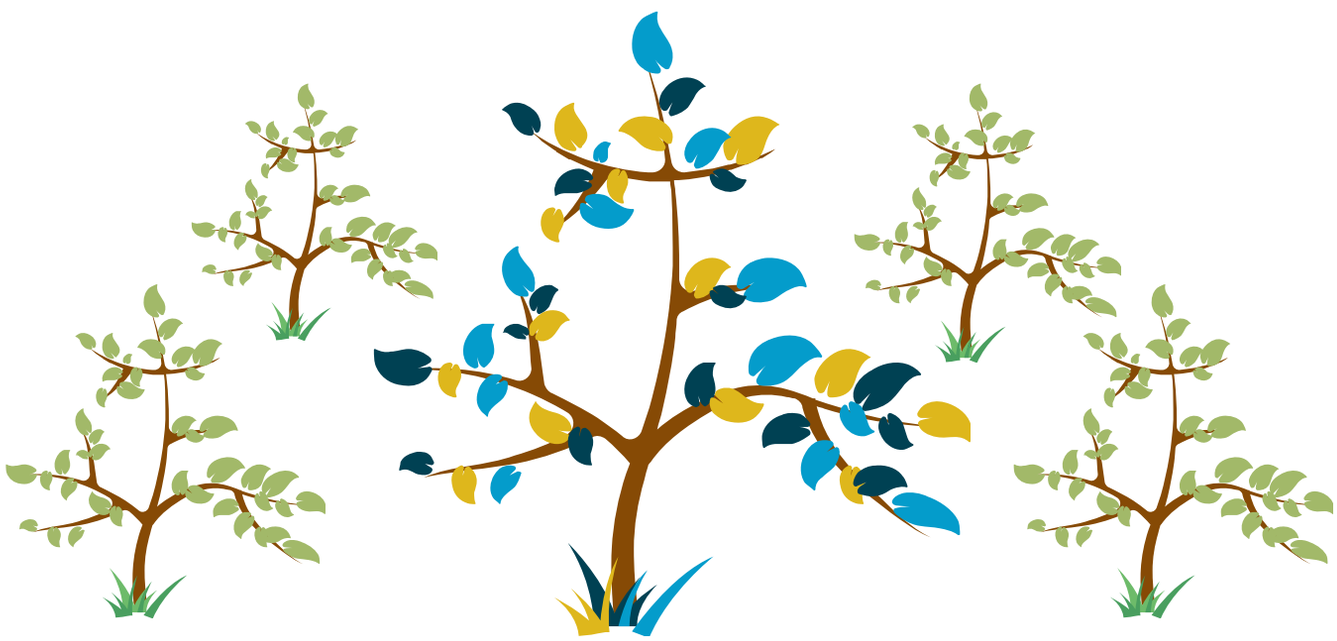
# Derry City and Strabane District Council's

# Owned Green & Blue Spaces

# Natural Capital Account



**A report by Vivid Economics for the Carnegie UK Trust**

**December 2019**

## Acknowledgements

**Derry City and Strabane District Council's Strategic Growth Partnership would like to thank the Carnegie UK Trust for funding this Natural Capital Account for Derry City and Strabane District Council's greenspaces. We would like to thank the Green Infrastructure Stakeholders for assisting in the co-production of the Natural Capital Account.**



For further information contact:
Christine Doherty
Christine.Doherty@derrystrabane.com
Tel: 02871 253253

# Contents

# This report informs the public service providers' understanding of the benefits of Derry City and Strabane District Council's owned greenspaces.

This report was commissioned by Derry City and Strabane District Council (DCSDC) and funded by the Carnegie UK Trust. The Trust seek to improve the lives and wellbeing of people throughout the UK and Ireland, by influencing policy, and changing lives through innovative practice and partnership work. The Trust is currently providing support to the DCSDC's Strategic Growth/ Community Planning Partnership via participation in the Embedding Wellbeing in Northern Ireland project. This project is designed to support participating Community Planning Partnerships to overcome challenges, which they have identified as a priority, as they seek to deliver their Community Plans.

DCSDC have taken the lead to develop the first Green Infrastructure (GI) Plan 2019 - 2032 and associated Action Plan in Northern Ireland, with the vision to assist with the delivery of actions under the three pillars of the Community Plan 2017-2032 and the development of the Local Development Plan 2032. The GI Plan aims to protect, improve and increase green spaces (vegetated areas) and blue spaces (waterways), to provide a multitude of environmental, recreational, economic, health and wellbeing benefits for the public. The GI Plan is linked to the strategic commitments of the 12 indicators and 18 out of the 42 Programme for Government outcomes. The Community Planning Partners co-designed the GI Plan 2019 - 2032.

An action from the GI Plan was to develop a Natural Capital Account for DCSDC's owned green and blue spaces, to show the value that these spaces provide for the environment, wider public health and wellbeing.

# Executive Summary

## Derry City and Strabane District Council supplies more than £75 million in benefits to residents each year through its 223 greenspaces.

Greenspaces will provide £1 billion in benefits over the lifetime of Derry City and Strabane District Council's Green Infrastructure Plan (GI) (2019-2032). This value could increase if parks are enhanced to encourage more, longer and active visits.

There are more than five million visits to Derry and Strabane recreational greenspaces each year. Visitors benefit from mental wellbeing and physical health improvements.

These benefits are provided at low cost.

- It only costs £1 to deliver over £22 of benefits.
- Greenspaces provide over £500 of benefit per adult resident per year.

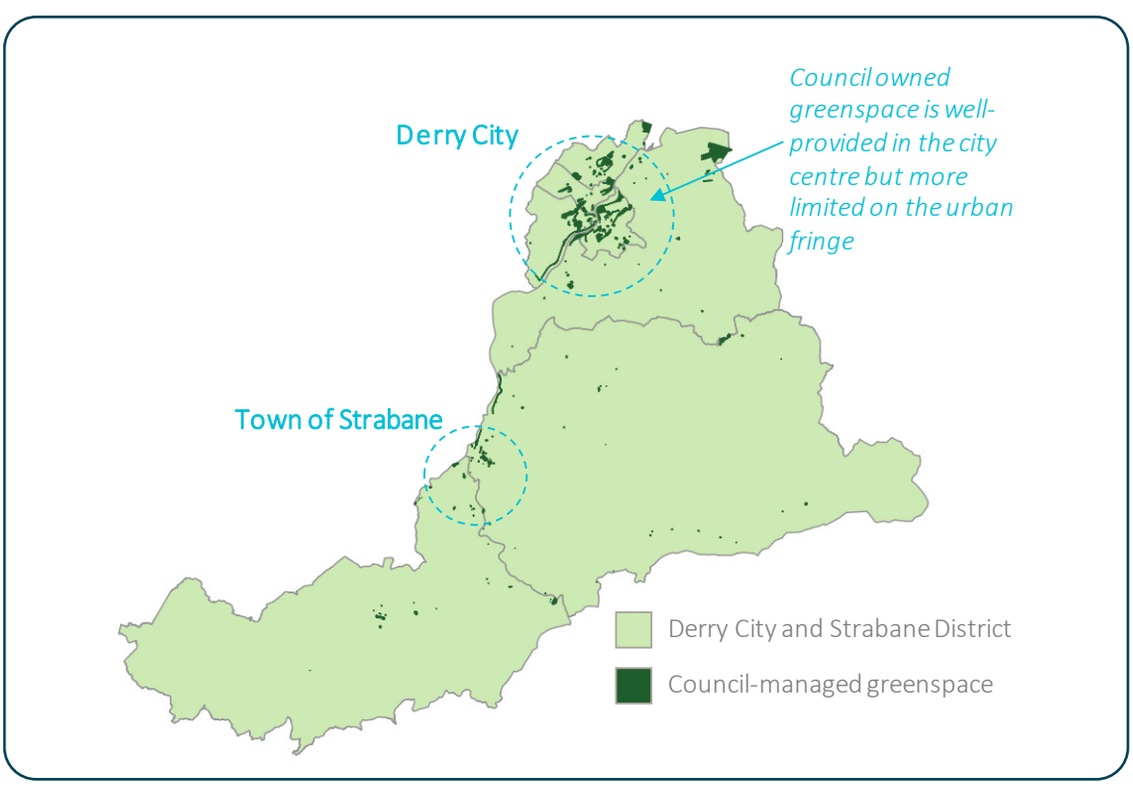



*Figure One. A map showing the location of Council managed green spaces*

*The town of Strabane and non-urban areas of the region have less greenspace options compared to residents in Derry City, but this could increase if the study was extended to include all publicly accessible greenspaces.*

# Introduction and background

## Natural capital accounting is an approach to estimating the economic benefits provided by greenspaces, particularly for public health and wellbeing.

A Natural Capital Account (NCA) can help inform and improve decision-making by framing public green and blue spaces as economic assets. The NCA was developed by Vivid Economics, in co-production with Derry City and Strabane District Council (DCSDC) and its Green Infrastructure (GI) Stakeholders, which form part of the Community Planning Partnership.

Natural capital describes components of the natural environment (including greenspaces) that provides economic benefits for people. These benefits can include cleaner air and water, improved physical health, mental health and wellbeing, carbon storage, temperature regulation and flood risk regulation.

This report presents an economic assessment of the services that DCSDC's greenspaces provide to residents, and highlights the resultant health and wellbeing outcomes. The NCA assigns a monetary value to key services provided by greenspaces. This makes it easier to compare benefits with ongoing spending, investment and with spending on other public services. Without such an account, the benefits and value for money are seldom explicit. The recommendations were developed in consultation with DCSDC and the GI stakeholders, to inspire new ways of working across public services, to deliver shared outcomes and assist with informed decision making.

## The Green Infrastructure (GI) Plan will take a new approach to developing, maintaining and enhancing GI and its benefits.

- Derry and Strabane have more than 230 council-managed green and blue spaces which benefit residents.
- To continue providing these benefits, they must be sustained.
- Additional benefits arise when enhancements attract new visitors and encourage more time to be spent in greenspaces.
- By understanding the value of services, it is easier for NGOs, greenspace, health, housing, education, grey infrastructure and local planning departments to work together on a shared strategy to implement the GI Plan, Community (Strategic Growth) Plan and Local Development Plan.

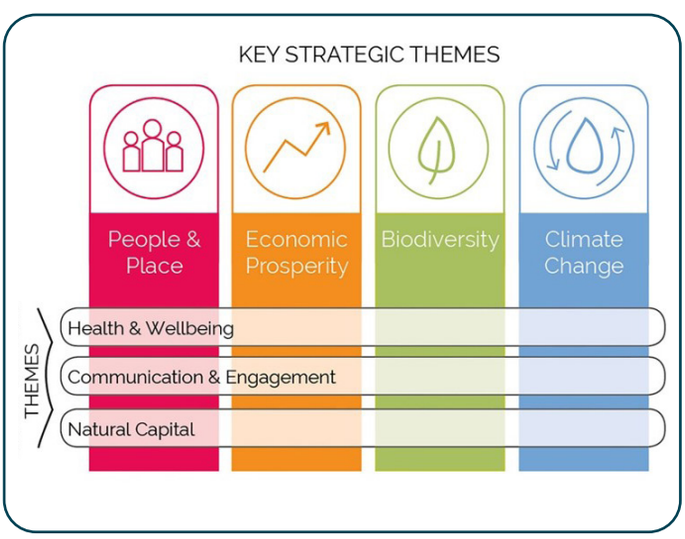



*Figure Two. DCSDC's GI Plan 2019 - 2032 Key Strategic Themes and Cross Cutting Themes.*

*The strategic and cross-cutting themes provide an overall framework for the management of GI under the Plan.*

*Source: Green Infrastructure Plan 2019-2032 Part One*

## The natural capital account for DCSDC greenspaces draws on methodologies developed for the Greenkeeper Tool.

Greenkeeper is an online tool designed to support planning and investment decisions around GI in cities across the UK. The methodologies underlying the tool were used to develop the DCSDC's owned greenspaces NCA.

Greenkeeper uses data on visit patterns, greenspaces characteristics, and evidence on the social, economic and environmental benefits of GI. Using the economic analysis and valuation skills of Vivid Economics, the health and wellbeing expertise of the European Centre for Environment and Human Health and the understanding of the planning and design process brought by Barton Willmore, Greenkeeper uses newly available datasets, technologies and insights to assess current performance and opportunities for any urban greenspace in the UK.

Greenkeeper provides key information on greenspace use and value for local authorities, private developers and investors. It will allow users to:

- Assess GI's contribution to urban life;
- Benchmark GI quality, visits and benefits and assess spaces within a portfolio;
- Inform wider planning, design, management and investment decisions;
- Consider and compare the impact of specific interventions; and
- Test the contribution of new greenspace as part of a proposed development.

Note: Greenkeeper will be launched in March 2020. For more information, visit http://www.greenkeeperuk.co.uk/.

## Natural capital accounting is systematic and consistent with financial reporting principles.

NCA is increasingly used as a tool to assess and monitor the quality of the environment and inform effective policymaking.

It has become more popular because it is systematic and adopts familiar financial reporting principles:

- For example, a key tenet of the 25 Year Environment Plan for England is taking a natural capital approach to decision-making related to the environment.
- Urban natural capital accounts are now being published at a national level by the Office for National Statistics (ONS).
- Cities and local authorities are beginning to employ natural capital accounting tools to better inform public investments and to advance urban development agendas.

## Natural capital accounting offers three potential advantages:

1. Expands the set of assets considered valuable to an economy:
   - Elevates the environment, health and wellbeing on the policy agenda.

2. Improves investment decisions:
   - The value of the environment is implicitly zero when unassessed, yet costs are always presented as they are easier to quantify.
   - Enables informed decision making and better use of available public assets and funding.

3. Helps deliver local policy objectives:
   - Housing, health and wellbeing.
   - Work in partnership with other public service providers to deliver shared outcomes.

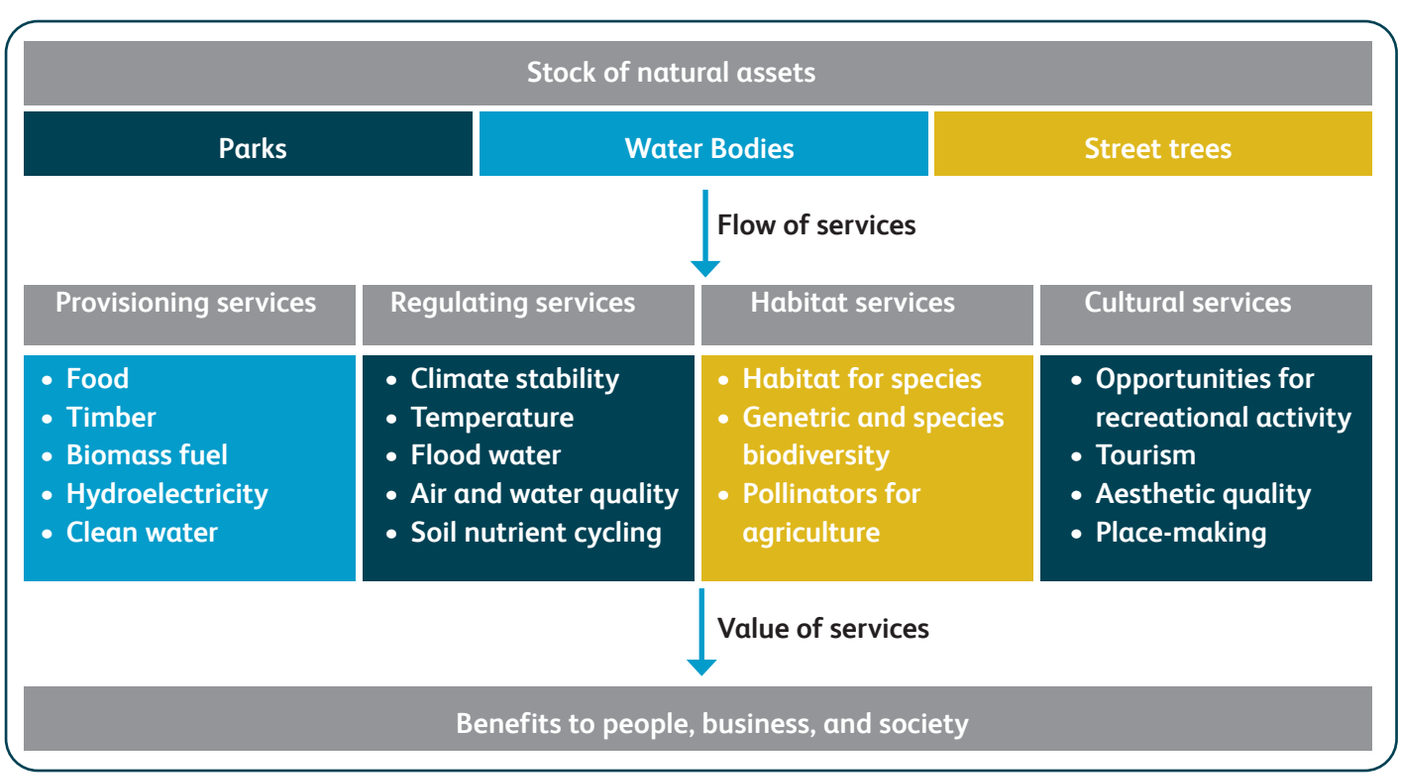



*Figure Three. A table of natural assets and their ecosystem services*

*Source: Vivid Economics and Brander and Eppink (2012)*

| | Natural Assets/Green Infrastrucutre | Cultural | | | | | Regulating | Provisioning | Option Values |
|---|---|---|---|---|---|---|---|---|---|
| | | Recreation | Physical activity | Tourism | Aesthetic, place making | Spiritual, eductional | Soil, water, air quality, carbon | Food, water | Bequest, intrinsic |
| | Green roof/wall | | | | ● | | ● | | |
| | Green Corridor | | ● | | ● | | ● | | |
| | Street trees | | | | ● | | ● | | |
| | Small greenspace | ● | | | ● | | ● | | |
| | Water features | ● | | ● | ● | | ● | | |
| | City farms | ● | | ● | | ● | ● | ● | |
| | Public squares, commons | ● | ● | ● | ● | | ● | | |
| | Sport pitches | ● | ● | | | | | | |
| | Public/domestic gardens | ● | | | ● | ● | ● | ● | |
| | Local parks | ● | ● | ● | ● | ● | ● | | ● |
| | Regional/national parks | ● | ● | ● | ● | ● | ● | | ● |
| | Wetlands, rivers | ● | | | | ● | ● | ● | ● |
| | Woodland | | | | | ● | ● | | ● |

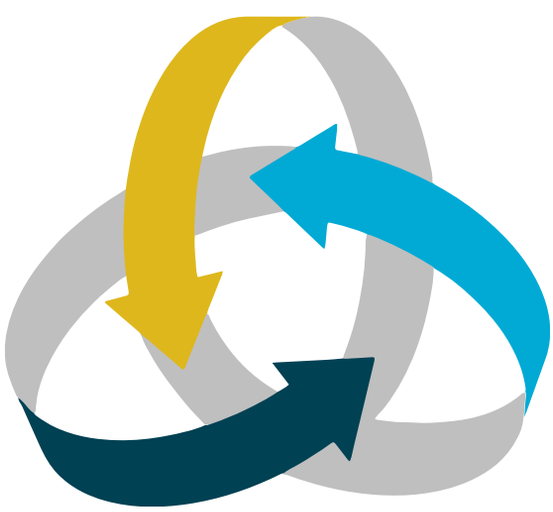
● = primary benefit ● = secondary benefit

*Figure Four. A table of GI assets & the ecosystem services provided for people.*

*Source: Vivid Economics and Natural England (2009)*

| Steps in natural capital accounting | Assessment | Information and tools required |
|---|---|---|
| STEP 1: Extent and condition of natural assets | How much of the asset is there? What is the condition of the asset? | Location and extent of greenspaces, tree cover and vegetation |
| + | | |
| STEP 2: Services provided in physical units | What services does the asset provide? | Census data, usage data, population health |
| + | | |
| STEP 3: Value of ecosystem services | How much do people value these services? | Local census data, healthcare costs, tourism values |

*Figure Five. The steps involved in creating a NCA, which maps key ecosystem services to green and blue space assets managed by Council.*



# Natural Capital Account for Derry City and Strabane District Council's Green and Blue Spaces

## *Key Findings*

An estimated five million visits are made to council-managed greenspaces each year.

Derry City and Strabane District Council's greenspaces supply more than £75 million in benefits (£500 per adult resident) each year.

The two greenspaces which create the most value are in the heart of Derry, offering easy access to residents and space for recreational visits.

For every £1 spent on the Council's greenspace maintenance and investment, it provides £22 of benefits per year.

Mental wellbeing accounts for more than half of the value provided by the Council's greenspaces.

Greenspaces in Derry and Strabane provide £26 million in physical health value, primarily driven by high-activity adult visitors, based on typical participation rates.

Residents in Derry and Strabane are willing to pay £2 million per year to live near greenspaces.

Greenspaces provide a range of additional benefits which are not monetised.

## An estimated five million visits are made to council-managed greenspaces each year.

Derry and Strabane have 800 hectares of council-managed greenspace:

- 134 spaces are used for recreational visits.
- 20 spaces are designated play areas.
- Greenspaces contain 185 hectares of tree cover.

The majority of recreational visits are made to spaces in Derry City:

- 3.5 million per year visits are made to spaces in Derry City.
- 400,000 visits per year visits are made to spaces in Strabane.
- Approximately 100,000 visits per year are made to spaces in rural areas

Derry City recreational greenspaces

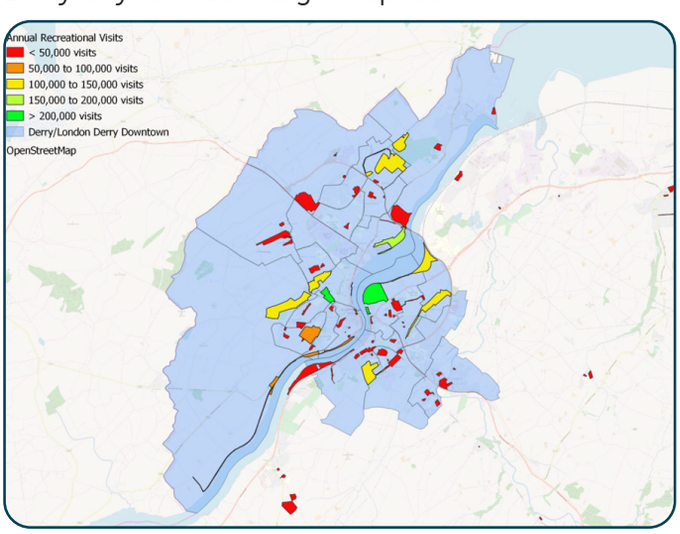



*Figure Six. A map of Derry City showing the annual visits to Council owned green spaces.*

The main value provided by greenspaces is enhancing health and wellbeing for adult visitors:

- £49 million per year in mental wellbeing value.
- £26 million per year in physical health value.
- £2 million per year in local recreational value.
- £66,000 per year in carbon sequestration value.

The value would be even higher if the following benefits could be valued and included in the account for council owned greenspaces:

- Air quality regulation
- Flood control
- Temperature regulation
- Biodiversity
- Noise regulation.

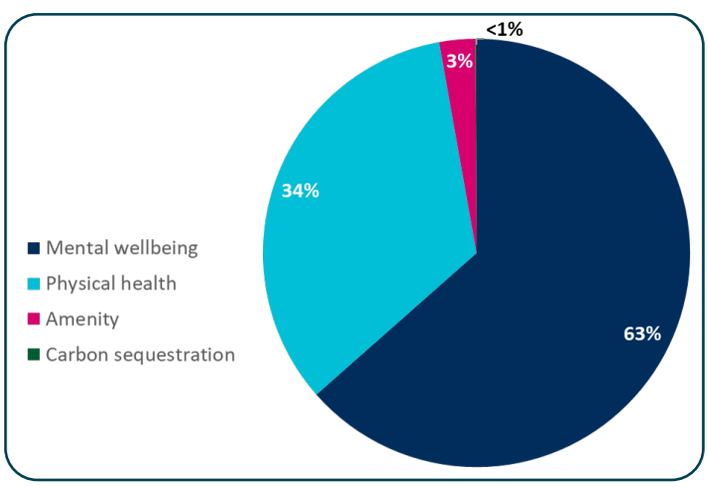



*Figure Seven. A pie chart showing the % of natural capital benefits of Council's natural assets.*

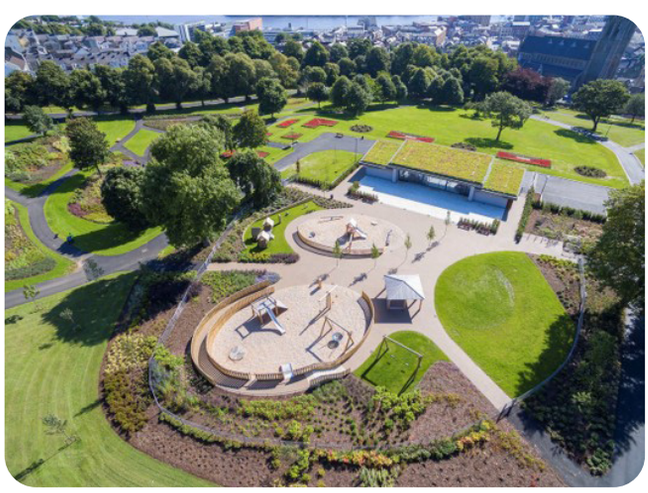
## The two greenspaces which create the most value are in the heart of Derry, offering easy access to residents and space for recreational visits.

St. Columb's Park generates benefits of £4.5 million per year:

- 32 hectares
- 250,000 visits per year
- 15 hectares of trees sequester more than 5,000 tonnes of CO2 per year.

Brooke Park generates benefits of £4.1 million per year:

- Eight hectares
- 250,000 visits per year
- More than 1,600 neighbouring households in Derry (within 200 metres).



## For every £1 spent on council's greenspace maintenance and investment, it provides £22 of benefits per year.

£5.1 mllion is spent on DCSDC's greenspace maintenance and capital investment each year. These greenspaces provide more than £75 million of benefits to residents. On average, 40% of capital projects are funded by the council (£1.2 million per year).

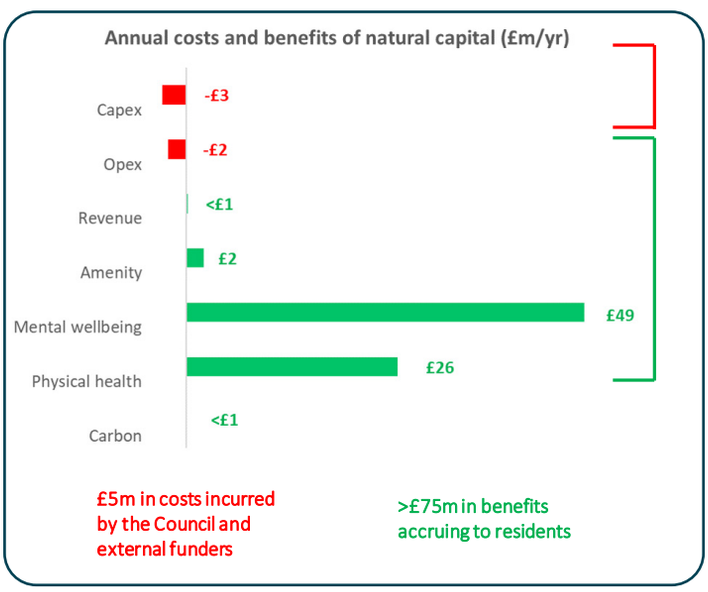



*Figure Eight. A diagram showing the comparisons between costs and benefits of Council's GI assets.*

Note: The cost-benefit ratio is 1:14 when only considering the total costs incurred by the council and funders.

## Mental wellbeing accounts for more than half of the value provided by the council's greenspaces.

Adult visitors who spend more than two hours per week in greenspaces gain the most wellbeing benefits, but less than half of visitors in the UK* meet this threshold. These benefits take the form of higher reported life satisfaction.

- 'High duration' visitors gain £2,900 per year in wellbeing value, spending more than two hours per week in greenspaces.
- 'Low duration' visitors gain £900 per year in wellbeing value, spending on average one hour per week in greenspaces.

Adult visitors to larger spaces tend to spend longer on average, gaining higher wellbeing values.

- St. Columb's Park, a large park with high patronage, provides an estimated £3 million per year in mental wellbeing value.

*Based on analysis of MENE survey data and OS Mastermap.

*Source: The valuation estimates are based on Vivid Economics analysis of survey data and subjective wellbeing valuation techniques for the Greenkeeper Tool.*

## Greenspaces in Derry and Strabane provide £26 million in physical health value, primarily driven by high-activity adult visitors, based on typical participation rates.

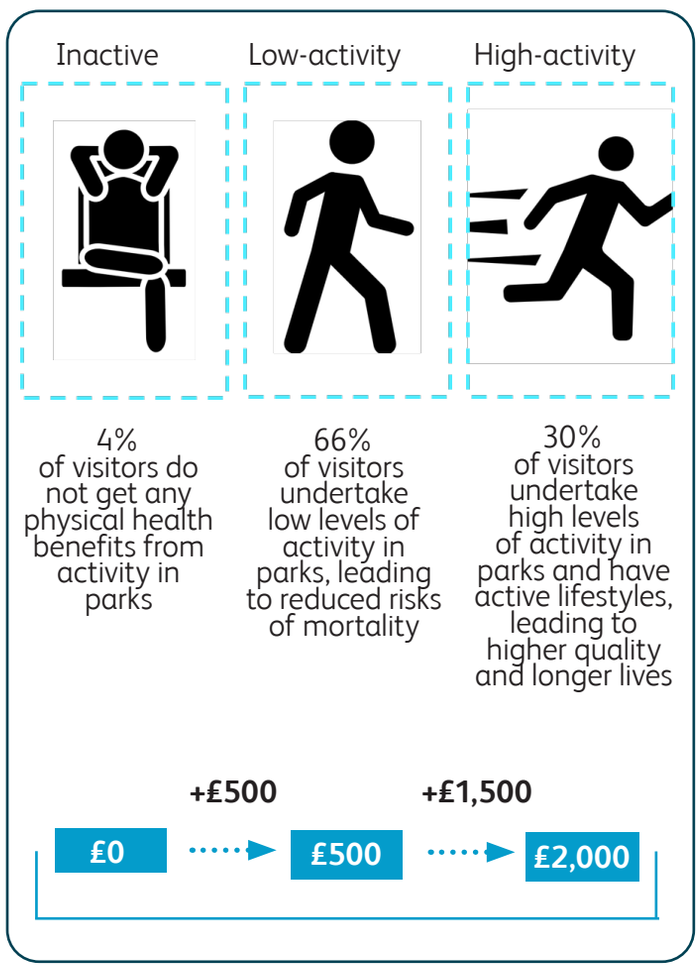



*Figure Nine. Average value of physical health benefits per visitor per year in a medium sized urban green space.*

## Residents in Derry and Strabane are willing to pay £2 million per year to live near greenspaces.

Local residential property values, assist with measuring people's preferences for living closer to greenspaces.

- Residential property values adjacent to green spaces are higher.
- Living near greenspaces provides easy access to recreation.
- Greenspaces improve the aesthetic quality of neighbourhoods.
- There are 35,000 homes in Derry-Strabane with greenspaces as a local amenity (within 200m).

| Park Size | Annual local value in Derry/Strabane |
|---|---|
| Small | £380,000 |
| Medium | £270,000 |
| Large | £410,000 |
| Very Large | £1,000,000 |

*Figure Ten. Annual increase in property value provided by small, medium, large and very large greenspaces in Derry and Strabane.*

| Ecosystem service | Benefits | Impact in Derry/Stabane |
|---|---|---|
| Temperature regulation | Greenspaces can help cool urban environments. This mitigates labour productivity losses from heat and reduces the need for air conditioning. | Greenspaces and tree cover in greenspaces have an annual cooling effect of 0.06°C in Derry City*. |
| Air pollution removal | Greenspaces provide physical health benefits by removing harmful pollutants from the air. These benefits translate into economic gains due to decreased medical expenditures for the NHS and supports individual wellbeing. | The Office for National Statistics (ONS) estimates that all vegetation in Derry and Strabane District, including greenspaces, generates £7.50 in annual benefits per resident. This is equivalent to £1.1 million in avoided health damages per year. |
| Ecological quality | Greenspaces contribute to the preservation of biodiversity and habitats for urban species. | Derry and Strabane have a wealth of plants, animals and natural landscapes. The GI Plan stresses the importance of biodiversity and ecosystem services to the economy, environment, health & wellbeing. |

*Figure Eleven. A table showing the range of additional benefits that green spaces provide that are not monetised.*

Notes: There are other ecosystem services provided by greenspaces which are not discussed in this report, including SUDS, water quality regulation and more.

*This estimate includes only the cooling effect from council-managed greenspaces and tree cover in those spaces, and does not include the cooling effect from other greenspaces, tree cover or water bodies.

# Recommendations

## The benefits of public greenspaces can be enhanced to achieve higher value for a greater proportion of the population.

Natural capital accounting (NCA) demonstrates greenspaces are value-creating assets. Public authorities can increase the benefits by raising the quality, multi-functional and availability of greenspaces. The findings will help the Green Infrastructure Stakeholders to value greenspaces and deliver shared outcomes to improve the environment, health and wellbeing of the district, linked to the Community (Strategic Growth) Plan and Local Development Plan 2032.

As local authorities in Northern Ireland are structurally differently from Great Britain and the Republic of Ireland, the current findings are not directly comparable to local authorities in these regions, as these local authorities are responsible for more functions, for example, social housing, education and health provisions. A recommendation from this report is to extend the Natural Capital Account to include all publically accessible greenspace within the District, to make the findings more comparable with the rest of the British Isles.

The Green Infrastructure Stakeholder co-production workshop highlighted that:

- Public health benefits could be improved through longer and more active use of greenspaces;
- Investments in existing greenspaces could increase benefits by attracting new visitors and
- Targeted access for under-served parts of the population could improve health outcomes, by working with the stakeholders.

## There are opportunities to improve public health and wellbeing by encouraging longer and more active use of spaces.

Greenspaces offer an affordable option for improving health and wellbeing. There are multiple ways to target health outcomes in existing greenspaces:

1. **Target visit duration:** Most park visitors spend over one hour per week hour in greenspaces. A visitor who spends 60 minutes in greenspaces per week gains wellbeing valued at £900 per year, compared to a visitor who spends over 120 minutes who gains wellbeing valued at £2,800 per year. Visitors could be supported by offering facilities which encourage longer visits such as toilets and cafes.

2. **Target physical activity:** Less than 1/3 of greenspace visitors meet the recommended NHS physical activity guidelines. Increasing this proportion to 1/2 could increase the value of physical activity by nearly 25%, equating to an additional £6 million per year. This could be achieved by increasing activities such as ParkRun™ and facilities for organised sports.

These aims could be achieved by transforming the 90 council-owned non-recreational greenspaces into high quality greenspaces with additional amenities.

## Investments in existing spaces could increase value by attracting new visitors.

Investing in maintenance, programming and amenities could encourage new visitors, potentially at low cost relative to the significant health and wellbeing benefits.

- 60% of urban residents in the UK do not make regular visits to greenspaces.
- Increasing the number of visits to Derry City and Strabane District Council's greenspaces from 5 million to 7.5 million per year could increase the value of existing spaces to above £110 million per year. This could be achieved by working in partnership with the Green Infrastructure Stakeholders to deliver shared outcomes.

Our analysis found that amenities increase the probability that residents will choose to visit a greenspace*, exemplified by the high footfall at Brooke Park, which has many amenities including water features, a sports centre and a cafe. Visit-driving features include:

- Play areas
- Sports pitches
- Cafes
- Toilets
- Easy access points.

*Source: Vivid modelling analysis of MENE survey data and OS Mastermap greenspace characteristics*

## Targeted access for under-served areas could improve health outcomes.

Residents who lack access to greenspaces may be precluded from health and wellbeing benefits, particularly in Strabane and rural areas.

- Greenspaces provide a free space for improving health and wellbeing.
- Only 30% of visits occur in greenspaces outside Derry City.

However, a more complete understanding of recreational opportunities in Derry and Strabane is needed.

- The current Natural Capital Account is based only on council-managed greenspaces and should be extended to include all publically accessible greenspaces.
- A full Natural Capital Account of publically accessible greenspace within the District would help the Green Infrastructure Stakeholders coordinate service provision, identify areas of deprivation and identify greenspaces under excessive pressure.

Residents in rural areas have relatively less council-managed recreational spaces within short walking distances (200m) but may have alternative options such as gardens, allotments or other public sector greenspaces.

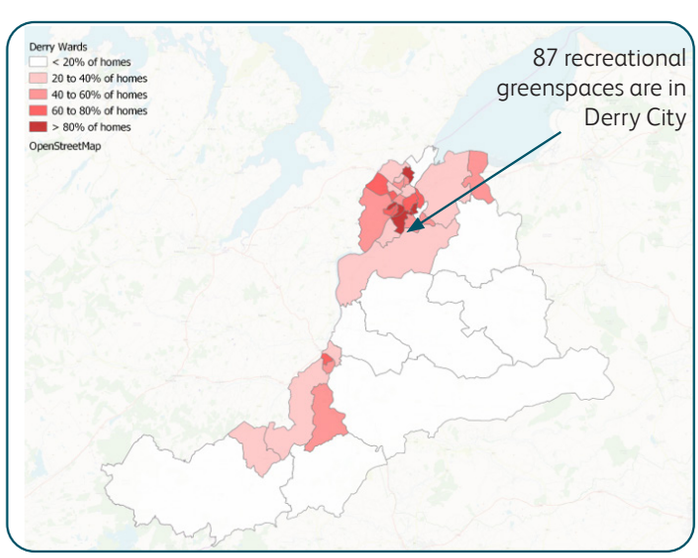
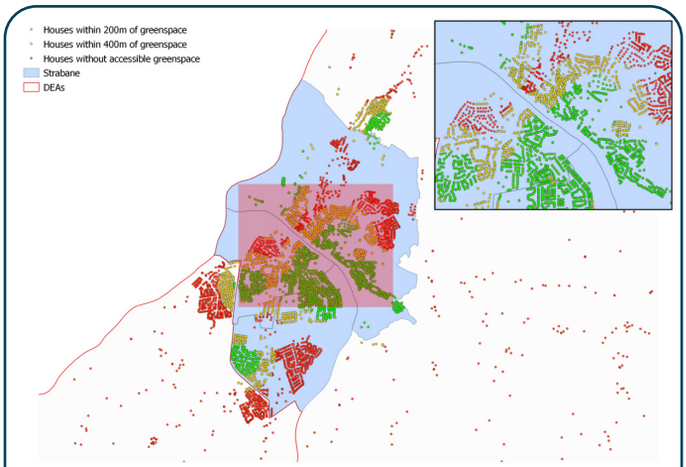



*Figure Twelve. A map of the District showing the % of properties within 200 m of a Council owned green space.*

## 48% of Strabane residents live within 200metres of recreational greenspaces.




…compared to 59% of Derry City residents

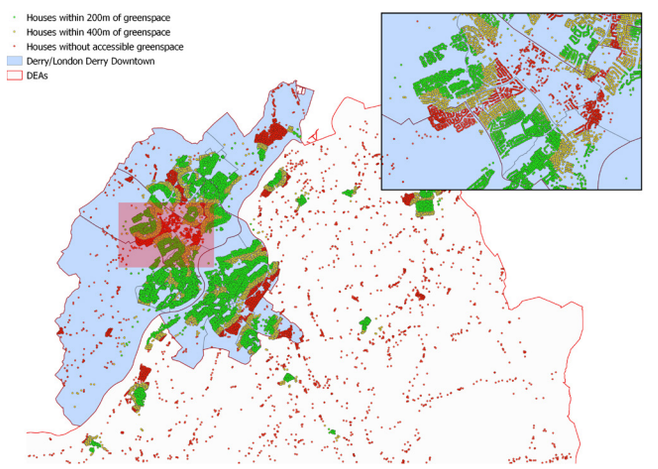



*Figure Thirteen. Maps of Derry and Strabane to show comparisons of properties within 200 m of a Council owned green space.*

## The Green Infrastructure Plan offers an opportunity to capitalise Natural Capital Accounting in decision-making.

Public green spaces have a strong economic case for funding support from the public exchequer and from developers.

The Green Infrastructure Plan provides an opportunity for new policies and investment decisions to directly draw on the findings from the Natural Capital Account. The findings can be used to:

- Highlight spaces which are valuable and spaces where investment is needed to increase environmental, recreational, physical health and wellbeing benefits.
- Relate the cost of interventions to value for money.
- Make the business case for infrastructure which connects residents to greenspaces, linked to the Local Development Plan 2032.
- Safeguard spaces which are valuable for current and future residents' wellbeing, linked to Local Development Plan 2032.
- Co-production of GI initiatives by the Green Infrastructure Stakeholders to increase the natural capital of greenspaces. This will help to deliver shared outcomes and improve the environment, physical and health and wellbeing of the district, linked to the Community Plan 2017 – 2032.

# Methodology Annex

| Data | Source | Decription |
|---|---|---|
| Greenspace map | DCSDC | Shapefile of all greensapaces in Derry and Strabane |
| Tree cover | DCSDC | Estimate of tree cover in each greenspace |
| Visitor numbers | DCSDC | Estimate of visits per year in greenspace |
| Housing points | DCSDC | Pointer data on all homes in Derry and Strabane |
| Housing uplift % | ONS | House price uplift for proximity to different sized greenspaces |
| Average captial values | DCSDC | Average property value by Ward in Derry and Strabane |
| Carbon sequestration | Forestry Commission | Carbon sequestration per hectare of tree cover |
| Visit duration/activity rates | MENE survey/Vivid analysis | Average activity rates, visit rates and visit durations which underpin health and wellbeing valuation |

*Figure Fourteen. A table showing the data and sources used to inform the NCA*

Notes: See the assumptions tab in the Natural Capital Account for a complete list of assumptions and sources.

# Methodology

## Mental wellbeing methodology.

The value of mental wellbeing is based on improvements in life satisfaction reported by adult park visitors.

- Individuals who spend more time in greenspaces report higher levels of life satisfaction than those who spend less time in greenspaces (Vivid Economics 2019, White et al. 2019).

The value of life satisfaction from greenspace visits is calculated by quantifying the amount of money that would lead to an equivalent increase in life satisfaction.

The total value per greenspace is a product of the number of visits per year, the share of visits made by low and high duration visitors, and the value per visit by visitor type.

Note: Mental wellbeing and physical health value only capture value to adult visitors. 75% of estimated visits are assumed to be made by adult visitors, except designated playparks, where 50% of estimated visits are assumed to be made by adult visitors.

## Physical health methodology.

Physical health benefits are calculated separately for low and high activity adult visitors.

- Low activity visitors undertake some exercise in greenspaces but do not meet NHS recommendations.
- High activity visitors meet NHS physical activity recommendations.

The health benefits for low activity visitors is calculated by measuring the reduction in risk of all-cause mortality from their exercise in green space.

- The risk reduction is expressed in the quantity of fatalities prevented, then given a monetary value using the Department for Transport (DfT) Value of a Prevented Fatality (VPF) (WHO, 2017; Glover and Henderson, 2010).

The health benefits for high activity visitors is calculated by measuring the number of Quality Adjusted Life Years (QALYs) gained through exercise in green space.

- The QALYs gained is expressed in monetary terms using the HM Treasury Green Book value of a QALY (HM Treasury, 2018).

The total value per greenspace is a product of the number of visits per year, the share of visits made by low and high activity visitors and the value per visit by visitor type.

Note: Mental wellbeing and physical health value only capture value to adult visitors. 75% of estimated visits are assumed to be made by adult visitors, except designated playparks, where 50% of estimated visits are assumed to be made by adult visitors.

## Amenity value methodology

Amenity (recreational) value measures people's preferences for living closer to green spaces, which is expressed by their willingness to pay in the housing market.

- The uplift value is estimated for properties within 200m of greenspaces.
- Uplift value coefficients are based on the hedonic pricing model from the ONS.
- Property uplift values are annualised over 30 years at 3.5% discount rate.

| Park Size | Property price uplift |
|---|---|
| Small | 0.53% |
| Medium | 0.60% |
| Large | 1.07% |
| Extra Large | 1.45% |

*Figure Fifteen. A table showing the % of property price uplift for properties within 200 m of a Council owned green space.*

*Source: Uplift coefficients from ONS (2018) hedonic price model.*

## Carbon sequestration methodology

Trees capture and store atmospheric carbon dioxide (CO2).

- Each tonne of CO2 sequestered prevents future damage by projected climate change.

Tree canopy cover (as estimated by the council) within greenspaces is used to estimate the amount of carbon sequestered and valued using the price of untraded carbon from the HM Treasury Green Book.

- Carbon sequestration is estimated by assuming an average rate of carbon sequestration per hectare of trees of 5.4 tonnes of carbon dioxide (CO2) per year (ONS 2017).
- The price of one untraded tonne of CO2 in 2019 is £68.

The value of carbon sequestration is a product of the annual carbon price and the total annual sequestration from the trees in a greenspace.

Notes: This is a conservative estimate of carbon sequestration value as it does not capture the value of CO2 stored in trees or other habitats.

# References


Glover, G., & Henderson, J., 2010. Quantifying health impacts of government policies: A how-to guide to quantify the health impacts of government policies. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/216003/dh_120108.pdf [accessed on 01/12/2019].

HM Treasury, 2018. The Green Book: Central Government Guidance on Appraisal and Evaluation. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/685903/The_Green_Book.pdf [assessed on 1/12/2019].

Office for National Statistics. 2018. Estimating the impact urban green space has on properly price. https://www.ons.gov.uk/economy/nationalaccounts/uksectoraccounts/compendium/economicreview/july2018/estimatingtheimpacturbangreenspacehasonpropertyprice (accessed on 01/12/2019).

White, M.P., Alcock, L., Grellier, J. 2017. Spending at least 120 minutes a week in nature is associated with good health and wellbeing. Available at: https://ore.exeter.ac.uk/repository/handle/10871/37706 [accessed on 01/12/2019].

World Health Organisation,. 2019. Health economic assessment tool (HEAT) for walking and for cycling: Methods and user guide on physical activity, air pollution, injuries and carbon impact assessments. Available at: http://www.euro.who.int/__data/assets/pdf_file/0010/352963/Heat.pdf?ua=1 [assessed on 01/12/2019].


EMBEDDING
**WELLBEING**
in Northern Ireland

The Carnegie UK Trust works to improve the lives of people throughout the UK and Ireland, by changing minds through influencing policy, and by changing lives through innovative practice and partnership work. The Carnegie UK Trust was established by Scots-American philanthropist Andrew Carnegie in 1913.

**Andrew Carnegie House**
**Pittencrieff Street**
**Dunfermline**
**KY12 8AW**

**Tel: +44 (0)1383 721445**
**Fax: +44 (0)1383 749799**
**Email: info@carnegieuk.org**
**www.carnegieuktrust.org.uk**

This report was written by:
Vivid Economics Limited
163 Eversholt Street
London
NW1 1BU

December 2019

Suggested citation:
Vivid Economics, Derry City & Strabane District Council & Carnegie UK Trust. 2019. Derry City and Strabane District Council's Owned Green & Blue Spaces Natural Capital Account. www.derrystrabane.com/gi

CarnegieUK TRUST

CHANGING MINDS • CHANGING LIVES

Carnegie United Kingdom Trust
Registered charity SC 012799 operating in the UK
Registered charity 20142957 operating in Ireland
Incorporated by Royal Charter 1917

Derry & Strabane recycles

FSC www.fsc.org MIX Paper from responsible sources FSC® C015417

ISBN 9781912908325