



GREENKEEPER

ENHANCING URBAN GREEN INFRASTRUCTURE

Future Parks Accelerator

13 May 2019

James Patterson-Waterston, Therese Karger-Lerchl
Vivid Economics





Vivid Economics is a leading strategic economic consultancy

Founded in London in 2006, we now have:

- a team of over 60 economists
- an annual turnover of around US\$7m
- staff in the UK, Netherlands, Peru, Brazil and the USA

An ability to use economic expertise to deliver original, robust and useful solutions:

- we have a strong network of leading academics
- we leverage innovative models and methodologies

Broad experience across sectors and themes:

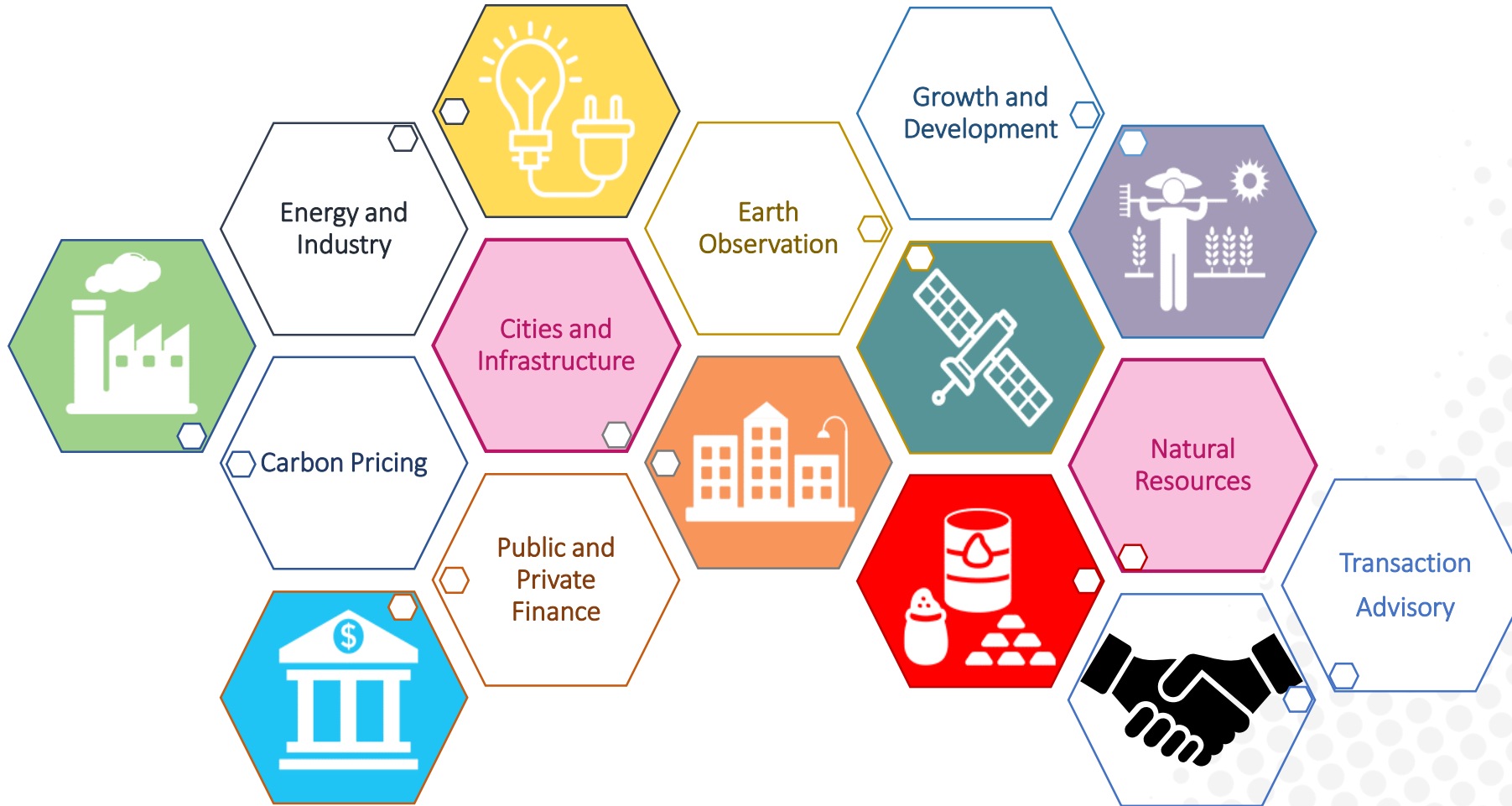
- expertise in infrastructure, industry, resources and finance
- themes of growth, competition, and innovation
- industry leaders in applying and developing economic tools

We work in more than 60 countries for governments, development institutions and private sector clients





We deliver projects across eight core service offerings





Our Cities and Infrastructure practice offers world leading expertise that bridges the gap between policy and commerce

The efficient provision, financing and operation of resilient urban infrastructure is a major contributor to economic output and quality of life. This is particularly true for the development, planning and management of rapidly growing cities.

Vivid's Cities and Infrastructure practice provides world leading city-specific analysis at the interface between policy and commerce. We deliver the best possible decision support across a diverse range of issues, gained from the experience we continuously distil into our analytical frameworks.

In our Cities Practice, clients include blue chip investors, operators, advisors and multilaterals



WORLD BANK GROUP



Global Platform for Sustainable Cities



Global Green Growth Institute

GMCA
GREATER MANCHESTER COMBINED AUTHORITY
ANDY BURNHAM
MAYOR OF GREATER MANCHESTER



THE NEW CLIMATE ECONOMY



Department for Business, Energy & Industrial Strategy

LD&DESIGN



GREATER LONDON AUTHORITY

Cities Alliance
Cities Without Slums



Foreign & Commonwealth Office



IDB
Inter-American Development Bank



TEES VALLEY COMBINED AUTHORITY

TEES VALLEY MAYOR



Empowering urban environments to flourish, from designing effective policies, to attracting investment and financing infrastructure



Inclusive urbanisation strategies

Achieving a sustainable development trajectory by:

- designing resilient sub-national strategies
- supporting spatial planning through land use analysis
- building institutional capacity and improving public finance management



Industry and trade development

Unlocking the potential to grow, diversify and link to markets by:

- identifying priority sectors and industry opportunities
- designing value-add business clusters, Economic Zones
- developing the business case for economic interventions
- advising fiscal and non-fiscal incentives to attract investors



Infrastructure delivery

Increasing the well-being of city residents by:

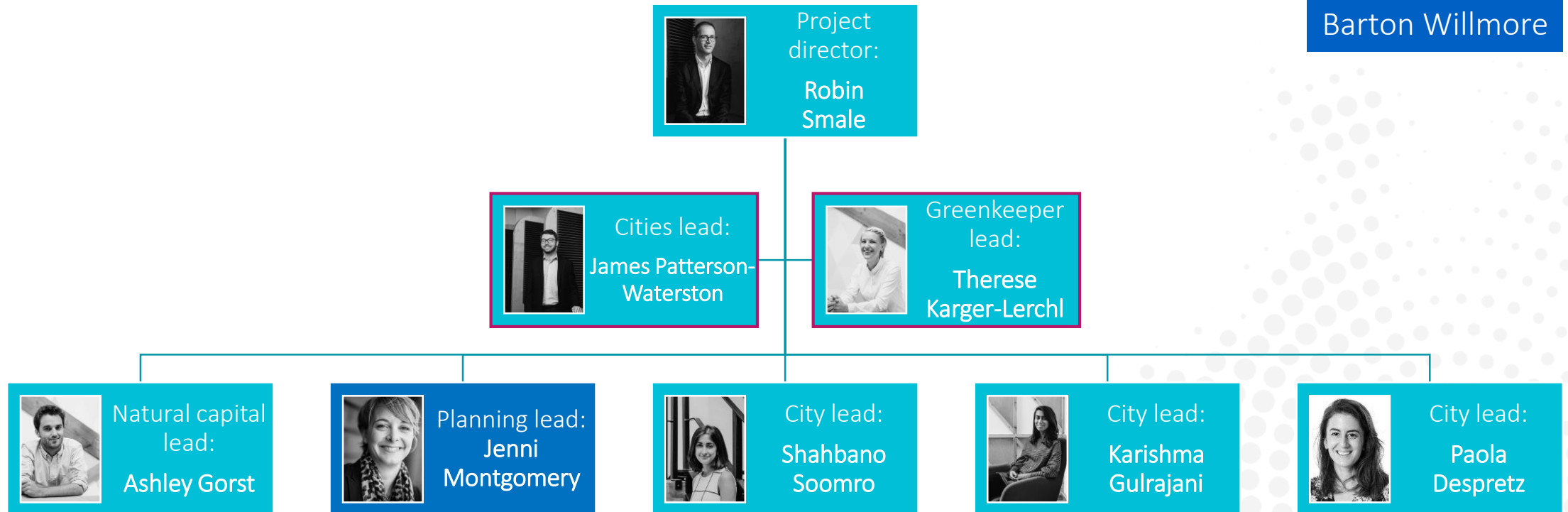
- forecasting investment needs
- optimising provision for economic and social impact
- designing financing options to unlock best returns
- utilising digital technology to transform service delivery



The team for FPA combines global expertise in natural resource management, cities and infrastructure and planning policy

Vivid Economics

Barton Willmore





Greenspaces are essential to productive and healthy cities, but the benefits they deliver are difficult to quantify



Healthy and productive cities depend on access to green infrastructure



Yet planners and local authorities currently lack the tools to assess the benefits greenspaces provide

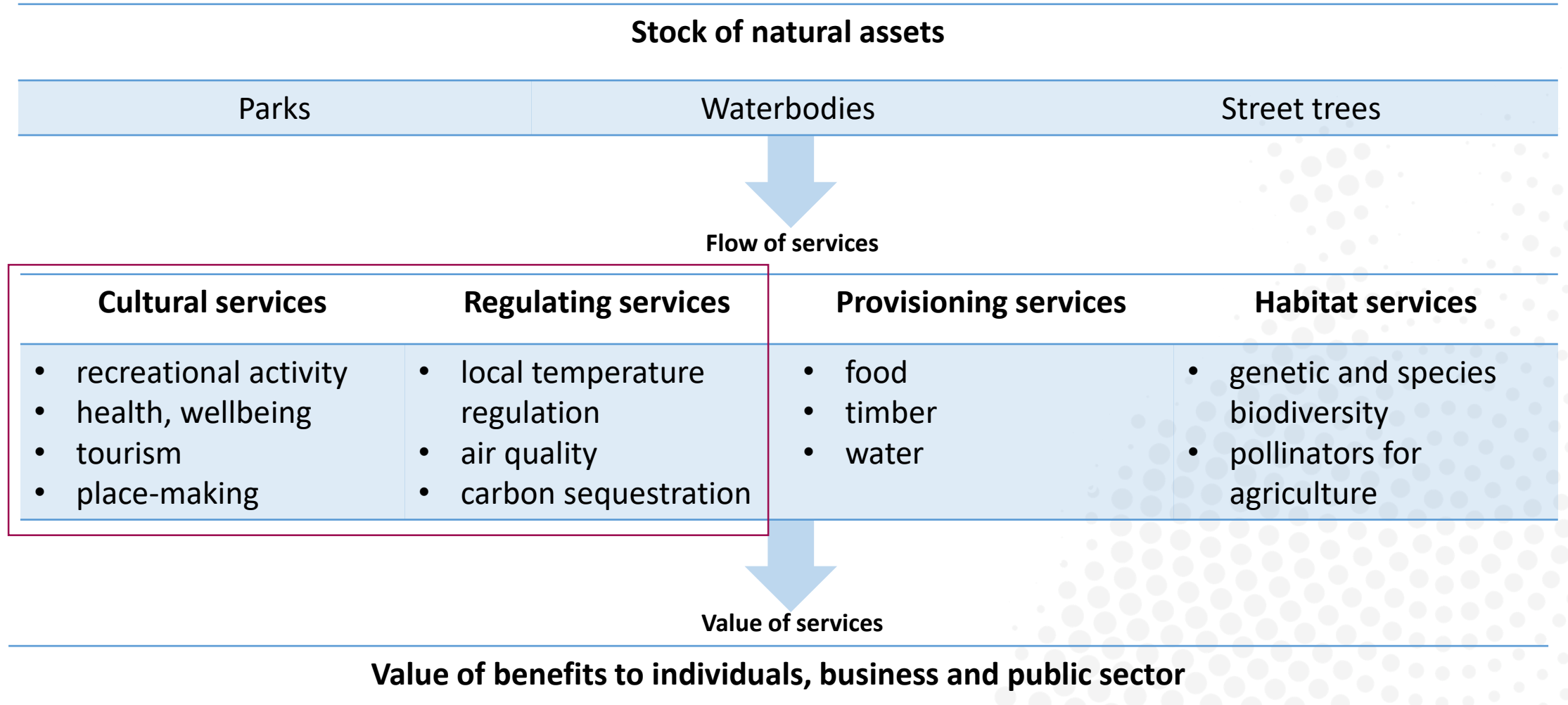


A poor evidence base leads to investments that do not meet the needs of local communities, underproviding crucial services



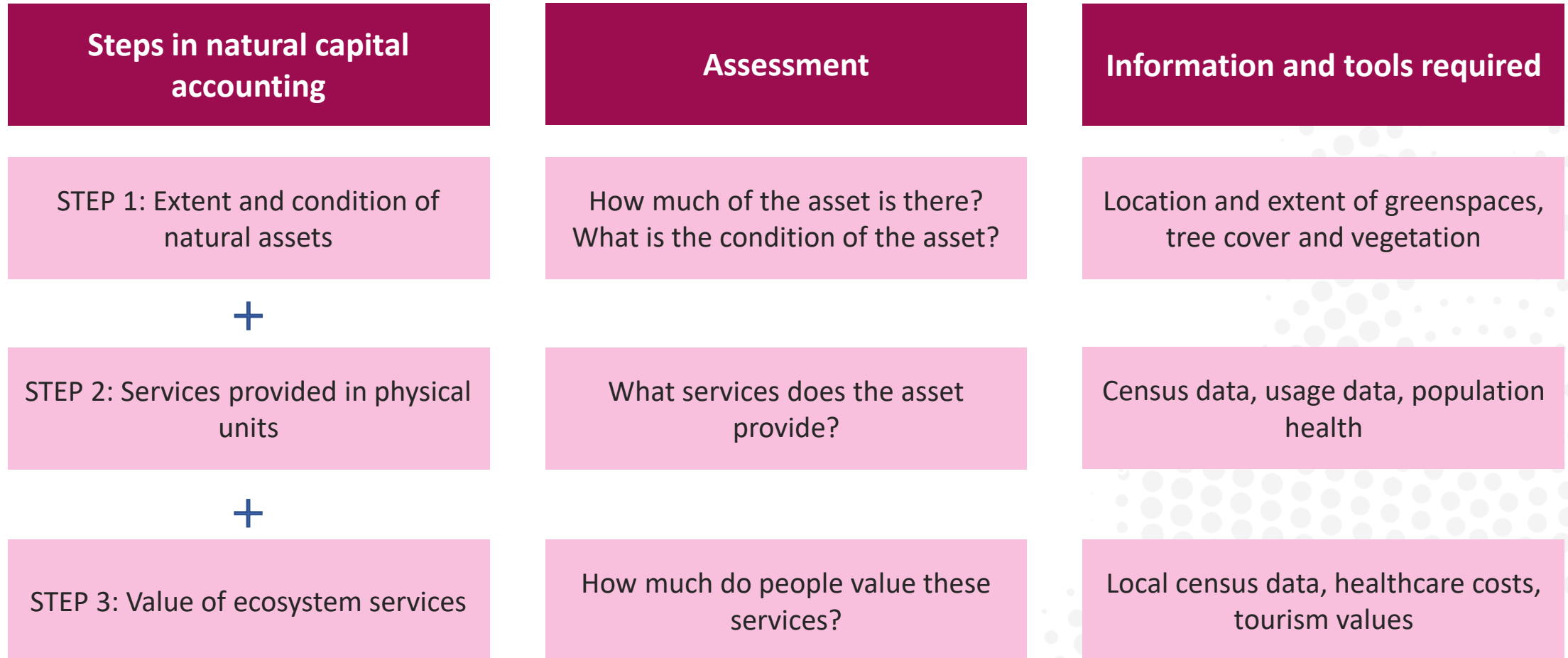
The role of ecosystem service valuation for effective urban planning

- natural assets produce a set of services that benefit city residents





Building a natural capital account





London's natural capital account illustrates the value of multiple ecosystem services provided by urban greenspaces

Services provided by natural assets	Public services (£ billions)	Residents (£ billions)	Business (£ billions)	Total (£ billions)	Share (%)
Recreation		17		17	19
Mental health	1	3	2	7	7
Physical health	2	5	3	11	12
Amenity		56		56	61
Carbon (soil)				<1	1
Carbon (trees)				<1	<1
Temperature		1		1	1
Gross asset value	3	82	5	91	100
	4%	90%	6%	100%	



Natural capital accounting can support a variety of policy and urban planning decisions

Policy or planning decision	Use	Policy or planning question	Analysis
Priorities and issues	Show current situation and future scenarios	Status of natural assets	Interpretation of physical and monetary accounts past and present
Response and implementation	Supports assessment and design of policy	Economic, social and environmental benefits and costs of policy	Ex-ante assessment of costs and impacts
Monitoring, evaluation and adaptation	Track progress and monitor policies	Are policies meeting goals and target outcomes?	Assessment of policy progress over time against indicators



Managing assets and investments in green infrastructure based on outcomes could improve policy and urban planning effectiveness

Cities can use the evidence base built up in natural capital accounts to build policies around green infrastructure management to take a:

- **Targeted approach:** Protect and enhance specific assets that contribute to specific policy objectives e.g. parks and other green infrastructure to support health outcomes related to physical activity
- **Integrated approach:** Better integration with other policies by comparing benefits and costs of natural solutions with traditional solutions or alternative policies



The Greenkeeper team combines expertise in economic valuation, urban planning and cutting edge health research





New datasets on the use and features of greenspaces and new evidence on the multiple benefits they provide allow better assessments

Key attributes of VE tool	Greenkeeper	ORVal/ NEVO	i-Tree	Eco-Serv GIS	InVEST	BEST SUDS	GI-Val	NCPT
Spatially explicit	✓	✓	✓	✓	✓	no	no	no
No technical knowledge and data input needed	✓	✓	✓	GIS	GIS and data requirement	data requirement	data requirement	data requirement
Values multiple benefits of greenspaces	✓	no	no	✓	✓	no	✓	✓
Models modifications to existing and new sites	✓	✓	✓	n/a	n/a	no	no	no
Coverage in the UK	England, Scotland	England, Wales	not all tools have UK coverage	✓	✓	✓	✓	✓
Applicable in urban areas	✓	no	✓	✓	✓	✓	✓	✓



With Greenkeeper, decisionmakers will have the tools to map, compare, and evaluate current and potential greenspace benefits

1

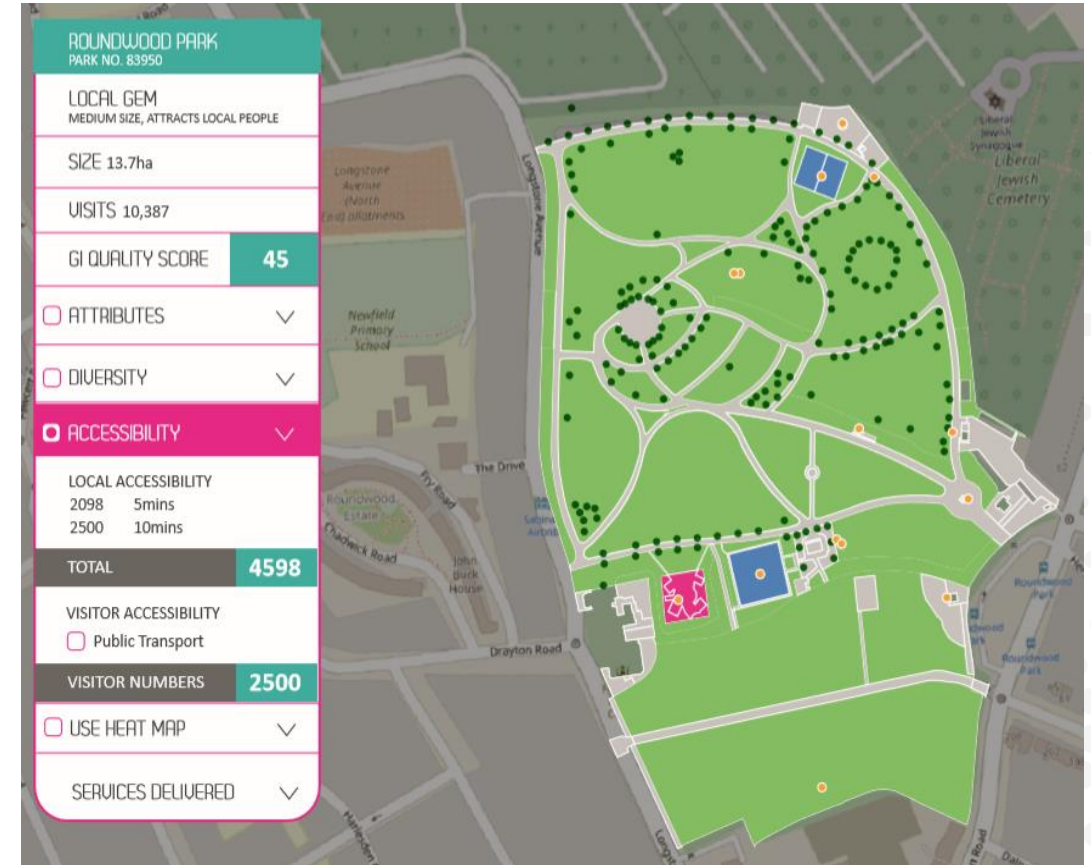
BASELINE INVENTORY

2

BENEFIT VALUATION

3

IMPACT OF INVESTMENT OPTIONS



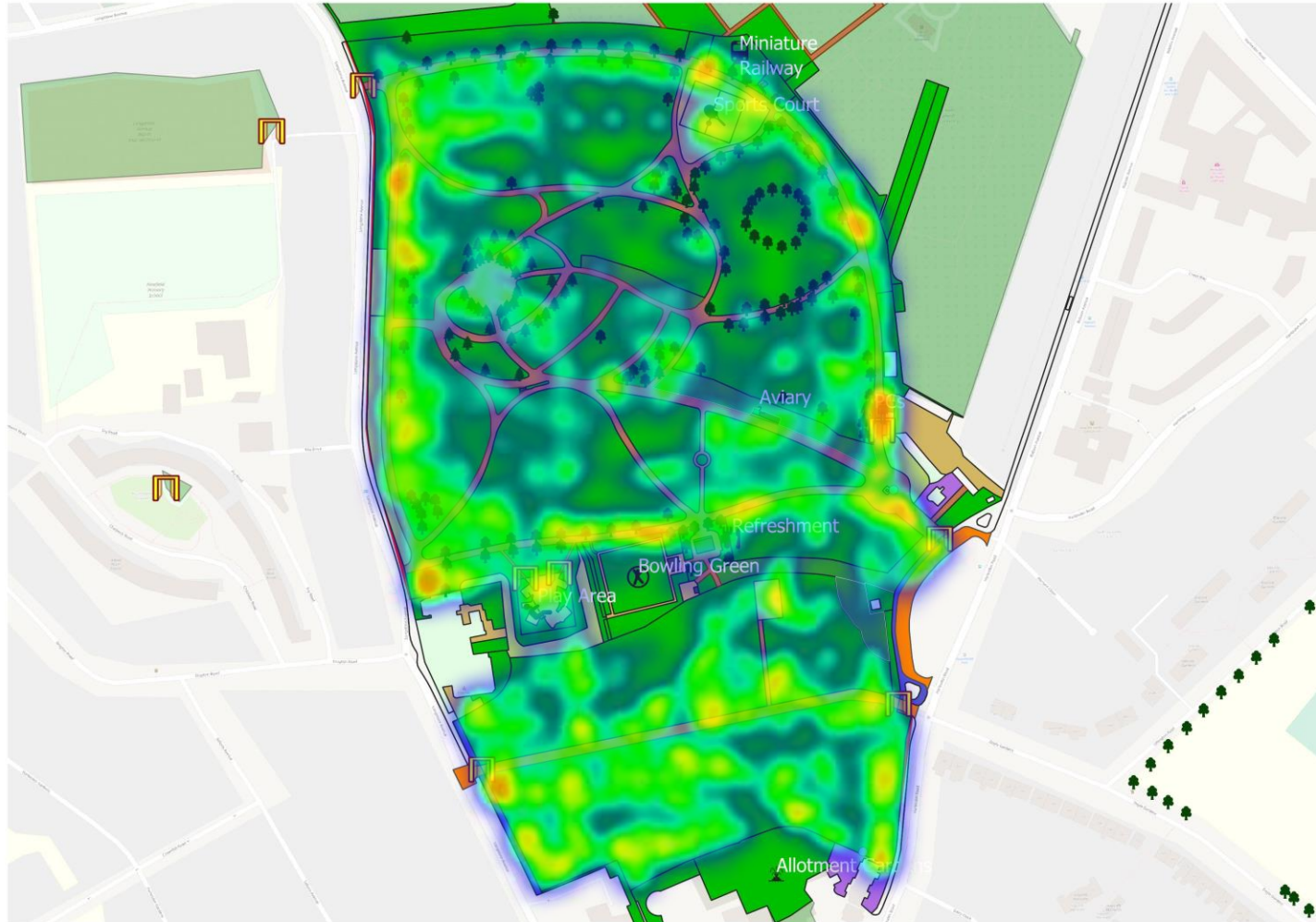


The baseline inventory provides comprehensive information about the characteristics and features of urban greenspaces



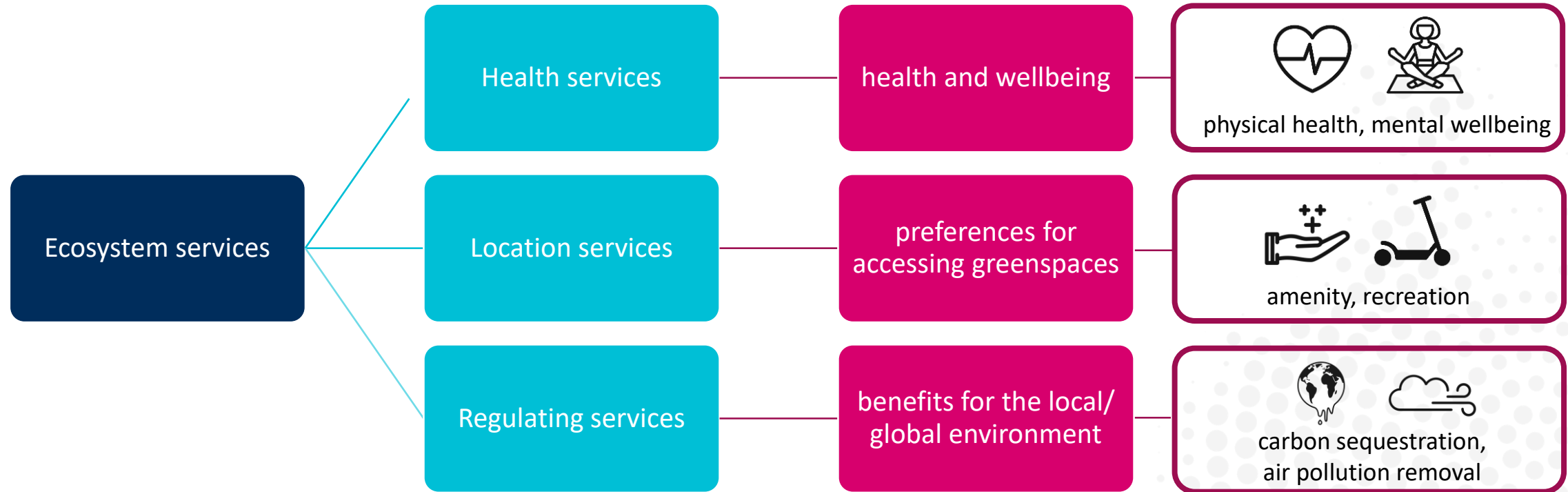


Visit numbers and heat maps provide information about how greenspaces are used for recreation and what visitors value about them



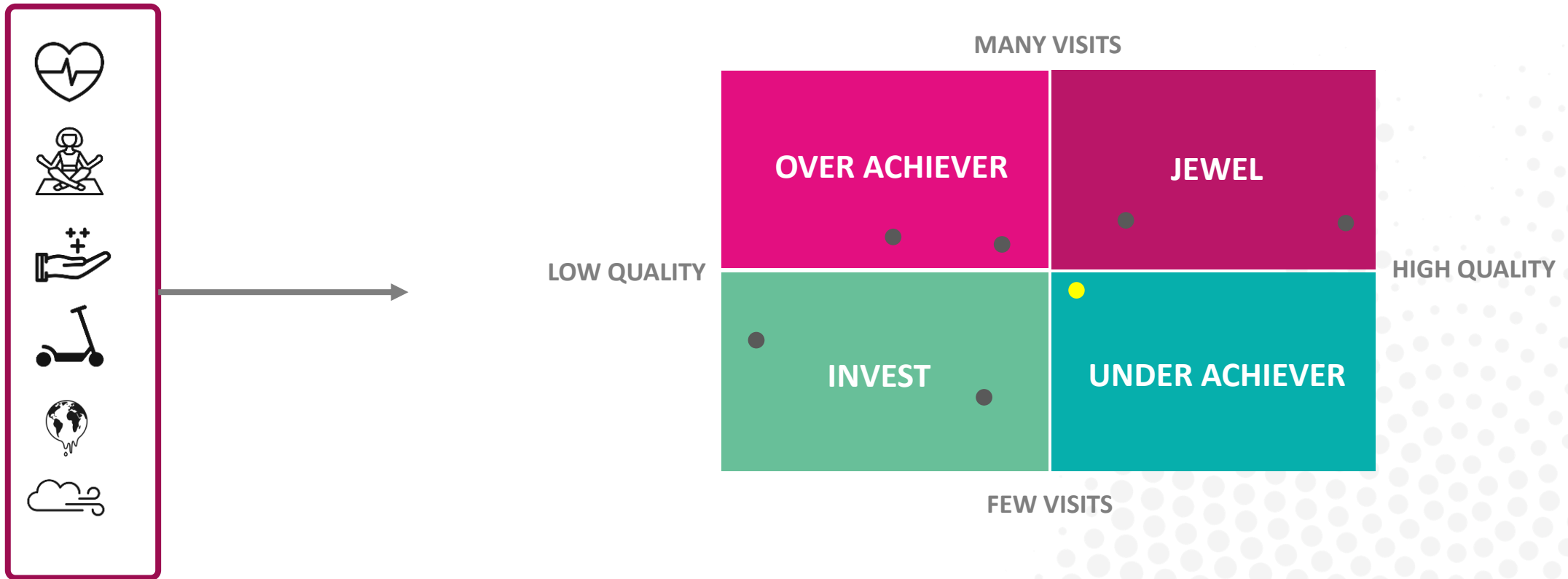


Visits and characteristics define the ecosystem services a greenspace provides



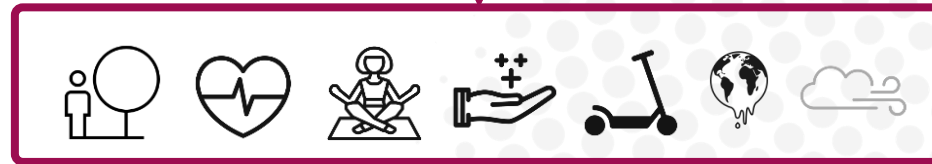
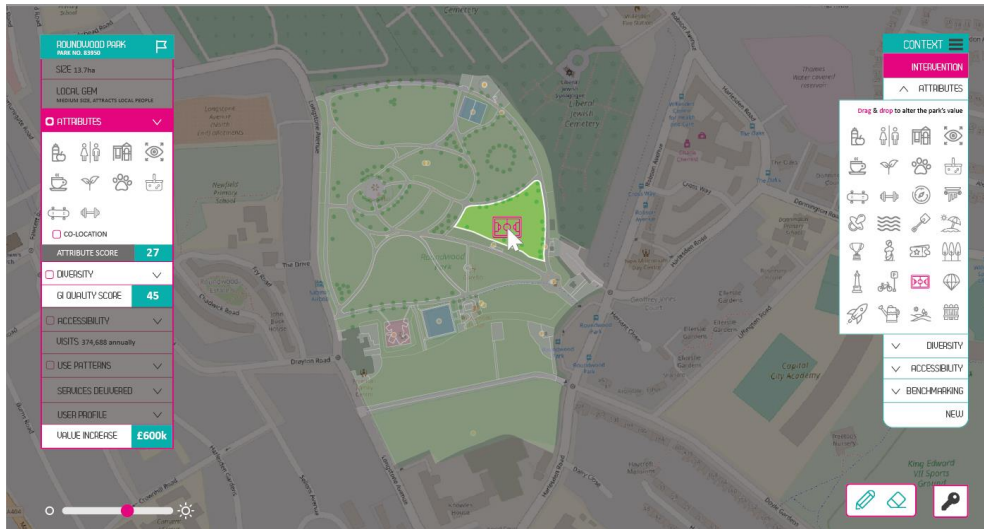


The values are expressed in physical and monetary terms, and allow a comparison across a peer group





Greenkeeper models changes in visits and ecosystem services that would result from investment or disinvestment in greenspaces





Example: health benefits depend on activity levels of greenspace visits

Inactive



9%

of visitors do not get any physical health benefits from activity in parks

Low-activity



61%

of visitors undertake low levels of activity in parks, leading to reduced risks of mortality

High-activity



29%

of visitors undertake high levels of activity in parks and have active lifestyles, leading to higher quality and longer lives

£0

+£460

£460

+£240

£700

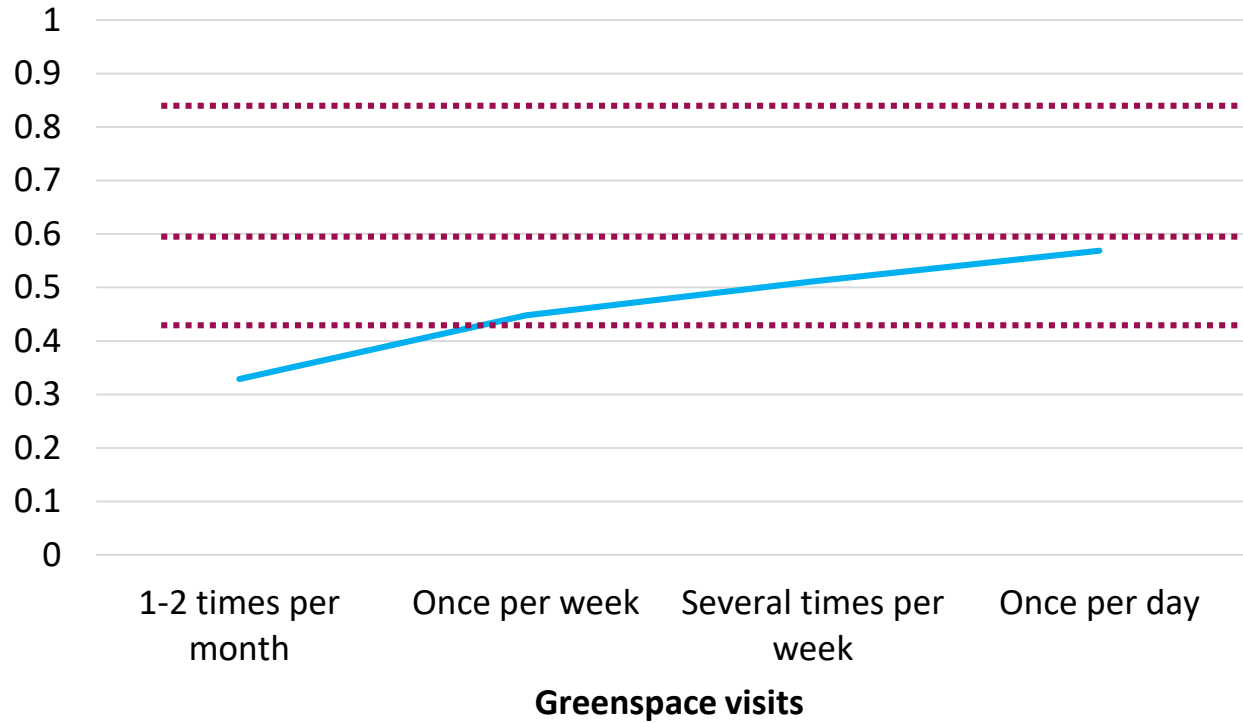
Average value of physical health benefits per visitor per year



Example: Regular visits to parks improve wellbeing similarly to having full time employment or being married



Improved reported life satisfaction on a 1-10 scale
compared to not visiting greenspaces



able-bodied compared to disabled

employed full-time compared to unemployed

married compared to unmarried



Ecosystem service valuation can support the business cases for strategic green infrastructure investment



Investment in green infrastructure **creates real value** for residents

This preference is reflected in the **premium they pay to live near it**

Strategic investment generates financial returns to developers and local authorities



Improving access and quality of green infrastructure **increases physical activity**

This results in **better population health outcomes** and lower health costs

Strategic investment can be part of a preventative health strategy for local health services and secure funding



Increasing green infrastructure exposure, **improves the wellbeing** of residents

This contributes to a happier and **more productive local labour force**

Strategic investment can be part of the local economic strategy with benefits to employees, firms and local authorities



Our team



Robin Smale
Director

Robin is a Director and co-founder of Vivid Economics with over 20 years' experience in the economics of energy and climate, natural resources management, infrastructure, heavy industry and finance.

He leads the development of Greenkeeper, using new sources of data, analytical methods and scientific evidence to understand patterns and drivers of greenspace use. He has led several hundred projects, for many of government and private sector clients, covering a wide range of strategic, policy, scenario, econometric, financial and market analyses. The portfolio includes ground-breaking analyses and contributions to key policy and commercial decisions.

Robin heads Vivid Economics' earth observation and data analytics practice. He was also a founder member of the UK Natural Capital Committee 2012–15.



James Patterson-Waterston
Principal,
Cities and Infrastructure

James leads Vivid Economics' Cities and Infrastructure team and has been engaged in international urban development projects for over ten years. His work has encompassed strategy and regeneration projects throughout the UK and internationally, both for the private sector and local and national governing authorities.

James' expertise is in urban and regional economic strategy development; feasibility studies; implementation planning; spatial and master planning; sustainable urban development; and area-based economic assessment. He is therefore interested in how Greenkeeper can support spatial planning decisions and how it can fit seamlessly into the real estate development process, enhancing economic and social value.

He is also a member of the Institute of Economic Development and an elected Academician of the Academy of Urbanism.



Our team



Therese Karger-Lerchl
Senior Economist,
Cities and Infrastructure

Therese is an urban economist. She manages the development of Greenkeeper and advises private and public sector clients on urban development strategies. Her focus areas are cities, innovation and international development.

Therese has previously worked at the Open Data Institute, at the South African National Treasury, as well as at KPMG and GIZ. Her focus is on applying economic concepts to advise cities on policy for sustainable infrastructure investments and urban planning.



Ashley Gorst
Senior Economist,
Natural Resources

Ashley is an economist focusing on using econometric tools, which have been applied to natural accounting frameworks and remote sensing data in the UK and abroad. He is interested in advancing the analysis of the benefits greenspaces provide, particularly those related health.

Ashley holds a PhD from the London School of Economics and Political Science (LSE) in Environmental Economics, where his research focused on analysing climatic and technological constraints to agricultural productivity to understand challenges to food security.



Our team



Shahbano Soomro
Economist

Shahbano specialises in sustainable urban development at Vivid, with experience developing potential green growth pathways in the UK, Indonesia and Pakistan. Her focus in the Greenkeeper team is on supporting policymakers and businesses to maximise the opportunities of urbanisation and growth by investing effectively in urban greenspaces.



Caroline Vexler
Analyst

Caroline is an analyst with a focus on cities and infrastructure and natural resources. She leads the health and wellbeing analysis for Greenkeeper, working closely with the University of Exeter to gain new insights into the role green infrastructure plays in promoting population health outcomes.



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