



**Canal &
River Trust**

Making life better by water

Valuing our Waterways

Aggregate Benefits to Society
and the Economy

Technical Report

March 2024



canalrivertrust.org.uk

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Welcome to our Technical Report

Canal & River Trust is the charity that cares for and brings to life a 2,000-mile network of canals and towpaths, river navigations, docks and reservoirs in England and Wales.

From providing local free spaces for people to exercise, connect with nature and improve their mental health, to green traffic-free corridors for active travel, nature recovery and wildlife migration, our network of canals and towpaths, other waterways and waterspaces is bringing substantial, widespread benefits to society, supporting jobs and local economies, playing an important role in the nation’s water and utilities infrastructure, delivering new sources of renewable energy as well as providing urban cooling benefits.

Our research and evidence seek to demonstrate how our network is contributing to the transformation of many urban and rural communities and the potential it has to help address many societal challenges being faced now and, in the future – such as climate change, biodiversity decline, water shortages, inactivity and loneliness.

Our new impact report, *Transforming Places and Enriching Lives – Canal & River Trust Impact Report 2021-23* (March 2024), seeks to bring to life the stories and testimonies, partnerships and projects that sit behind the monetary values set out in our *Valuing Our Waterways – Aggregate Benefits to Society and the Economy – The Headlines* (November 2022), along with showcasing how individuals and communities are benefitting from using and engaging with our network.

The Trust acknowledges that it cannot depend solely on storytelling but must be able to prove and validate through robust and transparent evidence-based outcome reporting, the difference our work and the spaces that we care for are making to individuals, communities, society as a whole and the economy.

Our evidence base demonstrates firstly that our network of canals and towpaths, other waterways and waterspaces is a truly cross-cutting policy theme and secondly the breadth, form and scale of contribution that our network is making to individuals, society as a whole and the economy.

Through robust measurement and valuation, the Trust has sought to: prove and validate the

value generated from investing in our network and their waterside communities; and improve our effectiveness by understanding which of our activities and interventions make the greatest difference.

In November 2022, we published the headline findings on the social value and economic impact of canals and towpaths, river navigations, docks and reservoirs, following the principles of the HM Treasury Magenta Book (2020), the HM Treasury Green Book (2022) and the Supplementary Green Book Guidance on Wellbeing (2021) to provide a holistic measure of the contribution of our network as a whole.

In collaboration with the research consultancy Simetrica-Jacobs, leaders in social value, we applied appropriate valuation techniques that are fully aligned with the valuation methodologies recommended for use by the HM Treasury Green Book guidance.

We worked with Dr Daniel Fujiwara and others over several years to develop robust and credible values, from innovative work to estimate the wellbeing values associated with use of the network, to valuing its unique heritage. This evidence is important for demonstrating the value to society of our network of canals and towpaths, other waterways and waterspaces and the importance of maintaining these assets in good condition in order to continue delivering these benefits to society and the economy in the future.

This technical report is designed to share our approach and methodologies used to quantify and monetise the benefits of our network, which underpin the monetary values set out in our November 2022 headline report.



Heather Clarke
Strategy & Impact Director,
Canal & River Trust

Network map



Purpose and scope of the report

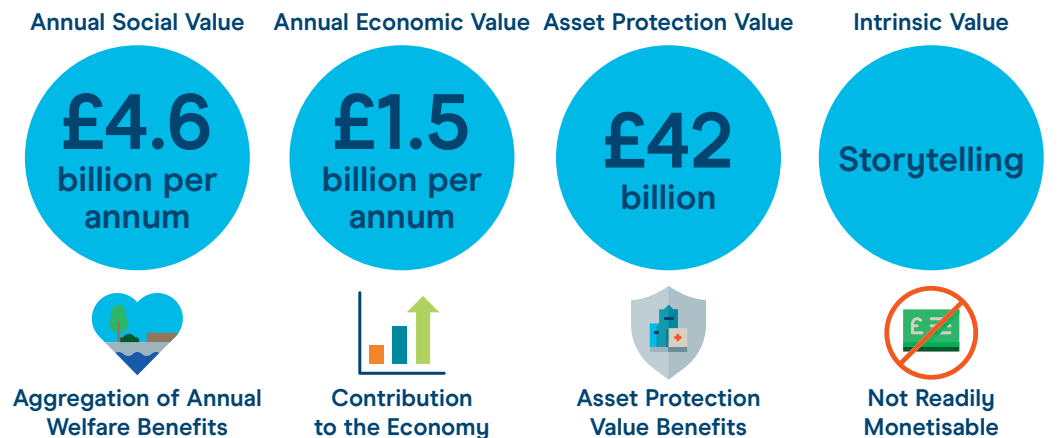
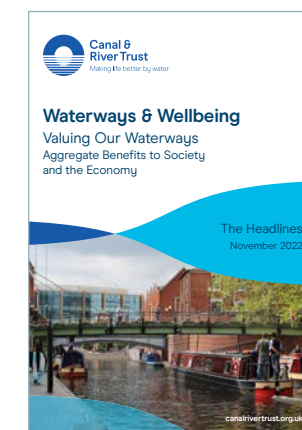
In November 2022, Canal & River Trust published 'Valuing Our Waterways – Aggregate Benefits to Society and the Economy' setting out the headline findings from Canal & River Trust's study on understanding the social value and economic impact of our canals and towpaths, river navigations, docks and reservoirs by calculating the aggregate benefits delivered by our network to society and the economy.

This technical report seeks to provide detailed information on the methodologies that drive the monetary values set out in the November 2022 report. The Trust's Value Framework, developed in 2018, is used as the foundation for this report by demonstrating the channels through which the Trust creates impact and value to society.

We have worked with the research consultancy Simetrica-Jacobs, leaders in social value, to apply appropriate valuation techniques that are fully aligned with HM Treasury guidelines.

The valuation methodologies recommended for use by the HM Treasury Green Book (2022) are used as a basis for valuation in this study. Subsequently, we use the evidence from all our valuation research to produce an overall aggregate picture

of the current annual social value and economic impact delivered by the Trust's canals and towpaths, other waterways and waterspaces.



Chapter 1: Introducing Canal & River Trust *Who we are and what we do*

We are the charity that looks after and brings to life the nation's network of canals and towpaths, river navigations, docks and reservoirs.

Canal & River Trust (the Trust) is a registered charity, formed in 2012 to care for 3,219 kilometres (2,000 miles) of working canals, river navigations, docks and reservoirs across England and Wales.

Our vision – our canals are living waterways that transform places and enrich lives.

As 'living waterways', our 250-year-old canal network provides vital habitats for wildlife and essential open spaces and routes for people and boats, with towpaths available for everyone, every day.

Our purpose is to achieve a sustainable future for our network of canals, keeping them open and alive; making them resilient and safe; and maximising their value for people, nature and the economy.



Our canal network brings character and a connection to a unique living heritage, providing a focus for urban regeneration and rural prosperity. Our network of canals, navigable rivers and docks is in the heart of many of our towns and cities. It helps local communities, businesses and the environment to thrive and be sustainable. Our canals, other waterways and waterspaces connect us with nature, with each other, with our past and our future. Being by and on water helps us to live happier and healthier lives.

We believe that life is better by and on water and that our network of canals, other waterways and waterspaces improve the wellbeing of individuals and communities, places and the economy as well as the planet.

The Trust is a UK success story. Since 2012 we have established ourselves as an effective custodian of this network and are delivering on our charitable objectives, broadening the reach of these canals and towpaths, river navigations, docks and reservoirs, growing support and generating income.

This extensive network passes through some of the most heavily populated, and most economically disadvantaged communities in England and Wales, providing accessible green and blue space on the doorstep, where it is needed most.

We have established successful partnerships with national bodies, local authorities, stakeholders, communities, and businesses across the network.

The annual social value being generated by our network and activities is £4.6 billion including £1.1 billion cost savings to the NHS derived from active use of this network of canals and towpaths, river navigations, docks and reservoirs.



The annual economic value from boating and wider water-based tourism expenditure generates over £1.5 billion worth of Gross Value Added (GVA) with more than 80,000 jobs being directly or indirectly dependent upon our network, supporting the visitor economy and marine sector.

As the owner and operator of significant national infrastructure with attendant wider liabilities, the Trust is unique in terms of the scale and nature of statutory duties and responsibilities.



“**An open and well-maintained Canal & River Trust inland waterways network delivers broad benefits aligned to our nation's priorities. In January 2023 the government published our ambitious Environmental Improvement Plan (EIP). The government recognises that the Canal & River Trust has an important role to play in contributing to the EIP, alongside other government priorities.**”

Dr Therese Coffey (Former Secretary of State for DEFRA)

We are both protector of public and community safety and services, and provider, of public benefits.



PROTECTOR Supporting national infrastructure and public safety

We are a charity that manages significant national infrastructure (including over 10,000 nationally important assets) with open access, on behalf of the nation.

The reservoir dams and canal embankments maintained by the Trust protect many households, businesses and utilities as well as other national infrastructure such as electricity sub-stations, transport infrastructure and schools.

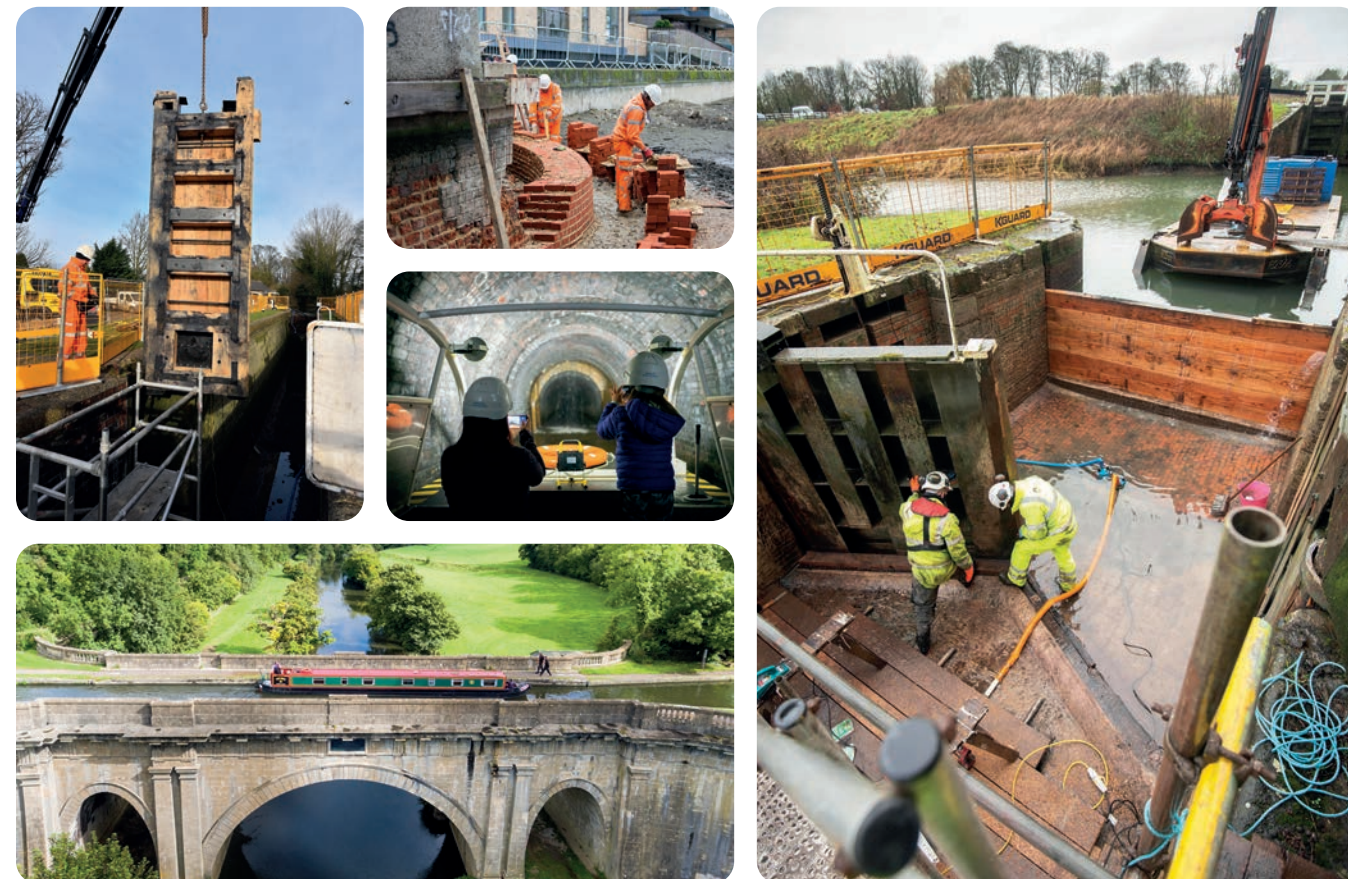
The presence and resilience of this interconnected network is vital to the UK's energy, telecommunications, and water supply and its flood protection.

It has an estimated protection value of £42 billion benefiting 13.4 million people and 370,000 businesses as well as supplying enough water for approximately 5 million people.

Estimated protection value of £42 billion benefiting 13.4 million people and 370,000 businesses



Caring for our canal network Investing in the 200-year-old assets so they are resilient and safe to use



Means people can enjoy more time by and on water...





PROVIDER

Providing free and accessible urban blue-green space on the doorstep of 9 million+ people

Our canals and towpaths, river navigations, docks and reservoirs provide free and accessible urban blue-green space 'on the doorstep' for 9 million+ people who live within a 10–15 minutes' walk (1km) of one of these waterways. Within this population, more than 60% of households (over 2 million households) experience wellbeing inequalities and 19% of residents are from ethnically diverse backgrounds. 50% of the total population of England and Wales, nearly 30 million people, live within 5 miles of these urban waterways (based upon ONS statistics).

In 2022/23, we attracted 10.3 million visitors and 888 million 'unique visits' – providing free, safe and accessible outdoor space 'on the doorstep' for daily exercise and active travel. Whilst this total number of visitors declined slightly during the COVID pandemic (in 2020/21), the actual number of visits increased as those living close to their local canal used it with greater frequency.

The canals and towpaths, other waterways and waterspaces that we care for are open to everyone and are free of charge to enjoy. For communities suffering a deficit of green or blue spaces, poor wellbeing or socio-economic disadvantage, and for those households with no/limited private gardens and spaces, these waterways present unique opportunities.

Users & Visitors to the Trust Waterways	2019-20	2020-21	2021-22	2022-23
Total Unique Visits	677 million	743 million	786 million	888 million
Number of Unique Visitors	9.2 million	8.3 million	9.1 million	10.3 million

Since 2019 the number of unique visits has grown by over 30%, attracting 10.3 million visitors and 888 million 'unique visits' during 2022/23.

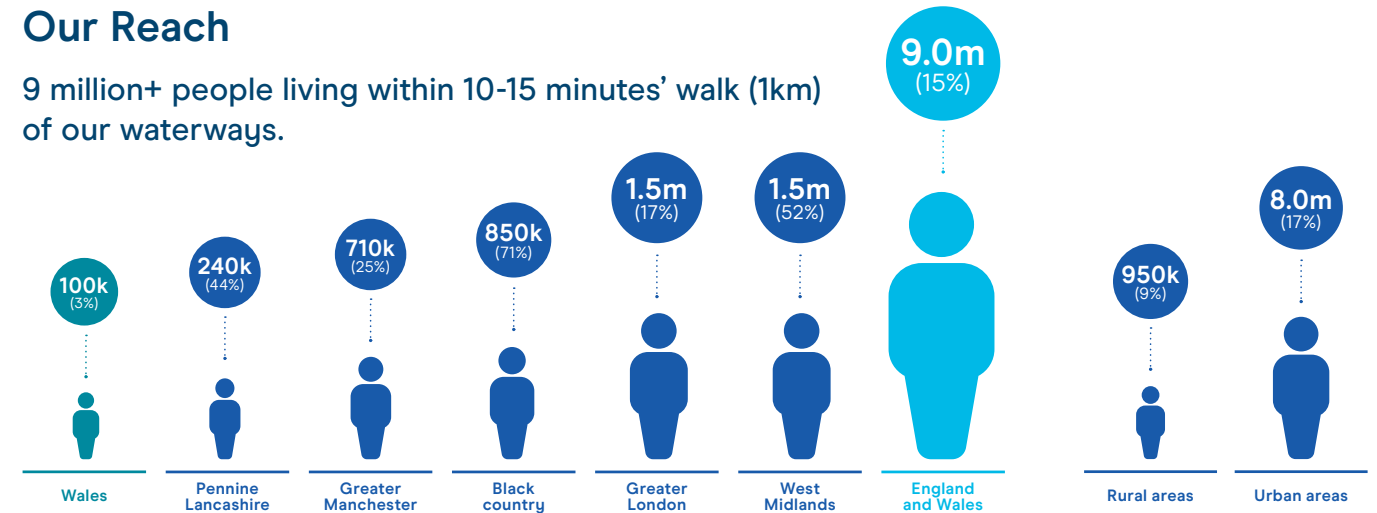
“It takes you away from the city. Is like an escape, especially in London. Being close to nature, you don't have to go anywhere, like it's right there!”
Youth volunteer, 19, London

83% of those who live within 10-15 minutes' walk (1km) agree that their local waterway is important to their area.

Our communities

Our Reach

9 million+ people living within 10-15 minutes' walk (1km) of our waterways.



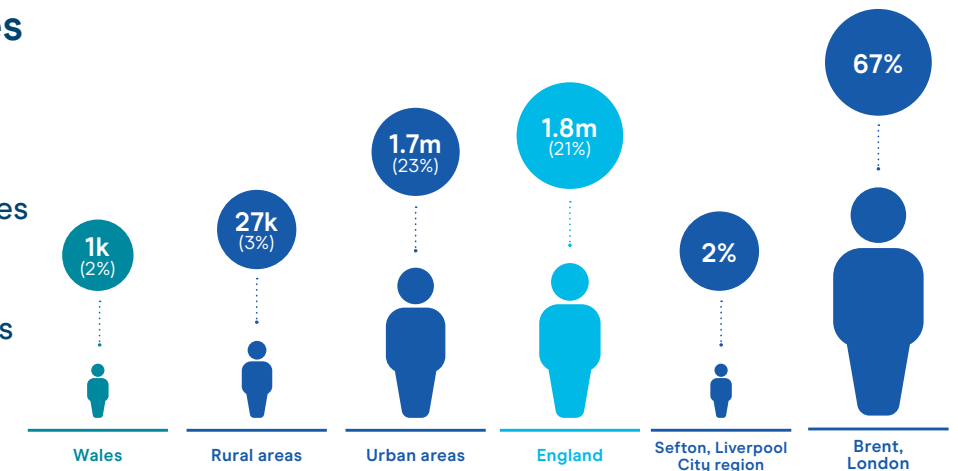
Wellbeing Inequalities

61% of households (up to 72%) living within 10-15 minutes' walk (1km) of our network have health and wellbeing challenges – opportunities to help tackle wellbeing inequalities and support levelling up.

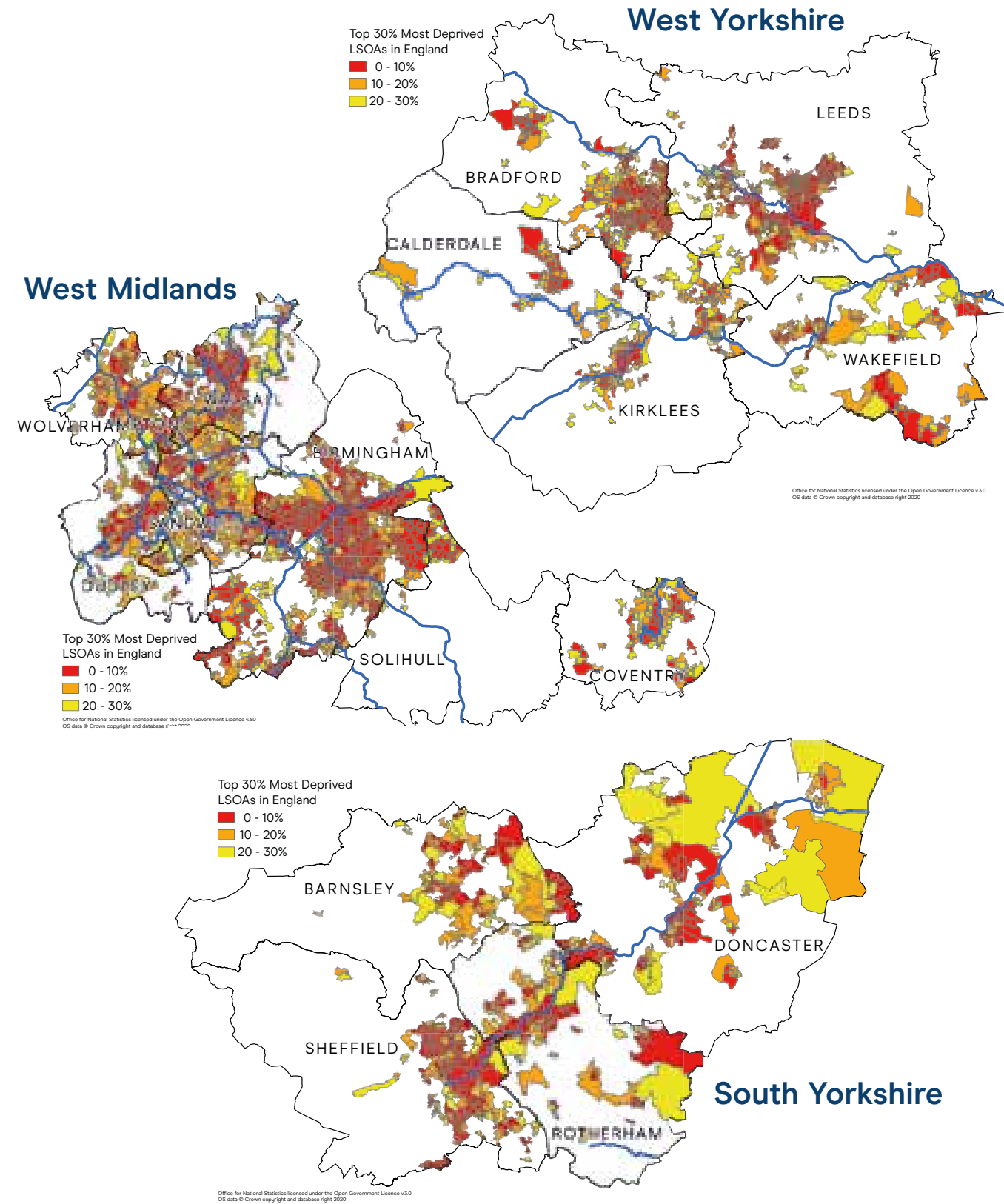


Diverse Communities

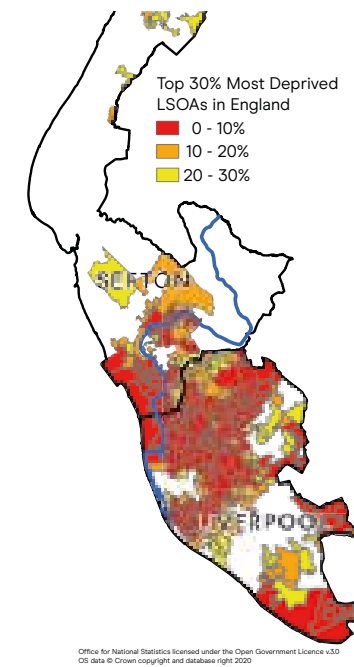
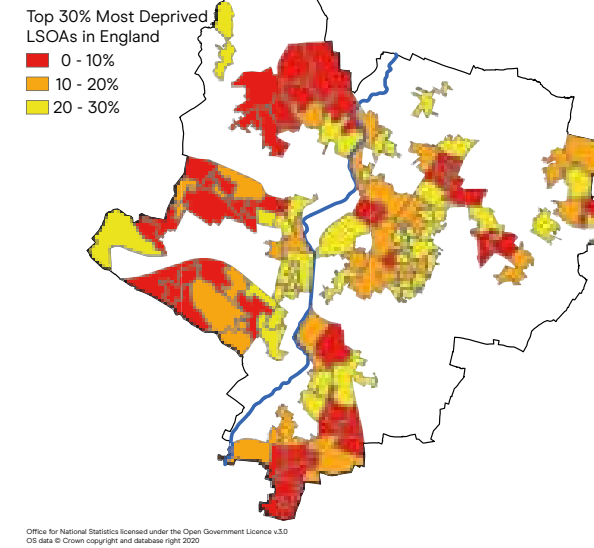
19% of people living within 10-15 minutes' walk (1km) are from ethnically diverse backgrounds – opportunities for our network of canals and towpaths, other waterways and waterbodies to be truly inclusive.



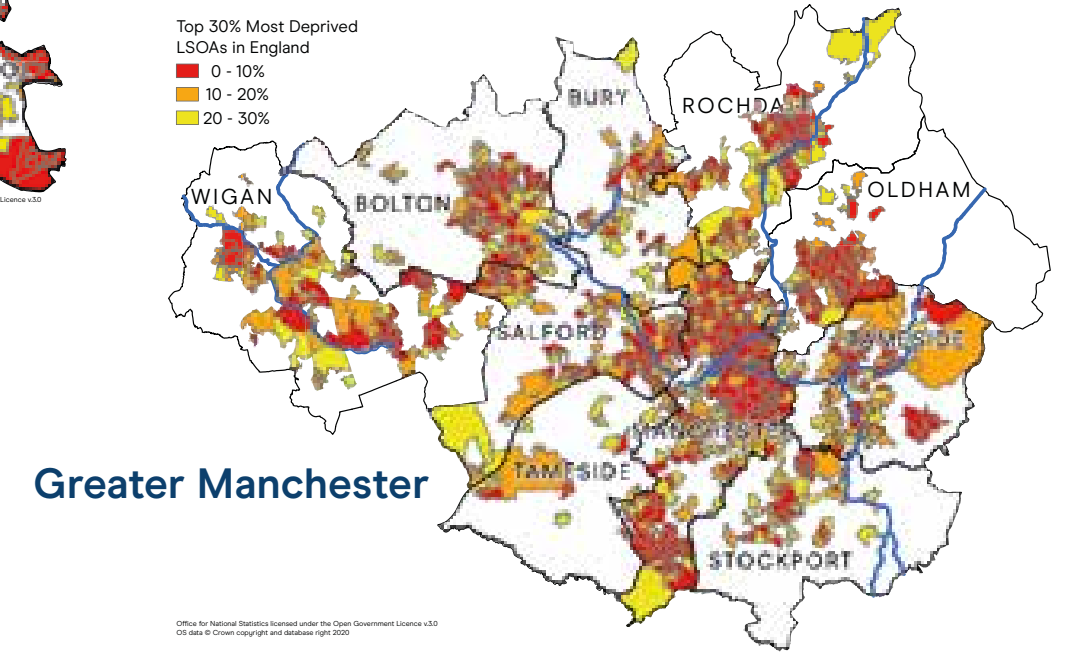
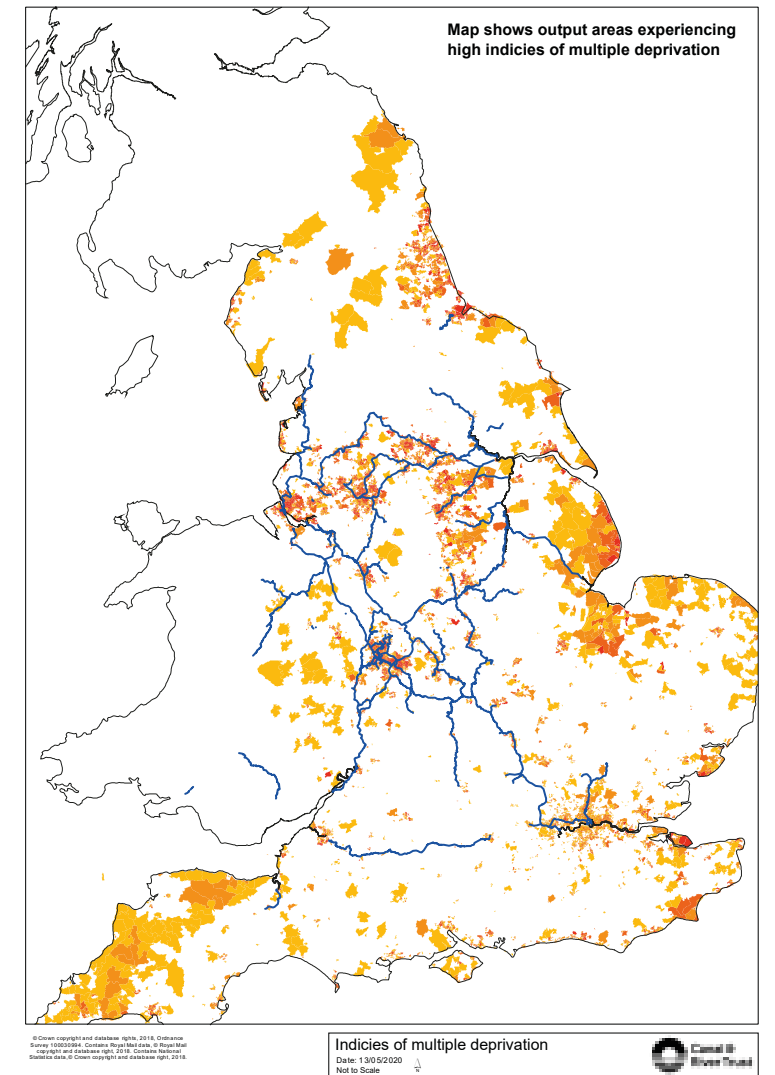
Maps showing potential for our canals, other waterways and waterspaces to address areas of deprivation



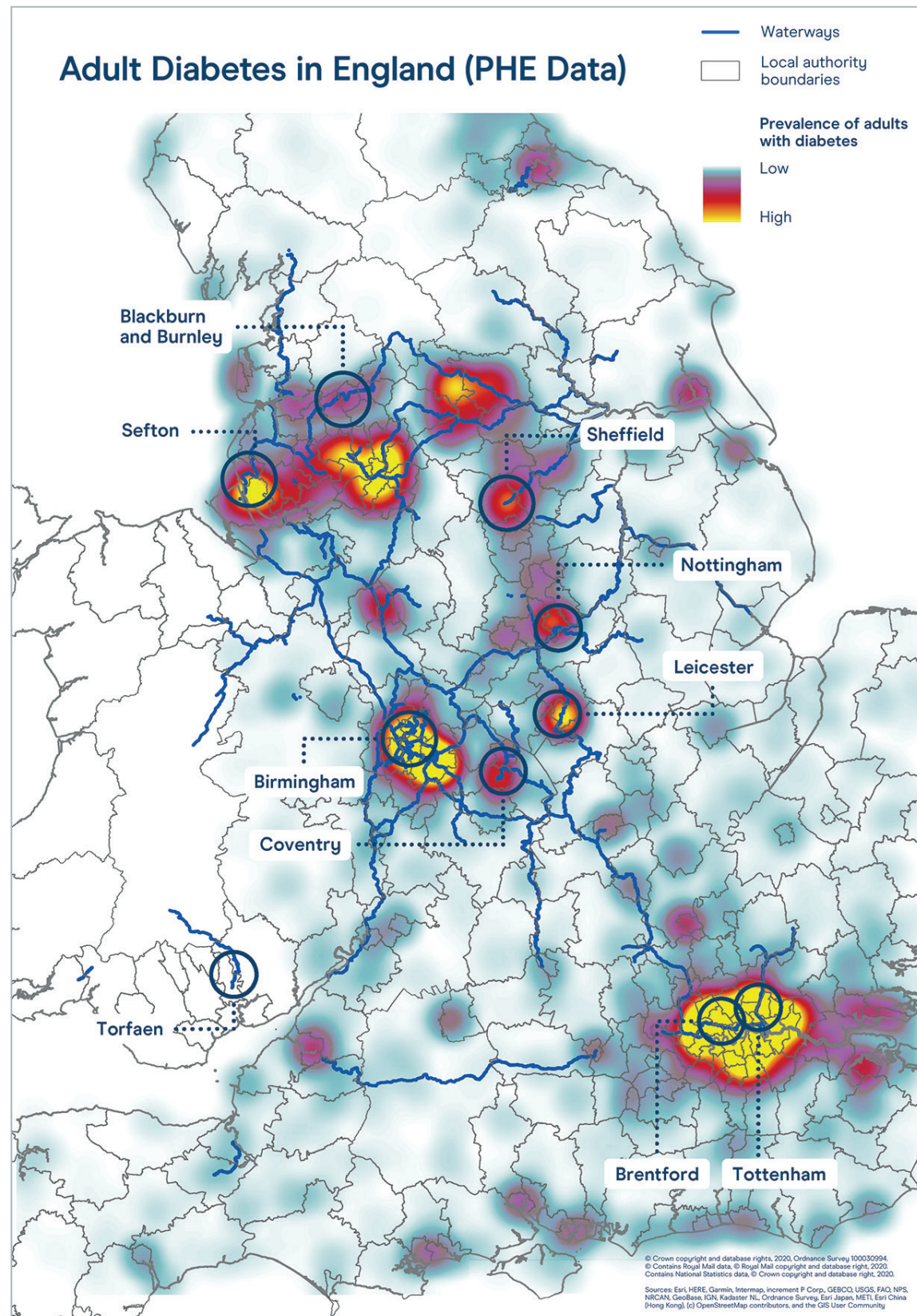
Leicester



Liverpool and Sefton

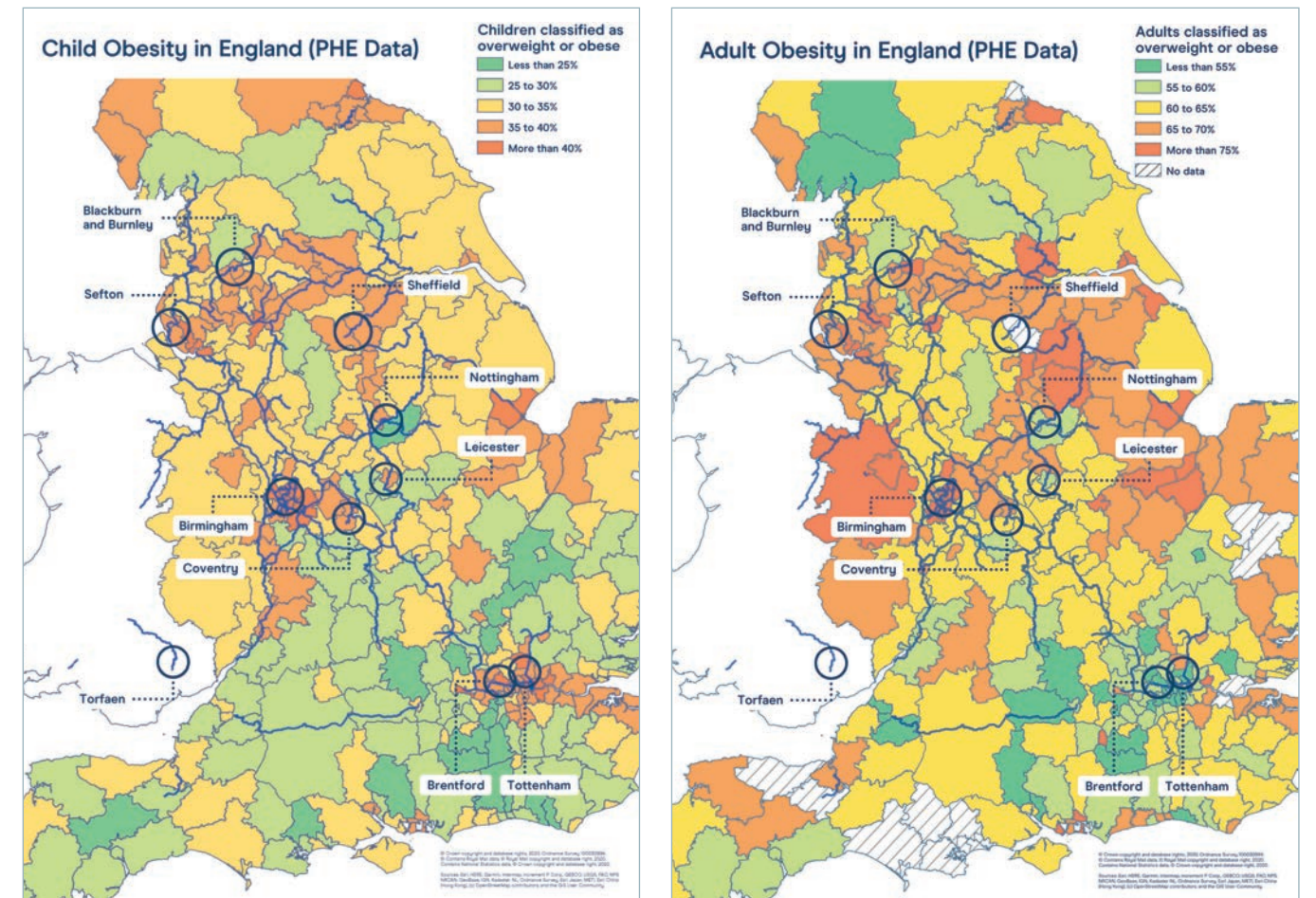


Greater Manchester



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Our Let's Walk programme encourages people in urban communities to use their local canal for regular health living walks.

Investing in our network for the benefit of the nation

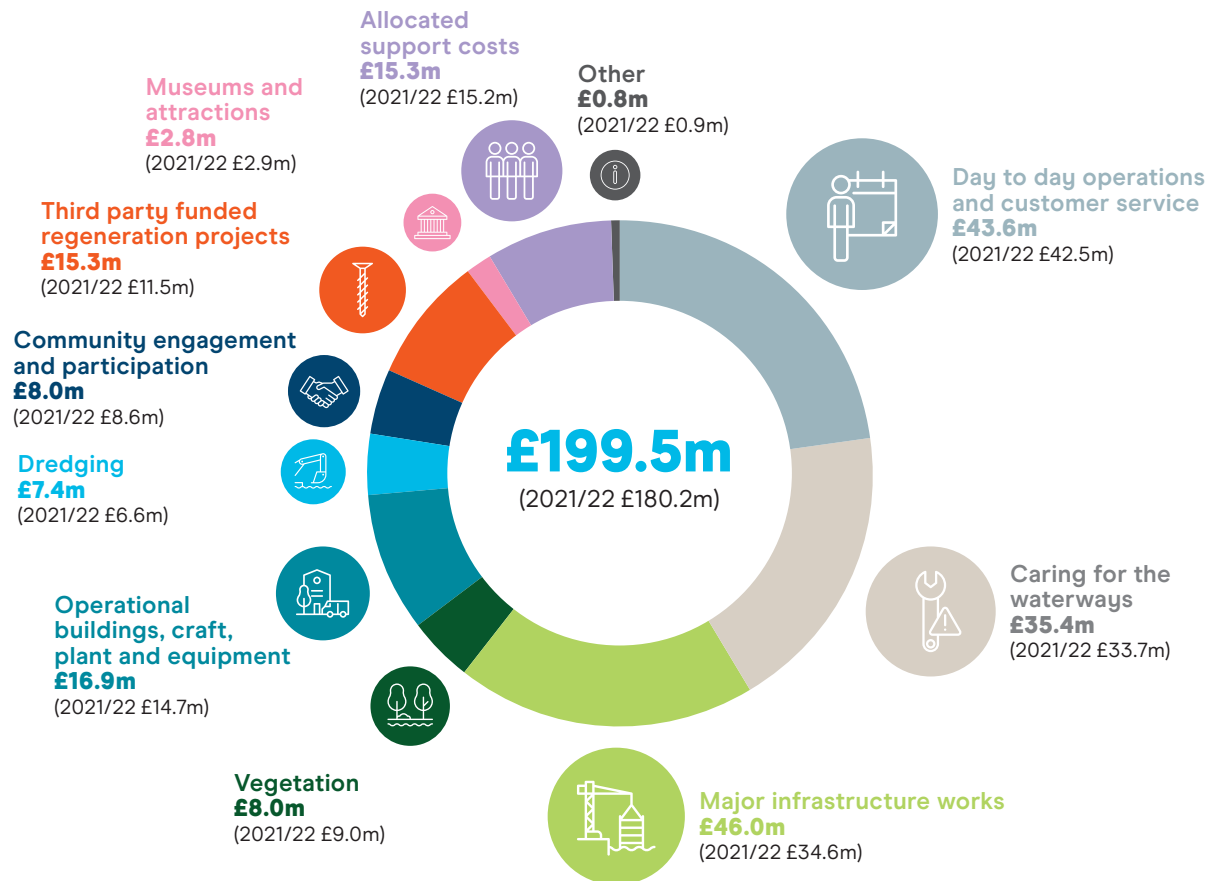
The network of canals and towpaths, river navigations, docks and reservoirs in our care is among the finest examples of working industrial heritage in the world.

Our network includes 82 reservoirs (of which 71 are large raised reservoirs subject to the Reservoirs Act 1975), four inland ports, along with hundreds of bridges, aqueducts, tunnels, embankments and important wildlife sites. Built over two centuries ago to enable the Industrial Revolution, it comprises the third largest collection of listed buildings in the country, 49 scheduled ancient monuments, two museums and five World Heritage Sites.

Our network managed on behalf of the nation, is one of the UK's largest free-to-access blue spaces, with 10.3 million users visiting regularly, and 888 million unique visits recorded during 2022/23.

There are more powered boats and a wider range of users on the water than ever before. We have seen growth in canoeing, paddle boarding, rowing and other unpowered boating activities in particular. Growth in

Our Expenditure on Charitable Activities 2022/23



volunteers and our work with partner organisations have continued. Since January 2021, our volunteers have given over 1,996,000 hours of their time and we worked with 564 partner organisations.

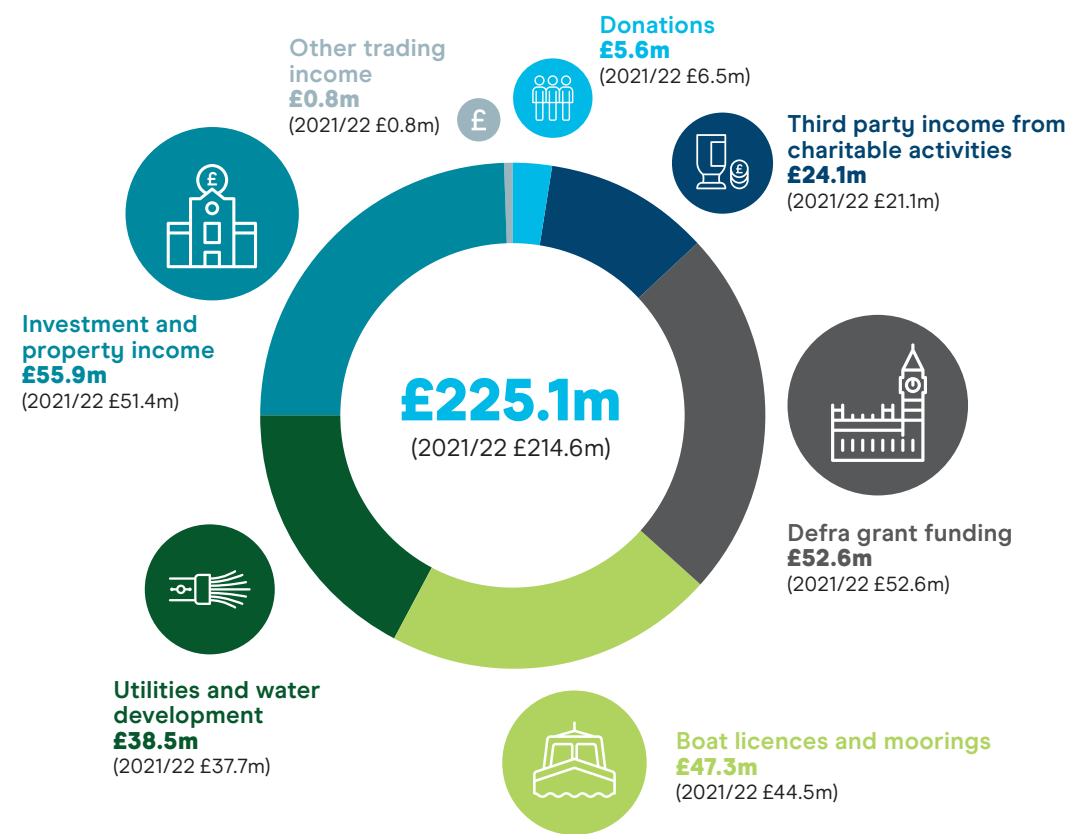
We invested £199.5 million in our canals, other waterways and waterspaces in 2022/23, of which the largest element (£89.6 million) was on day-to-day operations and on stewardship of our waterway infrastructure and the environment.

We rely on our UK Government grant, fees from boat owners and businesses and our investment and commercial income to fund the cost of maintaining our network. Our work is increasingly supported through lottery funds, corporate and local authority partnerships and growing voluntary donations from members of the public.

In 2022/23 the Trust's income was £225.1 million. Our grant from Defra was £52.6 million and we generated the remainder through our investments and activities and from third party or charitable funds as set out in the chart below. Our grant agreement with Government runs until 2027, and we continue to engage with Government on our future funding needs in order to continue our role as their strategic and delivery partner, protecting key assets and communities and creating value through the delivery of a wide range of public benefits.

We continue to maximise our income generation, actively manage and grow our endowment and attract charitable income from statutory and voluntary funding, corporate partnerships, individual and legacy giving activities.

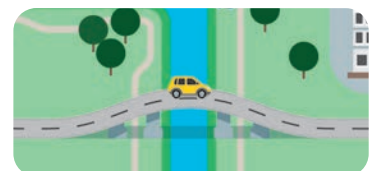
Our Income 2022/23



Our network and offer



Owns and maintains **10,000** major infrastructure assets including **1,072** important national infrastructure assets



871 public road bridges and **2,099** other bridges



782 major embankments and **827** major cuttings



1,581 locks, **281** aqueducts, **55** tunnels, **1,954** culverts and **796** weirs (133 on rivers)



Oldest reservoirs in UK, with **71** being large raised reservoirs under the Reservoirs Act



4 dock complexes, Tees Barrage and **3** harbour authorities



HOSTING

Public Road bridges	Towpaths
1,136 electricity cables	1,576km electricity cables
422 water mains and 106 sewers	
374 gas mains	1,302km gas mains
1,806 telecom cables	659km telecom cables

PROTECTING

Embankment	Reservoir
840 sub stations protected	387 sub stations protected
128 schools protected	34 schools protected
Railways protected at 570 locations	Railways protected at 55 locations
Motorways protected at 114 locations	Motorways protected at 18 locations
370,294 people protected	193,663 people protected
31,881 businesses protected	
122,428 properties protected	80,693 properties protected

Chapter 2: Our Approach to Impact Generation

Our vision and strategy

In 2014 we set out our vision – *Living Waterways Transform Places and Enrich Lives* – together with a long-term strategy based on being a Trust for waterways and wellbeing. The chart opposite describes how the dual components of this strategy interface to create a ‘virtuous sustainable circle’ – the more people who appreciate the wellbeing benefits of the waterways, the more support the Trust can secure for long-term future care of these waterways.

Our strategy involves looking after the network in our care, so that the basic service ‘offer’ to all users and visitors is delivered safely and efficiently. Along with promoting them widely to 9 million+ people who have canals, other waterways and waterspaces ‘on their doorstep’, so that many more people connect with, and benefit from, this free and accessible community resource.

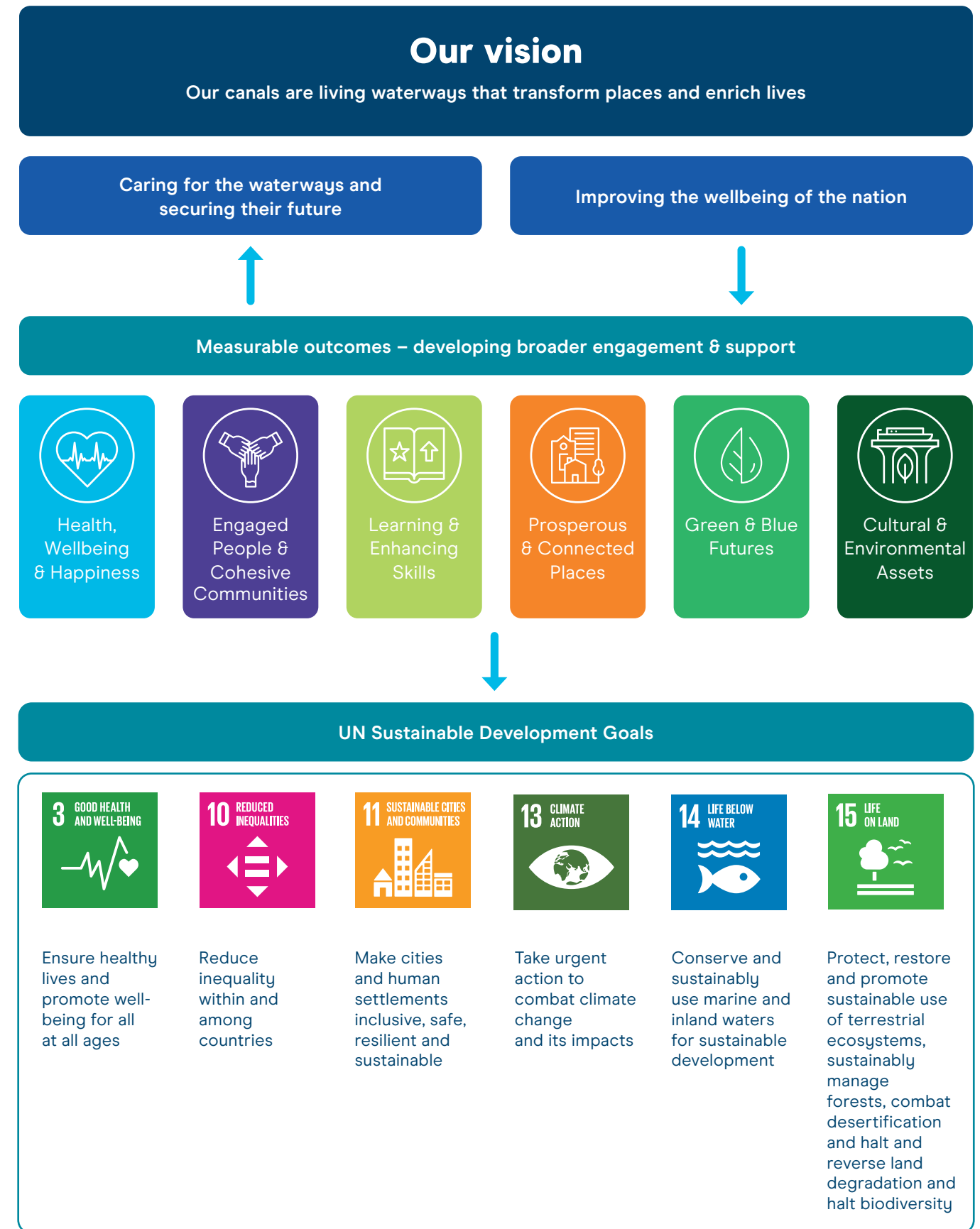
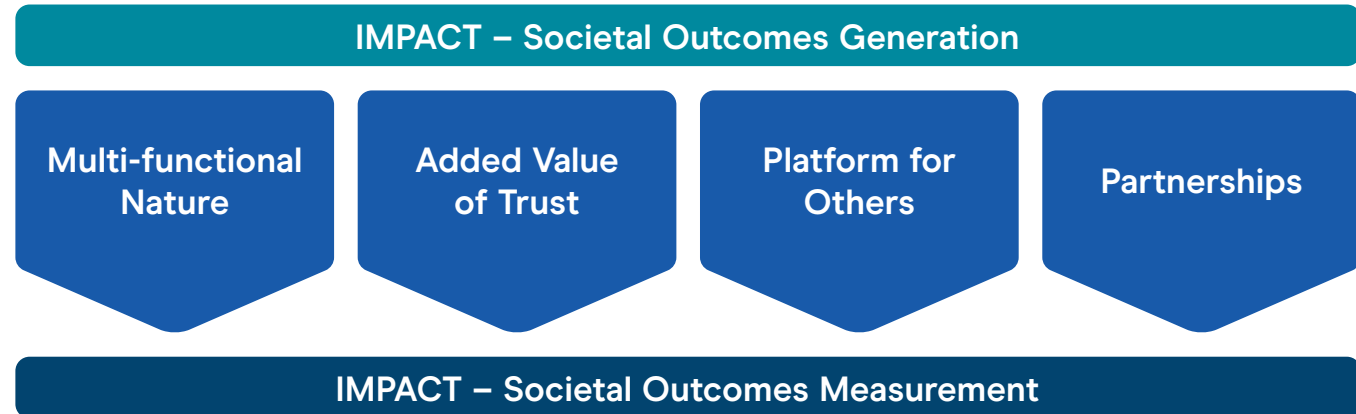
Our network of canals, navigable rivers, docks and reservoirs are delivering a wide range of economic, social, environmental and cultural

Our canals are living waterways that transform places and enrich lives.

benefits to society. They are improving the wellbeing of individuals, communities, nature, the economy and the planet and have the potential to make significant contributions to six of the UN sustainable development goals.

The level of contribution to these UN goals is heavily dependent upon the resilience of this historic waterway infrastructure and the canals, other waterways and waterspaces as well as the towpaths being safe and inviting places to visit, use and enjoy.

The breadth of the social impact and societal outcomes are generated by the presence of the canals and towpaths, other waterways and waterspaces themselves, the activities and interventions made by the Trust, and other organisations using our network as a platform.



Creating the necessary conditions for delivering societal impact

1. Maintaining & improving waterway resilience in the face of growing impact from the climate emergency

The canals and towpaths, river navigations, docks and reservoirs in our care play a hugely important role in society today, valued and used by people as never before. But they remain one of the oldest critical infrastructure networks in the world and are under increasing pressure from climate change.

Most of the vital earth structures supporting these manmade waterways were built for the demands

of the late 18th or early 19th centuries with little expectation that they would still be in daily use more than 200 years into the future. Increasing extremes in weather patterns are bringing considerable challenges to this ageing infrastructure. We are experiencing regular extreme weather events on an unprecedented scale and must deliver an extraordinary level of investment over the next few years to keep pace with the ever-rising impact of climate change.

2. Removing the barriers to use

The delivery of social value and economic impact is underpinned by having infrastructure that is resilient and able to offer communities clean, safe and inviting blue spaces and routes. The benefits of these spaces are dependent on feelings of safety and the quality of the environment, and there is evidence that people associate the cleanliness of the environment with safety.

The presence of these barriers cuts across all demographics but are

more acute among older people, females and people from diverse ethnic backgrounds, and amongst non-users living within 1km of our waterways in metropolitan and urban areas. These are often the most deprived and ethnically diverse urban communities, where the potential impact is greatest. We need to continue to remove the physical and psychological barriers to use and address perceptions of being an unsafe and unpleasant environment.

3. Extending our reach & impact

Achieving social value and economic impact such as the improved physical and mental health benefits associated with spending time in blue-green spaces is dependent on people valuing, using and enjoying their local canals and towpaths, other waterways and waterspaces. We are

involved in a wide range of community engagement activities to reach people who do not yet know about or use our network, to encourage greater and diverse use, change local perceptions and increase support for these spaces.



Our 'Beauty on the Doorstep' Programme



- According to its website, the **Green Flag Award**® aims to:
- ✓ Ensure that everybody has access to quality green and other open spaces, irrespective of where they live.
 - ✓ Ensure that these spaces are appropriately managed and meet the needs of the communities that they serve.
 - ✓ Establish standards of good management.
 - ✓ Promote and share good practice amongst the green space sector.
 - ✓ Recognise and reward the hard work of managers, staff and volunteers.



Perceptions & Barriers



Caring & Loved



Micro Benefits



Our 'Wellbeing on the Doorstep' Programme – our community outreach activities



Generating our impact – our ten outcome focus areas

To achieve maximum impact, the Trust must use its resources where it can make most difference.

We have selected ten areas across England and Wales which have reach into communities at most in need, offering significant opportunities to make a real difference.

In these outcome focus areas, we have worked with local partners, including local, town and parish councils, charities, faith groups and businesses, to showcase how our network of canals and towpaths, other waterways and waterspaces can contribute to individual and community wellbeing. We are evaluating the impact of adopting a place-based, holistic approach, working in co-production with local communities where appropriate.

The Trust's 'Community Roots' programme, funded by the players of People's Postcode Lottery, focuses on making canals, navigable rivers, docks and reservoirs relevant to local people in each of these ten areas, understanding patterns of use, perception of the value of their local waterway and building sustainable 'community ownership' through local empowerment and support.





Sheffield



Blackburn and Burnley



Black Country



Birmingham



Leicester



Tottenham Hale



Torfaen



Brent



Sefton



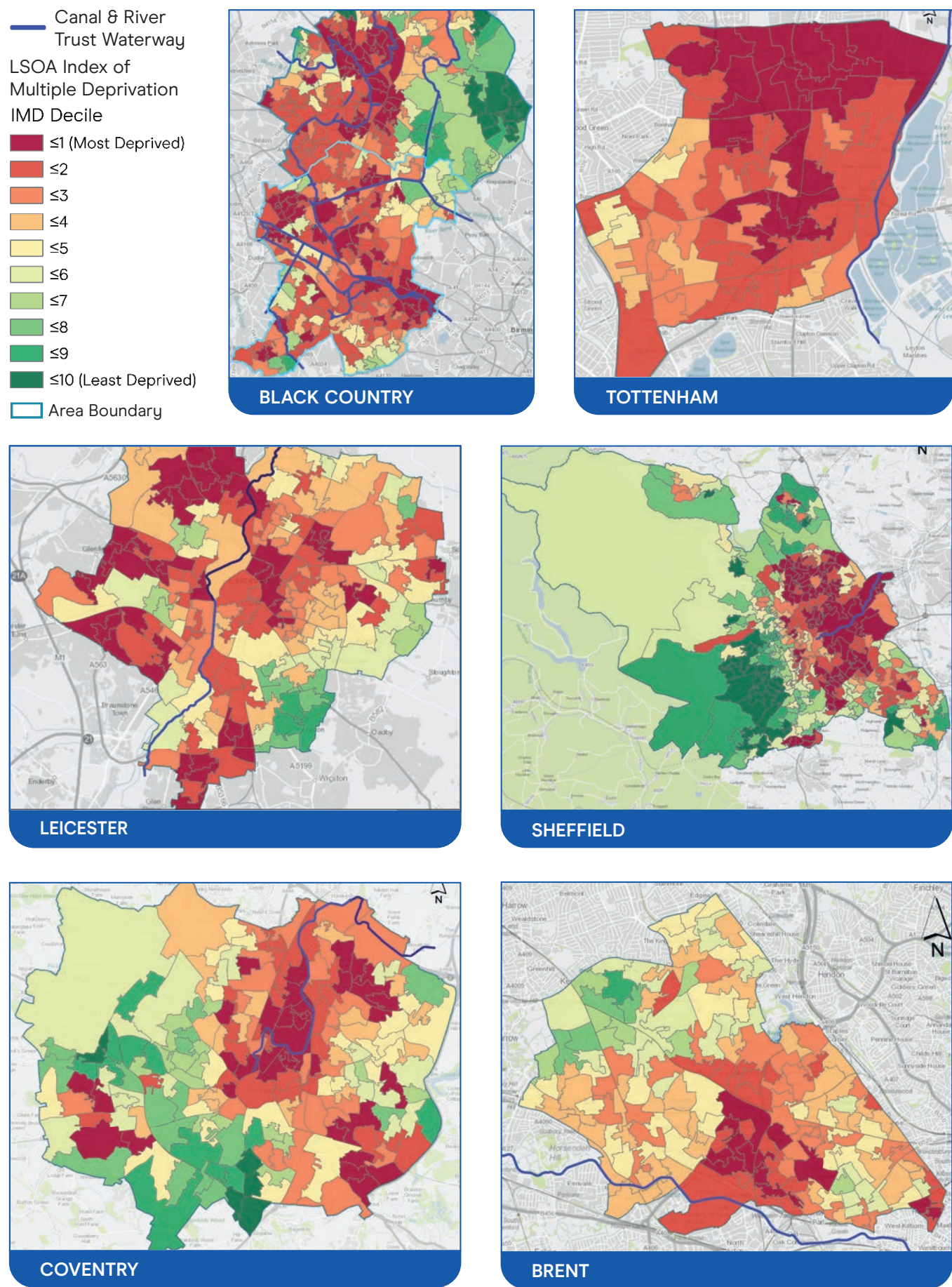
Coventry

Our ten outcome focus areas

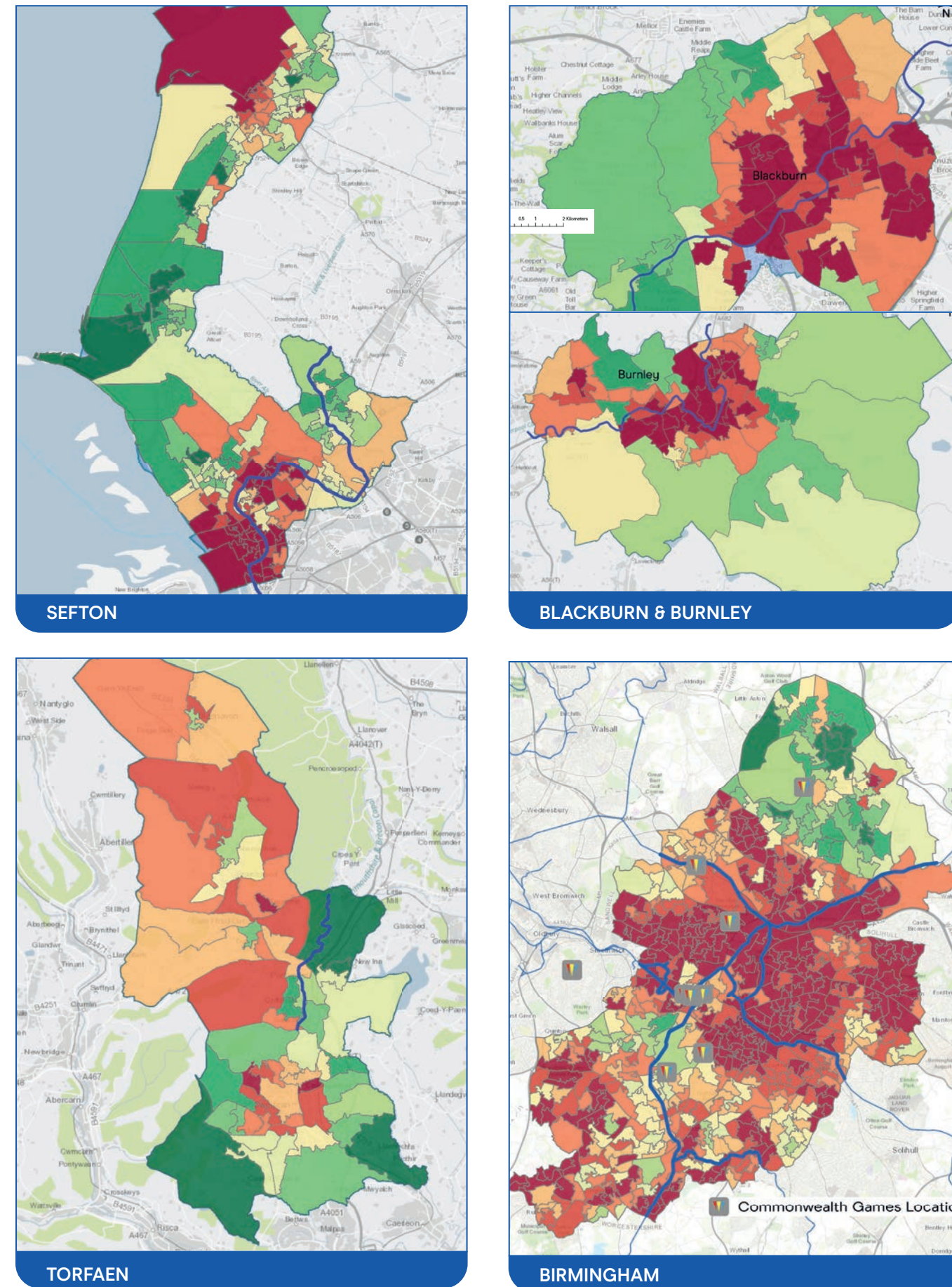


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Chapter 2: Our Approach to Impact Generation



Chapter 2: Our Approach to Impact Generation



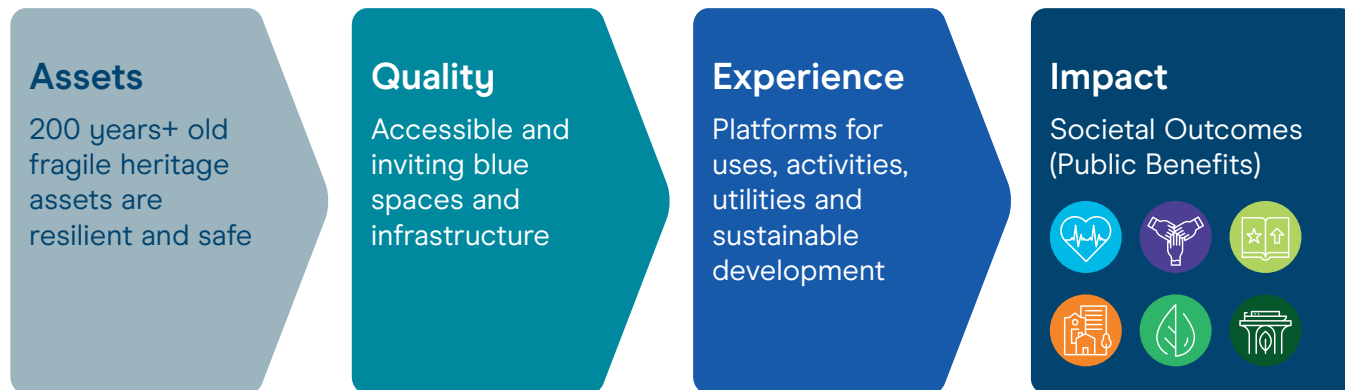
Chapter 3: Our Approach to Measuring Impact

Our Pathways to Benefits (Logic Chains)

We have developed logic chains on pathways to delivering public benefits.

These logic chains seek to robustly and clearly demonstrate the direct interconnections and interdependences between the

condition and resilience of our assets, being safe and inviting places to use, visit, host and invest by third parties and the activities, investment and interventions made by the Trust with the generation of public benefits.



Our Outcomes Measurement Framework

Our 'Waterways & Wellbeing – Building the Evidence Base' Report, a technical report published in September 2017, was designed to outline our Outcomes Measurement Framework (OMF) that was designed in collaboration with Cardiff University's Sustainable Places Research Institute (PLACE). The aims of the framework are twofold – firstly to robustly demonstrate the relevance and value of the waterways to the communities we serve and to society as a whole. Secondly, to adopt a cross-cutting approach to outcome measurement that truly reflects the breadth and multi-benefit nature of our network's contribution to society and the economy.

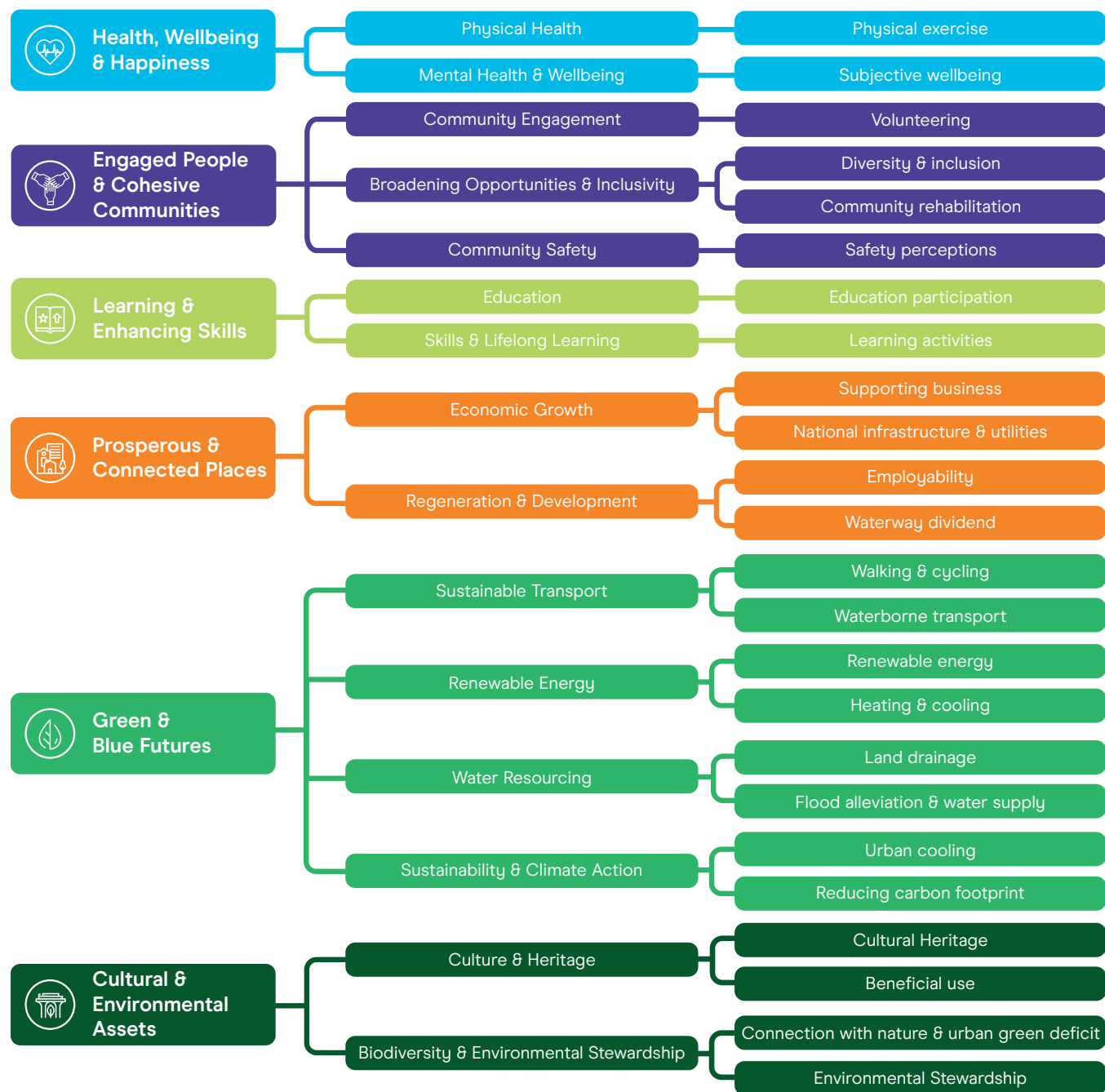
The OMF is organised into six domains which encompass the diverse and 'multi-benefit' nature of waterways, the Trust's strategic goals and ambitions, and the breadth of potential impacts and outcomes; as well as reflecting the strong synergy with wider economic, social, cultural and environmental wellbeing.

Within each domain are a set of sub-domains, which are linked to individual output or outcome indicators that are evaluated and, where possible, monetised to demonstrate the societal value generated by that activity.

Since its original publication in 2017, the OMF has provided the foundations on which the Trust has been implementing research, evaluation and measurement programmes as well as creating a repository of evidence-based case studies for 'storytelling' purposes.

The National Infrastructure Commission 'Quality of Life – Discussion Paper' (June 2022), explored the relationship between wellbeing, and the built and natural environment. The Commission developed a framework that maps outcomes across six domains derived from the Office for National Statistics Measures of National Wellbeing. Our OMF work was specifically referenced as example of best practice in this area within the review of this discussion paper undertaken by What Works Well Centre for Wellbeing (March 2023).





In response to wider policy ambitions, societal challenges and movements that have arisen since the publication of our 'Waterways and Wellbeing – Building Our Evidence Base' Outcomes Report (September 2017), we have revisited our OMF.

This has resulted in the inclusion of two additional sub-domains –

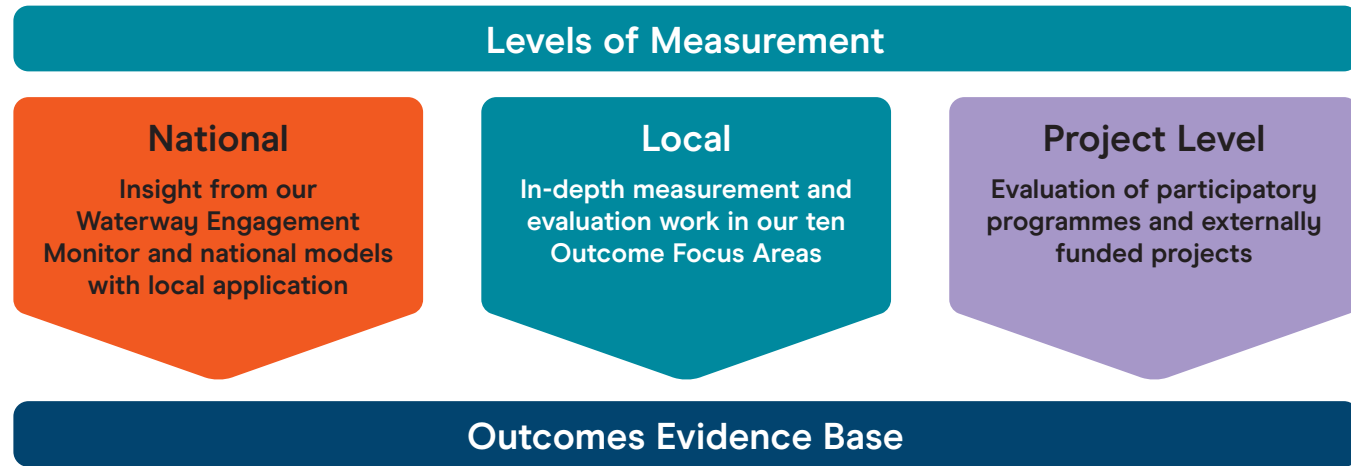
Sustainability and Climate Change (covering urban cooling and reducing carbon footprint) and Connection with Nature & Urban Green Space Deficit – as well as the reframing of two other sub-domains, flood alleviation and water supply.

Domain	Sub Domain	Theme	Outcome Ambition
Prosperous & Connected Places	Economic Growth	National Infrastructure & Utilities	Contributing to the Government's digital connectivity and infrastructure revolution
		Water Resourcing	Flood Alleviation & Water Supply
Green & Blue Futures	Sustainability & Climate Action	Urban Cooling	Waterways' role in urban heating resilience of public spaces
		Reducing Carbon Footprint	Reduction in footprint and offsetting of emissions of both the Trust and our customers to meet Net Zero target
Cultural & Environmental Assets	Biodiversity & Environmental Stewardship	Connection with Nature & Urban Green Space Deficit	Connectedness to nature of Trust waterway users. Linked to UK 25-year Environment Plan

Our measurement methodologies in practice

Due to the geographical breadth of our network and the significant level of activities and interventions, it is not affordable or cost-effective for the Trust to measure everywhere and

everything. Instead, we have chosen to focus our resources and efforts on measuring and evaluating outcomes at three levels.



We have sought to evidence, in a systematic way, the impact of our programmes, externally funded projects and contracted projects promoted by the Trust or partnership-led projects by measuring the effect

and impact of these activities and interventions. To achieve this, we have designed and introduced a simple evaluation process which can be scaled to the size of the programme or project under review.

Our Five Step Evaluation Process



Insight from our Waterway Engagement Monitor 2022/23

The different ways that people are spending their time on and by the water.



An individual is only counted once in the 'total' figure, they may however have done more than one activity during their visit and therefore the percentage total does not sum to 100%.

* Both trip or excursion boats as well as private boats.
** Includes activities such as canoeing, rowing boats and sailing boats.

Source: Waterway Engagement Monitor 2022/23, conducted on behalf of the Canal & River Trust by DJS Research. The WEM is a year-round, online survey amongst a representative sample of 20,400 adults (15+) across England and Wales.

Chapter 4: Our Approach to Valuing Impact

Following HM Treasury Guidelines

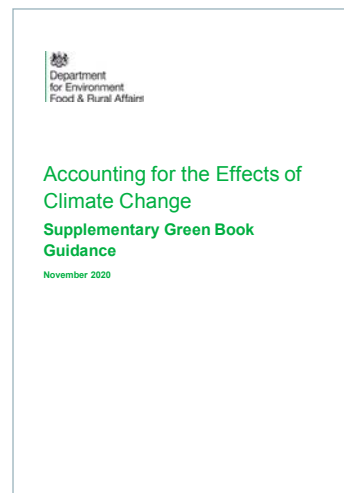
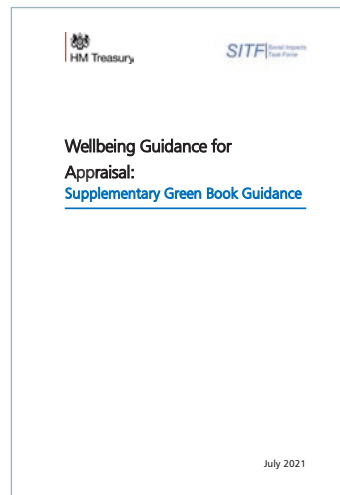
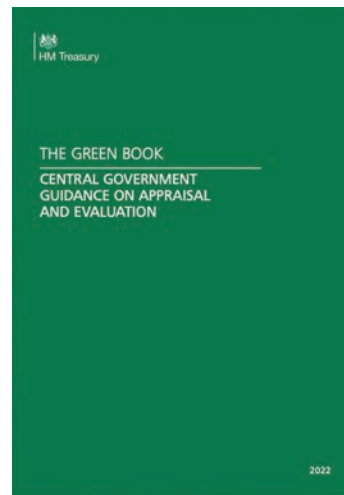
In developing our associated OMF research and evaluation plans, we have been mindful to ensure that our methodologies align with HM Treasury guidance and wider research sector best practice. The key guiding documents that have informed our thinking and activities are briefly outlined below.

HM Treasury Green Book (2022) – Valuation of Benefits

The Green Book is the guidance issued by HM Treasury on how to appraise policies, programmes and projects. It also provides guidance on the design and use of monitoring and evaluation before, during and after implementation of a project or programme. The Trust has used the Green Book, particularly Chapter 6 – ‘Valuation of Costs and Benefits’ to inform the development of our ‘Value Framework’ (which maps each OMF sub-domain to appropriate valuation evidence or techniques) and to ensure that our research findings are developed in a robust manner that aligns with Green Book best practice.

The Trust is a strong proponent of the use of wellbeing valuation and advocates for the concept of a “Wellbeing Adjusted Life Year” to bring a standardisation of approach to valuation of wellbeing impact, as recommended in the supplementary Green Book guidance on wellbeing.

We also recognise the importance of accounting for the effects of climate change, particularly since many of the benefits we deliver and risks that we manage are linked closely to these effects. Therefore, the Green Book supplementary guidance on the environment (published November 2020) is considered another key reference text.



Market prices

Prices from the relevant market (excluding taxes and subsidies). In some cases, a closely comparable market can be used where a direct market price is unavailable.

Generic prices

Use of a Green Book approved transferable price applicable to the proposal.

Revealed preference

Techniques which involve inferring the implicit price placed on a good by consumers by examining their behaviour in a similar or related market. Hedonic pricing is an example of this where econometric techniques are used to estimate values from existing data.

Stated preference willingness to pay

Research study by professionally designed questionnaire eliciting willingness to pay to receive or avoid an outcome.

Stated preference willingness to accept

Research study by professionally designed questionnaire eliciting compensation to accept a loss.

Wellbeing

Use of direct wellbeing based responses (in existing data or from research by questionnaire) to estimate relative prices of non-market goods.

Estimation of a central reference value and a range

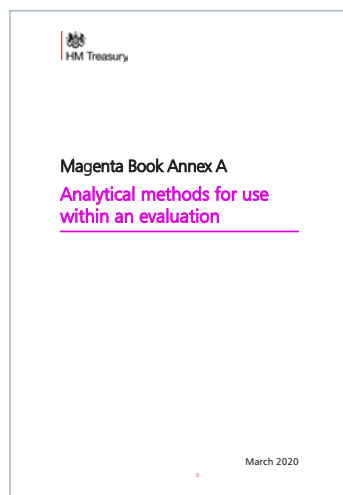
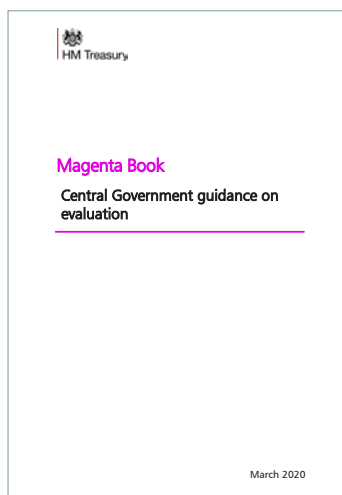
Based on available data.

HM Treasury Magenta Book (March 2020) – Adopting Five Step Evaluation Process

The HM Treasury’s Magenta Book is a complementary document to the Green Book, providing a comprehensive overview of the evaluation process that should be followed in Government.

The Magenta Book sets out guidance on the scoping, design, management, use and dissemination of evaluations and emphasises the value of evaluation in providing evidence for the design, implementation and review stages of the policy cycle.

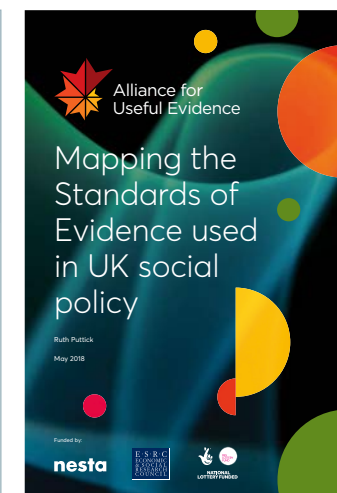
The Trust has used Magenta Book principles and the five-step process for undertaking evaluations when designing our evaluation process and framework to ensure rigour.



NESTA Standards of Evidence (October 2013) – Applying to OMF Evidence Gathering

Our ambition is to populate our Outcomes Measurement Framework with the most robust evidence on the impact of waterways and the activities and interventions made by the Trust under the six OMF domains and their corresponding sub-domains.

The strength of our existing and planned evidence gathering activities have been systematically assessed against the five-scale framework contained within the NESTA Standards of Evidence as summarised in the table below.



Level	NESTA Expectation	How the Evidence can be Generated (NESTA)	Application by the Trust
One	You can describe what you do and why it matters, logically, coherently and convincingly.	You should be able to do this yourself, and draw upon existing data and research from other sources.	Number of participants. Frequency of participation. Description of activities undertaken.
Two	You capture data that shows positive change, but you cannot confirm you caused this.	At this stage, data can begin to show effect but it will not evidence direct causality. You should consider methods such as: pre- and post-survey evaluation, cohort/panel study, regular interval surveying.	A range of surveys including Waterways Engagement Monitor, towpath and destination surveys.
Three	You can demonstrate causality using a control or comparison group.	We will consider robust methods using a control group (or another well justified method) that begin to isolate the impact of the product/service. Random selection of participants strengthens your evidence at this level.	Access to control groups is likely to be difficult and impossible in many instances. Extent of activity would not warrant investment in measurement of non-participants. In some settings, pseudo-control groups can be formed using irregular participants.
Four	You have one + independent replication evaluations that confirms these conclusions.	At this stage, we are looking for a robust independent evaluation that investigates and validates the nature of the impact. This might include endorsement via commercial standards, industry Kitemarks etc. You will need documented standardisation of delivery and processes. You will need data on costs of production and acceptable price points for your (potential) customers.	
Five	You have manuals, systems and procedures to ensure consistent replication.	We expect to see use of methods like multiple replication evaluations; future scenario analysis, fidelity evaluation.	

Developing our Value Framework

Many of the indicators contained within the OMF provide valuable evidence of the social value of the impacts and outcomes being generated by waterways themselves; the activities and interventions made by the Trust, in partnership with others or by other organisations using our canals and towpaths, other waterways and waterspaces, as a platform. However, these indicators are not themselves suitable for use in economic valuation studies or cost-benefit analyses.

The Trust commissioned the research consultancy firm Simerica-Jacobs in 2018 to produce a 'Value Framework' which sought to map each OMF sub-domain to appropriate valuation evidence or techniques that are consistent with HM Treasury Green Book principles concerning the valuation of non-market goods.

The Green Book emphasises the need to ensure that social values are considered in a comprehensive way and represent the full impact on individuals and community quality of life. The valuation study entailed a detailed mapping process to understand the most suitable valuation methods for each OMF sub-domain.

The following valuation techniques were considered:

- **Market Prices** – the direct value of spend on local goods and services per individual waterway. However, many of the multi-benefits derived from waterways and the activities and interventions made by the Trust are not reflected directly in markets.
- **Revealed Preference** – approaches to infer the value people place on non-market goods through their actual choice behaviour. For example, hedonic pricing, where the value people place on amenities (e.g. living close to canals) is estimated from house prices.
- **Wellbeing Valuation** – measuring the impact of an outcome by its effect on subjective wellbeing. A key benefit, of this approach, is that it is based on how people experience a 'public good' / non-market good.
- **Stated Preference** – survey-based approach that establishes valuations based on an individual's willingness to pay for a particular benefit. This is the main method for capturing non-use values and can be applied to nearly all domains. This approach is particularly suitable for capturing the heritage, cultural and environmental values associated with the assets owned and/or managed by the Trust.
- **Avoided Cost** – approach provides an estimate of the social value generated due to financial cost savings (for example, savings to the NHS associated with a healthy population).
- **Value Transfer** – approaches involve using existing valuations, based on any of these methods, and applying them to the 'policy' context. These approaches work well where the studies available for value transfer match the specific characteristics of the policy good in question. For example, a canal, towpath, lock, bridge or aqueduct or other built heritage structure.

Adopting a Theory of Change approach

The Trust delivers a range of public benefits which we can measure and value.

The relationship between the Trust's benefits to individuals, society and economy and how the Trust achieves these benefits through the work it does follows a 'Theory of Change' approach. Theory of change, as laid out in the HM Treasury Magenta Book, is a method that explains how a given intervention is expected to lead to a specific development change, drawing on a causal analysis based on available evidence.

Following the 'Theory of Change' approach set out in the Magenta Book, we have measured and valued the breadth of societal benefits of the activities and programmes delivered on and alongside our canals and towpaths, other waterways and waterspaces.



Aggregating the social and economic value of our canal network

We worked with Simetrica-Jacobs to develop a robust assessment of the total annual social and economic value generated by the waterways and delivered by the activities and interventions made by the Trust. We adopted a step-by-step approach to aggregation for each public benefit, including undertaking triangulation across individual valuation studies. Triangulation refers to the use of multiple, independent data sources and methods to produce a common perspective. The objective of a robust triangulation process is to increase the transparency and reliability of the valuations that underpin an aggregate assessment.

The steps below set out the process that we followed:

- 1. Scoping of individual valuation studies for use**, including an overview of the study methodology and assessment of its robustness.
- 2. Comparison of the valuation studies** – where more than one relevant study exists for an outcome area, these studies were compared for differences and similarities.
- 3. Approach to aggregation** – For each outcome area, the recommended valuation studies identified in steps 1 and 2 as outlined above, have been applied to estimate the aggregate benefits that arise from that outcome.
- 4. Reporting the overall results** – aggregate valuations across the range of key outcome areas in the OMF are then brought together into an overall reporting framework. A key consideration was the extent to which outcome areas and valuation studies overlap and were therefore ‘covering’ the same value.

The aggregation research sets out the public benefit groupings as follows:

Aggregation of annual welfare benefits, of those that are quantifiable and readily monetisable, across the following core areas:

- o Physical exercise
- o Subjective wellbeing
- o Volunteering
- o Waterway dividend ('Amenity Value')
- o Walking and cycling (supporting decarbonisation of transport)
- o Renewable energy
- o Water resourcing
- o Cultural heritage ('everyday' and iconic)
- o Biodiversity and environmental stewardship

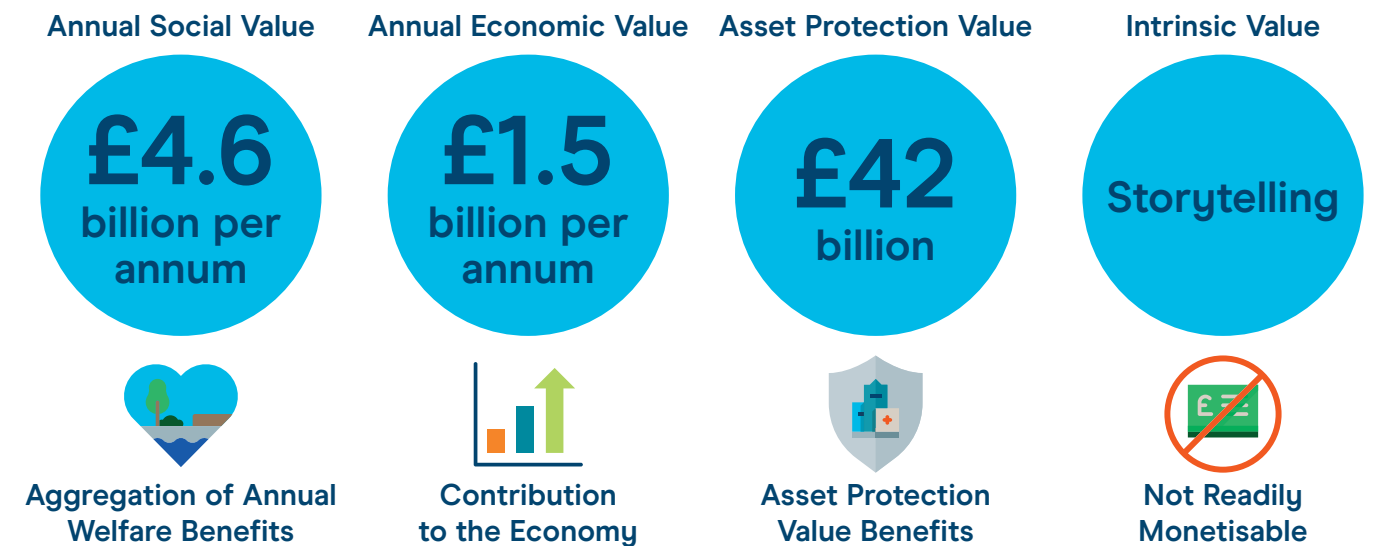
Contribution to the Economy through Gross Value Added (GVA) and employment derived from waterway related businesses and tourist expenditure.

Asset Protection Value Benefits ('Cost at Risk'), that is the protection offered by assets, such as reservoirs and embankments, in good condition.

The next section in this chapter provides a brief explanation on our impact reporting work showcasing the breadth and richness of our intrinsic value.

Chapters 5-7 provide a brief overview of the methodology and key findings from these studies and a summary of the aggregation work undertaken by Simetrica-Jacobs, building upon these studies.

Chapter 8 describes the different forms of protection value offered by our infrastructure.



Our Intrinsic Value – Report on our impact for storytelling

Our network of canals and towpaths, river navigations, docks and reservoirs contribute to our lives in a host of different ways, some of which cannot be quantified using the valuation methods set out in this report.

Transforming Places and Enriching Lives – Our Impact Report 2021-23 seeks to showcase a few of the many stories and testimonies, partnerships, programmes and projects that sit

behind the monetised values set out in this technical report and capture those benefits that do not immediately support bottom line metrics but are of qualitative value.

Intrinsic Value



Not Readily Monetisable

 Health, Wellbeing & Happiness	Improving health outcomes, helping tackle health and inequalities and save the NHS £1.1 billion every year.	 Prosperous & Connected Places	Contributing £1.5 billion per year in added value to the UK economy and supporting 80,000 jobs through businesses based on our waterways and tourism; supporting sustainable urban waterside living and levelling up; connecting and servicing communities by hosting vital telecommunications and utilities across the country.
 Engaged People & Cohesive Communities	Using our network to provide vital blue space for 9 million+ living within 10–15-minute walk and to build and sustain social connections and community cohesion.	 Green & Blue Futures	Protecting homes and businesses from flooding by our embankments and reservoirs being in good condition totalling approx. £42 billion of social value, and our network supporting the green economy and water security.
 Learning & Enhanced Skills	Providing a unique space for outdoor learning, building character and resilience, developing employability skills and improving life chances for children and young people, many from the most economically disadvantaged areas.	 Cultural & Environmental Assets	Caring for our internationally renowned working heritage and 2,000 miles of wildlife corridors, and connecting people with our cultural heritage and nature.



“Volunteering gives me a purpose, it has a really positive effect on me mentally and physically. I have gained so much confidence.”
James



“My mum and sister had strokes and caring for them has taken its toll on my own mental health. After losing my mum in 2019 the waterways have been a great source of calm and somewhere to recover, grieve and find new happiness – pushing myself to do something outside my comfort zone. To get out again in nature and meeting new people, which will all help with my mental health.”
Velma

“It actually all started when me, my Nan and my Grandad were on a walk on the canal and I saw some people fishing and I said to my Nan ‘you promised you would take me fishing!’”
Daniel



Chapter 5: Annual Social Value – Aggregation of Annual Welfare Benefits

Between 2018 and 2022, we commissioned several independent studies to better understand the contribution that our network makes to people’s lives, where we live, our natural world and the economy.

The annual flow of welfare benefits to society, generated by the Trust’s network of canals and towpaths, river

navigations, docks and reservoirs, is the core measure of aggregate value. These are illustrated below:



Annual Social Value

£4.6 billion per annum



Aggregation of Annual Welfare Benefits

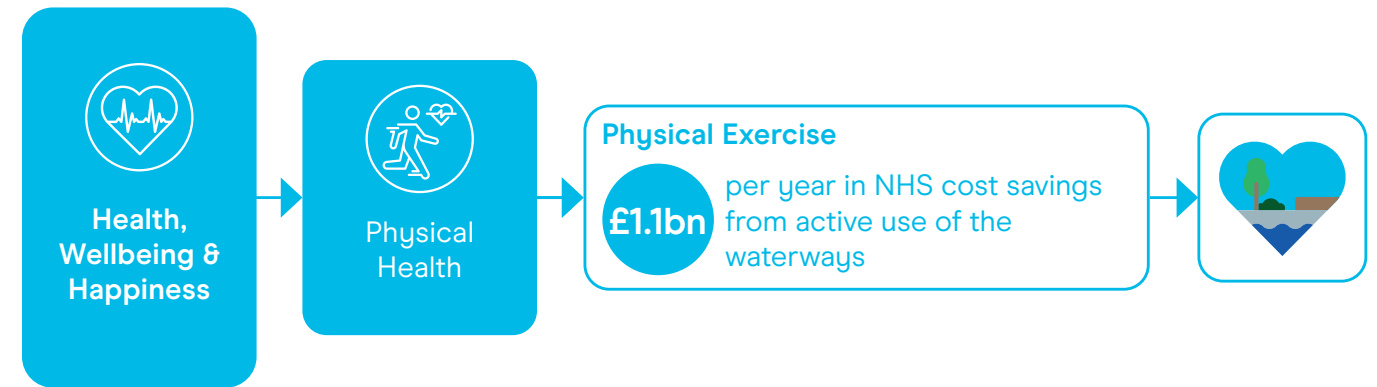
Physical Exercise

To measure our network’s impact on physical health, we undertake an extensive online monthly survey (Waterway Engagement Monitor, WEM) monitoring the general public’s use of our network of canals and towpaths, other waterways and waterspaces. Through this survey, it is possible to estimate the total annual number of active visits to our canals and towpaths, river navigations, docks and reservoirs. This is defined as visits that contribute to the visitor meeting the recommended physical activity guidelines of at least 75-150 minutes (Note 1) of moderate to vigorous activity per week.

We assessed the value of physical health benefits associated with recreational usage of our network of canals and towpaths, other waterways

and waterspaces. Improved health typically has two types of value to society: primary values to individuals and secondary values to the NHS. These values can be added together; however, within the context of this report, physical health benefits to the individual would likely represent an overlap with subjective wellbeing benefits and therefore should not be considered additional to the wellbeing value. On this basis, we do not include a primary value for the individual in the aggregation process.

The value below represents the benefits to the Exchequer in the form of NHS savings from avoided treatment due to individuals improved physical health (because of active visits to the Trust’s network).



Note 1 – Department of Health and Social Care, 2019: Physical activity guidelines: adults and older adults – GOV.UK (www.gov.uk).

Subjective Wellbeing

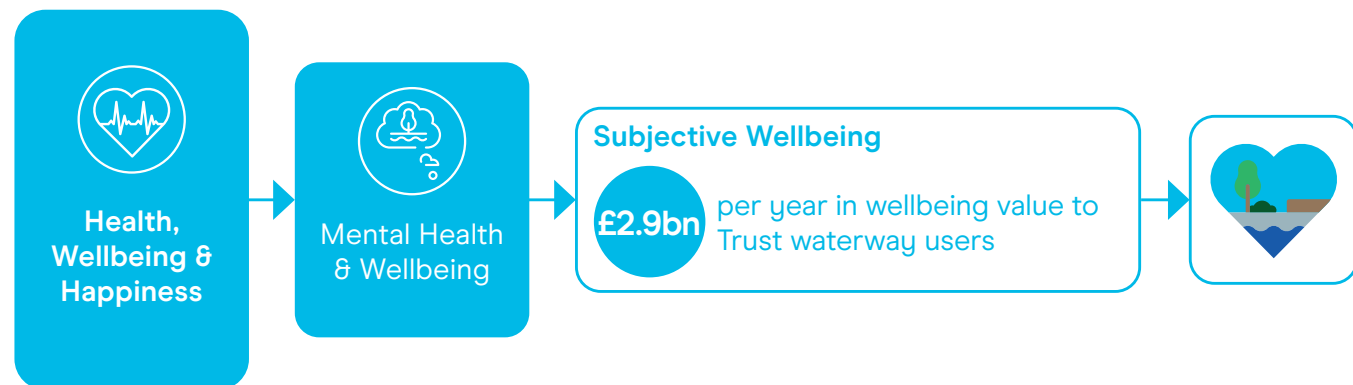
In addition to providing spaces and opportunities where people can enhance their physical wellbeing, we are committed to providing an environment which contributes to improving mental health and ‘wellbeing’ as part of a wider public policy agenda. To measure the wellbeing impacts associated with using our network, each year we monitor the four key subjective wellbeing measures set out by the ONS (life satisfaction, happiness, anxiety, and sense of worthwhile) in the WEM survey.

We assessed the impact of usage of our canals and towpaths, other waterways and waterspaces on the subjective wellbeing of people visiting and using our network in England and Wales and valued this usage in monetary terms to express the impact in a ‘common currency’ with costs. The analysis involved rigorous statistical techniques such

as Ordinary Least Squares (OLS) to consider the extent to which waterway engagement is associated with the four wellbeing measures from the WEM.

The monetary wellbeing value associated with visits to a canal or another waterway or waterspace is calculated using the wellbeing valuation approach which combines an estimate of the subjective wellbeing gain per visit with a causal estimate of subjective wellbeing gain from increased household income.

We note that the value below is lower than the £3.8bn figure previously reported for 2018 (Note 2) which represented the overall value to ALL waterway users whereas the £2.9bn figure represents the value generated by users of canals and towpaths, other waterways and waterspaces owned and/or managed by the Trust only.



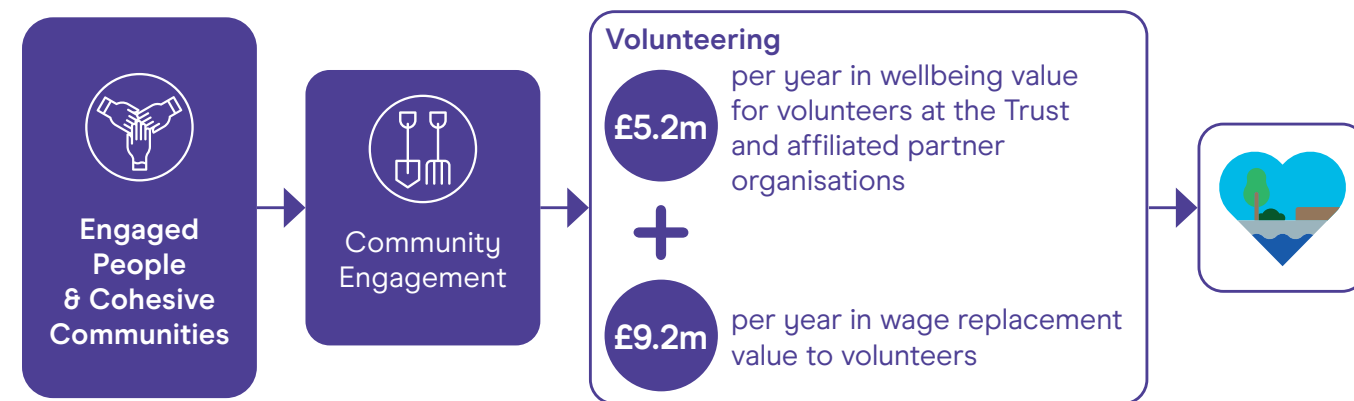
Note 2 – Assessing the wellbeing impacts of waterways usage in England and Wales (canalrivertrust.org.uk).

Volunteering

We are heavily reliant on the work of our volunteers in overseeing and maintaining our network of canals and towpaths, river navigations, docks and reservoirs and promoting their use. Volunteering opportunities range from full-time office roles to lock keepers, towpath taskforces helping to keep the canals attractive and inviting places – undertaking key tasks such as vegetation management, litter picking or repairing the towpath. People can either volunteer for us directly or via one of our partner organisations.

The monetised impacts of volunteering at the Trust are broken down into social and economic benefits. Social benefits here are represented by the subjective wellbeing value to people who volunteer with us or one of our affiliated partner organisations, estimated using the wellbeing valuation approach. In addition, we estimated a conservative proxy of the economic benefits of the volunteer projects using the wage replacement approach. This represents the benefits to the volunteer in the form of hypothetical wages for their volunteering work.

“Volunteering is widely recognised in the economic literature as a contributor to enhanced wellbeing, including improved life satisfaction, increased happiness and decreases in symptoms of depression.”
(What Works Centre for Wellbeing, 2020)



Community Rehabilitation

Case Study: Estimating the Social Value of Community Rehabilitation on Our Network of Canals

Probation and community sentences are increasingly viewed as a good alternative to short-term prison sentences as they have been generally shown to be associated with lower reoffending rates, as evidenced in the Ministry of Justice’s summary of evidence on reducing reoffending (Note 3).

We have recently partnered up with the National Probation Service (NPS) of the Ministry of Justice (MoJ) in facilitating community sentences. Part of the community sentence consists of performing unpaid work on a project that benefits the local community. We offered a range of ways in which people on probation (PoP) can do their community rehabilitation work. For example, clearing litter and fly-tipping from canals, towpath repairs, graffiti removal and vegetation management across England and Wales.

On behalf of the Trust, State of Life gathered evidence of the benefits of community rehabilitation on canals, other waterways and waterspaces for participant physical health and

mental wellbeing, as well as the associated social value in monetary terms. Data was collected by administering a survey to PoP doing their community rehabilitation work on canals managed by the Trust in Staffordshire and the West Midlands (Note 4).

Using statistical techniques such as Ordinary Least Squares (OLS) regression, the study concluded that doing community rehabilitation work on our network, as opposed to elsewhere, is associated with a statistically significant increase in life satisfaction. These improvements in wellbeing were subsequently monetised through an economic value for wellbeing (the WELLBY), as recommended in the HMT Green Book Supplementary Wellbeing Guidance (Note 5).

The estimated social benefit is **£9,550 for every** PoP working on waterways in the Staffordshire and West Midlands region. **For the 168 PoPs working on our canals in this region, the total yearly social value is estimated at £1.6 million.**



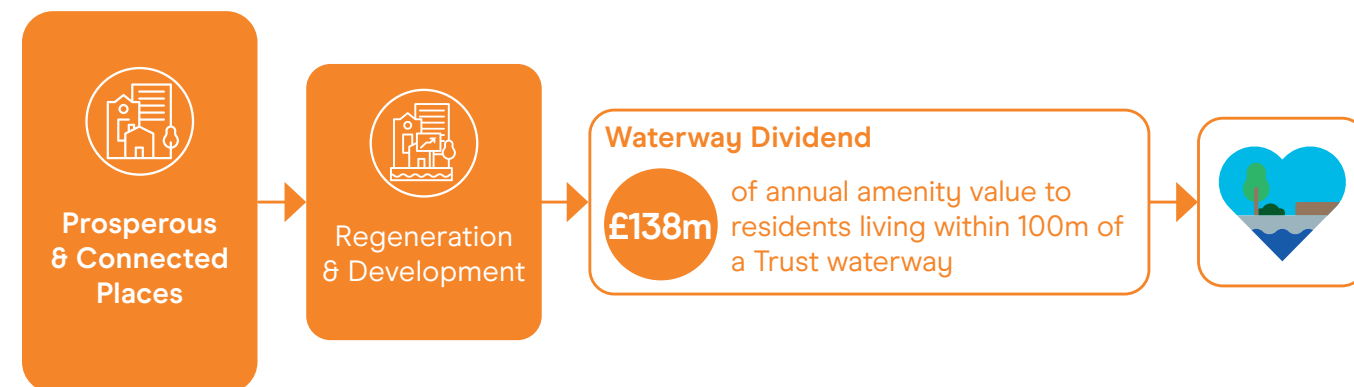
Note 3 – Transforming Rehabilitation: a summary of evidence on reducing reoffending (publishing.service.gov.uk).
 Note 4 – To act as a point of comparison, data was also collected for PoP’s undertaking their community rehabilitation work outside of Trust waterways.
 Note 5 – Wellbeing_guidance_for_appraisal_-_supplementary_Green_Book_guidance.pdf (publishing.service.gov.uk).

Waterway Dividend ('Amenity Value')

Our canals, navigable rivers and docks and the work that we do to care for these spaces contributes to the regeneration, development, and resilience of ‘place’. Regeneration and development stimulate economic benefits through construction employment and house price growth. Notably, it also contributes to wider society through an increased sense of place, a more attractive neighbourhood, and a more enjoyable experience for those living around or visiting the regenerated or newly developed canal.

In 2019, London School of Economics analysed the potential effect on house prices of proximity to canals, other waterways and waterspaces managed

by the Trust. A similar method was used by the ONS to estimate the value of green and blue space implicit in property prices in urban areas in Great Britain in the initial urban ecosystem accounts (July 2018). The valuation approach, commonly known as the ‘hedonic price method’, unfolds willingness to pay from real world choices that people have made. This methodology was used to estimate the house premium paid by those who live nearby a Trust waterway. The benefit is presented as the amenity value to residents who live within 100m of a canal or another waterway or waterspace owned or managed by the Trust with a direct view of the water or immediate access.

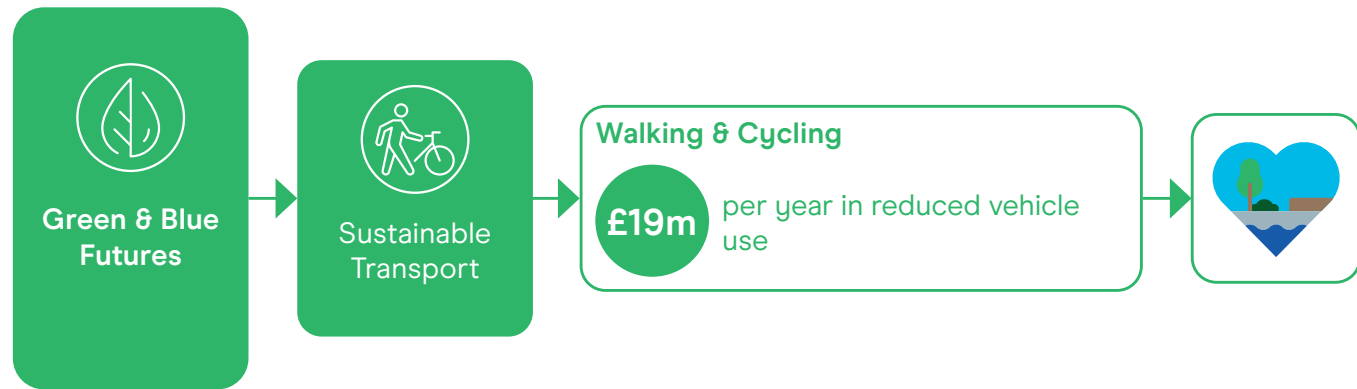


Walking and Cycling (supporting decarbonisation of transport)

This outcome area focuses on making a positive contribution to the UK's policies on reducing congestion and CO2 emissions and improving productivity, air quality, health and connectivity through walking and cycling on our network of towpaths.

We estimated the benefits generated by reduced car use (in kms saved) due to commuter walking and cycling

on our towpaths. Our research utilises an avoided damage costs method, as recommended in best-practice guidelines set out in the Department for Transport (DfT)'s Active Travel Mode Guidance. The benefits from reduced car use are captured specifically through reduced road congestion, GHG emissions, air quality and noise.

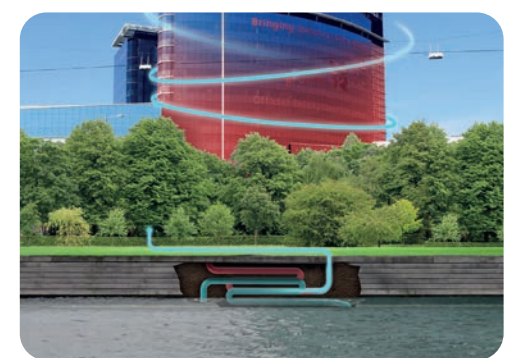
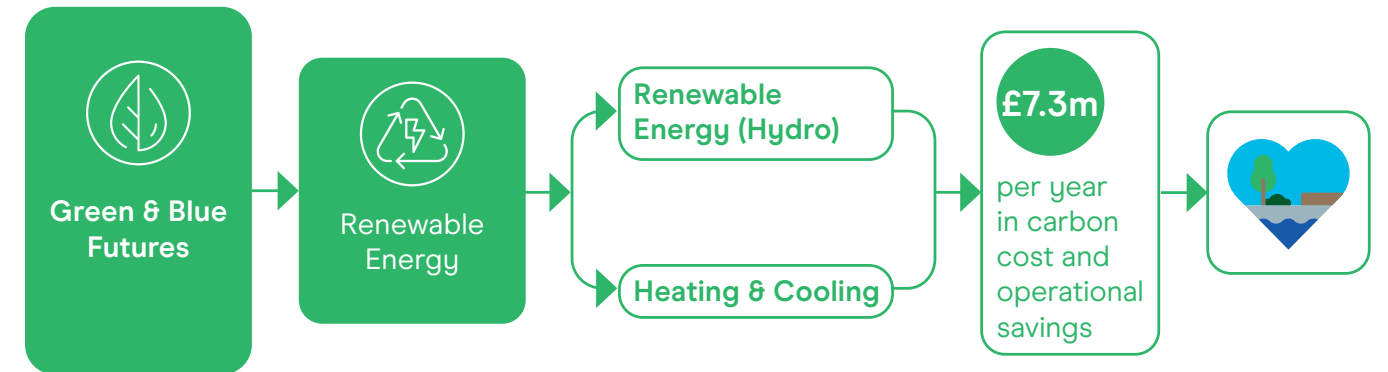


Renewable Energy

For several years, we have been developing a range of renewable energy schemes on our estate comprising renewable cooling and renewable heating (using our canals, other waterways and waterspaces) and renewable electricity (from hydroelectricity generated by our canals, other waterways and waterspaces, as well as from solar and wind sources) as set out in our Impact Report 2021-23. These schemes result in avoided carbon emissions,

operational cost savings and revenue from renewable incentive schemes.

We have evaluated our renewable energy schemes and estimated the scheme benefits illustrated below. More specifically, the monetised benefits consist of the cost of carbon saved by using the scheme-specific renewable source of energy, savings in operational costs and additional revenue from Renewable Heat Incentives (RHI) or Feed-in Tariff (FIT) schemes.



Water Resourcing

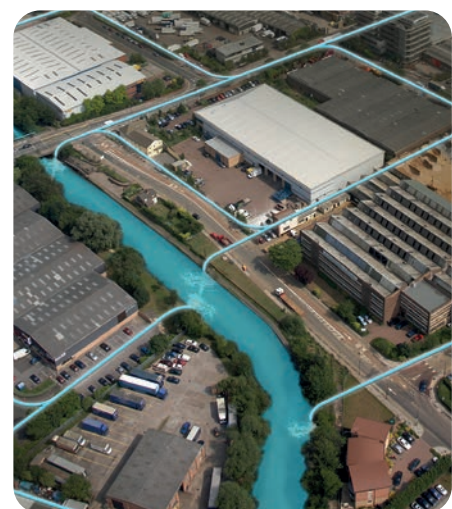
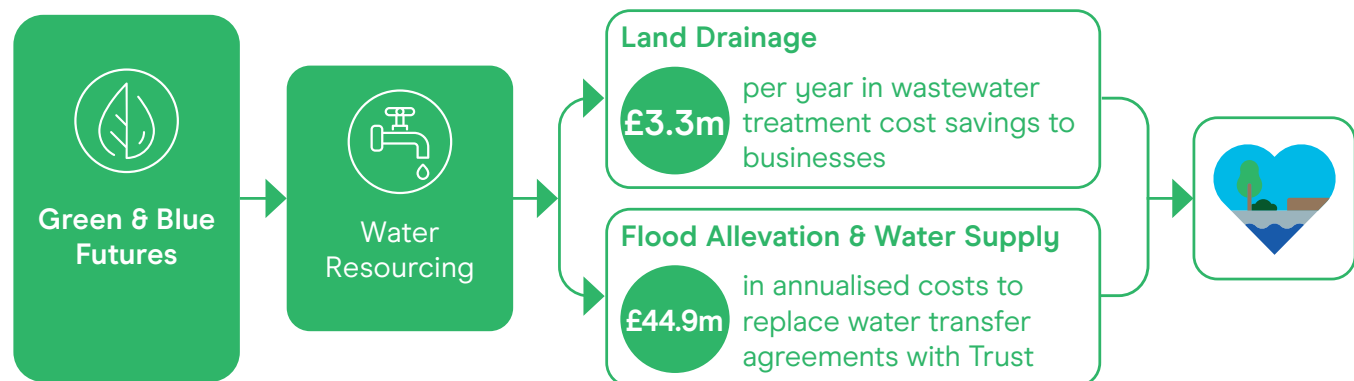
This section covers the following benefit areas associated with water resourcing:

- **Land drainage:** The benefits that canals provide in draining both urban and agricultural landscapes. Specifically, they relate to the extent to which surface water drainage into our network of canals reduces the downstream cost of treatment to water companies.
- **Water supply:** The benefits delivered by our network providing bulk raw water transfer from its assets to water companies

Regarding land drainage, we estimated wastewater treatment operational and investment savings through application of the CIRIA 'BEST' tool. These calculations were conducted for two case study sites

(Rochdale Canal and Regent's Canal) and subsequently extrapolated to estimate the aggregated benefits for the full network.

We also calculated the value of water supply through two case studies of Bristol Water and United Utilities. The case studies modelled a 'what if' scenario whereby abstraction to each company was not available and the total cost of replacing these water sources though alternative means was estimated. The figure is calculated through modelling the next best available method of water abstraction (e.g. a new reservoir or desalination) and represents the average incremental social cost of water supply. In other words, it is the cost of replacing existing water transfer agreements with the Trust.



Cultural Heritage ('everyday' and iconic)

Our network of canals and towpaths, river navigations, docks and reservoirs is among the finest examples of working industrial heritage in the world and we are proud to be custodians of these structures. We had identified gaps relating to the value associated with our urban heritage assets and so, in 2020 conducted a contingent valuation (stated preference) study focused on estimating the value 'everyday' heritage of our network with features such as arched accommodation bridges, locks, aqueducts which all contribute to a strong 'sense of place' and local identity. The following sections of our network were considered in the study:

- Aire & Calder/Calder & Hebble Navigation
- Birmingham Canal Navigations Main Line
- Regent's Canal
- Sheffield & Tinsley Canal
- Manchester, Bolton & Bury Canal

Respondents were asked their maximum willingness to pay (through a hypothetical increase in a household's council tax payment) to maintain the heritage of their local waterway in good condition and protect it from deterioration over the next decade. The values presented below relate to the value of the

everyday heritage of these urban waterways to both those who visit (site users) and those who do not visit (non-users) them.

Beyond 'everyday' heritage, our network covers several highly unique sites, some of which are part of the 'Seven Wonders of the Waterways', classified as a UNESCO World Heritage Site or given a Grade I / II* listed status. We conducted further contingent valuation research in 2022 to identify the heritage value of some of our iconic and unique heritage sites. The following six sites were valued:

- Anderton Boat Lift
- Bingley Five Rise Locks
- Caen Hill Locks
- Foxton Locks
- Pontcysyllte Aqueduct World Heritage Site
- Standedge Tunnel and Visitor Centre.

The aggregated unique heritage values presented below capture the value to both those who visit (users) and those who do not visit (non-users) these unique sites. The focus is solely on the heritage aspects of these unique sites, excluding all other non-heritage related benefits (e.g. recreational value).

We have carefully considered the question of potential double counting of benefits between the use values presented in this section and the wider subjective wellbeing values reported earlier in this chapter. However, given that the heritage valuation survey was designed to avoid potential inclusion of non-heritage benefits we have concluded that the risk of double counting is low and therefore it is acceptable to include both the use values and the subjective wellbeing values in the estimate of aggregate benefits delivered by the Trust.



Biodiversity and Environmental Stewardship

Our network of canals, river navigations, docks and reservoirs form part of the nature recovery network in UK and make a significant contribution to natural resources for public benefit, despite being artificial (or at least heavily modified). By their nature, canals incorporate a range of habitats which can be important, not only in their own right but as connecting corridors. The bankside and aquatic ecosystems within our network contribute to local and national flows of ecosystem services. The benefits associated with the management of our wildlife sites – Sites of Special Scientific Interest, also known as SSSIs, provide an indication of the value of the environmental stewardship of our activities.

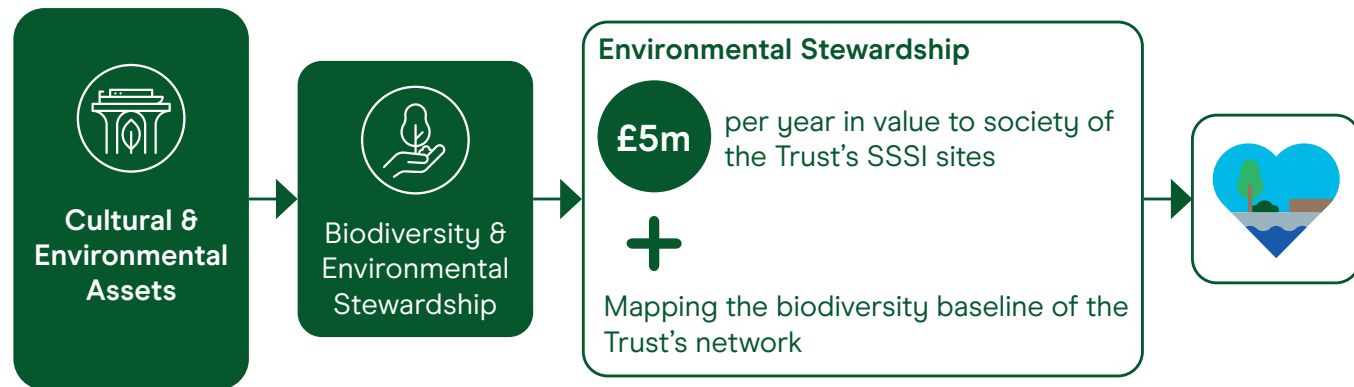
Our aggregation approach was based on a stated preference valuation study undertaken by Christie et al (2011) to value the benefits of maintaining and enhancing SSSIs. This study applied a discrete choice

experiment methodology to value the ecosystem service benefits supported by biodiversity including nature's gifts (wild foods), water regulation, climate regulation, research and education and sense of experience. Values per household per annum for scenarios relating to maintenance and improvement of SSSIs by habitat type were estimated.

We have worked with FPCR Environment & Design Consulting to survey and map the ecological footprint (forming our baseline) of our network and identify opportunities for biodiversity enhancement through the Government's mandatory biodiversity net gain requirement (Note 6) introduced into the planning system in February 2024.

This study collects a wide variety of data on habitats and the ecological systems associated with our network. For further information on this work, please refer to our Impact Report 2021-23.

We note that the value related to Environmental Stewardship below is likely to represent a significant under-estimate of the benefits in relation to the environmental stewardship activities across the Trust's network as SSSI management accounts for a small component of the work. For example, while SSSIs represent 5.4% of the Trust's network, 47% of the Trust's network has some form of ecological designation. The figure is therefore an under-estimate of value.



Note 6 – Consultation on Biodiversity Net Gain Regulations and Implementation_January2022.pdf (defra.gov.uk).

Chapter 6: Annual Economic Value – Contribution to the Economy

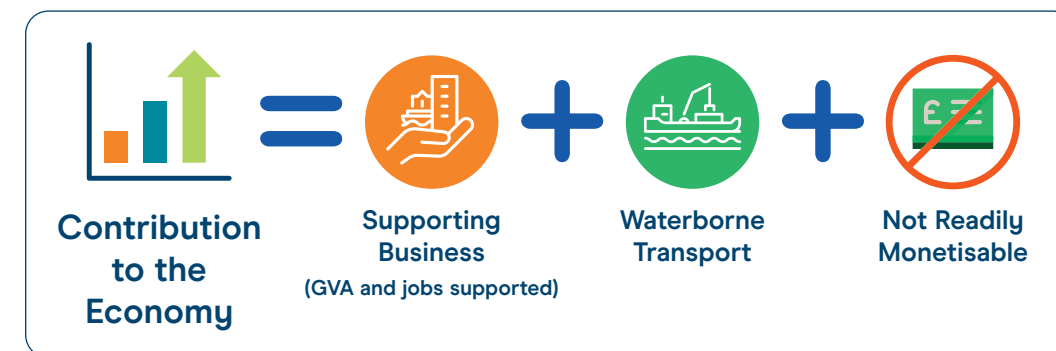
Annual Economic Value



Contribution to the Economy

Our canals and towpaths, other waterways and waterspaces make an important economic contribution to local, regional and the national economy:

- Expenditure of boating and water sports participants on activities
- Gross Value Added (GVA) and employment impacts associated with businesses that depend directly or indirectly on our network of canals and towpaths, river navigations, docks and reservoirs for their revenue streams
- The value of reducing road haulage miles through increased transport of waterborne freight
- Our canals, other waterways and waterspaces as corridors for growth, housing, regeneration & investment

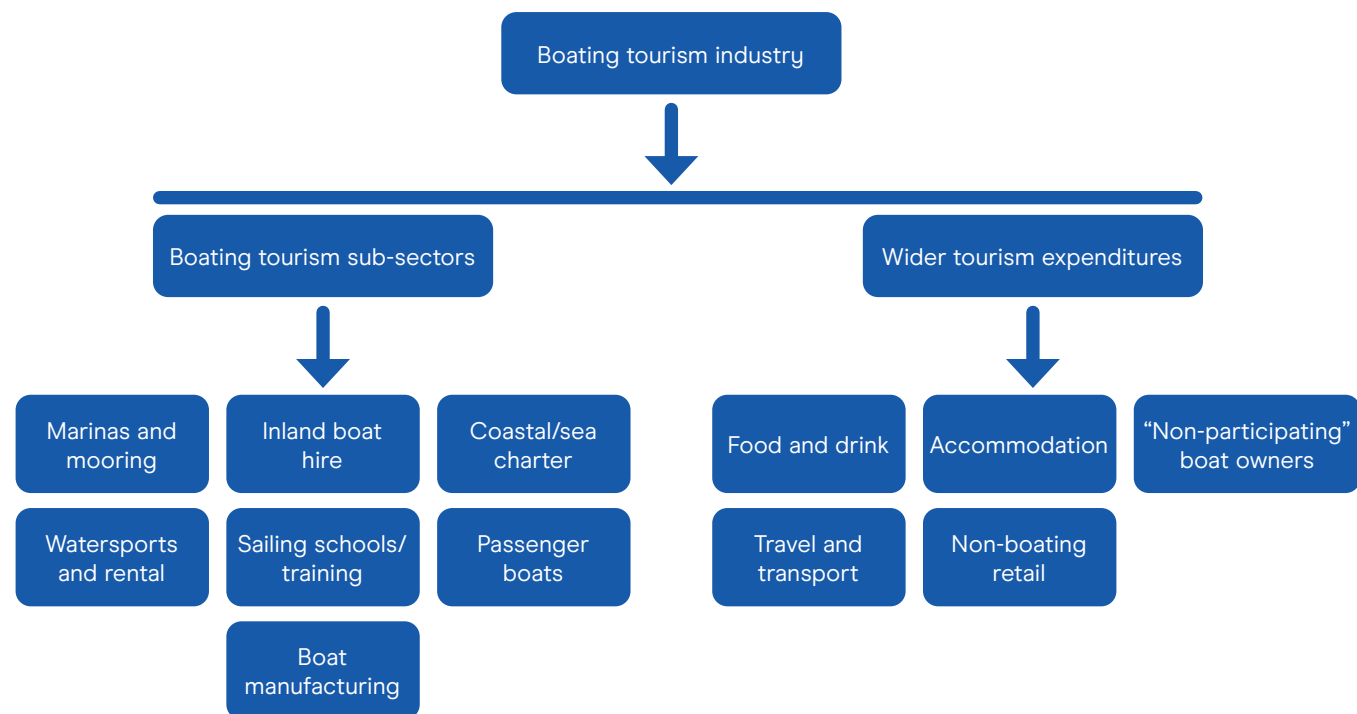


Supporting Business (GVA and jobs supported)

Boating activities make a significant contribution to the UK economy through the expenditure of boating and watersports participants. We partnered with British Marine to estimate the total economic impacts associated with businesses that depend **directly** on our inland waterways for their revenue streams, (e.g. through marina fees or income from passenger boats) and those that depend **indirectly** on our network (e.g. restaurants and pubs on the waterfront, accommodation providers or revenue from tourist shops).

As illustrated in the diagram below, these expenditures fall into two discrete categories:

- Expenditures on boating goods and services provided by the boating tourism sub-sectors (e.g. marinas and moorings, inland boat hire, watersports rental, schools/training and passenger boats, boat manufacturing).
- Wider tourism expenditures on non-boating goods and services, which occur due to participation in boating and watersports activities.



The following key economic impact indicators are used to quantify the benefits arising from these expenditures:

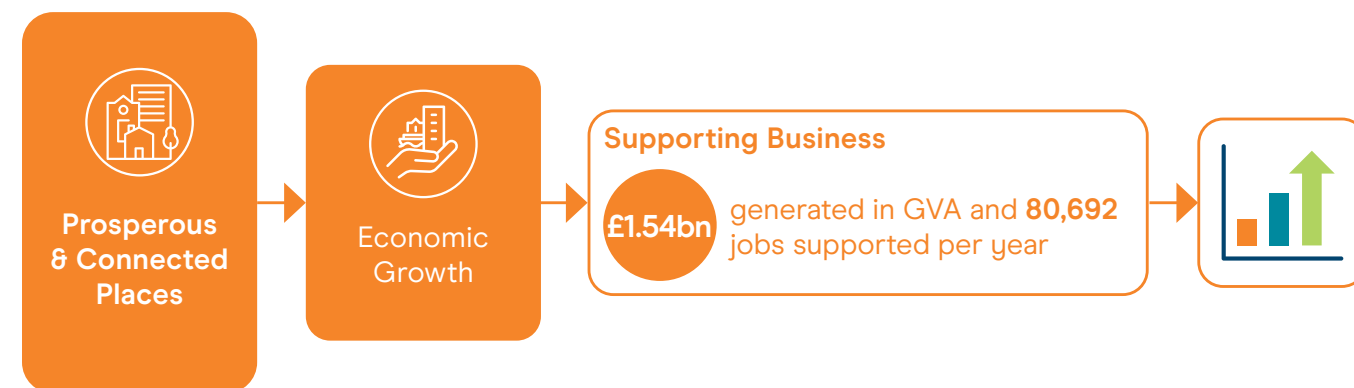
- **Gross Value Added (GVA):** the value of goods or services produced in the economy, typically used to capture contributions to Gross Domestic Product (GDP).
- **Employment (jobs supported):** Measured on a full-time-equivalent annual basis (based on proportion of a 37-hour full-time working week).

For each impact indicator, direct economic impacts were estimated by identifying the proportion of GVA/employment generated per unit of output. Indirect economic impacts were captured through multiplier effects, using publicly available UK

and Scottish Government Input-Output Analytical tables. This method of estimating economic impact through value added to the economy is supported by the Office for National Statistics (ONS).

The ONS's Input-Output analytical tables (IOATs) provide a complete picture of the flows of products (goods and services) in the economy for a given year. They detail the relationship between producers and consumers and the interdependencies of industries. The IOATs produce estimates of supply chain multipliers (e.g. Type I multipliers), which can be used to estimate the indirect effects of different products on the wider UK economy, resulting from their intermediate purchases from other sectors.

The valuation below was estimated for the years 2018/19. At the time of project inception, the latest available wave of data (2019/20) was not considered for this analysis due to the impact of COVID-19 on annual expenditure in the boating tourism industry.



Supporting Business (GVA and jobs supported)



Supporting Business

Case Study: Economic value of visitor activities at our waterway destination sites

We commissioned Simetrica-Jacobs to capture the economic benefits generated by visitor activities at our key waterway destination sites on our network.

The economic activities considered within the scope of this research were:

- 'Boating' visitor expenditures:** on-site managed boat trips. It should be noted this does not cover expenditure on short or long-term boat hire.
- 'Wider' visitor expenditures:** For example, eating and drinking in pubs/restaurants, buying food, drinks or snacks and purchasing car parking tickets.

The assessment considered the economic impact of visitor activities at the following sites:

- Albert Dock, Liverpool
- Hatton, Warwickshire
- Anderton Boat Lift, Cheshire
- Llangollen, Denbighshire
- Bradford-on-Avon, near Bath
- Pontcysyllte Aqueduct, North Wales
- Brecon and Llangynidr, Powys
- Skipton, North Yorkshire
- Caen Hill Locks, Devizes, Wiltshire
- Standedge Tunnel, West Yorkshire
- Ellesmere Port, Cheshire
- Stoke Bruerne, Northamptonshire
- Foxton Locks, Leicestershire
- Tring Reservoir, Buckinghamshire
- Gloucester Museum, Gloucestershire

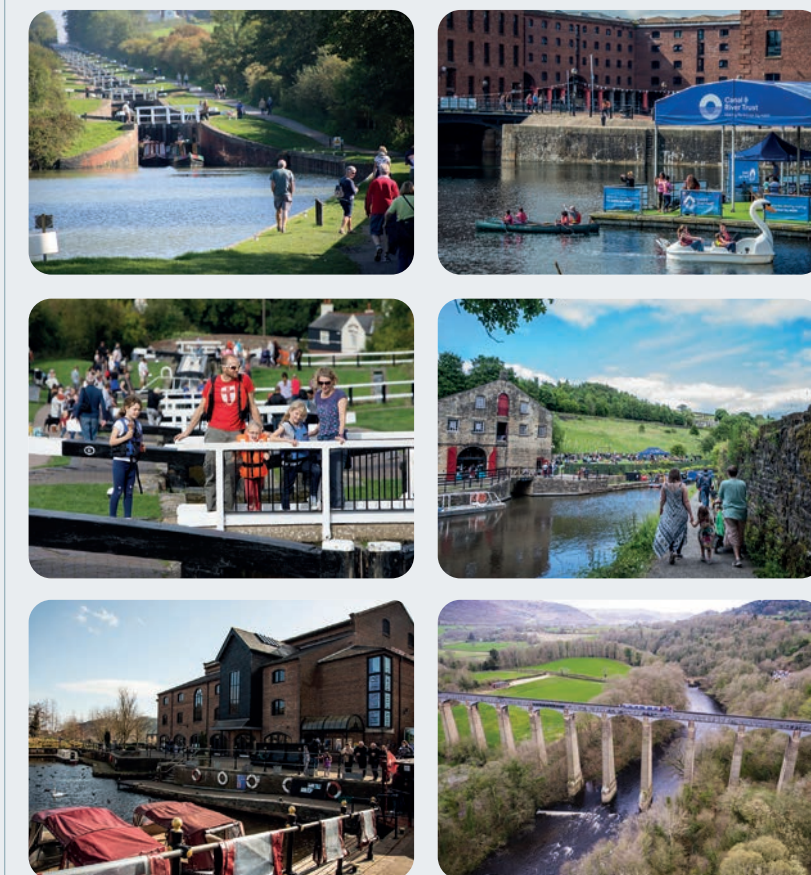
SIMETRICA | Jacobs

The aggregated GVA and full-time equivalent (FTE) jobs supported estimates (per annum, 2019 prices) for all 15 sites are presented in the table below:

Aggregate Annual Economic Contribution

Site	Economic Impact	Economic Impact Level	Estimate p.a.
Aggregated (15 sites)	GVA p.a.	Direct	£9,050,000
		Indirect	£5,040,000
		Total	£14,090,000
Aggregated (15 sites)	FTE jobs supported p.a.	Direct	530
		Indirect	270
		Total	800

Please note that the GVA and FTE figures above relate specifically to case studies conducted at the sub-regional level.



Supporting Business

Case Study: Economic impacts of our development projects

Stantec conducted a series of case studies to capture the investment, skills and employment, and tourism impacts of Trust-involved development projects. Sites selected for the study include the following:



- **Brentford Lock West, London.** A development being undertaken by Waterside Places, a joint venture between Canal & River Trust and Muse Developments.
- **Marsworth Wharf, Buckinghamshire.** Undertaken by H2O Urban.
- **Burscough Wharf, West Lancashire.** Formerly a Canal & River Trust storage yard, the site has been developed by the Trust into a mixed-use leisure development.
- **Port Loop, Birmingham.** A joint venture formed between the Trust and Birmingham City Council, with People for Places and Urban Splash as development partners.



The table below, summarises the economic impacts of four representative schemes considered within the research:

	Brentford Lock West	Marsworth Wharf	Burscough Wharf	Port Loop
Investment	£82 million	£3.2 million	£1.3 million	£151 million
Construction job years supported	1,050	25	10	1,197
Commercial, leisure & hospitality space	9,061 square metres	–	1,115 square metres	Community hub & training facility; leisure centre & swimming pool; public green space
Full time equivalent jobs supported	440 FTEs	–	55 FTEs	–

Please note that the figures above relate specifically to case studies and do not represent a national (or aggregated) value of regeneration and development for the Trust's network.

Waterborne Transport

Case Study: Economic impact of waterborne freight on our network

Waterborne freight on our network plays a key role in reducing the number of road haulage miles and contributing to the reduction in road congestion, accidents, GHG emissions, air quality and noise. The value of carrying freight on our network of canals, river navigations and docks is the diversion of large vehicles (HGVs) off the busy road network.

To demonstrate how our network contributes to easing local traffic congestion, and national and corporate emission and carbon reduction targets, we estimated the benefits of a mode shift away from road traffic using guidelines on the marginal external costs of road freight published for the Department for Transport.



Exol Pride: The Exol Barge carries 400 tonnes of lubricating oil on the canal system twice a week from Hull docks to the bulk blending facility at Rotherham. The barge capacity is equivalent to approximately 16 lorry loads, taking c.720 lorries/year off the roads. **The cost benefit of the reduction in Heavy Goods Vehicle (HGV) traffic entering the UK road network due to the shift to waterborne transport totals over £4,500 per year for this route.**



Knostrop: The Knostrop operation carries 500 tonnes of marine dredged aggregate on the canal system from Goole to Knostrop wharf in Leeds, totalling some 50,000 tonnes per annum. The barge capacity is equivalent to around 18 lorry loads, so this solution takes c.1,500 lorries/year off the roads. **Monetised benefits total around £4,200 per year for this route.**



Mainmast barges: The two Hull-based Mainstay tank barges have been operating on Trust controlled inland waterways for 20 years now, carrying between 350 and 500 tonnes of rape seed oil each trip totalling over 2,500 tonnes a week. An estimated 130,000 tonnes were transported last year, equivalent to taking c.9,000 HGV journeys per year off the city's roads. **The cost benefit of reductions in HGV traffic entering the road network due to the modal shift totals over £3,800 per year for this route.**

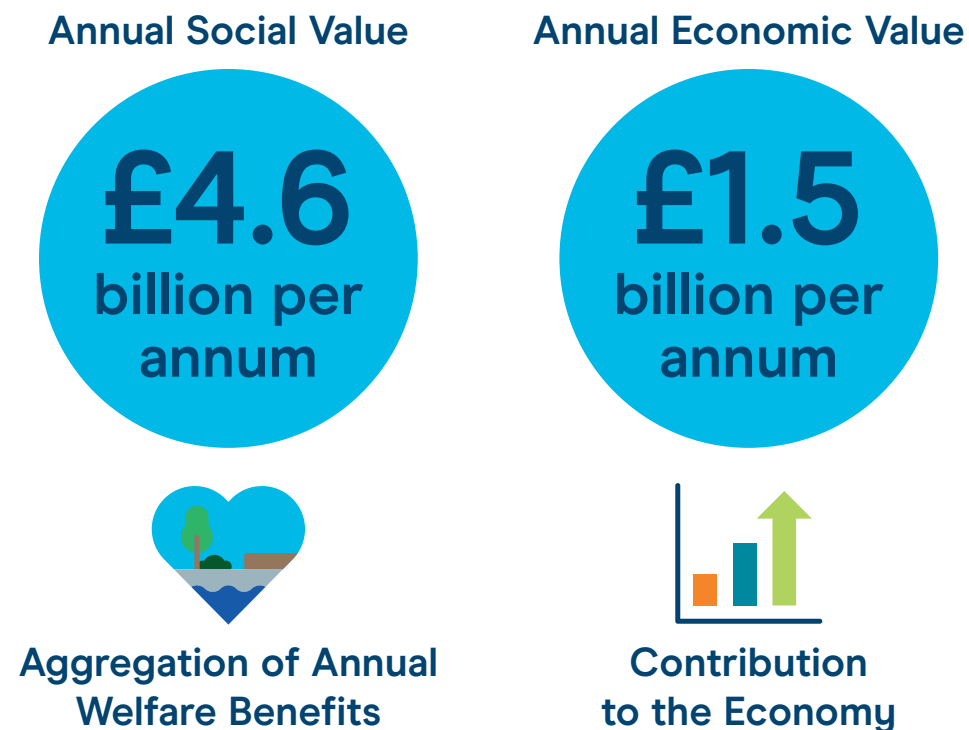


River Severn: The Severn operation carries 700 tonnes of marine dredged aggregate daily on the canal system from Ryall Quarry to Ripple wharf (concrete manufacturing site), totalling some 287,000 tonnes per annum. The barge capacity of 350 tonnes is equivalent to around 12.5 lorry loads and c.10,250 lorries/year off the roads. **Monetised benefits total around £5,433 per year for this route.**

Please note that the figures above relate specifically to case studies at the sub-regional level and do not represent the national (or aggregated) value of waterborne transport for the Trust's network.

Chapter 7: Aggregated Social and Economic Value of our Network

To summarise, the aggregated Social and Economic Value of our network of canals and towpaths, river navigations, docks and reservoirs is illustrated in the graphic below.



The table below presents a breakdown of the key findings in terms of an overall aggregation of the annual welfare benefits delivered by our network of canals, other waterways and waterspaces that we own and manage and the activities and interventions that we undertake.

	Welfare benefits	Valuation year (in prices) (Note 7)
Subjective Wellbeing		
Individual benefits associated with Trust waterways usage	£2.9bn	2020
Physical Exercise		
Exchequer (NHS savings)	£1.1bn	2021
Volunteering		
Individual – Trust and partners volunteers (subjective wellbeing)	£5.2m	2021
Trust and partner organisation volunteers (economic benefits)	£9.2m	2021
Amenity Value		
Household (amenity value of living in close proximity to waterways)	£138.0m	2019
Decarbonisation Of Transport		
Individual (congestion, accidents, GHG emissions, air quality and noise)	£19.0m	2021
Renewable Energy		
Avoided carbon emissions, operational cost savings and revenue from renewable incentive schemes	£7.3m	2021
Water Resourcing		
Land drainage (Annual wastewater benefits – avoided operational and infrastructure costs to water companies)	£3.3m	2020
Water Supply (annualised costs of replacing water supply)	£44.9m	2020
Cultural Heritage		
‘Everyday’ urban canal heritage (‘households use value’)	£13.6m	2020
‘Everyday’ urban canal heritage (‘households non-use value’)	£93.4m	2020
Unique canal heritage (‘households use value’)	£4.0m	2022
Unique canal heritage (‘households non-use value’)	£211.0m	2022
Biodiversity and Environmental Stewardship		
Environmental stewardship benefits of Trust SSSIs (Household values, England only)	£5.0m	2020
Total Annual Welfare Benefits	£4.6 billion	

Note 7 – Some studies were conducted in an earlier year (e.g. our subjective wellbeing research was commissioned in 2018) but have been updated to reflect more recent prices.

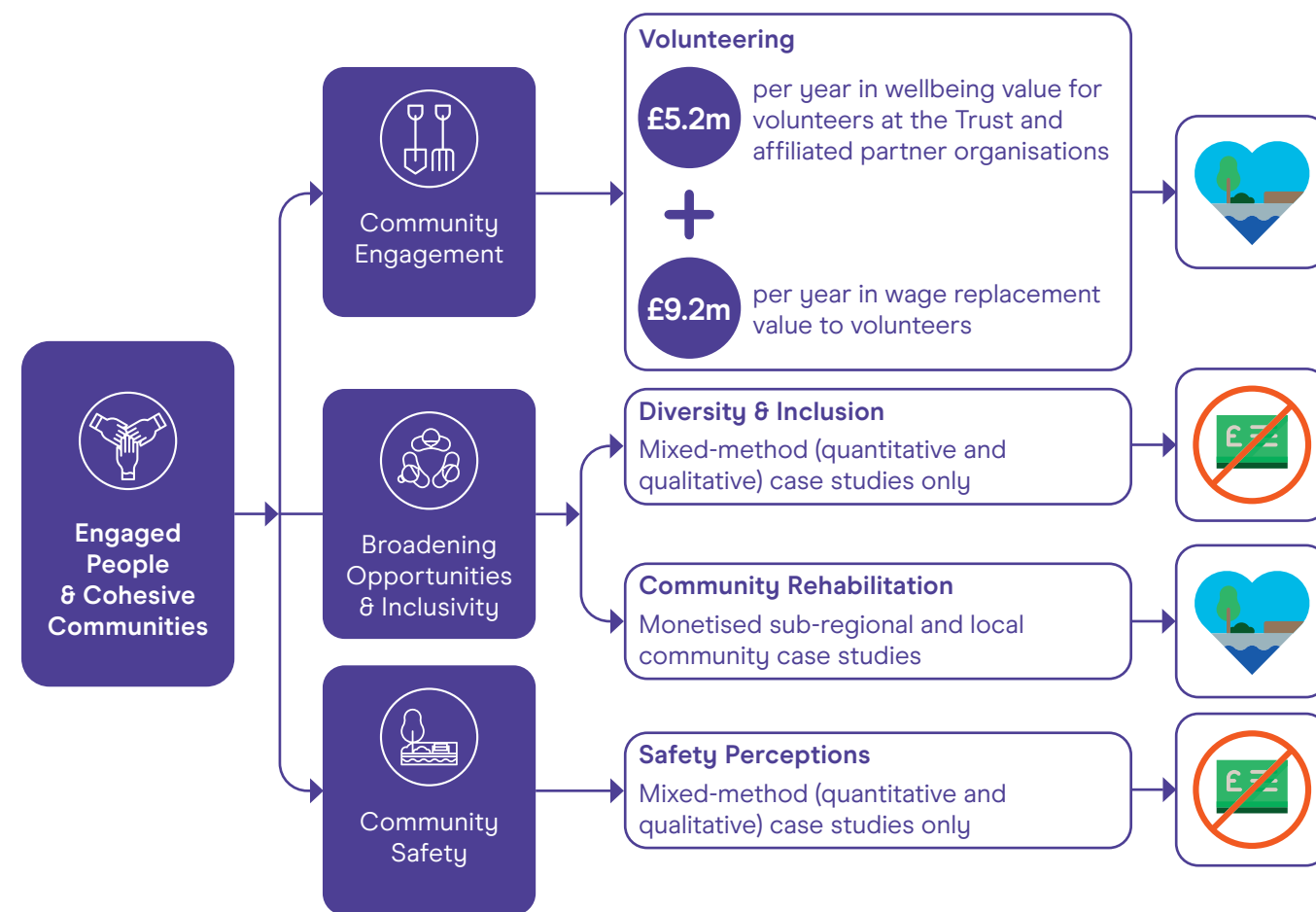
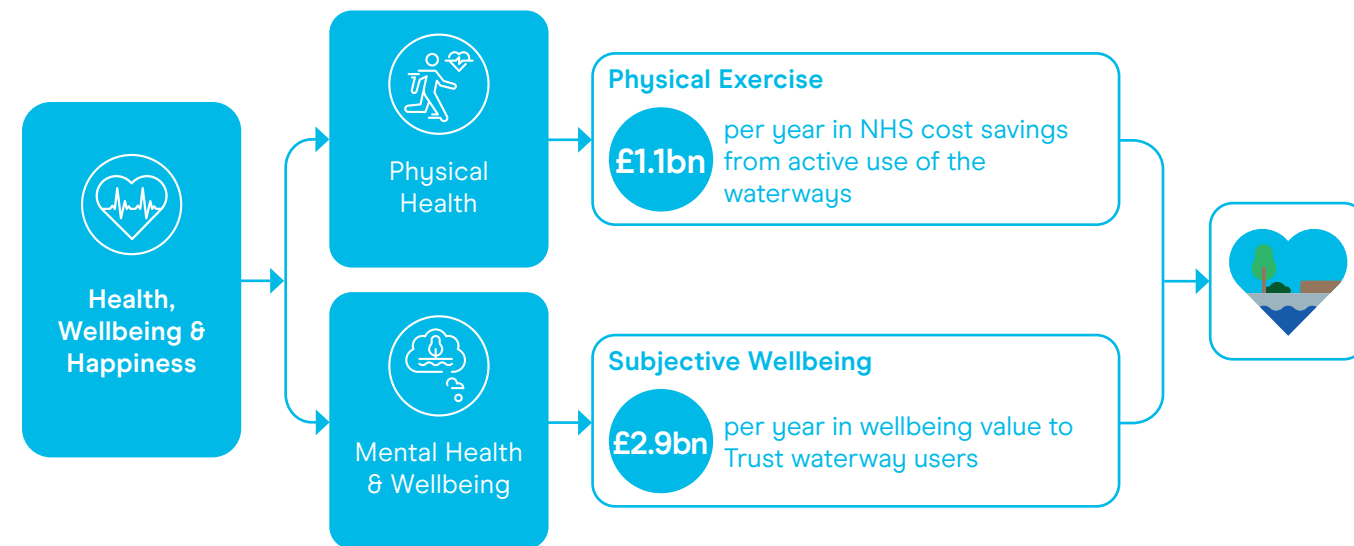
A breakdown of the contribution to the economy benefits are presented below. These are represented by the total levels of GVA and employment (FTE jobs) generated by our network through boating tourism and wider tourism expenditure:

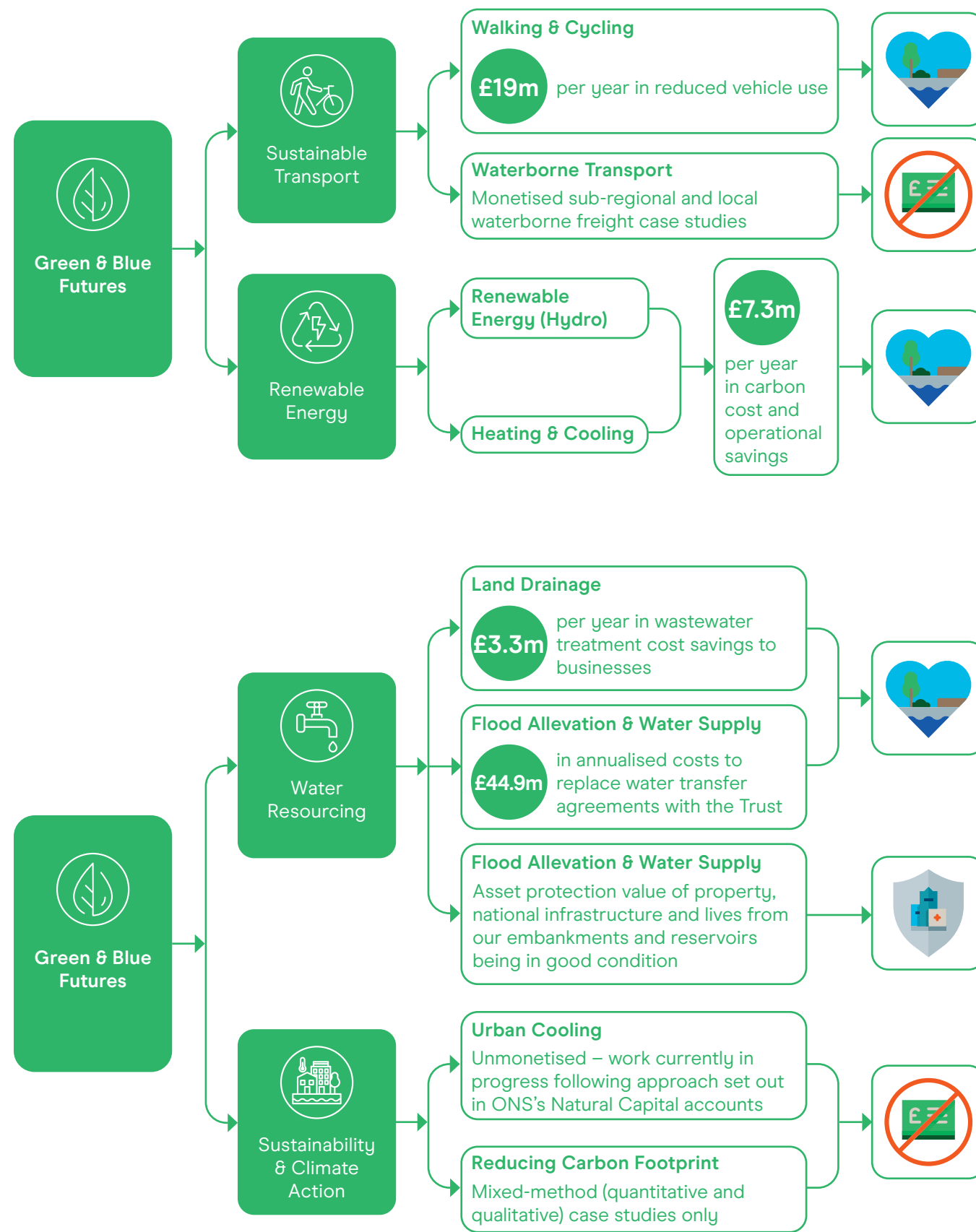
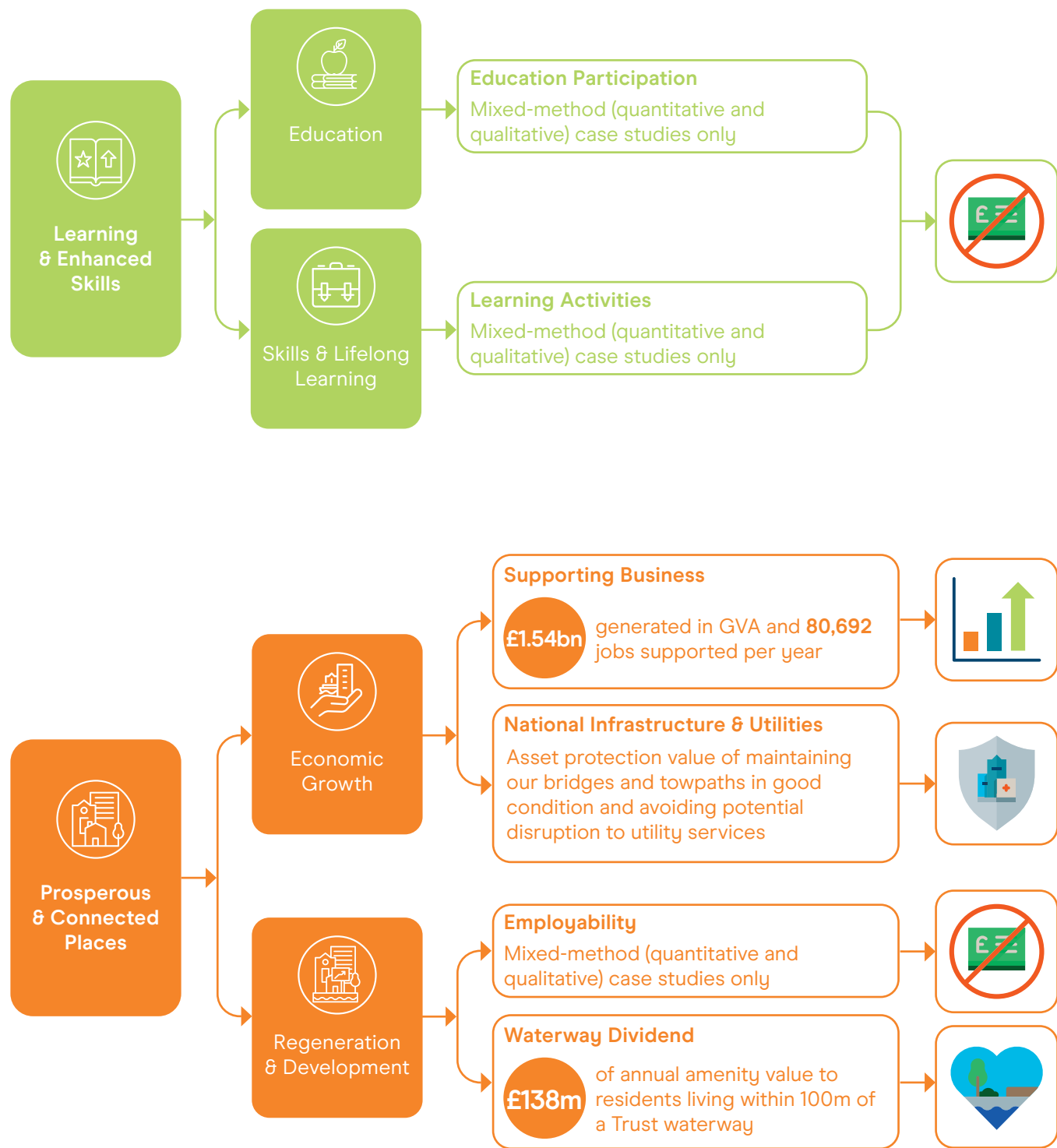
	Contribution to the economy	Valuation year
Total GVA generated by boating tourism (£ million)	£282 million	2018/19
Total employment generated by boating tourism (FTE jobs)	7,612 jobs	
Total GVA generated by wider tourism expenditure (£ billion)	£1.254 billion	
Total employment generated by wider tourism expenditure (FTE jobs)	73,080 jobs	
Total (£ billion)	£1.536 billion	
Total employment generated (FTE jobs)	80,692 jobs	

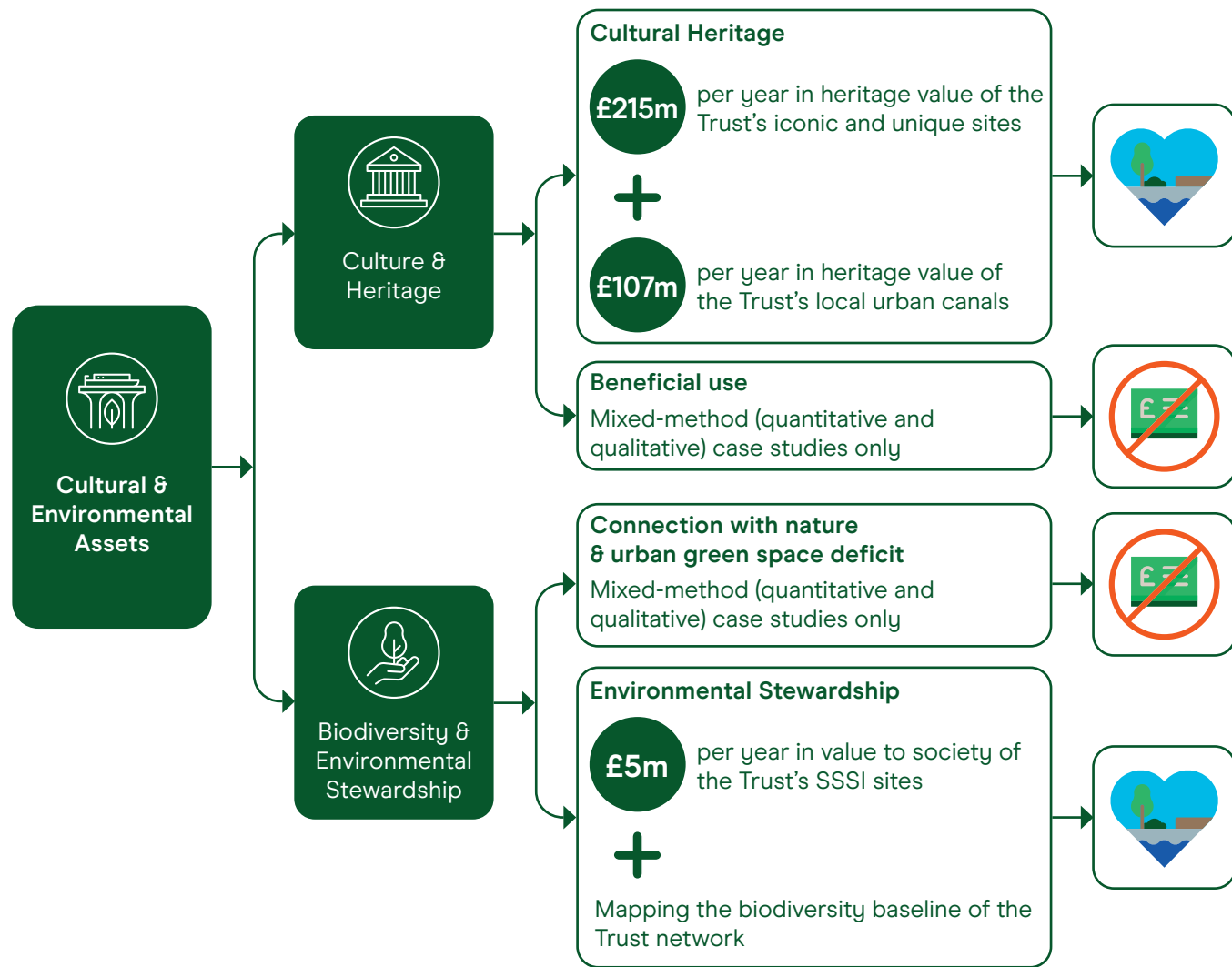


We provide a visual overview of all indicators across each of the six domains listed in the OMF. Beyond the monetised benefits presented in Chapters 5-6, the visual also illustrates indicators that are, as of now, un-monetised. For further detail on our un-monetised and qualitative research, please refer to our Impact Report 2021-23.

Aggregate benefits to society and the economy







Chapter 8: Asset Protection Value Benefits offered by our Waterway Infrastructure

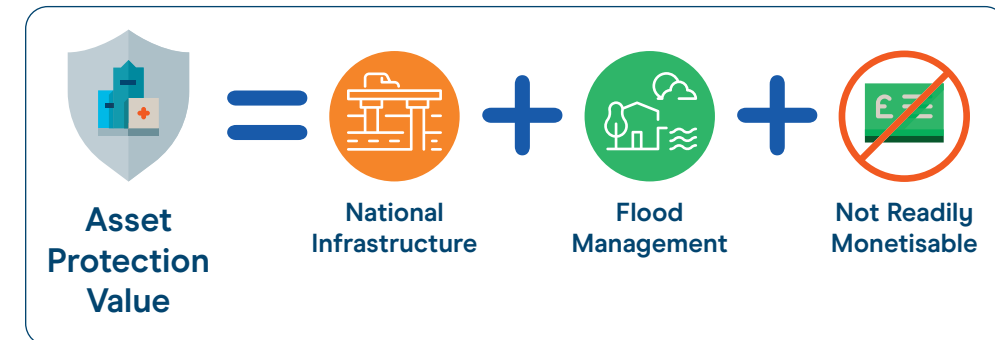
Asset Protection Value



Asset Protection Value Benefits

The asset protection benefits to society, based on maintaining our assets in good condition, include:

- Hosting third party infrastructure within the towpaths and public bridge crossings that we own and manage
- Protecting households, businesses, and national infrastructure (canal embankments and reservoirs) through flood management



HOSTING			PROTECTING			
Public Road bridges	Towpaths	Embankment	Reservoir	Embankment	Reservoir	
1,136 electricity cables	1,576km electricity cables	840 sub stations protected	387 sub stations protected	370,294 people protected	193,663 people protected	
422 water mains and 106 sewers		128 schools protected	34 schools protected	31,881 businesses protected		
374 gas mains	1,302km gas mains	Railways protected at 570 locations	Railways protected at 55 locations	122,428 properties protected	80,693 properties protected	
1,806 telecom cables	659km telecom cables	Motorways protected at 114 locations	Motorways protected at 18 locations			

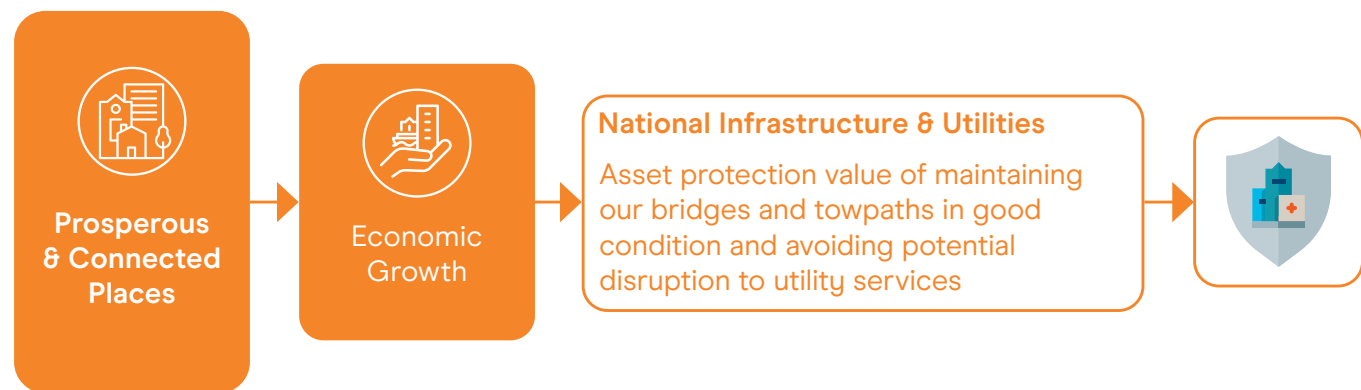
National Infrastructure

The Trust owns and maintains just under 3,000 bridges in England and Wales. 871 are public road bridges carrying electricity, gas, water, and telecommunications infrastructure. The work that we do to maintain these bridges and towpaths prevents these assets, and consequently the utilities, from being disrupted or put out of action and therefore avoids the costs of any disruption (Note 8). The potential cost of disruptions can be quantified in terms of costs to households and businesses incurred from disruptions and repair costs.

In 2021, we assessed the physical and economic importance of third-party utility infrastructure passing over road bridges owned and maintained by the Trust and the related infrastructure buried under our towpaths. A mixed

method (contingent valuation and economic cost) approach was developed to estimate the costs to households and businesses through supply interruptions linked to our bridges and supply outages within utility services. The impacts were modelled as such:

- **Households:** Willingness to pay (WTP) to avoid disruptions to services (stated preference methods).
- **Businesses:** WTP to avoid disruptions to services (stated preference methods).
- **Repair costs:** costs to utility providers of permanently restoring any lost connections (economic costs).



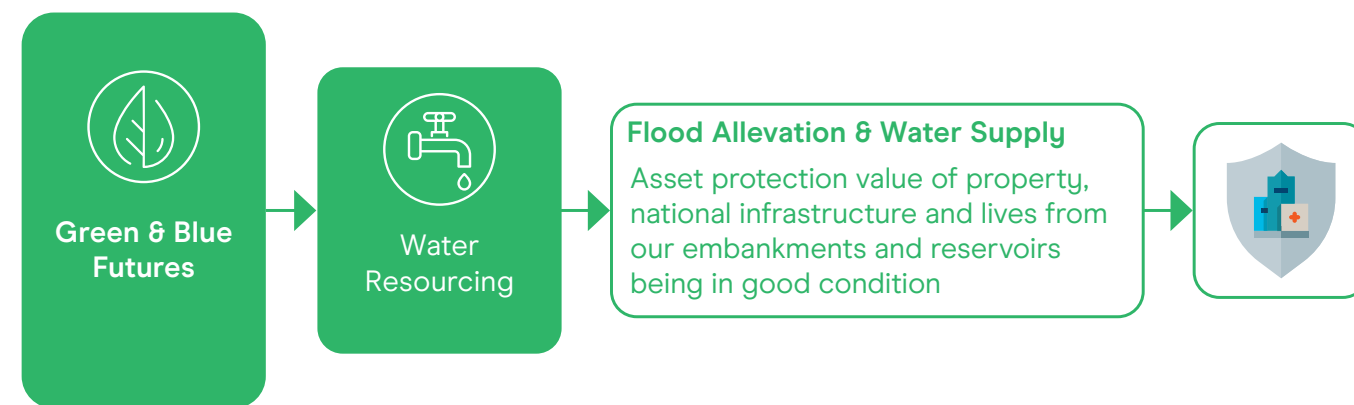
Note 8 – This valuation is based on total potential costs at risk if all bridges and towpaths are not maintained, rather than a high annual probability of failure.

Flood Management

Within the OMF's water resourcing sub-domain, a core benefit is captured by flood management, specifically the protection benefits from keeping embankments and reservoirs in good condition. These can broadly be interpreted as the value of property and lives protected from inundation by maintaining the Trust's network of canal embankments and reservoir assets.

We valued the property and lives protected from inundation by our network of canal embankments and

reservoir assets by undertaking site-specific modelling in 551 embankments. These were extrapolated to the entire canal network based on asset condition grade, and estimated damages and utilised Trust data on damages for 71 large raised reservoirs. Using the Multi-Coloured Manual (flood appraisal manual), we used a damage cost avoidance method to estimate the asset protection value from our embankments and reservoirs being in good condition.



The table below summarises the range of asset protection values associated with third party infrastructure through the use of our bridges and towpaths and flood management through the protection of property and people from our reservoirs and embankments.

	Estimated costs at risk	Valuation year
Third Party Infrastructure		
Bridges	£1.08bn	2021
Linear assets (towpaths)	£0.79bn	
Total 'cost at risk'	£1.87 billion	
Flood Management		
Flood Management – Embankments	Total 'cost at risk': £27.5bn property, £1.5bn national infrastructure and £0.15bn risk of life	2020
Flood Management – Reservoirs	Total 'cost at risk': £3.6bn property, £0.8bn national infrastructure and £6.7bn risk of life	
Total 'cost at risk'	£40.25 billion	
Total cost 'at risk' – third party infrastructure and flood management	£42.1 billion	

Chapter 9: Looking to the Future – Our Next Steps

Significant progress in understanding the value of our network of canals and towpaths, other waterways and waterspaces

This technical report sets out the detailed findings from our work in understanding the social value and economic impact of our network of canals and towpaths, river navigations, docks and reservoirs by calculating the aggregate benefits delivered to society and the economy.

It highlights the significant resources that the Trust has invested in understanding the multiple benefits delivered by our network, our activities and interventions and the associated social value. All of our research on capturing social and economic value has been taken forward by carefully defining and applying appropriate valuation techniques that are fully aligned with HM Treasury Green Book.

Of particular note has been the ground-breaking research on the subjective wellbeing benefits associated with use of our network of canals and towpaths, other waterways and waterspaces, building on the increasing awareness of the importance of wellbeing as a lens through which to view policy. We have worked with State of Life to capture the subjective wellbeing benefits of community rehabilitation work on network at the sub-regional and local level, using the recommended

WELLBY valuation approach as set out in the HM Treasury Green Book Supplementary Guide on Wellbeing (2021).

This report focuses on the annual welfare benefits that are quantifiable and monetisable. However, there are a range of public benefits that are less readily monetisable or even, in some cases, suitably quantifiable. For example, the values for environmental stewardship and biodiversity should be seen as only very partial and do not take account of the important role of our network in providing connectivity to habitats or the difficulty in valuing biodiversity. For those benefits that are not readily monetisable, we have developed a set of mixed-method (quantitative and qualitative) case studies to demonstrate the full breadth of benefits being delivered by our waterways as part of our Impact Report 2021-23.

Developing our 2035 Strategy – Keeping our canals open and alive

Our purpose is to achieve a sustainable future for our network of canals, keeping them open and alive, making them resilient and safe; and maximising their value for people, nature and the economy.

Following the Government announcement in July 2023 regarding the reduction in our future funding, combined with the growing impact of the climate on an ageing network, we have undertaken a strategic review. The purpose of this review is to redefine how we will work towards achieving our purpose, with our canals thriving, as living waterways that transform places and enrich lives.

To fully realise the potential benefits to society from our network of canals and towpaths, river navigations, docks and reservoirs, our strategic direction responds to four overarching external drivers – delivering societal outcomes to help address some of the most significant challenges our nation faces over the next ten years and beyond.

To secure the future and fully unlock the social, economic and environmental impact potential of the network, it is imperative that we attract new funding and investment,

develop new partnerships and build upon our existing relationships and supporter base. This includes UK and Welsh Government and their sponsored bodies, Local Government, statutory funders, lotteries, philanthropy and corporate partners, as well as local businesses and groups. We must collaborate and work with national, regional and local partners, empower our communities and explore opportunities 'to do things differently'.

We are committed to managing our nationally important infrastructure effectively and efficiently which includes engineering structures, water, environment and heritage. These provide the pathways to societal outcomes. We will strive to deliver a consistently good and rewarding customer and visitor experience, attracting more satisfied users, on and by the water.

Key Drivers of Impact



Resilience & Security

Water Resourcing & Security

Drainage & Flood Protection



Nature

Biodiversity & Nature Recovery Network

Connecting to Nature



Health & Wellbeing

Active Lives

Improving Mental Wellbeing



Place & Prosperity

Connected Communities & Places

Sustainable Development, Growth & Living

New policy directions to inform our research priorities

New developments in methodology and policy thinking provide an important longer-term direction of travel for our research priorities.

It is important to ensure that we are aligned with the latest government guidelines and reporting impacts across the following areas in particular:

- **Biodiversity Net Gain (Defra)**
- **Natural Capital Accounting (ONS and Defra)**
- **Culture and Heritage Capital Programme (DCMS)**

Ecological Baseline and Biodiversity Net Gain

Our ESG commitment under the UN Sustainable development goal 15 ‘Life on water’ (as set out in our Annual Report 2021/22):

Contribute to nature recovery through the carrying out of a biodiversity footprint survey of the Trust’s network by the end of 2023 to coincide with the coming into force of the Biodiversity Net Gain Regime

Our ecological footprint mapping project with FPCR Environment and Design Consulting has modelled the ecological baseline for the habitats present on network and estate, and their condition, through a combination of existing data sources, statistical modelling, and circa 1000 ecological surveys. This enables us to better understand the value of habitats on our network and where the best opportunities to undertake habitat enhancements are likely to be.

All planning permissions for major developments granted in England (with a few exemptions) must deliver at least 10% Biodiversity Net Gain (BNG) from 12 February 2024. This requirement will be extended to most smaller developments in Spring 2024. BNG is an approach to development, and land management, which aims to leave the natural environment in a measurably better state than it was beforehand. BNG delivers measurable improvements for biodiversity by creating or enhancing habitats in association with development. This includes delivering enhancements to canals and rivers where development sites include land within 10 metres of either side of the watercourse. We are carefully considering how this policy will affect our own future planning applications as well as opportunities to provide fundable project sites for BNG.

Natural Capital Accounting

A significant development has been the increasing UK policy importance given to natural capital since 2011 and to the application of natural capital accounting. Natural capital refers to natural assets that have value to society, such as forests, fisheries, rivers, biodiversity, land and minerals that provide flows of ‘ecosystem’ services. Natural capital frameworks can be applied both to policy appraisal and accounting. As

highlighted by Defra (Note 9): “Natural capital accounting is the attempt to bring a systematic, standardised and repeatable framework to recording information on natural capital and the services it provides, whether or not those services have a market value”. Natural capital accounts have been in development at the national level in the UK by the Office for National Statistics since 2011. At the organisation level, the Natural Capital Committee’s development of Corporate Natural Capital Accounting (CNCA) provides a methodology for potential use.

The core outcome of this work is to develop a set of natural capital accounts for the Trust to monitor changes in its natural capital over time and help to inform resourcing and management decisions. This will build on the substantial evidence base on the value of waterways developed by the Trust to date. These approaches can be applied at many different levels and for different policy applications. Therefore, a crucial first step is to consider the purpose and role of a natural capital account as this will shape the recommended approach to be taken.

It is important to note that the evidence contained within this technical report follows HM Treasury Green Book principles which are relevant for use in an accounting context and can feed into the future development of natural capital accounts.

Culture and Heritage Capital

The developments in natural capital have more recently prompted the capitals approach to be explored in the context of culture and heritage, as set out in Valuing Culture and Heritage Capital: A framework towards informing decision making (DCMS, 2021) (Note 10). This highlighted the need to understand what types of services and benefits flow from a Culture and Heritage Capital (CHC) framework and the benefits of adopting a capitals framework. A recent study, Scoping Culture and Heritage Capital Report Technical Report (Note 11) concluded that the introduction of the CHC framework presents significant opportunities from the point of view of valuing the arts, culture and heritage, as well as policy decision-making. However, it also indicated that developing and implementing this framework requires sustained research, methods refinement, and capacity-building.

We are committed to working with DCMS and other relevant partners to explore the application of cultural and heritage capital, building on our recent work to value the urban and unique heritage of our network. This new area of research will also be important in better understanding the links and overlaps between natural capital and culture and heritage capital to ensure that both play their part in better management and enhancement of our fragile and precious network of canals and towpaths, river navigations, docks and reservoirs for the benefit of society for now and in the future.

Note 9 – Enabling a Natural Capital Approach guidance – GOV.UK (www.gov.uk).

Note 10 – Valuing Culture and Heritage Capital: A framework towards informing decision making – GOV.UK (www.gov.uk).

Note 11 – UAL et al, October 2022, Funded by DCMS, UKRI and AHRC.



Our Challenges Ahead...



...Potential to Make A Real Difference



Opportunities to partner with us

If you would like to find out more about our work and how you can support us to continue to make a difference to people, places and nature, please get in touch.

#KeepCanalsAlive



Canal & River Trust

Making life better by water

   canalrivertrust

Enjoy • Take Action • Volunteer • Donate
canalrivertrust.org.uk

We're the UK's largest canals charity, looking after a 2,000 mile network of canals, river navigations, docks and reservoirs across England and Wales.

Together, let's make sure they continue to be here for tomorrow and beyond.

A network of more than 2,000 miles of stunning canals and navigable rivers runs through our landscapes. From our countryside to our bustling cities, canals are a place for everyone to connect with nature and our past.

However you use them, we all deserve open spaces where we can feel happier and healthier, and where wildlife can thrive. But the future of the nation's canals, other inland waterways and waterspaces and the habitat they support is threatened by changing temperatures, unpredictable rainfall and the tests of time.

Together, we can make sure they continue to be here for tomorrow and beyond.

- Become a Friend
- Support an appeal
- Leave a gift in your Will
- Speak up for canals
- Volunteer with us
- Partner and work with us

Join us and let's #KeepCanalsAlive

SUPPORT US



 SCAN ME