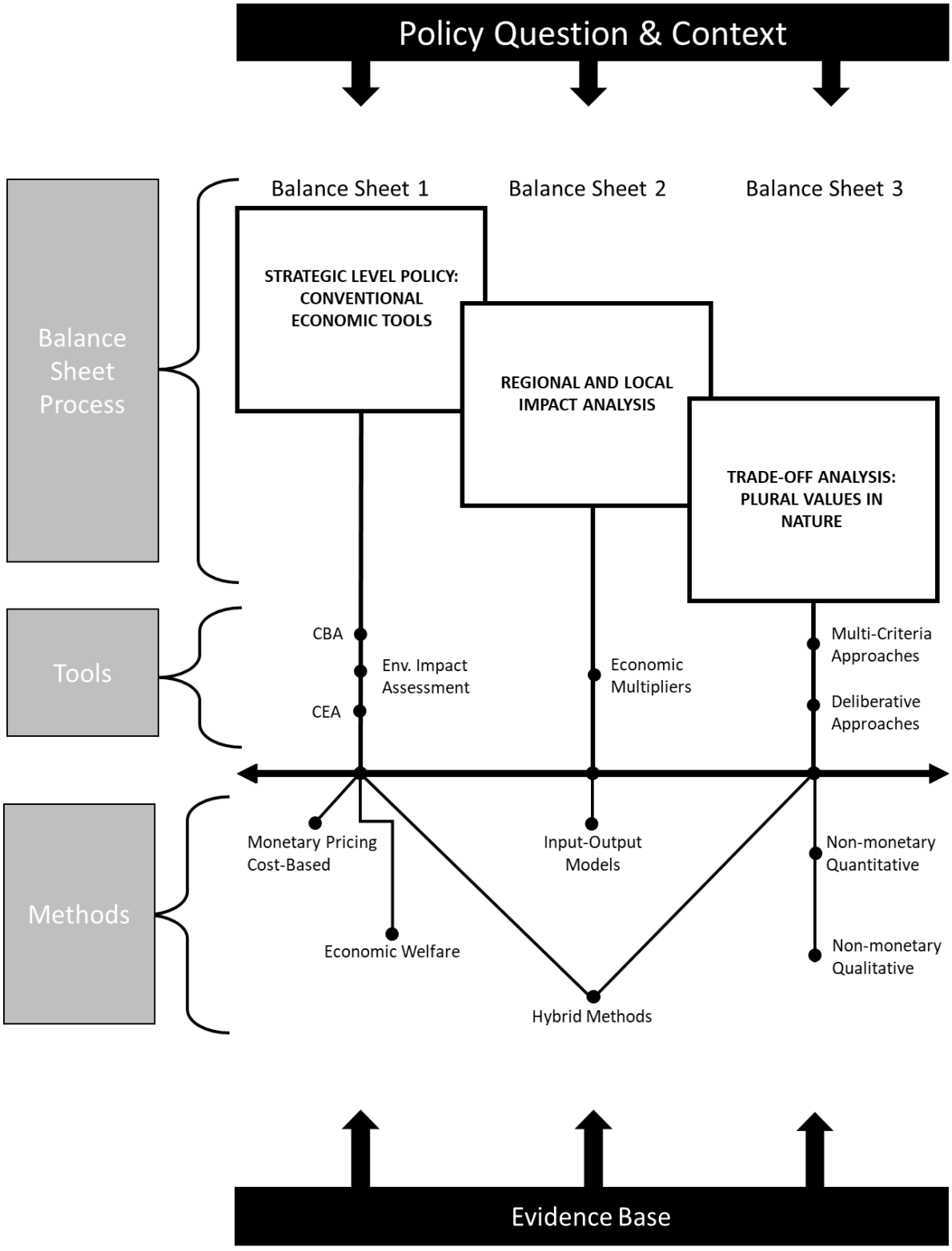
Finally, Figure 5 ties together the BSA, policy tools, and valuation methods described in this report. As in Figure 1 (The Valuation Process), the policy question and context represent the first stage. But while the 'top-down' policy needs drive the entire process, building the evidence base for informing decisions is a 'bottom-up' endeavour, and requires following the valuation process outlined in Figure 1.

Following Figure 5 from the bottom up shows how the various valuation methods may be combined in established policy tools (e.g. cost-benefit or multi-criteria analysis) and how these may ultimately enter the balance sheet process. Economic welfare valuation methods (bottom left) are required to go beyond a purely market-based analysis. For green infrastructure, this is where most of the value lies, and it therefore constitutes a crucial component of the evidence

base. For a more complete understanding of green infrastructure impacts, hybrid approaches might combine economic welfare analyses with wellbeing surveys.

Although Figure 5 may appear complex, this is because it shows relationships between multiple elements of the ‘valuation toolkit’. Fortunately, most policy questions would only require a small subset of these. The decision trees provided in Appendices II & III help the user navigate through the valuation process and identify which components of Figure 5 are relevant to a given policy question.

FIGURE 5. BALANCE SHEET & VALUATION: PUTTING IT ALL TOGETHER



CBA: Cost-Benefit Analysis
CEA: Cost-Effective Analysis
Economic Welfare methods refers to the non-market valuation methods described in Section 3

Hybrid Methods combine monetary and non-monetary evidence (e.g. valuation & wellbeing) in the same study.

References

Agarwala, M., Atkinson, G., Fry, B. P., Homewood, K., Mourato, S., Rowcliffe, … Milner-Gulland, E. J. (2014). Assessing the Relationship Between Human Well-being and Ecosystem Services: A Review of Frameworks. *Conservation and Society*, *12*(4), 437. https://doi.org/10.4103/0972-4923.155592

Baker, R., Ruting, B. (2014). Environmental Policy Analysis: A Guide to Non-Market Valuation, Productivity Commission Staff Working Paper. Australian Government January 2014. https://www.pc.gov.au/research/supporting/non-market-valuation

Boyle, K. J. (2017). Contingent Valuation in Practice. In P. A. Champ, K. J. Boyle, & T. C. Brown (Eds.), *A Primer on Nonmarket Valuation* (2nd ed., pp. 83–132). Dordrecht, The Netherlands: Springer. https://doi.org/10.1007/978-94-007-0826-6_5

Day, B., & Smith, G. (2016). *Outdoor Recreation Valuation (ORVal) User Guide. Version 1.0*. Exeter, UK. Retrieved from https://www.leep.exeter.ac.uk/orval/pdf-reports/orval_user_guide.pdf

Day, B., & Smith, G. (2017). *The ORVal Recreation Demand Model Advanced Technical Report*. Exeter, UK. Retrieved from http://leep.exeter.ac.uk/orval/pdf-reports/ORVal_Modelling_Report_2017.pdf

GTS. (2009). Overview of STEAM. Scarborough, UK: GTS. Retrieved from http://mediafiles.thedms.co.uk/Publication/LM/cms/pdf/STEAM OVERVIEW~ Eng-Wal-NI.pdf

HM Government. 2018. “National Planning Policy Framework.” London, UK. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/740441/National_Planning_Policy_Framework_web_accessible_version.pdf

Johnston, R. J., Rolfe, J., Rosenberger, R. S., & Brouwer, R. (2015). *Benefit Transfer of Environmental and Resource Values*. (R. J. Johnston, J. Rolfe, R. S. Rosenberger, & R. Brouwer, Eds.) (Vol. 14). London: Springer. https://doi.org/10.1007/978-94-017-9930-0

Kahlmeier, S., Götschi, T., Cavill, N., Fernandez, A. C., Brand, C., Rojas Rueda, D., … Racioppi, F. (2017). *Health economic assessment tool (HEAT) for walking and for cycling Methods and user guide on physical activity , air*. Copenhagen: World Health Organization. Retrieved from http://www.euro.who.int/__data/assets/pdf_file/0010/352963/Heat.pdf?ua=1

MacKerron, G. (2011). Happiness Economics From 35 000 Feet. *Journal of Economic Surveys*, no-no. https://doi.org/10.1111/j.1467-6419.2010.00672.x

Miller, R. E., & Blair, P. D. (2009). *Input-output analysis: foundations and extensions*. Cambridge university press.

Natural England. (2016). *Monitor of Engagement with the Natural Environment: Visits to Coastal England*.

Parsons, G. R. (2017). Travel Cost Methods. In P. A. Champ, K. J. Boyle, & T. C. Brown (Eds.), *A Primer on Nonmarket Valuation* (2nd ed., pp. 187–234). Dordrecht, The Netherlands: Springer. https://doi.org/10.1007/978-94-007-0826-6_9

Taylor, L. O. (2017). The Hedonic Method. In P. A. Champ, K. J. Boyle, & T. C. Brown (Eds.), *A Primer on Nonmarket Valuation* (2nd ed., pp. 235–292). Dordrecht, The

Netherlands: Springer. https://doi.org/10.1007/978-94-007-0826-6_10

Turner, R. Kerry. 2016. “The ‘Balance Sheet’ Approach within Adaptive Management for Ecosystem Services.” In *Routledge Handbook of Ecosystem Services*, edited by Marion Potschin, Roy Haines-Young, Robert Fish, and R .Kerry Turner, 1st ed. New York, NY

Appendix I: Example Trail Surveys

The first example trail survey does not include in-depth wellbeing questions.

SSX – Walsingham Norfolk Trails User Survey

We are surveying Norfolk Trails users to better understand how we can improve our services - please help us by completing this form. Put a tick in the relevant boxes, e.g. [√]. The information you give is **CONFIDENTIAL and ANONYMOUS**. Please complete only ONE form for each GROUP and put it into the box provided.

1. Please record today's day and month:

Mon Tue Wed Thu Fri Sat Sun
[ ] [ ] [ ] [ ] [ ] [ ] [ ]

Jan Feb Mar Apr May Jun
[ ] [ ] [ ] [ ] [ ] [ ]
Jul Aug Sep Oct Nov Dec
[ ] [ ] [ ] [ ] [ ] [ ]

2. How many people are in your party? (including yourself)

Male	----------	Female
	Under 18	
	18-35	
	36-60	
	Over 60	

3. Are you: Walking [ ] Dog walking [ ] Cycling [ ] Enjoying nature [ ] Sightseeing [ ] Other _____

4. Are you on pilgrimage? Yes [ ] No [ ]

5. How many times will you pass this point today? Once [ ] Twice [ ] More [ ]

6. How far along this path are you planning to go today? Please give as a distance or from place to place _____

7. Is this your first visit to this path?
YES [ ] NO [ ]
If NO, roughly how often do you visit this path?
[ ] times a week [ ] times a fortnight
[ ] times a month [ ] times a year
[ ] less often

8. What did you enjoy about your walk?
_____

9. Do any of the following benefits apply to you in walking this path? Improved health [ ] Contact with nature [ ] Getting to places [ ] Time with other people [ ] Time alone [ ] Spiritual [ ] Other _____

10. In your opinion, what improvements would make walking this path more attractive?
_____

11. Which BEST describes your visit to Walsingham? Please select one answer only:
[ ] on a SHORT visit (less than 1 hour)
[ ] on a PART-day visit (1-5 hours)
[ ] on a FULL-day visit
[ ] on a multi-day visit. How many days?____
[ ] I live here

12. What sites did you visit?
Little Walsingham [ ] Great Walsingham [ ]
Roman Catholic shrine [ ] Anglican shrine [ ]
Walsingham Estate [ ] Other _____

13. Where did you come from today?
_____

14. How did you get here today? Coach [ ] Car [ ] Walk [ ] Cycle [ ] Motorbike [ ] Public transport [ ]

15. During your visit to Walsingham, how much do you expect you (including your dependents) will spend? Please state the amount corresponding to each item or leave it blank

Accommodation [£]
Food and drink [£]
Local transport [£]
Other activities/expenses [£] _____

16. If it were possible to extend this path by 5 miles to Fakenham, would you be willing to donate to make this happen? Yes [ ] No [ ]

17. If YES how much would you wish to donate?
£_____

The following questions help us with research

18. What is the postcode of your permanent address? If you are from overseas, which country are you from? _____

19. What is your household's annual income before tax?

Up to £12,800	[ ]	£12,800-£16,100	[ ]
£16,100-£23,200	[ ]	£23,200-£35,600	[ ]
£35,600-£53,100	[ ]	£53,100-£75,000	[ ]
£75,000-£170,000	[ ]	Above £170,000	[ ]

20. What is your highest level of education?
School [ ] Bachelor Degree [ ] Apprenticeship [ ]
Master's degree [ ] Doctorate [ ]

21. What is your current job status?
Student [ ] Employed [ ] Unemployed [ ] Retired [ ]

22. Do you have any comments?
_____
_____

Thank you for your help. Please post this completed survey through the slot in the box.

Office use only: Code_____ Please only complete this survey once even if you use the trail again.

This second example trail survey incorporates five objective wellbeing questions.

SSX – Walsingham Norfolk Trails User Survey

We are surveying Norfolk Trails users to better understand how we can improve our services - please help us by completing this form. Put a tick in the relevant boxes, e.g. [√]. The information you give is **CONFIDENTIAL and ANONYMOUS**. Please complete only ONE form for each GROUP and put it into the box provided.

1. Please record today's day and month:

Mon Tue Wed Thu Fri Sat Sun
[ ] [ ] [ ] [ ] [ ] [ ] [ ]

Jan Feb Mar Apr May Jun
[ ] [ ] [ ] [ ] [ ] [ ]

Jul Aug Sep Oct Nov Dec
[ ] [ ] [ ] [ ] [ ] [ ]

2. How many people are in your party? (including yourself)

Male	----------	Female
	Under 18	
	18-35	
	36-60	
	Over 60	

3. Are you: Walking [ ] Dog walking [ ] Cycling [ ] Enjoying nature [ ] Sightseeing [ ] Other _____

4. Are you on pilgrimage? Yes [ ] No [ ]

5. How many times will you pass this point today? Once [ ] Twice [ ] More [ ]

6. How far along this path are you planning to go today? Please give as a distance or from place to place _____

7. Is this your first visit to this path?
YES [ ] NO [ ]
If NO, roughly how often do you visit this path?
[ ] times a week [ ] times a fortnight
[ ] times a month [ ] times a year
[ ] less often

8. In your opinion, what improvements would make walking this path more attractive?

_____

9. Which BEST describes your visit to Walsingham? Please select one answer only:
[ ] on a SHORT visit (less than 1 hour)
[ ] on a PART-day visit (1-5 hours)
[ ] on a FULL-day visit
[ ] on a multi-day visit. How many days?____ days
[ ] I live here

10. What sites did you visit?
Little Walsingham [ ] Great Walsingham [ ]
Roman Catholic shrine [ ] Anglican shrine [ ]
Walsingham Estate [ ] Other _____

11. Where did you come from today?

_____

12. How did you get here today? Coach [ ] Car [ ] Walk [ ] Cycle [ ] Motorbike [ ] Public transport [ ]

13. During your visit to Walsingham, how much do you expect you (including your dependents) will spend? Please state the amount corresponding to each item or leave it blank

Accommodation [£]
Food and drink [£]
Local transport [£]
Other activities/expenses [£] _____

14. If it were possible to extend this path by 5 miles to Fakenham, would you be willing to donate to make this happen? Yes [ ] No [ ]

15. If YES how much would you wish to donate?
£_____

The following questions help us with research

16. What is the postcode of your permanent address? If you are from overseas, which country are you from? _____

17. What is your household's annual income before tax?

Up to £12,800	[ ]	£12,800-£16,100	[ ]
£16,100-£23,200	[ ]	£23,200-£35,600	[ ]
£35,600-£53,100	[ ]	£53,100-£75,000	[ ]
£75,000-£170,000	[ ]	Above £170,000	[ ]

18. What is your highest level of education?
School [ ] Bachelor Degree [ ] Apprenticeship [ ]
Master's degree [ ] Doctorate [ ]

19. What is your current job status?
Student [ ] Employed [ ] Unemployed [ ] Retired [ ]

Understanding health and well-being

20. Please tick the relevant box for each question

How happy do you feel today?	Not happy [ ]	OK [ ]	Happy [ ]	Very happy [ ]
How happy do you feel with your life in general?	Not happy [ ]	OK [ ]	Happy [ ]	Very happy [ ]
How do you rate your mental health nowadays?	Very poor [ ]	OK [ ]	Good [ ]	Excellent [ ]
How do you rate your physical health nowadays?	Very poor [ ]	OK [ ]	Good [ ]	Excellent [ ]
How often do you feel lonely?	Most days [ ]	Often [ ]	Some days [ ]	Hardly ever [ ]

Do you have any comments?

_____

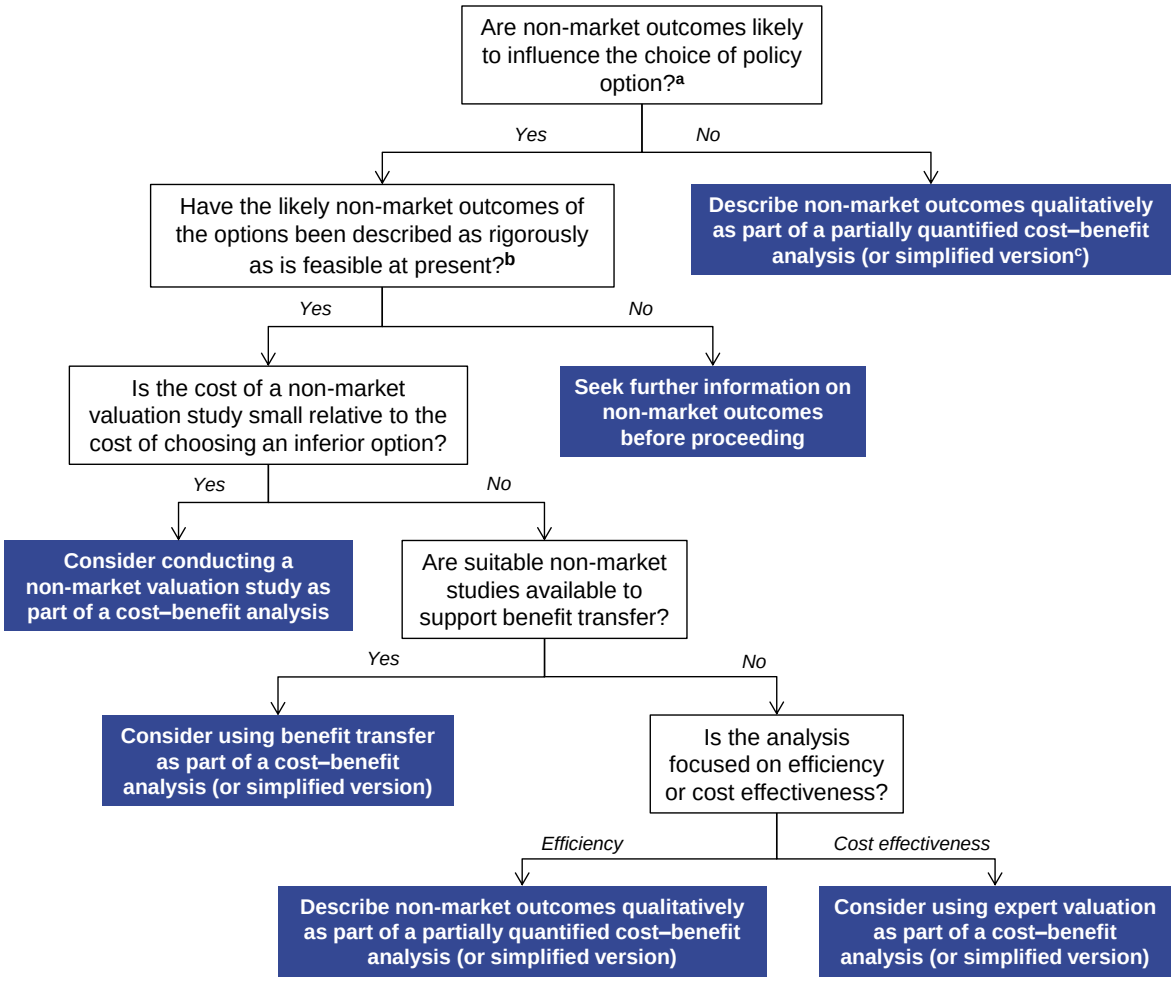
_____

Thank you for your help. Please post this completed survey through the slot in the box.

Office use only: Code_____ Please only complete this survey once even if you use the trail again.

Appendix II. Decision Tree: Do we Need a Valuation Study?

Before embarking on the valuation process, it is important to understand how the information will be used in decision-making. The following decision trees help identify why a valuation exercise is necessary, and which methods are most appropriate.



a Preliminary analysis could be useful in establishing whether the value of non-market outcomes is likely to be material in determining which option has the highest net benefit. **b** This does not imply that action should be delayed until uncertainties about the effects of policy options are resolved. Precaution should be applied through risk management frameworks that take account of uncertainty **c** The depth of analysis should be commensurate with the overall effects and in some cases a formal cost–benefit analysis is not justified (Australian Government 2013).

Figure II.a: Policy analysis and non-market outcomes *Source*: Baker and Ruting (2014, p66)
Figure 3.1 Dealing with non-market outcomes in policy analysis

Appendix III. Decision Tree: Which Valuation Method Should we Use?

Once it has been concluded that a valuation study is needed, the following decision tree helps to identify which valuation approach is most appropriate.

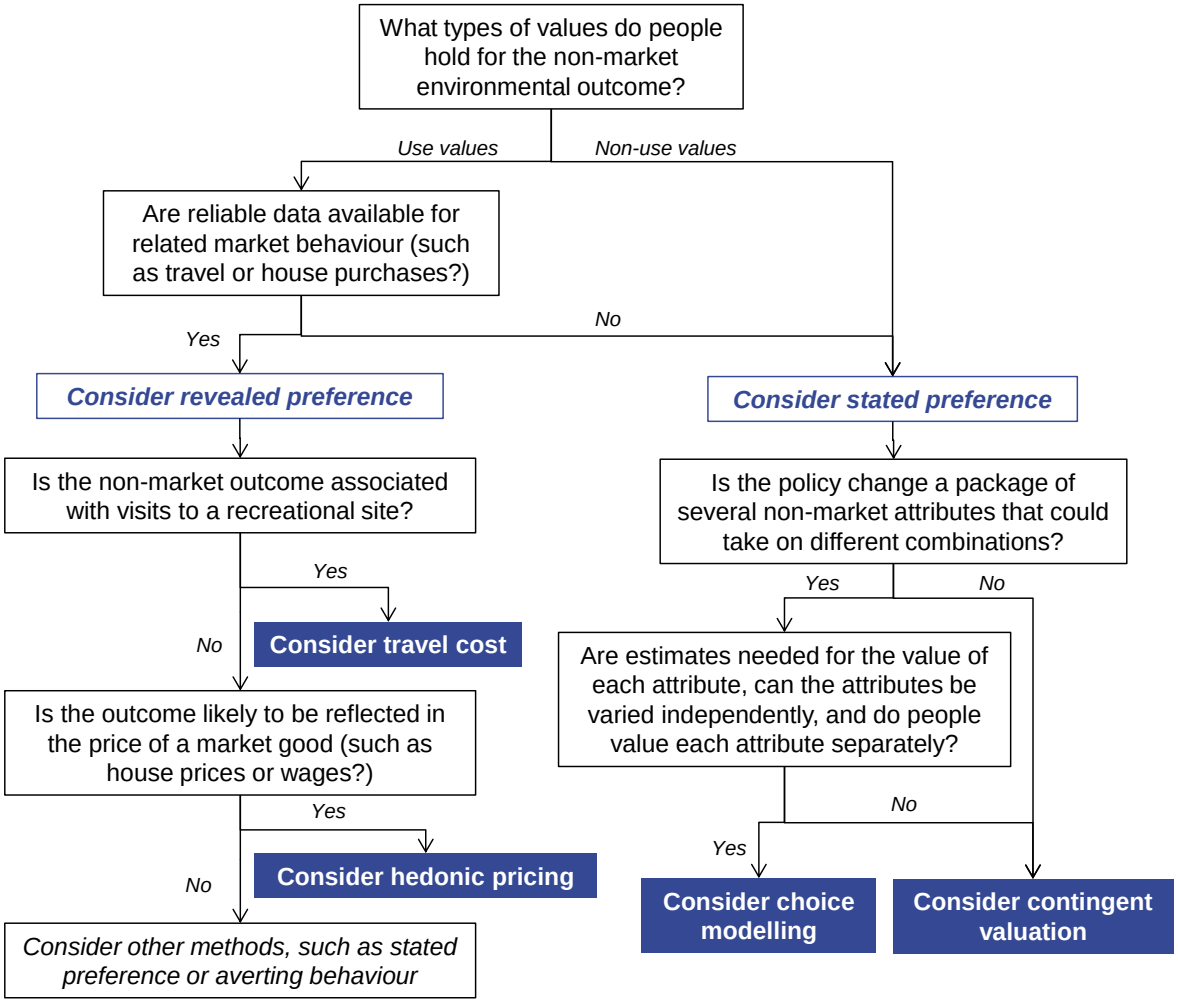


Figure II.b: Flow chart to guide selection of a non-market valuation method *Source*: Baker and Ruting (2014, p51) Figure 2.1 Selecting a non-market valuation method — initial questions

Appendix IV: Review of Existing Data

Data report
Assessment of the data is described in three sections: counter data, Walsingham data, survey data. For each, summary data and any analysis is provided followed by a description of data issues. Where analysis has been undertaken, findings are given.

Key		
Highlighted in grey		Analysis performed by software, NCC, consultant. For unhighlighted text, either CSERGE has written a comment/fact on the data or undertaken initial analysis
Blue writing		Refers to additional information
• Black bullet	(in Analysis box)	Gives details of issue with data
- Dash bullet	(in Analysis box)	Gives suggestion/solution option

Counter data				
Date Range	**Resolution**	**Location/Source**	**Format**	**Access**
April 2012-March 2018	Hourly via Eco-visio.net (NCC sent spreadsheet with monthly data)	49 stationary counters 6 mobile counters (one of which was at Walsingham) – but only 51 counters on Eco-visio.net For Lat/Long see Counter Details Trails (NCC)	Commonly exported as Excel, can be exported as CSV	Eco-visio.net[i] (only works in Microsoft Edge)
Most counters have data for a shorter period.	The exported Excel spreadsheet that has been "analysed" is monthly			

Analysis

- Calculated total visits by trail =SUM(all counters on trail): monthly, quarterly, then % change for quarters
- Annual totals for each counter – bar chart by counter
- Economic analysis: using £pp (Coastal from MENE, Countryside has several values from MENE, UEA, and Insight Track). Only Coastal paths completed.
- Coastal paths have been down-weighted (scaled down to try to correct for people who passed the same counter twice on an 'out and back' walk. They have done this using a scale-down factor for each Stretch –where this comes from is unknown), and differences in people and£ calculated
- Each trail has analysis of numerous graphs – counts yearly, monthly
- Eco-visio.net performs analysis of the most recent year automatically for each counter
- Supplementary document: Legend for locations and list of locations of counters

Issues with data

Anomalies

- There are many anomalies
- The exported Excel spreadsheet has some of these anomalies corrected, by:
    - Values removed
    - Values replaced with summer/winter/spring/autumn averages
- There are many instances of two types of anomaly: (i) missing data, i.e. the counter stopped working; (ii) extremely high values (e.g. insects/posters tripping the sensor)
- The anomalies are not corrected when directly exported from Eco-visio.net

- One option is to find the extreme values, replace them as missing values, and interpolate between them
- Recommendation is to extract the raw data and correct for anomalies. This would provide hourly (rather than monthly) corrected data, and let us design a strategy for correction (possibly simple linear interpolations).
- This would involve

    - Deciding which trend to plot – for most counters, yearly on that date would give enough data for an adequate line of best fit. Where there is insufficient data, equivalent dates (e.g. 'first Wednesday of a summer month') can be used to generate enough points to form the line of best fit.
    - Immunising the extremely high values that are not anomalous (but due to events, for example) against a function which will replace the high anomalous values with zeros, in order to be replaced by values. Equally, any zero values that are true values must also be immunised.

- Note, in the above point, "date" refers to 'first Wednesday of August' rather than '3rd of August'

II. Walsingham data

Traffic – Stays at Anglican Shrine			
Date Range	**Location/Source**	**Format**	**Access**
Sep 2016 – July 2017	Anglican Shrine	Word documents in weeks	

Analysis

- Includes, for the most part, where visitors came from and how they travelled, how long they stayed
- Also includes other visitors

Issues with data

- **PREVIOUSLY** Word documents in terrible condition; inconsistent time spans - now have copied to Excel and put in better format.
- The dates are not formatted as dates in Excel but as text. Text has been converted to dates to enable analysis such as length of stay
- Origin is in the form of a place name, not a postcode

Findings

- 2181 individual visitors, 10,849 visitors staying as part of a group = 13,030 visitors total from Sep 2016- July 2017
- 425 groups, mean group size is 25.5
- Length of stay ranged from day trips to day trips to 5 day stays (at the shrine). The mean length of stay was 2.31 days per group and 1.65 days per person. This is skewed

by an extremely large 2000-person strong pilgrim group. With this pilgrim datum removed, the mean is 2.31 days per group and 2.02 days per person stay.

Traffic – Origins of visitors to Catholic Shrine			
Date Range	**Location/Source**	**Format**	**Access**
?	Catholic Shrine	KML file	Via link to Google my maps

Analysis

- Wrote a code to extract postcodes from KML (now in Excel)

Issues with data

- No idea of time span, or numbers other than that they total 8000.
- Access to data would improve analysis of visitation to the site.
- Note: also have estimates of traffic numbers via coaches during high seasons/holidays

Traffic – Anglican Shrine usage		
Date Range	**Location/Source**	**Format**
?	Anglican Shrine	Excel

Analysis

- Number of visitors in a wheelchair/unable to climb stairs/able to climb stairs

Issues with data

- No information on dates

Traffic – Anglican Shrine Museum Visitors		
Date Range	**Location/Source**	**Format**
Feb 2013-July 2018	Anglican Shrine	Excel

Analysis

- Gives admission numbers daily
- Indicates adult/child/school group/pilgrimage and vouchers used, as well as which days were Bank Holidays/charity days. –unclear as to what 'Non-entry' means
- Summary analyses: yearly sums, yearly % increase

Issues with data

- Does not provide a lot of information, e.g. postcodes

Findings

- 33,212 entries total in 2017 – number of entries increasing, from just over 25,000 in 2013

Survey data – Walsingham			
Date Range	**Location/Source**	**Format**	**Details**

Aug 2017 – May 2018	Catholic shrine, Anglican shrine, some point on trail IP 82.203.24.1 NCC	Excel spreadsheet (with questions present at top) (NCC.Walssurveydata.xlsx) And pdf for 3 extra (07.08.18 Additional Walsingham Surveys.pdf)	209 surveys + 3 more Charlotte sent (212 total) 09/08/2017 51 out of the 209 surveys self-report as pilgrims
Analysis			
• % of pilgrims calculated, with and without Norfolk residents			
Issues with data			
• The change in the questions to remove *on a pilgrimage* from question 4 and insert it as its own question was changed in the surveys but not on the analysis software – this does not affect the data. • Not all surveys have all data filled out. • Some confusion about which surveys relate to the trail, the Catholic shrine, or the Anglican shrine – also it is unsure where on the trail the surveys were intercept or from a survey box. • Do not provide information about where the people came from on that day, only where they live • "Full-day visit" was not an option for question 5 – jumped from PART-day visit (1-5 hours) to multi-day visit (more than 1 day) - A modified survey for valuation purposes is required			
Findings			
• 95.2% (208) gave postcodes • 23% (51) identified as pilgrims.			

III. Survey data: Norfolk-wide

Survey data – Norfolk Trails; National Trails			
Date Range	**Location/Source**	**Format**	**Details**
Norfolk Trails 2017-2018 Insight Track	Face-to-face on trails, online, Smart Survey are tablets on trails? Trails (NCC)	Excel spreadsheet Questions at top of sheet or in separate sheet name User Survey Template	525 face-to-face 2380 online 131 SmartSurvey [3036 total]
National Trails 2015-2016			34 total
Norfolk Trails Coastal Stretches 2016			567 Stretch 3 203 (Summer) + 248 (Winter) Stretch 1
Analysis			

- Majority have postcodes, and some details of travel (e.g. did you use public transport?), details of recreational spending, length of stay
- Has postcodes, and asks where they have come from on that day
- Norfolk trails, National trails online, Str1 data, Str3 data

Issues with data

- Don't have exact dates of questionnaire or trips, only month, weekday, time for face-to-face
- Insight Track: inconsistent terminology in weekday logging (Fri vs. Friday etc.)

Findings

-

Survey data – Footprint Ecology			
Date Range	**Location/Source**	**Format**	**Details**
2015-2016	Norfolk Footprint Ecology (NCC)	Excel spreadsheet	1342 surveys on 320 separate occasions

Analysis

- Lots of data about weather conditions at time of survey and group size
- Survey template, Methodology, report, the raw data and the tally data (info on retrieval)

Issues with data

- Soft data

Survey data/Count data – Marriott's Way User Intercept			
Date Range	**Location/Source**	**Format**	**Details**
April 2016	Single point on Marriott's Way Trails (NCC)		Manual count and survey data

Analysis

- Usage estimate, uses for route

Issues with data

- No raw data, only reports.

Appendix 2 - Trails survey (Walsingham)

See page 100 as part of the CSERGE report

Appendix 3 – Walsingham survey final

We are researchers from the University of East Anglia (UEA), funded by Norfolk County Council, carrying out a survey to better understand visitation to Walsingham and how this footpath is used. The survey has received research ethics approval from UEA. The information you give is **confidential and anonymous**. Data collected will be used for research. Do you **consent to participate** in this research? Please initial here [ ].

0.Today's date: __/___/2019

1. Location: _____

3a. Which BEST describes your visit to Walsingham? Please select **one** answer only:

[ ] on a SHORT visit (less than 1 hour)
[ ] on a PART-day visit (1-5 hours)
[ ] on a FULL-day visit
[ ] on a multi-day visit. How many days? _____
[ ] I live here

4. What sites did you/will you visit?

Walsingham village [ ] Catholic Shrine [ ] Anglican Shrine [ ] Walsingham Abbey [ ] Wells and Walsingham Light Railway [ ] Other (specify)

_____

5. Which activities are you doing today or during your stay? Please tick any activities you are doing.

Sightseeing/photography	
Shopping/eating out	
Outdoor recreation/nature	
Taking part in spiritual/religious activities	
Visiting cultural/heritage sites	
Other (specify)	

6. Which of these (above) is your main reason for your visit today? _____

7. Are you on pilgrimage? Yes [ ] No [ ]

8. Where did you come from today?

_____

9. How did you get to Walsingham?

Car [ ] Cycle [ ] Minibus [ ] Coach [ ] Motorbike [ ]
Public transport [ ] Walk [ ] Other [ ] (specify) _____

10. How long did you take to get to Walsingham?

1-15 mins [ ] 16-30 mins [ ] 31-60 mins [ ]
60-90 mins [ ] 90-180 mins [ ] over 180 mins [ ]

11. In the last 12 months, how many times have you been to Walsingham? _____

12. What do you think of Walsingham? Please tick.

Easy to get to [ ] Clean [ ] Well maintained [ ]
Crowded [ ] Lots to do [ ] Historical [ ] Beautiful [ ]
Other [ ] (specify) _____

13. How many people (including you) **are in your group?** _____

14. How old are you? Enter your birth year _____

15. What is your gender? Female [ ] Male [ ]
Prefer not to say [ ]

16. During your visit to Walsingham, how much do you expect you and your dependents will spend?

Please state the amount for each item or leave it blank.

Accommodation	[£	]
Food and drink	[£	]
Local transport	[£	]
Souvenirs	[£	]
Local products	[£	]
Entrance tickets	[£	]
Parking	[£	]
Other activities/expenses	[£	] _____

17. How many minutes are you planning to walk today? Please specify as minutes or from place to place.

_____

18. The Pilgrim Way footpath follows a disused railway line. It connects the Catholic Shrine with Walsingham village. Please tick.

Have you walked this path? Yes [ ] No [ ] Unsure [ ]
19. If 'No', do you plan to walk it? Yes [ ] No [ ] Unsure [ ]
20. If 'Yes', was this today? Yes [ ] No [ ]
21. If 'Yes' how many times in the last 12 months?

_____

22. How do you think you might benefit from walking this footpath?

Please specify a score between 0 and 10 for each item, where 0 is 'Not important' and 10 is 'Very important'.

Getting out into nature	
Closer connection to spirituality	
Being with others	
Time to myself	
Contribution to my health/mental health	
Other (specify)	

23. Norfolk County Council wishes to improve the footpath. When choosing where you walk, how important to you are the following?

Please specify a score between 0 and 10 for each item, where 0 is 'Not important' and 10 is 'Very important'.

Natural environment/biodiversity	
Benches/places to sit	
Bins/rubbish free path	
Clear signage	
Information boards on footpath	
Wide path (space for cyclists)	
Other (specify)	

24. Walsingham is popular with visitors and pilgrims. The footpath requires constant maintenance. If a dedicated fund were established to collect funds for maintenance, would you be willing to contribute to it?

Yes [ ] No [ ] Why? _____

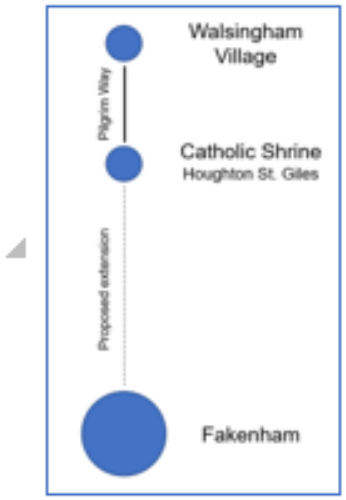
Remember that any money you pay for improvements/maintenance of the footpath will not be available for you to spend elsewhere.

25. If you answered YES, how much would you be willing to donate each year? £_____

26. Do you already contribute to any nature or heritage organisation?
Yes [ ] (specify) _____ No [ ]

27. Norfolk County Council is proposing to extend the footpath for about 5 miles towards Fakenham. Are you in favour of this?
Yes [ ] No [ ]

28. Looking at the map would you use the new route (dashed line)? Yes [ ] No [ ] Maybe [ ]



29. If Yes, how many times a year might you use the new path?
_____

Please answer the following questions to the best of your ability. The first set are about your general wellbeing and the remainder are important for the data analysis. All answers are confidential and are only used in aggregated data analysis.

30a. Overall, how satisfied are you with your life nowadays?
Please put a line or cross corresponding to how you feel

0 1 2 3 4 5 6 7 8 9 10
Not at all — Completely

30b.Overall, to what extent do you feel that the things you do in your life are worthwhile?

0 1 2 3 4 5 6 7 8 9 10
Not at all — Completely

30c. Overall, how happy did you feel during the past 4 weeks?

0 1 2 3 4 5 6 7 8 9 10
Not at all — Completely

30d.Overall, how anxious did you feel during the past 4 weeks?

0 1 2 3 4 5 6 7 8 9 10
Not at all — Completely

31a. How much of the time, during the past 4 weeks have you felt calm and peaceful?
All of the time [ ] Most of the time [ ] Some of the time [ ] A little of the time [ ] None of the time [ ]

31b. How much of the time, during this visit to Walshingham have you felt calm and peaceful?
All of the time [ ] Most of the time [ ] Some of the time [ ] A little of the time [ ] None of the time [ ]

32. What is the area code (first 3 digits of your postcode) **of your permanent address? If you are from overseas, which country are you from?**
_____

33. What is your highest level of education?
School [ ] Bachelor Degree [ ] Apprenticeship [ ] Master's degree [ ] Doctorate [ ]

34. What is your current job status?
Student [ ] Employed [ ] Unemployed [ ] Self-employed [ ] Retired [ ]

35a. Do you consider yourself as belonging to a religious denomination? Yes [ ] No [ ] Prefer not say [ ]

35b. If YES, to which denomination do you belong?
Anglican [ ] Roman Catholic [ ] Orthodox [ ]
Other [ ] (specify) _____ Prefer not to say [ ]

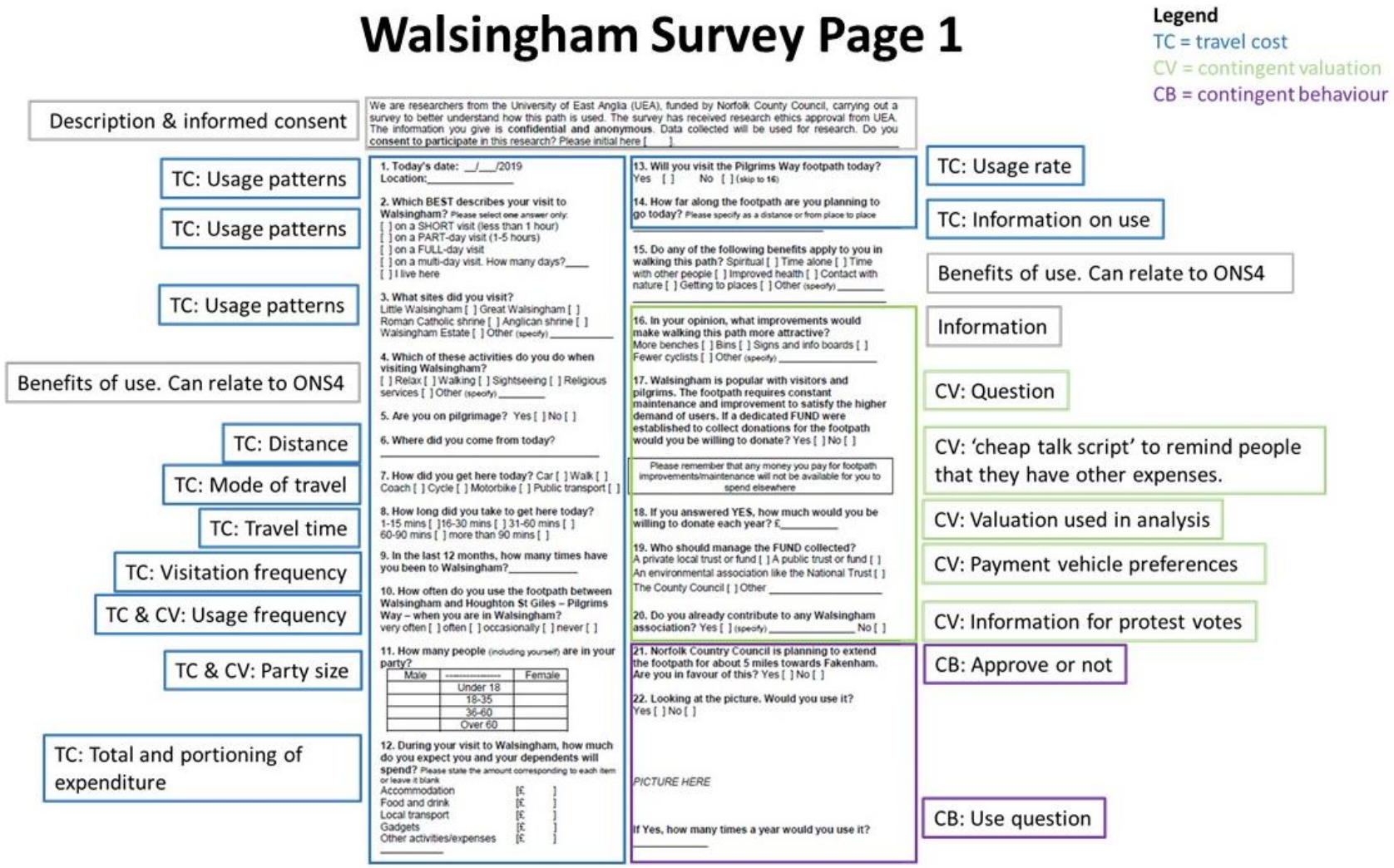
36. What is your household's annual income before tax?

Up to £12,800	[ ]	£12,800-£16,099	[ ]
£16,100-£23,199	[ ]	£23,200-£35,599	[ ]
£35,600-£53,099	[ ]	£53,100-£74,999	[ ]
£75,000-£170,000	[ ]	Above £170,000	[ ]

37. Do you have any comments?
_____
_____

Thank you for your responses.

Appendix 4 – Walsingham survey annotated with methods



Walsingham Survey Page 2

Legend
TC = travel cost
CV = contingent valuation
CB = contingent behaviour

Motivation to answer questions needed for statistics

Office of National Statistics ONS4 Wellbeing questions

To help us with our analysis, it would be really helpful if you could please answer the following questions. Please remember that all of your answers and confidential and anonymous and this information is only used in aggregated data analysis.

23. Overall, how satisfied are you with your life nowadays? Please put a line or cross corresponding to how you feel

0 1 2 3 4 5 6 7 8 9 10
Not at all — Completely

Overall, to what extent do you feel that the things you do in your life are worthwhile?

0 1 2 3 4 5 6 7 8 9 10
Not at all — Completely

Overall, how happy did you feel yesterday?

0 1 2 3 4 5 6 7 8 9 10
Not at all — Completely

Overall, how anxious did you feel yesterday?

0 1 2 3 4 5 6 7 8 9 10
Not at all — Completely

24. What is the postcode of your permanent address? If you are from overseas, which country are you from? _____

TC: Zonal TC

25. What is your highest level of education?
School [ ] Bachelor Degree [ ] Apprenticeship [ ] Master's degree [ ] Doctorate [ ]

TC&CV&CB: Used in statistics

26. What is your current job status?
Student [ ] Employed [ ] Unemployed [ ] Self-employed [ ] Retired [ ]

TC&CV&CB: Used in statistics

27. What is your household's annual income before tax?

Up to £12,800	[ ]	£12,800-£16,100	[ ]
£16,100-£23,200	[ ]	£23,200-£35,600	[ ]
£35,600-£53,100	[ ]	£53,100-£75,000	[ ]
£75,000-£170,000	[ ]	Above £170,000	[ ]

TC&CV&CB: Used in statistics

28. Do you have any comments?

_____
_____
_____

Standard practice to allow respondents to comment

Thank you

Appendix 5 – Calculations and technical information

Single-site travel cost method.

The theory:

Individual *i* chooses the number of recreational trips to take to Walsingham (x_{ij} index j for generality) over the unit of 12-months time (index y_{ij}, for generality). The round-trip cost is c_{ij} and z_i is the set of other goods that individual can buy with hies/her income (m_i)

Assume weak complementarity between trips x_{ij} and quality q_j at a site, and an utility function with the usual properties:

$$U(x_{ij},y_{ij},z_i)$$

The total budget constraint is:

$$\sum_{j=1}^{J} y_{ij}c_{ij} + z_i \leq m_i \qquad (1.)$$

Define as T_i the total time available over the period in consideration (12 months in our specification)

Define as t_{ij} the time required for each trip (including travel time)

Define as h_i the time spent working

Hence the following equality holds:

$$\sum_{j=1}^{J} y_{ij}t_{ij} + h_i = T_i \qquad (2.)$$

suppose now that income is composed of *fixed* income and income from labour at the wage rate w_i:

$$m_i = m_i^0 + w_i h_i \qquad (3.)$$

Than the final price for the trip is made up of:

$$p_{ij} = c_{ij} + t_{ij}w_{ij} \qquad (4.)$$

Notice that trip price for the individual now includes the opportunity cost of income.

Interior solutions to the U-maximization problem gives the Marshallian demand:

$$y_{ij} = f_j(\mathbf{p}_i, m_i) \qquad (5.)$$

Data modelling for travel cost data

So, the theory is quite simple, the problems are mostly empirical. To empirically treat the data we need to model the statistical error and the function form of the following equation

$$N\_visits_i = f(X, TC, TCS) + e_i \qquad (6.)$$

where N_visits is the quantity of recreational trips demanded in the last 12 months, X is a vector of respondent-specific attributes (e.g. age, income), TC is travel cost to visit Walsingham and TCS is the possible cost to reach a substitute site if exists. In the current structure of the questionnaire, we did not ask for substitute and this implies that TCS is zero. The error term is capturing the noise in the data and accordingly to his specification is leading to different models. The linear and log-linear specification is the simplest approach doable in common statistical software. However the most common model is the negative binomial model and the expected mean of this modes model has a semi-log specification:

$\square_i = \exp(f(x_i, TC_i)$

and the error term follows a Gamma specification which can handle the problem of over dispersion. As the data come from onsite sample they might suffer from endogenous stratification. This means that frequent visitors were more likely to be surveyed and therefore represented. This can be corrected subtracting one from the dependent variable ["Number of Visits" Q11 inn the questionnaire]. This correction has been widely used in the revealed preference literature (e.g. Prayaga et al 2010, Loomis 2003, Haab and McConnell 2002).

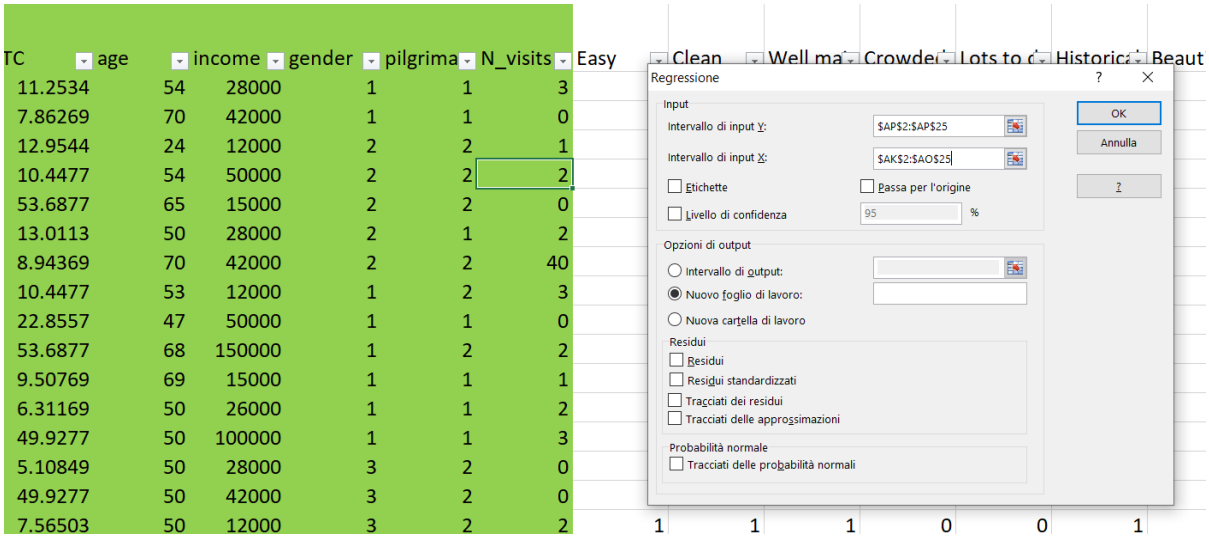
Data preparation and modelling steps

	Data analysis	Data preparation	In the model
Dependent variable is N_visits= Question Q11 in the questionnaire	Statistical descriptive analysis are needed to verify that outliers (extremely high/low or clusters numbers) are properly treated.		Variable discrete normally between 1-365.
TC=travel cost This will be derived by Q8, Q9, Q10 and Q32.	Distance travelled is obtained measuring the distance between Q8/Q32 and Walsingham using Google maps facilities. Q9 will determine the cost of travelling given the transport mode.	Travel costs=Distance is multiplied by average travel cost per mile (e.g. 0.20 per car). The total travel cost is divided by	A single continuous variable is included and is given return cost of travelling as: 2*(Travel costs+travel time cost)

	Q10 is a control variable to contrast calculated distance/time with perceived/reported travel time. When Q8, Q32 are missing travel time is converted in travel distance using conversion factor per travel mode (e.g. 60 minutes by car correspondents on average to 50miles)	people travelling together (Q13). Assumption might be needed here. Parking costs are included here. Travel time cost= The cost of travel time is obtained by Income*wage proportion ratio (e.g. 1/3 or ¾) to get the opportunity cost of travelling.	
X= include individual characteristics like types of visitor (Q7, Q3a) age, gender, employment (Q14, Q15, Q34)	Distribution of individual variables need to be inspect before modelling		Variables can enter the model as

Excel can be used for first simple models using Data analysis add-on component.

Example how to set up the linear model in Excel is below. Other (better) statistical software can be used for data analysis (e.g. SPSS, R, Stata).



TC	age	income	gender	pilgrima	N_visits	Easy	Clean	Well ma	Crowde	Lots to d	Historic	Beaut
11.2534	54	28000	1	1	3							
7.86269	70	42000	1	1	0							
12.9544	24	12000	2	2	1							
10.4477	54	50000	2	2	2							
53.6877	65	15000	2	2	0							
13.0113	50	28000	2	1	2							
8.94369	70	42000	2	2	40							
10.4477	53	12000	1	2	3							
22.8557	47	50000	1	1	0							
53.6877	68	150000	1	2	2							
9.50769	69	15000	1	1	1							
6.31169	50	26000	1	1	2							
49.9277	50	100000	1	1	3							
5.10849	50	28000	3	2	0							
49.9277	50	42000	3	2	0							
7.56503	50	12000	3	2	2	1	1	1	0	0	1	

<u>The output of regression will look like this (this is a dummy output).</u>

Statistica della regressione								
R	0.807289							
R squared	**0.66**							
R squared adjuste	**0.43**							
Errore standard	22.00078							
observations	24							
ANALISI VARIANZA								
	gdl	*SQ*	*MQ*	*F*	*gnificatività F*			
Regressione	5	1732.719	346.5437	0.715948962	0.619651			
Residuo	18	8712.615	484.0341					
Totale	23	10445.33						
	Coefficienti	*rore standa*	*Stat t*	*alore di significativi*	*feriore 95%*	*periore 95*	*eriore 95.0*	*periore 95.0*
Intercetta	-28.5973	3.751488	**-7.62**	0.379662167	-95.3047	38.11012	-95.3047	38.11012
TC	-0.09954	0.021328	**-4.67**	0.646310157	-0.54762	0.348546	-0.54762	0.348546
age	0.372398	0.049129	**7.58**	0.458258545	-0.65976	1.404553	-0.65976	1.404553
income	-8.9E-05	1.26E-05	**-7.06**	0.489395586	-0.00035	0.000175	-0.00035	0.000175
gender	5.69647	6.630598	0.859119	0.401571974	-8.2339	19.62684	-8.2339	19.62684
pilgrimage	7.556835	1.527644	**4.947**	0.482088298	-14.5609	29.67459	-14.5609	29.67459

The bold cells are crucial for overall validity of results. If they do not pass statistical tests, results cannot be used for welfare analysis.

Adjusted R squared needs to be as close as possible to 1, although 0.40 is quite good for recreational demand models.

Individual parameters significance (Stat t column) needs to be in absolute value greater than 2. In this mock example all variables are significant except gender. TC is negative, that is the higher the cost to get to Walsingham the lower the number of visits. Also the older the respondent the higher the number of visits, the higher the income of the respondent the lower the chance to visit, i.e. it might be that that wealthier people prefer other destinations (this is purely speculative!), and gender is not significant, i.e. women and men have the same preferences to visit Walsingham.

<u>Welfare measures</u>

Considering that the estimates of the travel cost model in this mock example are statistically valid, to derive the willingness to pay to access the site we need to calculate:

-1/Beta of TC variable=-1/-0.09=£10.04.

This represent the WTP to access Walsingham for every visit for a generic visitor. Differentiation across type of visitors are also possible.

Appendix 6 – Data Audit

What are we valuing	Data needed	Example – what is Norfolk using?	Have you got this data? Green = yes Amber = somewhat Red = no	How difficult for you to get or analyse the data? 1 = Very few barriers 2 = ok 3= difficult	If you have data: Where/how did you get this data?	If you haven't got data: What barriers do you face?
Expenditure Value (Direct)	Average visitor spend	**Survey (question – how much would you spend)** *Also average spend value available from MENE (Monitor Engagement with Natural Environment) – very approximate as focuses only on recreational activity not added 'pilgrimage value'. But used in EU.				
	Number of people	**People counter data** *ORVal Tool (statistical modelling of route on map provides estimated visits)				
Physical Health	How long walked for/level of activity	**Survey (question – how many minutes exercise**) or use an app such as Better Points + HEAT (Health Economic Assessment Tool) EU wide WHO tool which provides value of exercise				

Wellbeing	Four questions based on one point in time: • Life satisfaction • Life is worthwhile • Happiness • Anxiety	**Survey (4 standard wellbeing questions** from UK Office National Statistics – now attuned to European Survey on Income and Social conditions)				
	Rating of visit/pilgrimage on feeling 'calm and peaceful'	**Survey (2 questions)**				
Economic Welfare/ Social value **(Indirect)**	No of volunteering hours	Collect data from local organisations				
	No of school visits	Collect data from local organisations				
	£ figure for proposed route	**Survey (question based on choice experiment/contingent valuation)** * ORVal Tool (statistical modelling of route on map provides 'Welfare value')				
	Similar studies that value: • £ per access to site • £ per km For activities & habitats.	**Benefit Transfer**				
	Cost visitor would pay for visit	**Survey (question based on revealed preference)**				

Environment	Various	NCC is working with UEA and others to develop this area. Progress is being made in conjunction with others actors interested in valuing natural capital.				
Multiplier value	How much money into local economy – spend and jobs created	*Regional Input/Output table recommended *Lighter version feasible using national data co-efficients				

12. Bibliography

AECOM. (2017) (Waterford Greenway Intercept Survey 2017: Baseline Survey Report. Available at: http://www.waterfordcouncil.ie/media/greenway/WaterfordGreenway-BaselineSurveyReport-Jan2018.pdf (Accessed Dec 14, 2019)

ARC (2014). Green Pilgrimage Network. A handbook for faith leaders, cities, towns and pilgrims: “Pilgrims Leaving a Positive Footprint on the Earth”. Alliance of Religions and Conservation. Available at: http://www.arcworld.org/downloads/Green_Pilgrimage_Network_Handbook.pdf (Accessed Nov 15, 2019)

Badura, T., Bateman, I., Agarwala, M., Binner, A. (2016) Valuing preferences for ecosystem-related goods and services, pp 228-242 in Routledge Handbook of Ecosystem Services, Routledge.

Bateman, I.J., Brouwer, R., Ferrini, S., Schaafsma, M., Barton, D.N., Dubgaard, A., Hasler, B., Hime, S., Liekens, I., Navrud, S., De Nocker, L., Ščeponavičiūtė, R., Semėnienė, D. (2011). Making benefit transfers work: Deriving and testing principles for value transfer for similar and dissimilar sites using a case study of the non-market benefits of water quality improvement across Europe. Environmental and Resource Economics, 50(3): 365-387.

Bennett R. M., Tranter R.B. , Beard N., Jones P (1995). The Value of Footpath Provision in the Countryside: A Case-study of Public Access to Urban-fringe Woodland. Journal of Environmental Planning and Management

Bennett R.M., Tranter R.B., Blaney R. J. P., (2003). The Value of Countryside Access: A Contingent Valuation Survey of Visitors to the Ridgeway National Trail in the United Kingdom. Journal of Environmental Planning and Management, 46:5, 659-671

Booking.com. (2018). Where Sustainable Travel is Headed in 2018. 2018. Available at: https://globalnews.booking.com/where-sustainable-travel-is-headed-in-2018/ (Accessed Dec 2, 2019)

Boyle, K. J. (2017). Contingent Valuation in Practice. In P. A. Champ, K. J. Boyle, & T. C. Brown (Eds.), A Primer on Nonmarket Valuation (2nd ed., pp. 83–132). Dordrecht, The Netherlands: Springer. Available at: https://doi.org/10.1007/978-94-007-0826-6_5 (Accessed 2018).

Bryan J., Jones C., Munday M., Roche N. (2011). The Economic Impact of Walking and Hill Walking in Wales. Welsh Economy Research Unit Cardiff University

Buckley C., Hynes S., van Rensburg T. M. and Doherty E., (2009). Walking in the Irish countryside: landowner preferences and attitudes to improved public access provision. Journal of Environmental Planning and Management Vol. 52, No. 8, December 2009, 1053–1070

Buckley C., Tom M. van Rensburg, Hynes S. (2008). Recreational demand for farm commonage in Ireland: A contingent valuation assessment. Land Use Policy 26 (2009) 846–854

Cameron C.A., Windmeijer F.A., (1995). R-squared Measures for count Data Regression models with applications to Health care utilization. Journal of Business and Economic Statistics,

Carrillo, M., Jorge, J.M. (2017) Multidimensional analysis of regional tourism sustainability in Spain. Ecological Economics, 140: 89-98.

Carson, R.T., Flores, N.E., and Meade, N.F., (2001). Contingent valuation: controversies and evidence. Environmental and resource economics, 19 (2), 173–210

Christie, M. and Matthews, J. (2003) The Economic and Social Value of Walking in Rural England, report for the Ramblers Association.

College of Forestry, Oregon State University. Recreation Use Values Database. Available at: http://recvaluation.forestry.oregonstate.edu/ (Accessed Dec 30, 2019)

de Cunha Lemos, Â.D., Giacomucci, A. (2002). Green procurement activities: some environmental indicators and practical actions taken by industry and tourism. International Journal of Environment and Sustainable Development, 1(1): 59-72.

Department for Environment, Food and Rural Affairs (DEFRA) UK. Research Database. Available at: http://sciencesearch.defra.gov.uk

Department for Public Health (2016). Health matters: getting every adult active every day. Available at https://www.gov.uk/government/publications/health-matters-getting-every-adult-active-every-day/health-matters-getting-every-adult-active-every-day (Accessed Dec 9, 2019)

Department for Public Health UK (2016). Working Together to Promote Active Travel: A briefing for local authorities. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/523460/Working_Together_to_Promote_Active_Travel_A_briefing_for_local_authorities.pdf (Accessed Dec 9 2019)

Department for Transport UK (2015), 'Cycling and walking: the economic case for action'. Available at: https://www.gov.uk/government/publications/cycling-and-walking-the-economic-case-for-action (Accessed Dec 2, 2019)

ECF (2018). The Benefits of Cycling: Unlocking their potential for Europe. Available at: www.ecf.com (Accessed Dec 8, 2019)

Eco BnB (2016). The economic benefits of Sustainable Tourism. Available at: https://ecobnb.com/blog/2016/10/economic-benefits-sustainable-tourism/ (Accessed Dec 13, 2019)

Eiswerth M.E., Englin J., Fadali E., Shaw W.D., (2000). The value of water levels in water-based recreation: a pooled revealed preference/contingent behavior model. Water Resources Research, 36(4): 1079-1086.

European Commission (2018). Best Environmental Management Practice in the Tourism Sector. Available at: https://ec.europa.eu/environment/emas/takeagreenstep/pdf/BEMP-7-FINAL.pdf (Accessed Dec 4, 2019)

European Commission. (2016) The European Tourism Indicator System ETIS toolkit for sustainable destination management. Available at:

https://ec.europa.eu/growth/sectors/tourism/offer/sustainable/indicators_en (Accessed DEc9, 2019)

European Commission (2014). Guide to Cost-Benefit Analysis of Investment Projects. Available at https://ec.europa.eu/regional_policy/sources/docgener/studies/pdf/cba_guide.pdf (Accessed Dec 10, 2019)

European Parliament (2012) 'The European Cycle Route Network Eurovelo Study' *European Cyclists Federation*. Available at: https://ecf.com/sites/ecf.com/files/EP%20study%20on%20EuroVelo%20network.pdf (Accessed Dec 12, 2019)

Ferrini, S., Schaafsma M., Bateman I., (2014). Revealed and stated preference valuation and transfer: A withinsample comparison of water quality improvement values, Water Resources Research, 50, (6), 4746-4759

Green Pilgrimage Interreg - https://www.interregeurope.eu/greenpilgrimage/ (Accessed 12 Dec, 2019)

Haab T.C., McConnell K.E. (2002) Valuing environmental and natural resources: the econometrics of non-market valuation, Edward Elgar Publishing, Northampton.

Heron, C. and Bradshaw, G. (2010). Walk This Way: Recognising Value in Active Health Prevention, Natural England.

HM Government. 'Be Active Be Healthy: A plan for getting the nation moving. London, UK. 2008. Available at: http://www.laterlifetraining.co.uk/wp-content/uploads/2011/12/DoH-Be-Active-Be-Healthy-2009.pdf (Accessed Dec 12, 2019)

HM Gov. (2019) 'Monitor of Engagement with the Natural Environment: Headline report and technical reports 2018 to 2019'. London, UK, 2019 Available at: https://www.gov.uk/government/statistics/monitor-of-engagement-with-the-natural-environment-headline-report-and-technical-reports-2018-to-2019 (Accessed Dec 12, 2019)

HM Government. (2018) 'National Planning Policy Framework.' London, UK. 2018 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/740441/National_Planning_Policy_Framework_web_accessible_version.pdf (Accessed Dec 12, 2019)

Hopkinson and Wardman, (1996). Evaluating the demand for new cycle facilities. Transport Policy, 3(4), 241– 249.

Hynes S., Buckley C., Rensburg T. V., (2007). Recreational Pursuits on Marginal Farm Land: A Discrete-Choice Model of Irish Farm Commonage Recreation. The Economic and Social Review, Vol. 38, No. 1, Spring, 2007, pp. 63–84

Insight Track (2018). User Research to Inform Decision-Making Research findings for Norfolk Trails. Available at: shorturl.at/ilq57. (Accessed Dec 6, 2019)

Interreg MED (2018), Sustainable Tourism Indicators: Manual of Transfer of Best Practices, (Marseille, France), Interreg MED Available at: https://mitomed-plus.interreg-med.eu/what-we-achieve/deliverable-library/detail/?tx_elibrary_pi1%5blivrable%5d=5921&tx_elibrary_pi1%5baction%5d=show&tx_elibrary_pi1%5bcontroller%5d=Frontend\Livrable&cHash=219225a31fbfdd0a43b77b897bf92ed4 (Accessed Dec 9, 2019)

Johnston J.R et al. (2015). Benefit Transfer of Environmental and Resource Values: A Handbook for Researchers and Practitioners. Springer

Laird J., Page M., Shen S. (2013). The value of dedicated cyclist and pedestrian infrastructure on rural roads. Transport Policy 29(2013)86–96

Lanz B., Provins A., (2013). Valuing Local Environmental Amenity with Discrete Choice Experiments: Spatial Scope Sensitivity and Heterogeneous Marginal Utility of Income. Environ Resource Econ (2013) 56:105–130

Loomis J., (2003). Travel cost demand model based river recreation benefits estimates with on-site and household surveys: comparative results and a correction procedure. Water Resources Research 39(4)

Manton R., Hynes S. & Clifford E. (2016). Greenways as a tourism resource: a study of user spending and value. Tourism Planning & Development

Map My Emissions. Carbon Calculator. Available at: https://mapmyemissions.com/about (Accessed Dec 10, 2019)

McGurk E., Hynes S., Manton R., Thorne F. & Clifford E., (2019) Greenways, recreational access and landowner willingness to accept: a contingent valuation study of farmers in Ireland. Journal of Environmental Planning and Management

Midmore P., (2000). The Economic Value of Walking in Rural Wale. An independent report produced for the Ramblers' Association in Wales (also as a Working Paper Welsh Institute of Rural Studies)

Miller, R. E., & Blair, P. D. (2009). Input-output analysis: foundations and extensions. Cambridge University Press.

Monterrubio, C. Rodrigues-Munoz, G. (2013) Social benefit of ecotourism: The Monarch Butterfly Reserve in Mexico. Available at: https://www.researchgate.net/publication/291344670_Social_benefits_of_ecotourism_The_Monarch_Butterfly_Reserve_in_Mexico (Accessed Dec 10, 2019)

Morris J., Colombo S., Angus A., Stacey K., Parsons D., Brawn M., Hanley N., (2008). Eliciting public preferences for managing the public rights of way. Landscape and Urban Planning 93 (2009) 83–91

National Health Service (2014). 'Exercise may help prevent Alzheimer's disease'. Available at: https://www.nhs.uk/news/lifestyle-and-exercise/exercise-may-help-prevent-alzheimers-disease/ (Accessed Dec 12, 2019)

Natural England (2019) 'Accounting for National Nature Reserves: A Natural Capital Account of the National Nature Reserves managed by Natural England (NERR078)', available at: http://publications.naturalengland.org.uk/publication/4535403835293696 (Accessed Dec 10 2019)

Natural England (2013) The New deal; Management of National Trails in England from April 2013 (NE426). Available at: http://publications.naturalengland.org.uk/publication/6238141 (Accessed Dec 12, 2019)

Natural England (2019) 'Monitoring Engagement in the Natural Environment Survey (2009 - 2019)' Available at:

https://defra.maps.arcgis.com/apps/MapSeries/index.html?appid=2f24d6c942d44e81821c3ed2d4ab2ada (Accessed Dec 2, 2019)

NICE. (2008). Public Health Guidance PH13. Available at: https://www.nice.org.uk/guidance/ph13 (Accessed Dec 8, 2019)

Norfolk County Council (2019). Norfolk Access Improvement Plan. Available at: https://www.norfolk.gov.uk/out-and-about-in-norfolk/public-rights-of-way/norfolk-access-improvement-plan. (Accessed Dec 10, 2019)

Norfolk Insight. Health and Wellbeing Profiles. Available at: http://www.norfolkinsight.org.uk/jsna/document-library/health-and-wellbeing-profiles/ (Accessed Dec 9, 2019)

Northern Irish Tourist Board. A practical guide to experiential tourism in Northern Ireland. Available at: www.insights-practical-guide-to-experiential-tourism.pdf (Accessed Dec 12, 2019)

Parsons, G. R. (2017). Travel Cost Methods. In P. A. Champ, K. J. Boyle, & T. C. Brown (Eds.), A Primer on Nonmarket Valuation (2nd ed., pp. 187–234). Dordrecht, The Netherlands: Springer. Available at: https://doi.org/10.1007/978-94-007-0826-6_9 (Accessed 2018)

Prayaga P., Rolfe J., Stoeckl N., (2010). The value of recreational fishing in the Great Barrier Reef, Australia: a pooled revealed preference and contingent behavior model. Marine Policy, 34: 244-251.

Rayment, M. (1995). Nature conservation, employment and local economics: A literature review. RSPB: Sandy

Slee B, Farr H and Snowdon P. (1997). The economic impact of alternative types of rural tourism. *Journal of Agricultural Economics* 48(2), 179-192

Sport England. Active People Interactive. Available at: https://activepeople.sportengland.org/ (Accessed Dec 10, 2019)

SQW (2015). Devon cycling and walking trails Economic impact analysis for Devon County Council

Turismo de Galicia and University of Santiago, 'Socio-economic study of the St. James Way', Available at: http://www.turgalicia.es/aei/portal/docs/documentacion_vinculada/ir3487.pdf (Accessed Nov 29, 2019)

Turner, T. (1995). Greenways, blueways, skyways and other ways to a better London. Landscape and Urban Planning, 33: 269-282

UN General Assembly (1989), *Implementation of General Assembly resolutions 42/186 and 42/187 : resolution / adopted by the General Assembly*, A/RES/44/227, available at: https://www.refworld.org/docid/3b00f2220.html (Accessed Dec 9, 2019)

UN World Tourism Organization. (2004). Indicators of Sustainable Development for Tourism Destinations - A Guidebook, Madrid, Spain. World Tourism Organization

University of Exeter. ORVal - The Outdoor Recreational Valuation Tool. User Guide, Reports and Case Study Documents. Available at: https://www.leep.exeter.ac.uk/orval/documents (Accessed Dec 9, 2019)

Vallecilloa, S., LaNottea, A., Zulian, G., Ferrini. S., and Maesa. J. (2019) Ecosystem services accounts: Valuing the actual flow of nature-based recreation from ecosystems to people. *Ecol Modell.*Vol. 392. pp.196-211.

Viljoen, F. (2007). Sustainability indicators for monitoring tourism route development in Africa. Master's Thesis, University of Stellenbosch.

WHO (2019) *Health and sustainable development: urban green spaces*. Available at: https://www.who.int/sustainable-development/cities/health-risks/urban-green-space/en/ (Accessed Dec 10, 2019)

Zuzana, J., Zuzana, L. (2015). Monitoring system of sustainable development in cultural and mountain tourism destinations. Journal of Competitiveness, 7(1): 35-52.