

Canal &
River Trust

Waterways & Wellbeing

Building the Evidence Base
First Outcomes Report

September 2017

Waterways & Wellbeing

Building the Evidence Base

First Outcomes Report, September 2017

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Foreword

Whilst our amazing inland waterway network is over 200 years old, it is only in recent times that we have started to appreciate the broad social, economic and environmental impact that it has on the people using it and the communities living alongside it.

This report brings together the work of the past few years as we seek to capture more rigorously the positive outcomes that the Trust's canals and river navigations deliver, making a material difference to people's lives. Our contribution to personal and community wellbeing may seem obvious to anyone who has visited and soaked up the tranquillity of the waterways, and recognised their connection to the millions of people living within such a short distance of them; but it is only by developing a measurement framework to robustly capture and demonstrate the benefit that we will be able to prove it authoritatively.

The Canal & River Trust is committed to delivering the greatest benefit that we can to the nations we serve (England & Wales), and we want to gauge our progress against a consistent and comprehensive set of measures that reflect both the scale of our national impact and the range of outcomes we can support.

This report is just the start – it provides the technical foundation from which our future reports will build – so we can engage other policymakers and funding partners active in this field, to encourage dialogue and be transparent about our work, to invite scrutiny and feedback. By next year (and beyond) we will be able to report the outcomes in richer detail, for the wider public audience to share.

I'd like to thank all of those who have helped us get this far – all those who generously give their time to participate in the high calibre External Reference Group that guides our work, and others across academia, the third sector and in and around Government who have given their input, to ensure it aligns with best practice.

With the publication of this report, it feels like we have established a base camp from which we can climb upwards to start to understand and share the outcomes generated by our waterways, a legacy we can all enjoy.



Richard Parry
Chief Executive,
Canal & River Trust



Leicester River Festival, River Soar

Over the five years that I was a Trustee of the Canal & River Trust, I was struck by how our inland waterways touched so many aspects of our society and our economy: physical and mental health, transport, leisure, local regeneration, volunteering, energy production and more. The challenge for the Trust is how to measure both the innate impact of its waterways, and the difference that the Trust itself makes through its activities.

Through better measurement, the Trust will be able to demonstrate to its funders and partners the importance of well-maintained waterways – and it will also be able to improve its effectiveness by understanding which of its interventions make the biggest difference.

For the past three years, the Trust has been developing its Outcome Measurements Framework to bring together a selection of key indicators to measure its impact on wellbeing. It has also started to put into place the mechanisms to now start the measuring. This first public report shows the work so far.

Many organisations are working to improve the measurement of their impact on wellbeing, and through the External Reference Group (ERG), composed of experts from Government and other sectors, the Trust is drawing on and contributing to the body of knowledge on how to do this effectively. This first report is the start of a conversation – to share what has been done so far, and to invite contributions and ideas from stakeholders.



Tom Franklin
CEO Citizenship Foundation
and ERG Chair

Executive summary

Purpose of the report

This is the first Outcomes Report to be published by the Canal & River Trust (the Trust).

The Trust acknowledges that it cannot depend solely on storytelling but must be able to demonstrate its impact more persuasively through an evidence base, to prove and validate the difference it is making to individuals, communities and society. The Trust's ambition is for waterways to make a difference locally, to be inclusive and relevant. There is significant potential and opportunity to achieve this ambition and for waterways to contribute to personal, community and societal wellbeing.

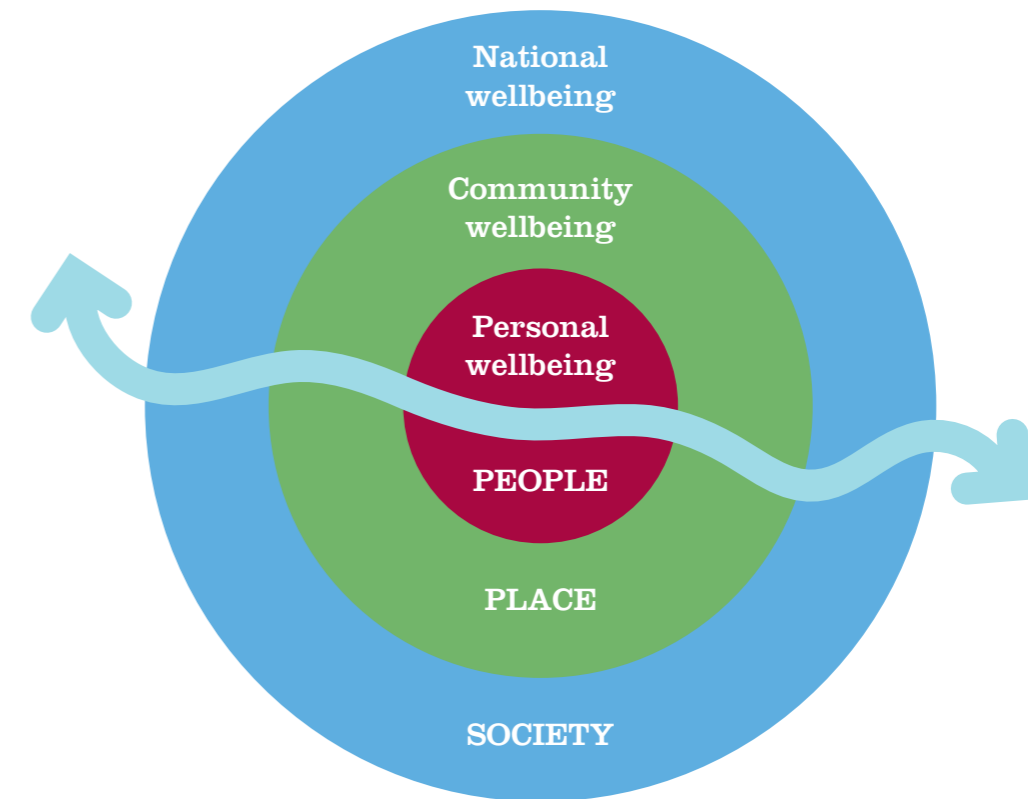
To demonstrate and evidence that our waterways are 'transforming places and enriching lives', we recognise the necessity to measure the value of the multipurpose nature of our waterways in terms of:

- how they are being used by others as platforms for a wide range of activity;
- the difference that our activities and interventions are making to local people's lives; and
- the contributions they are making to the economic, social, environmental and cultural wellbeing of the nation.

To be credible, it is important that we publish robust and transparent evidence-based outcome reporting, which can track trends and stand up to external scrutiny. This evidence base will help to demonstrate that the waterways are a truly cross-cutting policy theme and also demonstrate the contribution that waterways are making to personal, community and societal wellbeing in England and Wales. We are seeking to build an evidence base that supports a shift away from traditional and narrow perspectives of waterways towards a wider recognition in policy terms, that truly reflects the cross-cutting nature of waterways' contribution to wellbeing in its widest sense.

Through robust measurement, the Trust will be able to:

- prove and validate to national and devolved policy and decision makers, as well as to statutory and voluntary funders and partners, the value generated from investing in waterways and their waterside communities; and
- improve effectiveness by understanding which of our activities and interventions make the greatest difference.



Our first Outcomes Report is a 'technical' report aimed at sharing our approach to measurement – explaining our 'whole framework' model and the measurement and evaluation methodologies being adopted.

In collaboration with the Sustainable Places Research Institute (PLACE) at Cardiff University, we have designed an Outcomes Measurement Framework (OMF) which:

- adopts a cross-cutting approach to outcome measurement that embraces the breadth of the potential impacts and outcomes that are being generated by the presence of the waterways themselves and the activities and interventions made by the Trust, partnerships and other organisations using our waterways as a platform;
- encompasses the diverse and 'multi-benefit' nature of waterways, the Trust's strategic goals and 2025 ambitions and the breadth of these potential impacts; as well as
- reflecting the strong synergy with wider economic, social, cultural and environmental wellbeing.

The report focuses on explaining the OMF design and methodologies being adopted and is supported by early insights learnt. We have deliberately not attempted to report on the outcomes delivered, as there is insufficient evidence at this stage to be robust and credible. It is hoped that by openly sharing our learnings and experiences, that this will encourage engagement and dialogue, galvanise support and build a strong foundation for our second Outcomes Report, to be published next year.

Report section summaries

SECTION 1: WHO WE ARE & WHY WE MEASURE

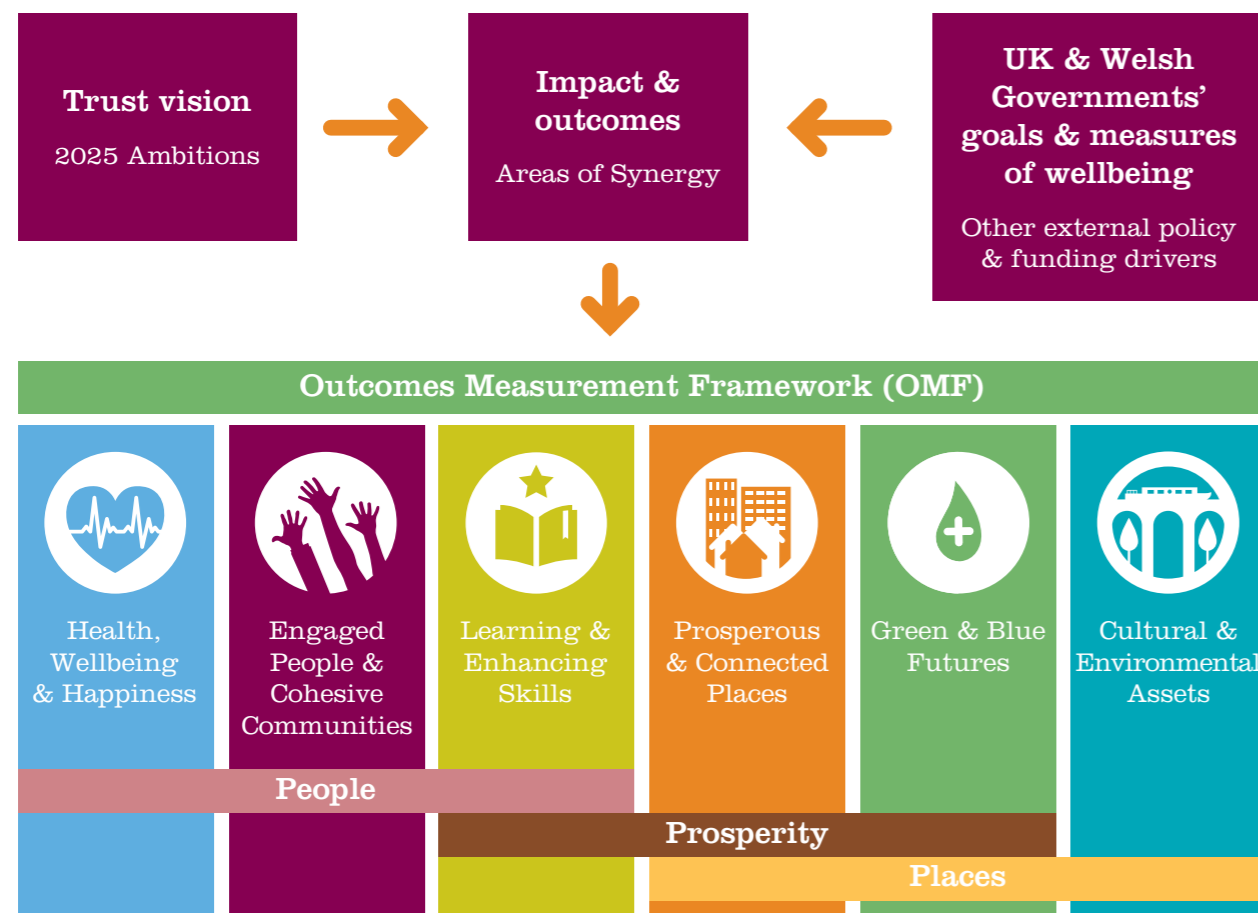
This section of the report provides background on:

- the organisation, our vision and ten-year strategy;
- our role as a waterway and wellbeing trust; and
- the reasons why we are engaging in measurement of outcomes.

SECTION 2: WHAT WE MEASURE – Waterways & Wellbeing

The Trust's ambition is for waterways to make a difference locally, to be inclusive and relevant. This section of the report outlines:

- the opportunities and challenges in realising this ambition;
- the synergy between our outcomes measurement work and the measurement frameworks for national wellbeing in England and Wales; and
- our Outcomes Measurement Framework (OMF).



SECTION 3: HOW WE MEASURE – Design

This section of the report explains our approach to building the Outcomes Measurement Framework (OMF) in collaboration with PLACE, including details of the guiding principles and research method adopted; our selection process for shortlisting the OMF indicators; and the production of logic chains to provide a 'route map' for implementation.

SECTION 4: HOW WE MEASURE – Governance & Baseline

In November 2015, our Board of Trustees approved the OMF and the establishment of an External Reference Group (ERG) to act as a sounding board for this framework. This section of the report sets out the governance that has been put in place to maintain rigour, scrutinise our evaluation and measurement activities as well as learn from best practice.

The starting point for the phased implementation of the OMF, has been to gain a better understanding of the communities living within our waterway corridors. This section also explains the demographic profiling and analysis work undertaken to-date to establish our baseline on waterway corridor populations in terms of reach potential and the diversity of demographic characteristics.

SECTION 5: HOW WE MEASURE – Measurement Tools & Data Sources

This section of the report sets out:

- our approach to evaluation and measurement – at three levels: national, local and project;
- selection of fourteen longitudinal study areas (LSAs) and two counterfactual study areas (CSAs) to demonstrate the degree of impact delivered over time at a local level but when aggregated can be used to present a national picture on waterways and wellbeing and track changes, impact and trends over time. These LSAs will be the areas where we focus our in-depth measurement and evaluation work across all the six OMF domains;
- the principal quantitative and qualitative measurement and valuation methodologies that we are utilising to evaluate and measure outcomes, namely:
 - Waterway Engagement Monitor (WEM);
 - towpath measurement of volume, type and motivations of towpath users;
 - evaluation of projects and day-to-day activities (including on building our new e-Project evaluation toolkit, repository of evidence for effective storytelling and suite of research tools); and
 - the valuation methodologies for monetisation that we intend to apply;
- the main activities associated with 'putting the measurement and evaluation infrastructure in place' so that we can start collating the data to build the evidence base.

SECTION 6: HOW WE MEASURE – Filling Knowledge Gaps

As part of the OMF development work, we identified two key areas where the Trust lacked proper insight and evidence to support our activities. This section of the report provides an overview our outcomes related research programme, which has focused on these two areas and has involved the Trust working with academia and sectoral experts, namely:

- understanding of the motivations and barriers to use by different communities, a participatory research project conducted by PLACE; and
- appreciation of the role that waterways could play in improving mental health outcomes, a desktop research project undertaken by the Centre for Sustainable Healthcare.

SECTION 7: HOW WE MEASURE – Findings & Insights

This section of the report seeks to outline what we have learnt so far from the national WEM monthly online survey, the local community surveys conducted in the fourteen LSAs and two CSAs, the first wave of towpath intercept surveys conducted in the LSAs and the findings and conclusions from the two aforementioned research projects. The insights gained have been grouped under the following headings:

- subjective Wellbeing (Personal);
- communities and their waterways;
- local identity, value and connections;
- physical and mental health; and
- motivations and barriers.

SECTION 8: HOW WE MEASURE – Future Plans

This final section of the report describes our planned activity for the next twelve months including: putting the outstanding measurement and evaluation infrastructure in place; building evidence base on Trust's activities and outcomes generated by others; and our planned research programme.

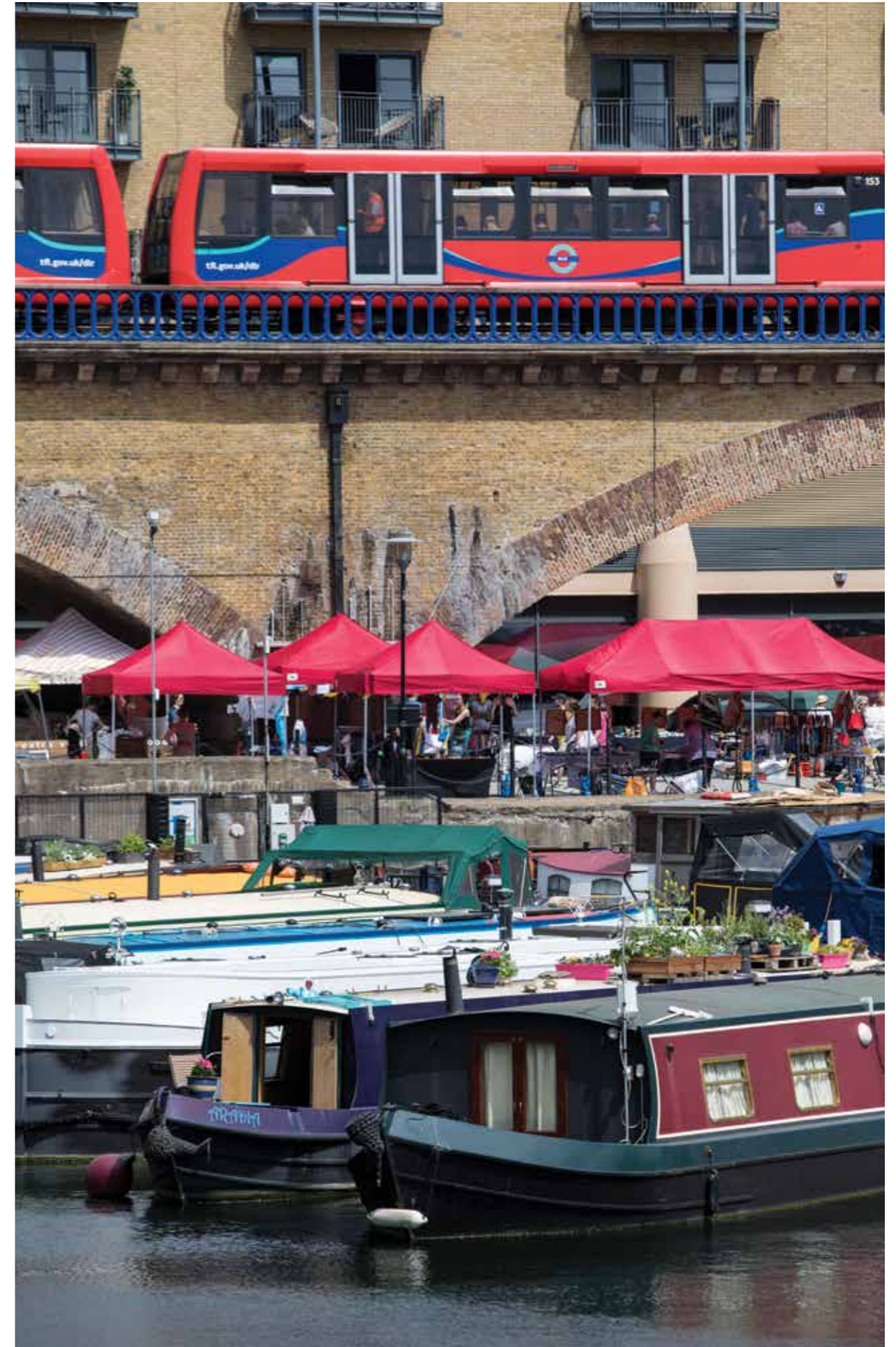
Collaborative working

Throughout the report there are references to the different collaborative working arrangements between the Trust and various partners from the public and charity sectors, academia and sectoral experts from the private sector.

Although our outcomes measurement work is still in the early phases of implementation, we are keen to disseminate and share our work with the wider, well-informed community that will be able to advise, support and champion what we are doing. We hope that firstly, our approach and activities in the fields of research, measurement and evaluation will contribute to the growing evidence base. Secondly, we hope that our future evidence-based case studies can be used to help distil and share the evidence on waterways and wellbeing supporting national and devolved policy and decision makers in England and Wales.

Later this year, the Trust intends to share the detailed insights derived from the local community surveys and towpath intercept surveys undertaken within the fourteen longitudinal study areas, with the relevant local authorities and other key local partners.

Finally, the Trust would like to take this opportunity to thank firstly, the ERG members for all their time and support in providing insight, guidance and constructive feedback and challenge, which has been invaluable in shaping our work. Secondly, we would like to give special thanks to Nancy Hey, Director of the What Works Centre for Wellbeing, for all her guidance, introductions, sharing of knowledge and encouragement and for connecting us with the wider wellbeing research, evaluation and policy community.



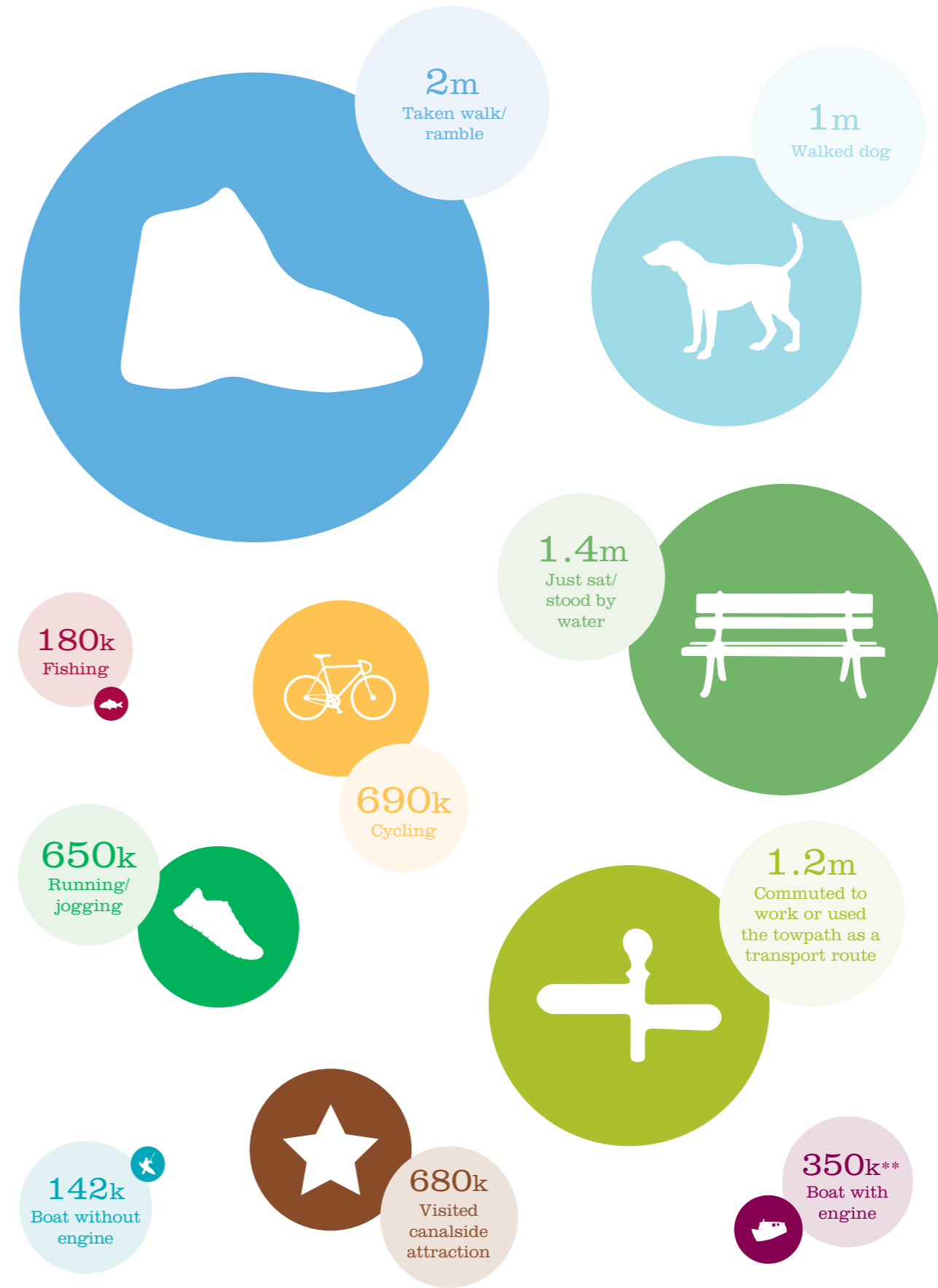
Market at Limehouse Basin

4.3m

During a typical two-week period 4.3m people visit one of our waterways. Some may only use the waterways once, others may visit most days walking their dog or commuting to work.

Opposite are some of the most common activities and the number of people taking part*

 Canal & River Trust waterways



* An individual is only counted once in the 'total' figure, they may however have done more than one thing during their visit
 ** Includes trip boats, hire boats and friends/family members accompanying a licence holder on a private boat

Source: Waterway Engagement Monitor 2016/17, conducted on behalf of the Canal & River Trust by BDRC Continental. The WEM is a year-round, online survey amongst a representative sample of 11,500 adults (15+) across England and Wales.

1



Richmond Court community adoption, Chester, Shropshire Union Canal

Section 1:

Who we are & why we measure

Who we are and what we do

The Canal & River Trust (the Trust) is a registered charity, formed in 2012 to care for 3,219 kilometres (2,000 miles) of working canals and river navigations, docks and reservoirs across England and Wales. Our vision is for living waterways that transform places and enrich lives.

We work in partnership with others to support the health and wellbeing of millions of local people, offering sustainable routes which connect communities and providing access to learning and education for thousands of children and young people. We license and support boating on our waterways, as well as promoting a wide variety of other uses from canoeing and angling to freight and renewable energy.

The inland waterway network in our care consists of 2,500 kilometres of canal and 550 kilometres of rivers and is among the finest examples of working industrial heritage in the world. It includes 72 reservoirs, 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, one of which we manage directly.

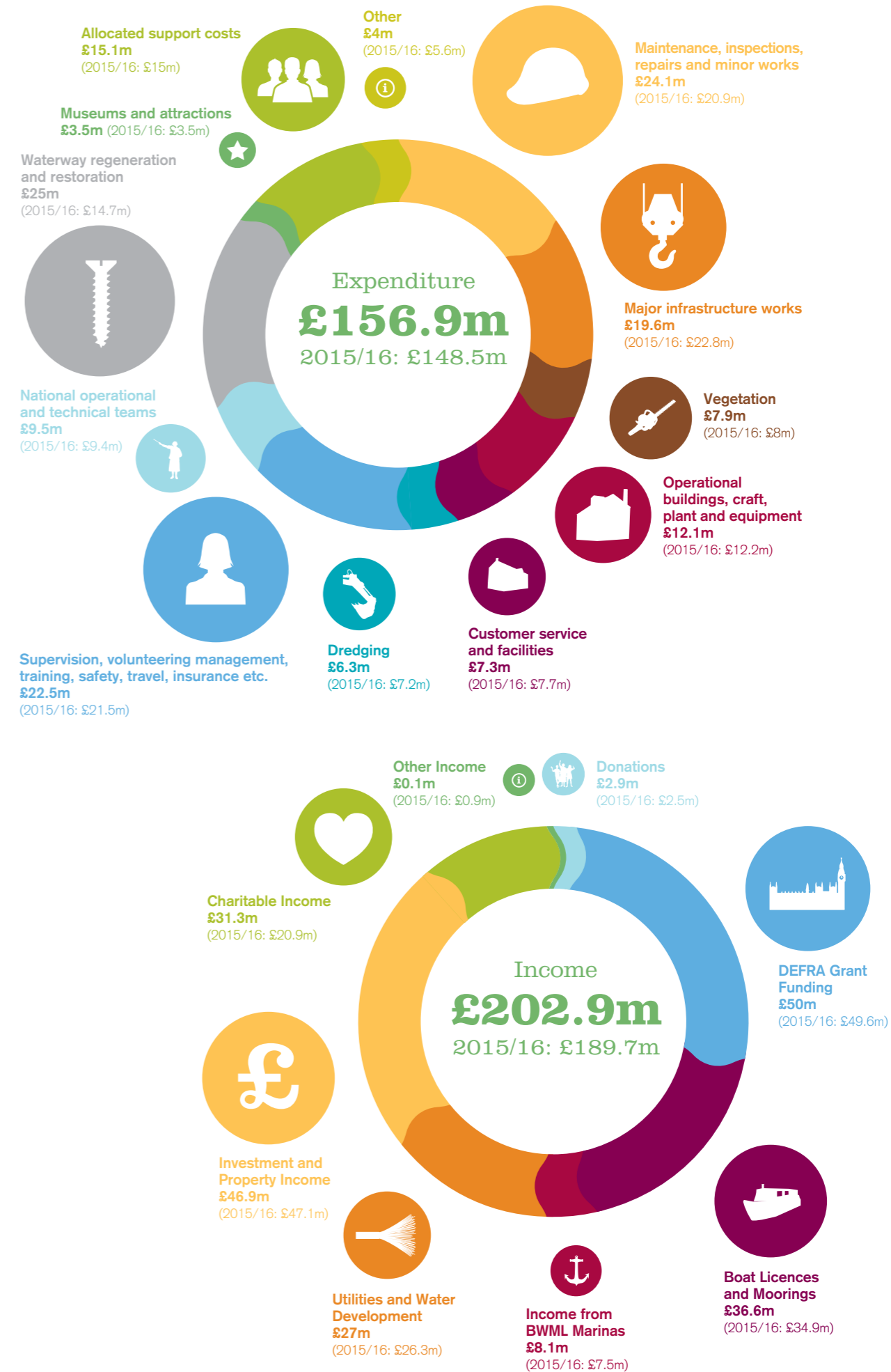
This extensive waterway network provides the Trust with an immense potential reach, in both geographical and demographic terms.

Our resources expended on charitable activities

The nation's inland waterways are one of the UK's largest free-to-access cultural spaces, visited by an estimated 18–20 million people each year, generating nearly 396 million visits in aggregate and circa 4.3 million people visit regularly. There are more powered boats and wider range of uses on the water (in particular growth in canoeing, rowing and other unpowered boating activities) than ever before. There has been a massive expansion in volunteers and adoptions, with our volunteers giving over 540,000 hours of their time, and 181 community canal adoption schemes (each adoption scheme roughly equating to 1.6 kilometres (one mile)) recorded in 2016/17.

Our income

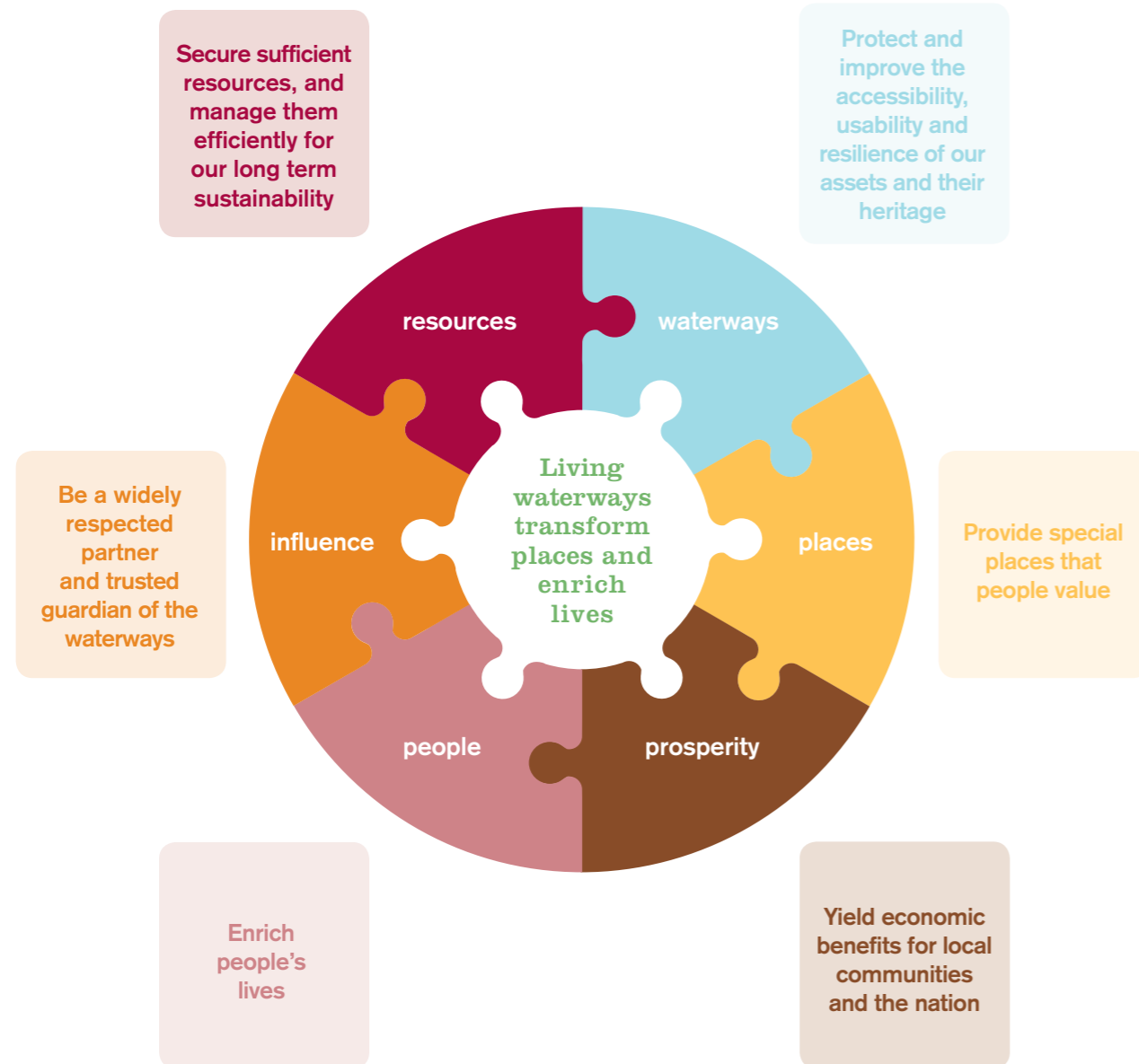
We rely on our Government grant, fees from boat owners and businesses and our investment and commercial income to fund the cost of maintaining our network, which exceeds £100 million per year. Our work is increasingly supported through lottery funds, corporate and local authority partnerships, growing voluntary donations from members of the public and our dedicated volunteers who, last year, gave us half a million hours of their time.



Our vision & strategy

Our 10-year strategy sets out the six areas that underpin our ambitious vision for living waterways that transform places and enrich lives.

It highlights the changes the Trust must make between now and 2025 to become more customer and community focussed; as well as become more effective, productive and financially sustainable.



Our 2025 ambitions

Our ambition is for more people to use our waterways and to be actively involved in caring for them, and for these people to be increasingly representative of the local populations the waterways serve. Regular users of and visitors to our waterways will reflect the demographic profile of the communities around the waterways at both national and local levels.

The number of people using our waterways for physical activities and practical volunteering (including social action) will show a continually improving trend, particularly in those areas with key health indicators below the national average.

The canals, rivers, docks, reservoirs and towpaths in our care will be highly valued by local communities as special amenity spaces and routes, delivering a range of benefits including improving the connectivity between places, enhancing liveability and strengthening the resilience of places, supporting healthy and active living.

Waterway corridors will be thriving and enterprising places, supporting a wide range of local businesses and social enterprises. They will contribute to the visitor and green economies, help to create the conditions for economic growth in less prosperous areas and enhance liveability through regeneration and renewal. Waterways will increasingly be used as part of the sustainable transport network and as a source of renewable energy, supporting economic growth and contributing to the creation of a low carbon economy and smart cities and towns.

The waterways, museums and attractions in our care will facilitate the participation of everyone. They will especially engage with children and young people from the range of communities around the waterways, through different cultural activities and learning programmes, active participation and skills development. They will also provide a platform for vocational or skills-based learning, preventative and / or rehabilitation programmes to improve opportunities for young people and adults.

The social, economic, environmental and cultural benefits to local communities and the UK economy generated by our waterways and associated activities will continue to grow.

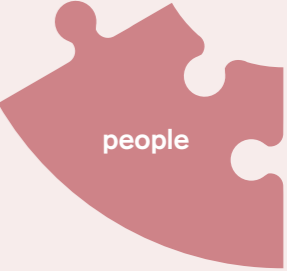



By 2025

- No more than 10 unplanned closures lasting 48+ hours per year
- Customer satisfaction rating of 85%
- Our waterways, towpaths, destinations, museums and attractions will attract half a billion visits per year
- Meeting Government contract and other statutory obligations linked to asset condition and reliance
- 80 kilometres (50 miles) of restored waterways at no significant net cost to the Trust

By 2025

- 500 adoptions or around 800 kilometres (500 miles) of our waterways will be actively cared for by the community and local groups
- Regular users of / visitors to our waterways will reflect the demographic profile around the waterways







By 2025

- Employee engagement survey results within the upper quartile
- The employees and volunteers of the Trust, and contractors and suppliers to the Trust, will be more reflective of the communities they serve
- One million volunteering hours each year and a volunteer rating of 95%
- Investment assets to be worth at least £1 billion by 2025
- Income generated from our commercial and charitable activities will be on a rising trend in real terms
- Routine controllable fixed costs to be on a declining trend in real terms

By 2025

- 50 projects which utilise low value Trust-owned assets for wider charitable objects delivered by 2025
- 100,000 people visiting our open days and other events by, or associated with, the Trust across the network each year
- One million children and young people will engage with our waterways, museums and attractions each year





By 2025

- 90% of people (living close to a waterway) to be aware of, and recognise the value of their waterway
- 75% of people to be aware of the Trust
- Our overall brand and reputation index will be on a rising trend
- Stable base of 100,000 Friends, who actively support the Trust

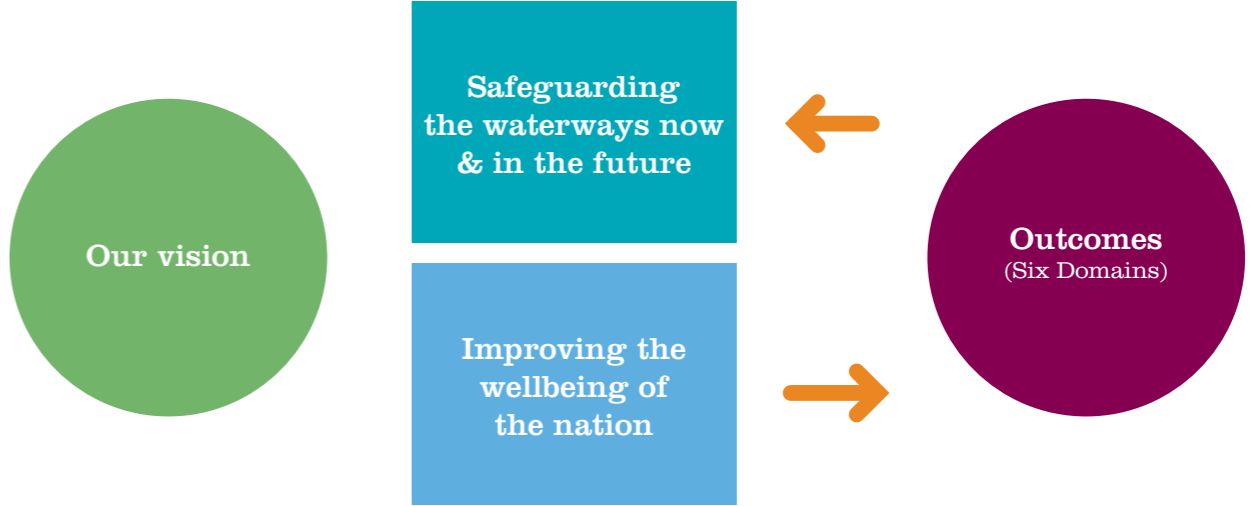
By 2025

- 25% of our waterway network will be awarded the accolade of 'great public space status' under the DCLG Green Flag Award® scheme or equivalent
- Our 'top 50' destinations will be awarded membership under Visit England's Visitor Attraction Quality Assurance Scheme or equivalent



Waterway and Wellbeing Trust

Waterways have the potential to make people happy, re-connect people with place, and help improve wellbeing inequalities – realising our ambition for the Trust to make a difference locally, to be inclusive and relevant.



Why measure outcomes & communicate impact?

Larger charities like the Trust cannot depend solely on storytelling to demonstrate how we are adding value locally, delivering public benefits and contributing to societal wellbeing in its widest sense. We need to be able to demonstrate our impact more persuasively through an evidence base, to prove and validate the difference we are making to individuals, communities and society. 'Outcomes' are the real improvements that people see in their communities and in their lives.

To demonstrate and evidence that our waterways are 'transforming places and enriching lives', the Trust recognises the obligation to measure the value of the multipurpose nature of our waterways in terms of:

- how they are being used by others as platforms for a wide range of activity;
- the difference that our activities and interventions are making to local people's lives; and
- the contributions they are making to the economic, social, environmental and cultural wellbeing of the nation.

To be credible, we need to publish robust and transparent evidence-based outcome reporting which can track trends and stand up to external scrutiny.



At the moment, the Trust does not have full appreciation of, or the ability to properly report on, the scale or monetary value of the impacts and outcomes delivered by our waterways and activities. It is imperative that we seek to raise awareness of the extent, form and value of the public benefits that our waterways are delivering and how those benefits contribute to supporting the economic, social, cultural and environmental wellbeing of the nation, in terms of:

- fiscal value (created because of avoided activity that would otherwise have to be provided by the public sector or another funding body, for example, a reduction in NHS spending arising from improvements in health);
- economic value (the net increase in earnings or economic growth in the local economy); and
- social value (wider gains to society).

To be credible, we recognise that we need to publish robust and transparent evidence-based outcomes reporting, which can track trends and stand up to external scrutiny. The benefits of such robust outcome measurement and reporting include:

- an increased awareness and understanding of the value of investing in waterways and their contribution to wellbeing;
- helping to position the Trust as a trusted and preferred partner of statutory and charitable funders;
- assisting the Trust in establishing itself as an authoritative voice and embedding waterways across different policy areas at the different spatial levels (from national to sub-regional, local and neighbourhood levels); and
- driving improvement across the Trust's performance, by identifying our planned activities and interventions to grow and stimulate the shift in the outcomes and by creating a feedback loop, so that our strategy can be refined and developed in light of the impacts and outcomes we successfully deliver.



Another route to the city centre, Granary Wharf Leeds



Celebrating the Leeds & Liverpool Canal bicentenary

Section 2:

What we measure – Waterways & Wellbeing

Realising our ambition – being local, relevant & inclusive

It is the Trust's ambition for waterways to make a difference locally, to be inclusive and relevant. There is significant potential and opportunity to achieve this ambition and for waterways to contribute to personal, community and societal wellbeing.

There are however, also significant challenges to overcome, if this ambition and contribution to wellbeing are to be fully realised. This section of the report briefly outlines these opportunities and challenges. It explores the synergy between our outcomes measurement work and the measurement framework for national wellbeing published by UK Office for National Statistics (ONS) to measure economic performance and social progress in UK and the seven wellbeing goals defined in The Wellbeing of Future Generations (Wales) Act 2015 (and supporting suite of Welsh national wellbeing indicators).

Opportunities & potential reach

This extensive waterway network provides the Trust with an immense potential reach, in both geographical and demographic terms. Analysis of the 2011 Census indicates that over eight million people live within one kilometre of a waterway owned and managed by the Trust in England and Wales, (representing 14.5% of the total population for England and Wales); and that this population is reflective of the diverse nature of communities in the UK. These waterways are located within the boundaries of 179 local authorities and over 900 parish and community councils in England and Wales that have our waterways within their administrative areas.

Potential reach of our waterways	Population live within one kilometre	Population live within 8 kilometres (5 miles)
England	15%	52%
Greater London	15%	72%
Greater Manchester City Region	25%	92%
West Midlands City Region	51%	100%
Wales	3%	17%
Burnley	70%	100%
Black Country	70%	100%

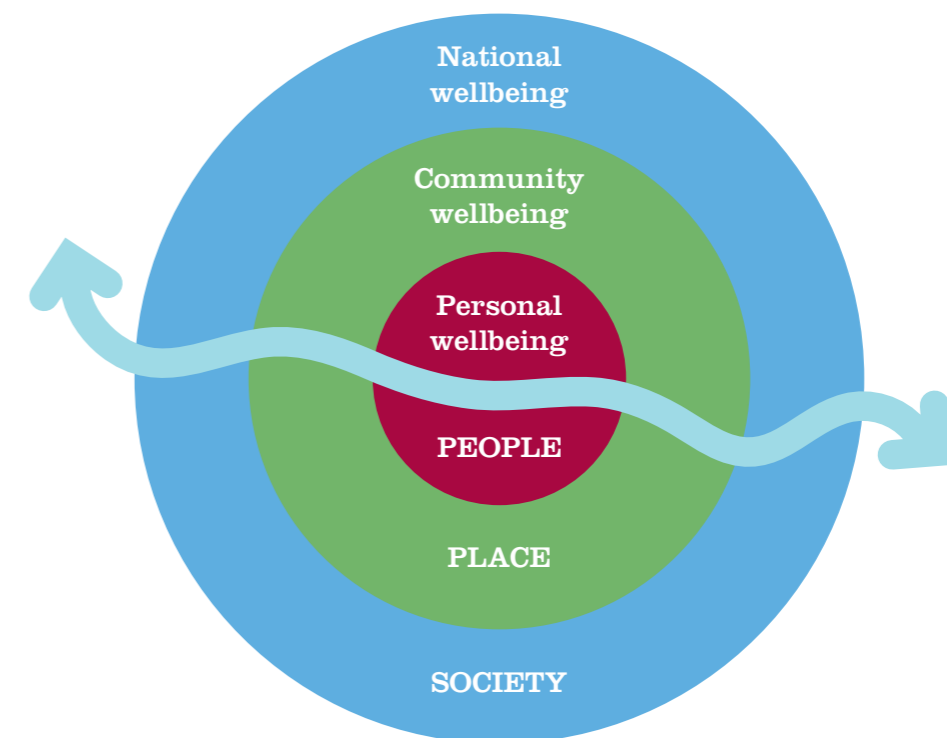
The waterways provide vital access to green and blue space (with towpaths free for anyone to visit and use) for many of the communities that are amongst the most deprived within England and Wales.

- Nationally 20.5% of waterway corridor populations (living within < one kilometre of a waterway) are from Black, Asian and Minority Ethnic (BAME) background, compared to 14% for England and Wales. This rises to 23% in urban areas (greater than the 16.6% national average in urban areas) and falls to just 3% in rural areas (2.5% in rural areas nationally). This is pattern is also reflected in the different faith profiles, with 10% of those living within one kilometre of one of our waterways identified as Muslim or Sikh, compared to below 6% nationally.

Reach potential	Ethnicity (BAME population) – Whole	BAME population that live within < one kilometre of waterway
England	14%	21%
Wales	4.4%	2%
Urban Areas	16.6% (national average)	23%
Rural Areas	2.5 (national average)	3%
Brent	63.7 (whole LA)	67%
Torfaen	2% (whole LA)	1.5%

- Nationally 6% of the population living in the waterway corridors report being in bad or very bad health, rising marginally in urban areas and falling to 4.6% in rural. This is marginally above average for England and Wales in urban areas, but slightly lower in rural areas.

Personal wellbeing is measured by how satisfied people say they are with their life – the greater feeling of connectivity with place, the greater the feeling of wellbeing. With over 14% of the national population living within one kilometre of one of our waterways, over eight million people have access to this 'free to use and enjoy' resource on their doorstep: this presents immense opportunities to enhance personal and community wellbeing across many different communities in a wide variety of places. Waterways can provide a strong sense of place and connection and help shape the way people live their lives, feel about themselves and their relationships with others in their community – all creating better outcomes in terms of individual, community and societal wellbeing.

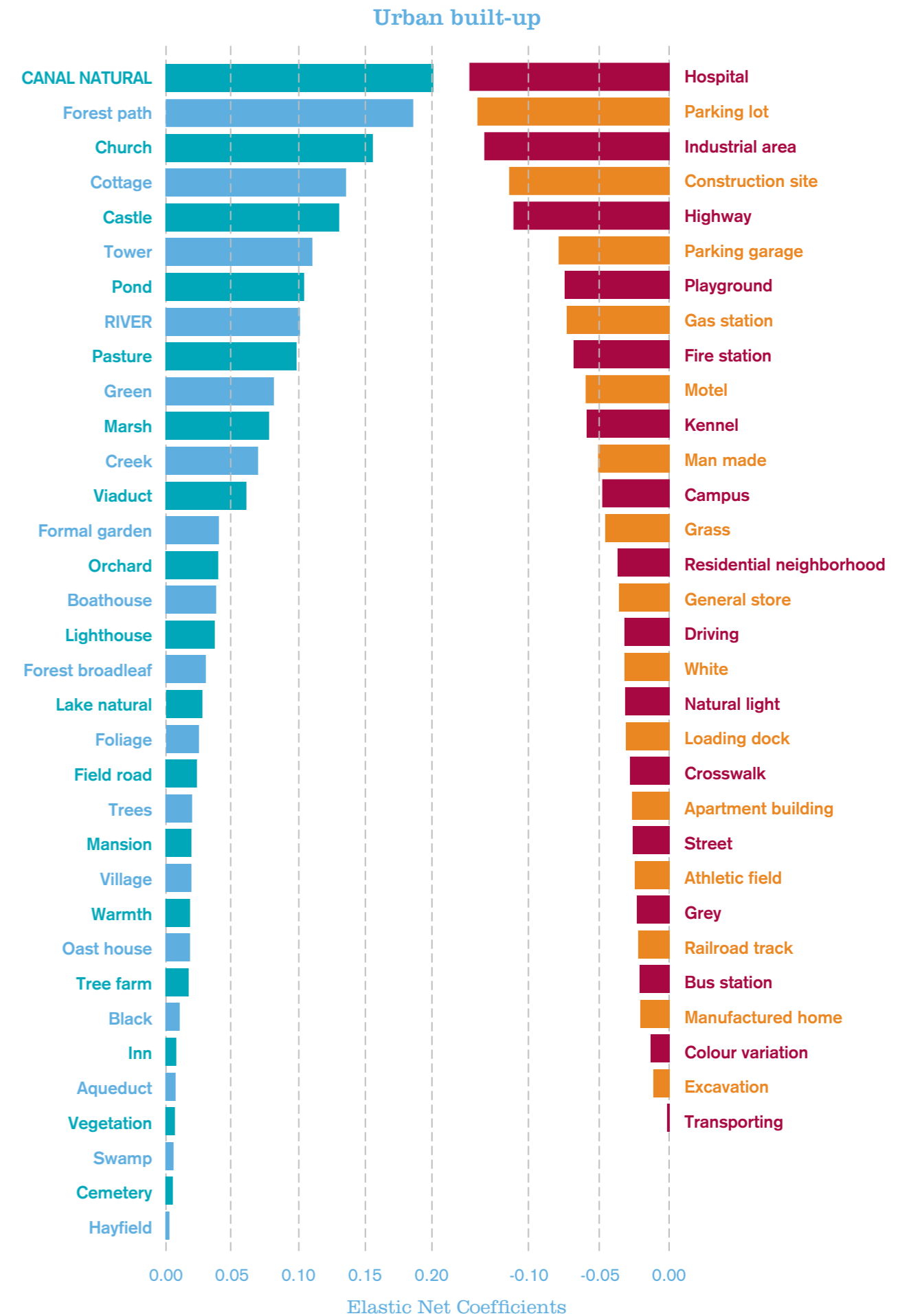


Located on people's doorsteps, waterways are local 'places' where we live, work and play; and accordingly have a significant role to play in:

- (re)connecting people with place and improving their sense of belonging. Evidence published in *Where We Live Now – Perspectives on place and policy report* (March 2016) and *Where We Live Now – Making the Case for Place-based Policy* (March 2017) by the British Academy has revealed that quality of place really matters to people and people are proud of what made their place special; but yet too many people feel that we are 'becoming a country of anonymity'. This strong feeling of dissatisfaction, frustration and lack of connection was reflected within Brexit referendum results;
- helping to improve wellbeing and address inequalities (both overall wellbeing inequality and wellbeing inequality between groups) as defined within the *Wellbeing Inequalities Report* (March 2017) published by What Works Centre for Wellbeing and New Economics Foundation, in partnership with Economic & Social Research Council and HM Government. Our waterways pass through 68% of the 50 most deprived districts and wards in England (Lower Super Output Areas defined by the Office of National Statistics);
- creating attractive and healthy places to live, work, invest and spend leisure time. There is a consensus view of the Northern Powerhouse partners that the widening of definition of connectivity and importance of quality of life are also required to help underpin the Government's approach to increasing productivity and driving growth as well as helping to improve wellbeing. The British Academy (March 2016) recommends that 'greater weight should be placed on the value of the things which improve the quality of our lives, including green space, access to nature and culture, etc') with any new definitions of progress and productivity;
- providing a platform for mass participation to combat inactivity in adults, young people and children by getting 'Everyone Active Everyday' ambition and the new 'Active 10 / One You' campaign being promoted by Public Health England. Combatting inactivity is also a strategic priority of Sport England (as set out in *Towards an Active Nation Strategy*, May 2016) and 'Getting Wales Moving', a joint report by Public Health Wales and Sport Wales (March 2017).

A recently published study in the Royal Society Open Science (July 2017) *Using Deep Learning to Quantify the Beauty of Outdoor Places* written by researchers at the University of Warwick and The Alan Turing Institute highlighted the importance of waterways in increasing the scenic value of outdoor spaces, especially those in urban areas. The 'canal natural' feature was found to be the strongest positive predictor of scenic quality and 'rivers' were ranked eighth in 'urban built-up', as detailed in the graph below. This research emphasises the role that the waterways can play in providing 'beauty' for local people and communities and enhancing the scenic quality of outdoor spaces, particularly in deprived areas with few natural alternatives.

Waterways therefore have the potential to impact on many aspects of everyday life and many different communities. They have the capacity to make a difference to personal, community and societal wellbeing but need to be seen as relevant to do so. They need to provide a place where people can feel safe, which they know is well used by their community and offer activities which relate to and reflect their own interests and circumstances.



Seresinhe CI, Preis T, Moat HS. 2017. Using deep learning to quantify the beauty of outdoor places. The Royal Society. p7



Challenges & barriers

Despite our waterways being one of the UK's largest free-to-access cultural spaces – attracting approximately 4.3 million people to visit regularly, and more powered boats and canoeing than ever before and experiencing a massive expansion in volunteers and adoptions – if the waterways are to survive, flourish and add value as community and cultural assets, they need to be seen as relevant to and valued by local communities, today and in the future.

The Trust is striving to become a charity whose users and visitors are reflective of the local communities living within the waterway corridors. The Trust is aiming to reach out and appeal to all communities living in the waterway corridors and to be relevant to people's everyday lives and enrich the lives of our beneficiaries (that is communities, visitors and customers) to deliver public benefits and contribute to personal, community and societal wellbeing.

There are three principal challenges facing the waterways and the Trust, namely:

- being more inclusive, to attract more people from Black, Asian and Ethnic Minorities backgrounds to visit, use and enjoy their local waterways as they are significantly under-represented in our user and visitor population;
- re-address the age imbalance, to attract more young people and encourage greater inter-generational interaction as our current user and visitor age profile is significantly older; and
- lack of awareness of the presence of a canal or river on people's doorstep and associated low perceptions.

Inclusivity and attracting users from different backgrounds reflecting locality, along with strong local community awareness, connections, participation and adoption are all necessary if the waterways are to be relevant to and valued by local communities.

These challenges and the potential for waterways and the activities and interventions made by the Trust to make a real difference in improving personal, community and societal wellbeing have shaped our 2025 ambitions, Outcomes Measurement work and our research programme.

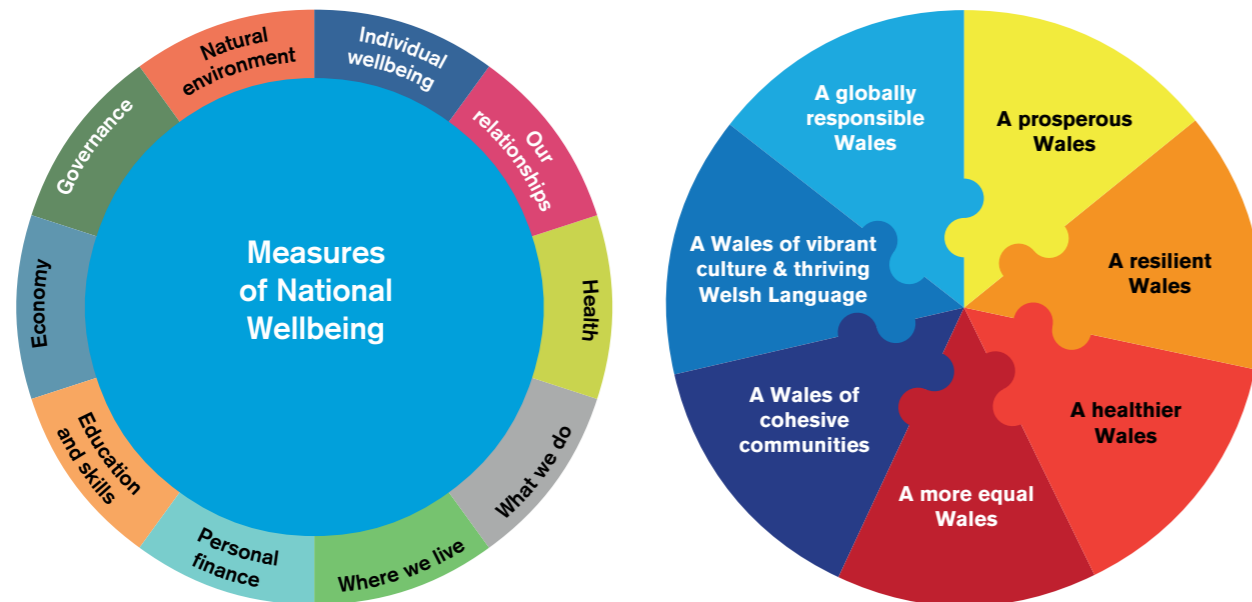
Our challenges	Waterways 2017 (Current position)	Waterway 2025 (Our ambitions)
<p>Challenge 1: Our user / visitor population under-represents Black, Asian and Ethnic Minorities</p> <p>Our impact can only realise its full potential if we become fully inclusive to all communities.</p>	<p>The proportion of waterway visitors from BAME backgrounds has increased, albeit only marginally, since 2012 to 9% of users in 2016/17 from our Waterway Engagement Monitor (WEM) surveys. This under-representation is further compounded by the fact that those living within one kilometre of one of our waterways are more ethnically diverse than the England and Wales average with 21% from Black, Asian and Minority Ethnic group compared to 14% across England (2011 Census).</p>	<p>Users and visitors being representative of the local communities that the waterways serve.</p>
<p>Challenge 2: Our visitor age profile is significantly older</p> <p>The challenge for the Trust is to create 'offers' that will attract more visitors from 15–24-year-old, 25–34-year-old and 35–44-year-old age groups, all of which are currently under-represented, particularly the 35–44 year olds (14% of adult visitors to waterways compared to the GB adult population of 19% in this age group).</p>	<p>Age profile of adult visitors to waterways owned or managed by the Trust is significantly older than that of the England and Wales population with 45–64 year olds over-represented (20.5% of adult visitors to waterways compared to the GB adult population of 15% in this age group), with 71% of boat licence holders being over 55 and more likely to be male (82%), though this may mask the fact that the male may be serving as the contact for a couple.</p>	<p>One million children and young people (<25) will engage with our waterways, museums and attractions through volunteering, arts, education and learning, active participation, cultural activities and social action each year, and they will reflect the diversity of local communities.</p>
<p>Challenge 3: Lack of awareness of the presence of a canal or river on the doorstep & perceptions</p> <p>Tackling the issues of lack of local awareness and having a greater understanding of perceptions, motivations and barriers are fundamental.</p>	<p>53% of those living less than 0.8 kilometres (0.5 miles) from a waterway managed or owned by the Trust have not heard of the Canal & River Trust. Only 31% of the adult population residents in England and Wales have visited a waterway owned or managed by the Trust in the last 12 months, with 12% of the adult population visiting at least once a fortnight, 9% of the adult population visiting once every 1–3 months and the remaining 10% of the adult population visiting less frequently. (WEM figures are based on the year to date period April–July 2017).</p>	<p>Our waterways, towpaths, destinations, museums and attractions will attract half a billion visits per year and 90% of people (living close to a waterway) to be aware of, and recognise the value of, their local waterway.</p>

Synergy with UK & Welsh Government goals & measures of wellbeing

The Trust's outcomes measurement work (which is set out in the next section of the report) has been 'proofed' against:

- the UK Office for National Statistics (ONS) published a measurement framework for national wellbeing to measure economic performance and social progress in UK; and
- the seven well-being goals defined in The Wellbeing of Future Generations (Wales) Act 2015 to help improve the social, economic, environmental and cultural wellbeing of Wales (and supported by the published a suite of 40 national indicators);

where waterways can and could make a significant contribution to goals, measures and indicators of wellbeing.



Office for National Statistics (ONS) Measures of National Wellbeing (2015) The seven well-being goals for Wales (Welsh Government 2015)

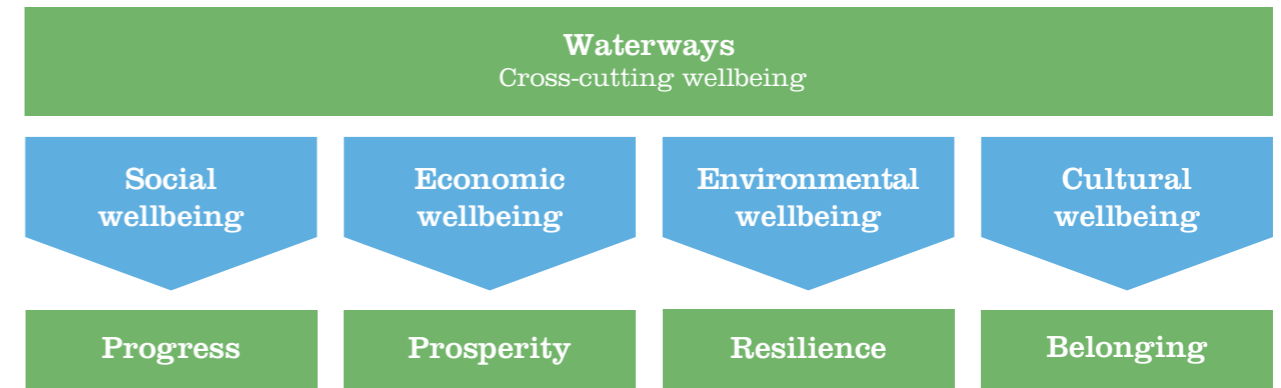
The table below shows the synergy between UK and Welsh Government goals, measures and indicators and our Outcomes Measurement Framework.

Domains	Synergy with Public Policy & National Indicators	
	Measures of National Wellbeing in England, September 2015 (Ten Domains, & 41 Indicators)	Wellbeing of Future Generations (Wales) Act 2015, October 2015 (Seven Wellbeing Goals & 40 Indicators)
Health, Wellbeing & Happiness	✓✓✓	✓✓
Engaged People & Cohesive Communities	✓✓	✓✓✓✓✓
Learning & Enhancing Skills	✓	✓✓✓✓
Prosperous & Connected Places	✓✓	✓✓✓✓✓
Green & Blue Futures	✓✓	✓✓✓✓
Cultural & Environmental Assets	✓✓	✓✓✓✓✓✓

Cross-cutting approach to wellbeing & measurement

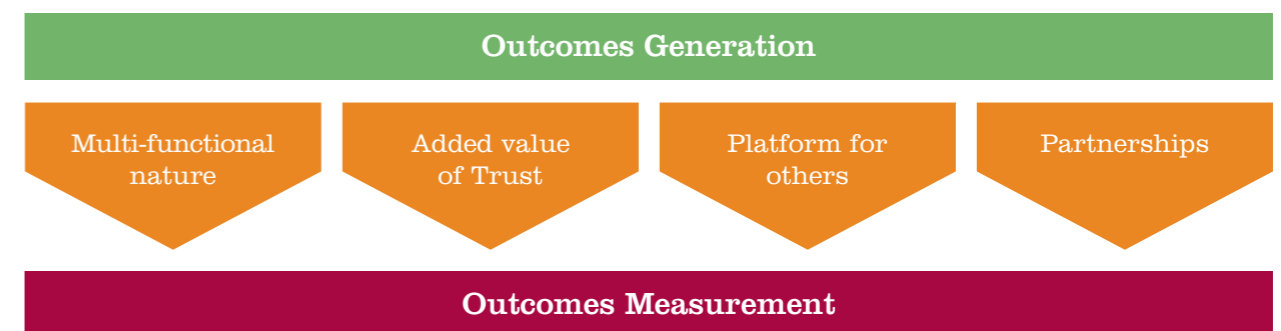
The Trust is adopting a cross-cutting approach to outcome measurement due to the breadth of the potential impacts and outcomes are being generated by waterways and the strong synergy with wider economic, social, cultural and environmental wellbeing.

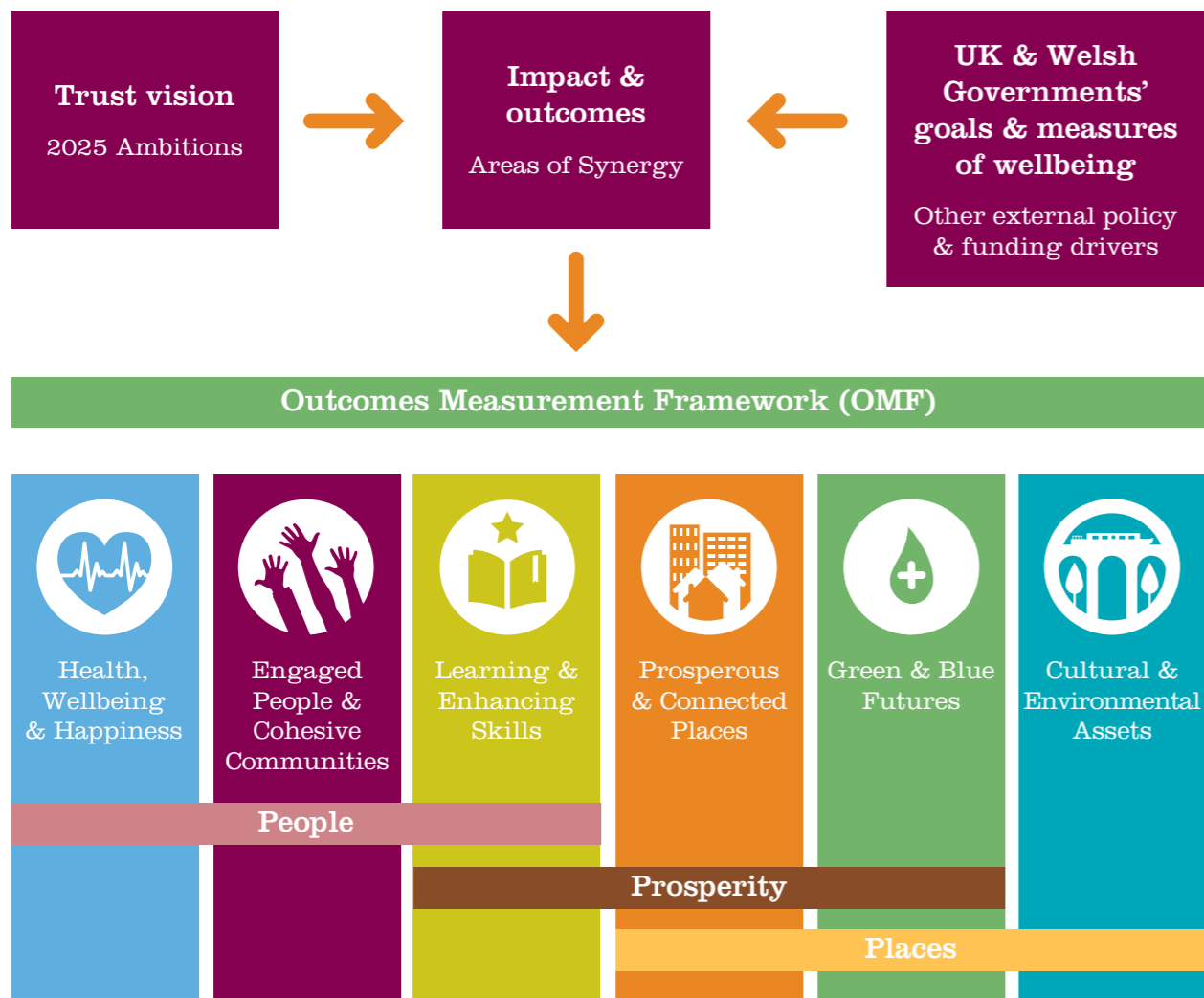
We are seeking to build an evidence base that supports a shift away from a traditional and narrow perspective of waterways towards a wider recognition in policy terms, that truly reflects the cross-cutting nature of waterways' contribution to wellbeing in its widest sense. To ensure that we are at the forefront of understanding of what waterways and the Trust can do to increase wellbeing for the local people and communities living the waterway corridors, we will continue to work closely with the What Works Centre for Wellbeing.



From an outcomes perspective, the Trust is in a **unique but challenging position due to the 'multi-benefit' nature of waterways**, derived from the diverse roles that waterways can and do play in society. The 'breadth' of impacts and outcomes are being generated by waterways in four ways, namely:

- the presence of the waterways themselves;
- the activities and interventions made by the Trust;
- the activities and interventions made by other organisations using our waterways as a platform; and
- the activities and interventions made by a partnership between the Trust and one or more third party.





Our Outcomes Measurement Framework (OMF)

In collaboration with Cardiff University's Sustainable Places Research Institute, we have developed an Outcomes Measurement Framework (OMF) which adopts a cross-cutting approach to outcome measurement. The OMF is organised into six domains which encompass the diverse and 'multi-benefit' nature of waterways, the Trust's strategic goals and 2025 ambitions and the breadth of potential impacts; as well as reflect the strong synergy with wider economic, social, cultural and environmental wellbeing (the design process is outlined in Section 3).

Outcome domains, sub-domains, ambitions & indicators

The OMF consists of a suite of outcomes ambitions and output and outcome orientated indicators, which have been grouped into six domains. The small suite of primary indicators is complemented by self-reporting and perception indicators. The 'OMF at a Glance' can be found in the pull-out section at the back of this document.



We will use our OMF to measure outcomes being generated by waterways themselves; the activities and interventions made by the Trust and in partnership with others. We also intend to use it to measure the activities and interventions made by hundreds of other organisations, charities, community groups, clubs and societies that are using our waterways as a platform.

Bringing our Outcomes Measurement Framework alive



Health, Wellbeing & Happiness

Outcomes ambitions

- providing an accessible environment to encourage more people to become physically active and meeting recommended levels of physical activity
- providing an environment which contributes to improving mental health and 'Wellbeing' as part of wider public policy agenda

Sport Participation Pilot Programme funded by Sport England & People's Postcode Lottery

- two-year pilot project 2015–17 to test the effectiveness of utilising waterways to increase community sport and physical activity
- over 1,100 people participated in the pilot which included the 'Two Arm Two Legs' half-marathon or 10 kilometre race in 2016
 - 30% of participants increased their activity levels, compared to pre-event training
 - 34% had never used the canal for exercise before the event but 73% of participants said they would use it for exercise in the future
 - One in ten of the participants described themselves as only slightly active or were inactive before the event

Two Arms on Two Legs Running Festival, along the Wendover and Aylesbury Arms of the Grand Union Canal



"Running and walking along the canal is such a joy; so many lovely things to see"



"I now know that when there is a canal nearby it is a safe, scenic place to run."



Engaged People & Cohesive Communities

Outcomes ambitions

- contributing to the involvement and resilience of local communities
- broadening participation by people from different socio-economic and ethnic backgrounds, age groups and abilities and improving community cohesion
- providing a platform for preventative and / or rehabilitation programmes
- providing an environment that positively contributes to the perceived safety and security of the locality

Coast-to-Coast Desmond Family Canoe Trail 2015–20

The vision behind this project is to create England's first coast-to-coast canoe trail, running over 240 kilometres (150 miles) from Liverpool to Goole, connecting some of the most deprived communities along its route.

Highlights over the first two years of the project:

- 857 young people and 4,524 local people actively involved
- 1,139 volunteer hours
- 97% of young people felt their confidence had improved
- 92% of young people stated their wellbeing and happiness had improved
- 92% of local people said they felt more connected to their local community
- 95% said they were more likely to visit their local canal

Desmond Family Canoe Trail, connecting communities and providing opportunities for young people to engage in healthier active lifestyles along the Leeds & Liverpool Canal



"Being involved in the project, along with other groups, has helped me to be more confident and this has helped me in starting a job."

"I am thinking about volunteering again in the future in my local area and I have enjoyed making a difference."



"I have learnt new skills and gained knowledge about the habitats and history of my local canal."



Learning & Enhancing Skills

Outcomes ambitions

- improving educational attainment prospects of school children
- improving the opportunities for young people (16–24 years old) and adults (25+ years old) to achieve vocational or skills-based qualifications and enhance continued learning opportunities

Our heritage trainees



STEM Programme learning, Leicester



Water Safety Education Programme with Canal & River Explorers



Budding Brunels work experience group, Carpenters Road Lock



Prosperous & Connected Places

Outcomes ambitions

- creating an environment that attracts new and supports existing businesses within the locality
- creating an environment that supports new employment opportunities and seeks to help tackle entrenched worklessness and youth unemployment within the locality
- contributing to the regeneration, development and resilience of place

Since the Trust was formed in July 2012 we are delivering, or plan to deliver, 11,500 residential units on our property estate as part of our development and regeneration activities.

Icknield Port Loop site plan, Birmingham



The outline planning consent (2013) for our Icknield Port Loop site, in partnership with Birmingham City Council, is for up to 1150 dwellings, creating a new canalside quarter in the city.



Aldcliffe Road development, Lancaster

One of our joint ventures, H2O Urban, won the Planning Magazine's 2017 National Planning Award for Best Housing Scheme under 500 homes at Aldcliffe Road in Lancaster. The judges described the scheme as an "exemplar approach to development in a conservation area".

Green & Blue Futures



Outcomes ambitions

- making a positive contribution to the UK's policies on reducing congestion and CO₂ emissions and improving productivity, air quality and connectivity
- contributing to the UK's policy on energy security through localised energy production and contribution to renewable energy targets
- contributing to increased efficiency in use of heating and cooling buildings and / or processes
- making a positive contribution to the land drainage system of the UK

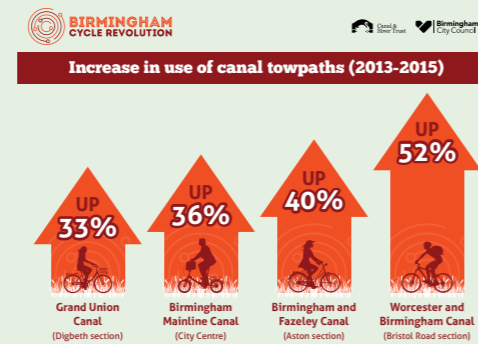
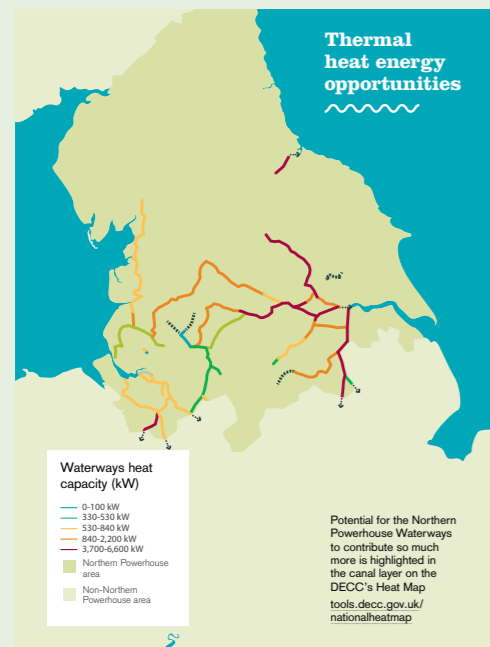
Department for Transport Funded Cycle City Ambition Schemes

Birmingham Cycle Revolution; Leeds-Bradford 'City Connect'; Manchester 'Velocity'; London 'Quietways' projects to significantly increase levels of towpath use for walking and cycling, helping to improve connectivity, air quality and safety, reduce congestion as well as improving physical health and wellbeing.

The Hepworth Wakefield, River Calder



"The Hepworth, Wakefield, is using water as a low carbon energy source to heat and cool the art gallery building"



Birmingham City Council



London Quietways project

The Northern Powerhouse Waterways flowing through the City Regions contain:



200 MW
enough thermal energy to produce 200 MW of energy...



100,000
...which would heat 100,000 houses.

Creative Concern



Cultural & Environmental Assets

Outcomes ambitions

- optimising the value to local economies, communities and identity derived from cultural and heritage assets
- optimising the value to local economies, communities and biodiversity derived from green spaces, natural and environmental assets

Community roots

Three-year conservation project to improve the SSSI areas on the Huddersfield Narrow and Rochdale Canals and involved the recruitment of 1,620 volunteers and the training of 149 volunteers. Supported by the Esmée Fairbairn Foundation and People's Postcode Lottery.

Helping hedgerows 2013-16

Project aimed at engaging volunteers and running specific training days to enhance hedgerows – 967 people participated; 23 courses delivered; and 188 trained volunteers.

Helping Hedgerows project



"Today has been a once in a lifetime experience because I never thought I'd be able to plant a rare plant in the canal."



Community Roots, wildflower seed planting at Stalybridge, Huddersfield Narrow Canal

3



Good Gym adoption group, Birmingham & Fazeley Canal

Section 3:

How we measure – Design

Building an effective Outcomes Measurement Framework (OMF)

Our Starting Point – Our Vision and Our 2025 Strategy

Being clear from the outset about what the Trust wants to measure and why, so that we design, implement and operate a measurement system that works for us and creates an evidence base that can be used to help drive both the delivery of our strategic goals and 2025 ambitions and the improvement in our organisational performance.

The starting point for our measurement work is that it must fully reflect what the Trust does and be grounded in what the Trust wants to achieve.

Outcomes Measurement Framework Phased Implementation

2015/16	2016/17	2017/18
Design of Outcomes Measurement Framework	Putting the Infrastructure in Place – Time Critical Testing & Piloting; Toolkits	Putting the Infrastructure in Place – Non Time Sensitive
	External Reference Group	Scaling Up Measurements in Longitudinal Areas
	Sharing & aligning OMF with others	Capture/buy/trade services – outcomes generated by others – Platform
	Filling Knowledge Gaps	Building repository of evidence – retrospective
	1st Outcomes Report	2nd Outcomes Report

Guiding principles for building the framework

From an outcomes perspective, the Trust is in a **unique but challenging position due to the ‘multi-benefit’ nature of waterways**, derived from the diverse roles that waterways can and do play in society. The ‘breadth’ of impacts and outcomes generated by waterways is more diverse but the ‘depth’ of each impact and outcome generated will often be less significant than those generated by other charities and bodies focussed upon a specific issue or policy area.

With this relative lack of depth in outcome generation, there is real value where strong synergy exists with the outcome ambitions of other organisations who are a well-recognised and authoritative voice in a particular area of policy and measurement that we align our approach, where possible. This will enable the Trust to contribute to their well-established Outcome Measurement Frameworks – leading to greater societal impact.

In developing a coherent framework to underpin our measurement work, it must:

- have a strong and direct link to our charitable objects, vision, strategic goals and 2025 ambitions;
- emphasise the breadth of impacts and demonstrate the cross-cutting contribution to wellbeing;
- align with well-established and recognised OMF devised by others (so we are measuring the same things and in the same way), where applicable; and
- be sufficiently robust for our needs without creating an over-ambitious, expensive and unwieldy system for the Trust to implement and operate and, wherever feasible, building upon what already exists both internally and externally.

Working with Cardiff University to build the framework

During 2014/15, the Trust worked collaboratively with Cardiff University’s Sustainable Places Research Institute (PLACE) to develop an OMF and suite of supporting output and outcome orientated indicators.

Before embarking on developing our OMF, we jointly sought to gain insight on effective approaches adopted and different ‘whole framework’ models devised and operated by others. For example, the outcome measurement work devised by Public Health England set out in *Improving outcomes and supporting transparency Part 1A: A public health outcomes framework for England, 2013–2016*. We also developed intelligence on the pitfalls to avoid. This involved taking account of best practice advice in building measurement frameworks – including in particular, *Building Your Measurement Framework: NPC’s Four Pillar Approach* by Anne Kazimirski and David Pritchard, New Philanthropy Capital, June 2014.

This comparative assessment and review of different ‘whole framework’ models devised by others and best practice guidance helped to define a clear suite of guiding principles which were used to steer the design of the framework (these principles are set out in the diagram on the OMF Design Process which can be found on page 46).

Scientific consulting research method

PLACE adopted a participatory science approach and applied a scientific consulting research method. The process of developing the Framework was informed by outcomes based accountability and evidence of how social benefits can be effectively measured. It also sought synergy with public policy priorities and governmental frameworks for monitoring sustainability and wellbeing in England and Wales.

PLACE combined academic desk research with roundtable interviews with key functional heads within the Trust. This mixed method approach enabled them to identify appropriate domains and suitable metrics to underpin these domains for the measurement framework. The purpose of this joint exercise was to assess the degree to which the Trust’s existing data reporting aligned with identifiable indicators from similar frameworks and academic research. It also ensured that the expertise of the Trust staff could be incorporated into the development of a bespoke set of domains capable of capturing in full, the breadth of societal outcomes generated by the waterways.

PLACE drew on their multi-disciplinary team to provide an initial peer reviewed long schedule of potential draft indicators, which were derived from an extensive review of:

- individual and / or domain level outcome indicators already in use by other organisations;
- relevant policy and academic literature; and
- priorities, practices and future ambitions of the Trust.

As outlined in Section 2, the OMF has been designed to encompass the 'multi-benefit' nature of waterways and consists of six domains, 14 sub-domains, the outcome ambitions and indicators (and can be found in the pull-out section at the back of this document).

Indicator shortlisting – criteria based selection process

The shortlisting exercise to identify the suite of primary indicators was challenging – iteratively reducing the draft schedule of potential primary indicators collated by PLACE from 340 to 19.

The Trust, working collaboratively with the Cardiff University researchers, applied the following criteria to shortlist the draft indicators. By using this set of criteria, it was possible to systematically identify and prioritise the most important outcomes to measure:

- outcomes we directly influence (rather than indirectly support);
- outcomes that underpin and support our vision and our 10-year strategy with 2025 ambitions;
- outcomes that are not too costly to measure;
- outcome measurements that will produce credible data;
- access statutory and voluntary funding; and
- outcomes for which there is synergy with recognised indicators adopted and used by others.

Where they are appropriate and relevant, the Trust has sought to align the outcome indicators with those used by others. As well as enabling us to make direct comparatives, the outcomes measured by the Trust can also in turn be used by others, increasing our credibility and optimising the value and use of our measurement work (for example, Public Health England – an indicator relating to the significance of accessible green space as a determinant of public health). In other policy areas such as 'Digital Britain', 'Transport Modal Shift' and 'Energy Security', there are acknowledged metrics which PLACE and the Trust utilised.

Suite of indicators & logic chains

For each outcome, a primary indicator and process of collecting data to measure progress was identified. PLACE and the Trust developed draft logic chains for each indicator including information on: data sources; methods of data collection and analysis; measures of outputs, processes and quality; and plans for future research. The logic chain template devised by PLACE (based upon an adaptation of the version devised by Public Health England contained within *'Improving outcomes and supporting transparency Part 1B: Public health outcomes framework for England, 2013–2016 appendices'*) is set out below.

As part of this logic chain development work, an assessment of scale of impact was undertaken for each indicator in accordance with the fact that the different outcome ambitions will deliver different scales of impact. This is because our contribution will vary significantly across the suite of outcome ambitions, dependent upon either the capacity of the waterways themselves or the scope of external policy challenge. This has been a determinant factor in identifying the appropriate level and form of measurement and investment. This logic chain development work also involved an assessment of the ability to report; and frequency of reporting to identify those indicators that are currently being measured, those indicators not currently measured but relatively easily achievable and those indicators not readily accessible to measure.

Domain
Sub-domain
Outcome ambition
Outcome indicator
Definition
Rationale
Data source
What to measure
How to measure
Factors influencing selection of measurement option
Example of data collection question(s)
Who to measure
Baseline
Frequency
Cross-reference to Trust's charitable objects, strategic goals & 2025 ambitions
Trust's activities contributing to societal / wellbeing outcomes
Notes / references

The result is a robust and achievable framework that sets out cross-cutting ambitions (accompanied by a suite of primary indicators reflective of wellbeing in its widest sense) to enable the Trust to measure progress, using an outcomes-focused approach, which supports the strategic vision whilst contributing to wellbeing.

The design process adopted in developing our OMF is illustrated in the diagram overleaf.

Outcomes Measurement design process

Guiding principles & internal drivers:

- Strong link to our **vision, strategic goals and 2025 ambitions**
- Emphasis on **breadth of impacts** (reflecting the different roles of the waterways and Trust's activities) rather than the depth of impact
- **Transparent and realistic** – evidence-based impact reporting which can stand up to external scrutiny
- **Clear and robust narrative** about how the Trust has an impact, with quantitative support
- **Pragmatic and cost effective** – building on what tools and data sources already exist both internally and externally
- **Practical and relevant** – can be used to help drive improvement in organisational performance
- **Flexible and futureproofing** – can be easily tailored for different target audiences; providing the Trust with a 'menu' of outcomes; ability to change and be built up over time
- **Do not re-invent the wheel** – measuring the same things and in the same ways as other organisations where their frameworks are well-established and recognised
- **Rigour** – choose an appropriate level of rigour for evidence of our impact that suits the Trust's purposes

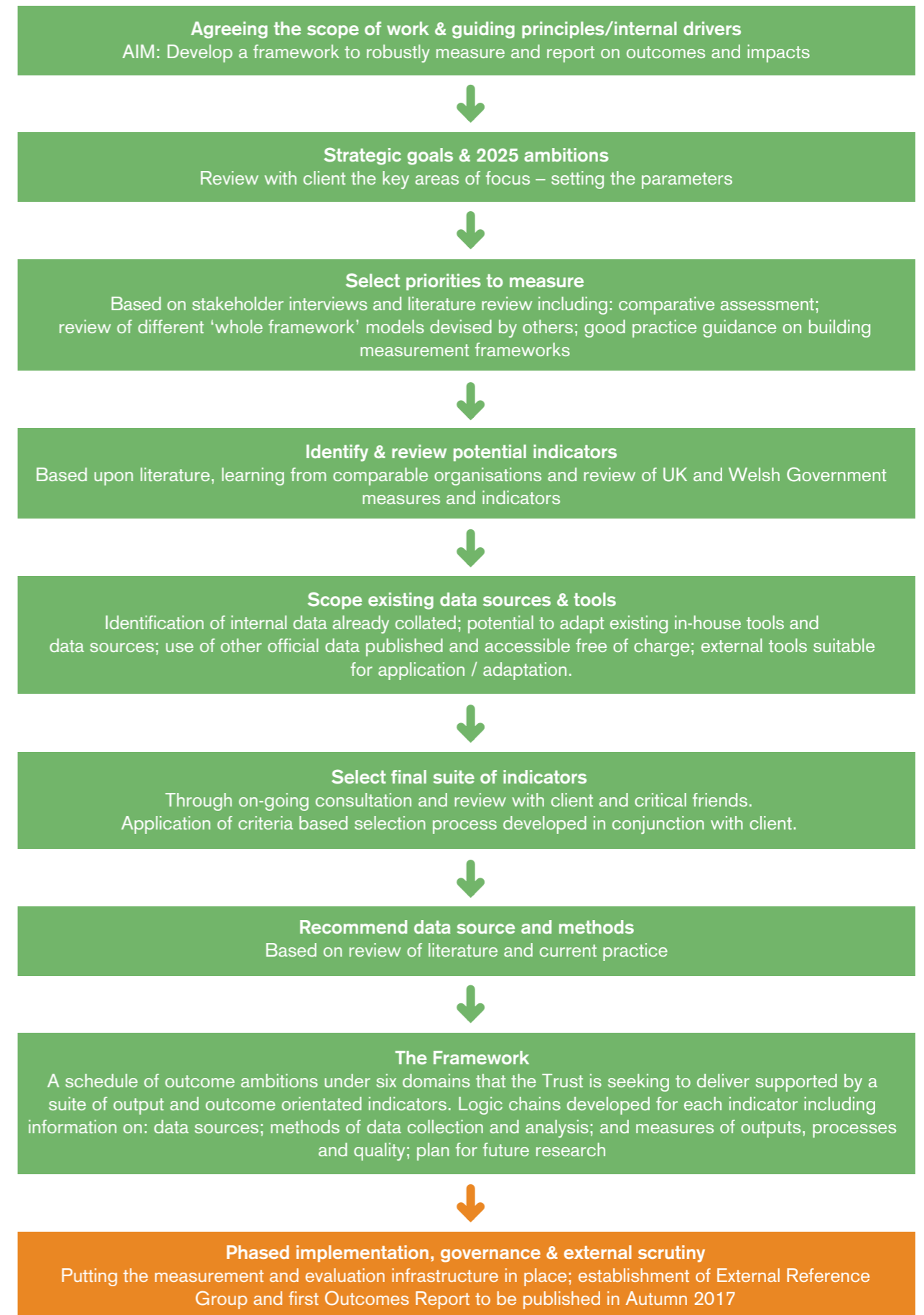
External drivers

- National and devolved policy context in England and Wales
- External funding landscape – statutory and voluntary
- Credibility and relevance to others
- Outcomes based accountability

Approach adopted by PLACE

- Participatory research involving staff
- Iterative process: purpose – reflect – amend
- Draw on best practice and expertise
- Seek to align with Government priorities and measures
- Qualitative and quantitative measures
- Researchers as critical friends

The process:



4



Cycling, walking & running along our canals, Islington

Section 4:

How we measure – Governance & Baseline

Governance & external scrutiny

As outlined in the previous section, the Trust, in collaboration with the Sustainable Places Research Institute (PLACE) at Cardiff University, has developed an Outcomes Measurement Framework (OMF) to robustly demonstrate the relevance and value of the waterways to the communities they serve. The framework will provide the foundation on which the Trust will:

- implement a research and evaluation programme to measure the economic, social, cultural and environmental contribution that the waterways make to wellbeing; and
- form the basis for outcome measurement and reporting as well as for creating evidence based ‘storytelling’ to illustrate the impacts and outcomes delivered.

In November 2015, our Board of Trustees approved the establishment of an External Reference Group (ERG) to act as a sounding board for this framework consisting of people with strong credentials in this field in order to help the Trust maintain rigour and learn from best practice.

OMF External Reference Group (ERG) remit

Whilst the ERG is not part of the Trust’s overall formal governance, the Group has two functions:

1. **To act as a ‘critical friend’**, providing a reflective assessment on proposed research methodologies, data collection and analysis with an opportunity to offer alternatives and learn from best practice. This will ensure that there is rigour of analysis both in academic and application terms as well as helping to mitigate against the risks of entrenched thinking.
2. **To provide public policy insights** in a wide range of fields linked to economic, social and environmental wellbeing, reflecting the cross-cutting nature of waterways, the breadth of our impact and our contribution to the nation’s wellbeing in its widest sense. These would provide a policy assessment of the proposed net contributions to the key domain areas. They would also provide insight into key policy themes and potential networks, for further dissemination of the findings.

ERG membership

The ERG is chaired by Tom Franklin, a former Trustee, and reports to the Board and is supported by Heather Clarke, Director of Strategy and Planning, the Trust’s executive lead on policy, research and measurement. Members were invited to join by our Chief Executive in consultation with the Chair. To reflect the breadth of public benefits measured, the ERG may have a membership of up to 10 members consisting of experts from a range of backgrounds, representative(s) from: academia; the public, private and charity sectors with interest / expertise in public policy and outcome measurement; and specialists in the field who advise and support the charity sector in outcome measurement and reporting. The ERG consists of eight members including the Chair and the schedule of members is listed on page 117.

ERG activities

The ERG has had two six monthly meetings since the augural meeting held in June 2016. The ERG has provided valuable insight and feedback which has guided the implementation phase of the Trust’s outcomes measurement work outlined in the section 5 on *Measurement Tools and Data Sources* of this report.

Understanding our Waterside Communities

Demographic profiling of waterway corridor populations

To gain a deeper understanding of the communities who live adjacent to or in close proximity to a waterway owned and / or managed by the Trust and those people who are using and enjoying them, the Trust has used its geographical information systems (GIS) capability in conjunction with small area data to explore the characteristics of the ‘waterway corridor’ population.

The ‘waterway corridor’ population has been defined as those people living within one kilometre of a waterway owned and / or managed by the Trust. This one kilometre geometry has been chosen subjectively on the basis that those people who live closer to the waterway should be the principal beneficiaries. This assumption will be revisited once more data is available through the towpath intercept surveys and the local community surveys conducted in the longitudinal study areas (both these surveys are explained within Section 5).

The Trust has mapped the census data and other official published data on population, ethnicity, health, deprivation, disability, education, employment and transport, both at local authority and at census Output Area (OA) level that fell within a one kilometre corridor of a canal or navigable waterway (from their geographic centre), where data is available.



Illustration of the buffer of one kilometre either side of the centreline of the waterway network owned and / or managed by the Trust created using GIS software

The following indicators derived from the demographic data contained within the 2011 Census relating to these 'riparian output areas' were mapped enabling the Trust to interrogate fully the socio-economic characteristics of the waterway corridor population:

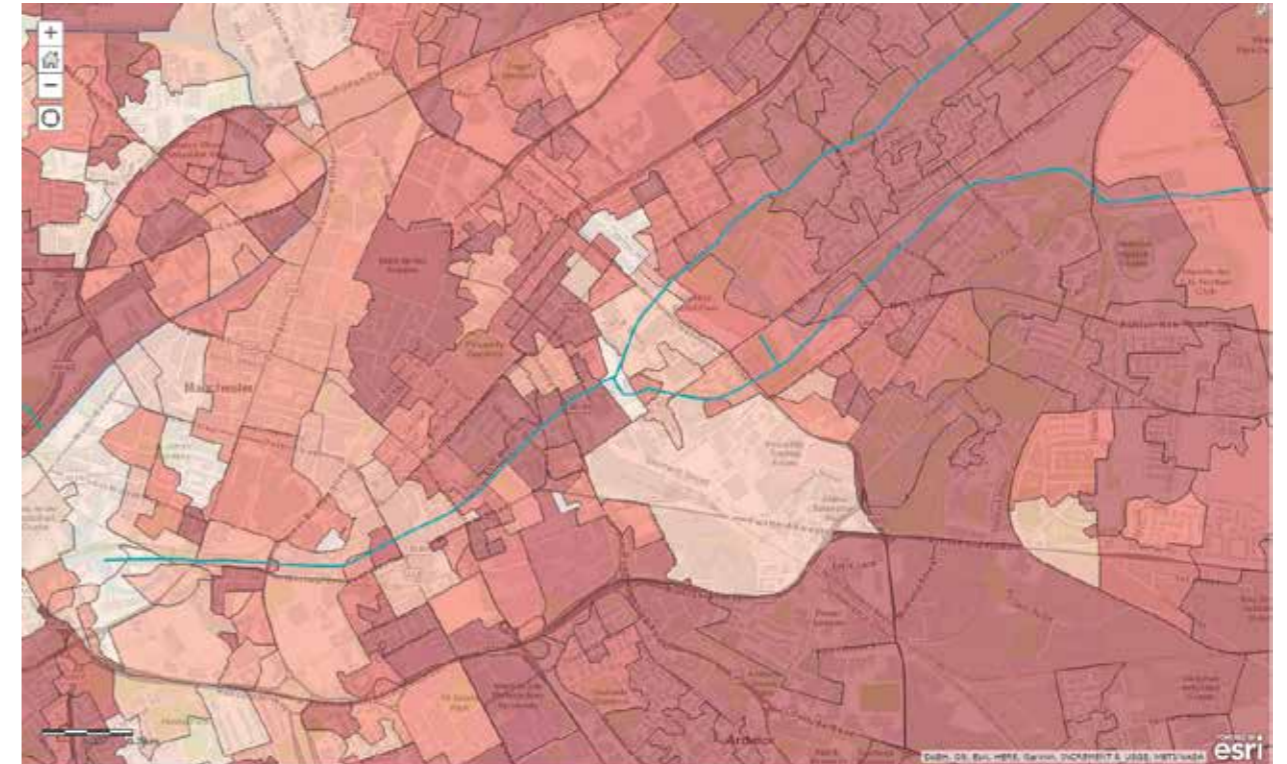
- **Deprivation data** – Children in poverty (Under 16s); long term unemployment; household deprivation
- **Economic data** – Gross weekly and annual pay; proportion of business (VAT) registrations per 10,000 resident population aged 16 and above; housing affordability
- **Health data** – Excess weight in adults (percentage of adults classed as overweight or obese); obese and excess weight (reception and year 6 – number of children); physical activity – less than 30 minutes a week and more than 150 minutes a week
- **Population data** – Resident population; ethnic group – all usual residents
- **Transport data** – Cars or vans in household; method of travel to work
- **Wellbeing data** – Life expectancy from birth; wellbeing

Analysis of data from the 2011 Census demonstrates how the demographic characteristics of those living within one kilometre of a Trust waterway compare with the demographic characteristics of England and Wales overall:

	England and Wales	Waterway corridor (population living within one kilometre of Trust owned or managed waterway)	Percentage
Population	56.1 million	8.1 million	14.5%
	England and Wales	Waterway corridor (population living within one kilometre of Trust owned or managed waterway)	Difference
Deprivation	57.66%	60.93%	3.27%
Disability	17.92%	17.85%	-0.07%
Education	28.31%	30.65%	2.34%
Unemployment	6.28%	7.46%	1.19%
Ethnicity	14.03%	21.01%	6.98%
Health	5.61%	6.01%	0.40%

- 1) Resident Population: 2011 Census, QS102EW.
- 2) Deprivation: 2011 Census, QS119EW. Proportion of households deprived in at least one dimension.
- 3) Disability: 2011 Census, QS303UK. Derived by adding together proportion of population who report that day-to-day activities are limited 'a lot' and 'a little'.
- 4) Education: 2011 Census, QS501EW. Derived by adding together proportion of population with 'no qualifications' or 'other qualifications'.
- 5) Employment: 2011 Census, KS601 EW to KS603EW. Proportion of economically active population who are unemployed.
- 6) Ethnicity: 2011 Census, KS201EW.
- 7) Health: 2011 Census, QS302EW. Proportion of population reporting 'bad' or 'very bad' health.

The Trust has mapped these chosen indicators for local authority 'districts' against the national average for that indicator using a heat map tool (where appropriate). For each indicator, the Trust has calculated the rank (for example, from most to least) for the riparian Local Authority District (LAD) and Census Output Area (OA). These have then been grouped into deciles (ranges of 10%) to develop our heat map against the national average.



Screenshot from the Census app providing information about deprivation relative to the national average in Central Manchester

Insights from demographic profiling & analysis work

The data and intelligence derived from this extensive demographic profiling and analysis work has firstly, enabled the Trust to establish the extent of the potential 'reach' in terms of population catchment within waterway corridors nationally and locally. Further details on population densities of waterway corridors within the different city regions are included within Appendix 3.

Secondly, this data and intelligence has revealed the significant regional and local variation in potential 'reach' in terms of connecting and engaging with communities with different demographic characteristics. For example, 70% of the populations living within < one kilometre of a waterway in Burnley in East Lancashire and Black Country in West Midlands and 67% in London Borough of Brent are from a BAME background. In contrast, Sefton within Liverpool City Region, Pocklington in East Riding of Yorkshire, Devizes in Wiltshire, Torfaen in South Wales and Wrexham in North Wales are all predominantly British White with less than 3% of the populations living within < one kilometre of a waterway from a BAME background. The comparative analysis between the demographic profiling outputs and the results from the national Waterway Engagement Monitor, the local community surveys and the towpath intercept surveys conducted within the longitudinal study areas (on how reflective the users are of the local population and residents' views of their local waterway as a community asset, etc) has highlighted the significant regional and local variations and defined the scale of the opportunity and challenge of the waterways being truly local, relevant and inclusive. This disparity between users and local communities is explored in more detail in Section 7.

In addition to gaining a better understanding of the communities living within waterway corridors, the Trust has also utilised the data and intelligence derived from this work to:

- inform the selection process for the longitudinal study areas (see Section 5 for more detail);
- respond to devolution more effectively – using the evidence base to support the embedding of waterways across different policy areas at the different sub-regional, local and neighbourhood levels; and
- provide local data sets for the operational staff and the Waterways Partnerships at the local level to identify target areas for future interventions and activities, in particular, the design of local community based projects. A bespoke online GIS app that enables the staff to be able to explore and interrogate these characteristics has been developed and rolled out.

Furthermore, the intelligence derived from this demographic profiling and analysis work formed the basis of case study included within the British Academy Policy Report (March 2017) on *Where We Live Now – Perspectives on Place and Policy* which has reviewed evidence in relation to people's attachment and connection to place to inform place-based policy making.

Sport England & national GP practice profile data

In addition to the demographic profiling that has taken place using small area Census data, the Trust has also used other sources of data to further its understanding of the communities who live within the waterway corridors.

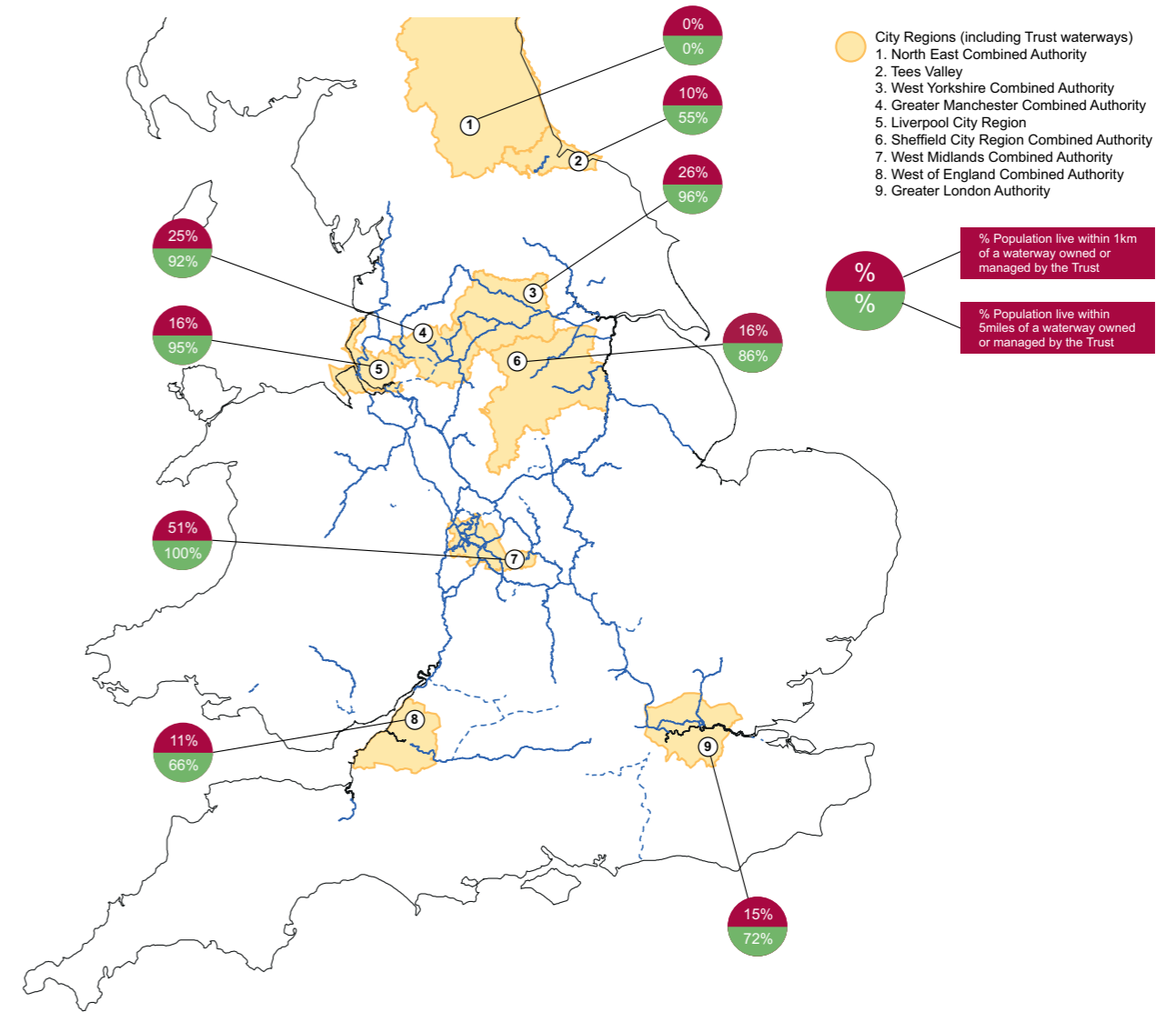
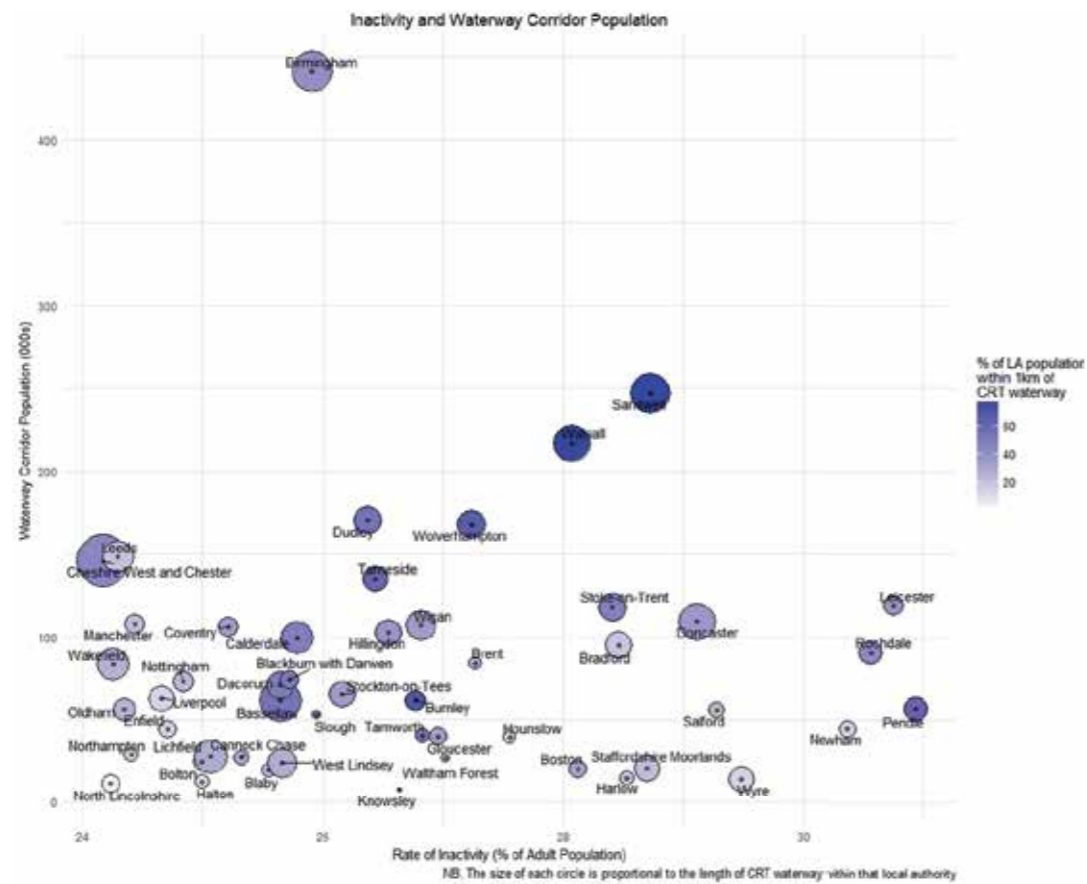
With specific reference to the Trust's efforts to increase activity levels, local authority level data from Sport England's Active Lives Survey has been used to identify the intersection between local need and the Trust's influence within each local authority.

Local need was measured by the proportion of the adult population which is inactive. The full dataset was then restricted to the least active 25% of all local authorities that also contain one of our waterways. The Trust's influence was proxied using three variables:

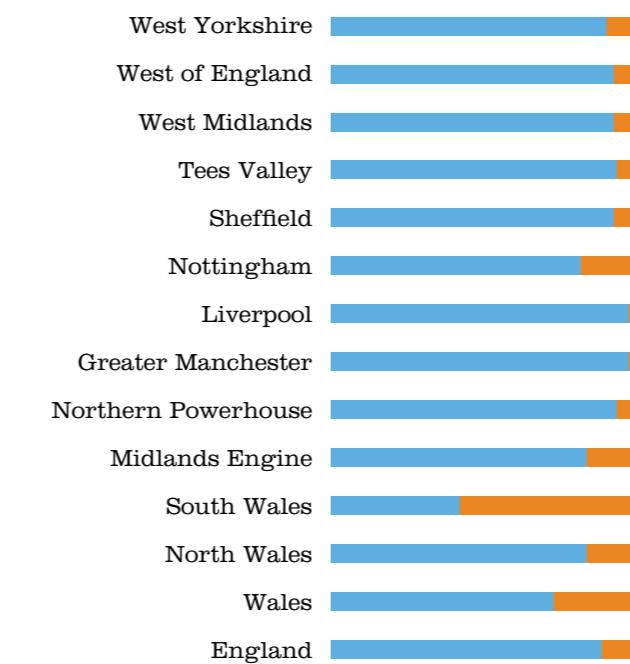
- the size of the population living within one kilometre of our waterway;
- the length of waterway within each local authority; and
- the percentage of the local authority population living within one kilometre of our waterway.

The results of this process can be shown in the graph below. The size of each circle is proportional to the length of waterway within the local authority and the shading relates to the proportion of the local authority population who live within one kilometre of our waterway.

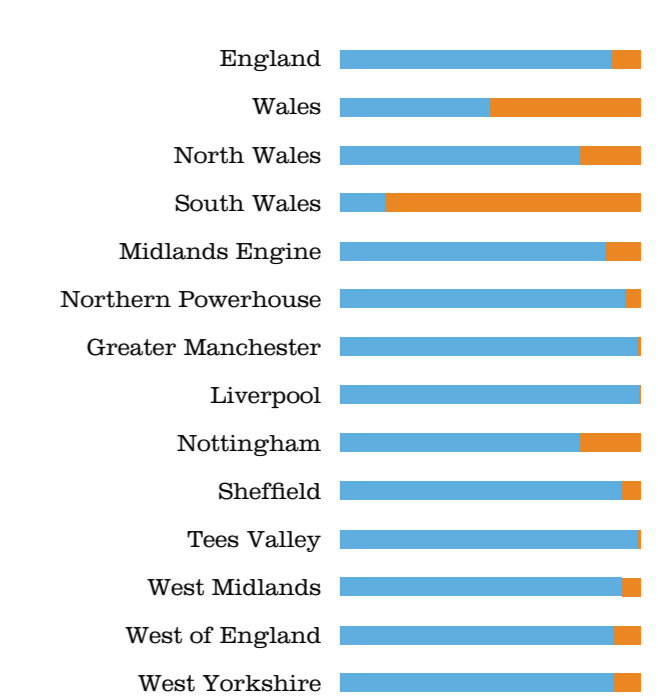
Similar exercises were carried out using information from Public Health England's National GP Practice Profiles dataset to identify areas with particularly high rates of obesity and mental health problems among registered patients. In addition, data from the National Childhood Measurement Programme was used to identify local authorities where a high proportion of Year 6 pupils are obese.



Rural/Urban Split by 8 km (5 mile) Waterway Corridor



Rural/Urban Split by 1km Waterway Corridor



Urban Rural

5



Family fun on a canoe

Section 5:

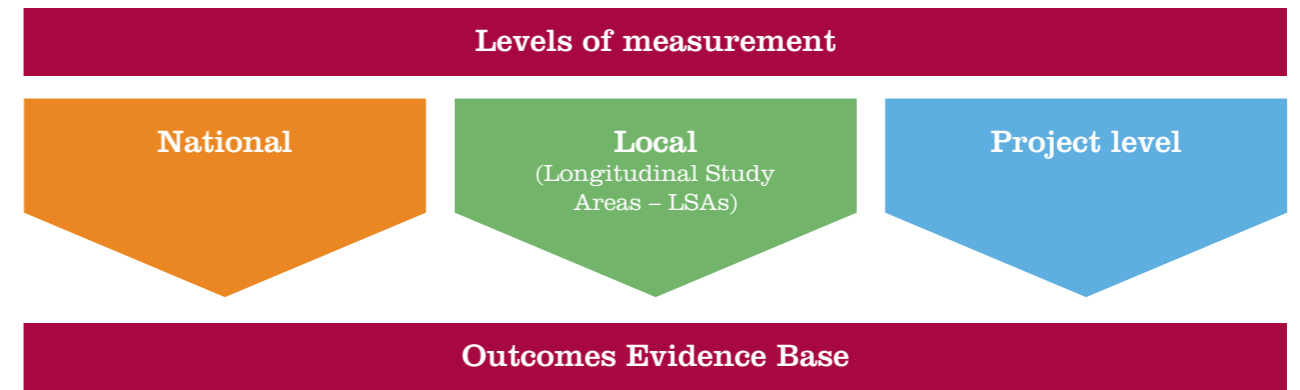
How we measure – Measurement Tools & Data Sources

Our approach to evaluation & measurement

This section seeks to briefly explain our approach to *where* and *what we measure*. Owing to the geographical extent of our waterways 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 concentrate our resources and efforts on measuring and evaluating outcomes at three levels.

National	Local	Project
<p>Insights from the Waterway Engagement Monitor, development of national models with local application, other initiatives and material where available. These national measures on their own are not sufficient to provide the depth of understanding and richness of data required for effective outcomes reporting.</p>	<p>Undertake in-depth measurement and evaluation work in the selected Longitudinal Study Areas (LSAs) in England and Wales across all the OMF domains (which are reflective of the different the communities of the UK). This should hopefully enable the Trust to demonstrate the relevance and value of the waterways and the form and degree of impact delivered over time at a local level; but when aggregated can be used to present a national picture on waterways and wellbeing and track changes, impact and trends over time.</p>	<p>Evaluations to be undertaken of externally funded projects and contracted projects promoted by the Trust or partnership-led projects to measure the effect and impact of the activities and interventions made by the Trust – to demonstrate the difference we are making to local people's lives. More detailed evaluations to be undertaken for those projects located within the longitudinal areas for the reasons cited above. (Evaluation of projects led by other charities and organised groups to demonstrate how the waterways are being used by others as platforms for a wide range of activity, will be a later phase).</p>



Longitudinal & Counterfactual Study Areas

Longitudinal Study Areas (LSAs)

The Trust has selected fourteen sections of waterway corridors across the network using a 'purposive sampling framework' that sought to identify areas of the waterway corridor that are reflective of the diverse nature of communities within England and Wales. These Longitudinal Study Areas (LSAs) will be the areas where we focus our in-depth measurement and evaluation work across all the six OMF domains.

Our internal Geographical Information Systems (GIS) capability was used to explore the demographic characteristics of the communities living within one kilometre of our waterways. This demographic analysis work formed the basis on which the other key selection criteria were applied for the identification of the fourteen Longitudinal Study Areas (LSAs).

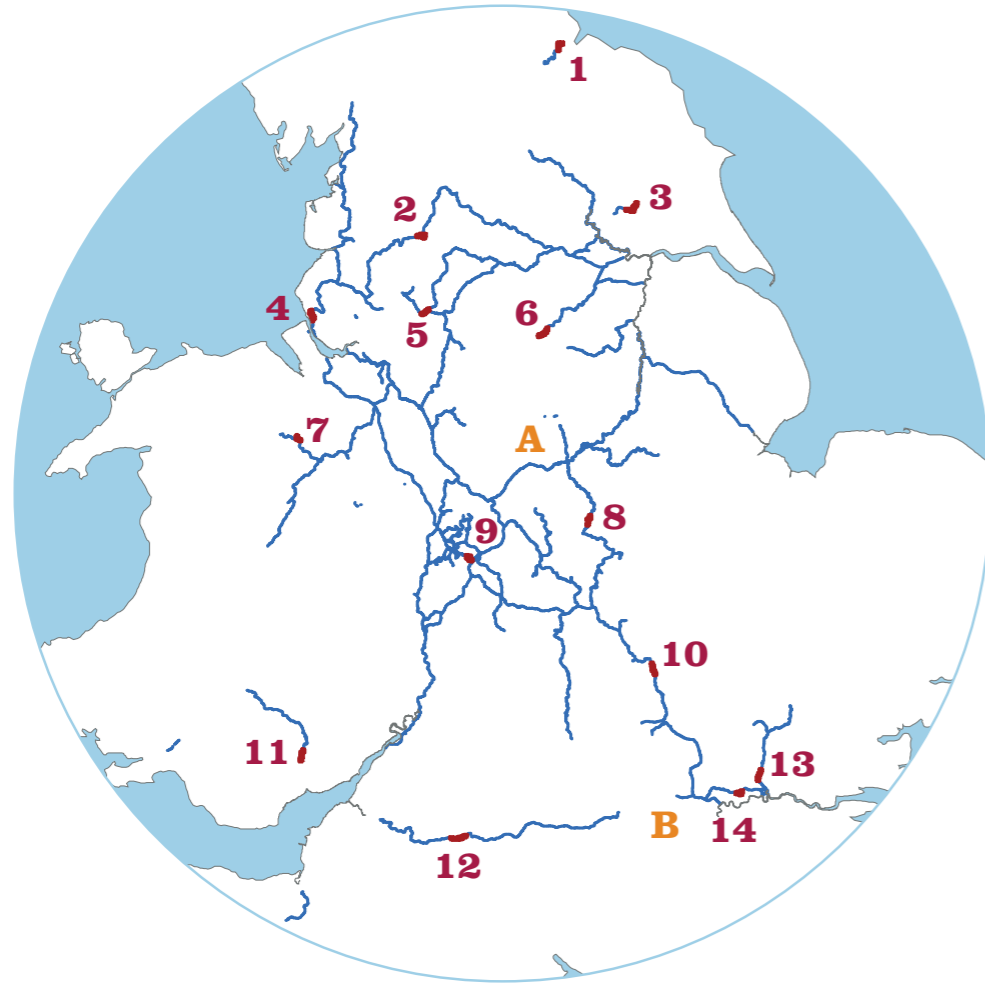
The LSA selection criteria:

- reflective of the diverse variation in demographic characteristics of the communities living within one kilometre of our waterways;
- where the Trust is likely to make significant interventions over time;
- reflective of the different waterway types, for example, canals, rivers, docks and reservoirs; and
- representative of all regions in England and North and South Wales.

These selected LSAs should hopefully enable the Trust to demonstrate the relevance and value of the waterways at a local level but when aggregated can be used to present a national picture on the waterways and wellbeing and to track changes, impact and trends over time.

The geographical domains of the fourteen LSAs range from three to eight kilometre sections of waterway corridors. The locations that were chosen through this process are shown on the plan that can be found overleaf. The detailed demographic characteristics of the areas selected are included in Appendix 2.

Plan of the longitudinal & counterfactual study areas



Longitudinal Study Areas (LSAs):

- 1. Stockton-on-Tees
- 4. Sefton
- 7. Wrexham
- 10. Milton Keynes

2. Burnley



Counterfactual Study Areas (CSAs):

- A. Derby
- B. Woking

14. Regent's Canal



3. Pocklington



5. Manchester



12. Devizes



9. Birmingham



13. Tottenham Hale



11. Torfaen



6. Sheffield

8. Leicester



Currently there is no LSA located in the East of England region since the Trust does not have any real presence there. We intend to discuss with our former colleagues in Scottish Canals as to whether they would like at least one LSA to be included.

Counterfactual Study Areas (CSAs)

Following feedback from the ERG, two counterfactual areas have been selected as ‘controls’ for evaluating impact, namely:

Derby (East Midlands) – an area within a one kilometre buffer either side of the now-derelict Derby Canal. Deprivation, disability, unemployment and health levels are roughly similar to averages across the national waterway corridor but smaller BAME population (12%) than national waterway corridor (21%). Part of the old canal line now forms part of the National Cycle Network. The results from this area will give some indication of the value of a similar green space without the water.

Woking (South East) – an area within a one kilometre buffer either side of the Basingstoke Canal, which is owned and managed by the local authority, providing opportunity to examine the added value of the Trust.

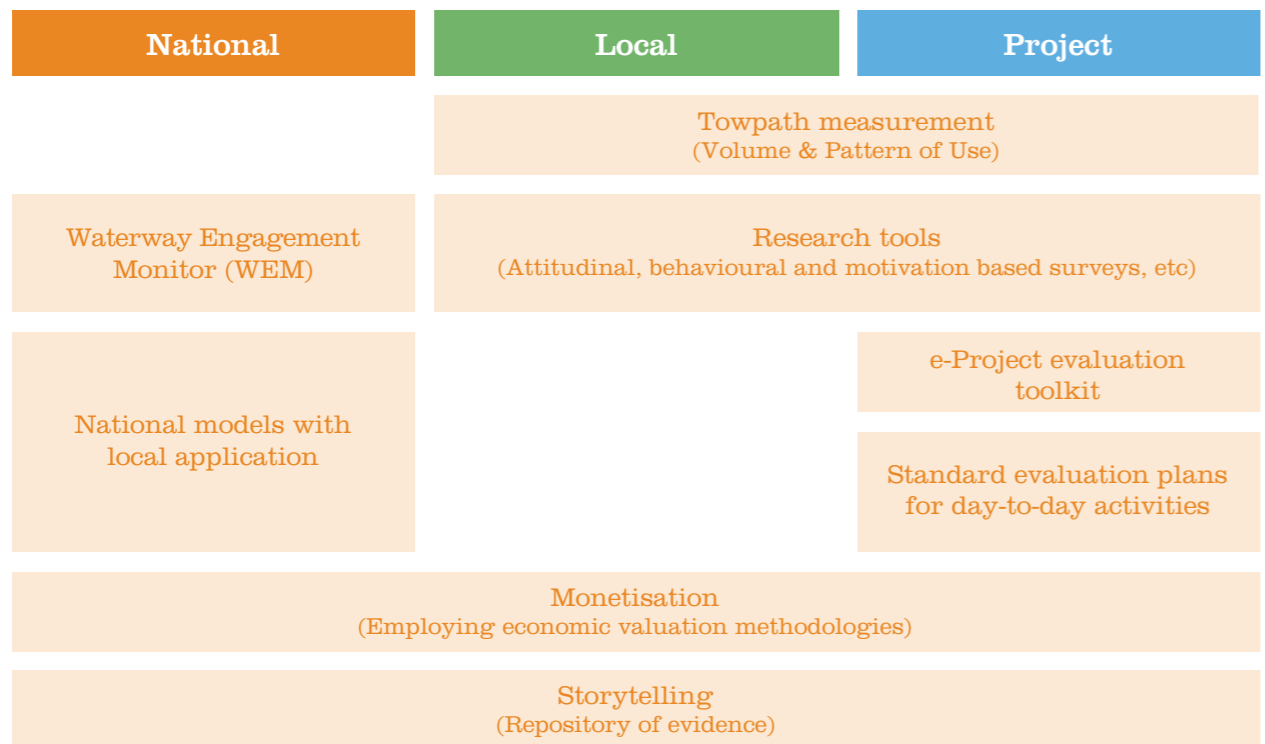
Introduction to our quantitative & qualitative measurement methodologies

This section seeks to provide an overview of:

- six principal measurement methodologies that the Trust is utilising to evaluate and measure outcomes; and
- the main activities associated with ‘putting the measurement and evaluation infrastructure in place’ so that we can start collating the data to build the evidence base.

A draft phased implementation and reporting plan for each primary indicator within the OMF, which was developed and refined following scrutiny by the ERG.

Taking account of the ERG recommendation that the Trust should focus on adopting a limited number of measurement methodologies, we are now concentrating on six main measurement methodologies, namely: Waterway Engagement Monitor (WEM); towpath use measurement; national models with local application; suite of research tools; e-Project evaluation toolkit and standard evaluation plans for day to day activities; and a repository of evidence for storytelling.



To date we have been focusing our efforts on ‘putting the measurement and evaluation infrastructure in place’ that will define the impact of the Trust, that is, capturing the outcomes generated from the activities and interventions made by the Trust or made in partnership with others.

It is the intention next year to explore ways of capturing and reporting upon ‘passive’ outcomes generated by other charities, clubs, societies, social enterprises, community etc, waterway sector or waterway dependent businesses (for example, hire boat companies) using our waterways as a platform.

For many of the OMF indicators, internal data already exists or can be obtained through adaptation and expansion of internal data sources, accessing Partner data or use of other official published data. However, there are a few OMF indicators, where the Trust does not have any measurement tools or data sources in place. Therefore, the Trust has been concentrating on those OMF indicators that are likely to yield the most significant impacts; but where we do not currently have any measurement tools or data sources. Identifying the most cost-effective and robust way of measuring towpath use and developing appropriate methods of measurement linked to participation and diversity are the two most important areas of focus.

A key aspect of this ‘putting the measurement and evaluation infrastructure in place’ is the engagement and collaborative working with key partners at national, city region and local levels to ensure that we are aligned and taking account of current thinking and best practice.

Measurement tools & data sources	Putting the infrastructure in place	Section no. & Pages no.
Waterway Engagement Monitor (WEM)	Adaptation of existing survey tool to capture outcomes measurement, primarily self-reporting and perception indicators	Section 5, page 64
Towpath use measurement	Testing and piloting new technologies for measuring volume and type of towpath use and designing, testing and piloting the towpath intercept surveys on motivations before scaling up	Section 5, page 65
National models with local application	Development work on the wellbeing index and waterway dividend metric (will not commence until 2018)	
e-Project evaluation toolkit and standard evaluation plans for day-to-day activities	Building and testing a project evaluation toolkit and standard evaluation plans for day-to-day activities which can be easily used across the organisation	Section 5, page 72
Storytelling	Establishing a repository of evidence, case studies, testimonies and examples for effective storytelling and building campaign	Section 5, page 75
Suite of research tools	Designing, testing and piloting new suite of research tools (including attitudinal, behavioural and motivation based surveys) and other research tools (to support the toolkits and the in-depth measurement in the Longitudinal Study Areas) before rolling out	Section 5, page 77
Valuation methodologies for monetisation	Identifying and applying appropriate methods to use for each indicator so that we can apply a monetary estimate on the contribution that waterways make to society.	Section 5, page 80
Filling the knowledge gaps	Outcomes related research programme to help establish the baseline and gain a better understanding of key issues and opportunities	Section 6, page 84

Waterway Engagement Monitor (WEM)

Adaption of an existing tool

The Waterway Engagement Monitor (WEM), an online monthly survey, is the Trust's primary tool for measuring brand awareness, engagement, participation and people's motivations for use of our waterways. This online monthly survey focuses on both use of the waterways such as volume of visitors to the waterways, frequency, activity type, visitor satisfaction, motivations and demographics as well as eliciting information of strategic importance to the Trust about the levels of brand awareness, appeal and advocacy within the wider population.

The Trust will use this tool to measure and evaluate some of the OMF indicators at a national level. This continuous survey (operational since 2004) is currently managed by BDRC Continental on behalf of the Trust. Between 2004 and April 2015 it was administered using a telephone methodology but moved in May 2015 to an online methodology with a sample drawn from online panels.

A nationally representative sample comprising 960 adults across England and Wales are interviewed each month, totally 11,500 adults over the year (and the sample is weighted to represent the England and Wales adult population). There is an even distribution of respondents throughout the month in order to smooth vagaries of weather and other extraneous factors. All survey respondents are adults aged 15 or over (although information is collected on ages of all household members including children and ages of all child participants in waterway activities). Data is weighted to the national GB population profile in terms of region, sex, social grade and age.

It will provide a national and regional benchmark against which local community surveys and towpath intercept surveys conducted within the Longitudinal Study Areas and project-specific evaluations can be compared.

WEM has been adapted to include the survey questions relating to:

- household demographics; long term illness, health problem, disability; ethnicity;
- alternative mode of sustainable transport; use as a location for physical exercise; awareness of and value of waterway to local area; and length of time lived in current neighbourhood; as well as
- the self-reported, attitudinal and perception indicators, linked to the six OMF domains.

Since April 2016, the Trust has included the four Office of National Statistics (ONS) four measures of subjective wellbeing. We intend to compare these results with the UK National Statistics for the same period when published by the ONS later this year.

Towpath measurement

Measurement of volume and type of towpath use

The Trust recognised at an early stage that some of the potentially high impact generating OMF indicators are dependent upon having robust and accurate data on the volume, frequency, timing, type and duration and patterns of use of our towpaths. This data is essential for calculation of the public benefit associated with physical health and sustainable transport. This data would also provide valuable insight on towpath use for management and commercial purposes and for measuring 'value for money' in relation to future towpath investment.

Historically, data was collected using manual and electronic pedestrian counters. However, budgetary pressures meant that British Waterways (predecessor to the Trust) was forced to deactivate many of these counters in 2011.

Since 2011, our primary source of data on volume, timing and patterns of towpath usage has been derived from surveys, both from our national WEM and ad hoc surveys at designated sections of the towpath as part of third party funded projects. From an outcome measurement perspective, there is an imperative for towpath usage data at a greater level of geographical accuracy than provided by the WEM and greater consistency and coverage at a local level.

The following sub-sections set out the Trust's approach to identifying an appropriate methodology which facilitates the measurement of the frequency, timing, type and duration of use of our waterways and towpaths.

Geolocation (anonymised mobile phone data) – testing a new technology

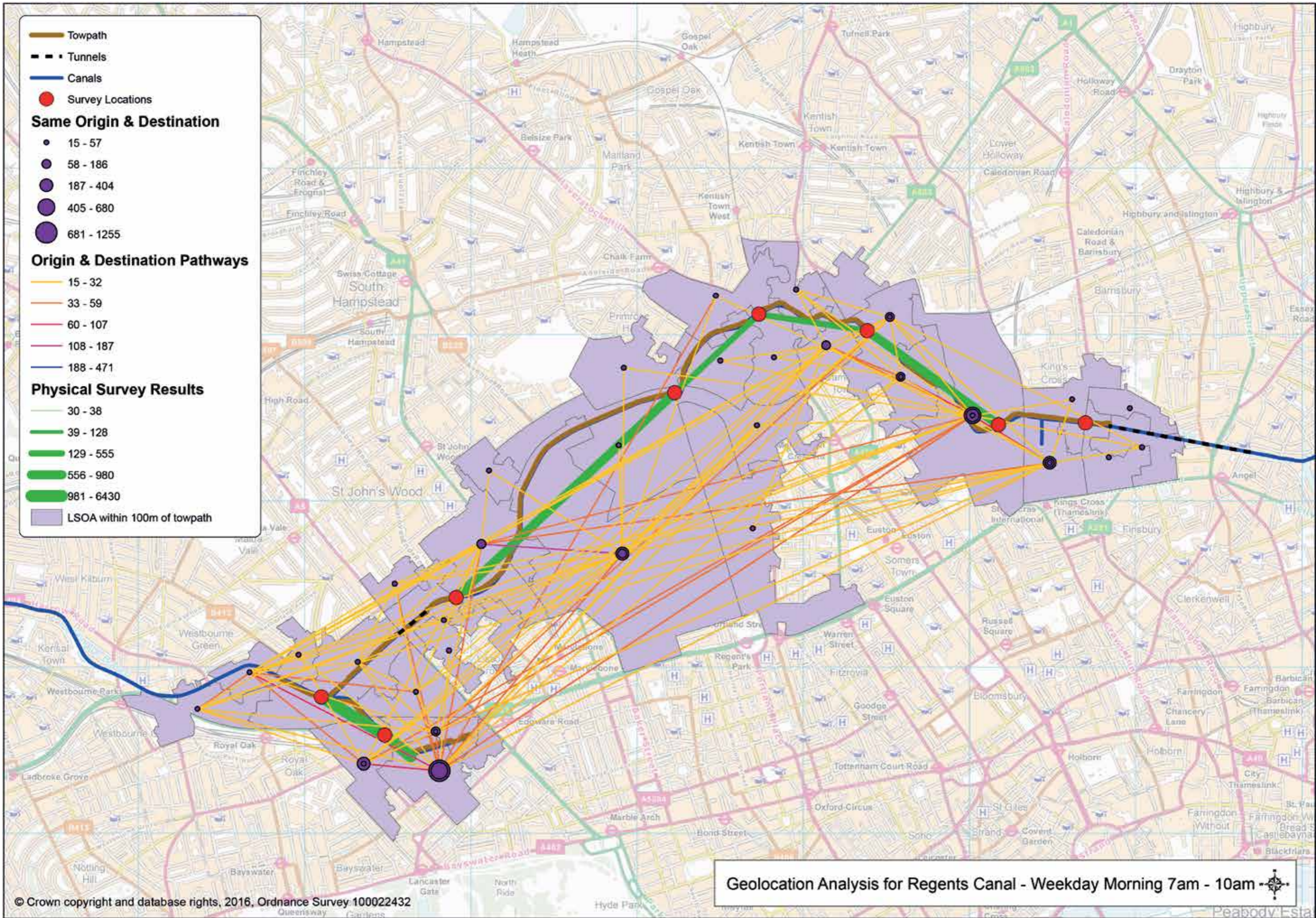
In late 2014 the Trust scoped out requirements (in relation to spatial accuracy, geographical coverage, reliability, affordability and value for money both in terms of capital and revenue) and undertook an initial desktop assessment of the strengths and weaknesses of current methodologies available for measuring towpath activity. Geo-location, an innovative new technology, was identified as potentially having the capability to provide national coverage using anonymised and aggregated mobile phone data to accurately capture the origin, destination, duration and type (cycling or walking) of journeys.

The Trust commissioned ESRI UK in partnership with Citi Logik in 2015, to appraise the suitability of the geolocation technology, utilising Vodafone captured data on our towpath network. Citi Logik, is a market leader in understanding transport demand patterns derived from anonymised mobile phone network and other location data and already working with different bodies in the transport sector (including strategic transport planning with the Welsh Government, pedestrian modelling with Transport for Greater Manchester and passenger throughput at and around tube stations).

Our waterway network consists of 50/50 split between urban and rural waterways, so one of the principal objectives of the study was to assess the spatial accuracy in different environments. Two contrasting sections of towpath were selected for establishing the proof of concept and comparative purposes, each area presented different challenges that required testing:

- Section of towpath with the presence of a visitor destination in rural location in North Wales, presenting potential mast coverage issues; and
- Highly urbanised section of towpath in Central London – presenting challenges of how to differentiate from parallel infrastructure like pavements and roads and the resource implications of handling significant amount of data.

The Trust conducted a parallel manual survey using volunteers and GPS app to count users within the pilot area in London during December 2015 and January 2016, for independent data validation and comparative analysis purposes.



Due to the technology still being in its embryonic stage of development, the Trust had to accommodate significant delays. These were partly attributable to ensuring from the outset, that Citi Logik and Vodafone UK had obtained all the necessary permissions to handle the anonymised network data and that robust measures were in place to address current and future privacy and data protection matters including full compliance with ICO and EU guidelines.

Despite best efforts by Citi Logik, the granularity of the data in those specific sections within the highly urbanised section of towpath in Central London with parallel infrastructure to the waterway, proved to be a major impediment to completing the flow counts along the towpaths (the technology was unable to differentiate activity on the towpath as opposed to adjacent roads and paths), and therefore, the spatial accuracy of the data likely to be achieved in urban areas would be insufficient for our purposes. Furthermore, it proved to be highly resource intensive, in terms of time and money, to undertake the analysis of the collated data due to sheer volume of the number of data points, for example, extracting the genuine towpath users from the average 400,000 people per day moving within the pilot area in London.

The Trust and our Partners concluded that the technology still requires significant refinement before it can be implemented cost effectively and provide sufficient level of spatial accuracy. However, we are hopeful that over time the coverage, the spatial accuracy and affordability issues associated with this technology will be addressed.

Alternative technologies for measurement considered

In 2016, the Trust commissioned Tracsis Plc, a technology-led company specialising in the provision of data-driven solutions (with a client base that includes Network Rail, Department for Transport, Transport for London, Transport for Greater Manchester and numerous other local authorities and large engineering and infrastructure companies), to undertake a detailed review of alternative technologies for towpath measurement and to provide us with a tested and cost-effective method which could be used over a five to seven-year period to support our Outcomes Measurement work. Tracsis Plc evaluated seven different technologies as part of this review and a summary of the review outputs are set out in the table included within Appendix 3.

Automatic 'intelligent' video counting and analytic technology (in which sensors count and differentiate users as well as record directional flow) was recommended as the preferred option for the following reasons:

- low maintenance costs (similar to security cameras);
- good reliability (no reliance on batteries or solar cells);
- ability to measure different uses such as dog walking, jogging, cycling, walking etc;
- ability to update processing capability to enable greater longevity of equipment; and
- installation does not rely on civil engineering work to the towpath.

Automatic 'intelligent' video counting & analytic technology – trials in Manchester

The automatic 'intelligent' video counting and analytic technology incorporates sophisticated machine learning algorithms to differentiate between types of users within field of vision with a circa 90% accuracy. Each counter unit consists of a camera, processor and communications device. The footage from the camera is analysed in real-time using a machine-learning algorithm to determine the number and type of towpath users, as well as their direction of travel.



Normal operation – privacy by design (99.9% of time)

The algorithms operate at 640 x 480 resolution compared to the industry standards for facial recognition being 1000 pixels per metre. Personal data never leaves the sensor and only completely anonymous data sent to cloud.

Four machine-learning sensors which count users, differentiate users and record directional flow were installed by Tracsis and Vivacity Labs along the Rochdale Nine section of the Rochdale in Central Manchester to test the new technology. Vivacity Labs, is a world-leader in gathering accurate, real-time transport data. The machine-learning algorithms for visual data gathering have been developed by Vivacity Labs in collaboration with Cambridge and UCL universities.

Count data was collected using these sensors during a three-day period in January 2017. During the same period, independent video footage was also collected for a selection of sample periods at each site and analysed manually for comparison against the automatically counted data. Additionally, data was collected using Bluetooth signal detectors integrated into the sensor units, which gathered a sample of the unique ID's transmitted by Bluetooth enabled devices worn or carried by towpath users such as phones, smart watches and exercise bands. Once processed, this data provided an insight into the journey patterns of a sample of towpath users between and at sensor survey points, showing journey times and repeat visits.



The data from Sensors 1 and 2 compared favourably with the manual count data in these two sites, producing a daily accuracy of at least 90%. The sensor installed at Site 3 was situated near a children's nursery: privacy concerns meant that the sensor had to be installed at a steep angle that affected the accuracy of this sensor. As a result of this finding, care will be taken to ensure that future sensors are installed at the optimal angle. The sensor at Site 4 suffered from a temporary partial obscuration caused by a cable entering the sensor's view. This obscuration was identified and moved on Day 2, leading to 100% accuracy of this sensor on the final day of the trial.

The pilot work has exposed several issues that needed to be addressed before this equipment could be installed and used. For example, privacy and data storage and collecting obligations, the field application of the technology and recording towpath use in low light levels and unlit rural locations at dawn and dusk (performed best during daylight hours). In response to lighting issues, Tracsis Plc will now implement a software 'low light upgrade' from October 2017 and is also targeting ongoing improvements in baseline detection accuracy, such that the technology improves to >95% for all major classes in all 'standard' lighting conditions by 2018. The sensors are currently being trained to recognise different user types, such as parents with pushchairs, children, or joggers as well as boats and water.

Sensor	Saturday 28th January 12:00–16:45			Sunday 29th January 12:00–16:45			Monday 30th January 12:00–16:45		
	Auto sensor count	Control count	% Accuracy	Auto sensor count	Control count	% Accuracy	Auto sensor count	Control count	% Accuracy
1	30	33	90.9%	83	82	101.2%	11	12	91.7%
2	468	473	98.9%	826	868	95.2%	349	353	98.9%
3*	317	493	64.3%	634	1022	62.0%	301	545	55.2%
4**	148	192	77.1%	312	387	80.6%	105	105	100.0%

* Site 3 optimal installation compromised by need to respect privacy of adjacent children's' nursery.

** Site 4 Day 1 and Day 2 accuracy affected by stray cable in field of view of sensor

Table showing the summary of the pilot results from the three-day period in January 2017, Tracsis and Vivacity Labs

Scaling up & roll-out

From the trial in Manchester, we concluded the deployment of automatic 'intelligent' video counting and analytic technology could provide us with a cost effective and sustainable technology for measuring different levels and types of activity on our towpaths.

During 2017/18 (in two tranches), we will be installing around 50 automatic video analytic sensors to monitor the volume and type of towpath use in the fourteen Longitudinal Study Areas; and installing temperature and air quality sensing capabilities in six of the more densely populated urban Longitudinal Study Areas. These additional 'environmental' sensors enable us to provide accurate real-time data on airborne PM10, PM2.5, PM1.0 or TSP particulate concentration along with temperature readings. This information will help the Trust assess the wider environmental and health benefits of off-road waterway routes in urban areas, for example, contrasting air quality and temperature of city centre areas with the waterway corridor. This is particularly important as recent research has shown that exposure to road traffic pollution can have a particularly adverse impact on health.

The sensors are housed in self-contained boxes around the size of a shoebox but require connection to a mains supply. We are currently identifying suitable locations and structures to fix them to or as a last resort install a CCTV style tower. It is intended that they will be in operation for five to ten years.

Working with others

We have undertaken a national review of all third party owned pedestrian and cycling counters currently operational on our network, in collaboration with Sustrans, Transport for Greater Manchester, Birmingham City Council and West Yorkshire Combined Authority. These operational counters have been mapped on our GIS system and will be used to benchmark current volume of use.

The Trust has also been working with Sustrans to review data collected through their cycle and pedestrian counters over c.25% of our waterway network and extensive intercept surveys on towpaths between 1999 and 2016 to enable us to estimate past and current volumes of towpath use and trends in use over the period.

Understanding attitudinal, behaviours and motivations of towpath users

The Trust has commissioned Plus Four Market Research Limited ('Plus4'), an independent agency (with significant experience in both quantitative and qualitative research) and a Company Partner of the Market Research Society, to undertake towpath intercept surveys of users on the towpaths within the fourteen Longitudinal Study Areas (LSAs) and the two Counterfactual Study Areas (CSAs) in three waves – July 2017, September 2107 and March 2018.

The purpose of the towpath intercept surveys is to gain detailed insight on the profile of towpath users and trends through gathering evidence on demographic characteristics, journey purpose, origin-destination, frequency, duration and distance as well as motivations, behaviours and perceptions of personal wellbeing and safety, connection with place, amenity value, etc. The template questionnaire survey incorporates the different OMF self-reporting and perception indicators (including the four ONS measures of subjective wellbeing as well as questions on attitudes towards the Trust). The template questionnaire survey was designed and tested in field by Kantar TNS in November and December 2016.

It is proposed that three waves of towpath surveys will be conducted, each consisting of 7 separate survey days – 2 weekend days and 5 weekdays. To obtain a representative sample (insofar as this is possible) of towpath usage, the surveys will be conducted across three separate months: one summer month, July, and two 'neutral' months, September and March. To capture the variety of motivations for towpath usage (that is, by people using them for commuting, health or recreational purposes) the survey will be conducted during morning and afternoon "rush hour" times and other times throughout the day.

Interviews were conducted Monday to Sunday between 07.30 and 19.30 on 10th to 16th July 2017. Intercepts were attempted for 45 minutes of every hour (alternating gender where footfall was sufficient to do so) and for 15 minutes of every hour towpath traffic was counted: split by walkers, runners and cyclists.

2435 towpath users participated in the 'full survey' (including online completes) and additional 796 participated in the 'short survey'. As a result, Plus4 has collected reason for use, age and gender for 3231 towpath users in total. In addition, 39 people participated in a further online qualitative research. Responses (including photographs) have been used throughout the survey insight and analysis report to further illustrate quantitative findings.

This report covers the overall findings and highlights where large variations occur by location and / or other sub-samples, for example, frequency, 'alone' or 'with others', gender, age, working status, SEG, walkers/joggers/cyclists, weekday/weekend and / or am/pm interviewing.

After learnings from first Wave, the Trust and Plus4 have agreed to discuss the locations and maps, questionnaire design and SNAP set-up and testing to optimise future planned Waves. Information gained from the 50 automatic video analytic sensors to count towpath activity, following installation, may also inform a revised approach for data collection and / or analysis of future Waves.

The data derived from automatic video analytic sensors in conjunction with towpath intercept surveys will enable the Trust to:

- elicit information to enable outcome measurement: towpath usage patterns; motivation for towpath usage; awareness or attitude towards the Trust; towpath user wellbeing; and demographic characteristics.
- estimate the amount of physical activity and active travel generated through access to the towpaths and the public benefit of associated with walking and cycling (using these estimates within the World Health Organisation's Health Economic Assessment Tool (HEAT) and the Department for Transport's WebTAG model).

The key insights gained from the results of the first wave of the towpath intercept survey results conducted within the fourteen LSAs and the two CSAs are included within section 7 of this report.

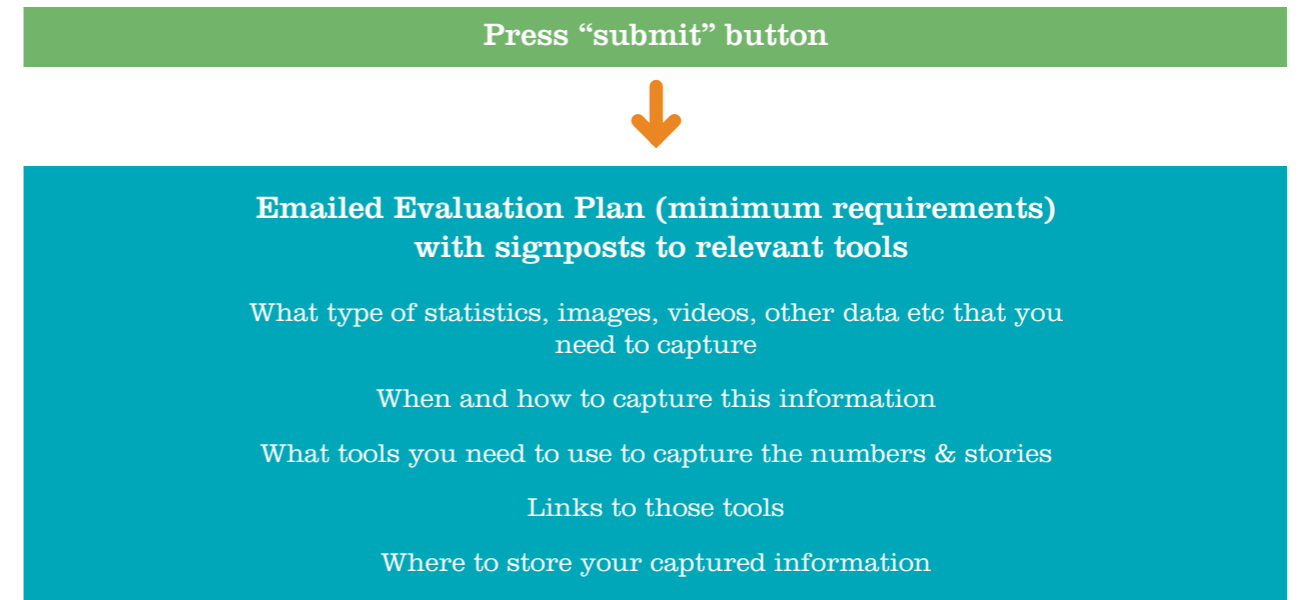
Evaluation of projects & day-to-day activities

e-Project evaluation toolkit

One of the measurement methodologies that we have been focussing on is the creation of an e-Project evaluation toolkit for capturing the impacts and outcomes arising from interventions made by the Trust. This will provide material for evidence-based case studies and effective storytelling.



The evaluation plans generated will be proportionate to the type, scale, funding source and location of project and should assist those in the Trust making funding bids (by aligning our outcomes work with the outcome priority areas of the main policy and funding bodies).



For smaller scale projects, the member of staff responsible for delivering the project will be provided with a standard evaluation plan to complete. For larger projects, or projects of a less typical nature or projects within the longitudinal study areas, the Trust's in-house Policy, Research and Impact Unit will develop a bespoke evaluation plan that will be used to evaluate the outcomes from each of these projects.

An e-Project evaluation toolkit platform to capture interventions made by the Trust has been designed, built and tested with support from the Institute of Cultural Capital and our in-house Digital Technology Team and external providers. The toolkit has been designed to ensure that the Trust undertakes the evaluation of all our externally funded and contracted projects being promoted by the Trust or working in partnership with others, in a consistent, robust and proportionate manner. Teams from across the Trust will complete a five-stepped process, entering a series of key variables about their project into the toolkit, leading to the generation of standard evaluation plans suited to the type and scale of the project and the likely outcomes.



e-Project evaluation toolkit (Scoping stage) – Five Stepped Process

Project impact families

Due to the plethora of projects that are delivered by the different parts of the organisation, we have grouped the different project types into project impact families, reflective of our vision and the project audience and beneficiaries. This has allowed us to define the primary anticipated outcome(s) for each project family and thus ensure each project delivers against our OMF.

Enriching lives – participatory activities

- cohort driven participatory activities
- education based participatory activities
- civil society based participatory activities
- outdoor recreation based participatory activities



Let's Fish, Fazeley

Towpath Taskforce Wigan



Transforming places – physical improvements

- environment
- green flag or other accolades
- heritage
- quality of place
- restoration & new waterway links



Mark of a quality green space award, Macclesfield Canal

Towpath improvements, Watford



Living waterways

- driving visits & customer experience linked to one off events / activity
- driving visits & customer experience linked to repeat visits driven programmes or attractions
- enabling greater towpath use



Family fun day at Gloucester Docks

Towpaths are often more accessible than other footpaths



The e-Project evaluation toolkit platform has been built and tested; the first tranche of qualitative and quantitative evaluation tools has been developed and tested; and training with the relevant staff on how to navigate the toolkit and use the tools is underway (with positive feedback received to-date).

We have purchased and installed SNAP professional survey software to support the data collection, analysis and reporting functions.

It is the intention in due course to explore the feasibility of designing and operating a version that can be used by other charities, SMEs, organised groups, sports clubs, etc to attempt to capture activities and interventions made by others using our waterways as a platform.

Standard evaluation plans for day-to-day activities

Many of the outcomes will be delivered through our ongoing activities rather than specific projects. For example, informal education (events; online programmes; uniformed groups); volunteering (individual) and adoptions (community) and volunteering & adoptions (corporates).

Whilst these activities should still be evaluated, we do not want to make this evaluation process over-burdensome. Our internal procedures have been or will be adapted and enhanced to ensure the necessary data is collected to input into the Outcomes Measurement Framework and subsequent monetisation work. For example, adaptation of registration forms to capture demographic characteristics information. We have identified all those day-to-day activities that can be covered by standard evaluation plans.

Repository of evidence for effective storytelling

Whilst other measurement methodologies may measure the size of any change, we will use storytelling as a tool to highlight how waterways are making the difference to lives (and influencing behaviours) and to understand why that change has occurred and what it means to the individual. This may form part of a project's evaluation plan or could be used as part of the ongoing research in Longitudinal Study Areas.

Storytelling can be a powerful method to understand a project's outcomes from participants' perspective. Simply asking participants to tell their story of a project often elicits momentous and significant experiences for the individual, and often unforeseen outcomes, rather than just the participants' views on what the researcher expects them to 'value'.

But storytelling is not just about outcomes measurement. The same stories can be used to drive advocacy and support, form the basis for compelling campaigns, whether explaining who we are and what we do to potential donors; through to providing a human narrative behind our outcomes and impacts when working with national and devolved policymakers and decisionmakers.

The development of a central repository of evidence, case studies, testimonies and examples for effective storytelling has recently commenced. This repository will be designed to collate, store and reference all the material required as part of the project evaluation plans.

“No numbers without stories, no stories without numbers”

Community fundraising to repair Nantwich Aqueduct, Shropshire Union Canal



Dragon boat racing, Queen Elizabeth Olympic Park Waterways



Hanover Primary School community garden



The Newham Music Canal Choir perform at the East London Waterways Festival



Brightworks project, Blackburn



'Heritage Heroes' on the Pocklington Canal



The Desmond Family Canoe Trail, Leeds & Liverpool Canal



Two Arms on Two Legs Running Festival

Suite of research tools

To support the e-Project evaluation toolkit, the standard evaluation plans for the day-to-day activities and the in-depth measurement work being undertaken within the LSAs and CSAs, a suite of qualitative and quantitative research tools has been developed and tested in partnership with the Institute of Cultural Capital, Kantar TNS (a global market research company) and the Trust's in-house Policy, Research and Impact Unit. These tools have been tailored to meet the specific needs of the different project impact families whilst collecting information relating to the demographic and socio-economic characteristics of towpath users, volunteers, participants and other members of the public who participate in Trust related activities. For example:

- community survey (non-towpath) to capture insights on attitudes, behaviours and motivations using a postcode based survey in various forms including interviewer administered on the doorstep; online self-completion questionnaire;
- events, festivals and open days survey to capture demographics, motivations, attitudinal, behavioural indicators in various forms including interviewer or volunteer administered; self-completion postcard survey on site; online self-completion questionnaire post visit; and
- diary (video; oral; written); written or recorded oral testimonies; self-reflection form; skills assessment form; internal record sheet.

The Trust commissioned Kantar TNS to develop a number of survey tools (including towpath intercept survey; community survey; event survey; and volunteer survey). The proposed methodology and questionnaire survey form for the community survey was cognitively tested on 39 people in Birmingham during November 2016. The proposed methodologies and questionnaire surveys for the other survey types were piloted as follows:

- **towpath intercept survey** – piloted in Manchester during November and December 2016;
- **event survey** – piloted at five events held during January and March 2017 (Marple Locks; St Pancras; Stoke Bruerne; Doncaster; and Tringford); and
- **volunteer survey** – piloted online.

Each of the survey types incorporated key primary indicators from the OMF (to capture objective data) as well as self-reporting and perception indicators (to capture subjective data) relevant to each survey group.

We have sought to utilise and adapt existing tools and toolkits where available and appropriate. For example, SILO – Supporting Improved Learning Opportunities for Hard to reach groups toolkit (2016) led by the Institute of Cultural Capital. SILO was an Erasmus Plus funded programme which aimed to develop a framework for capturing and validating adult employability skills as gained through participatory arts. This two-year research programme involved the development of developed baseline measurements, an evidence gathering framework and skills validation system mapped to the European Key Competencies for Life Long Learning. This programme of work is now adopted by organisations across Europe and UK. By working with the Institute, we were 'not reinventing the wheel' but utilising the learnings and easily adapting an existing tool to meet our needs (potentially saving the Trust significant time and money).

There is rarely one single method that can fully show of the complexities of a project, so the evaluation plans will suggest a mix of methods to capture both the numbers and the stories, including surveys, focus groups, walk-and-talk interviews, vox pops, scrapbooks and other creative tools etc.



Overview of survey methods recommended by Kantar TNS 2016

Local community surveys in Longitudinal Study Areas & Counterfactual Study Areas

The Trust is keen to understand the relevance and value of waterways within the different communities across England and Wales, at a local level. We are seeking to use local community surveys as a research tool, primarily within the fourteen Longitudinal and two Counterfactual Study Areas to: gain insight and understanding of whether local residents share the same attitudes towards waterways as do the people who use them; explore usage of waterways amongst residents; act as benchmark against towpath user intercept survey data; and input into the measurement of progress against key OMF indicators.

The Trust commissioned Kantar TNS to design a template for local community surveys aimed at gaining insight into:

- What proportion of the local population use their local waterway, why, and are they reflective of the local population within the local authority administrative area?
- What do people think about living close to the waterway, do people perceive it to be an asset for the local community?
- Does living close to the waterway contribute to positive outcomes for the individual and community?

To provide this insight, Kantar TNS designed the template questionnaire survey to capture information relating to:

- demographic and lifestyle measures;
- awareness of the Trust and of local waterway;
- attitudes to the waterway (whether important part of local area; important to me personally; preserves history/ heritage of area; contributes to culture of area; bring people from different backgrounds together);
- frequency of visits to the waterway;
- reasons for visiting the waterway and not visiting;
- community, including changes to area; sense of belonging; and
- OMF self-reporting and perception indicators (including the four ONS measures of subjective wellbeing).

In November 2016, Kantar TNS conducted 39 cognitive interviews in Birmingham to test the questionnaire survey designed for in-home interviews with local residents. Following the successful survey development and cognitive testing work in 2016, the Trust commissioned Kantar TNS in spring 2017 to conduct full local community surveys in all the fourteen Longitudinal and the two Counterfactual Study Areas during March and April 2017.

These surveys consisting of in-home interviews of a representative sample of local residents aged 16+ living within one kilometre of waterway within the respective areas. The sample sizes for each area were dependent upon the household density within each area (a representative sample of between 200 and 400 responses was gathered in each location, with 4,661 in-home face-to-face interviews conducted during March 2017, in total).

This method was chosen as it provides several benefits including the opportunity to use visual show prompts such as maps, a familiar and relaxed environment for the respondent, and importantly, greater control over the composition and representativeness of the sample. Catchment areas were first identified and matched to Census Output Areas and the demographic profile to be extracted. Lists of addresses within the defined areas were extracted from the Postcode Address File (PAF) in the same proportion as the resident population of each Output Area. Addresses were then split into blocks forming the fieldwork areas covered during interviewing shifts. Quotas were set for each area based on the age, gender and working status profile of the population. To maximise levels of response, interviewing shifts took place during a range of times of day and days of the week.

Results gathered will be compared against published demographic and attitudinal information available for each local authority, data from WEM and the towpath intercept surveys; as well as tracking any changes over time in each area. These surveys will be repeated over the next ten years, their frequency dependent on local change, level of intervention and available resources.

These surveys contribute, to a greater or lesser extent, against six of the OMF indicators in the Outcomes Measurement Framework.

The key insights gained from the results of the local community surveys conducted within the fourteen LSAs and the two CSAs are included within section 7 of this report.

Valuation methodologies for monetisation

Measurement of the OMF indicators will be accompanied by monetisation of each indicator, where appropriate. This monetisation-based evidence will be utilised in three ways:

- to support our long term public policy and affairs engagement strategy;
- To support third party funding applications made by the Trust; and
- To provide evidence internally regarding the relative merits of proposed projects.

In order to identify the most appropriate methodologies, a review was undertaken of both grey and academic literature in order to identify similar attempts to answer the research questions raised by the proposed monetisation of the OMF indicators.

When deciding on the most appropriate technique for each outcome indicator, attention was paid to the types of organisation or institution which had developed or employed each technique; the input data that would be needed and the ease with which the results of the monetisation process could be communicated to different internal and external audiences.

Through this review and assessment process, the Trust selected monetisation techniques for implementation which are set out in the table on the opposite page (and more detail is included within Appendix 4). The table below refers to the type of value estimated by each technique:

- *fiscal value* relates to 'cashable' savings that have been generated through an activity, for example, a reduction in NHS spending as a result of health improvements;
- *economic value* represents increases in earnings or economic growth; and
- *social value* highlights wider gains to society through improvements made to personal experiences.

Great care was taken throughout the process of selecting these monetisation techniques to ensure that each technique selected for our use would stand up to external scrutiny, with preference given to techniques that are included in HM Treasury's *Green Book*.

The selection of appropriate monetisation techniques is merely a necessary, but not sufficient, criterion for producing robust value estimates. It is also vital to ensure that the selected methodologies are implemented in a robust and transparent way. To ensure that we deliver this, the Trust intends to incorporate best practice guidelines regarding each of the techniques, as well as ensuring that any third party research is undertaken by well-respected experts in their respective fields.

The implementation of the Contingent Valuation Method (CVM) is a noteworthy example of some of the pitfalls facing researchers who wish to employ these techniques. At its most basic level, the CVM asks respondents to directly state the amount of money that they would be willing to pay (or accept) for a particular good or service. Despite the veneer of simplicity, it is well known that the implementation of the CVM is fraught with difficulties and sources of potential bias. For instance, the intrinsically hypothetical nature of the CVM means that people may be asked to place a value on a good or service, for which they have few or ill-defined prior preferences. Among the possible methods for alleviating this problem is the use of a 'cheap talk' script within the survey instrument, which specifically warns respondents about this 'hypothetical bias' problem. Although this is only a single example of a potential problem within one valuation technique, it serves as an illustration of the robust and rigorous approach that will be at the heart of the Trust's valuation efforts.

Technique	Description	Relevant OMF Sub-domains & Indicator(s)	Type of value		
			Social	Economic	Fiscal
World Health Organisation Health Economic Assessment Tool (HEAT)	Estimation of the economic value of mortality rate improvements through specified levels of physical activity.	Physical Health	✓		
Wellbeing Valuation Approach (WVA)	The impact that a good or service has on subjective wellbeing is estimated. The value of this impact is then calculated by determining the level of additional income necessary to produce an equivalent uplift in wellbeing.	Mental Health and Wellbeing Community Engagement Skills and Lifelong Learning Economic Growth (Employment)	✓		
New Economy Manchester Cost Benefit Analysis Toolkit	The unit cost database brings together cost estimates from Government reports and academic studies. The estimates represent the costs delivering a variety of services relating to crime, education & skills, employment & economy, fire, health, housing and social services. The Trust can create value by allowing various funding bodies to avoid these costs.	Broadening Opportunities and Inclusivity (Community Service) Economic Growth (Employment)	✓	✓	✓
Department for Transport Web-based Transport Analysis Guidance (WebTAG)	WebTAG provides a framework for valuing a transport modal shift. WebTAG estimates the impact of this modal shift on congestion, infrastructure, accidents, local air quality, noise, greenhouse gases and indirect taxation.	Sustainable Transport (Pedestrian) Sustainable Transport (Freight)	✓	✓	
Green Book Supplementary Guidance: valuation of energy use and greenhouse gas emissions for appraisal	The supplementary guidance to HM Treasury's <i>Green Book</i> provides analysts with a methodology for valuing energy usage and greenhouse gas emissions.	Renewable Energy (Heat) Renewable Energy (Electricity)	✓	✓	✓
Hedonic Price Method	A revealed preference economic technique for estimating the value of a good or characteristic. Commonly, data from the real estate market is used to estimate the value of environmental amenities.	Regeneration & Development	✓	✓	
Contingent Valuation Method	A stated preference economic valuation technique for estimating the value of a good or characteristic. This method involves asking survey respondents how much they would be willing to pay for a particular 'service'.	Culture & Heritage Biodiversity & Environmental Stewardship	✓		
Economic Impact Analysis	A technique that would assess the net increase in employment and economic output as a result of a project or development.	Economic Growth (Businesses)		✓	



Manchester Pride Festival, Rochdale Canal

Section 6:

How we measure – Filling Knowledge Gaps

Research programme

As part of the OMF development work, we identified two key areas where the Trust lacked proper insight and evidence to support our activities, namely:

- understanding of the motivations and barriers to the use of local waterways different communities; and
- appreciation of the role that waterways could play in improving mental health outcomes.

Our outcomes related research programme has focused on these two areas and has involved the Trust working with academia and sectoral experts.

Understanding motivations & barriers to community use

As already mentioned, **making waterways relevant – being local and inclusive** – is critical if, our waterways are to have a material role to play in transforming places and enriching lives. We recognise the need to significantly increase everyday use and participation and for waterways to be appealing and be culturally relevant to everyone.

However, for the Trust's future activities and interventions to make a valuable contribution to local communities and people's lives in general; and for the waterways themselves to provide effective platforms for activity by local communities, we need a greater understanding of the motivations and barriers to community use and how these vary across socio-demographic groups. To help us gain this understanding, the Trust engaged Cardiff University's Sustainable Places Research Institute (PLACE) to undertake in-depth research into use of, and engagement with, our waterways. This research project seeks to understand the motivations and barriers to community use and to identify opportunities for furthering community use of and engagement with our waterways in England and Wales.

Research project aim & objectives

The purpose of this participatory research project is to support our 2025 ambition of ensuring that the people using and benefiting from waterways reflect the demographic profile of the local population. This overarching aim of the participatory research project is under-pinned by the following objectives:

- to understand the demographic profile of waterway communities, highlighting areas of specific diversity or need;
- to understand who currently uses and engages with our waterways, the form this takes, and how the profile compares with local population;
- to understand the motivations for use, barriers that prevent this, and how these vary across socio-demographic groups – for example, perception and actual barriers, covering physical, social, cultural and psychological aspects;
- to gain detailed knowledge of the benefits for individuals and communities of use and engagement with our waterways, and how these vary across socio-demographic groups;
- to identify reasons for socio-spatial variation in engagement with our waterways; and
- to explore opportunities to increase use of, and engagement with, our waterways amongst those groups currently under-represented.

The research work will identify a suite of interventions to increase participation and diversity, which will be potentially transferable to other waterway communities. It will also deliver a 'handbook' to guide the Trust's local waterway teams through the process of understanding the diversity of the local population and potential benefits the local waterway could offer different groups.

Research method

This participatory action research project aims to break down the traditional boundaries between the researcher and the researched, making it a more collaborative process, and bringing about a positive change for those taking part.

Qualitative research techniques including semi-structured interviews, walk-and-talk interviews, focus groups and participant observation were used, with more specific participatory techniques employed as appropriate to participants' preferences, for example, participant photography, written and/or video diaries and participatory mapping.

The research fieldwork began early in 2016 and lasted through to spring 2017. Four areas were chosen for detailed investigation (listed in the table below), with specific demographic groups the primary focus in each area.

Case study areas sought to cover: diverse ethnic groups, young people, older people, deprived urban communities in England and Wales. Fieldwork was undertaken in the four detailed case study areas, each focusing on a specific demographic group or groups.

Location	Demographic focus
Blackburn	Young BAME, Women
Leicester	Somali and East African community
Milton Keynes	Families with young children
Tower Hamlets	Young and older people

The process of selecting case studies involved demographic profiling of waterway communities (using Census and other datasets, highlighting areas with a high population density of specific demographic groups, for example, BAMEs, NEETS, low activity etc) and refined in consultation with the Trust's operational colleagues working in each area. The robust demographic profile allowed the identification of areas similar to those included in the case study areas, enabling the results to be transferred across locations.

There exists a body of literature surrounding the barriers to outdoor recreation and use of greenspaces generally and across specific demographic groups. This work sought to build upon this existing knowledge and to identify barriers specific to waterways.

Project outputs

Outputs from this research project include:

- identification of a suite of interventions with the potential to overcome the barriers identified and guide our future plans and activities;
- evidence to show the transferability of the results across population groups and geographic areas allowing the Trust to action changes faster and more efficiently;
- provide a baseline for potential longitudinal tracking of our impact over the next ten years; and
- development of a toolkit for working with/engaging hard-to-reach groups for waterways teams within the Trust (currently in very early stages of development).

The findings from this research project to date are explored in Section 7.

Mental health benefits of waterways

In January 2016, we commissioned the Centre for Sustainable Healthcare (CSH) to carry out initial scoping work to research the benefits of waterways for mental health.

Literature review

As part of this research project, CSH reviewed the existing literature and evidence base around blue and green space (linked to specific and more general psychiatric disorders), social prescribing and the methodology used to assess mental and physical outcomes from nature interventions. Although there is very little specific research into mental health outcomes of interventions in blue space, there is a considerable amount of relevance relating to green space. There is a strong link between benefits to mental health and increased level of physical activity in general. Some studies, particularly around anxiety and depression, have been of participants engaging in physical activity such as health walks, with resulting positive mental health benefits being measured.

The Trust seeks to prioritise those interventions where the specific elements of the waterway environment can deliver benefits over and above generic physical activity interventions. A range of indicators for measuring mental health and the impacts of interventions were identified by SCH, all of which have the potential to be standardised and rolled out across the Trust's activities, enabling us to capture consistent data about impact of their interventions.

SCH sought to identify the most effective interventions but concluded that much of the supporting data is based on evaluation rather than data from defined methodologies. This conclusion aligns with the evidence based conclusion included within the Natural England report *A Review of Nature-based Interventions for Mental Health Care* (February 2016) which suggests that more standardised outcomes measures and use of methodologies is needed.

Key differentiating elements of the waterside environment

When considering potential interventions, CSH examined aspects of the Trust's waterways (including docks and reservoirs) which could potentially differentiate waterway interventions from other more general outdoor activities. These key aspects are:

- **access to water**, demonstrated as having a therapeutic impact;
- **potential to include 'on-water' activities in the provision;**
- **connections and access to nature;**
- **connection to local cultural identity** and built industrial heritage;
- **topography**, waterway environs tend to be generally flat with accessible towpaths;
- **accessibility** and potential access for all in urban areas;
- **links to communities**, particularly post-industrial areas with high levels of deprivation and an increased prevalence of mental ill health; and
- **logistics**, with existing network of storage and welfare facilities.

Interventions & indication of potential volumes

SCH identified the advantages, constraints and the additional benefits that could be derived from waterways associated with the different interventions and an indication of potential volumes by intervention type (dependent on the availability of proper supervision and the need for proper safeguarding provision to be in place).

Intervention types	Potential Volumes by Intervention		
	Individual interventions in depth work with 1 or 2 individuals per session	Small groups 2–10 individuals per session	Mass participation >10 individuals per session
Health walk			✓
Green gym		✓	✓
Water sports	✓	✓	
Tree planting & activities at healthcare centre close to a waterway			✓
Cycling group			✓
Guided walks often with an educational element			✓
Arts and cultural interventions	✓	✓	✓
Gardening and practical conservation activities	✓		✓
Dog walking	✓	✓	
Animal assisted therapy	✓	✓	
Arts and cultural interventions	✓	✓	✓
Proposed indicator for measuring mental health & the impacts of interventions	Goal Attainment Scaling	The Outcomes Star™	Warwick Edinburgh Mental Wellbeing Scale

Case study areas

Six urban case study areas were chosen representing a broad geographical area of England and Wales. Each of the areas having slightly different demographics and health priorities – Stoke on Trent; Milton Keynes; Islington; Blackburn; Wakefield; and Wrexham.

Desk-based research was undertaken to produce an overview of:

- priorities within an area, both in terms of conditions and geographical hotspots;
- interventions and green space activities already taking place, local organisations involved and partnership working opportunities; and
- recommended interventions at each case study area.

Mental health issues for each of the case study areas are often linked to addiction issues, physical inactivity and the stresses of living in a deprived environment, leading to anxiety and depression and other disorders. Research into the suitability of green/blue space interventions for tackling these health issues was evidenced.

Conclusion & recommendations

The study identified several unique characteristics of the waterside environment and a number of value-adding elements. There is potential for additional benefits to be derived from those interventions that have access to waterside environments compared to those interventions that do not have access. With properly planned interventions, SCH believe that waterways can therefore demonstrably deliver positive impacts on mental health.

SCH advocates that research into mental health outcomes of interventions in green and blue spaces would benefit from using more carefully selected methodologies and significant sample sizes. In order to determine robustly which interventions are most effective for people in each type of disorder category, more rigorous research is needed in this area. CSH has recommended that a comprehensive programme of outreach and engagement with the identified local delivery partners is instigated and the pilot projects implemented to test the mental health benefits of different interventions.

7



Boat passing through Carpenters Road Lock, Bow Back Rivers

Section 7: How we measure – Findings & Insights

What we have learnt so far

This section of the report seeks to outline what we have learnt so far from the national Waterway Engagement Monitor (WEM) monthly online survey, the local community surveys, the first wave of towpath intercept surveys conducted in the fourteen Longitudinal Study Areas (LSAs) and two Counterfactual Study Areas (CSAs) and the findings and conclusions from the two research projects detailed in Section 6.

In-depth and comparative analysis of the findings derived from WEM, local community surveys and the first wave of the towpath intercept surveys conducted in the LSAs and CSAs, demographic profiling of the waterway population and the Research Project on Understanding Motivations and Barriers to Community Use has yet to be completed.

However, some initial observations, insights and learnings from the different surveys and research project findings and conclusions have been made and these have been grouped under the following topic headings:

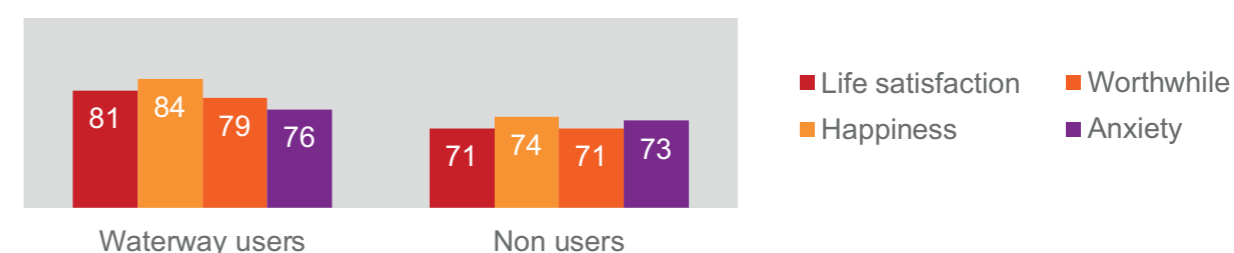
- subjective wellbeing (personal);
- communities and their waterways;
- local identity, value and connections;
- physical and mental health; and
- motivations and barriers.

Subjective wellbeing (personal)

The four Office for National Statistics (ONS) measures of subjective wellbeing were included within: the WEM survey since April 2016; the local community surveys (LCSs) and the first wave of the towpath intercept surveys conducted in the fourteen LSAs; and the two CSAs in March 2017 and July 2017 respectively. Within the WEM respondents in England and Wales, waterway users appear to have a slightly higher level of wellbeing (against the life satisfaction, happiness and feelings of worth measures) compared to the non-waterway users. The results from LCSs are also positive, with scores for personal wellbeing (life satisfaction, feelings of worthwhile and happiness) generally showing an uplift amongst waterway users, although we do not yet understand cause and effect.

90% undertook physical activities such walking, cycling, running etc. during visit

ONS wellbeing measures* (7-10 on scale except 0-3 for anxiety)



Source: Community Survey 2017 Overview Community Report (June 2017), produced by Kantar TNS

In relation to the ONS subjective wellbeing measures linked to anxiety, the scores are more mixed. Waterway users appear to have the same levels of anxiety as the non-waterway users within the WEM respondents whilst the figure is slightly higher in the LCS respondents in England and Wales. It may be that this reflects use of our waterways as places to get away from it all, when someone does feel anxious or stressed, but again, this is only one possible hypothesis and it will take time to test fully.

We intend to compare these results with the national figures related to the four ONS measures of subjective wellbeing for England and Wales for the same period when published later this year by the ONS but the table found on page 92 shows the comparison with the published figures for 2015/16.

The Cabinet Office Analysis and Insight Team analysed small area data the relating to waterway populations using the Virtual Microdata Laboratory, to compare waterway corridor population wellbeing with data from the annual ONS population survey over a four-year period. The results reveal that whilst there are some small differences in wellbeing scores within the results, it is inconclusive whether being close to a waterway improves wellbeing to any significant extent, particularly when considering factors which impact more on people's lives. For example, factors which contribute to the Index of Multiple Deprivation have a much greater influence on wellbeing than any possible improvement in wellbeing resulting from having good access to waterways. However, what does become apparent is the importance of the activities and interventions made by the Trust (and other charities, groups etc using our waterways as a platform) linked to improving personal and community wellbeing, for example, volunteering, participatory activities and meaningful engagement with the waterways through more frequent use and enjoyment. The Trust is interested in determining whether the activities and interventions we make (or made by others using our waterways as a platform) can make any discernible improvement to subjective wellbeing of people living within our waterway corridors.

ONS subjective wellbeing measures – comparison of reported scores with national statistics

	Four ONS Subjective Wellbeing Measures Thresholds – Proportion of respondents in each threshold (%)															
	Thresholds – Proportion of respondents in each threshold (%)				Worthwhile				Happiness				Anxiety			
	Low	Medium	High	Very High	Low	Medium	High	Very High	Low	Medium	High	Very High	Low	Medium	High	Very High
	0–4	5–6	7–8	9–10	0–4	5–6	7–8	9–10	0–4	5–6	7–8	9–10	0–4	5–6	7–8	9–10
ONS																
England (2015–16)	4.55	14.29	52.39	28.77	3.55	12.90	49.32	34.23	8.75	16.52	40.65	34.08	40.59	23.26	16.78	19.37
Wales (2015–16)	5.18	14.37	50.74	29.71	3.99	12.55	49.36	34.10	9.55	16.01	40.26	34.17	41.75	21.17	16.25	20.83
Results from the local community surveys in fourteen Longitudinal Study Areas (March 2017)																
All (people living within 1km of the waterway)	5.5	16	41.3	36.3	4.2	13.1	39.8	41	8.3	13.4	33.7	43.1	59.3	15.3	10.1	14
Towpath visitors/users:																
Regular (at least once a fortnight)	4.4	12.6	43.1	39	2.9	10.6	40.5	44.4	7.2	11.7	34.6	45.6	59	15.7	9.5	14.5
Occasional (visited at least once in the last 12 months)	4.1	16.1	43.1	35.9	3.6	12.2	41.4	41.8	7.5	13.2	34.4	43.9	60.2	15.8	9.7	13.4
Infrequent (not visited in the last 12 months / never visited)	8.2	20.2	38.3	33.1	6.5	17.4	37.5	35.8	10.4	17	32.2	38.9	58.8	14.4	11.3	13.9
If visited in the last two days	4.1	12.3	40.4	42.3	2.4	9.6	39.1	47.3	6.3	9.8	32.5	50.3	61.4	15.6	8.2	13.4

Communities & their waterways

Our impact can only realise its full potential if we become fully inclusive of all communities, whether this relates to ethnicity, age, gender, physical ability etc. It is important we understand if local waterways are used by local people, and not just measure the volume of use. The local community surveys (LCSs) in the fourteen longitudinal study areas (March and April 2017) and the first wave of towpath intercept surveys (July 2017), in conjunction with the findings and conclusions from the participatory research project on motivations and barriers to use of our waterway undertaken by Sustainable Places Research Institute (PLACE) at Cardiff University, will help us understand more about who is using their local waterway.

Reflecting the local population

Results of the WEM survey show that the age profile of adult visitors to the waterways we own or manage is significantly older than that of the England and Wales population with 45–64 year olds over-represented (20.5% of adult visitors to waterways compared to the GB adult population of 15% in this age group). The results from the first wave of the towpath intercept surveys in the LSAs reveal that the average age of the user is 47 years old, with the oldest average age of 56 being found in Devizes, Pocklington and Wrexham with the youngest average of 39–41 years old being found in London and Manchester.

Comparing an area's residents with waterway users (claimed) from the LCSs within the LSAs and CSAs however, indicates that the age profile of users at each of the waterways was broadly in line with their respective area profile. Birmingham and Stockton both recorded slightly higher than average waterway users aged 16–34 compared to the area overall, while only 25% of waterway users in Leicester were aged 16–34 compared to 45% of the area as a whole.

The second and third waves of the towpath intercept surveys in the LSAs (planned for September 2107 and March 2018) will provide further insight on the user age profile.

Our WEM surveys show that the proportion of waterway users from BAME backgrounds has increased, albeit only marginally, since 2012 to 9% of users in 2016/17. The results from the first wave of the towpath intercept surveys in the LSAs reveal that the ethnicity profile of waterway users as being 86% White British, 6% White Other and 8% BAME. Waterway users from a BAME background were significantly higher in the two LSAs in London (22–30%) and the LSA in Manchester (13%).

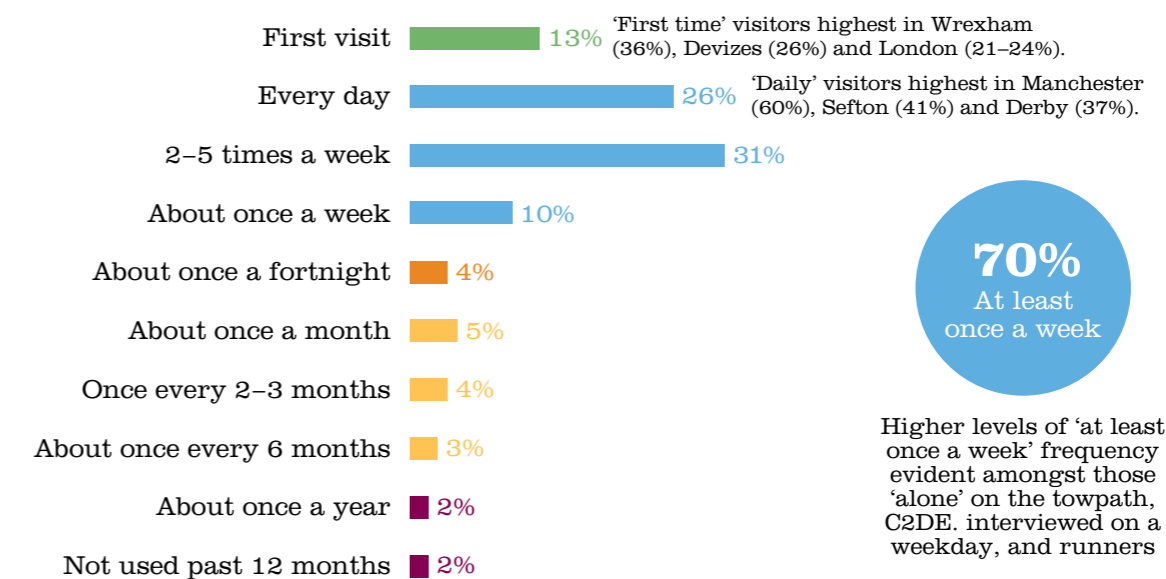
However, comparing area residents with waterway users (claimed) from the LCSs within the LSAs and CSAs, reveals that the proportions of the waterway users from BAME background, in most cases, were in line with the proportion in the local area. For example, whilst 52% of the local population in the Birmingham LSA are from BAME backgrounds, only 48% of those who claimed to visit were from these ethnic groups. Similarly, in the Sheffield case-study area 42% of the local population are from BAME groups, compared to only 39% amongst those who claimed to visit. The exceptions were Milton Keynes (14% BAME claimed visits compared to 21% all BAME respondents) and Tottenham Hale (36% BAME claimed visits compared to 44% all BAME respondents), where lower proportions of users were from BAME backgrounds than was evident in the total population in these areas. Thus, as suggested within findings and conclusions from the participatory research project on the motivations and barriers to the use of waterways being undertaken by PLACE, other barriers are likely to be at play, not simply ethnicity.

The WEM survey for 2016/17 has revealed that waterway / towpath users are unlikely to reflect the ethnic diversity of populations living in the waterway corridor, or the makeup of the national population.

Ethnic identity	% White	% Mixed	% Asian	% Black	% Other	% BAME
Population (Census 2011)	86.0	2.2	7.5	3.3	1.0	14.0
Waterway users (WEM 2016/17)	89.3	2.2	4.1	1.5	0.9	8.6
Difference	+3.3	0.0	-3.4	-1.8	-0.1	-5.4

Frequency of visits

The first wave of the towpath intercept survey reveals that 71% are frequent users, more than once a month, with 26% using their local waterway daily and 37% waterway users accessing the towpaths to get somewhere else, for example, commuting, studying, shopping.



Source: Towpath Survey a report on Wave 1 (July 2017), produced by Plus4

81% of these frequent waterways users are utilising the towpath at least once a week, with 60% of the waterway users in the LSA in Manchester and 41% of the waterway users in the LSA Sefton, claiming that they used daily their local waterway. 62% of users say it is quicker or more convenient to do so with 47% stating they like the scenery and surroundings. Comments include:

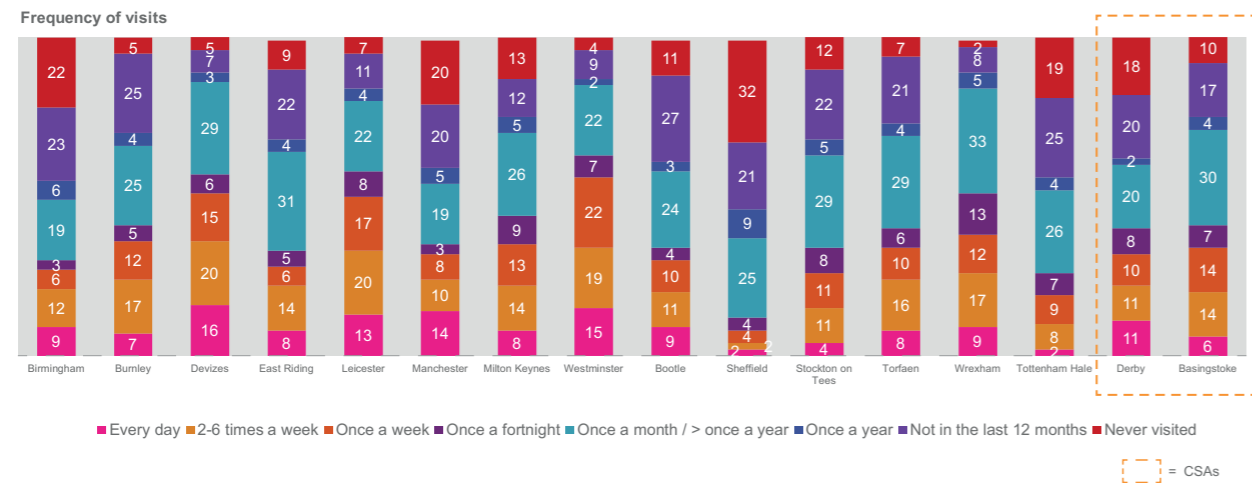
“It is close to home and gives me an opportunity to walk to the train station enjoying myself.”
Towpath survey online qualitative tasks conducted by Plus4, July 2017

“Urban towpaths are like another world – step off the street and on the towpath and everything changes – the sounds, the pace of life, the temperature. Somehow people are friendlier where they’re on the towpath than up on the streets.”
Towpath survey online qualitative tasks conducted by Plus4, July 2017

“Everyone you meet has a smile and at least a greeting if not a few words chat. This is totally different to even a walk in the park. People seem to feel more open and friendly.”
Towpath survey online qualitative tasks conducted by Plus4, July 2017

63% of waterway users were ‘alone’ on the towpath when they visited within the LSAs, and this increased to 76% in the Leicester and Manchester LSAs. Those most likely to be ‘alone’ on the towpath are frequent visitors, males, working, interviewed on a weekday and / or 7.30 am – 13.30 pm, runners and cyclists.

Although most of the people interviewed within the LCSs had used their local waterway at some point, there was often a significant proportion that had never visited or not visited in the past year. This ranged from around one in ten in Wrexham and Devizes through to 45% in Birmingham (inner city ward of Ladywood), 38% in Bootle and 53% in Sheffield. Conversely, the Paddington area (within the London Borough of Westminster) was claimed to be the most frequently used of the fourteen longitudinal study areas; 56% of those living within one kilometre visited at least once a week, followed by 51% in Devizes and 50% in Leicester. There is clear scope to encourage greater use of the local waterways in most of these LSAs.



Source: Community Survey 2017 Overview Community Report (June 2017), produced by Kantar TNS

There are clear variations in how each local community uses the local waterway and the next steps will be understanding more about who within the local population using their local waterway at least once a week, and at the other extreme, who has not used it in the past year or not at all. There will always be variations in how each local community uses their local waterway. Some of this will be down to physical aspects of the waterway, such as its location within the town or city and the links it forms between different places, but much will also be due the individuals who live in the area, their demographics, their broader lifestyles as well as their perceptions of the waterway.

The Trust recognises the importance of gaining a better understanding of how to leverage greater local use of the asset on their doorstep. One of the next stages of our research work will be to identify and understand if there are common typologies of frequent users of their local waterway and why; and at the other extreme, there are those who have not used the waterway in past year or maybe never.

Results from the LCSs have been compared to the national results derived from the WEM and over half of the fourteen 14 LSAs are used more frequently by the local population than seen nationally. The second and third planned waves of the towpath intercept surveys and actual counts (from the machine-learning sensors currently being installed within the LSAs) will put this into the context of total use to understand the proportion of all towpath users in each area that actually live in the local community.

Locations where waterway use is greater than seen nationally
Burnley
Devizes
Leicester
Milton Keynes
Torfaen
Westminster
Wrexham

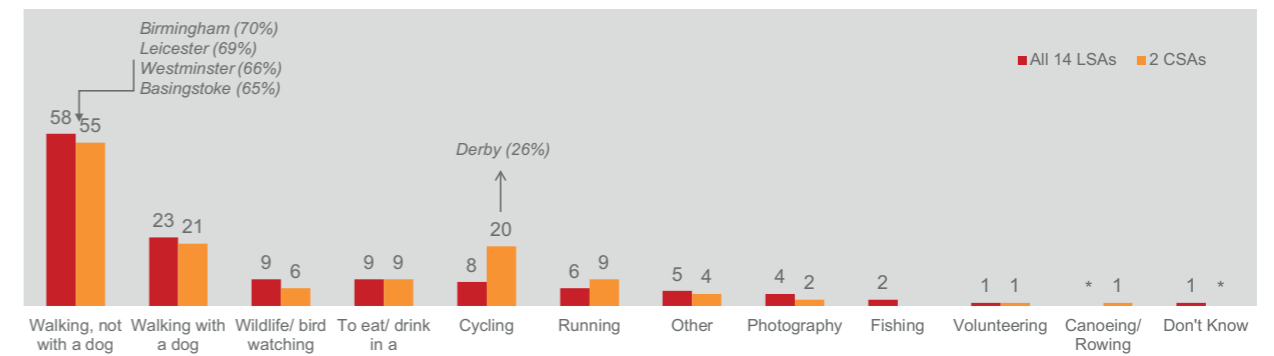
Locations where waterway use is typical of the national picture
Birmingham
[Ladywood ward]
East Riding
Manchester
Bootle
Stockton-on-Tees
Tottenham-Hale

Locations where waterway use is less than seen nationally
Sheffield

Purpose of visits

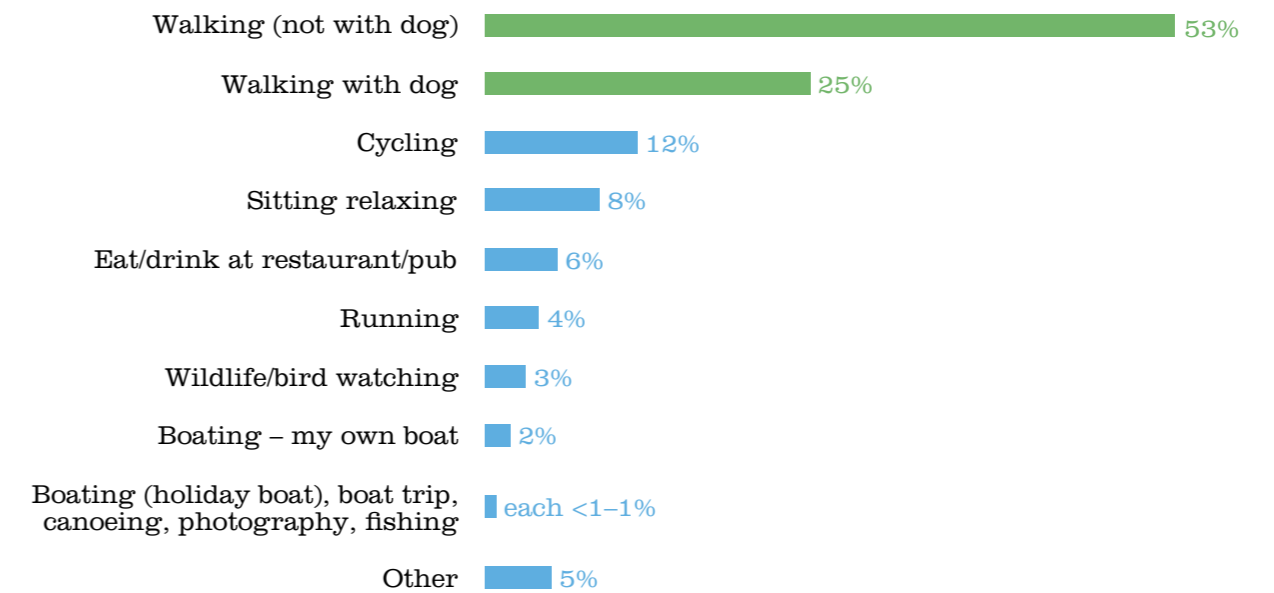
Walking without a dog was by far the most common activity undertaken by waterway users, following by walking with a dog. Cycling was more prevalent in Derby (counterfactual area).

Activities undertaken at the waterways by waterway users (claimed visits)



Source: Community Survey 2017 Overview Community Report (June 2017), produced by Kantar TNS

The first wave of towpath intercept survey results reflects similar pattern of use as found in the LCSs in the LSAs and CSAs.



Source: Towpath Survey a report on Wave 1 (July 2017), produced by Plus4

Local identity, value & connections

Waterways as valued places

Quality of place really matters to people and people are proud of what makes their place special in the areas that they live, according to the research findings published by the British Academy (March 2017). Our research has been set out to better understand the importance of waterways to people's sense of place and key findings are reported below.

The Waterway Engagement Monitor (WEM) indicates that 70% of adults believe waterways are an important part of local communities. This increases to 72% for those who live within 1.6 kilometres (one mile), and 84% of those who visit regularly. From the LCS results in LSAs, waterway users typically recorded high levels of agreement that the waterway is an important part of their local area, with Llangollen users most positive (98%). Although, the 'canal natural' feature was found to be the strongest positive predictor of scenic quality and 'rivers' were ranked eighth in 'urban built-up' in the recently published study in the Royal Society Open Science (July 2017), there are significant variations between the LSAs. The LCS respondents within the Sheffield LSA recorded the biggest difference with 81% of waterway users agreeing that the waterway is an important part of their local area compared to 25% non-users. Within the LSA in Birmingham of 90% waterway users agreeing that the waterway is an important part of their local area compared to 45% non-users was recorded.

In the majority of the fourteen LSAs surveyed, awareness of the proximity of the waterway was significantly lower amongst those who claimed not to have visited, particularly in Manchester (68% of non-users compared to 97% of waterway users) and Sheffield (60% of non-users compared to 88% of waterway users). Awareness by non-users was exceptionally high, over 95% in Wrexham, Devizes, Burnley and Stockton.

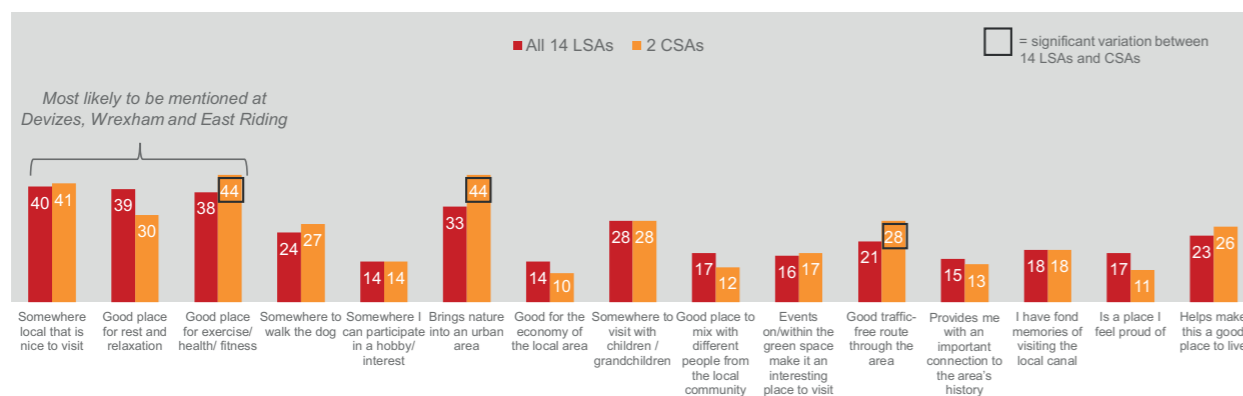
The value of the waterways to their local areas was significantly higher amongst waterway users, particularly in:

- Milton Keynes where 86% of users agreed compared to 34% of non-users; and
- Manchester where 82% of users agreed compared to 36% of non-users.

The variations were even greater with regards to the personal importance of the waterway, particularly in Birmingham (80% of waterway users agreed compared to 17% non-users) and Bootle (49% of waterway users agreed compared to 14% non-users). The smallest gap, although still notable, was recorded in Westminster, where 34% of non-users valued the waterway personally compared to 70% of waterway users.

Benefits of waterways (results derived from the local community survey conducted in the LSAs and CSAs)

Waterways users (claimed visits) %

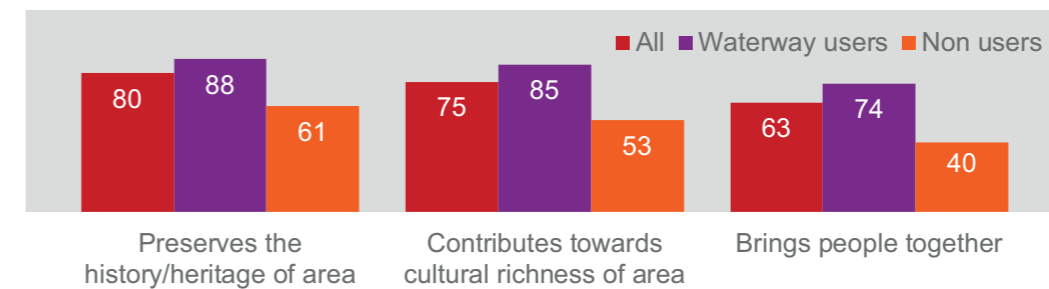


Source: Community Survey 2017 Overview Community Report (June 2017), produced by Kantar TNS

The most positive agreement regarding the contribution of waterways to local culture was recorded in East Riding, across both waterway users (90%) and non-users (83%). For most other areas, the differences by use were significant, particularly in Leicester (75% waterway users compared to 36% non-users) and Manchester (81% waterway users compared to 42% non-users).

The role and value of waterways in terms of heritage and connection with nature are viewed relatively high by waterway users in the LSAs:

- 87% of the waterway users agreed with the statement that canals/waterways make them appreciate nature and the wildlife;
- 79% of the waterway users agreed with the statement that canals/waterways make them appreciate the history and heritage of the area; and
- 75% of the waterway users agreed that Trust waterways contribute to the cultural richness of the area.



Source: Community Survey 2017 Overview Community Report (June 2017), produced by Kantar TNS

The first wave of towpath intercept survey results in the LSAs (July 2017) confirm the above findings.

84% of waterway users agreed with 'I felt safe' about their visit but 8% of non-users cited not feeling safe as a reason for not visiting more/at all.

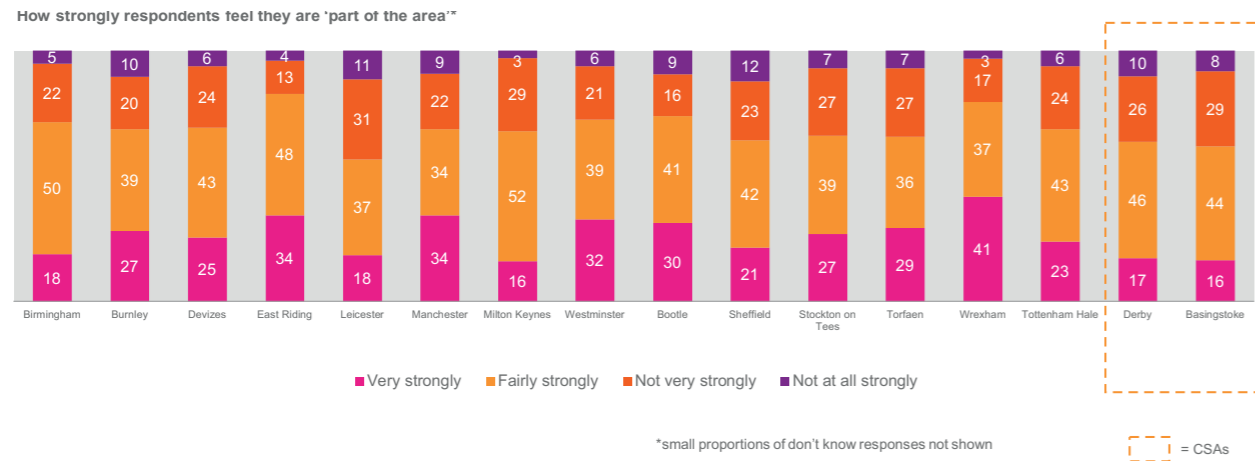
Sense of belonging

Evidence published by the British Academy (March 2017) has revealed that too many people feel we are 'becoming a country of anonymity' and there is a strong loss of sense of belonging.

Our research in the LSAs has revealed that the sense of community belonging is greater amongst waterway users (70% of waterway users claiming that they feel a very or fairly strong sense of belonging to their local community) than it is amongst those who do not visit (62% of non-users claiming that they feel a very or fairly strong sense of belonging to their local community). Interestingly, waterway users claim that they are more likely to think they can trust their neighbours, with 43% of waterway users think many of the people living in their neighbourhood can be trusted compared to 33% of those who do not visit. 75% of waterway users believe waterways are places where people stop and say hello to each other. Whilst this may be the reality that waterway users experience, it does not always translate to the perceptions of non-users, with only 54% of people living within close proximity of a waterway agreeing with this view.

With respect to attitudes to the waterways in bringing people from different backgrounds together, agreement was high amongst all residents in Wrexham that the waterway brings people together (with 90% waterway users and 80% non-users). Several areas recorded significant variations by use, most notably Bootle (67% waterway users compared to 26% non-users) and Tottenham Hale (79% waterway users compared to 39% non-users).

The strongest sense of community belonging was recorded in East Riding with 82% strongly feeling part of their area, followed by Wrexham (77%); those around Leicester were least likely to report such a connection, with 55% feeling part of their area. The sense of belonging did not vary significantly when analysed by waterway users only. East Riding and Wrexham continued to report the highest levels of belonging at 82% and 78% respectively.



Source: Community Survey 2017 Overview Community Report (June 2017), produced by Kantar TNS

Physical & mental health

Use of the waterways provides an opportunity for exercise, whether running or cycling or simply a brisk walk to work or walking the dog.

The WEM has found that physical exercise is the top motivation amongst visitors and users, with:

- 34% of visitors and users identified physical exercise was their main motivation and a further 22% said it was still one of their motives for visiting though not top of their list (56% in total);
- of those who said physical activity was their main motivation, 15% said they would not have participated had the waterway not been there, and 12% would have chosen an indoor location; and
- 7% of waterway users agreed that living near the [local] waterway encouraged them to do more exercise than they would living elsewhere.

The quantum and pattern of physical exercise undertaken as revealed by the WEM:

- 31% of those people using the waterways for these activities do so for over 3 hours each week exceeding the Chief Medical Officer's recommendation of 150 minutes;
- 41% use it for between 1–3 hours each week; and
- 28% for up to one hour.

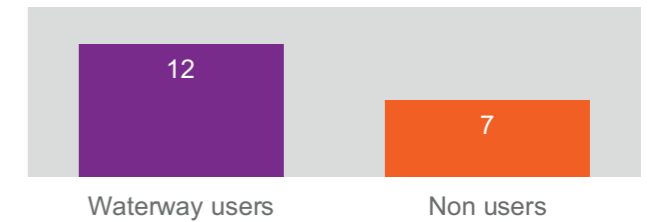
This national pattern of use and motivation is reflected locally, as shown by the local community surveys (March 2017) and the first wave of towpath intercept surveys (July 2017) conducted within the longitudinal study areas.

90% of waterway users surveyed within the LSAs as part of the LCS (March 2017) claim to undertake activities such as walking, cycling, running, etc during visits and 30% of waterway users cite their primary motivation for using the waterways is for health and fitness.

The LCSs within the fourteen LSAs show that the average number of "active days" was greater amongst waterway users (average of 12 days) compared to non-users (average of 7 days).



Average number of days of physical activity undertaken (active days):



Source: Community Survey 2017 Overview Community Report (June 2017), produced by Kantar TNS

The first wave of towpath intercept surveys in the LSAs reaffirmed that health and exercise is a significant motivation and revealed that:

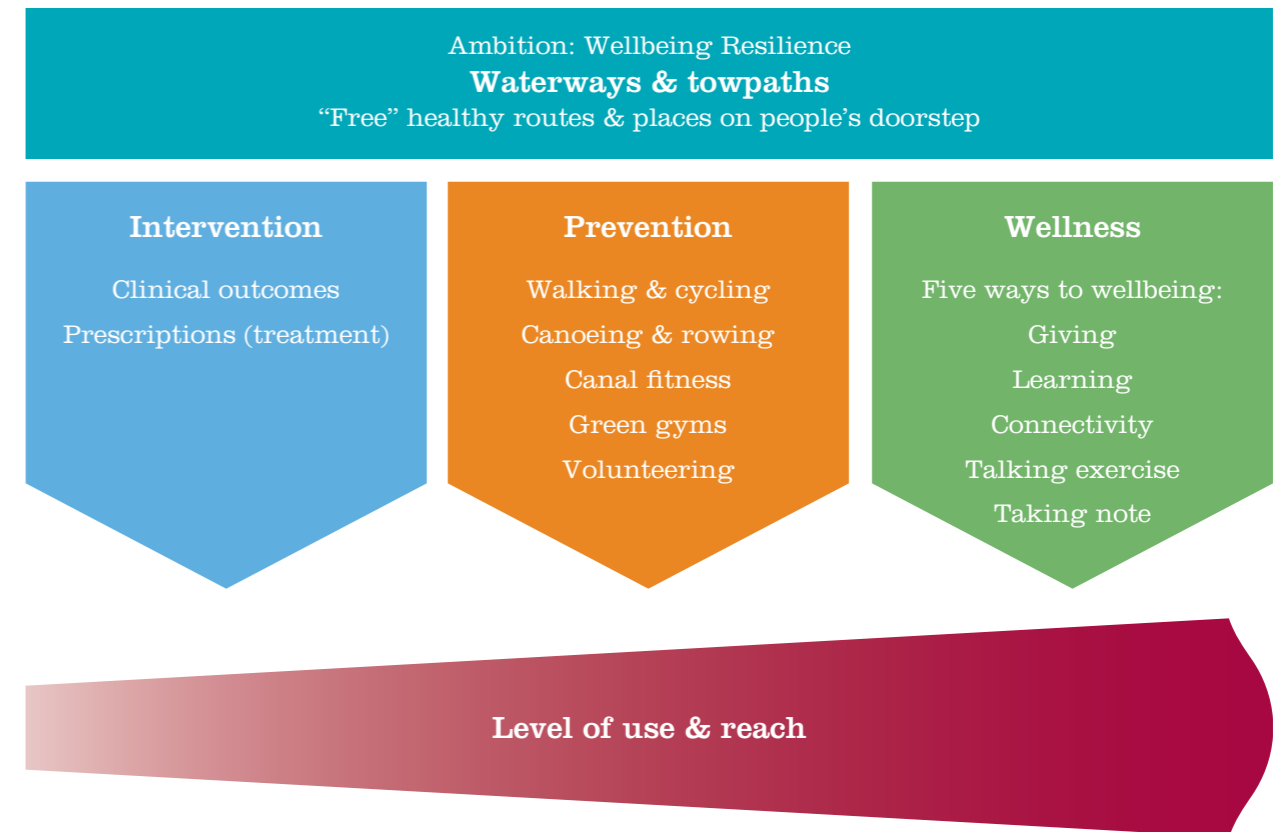
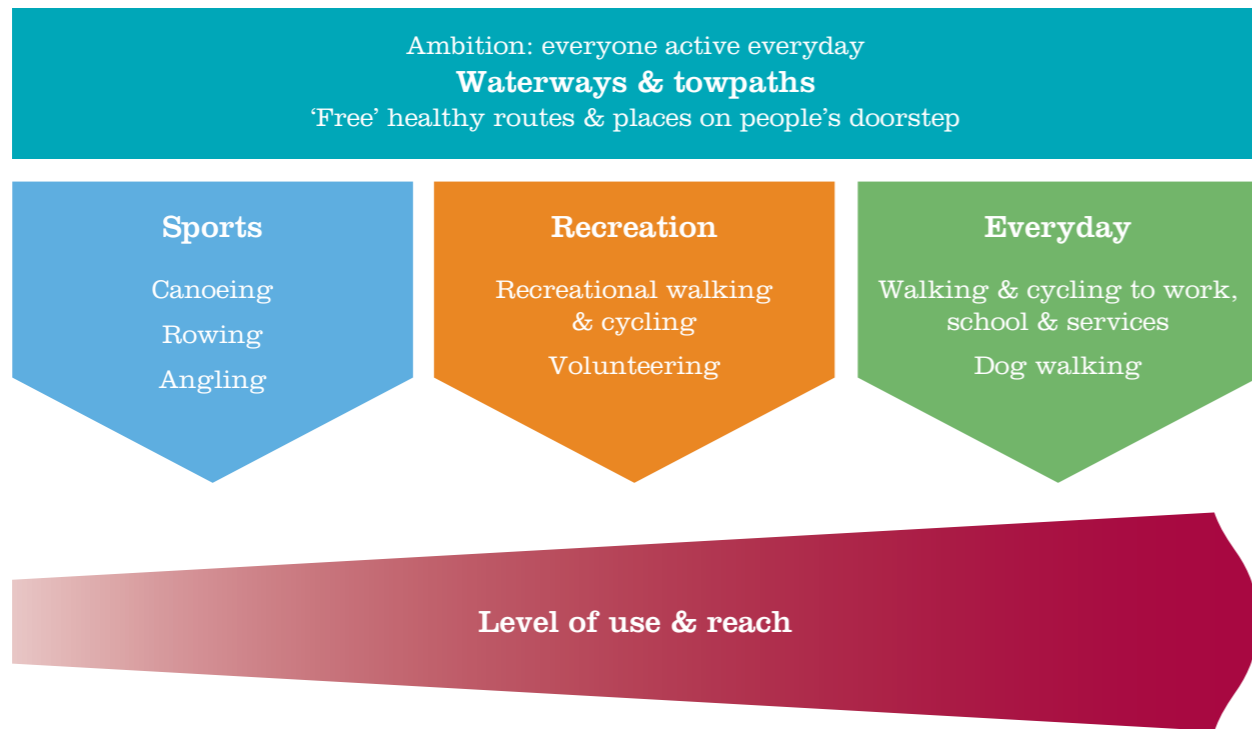
- 22% of the waterway users utilise the towpaths for health or exercise, with 70% of these do so at least once a week;
- at least 78% of the waterway users were recorded walking (with or without a dog), 12% cycling and 4% running along the towpath;
- had the towpath not been available, 74% waterway users would have looked for an alternative outdoor location or route and 12% would not have done any exercise;
- waterway users claim to have exercised on average 12 out of last 28 days and in the preceding week to the survey being conducted, averaged 40 minutes of exercise. 62% undertook some of these activities at the waterways and 74% surveyed, agree that the waterway encourages them to do more exercise; and
- 66% cited the reason for undertaking exercise at waterways was that they like the scenery and surroundings.

"Being 74 years old it gives me the exercise that I need and helps to keep me fit and healthy."
(Towpath survey online qualitative tasks conducted by Plus4, July 2017)

"I feel better exercising along the canal; nobody is watching or being judged – it's a little more private."
(WEM)

Whilst physical activities may be a key motivation amongst waterway users it is not always recognised amongst the people who do not visit their local waterways. Only 38% of those living within the one kilometre waterway corridors in the LSAs, consider their local waterway as being a good place for exercise, health and fitness. However, it is unknown whether this reflects the respondents' attitudes to health and activity or their perception of the local waterway.

The potential to utilise waterways to increase activity levels and improve physical health inequalities and outcomes is significant. The demographic profiling and mapping work referred to in Section 4 of this report, overlaid the resident populations living within one kilometre of the waterway corridors onto the areas of need (defined by physical inactivity from Sport England Active Lives Survey; obesity and mental health from Public Health England national GP profiles; and child (year 6) obesity from the National Child Measurement Programme) which has identified the areas where the greatest difference could be made.



Waterways can also help improve mental wellbeing and happiness, with 90% of waterway users reporting within the local community survey conducted within the LSAs, that they felt that waterways are good places to relax and de-stress. 95% of the waterway users interviewed as part of the towpath intercept survey in the LSAs agreed that ‘it was a good place to relax and de-stress’ and 92% of them agreed that ‘it helped me get away from it all and clear my head’.

“I use towpaths to escape from reality. It’s such a calming experience that many people can enjoy! Wildlife is always happy around me, and nothing is ever imperfect. The public are always happy and say good morning to me :) It’s a calming recipe for my anxiety and I enjoy it very much.”
(Towpath survey online qualitative tasks conducted by Plus4, July 2017)

“Life slows down”
(Towpath survey online qualitative tasks conducted by Plus4, July 2017)

“I love spotting wildlife, it lifts my mood and cheers my soul!”
(Towpath survey online qualitative tasks conducted by Plus4, July 2017)

“It helps me every day as I recently lost my husband after 55 years.”
(Towpath survey online qualitative tasks conducted by Plus4, July 2017)

The most interesting theme to emerge from discussion with young people, as part of the fieldwork from the participatory research project on the motivations and barriers to the use of waterways being undertaken by PLACE, is their appreciation of waterways as places to find stress relief and enhance mental wellbeing. However, it should point out that only a minority of young people involved in the research currently visit waterways for this reason.

“When I come here, this kind of thing, good fun, healthy as well because you don’t have a lot of stress. You know in our life, everything is stress, so actually sometimes I really need, so now ease my problems out”
(adult male, Leicester, research participant as part of research project undertaken by PLACE, 2016/2017)

“The canal helps me to cool off during stressful periods of time and helps me step back and have a better view of life from another perspective. It is calm and helps me forget about all my worries and what is going on no matter how long or brief the time I spend it always makes a vast impact!”
(young male in Blackburn, research participant as part of research project undertaken by PLACE, 2016/2017).

Motivations & barriers

From the national perspective, the WEM survey reveals that improving health and wellbeing emerges as the main motivator for visits to waterways. Whether it be the sense of wellbeing gained from time spent in the fresh air (60%) or from physical exercise (56%), people recognise the opportunities waterways offer to maintain their health. Physical exercise is the strongest motivation for individuals, followed by getting fresh air and relaxation resonating across demographic groups. This is consistent with the work by Natural England.

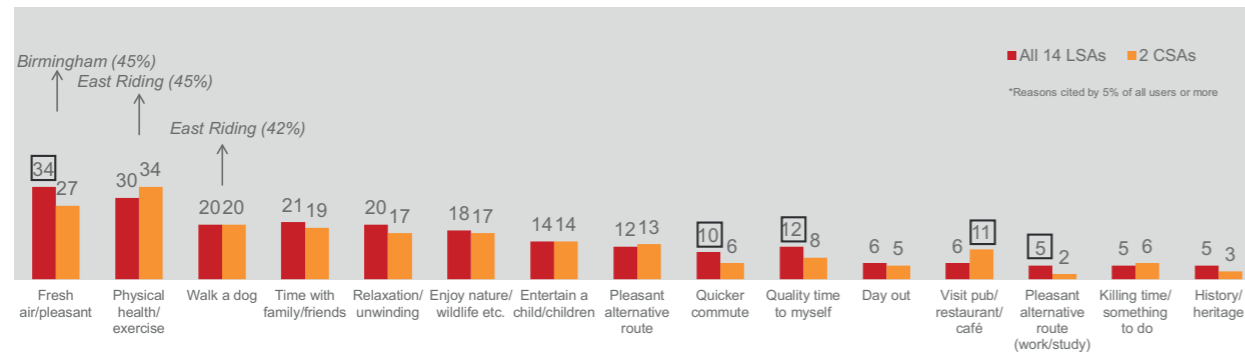
However, greater understanding of the motivations and barriers has been gained at local level, from:

- the local community survey and the first wave of the towpath intercept survey conducted in the LSAs and CSAs; and
- the findings and conclusions from the participatory research project on the motivations and barriers to the use of waterways being undertaken by PLACE, with fieldwork in four case study areas (namely: Leicester, Blackburn, East London and Milton Keynes) and analysis under four themes (namely: BAMEs; young people; women; older people).

At a local level however, there are two alternative main motivators. The main reasons cited for visiting the waterways within the local community survey (conducted in March and April 2017) reflect the national position. However, the results from the first wave of the towpath intercept survey (conducted in July 2017) reveal that primary reason cited by the waterway users (37%) is commuting purposes.

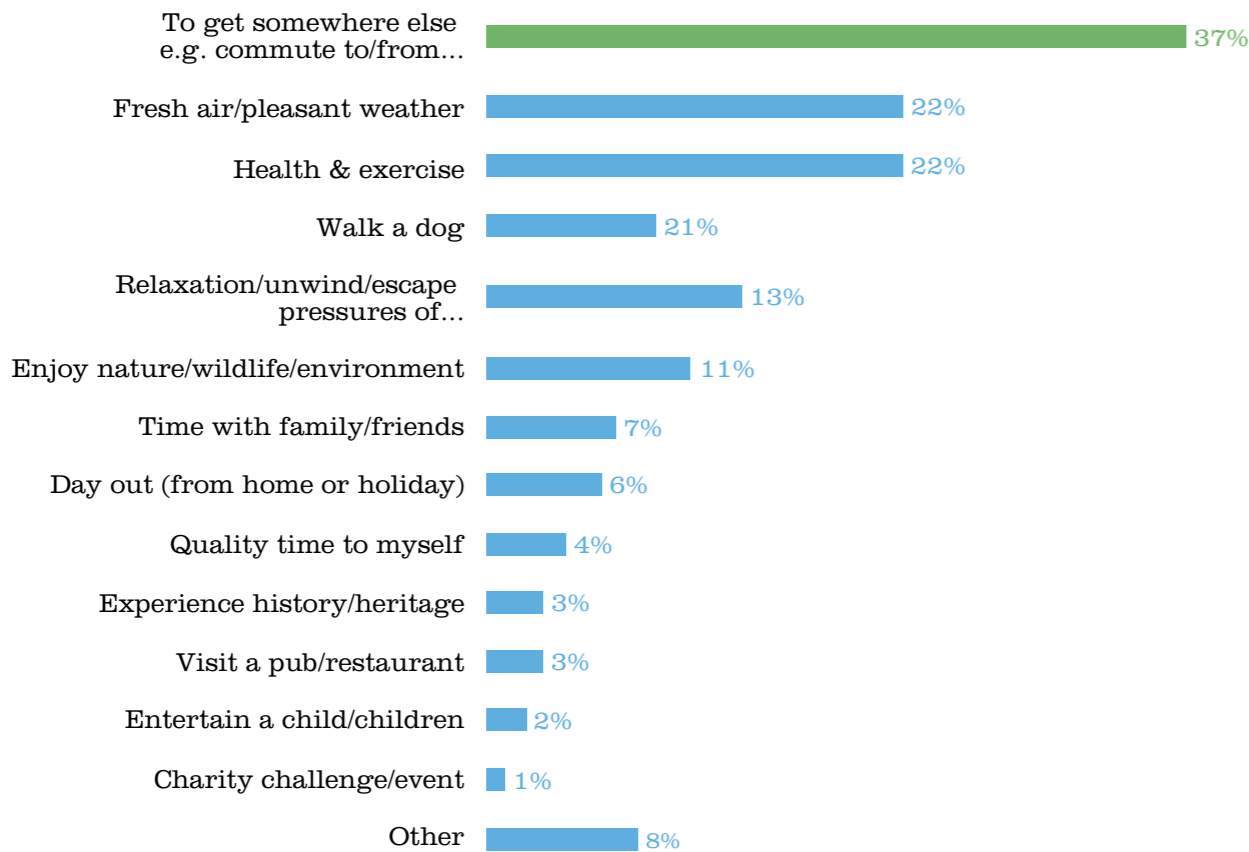
Reasons for visiting the waterways (results derived from the local community survey conducted in the LSAs and CSAs)

Reasons for visiting the canal by waterway visitors (claimed visits) *



Source: Community Survey 2017 Overview Community Report (June 2017), produced by Kantar TNS

Reasons for visiting the waterways (results derived from the towpath intercept survey conducted in LSAs and CSAs)



Source: Towpath Survey a report on Wave 1 (July 2017), produced by Plus4

At a local level, the main barriers cited in the local community survey and the first wave of the towpath intercept survey conducted in the LSAs and CSAs.

Reasons for not visiting/visiting more	14 LSAs %	Two CSAs %
I'm too busy/not enough time – work/study	19	22
Nothing in particular	16	16
The weather	14	7
My poor health	12	8
I'm too busy/not enough time – family	12	13
Not interested in visiting	9	10
I'm too busy – other commitments	8	9
I don't feel safe	8	5
Other personal mobility reasons	6	8
I didn't know about it/wasn't aware of the waterway	4	9
Not well maintained	4	3
Don't know what I would do there	4	5
Lack of facilities/poor facilities	3	2
It's too far away	3	3

Source: Community Survey 2017 Overview Community Report (June 2017), produced by Kantar TNS

Benefits and motivations relating to use of waterways

The participatory research project undertaken by PLACE draws together analysis across the four case studies – Blackburn, Leicester, Milton Keynes and Tower Hamlets to give insight into the benefits people seek from waterways and how they might motivate different kinds of people to visit.

Across all groups and the four locations the most significant benefits and motivations are similar with an emphasis on relaxation and socialising. Factors such as varying levels of familiarity with waterways or whether people are working full time seem to be more influential than demographic characteristics. People's motivation to visit the waterways seems to be less significantly influenced by ethnicity or gender than it is by their age or relative familiarity with the waterway. There is greater variation between age groups, notably between young and older people.

The main reasons as to why people would visit waterways can be grouped into four categories:

- **reasons to go and things to do** – getting around; socialising; good for the children; nature and greenspace;
- **personal benefits gained and sought** – health; education; personal development and wellbeing and stress relief;
- **emotional states** – qualities of the experience of being at a waterway such as pleasure and enjoyment as well as relaxation and how they affect people's state of mind or emotions; and
- **appealing features or characteristics** – outdoors, history, wildlife and nature.

The benefits and motivations cited most frequently were: relaxation; socialising; and entertaining children. The next most popular were: volunteering (both young and older people but for different benefits); pleasure and enjoyment; wildlife and nature; and, being outdoors and getting fresh air.

From the responses made by the different research participants, PLACE identified a three pronged approach to encouraging greater use of the waterways for the Trust to consider:

- awareness and understanding
- organising activities
- working with expert partners

Underpinning the above is the need for the waterway environment to be pleasant, safe, clean appealing and well-maintained.

Encouraging more people to use waterways requires work to shift people's perceptions of them as uninviting places. But this is not wholly a matter of spreading information because the waterway space also needs to have positive qualities – be safe, clean and pleasant – and afford opportunities for how people want to engage.

Key to engaging people not currently likely to visit waterways is understanding their motivations and interests, then seek ways to connect this to waterways. This may involve innovative activities not typically on offer, and requires flexibility in thinking about what constitutes a waterway activity.



Enjoying their first boat trip, Leicester

Barriers preventing use of waterways

The participatory research project undertaken by PLACE draws together the findings of their research in the four case study locations and provides an analysis of the barriers which prevent people using or visiting waterways.

There are few barriers specific to certain demographic groups, but some kinds of people are likely to experience more constraints.

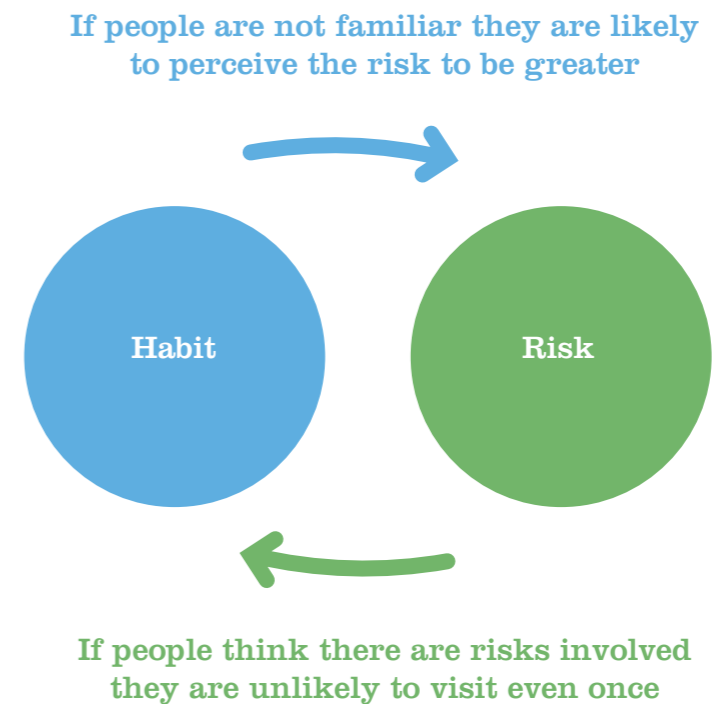
The barriers associated with young people relate to personal safety and security; boredom and lack of things to do; being too busy; and current leisure preferences.

Black, Asian and Minority Ethnic Groups' perspectives on barriers include anti-social and risky behaviour; low levels of familiarity with waterways; personal safety and security; as well as personal situation. The most constrained participants were young women from British Asian background as they expressed issues relating to their age, gender and ethnic background.

Individual barriers have been categorised under four headings:

1. waterway perceptions & understanding;
2. waterway space & environment;
3. personal situation; and
4. other, for example, weather, dogs etc.

The over-arching conclusion across the case studies is that the single most significant reason that people do not visit waterways is that they have not got a history or habit of doing so: the people least likely to go to a waterway are people who do not already go to a waterway.



Hygiene factors, perceived and actual personal safety and water safety are the most significant barriers across age groups and ethnic identity. Many of the issues highlighted are common to other public open spaces, and outdoor recreation in general. However, whilst some of the factors would apply to use of other green or public spaces, there are aspects which are specific to the nature of waterway environments and how they are perceived. There is a strong sense that the presence of water heightens the degree of risk, and compounds other safety concerns such as fear of attack.

Negative perceptions of waterways and strong associations with characteristics expected to threaten personal safety, are prevalent across a wide range of people. Those without direct personal experience of waterways people often imagine them to be less appealing than they find them to be once introduced to them.



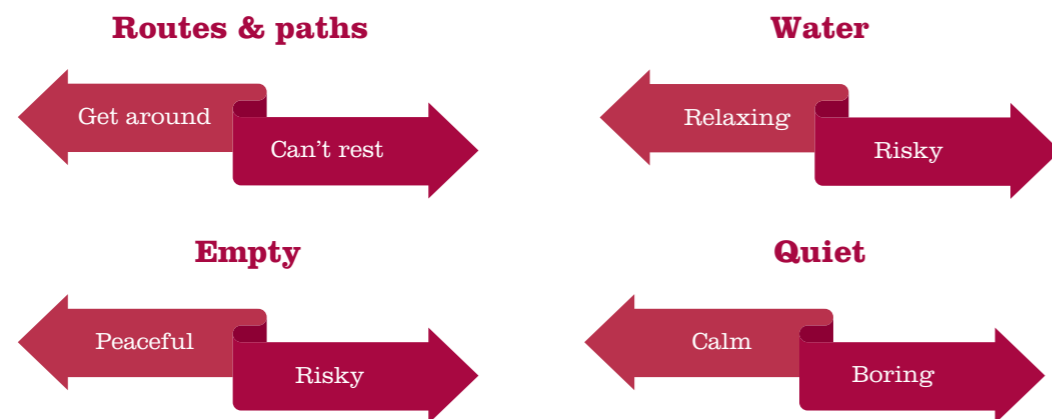
Unwelcoming environment – “It’s dark and scary” and “It’s not an appealing place to go”

Contradictory views and bi-polar perceptions of waterways

Many of research participants simultaneously hold both very negative and quite positive images of waterways, even those who had little awareness of what waterways are like. For example, this comment on a feedback form following a boat trip that was the young woman’s first experience of the local waterway: “The water’s not safe enough in case people fall in by accident (dirty) but it is so peaceful, beautiful and relaxing and enjoyable”. Another young man in Blackburn described the waterway as dirty and “full of dead bodies” but goes there to relax and “likes their history”.

Few people have wholly negative associations of waterways, and it is rare for people to see no positive aspects to them.

Perceptions of waterways are bi-polar in that the very features which attract certain people are the same ones which deter others. This means that work to promote certain attributes of waterways therefore attract some people and deter others, whilst increasing certain uses may have the effect of decreasing other users’ willingness to visit.



Waterway characteristics pulling in opposite directions (PLACE, 2017)

The principal learnings from this research project for the Trust, are that it is crucial to change both the perceptions of what waterways are like; as well as to address issues associated with the physical environment itself.

Comparison of the most significant barriers for each location and demographic group (produced by PLACE at Cardiff University (2017))

Barrier	All	Blackburn	Leicester	Milton Keynes	Tower Hamlets	Male	Female	Young	Adult	Older	White	BAME
Waterway perceptions & understanding												
Boring			*					*				
Dodgy	*	*			*	*	*	*	*	*	*	*
No information												
Not understand	*					*			*			*
Nothing to do	*		*					*				*
Scary	*	*	*		*	*	*	*	*	*	*	*
Unappealing												
Waterway space & environment												
Access												
Cyclists					*	*				*		
Dark	*									*	*	
Dirty	*	*	*	*	*	*	*	*	*	*	*	*
Facilities												
No people												
Not overlooked												
Pollution												
Towpath	*			*	*	*			*			
Water safety	*	*		*			*	*	*	*	*	
Personal situation												
Confidence												
Money												
No habit												
Not alone				*								
Parents												
Poor health mobility												
Preference	*	*					*	*				*
Too busy			*					*				*
Other												
Distance												
Dogs												
Parking												
Weather				*			*		*			

8



Canal Challenge Badge, testing knowledge of the local area and life skills

Section 8:

How we measure – Future Plans

Our planned activity for next twelve months

Our activities during next twelve months will focus upon:

- phase two of putting the measurement and evaluation infrastructure in place to support the outstanding OMF / outcome indicators;
- collating the statistical evidence to be able to report on, and apply the valuation methodologies to the different OMF domains and indicators for inclusion within our second Outcomes Report;
- the first phase of retrospective project evaluation work, to help build the repository of evidential case studies, testimonies and examples for effective 'storytelling';
- developing a proposition that enables the Trust to 'capture' the outcomes generated by others using our waterways as a platform (charities, clubs, social enterprises, etc); and
- using our outcomes work to inform our public policy and public affairs work and our response to devolution as well as provide strategic direction on the Trust's activities and interventions as part of the business plan preparation process.

Putting the infrastructure in place – towpath measurement

We are in the process of a two phase installation of around 50 automatic video analytic sensors, to monitor the volume and type of towpath use in the fourteen longitudinal study areas (LSAs). In addition we are also installing temperature and air quality sensing capabilities in six of the more densely populated urban LSAs. Further sensors will be installed as part of future property development schemes and externally funded projects initiated and /or delivered by the Trust and its partners.

Putting the infrastructure in place – new tools & models

In the first phase of *Putting the measurement and evaluation infrastructure* in place, the Trust concentrated our efforts upon those OMF indicators which generate high impact but which were not readily accessible to measure. We are now turning our attention to those other OMF indicators not currently being measured. Phase Two will involve the Trust building and testing new tools, primarily, national models with local application.

National towpath model

The Trust is seeking to build a national towpath model to support the measurement of the OMF indicators on physical health and sustainable transport.

At present, we estimate annual towpath usage using the Waterway Engagement Monitor (WEM). However, the WEM provides very little information about how aggregate usage is distributed across our waterway network. Over the coming years, we therefore intend to supplement the WEM by using the data that is collected from the automatic video analytic sensors being installed along the towpaths within the Longitudinal Study Areas to produce a bottom-up estimate of total usage.

Statistical analysis will be undertaken to identify the factors that drive towpath usage in areas with these sensors, with the results of this analysis being used to estimate usage in areas where no counters are present. It is anticipated that the drivers of towpath usage will include (but may not be limited to):

- socio-economic characteristics;
- travel to work patterns;
- connectivity / availability of access points;
- towpath and waterway environment quality; and
- proximity to attractions (owned or managed by the Trust or others).

Waterway dividend

Currently there are no models or studies that specifically measure the value attributable to waterways linked to regeneration, place branding and place making as well as to the resilience of place. It has previously been identified (Ecotec, 2014) that the presence of waterways has several property and investment related effects, namely:

- establishing developer and investor confidence;
- bringing forward the development of previously vacant or underused sites; and
- enhancing the image, vibrancy and vitality of an area.

"Canals, culture and housing help make Birmingham the top choice for people leaving the capital"

The Guardian

To address this gap, we intend to commission a piece of research which will design and test a detailed model of the waterway corridor to enable the measurement of the value attributable to waterways.

We envisage that this will be estimated through two distinct research projects:

- **an assessment of waterside regeneration and development schemes.** A representative sample of mapped waterside schemes will be investigated to identify the amount of investment involved in each scheme, the number of jobs created as a result and an estimate of the dependency of each of these schemes on the waterway environment.
- **use of the hedonic price method of economic valuation,** whereby house prices are used to estimate the amenity value of a specific 'good or service'. Working with a research partner, the Trust will identify the property price discrepancy associated with proximity to our waterway network, controlling for other house-specific, economic and environmental factors that are likely to influence property prices. In doing so, the Trust will be able to estimate the amenity value that house buyers place on proximity to a waterway.

Stated preference valuation

To support the measurement of the OMF indicators on culture and heritage, biodiversity and environmental stewardship, we intend to work with experts in stated preference valuation to estimate the value of the environmental and heritage assets owned and / or managed by the Trust. It is envisaged as part of this work that the Trust and our appointed research partner will design survey instruments that will be used to elicit the value that local people place upon the different assets. Further analysis will be undertaken to estimate how this value varies according to personal and geographical factors. These results will be used in conjunction with any available user and asset data held by the Trust to estimate the overall benefit produced by our environmental and heritage assets.

Rehabilitation study

As part of our work under the OMF indicator on broadening opportunities and inclusivity, the Trust intends to measure the value and effectiveness of waterway related community rehabilitation programmes, including community payback and fit for work schemes, by assessing their impact upon reoffending rates.

In collaboration with the relevant Probation Trusts, we intend to provide the Justice Data Lab with details of offenders who have participated in waterway related community payback schemes. The Justice Data Lab's analysis consists of matching individuals who have participated in a scheme or programme with statistically similar individuals who have not participated in the scheme. The 12-month reoffending rate of both groups is then compared to identify if scheme participants are less (or more) likely to reoffend than non-participants.

Building an evidence base on Trust's activities

Longitudinal Study Areas (LSAs) – in-depth research & evaluation

The Trust will continue to invest in our programme of annual local community surveys and towpath intercept surveys being conducted within the Longitudinal Study Areas (LSAs) and Counterfactual Study Areas (CSAs), to track impacts and changes over time. As part of our building the evidence base around the fourteen LSAs, in-depth evaluation work will be undertaken for all projects, initiatives and activities undertaken by the Trust and its partners.

We intend to explore whether there is merit in increasing the number of LSAs considering the findings from the local community surveys, which have revealed that only one of the fourteen LSAs have lower than the national results from the Waterway Engagement Monitor (WEM), in terms of visit frequency amongst those living with one kilometre of a Trust waterway to give a more balanced and reflective picture at the local level.

Gaining a better understanding of our results

In-depth analysis of current research findings

We will work with an independent researcher to undertake an in-depth comparative analysis of all the research data collated from:

- the local community surveys and towpath intercept surveys within the LSAs and CSAs;
- WEM annual insight report;
- conclusions from the two projects under our research programme, namely: the participatory research project on understanding motivations and barriers to community use undertaken by PLACE and the mental health benefits of waterways research project undertaken by the Centre for Sustainable Healthcare; and
- other surveys, for example, market research undertaken as part of individual giving review etc.

Wellbeing Valuation Study (mental health & wellbeing; community engagement)

As part of our work on OMF indicators on mental health, wellbeing and happiness and community engagement, we have incorporated the four ONS measures of subjective wellbeing into all the Trust's survey tools, wherever appropriate. The data that has been collected to-date indicates that towpath users, boaters and volunteers have marginally higher than average wellbeing scores than non-waterway users in the same locality. However, the Trust acknowledges that it would be inadvisable to use these results to conclude that towpath use, boating or volunteering associated with our waterways improves personal wellbeing, as it is probable that the increase in wellbeing is also driven by other factors.

To gain a better understanding of wellbeing effect caused by waterways, the Trust intends to commission a specialist consultancy to use appropriate statistical techniques to analyse our collected data and to control for other drivers of wellbeing. This analysis will provide a more refined estimate of the wellbeing effect and associated monetary value of the waterways and the activities and interventions made by the Trust.

Other initiatives

The Trust is currently developing several other initiatives to support our measurement and evaluation work, including:

- call to action activities and events, for example, Citizen Science Project proposition linked to environmental assets;
- retrospective project evaluation programme, involving secondary analysis and summative evaluation of completed initiatives and projects that have been carried since we became a charity in 2014;
- building a project evaluation toolkit specifically tailored for capturing the outcomes generated from our property development and joint venture activities;
- scheme specific evaluation plans, for example, Inland Port of Leeds; and
- creating a volunteer survey team, including training programme.

Building an evidence base on outcomes generated by others

One of the biggest challenges ahead for the Trust, is how we effectively measure the outcomes generated from others using our waterways as a platform. We are currently exploring options to enable us to capture outcomes generated through charities, clubs, societies, social enterprises, community groups, waterway related groups or waterway dependent businesses (for example, hire boat companies). We have undertaken an audit of all those charities, clubs, social enterprises and trusts that operate on our land and waterways and which have a contractual relationship with the Trust.

Extending & sharing our knowledge

Our research programme will focus upon the following five strands of activity:

- effect of waterways on anxiety;
- waterways and community wellbeing;
- waterways and urban cooling;
- waterways and visitor economy; and
- water resourcing and land drainage system.

Waterways & anxiety

In addition to the Wellbeing Valuation Study work referred to above, the Trust is keen to fully test the hypothesis that 'people are using of our waterways as places to get away from it all when they feel anxious or stressed'. As mentioned in the previous section of this report, the local community surveys in the LSAs reveal the scores for the ONS measure of subjective wellbeing on anxiety are higher for people who are using and visiting the waterways than non-waterway users and that 90% of users and visitors agreed that the waterway was a good place to relax and de-stress.

Waterways & community wellbeing

The results from the WEM reveal that waterway users and visitors are more likely to think they can 'trust' their neighbours, with 43% of visitors thinking many of the people living in their neighbourhood can be trusted compared to 33% of those non-waterway users.

The Trust is keen to explore further some of the conclusions made by British Academy in *Where We Live Now – Making the Case for Place-based Policy* (March 2017), particularly linked to connections, sense of belonging and importance of place. The Trust intends to work with a research partner within the fourteen Longitudinal Areas to fully test the hypothesis – *Does people using their local waterways help build neighbourhood trust, connections to place and sense of belonging in some way, or, are the people who have a strong sense of trust their neighbourhood more likely to feel happy and / or safe using their local waterways?*

The Trust is also very interested in working with the University of Warwick and The Alan Turing Institute to explore the possibility of quantifying the impact of the scenic value of waterways (in terms of health, sense of connection, belonging and happiness), especially upon those living within deprived urban areas.

Finally, the Mappiness is an iOS app, developed by researchers at the London School of Economics asks users to rate their wellbeing and feelings throughout the course of the day. This has potential to be utilised within the LSAs to examine how happiness and relaxation are affected by use of our waterways.

Waterways & urban cooling

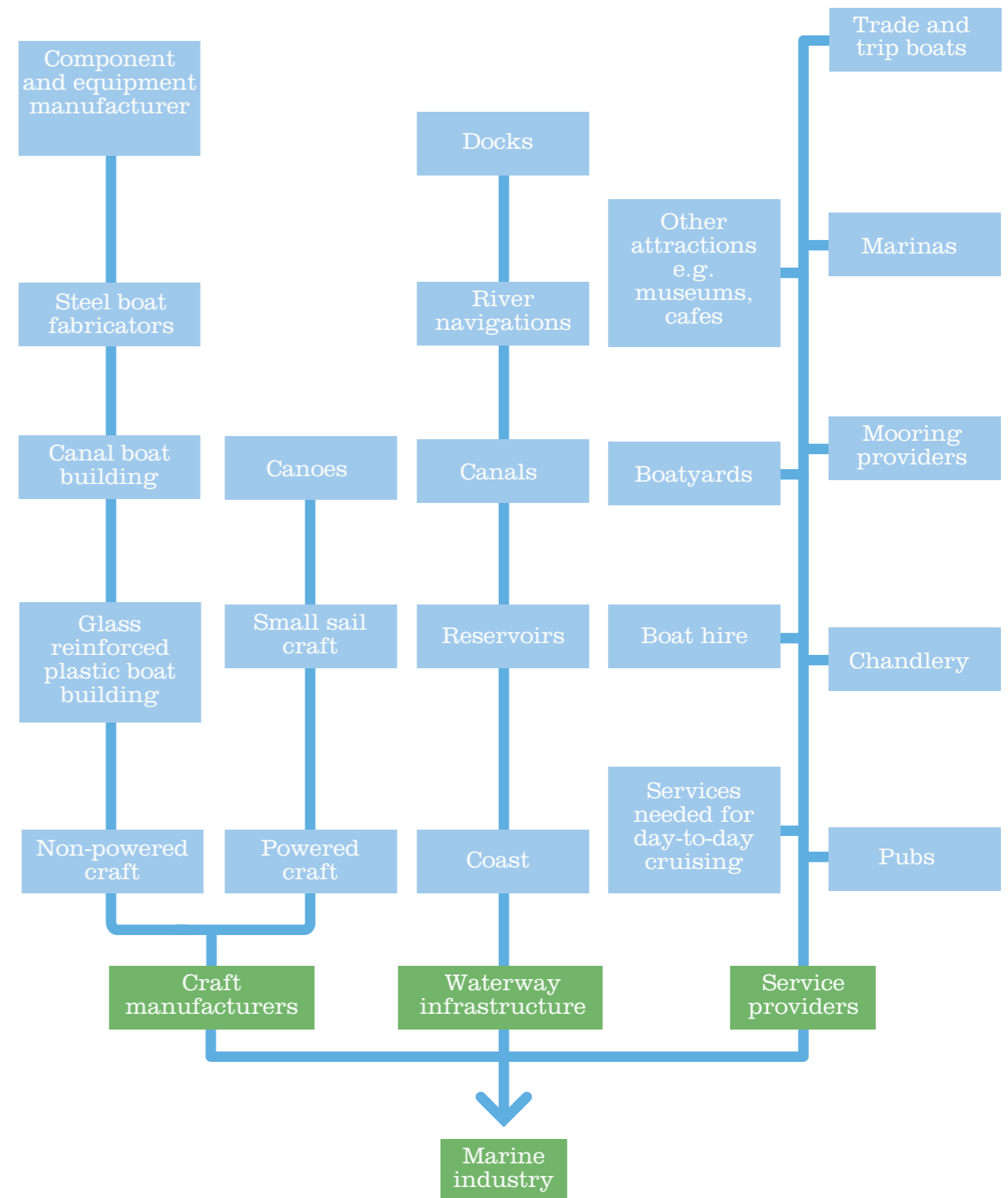
The Trust is currently discussing with Manchester University the development of a model to quantify the effect of urban cooling generated from our waterways and how it could be applied to the metropolitan and urban centres in UK experiencing currently or predicted to experience in the future, the heat island resulting from climate change.

Waterways & visitor economy

Under the OMF indicator on economic growth, the Trust would like to undertake joint research with British Marine to identify and estimate the size and economic impact of our waterway and associated visitor economy.

The diagram on next page illustrates the range of businesses which are directly dependent on thriving and well used waterways, or businesses located on the waterways whose business is dependent to some degree on visitors to the waterways.

The intention is to work with British Marine and a research partner to identify these businesses and to subsequently construct a representative sample who will be surveyed about their turnover, workforce size and the degree to which they believe their business is dependent upon the inland waterways.



Water resourcing & land drainage system

Our waterway network makes a positive contribution to the land drainage system of the UK. If it did not exist, or was not maintained to a sufficient degree, alternative infrastructure would need to be built to provide the same drainage function. British Waterways previously estimated the value of this land drainage function using a replacement cost approach, whereby the cost of this alternative infrastructure was estimated.

Given the age of the original research, the Trust would like to work with a research partner to conduct an updated version of this study using more recent cost estimates and a more refined definition of the drainage function provided by our waterways.

Sharing & aligning with others

As referenced throughout the report, the Trust has been collaboratively working with various partners from the public and charity sectors (with shared ambitions and interests), academia and sectoral experts from the private sector.

Current collaborative working includes (not exhaustive list):

- developing and testing adult learning offers and building an understanding of the impact we could make in this area in collaboration with Workers Educational Association – (OMF /outcome indicator on skills and lifelong learning);
- being partner in research and policy projects being led others such as the *Planning healthy – weight environments – a TCPA reuniting health with planning project* and the current follow-up project *Developers and Wellbeing: gaining a business perspective on building healthy places* being led by the Town & Country Planning Association and Public Health England;
- evaluating the effect of improvements made to the towpath surface along a stretch of the towpath in Birmingham to establish the return on investment associated with towpath improvements in collaboration with Sustrans (final report is expected in Autumn 2017);
- working in partnership with Digital Birmingham and Aston University as part of the *Smart Demonstrator – Canal Revival initiative* to use the canals as an incubator site to trial use innovative 'digital' solutions that seek to:
 - capture the movement of people and their interactions with the canal infrastructure, including access, egress and patterns of use;
 - improve physical safety and security (better design and surveillance);
 - improve environmental sustainability (water for heating and cooling, sustainable urban drainage); and
 - monitor the environment (air quality, temperature, water quality); and
- being a member of key networks such as Green Infrastructure Partnership, Outdoor Recreation Network etc.

Later this year, the Trust intends to share the detailed insights derived from the local community surveys and towpath intercept surveys undertaken within the fourteen LSAs with the relevant local authorities and other key local partners.

Although our outcomes measurement work is still in the early phases of implementation, we are keen to disseminate and share our work with the wider, well informed community that will be able to advise, support and champion what we are doing. We hope that firstly, our approach and activities in the fields of research, measurement and evaluation will contribute to the growing evidence base. Secondly we hope that our future evidence-based case studies can be used to help distil and share the evidence on waterways and wellbeing to support national and devolved policy and decision makers in England and Wales.

How to contact us

If you wish to discuss any of the approaches and learnings set out in this report or share your experience and future plans with the Trust, please contact us.

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Richard Rutter – Policy, Research & Impact Unit Manager, Richard.Rutter@canalrivertrust.org.uk

Acknowledgements

The Trust would like to take this opportunity to thank firstly, the OMF External Reference Group (ERG) members for all their time and support, in providing insight, guidance and constructive feedback and challenge, which has been invaluable in shaping our work. Secondly, we would like to give special thanks to Nancy Hey, Director of the What Works Centre for Wellbeing, for all her guidance, introductions, sharing of knowledge and encouragement and for connecting us with the wider wellbeing research, evaluation and policy community.

ERG Members

The External Reference Group (ERG) members are currently:

Paul Allin – Paul Allin is a visiting professor in the department of mathematics at Imperial College London. Former director of the Measuring National Wellbeing programme at the Office for National Statistics

Judy Cligman – Director of Strategy and Business Development at Heritage Lottery Fund (HLF)

Dr Anne Marie Connolly – Deputy Director, Health Equity and Mental Health at Public Health England (PHE)

Tom Franklin (ERG Chair) – CEO of Citizenship Foundation and former Trustee of the Canal & River Trust

Stephen Gibbons – Professor of Economic Geography at the Department of Geography and Environment, London School of Economics

Iona Joy – Head of Charity Unit, New Philanthropy Capital

Philippa Lynch – Senior Data Analyst for the Care and Health Improvement Programme, the Local Government Association

Ewen McKinnon – Cabinet Office Analysis and Insight Team (Wellbeing measurement, analysis and policy)

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bwa design – Webster Wickham, Creative Director and team

Report dated September 2017



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A look behind the scenes during one of our free public open days

Appendix 1: Population living close to a waterway owned & / or managed by the Trust

Geographical Reach	Population live within <u>one kilometre</u> of a waterway owned or managed by the Trust			Population live within <u>8 kilometres</u> (5 miles) of a waterway owned or managed by the Trust		
	Total	Urban areas	Rural areas	Total	Urban areas	Rural areas
England	15%	90%	10%	52%	90%	10%
Greater London	15%	99%	<1% (0.5%)	72%	99%	1%
Greater Manchester City Region	25%	99%	1%	92%	99%	1%
Liverpool City Region	16%	99%	<1% (0.5%)	95%	99%	1%
Nottingham City Region	25%	80%	20%	81%	83%	17%
Sheffield City Region	16%	94%	6%	86%	94%	6%
Tees Valley City Region	10%	99%	1%	55%	95%	5%
West Midlands City Region	51%	94%	6%	100%	94%	6%
West of England City Region	11%	91%	9%	66%	94%	6%
West Yorkshire City Region (Leeds)	26%	91%	9%	96%	92%	8%
Midlands Engine	30%	88%	12%	77%	85%	15%
Northern Powerhouse	16%	95%	5%	70%	95%	5%
Wales	3%	50%	50%	17%	74%	26%
North Wales	9%	80%	20%	34%	85%	15%
South Wales	13%	15%	85%	28%	43%	57%

Appendix 2: Longitudinal study areas (LSAs) & counterfactual study areas (CSAs)

Area	Longitudinal study areas – demographic characteristics																			
	Population			Deprivation			Disability			Education			Unemployment			Ethnicity (BAME Population)			Health	
	Whole LA	<1km to waterway	LSA	Whole LA	<1km to waterway	LSA	Whole LA	<1km to waterway	LSA	Whole LA	<1km to waterway	LSA	Whole LA	<1km to waterway	LSA	Whole LA	<1km to waterway	LSA	Whole LA	<1km to waterway
Birmingham	1,073,045	435,191	75,084	66.4%	71.1%	18.4%	17.5%	15.4%	34.4%	34.0%	34.0%	11.1%	11.7%	13.5%	42.1%	48.2%	66.6%	6.7%	6.6%	6.4%
Burnley	87,059	61,055	49,591	63.8%	67.1%	22.5%	23.2%	23.1%	34.1%	36.7%	37.0%	8.0%	9.2%	9.6%	12.6%	16.9%	16.6%	7.7%	8.2%	8.2%
Devizes	470,981	60,954	18,572	50.2%	54.1%	16.0%	17.0%	17.6%	22.8%	22.7%	24.9%	4.0%	4.2%	4.6%	3.4%	2.6%	2.8%	4.1%	4.2%	4.3%
Leicester	329,839	117,887	86,484	67.3%	67.9%	17.3%	16.7%	15.3%	38.2%	36.3%	34.8%	9.6%	9.2%	9.4%	49.5%	45.8%	51.8%	6.0%	5.9%	5.5%
Manchester	503,127	104,882	61,192	65.6%	66.5%	17.8%	17.1%	12.1%	30.3%	30.0%	20.9%	9.0%	9.0%	6.7%	33.4%	28.5%	32.4%	7.1%	7.2%	5.1%
Milton Keynes	248,821	89,703	35,397	53.3%	61.4%	13.9%	16.0%	15.8%	24.3%	28.6%	28.8%	6.3%	7.4%	8.2%	20.0%	21.3%	27.6%	4.1%	5.1%	5.4%
Pocklington	334,179	23,163	3,626	53.8%	43.5%	19.1%	17.2%	13.6%	27.8%	31.5%	21.7%	5.2%	6.2%	2.3%	1.9%	1.7%	1.6%	5.4%	5.2%	3.6%
Regents Canal	219,396	138,830	166,753	60.8%	64.0%	14.1%	14.9%	15.1%	25.4%	27.1%	27.3%	6.6%	7.3%	7.8%	38.3%	43.3%	43.0%	5.8%	6.4%	6.5%
Sefton	273,790	122,809	73,196	61.1%	70.4%	22.7%	23.6%	24.4%	29.0%	33.5%	36.3%	7.3%	9.3%	11.6%	2.6%	2.1%	2.7%	7.3%	8.4%	9.4%
Sheffield	552,698	36,327	36,628	60.0%	75.9%	18.8%	16.7%	16.8%	28.9%	37.7%	37.7%	7.3%	12.9%	12.8%	16.3%	50.6%	50.1%	6.2%	6.9%	6.9%
Stockton-on-Tees	191,610	65,566	33,840	56.7%	69.2%	19.0%	17.4%	21.7%	27.6%	27.3%	36.9%	8.4%	9.1%	14.6%	5.4%	9.5%	13.4%	6.3%	6.2%	8.8%
Torfaen	91,075	17,982	26,825	63.3%	61.9%	24.1%	23.2%	23.9%	32.9%	29.5%	32.3%	7.2%	5.4%	6.3%	2.0%	1.5%	1.8%	8.7%	7.8%	8.4%
Tottenham Hale	513,175	66,932	91,916	65.0%	74.0%	14.3%	14.9%	14.2%	31.5%	38.6%	40.0%	8.6%	10.5%	11.2%	43.7%	49.6%	49.4%	5.4%	6.1%	6.0%
Wrexham	134,844	12,997	8,239	59.1%	61.2%	20.7%	21.4%	22.9%	31.7%	32.8%	32.7%	6.0%	6.5%	6.5%	3.1%	1.1%	1.1%	6.2%	6.1%	6.8%
National	56,075,912	8,131,249	-	57.7%	60.9%	17.9%	17.9%	-	28.3%	30.6%	-	6.3%	7.5%	-	14.0%	21.0%	-	5.6%	6.0%	-
Woking (Basingstoke Canal)			53,783		50.2%			13.2%			22.5%			4.7%				22.4%		3.5%
Derby			27,262		60.9%			16.2%			24.6%			7.2%				12.0%		6.2%

Data Sources

- 1) Deprivation: 2011 Census, QS119EW. Proportion of households deprived in at least one dimension.
- 2) Disability: 2011 Census, QS303UK. Derived by adding together proportion of population who report that day-to-day activities are limited “a lot” and “a little”.
- 3) Education: 2011 Census, QS501EW. Derived by adding together proportion of population with “no qualifications” or “other qualifications”.
- 4) Employment: 2011 Census, KS601EW to KS603EW. Proportion of economically active population who are unemployed.
- 5) Ethnicity: 2011 Census, KS201EW.
- 6) Health: 2011 Census, QS302EW. Proportion of population reporting “bad” or “very bad” health.
- 7) Population: 2011 Census, QS102EW.

Appendix 3: Methodologies reviewed for towpath measurement – volume & use

Counter	Summary	Limitations	Power Supply Required	Total Cost for 50 units or equivalent	Recommendation
Geolocation	Use of mobile phone data through geo-location to accurately measure the volume and duration of people walking and cycling along our towpaths.	Spatial accuracy, cost and privacy issues.	No	£420,000 per month (14 sites).	This technique could provide the Trust with a range of advantages if cost and spatial accuracy limitations can be overcome. Maintain watching brief.
Manual	A simple but accurate method of counting comprises people manually counting different users. A person either uses an electronic hand held counter or records data using a tally sheet. In tests manual vehicle counting was 99% accurate.	Resource availability when counts are required. Not suitable for long term analysis on multiple sites with different user profiles.	No	Consider using for a national annual one day count on multiple sites.	
Pneumatic counting	One or more rubber hoses are stretched across the towpath and connected at one end to a data logger. The other end of the tube is sealed. When a pair of wheels hits the tube, air pressure in the squashed tube activates the data logger which records the time of the event. The data logger can establish vehicle direction by recording which tube is crossed first. Can be used in association with observational counts to calibrate use (Sustrans technique).	Counts cyclists but not pedestrians. If two bicycles cross the tubes at the same time then the direction can't be accurately determined. They are therefore not as effective on higher volume sites.	Permanent supply or battery operated.	Capital Cost – £250,000 – Annual Cost £75,000	Discounted – counts cycles only. – High maintenance required to service data loggers if battery operated.
Piezoelectric sensors	Piezoelectric sensors collect data by converting mechanical energy into electrical energy. The piezoelectric sensor is mounted in a groove cut into the towpath surface. When a bicycle moves over the piezoelectric sensor, it squeezes it and causes an electric potential – a voltage signal. When the bicycle moves off, the voltage reverses. This change in voltage can be used to detect and count bicycles. The counting device which is connected to the sensors is housed in an enclosure by the side of the towpath. Batteries (supplemented by solar cells) can be used as a power source. Data may be collected locally via an Ethernet or RS232 connection to a laptop, or may be transmitted by modem. Accuracy is considered to be 98%.	Sensors count bicycles only. Civil construction works needed to create grooves in towpath – heritage consent may be required in certain locations. Using sensors with GPRS and downloading data may be an issue in terms of battery life (if solar isn't effective or if regular reports are required). The sensors cannot differentiate types of users eg. boats, wheelchairs, dog walkers, pushchairs etc.	Permanent supply or battery operated. Low power requirement so batteries can be supplemented by photo voltaic cells. However daylight hours and vandalism should be considered. May be less effective and unreliable in winter.	Capital Cost - £250,000 + Civils Work Annual Cost £25,000	Could be considered for counting cyclists where power supply is unavailable. This system has been adopted by Scottish Waterways. Civil work will be needed, increasing the cost of installation.
Inductive loop	An inductive loop is a square of wire embedded into or under the road / path. The loop utilizes the principle that a magnetic field introduced near an electrical conductor causes an electrical current to be induced. In the case of traffic monitoring, a large metal vehicle acts as the magnetic field and the inductive loop as the electrical conductor. A device at the pathside records the signals generated. This detects vehicles by measuring the change in the earth's magnetic field as the vehicles pass over the detector. The sensor is either buried in the path, or enclosed in a box by the side of the path. If vehicles are following each other very closely, the magnetic detector may have difficulty discriminating between them. New products coming to market include fibre loop technology which is more sensitive than an induction loop solution as it is surface mounted, and hence better for measuring cycle traffic. Fibre optic sensors can achieve a high counting accuracy for detection of all types of bikes (steel, aluminium, carbon fibre) however they are high cost.	Traditional systems rely on metal crossing the loop – not appropriate for pedestrian counts or carbon fibre bikes. If vehicles are following each other very closely, the magnetic detector may have difficulty discriminating between them. Costs of new technology e.g. fibre optic sensors is prohibitive.	Battery (with limited life) for traditional equipment but preferably permanent power supply.	Capital Cost £500,000 Annual Cost £50,000	Discounted
Acoustic Detector	This detects objects by the sound created as object passes. The sensor is mounted on a pole pointing down towards the access route. It can collect counts for one or more travel paths. Some can communicate their counts wirelessly.	Not appropriate for cyclists or pedestrians when use is quiet and ambient sounds may be greater.	Permanent supply or battery operated	Capital Cost £250,000 Annual Cost £25,000	Discounted
Passive Infra red	Passive infrared devices detect objects by measuring the infrared energy radiating from the detection zone. When an object passes, the energy radiated changes and the count is increased. Can be built in to same housing as piezoelectric sensors.	Accuracy is an issue especially at busy sites when people walk closely together / in a group etc. down to c. 50% accuracy. Technology can not differentiate walkers and cyclists. Data is downloaded on site.	Battery or permanent supply. Battery life unknown for this product. £500 for purchase of each unit.	Discounted due to accuracy concerns and need to download data on site.	Could be considered for counting pedestrians where power supply is unavailable. This system has been adopted by Scottish Waterways and incorporated into the same housing as the piezoelectric sensors.
Automatic video analytic technology	Fixed site automatic video analytic technology to collect volumetric numbers of users at each site. The sensors are based on cutting-edge machine learning techniques, developed with researchers at Cambridge and UCL. Each sensor consists of a camera, processor & communications device (typically a 3G connection). The video footage from the camera is analysed in real-time by the processor using these machine learning techniques, generating insights about the field of view, and then the video is discarded, maintaining privacy.	Due to the processing requirement a permanent power supply is needed.	Batteries or Permanent Power however batteries would need regular changing with a resulting higher maintenance cost.	Capital Cost £282,000 see quotation Annual Reporting and Maintenance Cost Yr 2 onwards £22,400 + £290 electricity costs.	Due to adaptability and ability to count a variety of uses this is the preferred methodology albeit a permanent power supply is required.

Appendix 4: Proposed valuation methodologies for monetisation





Proposed Methodologies

A literature review of both the academic and grey literature was undertaken to identify previous attempts to answer similar research questions to those posed by the proposed monetisation of the OMF indicators.

As a result of this exercise, several potential valuation methodologies were identified. Subsequent internal research assessed the relative merits of each technique and their suitability for the proposed applications. In addition, discussions were held with some members of the External Reference Group and other relevant third parties. This exercise resulted in the identification of the following valuation techniques:

- World Health Organisation Health Economic Assessment Tool (HEAT)**
 HEAT uses a standard value of a statistical life (VSL) to estimate the economic value of mortality rate improvements through specified levels of physical activity (walking and cycling).
- Wellbeing Valuation Approach (WVA)**
 Most frequently, the WVA draws on large national survey data to estimate the impact of a good, service or activity and income on people's subjective wellbeing. These estimates are then used to calculate the amount of money that would produce an equivalent impact on wellbeing.
- New Economy Manchester Unit Cost Database**
 The unit cost database brings together cost estimates derived from government reports and academic studies. The estimates represent the costs of delivering a variety of services relating to crime, education & skills, employment & economy, fire, health, housing and social services.
- Department for Transport Web-based Transport Analysis Guidance (WebTAG)**
 WebTAG provides a framework for valuing a transport modal shift, for example, the value of switching from car-based transport to walking. WebTAG provides estimates the impact of this modal shift on congestion, infrastructure, accidents, local air quality, noise, greenhouse gases and indirect taxation.
- Green Book Supplementary Guidance: valuation of energy use and greenhouse gas emissions for appraisal**
 This supplementary guidance to Treasury's Green Book provides analysts with rules for valuing energy usage and greenhouse gas emissions.
- Hedonic Price Method**
 A revealed preference economic valuation technique for estimating the value of a good or characteristic. Commonly, data from the real estate market are used to estimate the value of various environmental amenities.
- Contingent Valuation Method**
 A stated preference economic valuation technique for estimating the value of a good or characteristic. At its most basic level, this method involves asking survey respondents how much they would be willing to pay for a specific "service".
- Economic Impact Analysis**
 A technique that would utilise business surveys to assess the net additional employment and subsequent Gross Value Added (GVA) as a result of a particular project or development.

Self-reporting & perception indicators (OMF secondary indicators)

Domain	Sub-domain	Self-reporting & perception indicators (Secondary Indicators – Subjective Data)
Health, Wellbeing & Happiness 	Physical health	1. Number (%) of people who self-report feeling that waterways owned and / or managed by Canal & River Trust contributes to their level physical health
	Mental Health & Wellbeing	2. Number (%) of people who self-report feeling that use of the Trust's waterways contributes to their level of mental health 3. Number (%) of people who self-report feeling happy during their use of the Trust's waterways 4. Number (%) of people who self-report feeling less stressed during their use of the Trust's waterways 5. Number (%) of people who self-report feeling that use of the Trust's waterways contributes to their level of wellbeing 6. Four ONS measures of subjective wellbeing 7. Number (%) of people who self-report feeling a sense of belonging to their community as a result of using the Trust's waterways 8. Number (%) of people who self-report feeling a sense of connection to their local environment as a result of using the Trust's waterways
Engaged people & Cohesive Communities 	Broadening Opportunities & Inclusivity	9. Number (%) of individuals self-reporting feeling able to contribute something positive to their community and society as a result of involvement in the Trust's volunteering activities 10. Number (%) of people self-reporting increased engagement with the Trust's waterways and managed activities
	Community Safety	11. Number (%) of incidents of crime or anti-social behaviour (to property or self) experienced by individuals whilst using the Trust's waterways 12. Number (%) of individuals self-reporting feeling of safety and security from crime risk when using the Trust's waterways
Prosperous & Connected Places 	Regeneration & Development	13. Number (%) of individuals who believe that the Trust's waterways increase the attractiveness of a locality as a place in which to live 14. Number (%) of individuals who believe that the Trust's waterways make a direct contribution to place branding
Cultural & Environmental Assets 	Culture & Heritage	15. Number (%) of people who feel that hosting of cultural events on, or adjacent to the Trust's waterways enhances experience of attendees 16. Number (%) of people who feel that the Trust's activities contribute to the cultural richness of the local area 17. Number (%) of people self-reporting increased feeling of connection to, and responsibility for the Trust's cultural and heritage assets 18. Number (%) of people self-reporting increased feeling of connection to, and responsibility for the Trust's natural assets 19. Number (%) of people self-reporting awareness of the value of local spaces of biodiversity as a result of the Trust's educational activity 20. Number (%) of people self-reporting adoption of pro-environmental behaviour during use of waterways and towpaths as a result of the Trust's educational activity



Langley, Slough Arm (Grand Union Main Line)

Outcomes Measurement Framework at a glance

Domain	Sub Domain	Outcome ambition	Primary indicators <small>(supported by a suite of secondary self reported and perception indicators)</small>
 Health, Wellbeing & Happiness	Physical Health	Providing an accessible environment to encourage more people to become physically active and meeting recommended levels of physical activity	Number of people engaging in physical exercise on waterways owned and /or managed by the Trust, of which people achieving physical activity per week on our waterways at levels in accordance with published guidelines
	Mental Health & Wellbeing	Providing an environment which contributes to improving mental health and 'wellbeing' as part of wider public policy agenda	Improvement in reported scores using Office National Statistics and other accepted scale based measures of subjective wellbeing such as happiness, life satisfaction, reduced anxiety and feelings of worth following engagement with or use of the waterways
 Engaged People & Cohesive Communities	Community Engagement	Contributing to the involvement and resilience of local communities	Number of people involved in volunteering linked to waterways owned and / or managed by the Trust
	Broadening Opportunities & Inclusivity	Broadening participation by people from different socio-economic and ethnic backgrounds, age groups and abilities and improving community cohesion Providing a platform for preventative and / or rehabilitation programmes	Number of people from different socio-economic and ethnic backgrounds, age groups and abilities participating in a range of activities, events, competitions and group visits in space owned and / or managed by the Trust Number of community service days on waterways owned and / or managed by the Trust that contribute to decrease in adult and young people re-offending
	Community Safety	Providing an environment which positively contributes to the perceived safety and security of the locality	Improvement in reported scores using accepted scale based measures of perceptions of waterways owned and / or managed by the Trust being safe and secure to use and visit
 Learning & Enhancing Skills	Education	Improving educational attainment prospects of school children	Number of children participating in formal education programme linked to the national curriculum on space owned and / or managed by the Trust
	Skills & Lifelong Learning	Improving the opportunities for young people (16-24 years olds) and adults (25+ years old) to achieve vocational or skills-based qualifications and enhance continued learning opportunities	Number of young people and adults achieving vocational or skills-based qualifications as a result of engagement in learning activities on space owned and / or managed by the Trust
 Prosperous & Connected Places	Economic Growth	Creating an environment which attracts new and supports existing businesses within the locality Creating an environment which supports new employment opportunities and seeks to help tackle entrenched worklessness and youth unemployment within the locality	Number of new businesses attracted to, and existing businesses retained within a waterway corridor location as a result of the Trust's activity, assets, goods and services Number of people claiming employment related benefits or classed as NEETs who obtain employment after participating in initiatives or programmes using waterway infrastructure owned and / or managed by the Trust
	Regeneration & Development	Contributing to the regeneration, development and resilience of place	Value of the 'waterway dividend' to the prosperity and sustainability of a waterway corridor
 Green & Blue Futures	Sustainable Transport	Making a positive contribution to the UK's policies on reducing congestion and CO ₂ emissions and improving productivity, air quality and connectivity	Volume of particulates saved as a result of pedestrian/cyclist kilometres travelled on towpaths owned and / or managed by the Trust as defined by Department for Transport Number of road haulage miles saved using waterways owned and / or managed by the Trust (converted into carbon savings recognised by Department for Transport)
	Renewable Energy	Contributing to the UK's policy on energy security through localised energy production and contribution to renewable energy targets Contributing to increased efficiency in use of heating and cooling buildings and/or processes	Gigawatt hours of energy produced through renewable energy sources on waterways and land owned and / or managed by the Trust Megalitres of water used in industrial, commercial, civic or residential buildings and/or processes for heating and cooling
	Water Resourcing	Making a positive contribution to the land drainage system of the UK	Number of discharges managed through waterways owned and / or managed by the Trust rather than requiring alternative drainage infrastructure
 Cultural & Environmental Assets	Culture & Heritage	Optimising the value to local economies, communities and identity derived from cultural and heritage assets	% of people who believe that the Trust's waterways and/or activities contribute to the heritage and cultural richness of the local area Number of historic buildings, structures and areas within waterway corridors brought back into beneficial use or enhanced through regeneration, repair or maintenance
	Biodiversity & Environmental Stewardship	Optimising the value to local economies, communities and biodiversity derived from green spaces, natural and environmental assets	Improvement in reported scores using accepted scale based measures of people's sense of connection to their local environment as a result of using / living near / engagement with waterways owned and / or managed by the Trust Extent of green spaces and habitats created or enhanced within waterway corridors through development, regeneration and environmental stewardship



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Blackburn, Leeds & Liverpool Canal