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Cover illustration by Clifford Harper.  
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Autumn is here, which means that as, I write MPs, councillors, the press, trade unions, charities, lobbyists and many other groups have just finished congregating in seaside towns and city centres for the party conference season. I, myself, had a busy couple of days in Brighton at the Labour Party conference, where I chaired the TCPA’s fringe event on the theme of ‘better housing, better planning, better places’.

Supported by the Lady Margaret Patterson Osborn Trust and Crest Nicholson, the fringe event attracted over 100 delegates and featured a lively debate covering a wide range of issues – including the impact of Brexit on the availability of a skilled construction workforce, the quality of new-build housing, and the voice of communities in the planning process. On the panel I was joined by Tony Lloyd MP, Shadow Housing Minister, Cllr Lewis Herbert, Leader of Cambridge City Council, and Chris Tinker, Chairman of Major Projects and Strategic Partnerships at Crest Nicholson.

I also spoke at the Association for Public Service Excellence’s fringe event on the role of councils in delivering affordable housing. This was a good opportunity to highlight some of the key findings from our recently published research report, Building Homes, Creating Communities.

On the next weekend I headed up to Manchester for the Conservative Party conference, where I chaired an equally packed fringe event on the same topic, with a speaker panel of Cllr Martin Tett, Leader of Buckinghamshire County Council, and Chair of the LGA Economy, Environment, Housing and Transport Board, and Peter Aldous MP, Chair of the All Party Parliamentary Group on Housing and Care for Older People. Key themes discussed were the need for upfront infrastructure investment and issues around the delivery of genuinely affordable homes.

In addition to the party conferences it has been a very exciting time at the TCPA. Earlier in September, Katy Lock, the Association’s Garden Cities and New Towns expert, and I attended the first meeting of a new All Party Parliamentary Group (APPG) on New Towns. The group will provide a much needed government focus on the regeneration needs of the post-war New Towns. The Chair of the APPG is Lucy Allan, MP for Telford, and other members include Dr Lisa Cameron MP (Co-Chair), Nick Thomas-Symonds MP (Vice-Chair), Rachel Maclean MP (Vice-Chair), Henry Smith MP (Vice-Chair), Robert Halfon MP (Vice-Chair), Lord Richard Best (Vice-Chair), and Iain Stewart MP (Treasurer). The TCPA is looking forward to working with the APPG on New Towns on future events and research.

I also had the pleasure of speaking at the Local Government Association’s conference on housing, health and ageing. The event provided an opportunity to share some of the TCPA’s leading-edge work on reuniting health and planning and provided a good opportunity to learn about local authority innovation in meeting changing needs in society.

We also held the first two pilot workshops for the Nationwide Foundation funded TCPA project exploring how councils can secure more affordable homes through innovation, new models of delivery, and partnership. The first workshop was held with Harlow Council and explored the regeneration opportunities in the post-war New Town; the second was held with the councils of the new West of England combined authority, who are working on a joint strategic planning framework. Later in the autumn we will be running pilot workshops with North Northamptonshire, where there is a joint planning unit and a joint planning committee, and with East Riding in Yorkshire.

In last month’s ‘On the Agenda’ I highlighted some of the TCPA’s autumn. These include:

- **A TCPA conference on retrofitting and enhancing green infrastructure – ‘Small Scale, Big Impact’**: The conference, held on 11 October, covered a number of themes, including opportunities for retrofitting green infrastructure in developments, making the economic case for green infrastructure, and translating research into practice.

- **A TCPA seminar on demystifying planning for healthcare**: Michael Chang, Project and Policy Manager at the TCPA and lead for the Association’s planning and health work, launched a short guide to health and Garden Cities at the seminar on 12 October, as well as the results of an online survey of planning and health professionals.
A TCPA seminar on the theme of ‘inclusive England’: The seminar is being held in Newcastle upon Tyne on 21 November in conjunction with the Centre for Urban and Regional Development Studies and the Institute for Social Renewal, both at Newcastle University. It is supported by Homes for the North. The event will provide an opportunity to focus on the social and economic challenges in towns largely outside the major cities and conurbations which can be overlooked by national policy-makers – yet, on some estimates, house two-thirds of the population.

TCPA Annual Conference: The TCPA Annual Conference, this year held on 23 November, is one of the main highlights of the Association’s events calendar, providing an opportunity to meet up with friends old and new and hear the latest policy announcements from the government. Keynote speakers include Nick Walkley, Chief Executive of the Homes and Communities Agency (HCA), and Rt Hon. John Healey MP, Shadow Secretary of State for Housing.

In addition to these great events, three additional seminars are now scheduled for December:

- A TCPA seminar on long-term stewardship on 7 December: Supported by Countryside Properties, the seminar will provide an opportunity to examine different approaches to the long-term stewardship of community facilities and assets – an essential ingredient to the ongoing success of a community.

- A TCPA seminar providing an introduction to the English planning system on 13 December: This two-hour course provides an introduction to the ‘nuts and bolts’ of the English planning system and provides updates on the key impacts of recent planning reforms. The training, delivered by the TCPA’s Director of Policy, Hugh Ellis, is run as an informal and interactive session which navigates through the complexity of the planning system.

- A TCPA seminar providing an introduction to land value capture, also on 13 December: This short introductory course covers the basic mechanics of land value capture and provides information on how it might work in different local circumstances. It is designed for practitioners, elected members and non-planners, to provide a better understanding of one the most contentious and important aspects of the planning system.

TCPA members benefit from a 50% discount on conference and seminar fees – so please do make the most of the opportunities for learning and networking.

Kate Henderson is Chief Executive of the TCPA.
Those familiar with the world of Star Trek will know that the Kobayashi Maru is computer-generated training exercise engineered by Spock to be so complex as to be unsolvable. No-one ever succeeds in providing a solution to the test, apart from Captain Kirk, who cheats by re-writing the program. The reform of English planning appears to be very like the Kobayashi Maru test, with the disadvantage for those of us on the team of the Raynsford Review of Planning, set up by the TCPA,¹ that we cannot cheat.

The Raynsford Review is now into the fourth month of an 18-month journey to explore the strange world of English planning and seek out a better set of solutions. In thinking about solutions the Star Trek series might be an appropriate starting point. In fact, the battle between Spock-like logic and Captain Kirk's pragmatism is exactly what the review team is beginning to confront. To add to the complexity, we seem to be in a strange world in which no-one seems to agree with anyone about anything.

It is, of course, far too early to draw any firm conclusions from the existing review evidence, but there are two major issues which appear to dominate the debate. The first relates to the nature of the evidence that has been submitted; and the second to the complexity of the policy and legal dilemmas which emerge from that evidence.

By December 2017 the review team will have held 20 engagement meetings across the country and a series of individual meetings with organisations. It is perhaps significant that there is a clear gap between what stakeholders will say publicly and what they care to tell us informally and off the record. For example, interviews with public sector planners reinforce a desire not to be seen to talk down planning in their own authority, with a resulting reluctance to express private conclusions about how challenging planning practice is. Likewise, some developers have publicly reflected on the value of a plan-led system, while recognising privately that land speculation ‘off plan’ has been a highly lucrative part of their business model.

One early conclusion of the review team is that there is a lack of good impartial evidence on many of the issues surrounding planning performance – there is a risk of becoming mired in competing waves of what is essentially hearsay based on the understandable corporate priorities of differing sectors. With limited time, the review team is now focused on trying to fill the research gaps, especially how to establish the scale of poor-quality development emerging from the planning process (a dominant theme in the feedback). Government doesn’t measure qualitative outcomes and few in local government wish to shout about what is essentially a story of failure.

The evidence we have seen so far is complex and diverse but is marked by profound disagreement between landowners, developers, NGOs, professional bodies, communities and the government on almost every aspect of the spatial planning system. As far as there is any agreement, it is based on a shared criticism of the current state of planning practice. Ironically, both communities and parts of the private sector are equally frustrated by uncertainty in the system – often for very different reasons. The key areas of concern and disagreement relate to:

- **The purpose and objectives of the system:**
  The argument here is between those who see planning’s priority as solely to deliver housing units in support of the wider economy and those who uphold a traditional view of planning as delivering sustainable development in the wider public interest. It is interesting that some respondents to the review do not see any distinction between the needs of developers and the public interest.

- **The degree to which the current system is delivering its objectives:**
  The success of the system is entirely dependent on the view taken of its objectives. The system is delivering housing permissions in advance of demographic need, but its record on actual delivery in general is much less impressive. The record on affordability is, of course, extremely weak. Applying a broader test of sustainable development to the system produces a complex picture of dysfunction in relation to a host of outputs, from connectivity, health and climate change to design and equality.

- **How much power the spatial planning system should have:**
  The use of prior approval and the expansion of permitted development have clearly
restricted the power of planning, and it seems likely that the system is at its weakest since 1947. It is also interesting that a majority of the feedback so far supports the view that the plan-led system is simply a fiction. The failure to use the positive delivery methods of development corporations on any meaningful scale was cited as one reason why planning was regarded as so negative.

- **How the balance of planning powers should be distributed between central and local government:** There has been broad agreement that local government has lost significant powers, and that a curious position has emerged in which central government has abandoned any role in direct positive planning (for example in engaging with new towns or growth areas) and as a result has focused all its efforts on trying to shape Local Plans.

- **The right spatial structure for planning, including local government structures and boundaries:** There has been strong articulation of the confusion and ‘mess’ of English devolution, and of the contrasting benefit of a rational approach, including a national plan and logical strategic planning functions. The review team has gone back to the Redcliff-Maud Commission on Local Government in England and its minority report, and it is perhaps unsurprising that the position now is confused when there has been no detailed reassessment of local government boundaries in England since 1969.

- **The degree to which communities should have meaningful control over their own local environment:** Of all the evidence we have received so far, it is that from the community sector which has been most damning of the current system. There is real anger about the system not listening to communities or overruling local aspirations. This area is, of course, complex, and these views may be more or less justified. However, the anger is real and leads some contributors to suggest that planning should now be centred on neighbourhood development plans as the dominant decision-making framework. Other respondents are frankly terrified at this prospect, seeing a recipe for complete stasis.

- **The question of betterment and fair land taxation:** There is an active debate on this issue, and on section 106 and the community infrastructure levy. As yet there is no agreement about how to make land tax less regressive through a mechanism for fair redistribution.

In addition to these questions of policy principle there have been a range of other related issues consistently raised in the evidence:

- the skills of planners, and the content of planning education;
- the poor morale of the planning service;
- the widespread confusion about key policy and practice changes, including the viability test, the legal weight of the development plan, the impact of devolution, the duty to co-operate, and a significant change to the status of green belt; and
- the failure of planning to adequately ensure the co-ordination of investment in a wider range of social, transport and utilities infrastructure.

It is significant that the resourcing of the planning service to enable a positive and informed response to users was by far the most significant issue raised by the private sector. Solving this problem would undoubtedly contribute more in the short term to meeting concerns on delivery than any other single measure.

One positive view of the evidence we have received so far is that it confirms the need for change and the value of asking fundamental questions about what the system is meant to be for. Less reassuring is the complexity and controversy which surround many of these problems. In some cases, they have remained unresolved for decades precisely because acceptable political solutions have been so hard to find.

And this takes us back to the Spock versus Kirk argument. For Spock, no planning reform can take place without a final and lasting settlement to local government structure in England, based on functional geography. The current system is simply illogical and confused. The same might apply to betterment taxation and to clarifying the operation of a plan-led system, and a host of other issues where solutions can be found. But, of course, all these solutions require a logic and rationality that is completely absent from the current debate on the future of England.

There has inevitably been a tendency to dwell on the negatives during this early stage of evidence-gathering, but over the next few months we need to move on to creative logical and practical solutions to these problems. There is no doubt that England is badly managed, and equally no doubt that the solutions are there. The question is whether there is any political will for change. Above all, we need as much help as possible from the wider planning community, both in identifying solutions and in forging a new consensus on the value of spatial planning to our future.

- **Hugh Ellis** is Director of Policy at the TCPA. The views expressed are personal.

**Note**

The designers of our 1947 town and country planning system carefully structured it as an ‘art and science’. That had been the vision of the founders of the Royal Town Planning Institute (in 1914), which included many interested parties, one of which was the TCPA.

The ‘art’ part was referenced because making arrangements for the future of town and country requires conscious design at many scales, from vast tracts and whole city regions, to the detail of individual buildings and landscape works. The ‘science’ referred to the research and technical analyses which would inform the designers in their work, providing both their brief, to some extent, and, sometimes in an irritating way, methods of measuring the success of their output to inform future briefs. The intellectual roots for the contribution of science are many, from public health studies for example; but the writings of Professor Sir Patrick Geddes, and particularly his mantra ‘survey, analysis, plan’, may be familiar to students of planning (at least, it ought to be!).

When drafting the 1947 Act, a further advantage of the ‘art’ was found to be that decisions, policies and programmes could be left mostly to the artful judgement of the government of the day. ‘Art’, viewed like that, gifted room for political manoeuvre on any planning matter at any time. A government’s dream.

Since then, three forces have been at work to try to stiffen up, or codify, our planning system to reduce the discretion of the decision-maker on planning matters. One has been the law, which, despite the oft-repeated assurance that ‘there are no precedents in the planning system – each case is decided on its merits’, keeps chipping away at the point. One decision on one project is extrapolated as precedent for all similar cases. The writer will not be the only planning consultant to be advised by his barrister to add pages of similar cases to a proof of evidence at planning inquiries. Another recent case succeeded in the High Court primarily because the Secretary of State did not refer to a recent decision he had made on another case.

The second force has been the European Union. The most powerful member states have planning systems which use codes – proposals either comply or they do not, in a tick-box way, and the activity of planning is therefore administrative rather than either art or science. Consequently the effect of the EU on the UK’s planning systems has been in large part to provide an overlay of a different system – almost a parallel planning system – which we have to operate as well as what we have inherited from the 1947 Act.

Environmental impact assessment (EIA) is the greatest of these overlays, providing great work for consultants, but with output documentation that is barely accessible to the public and almost certainly never read by decision-makers. This is not a criticism of EIA per se, as our own system could be crafted to incorporate similar survey and analysis, but it isn’t. It is just an explanation of the oil and water of artfulness and codified planning systems when forced to mix.

Third has been the harriers of the planning system who, for whatever reason, hunt the seam between the EU overlays and the older UK artfulness. Many legal challenges have been mounted against the quality of submitted EIAs. The latest battlefield for such people are challenges because of insufficient assessment of the impact on air quality.

When things get difficult in the world of planning (and today’s housing crisis is one of the greatest difficulties), the reaction of the administrators who now control our system is to reach for a code, a formula, a machine that gives answers. Thus the DCLG (the Department for Communities and Local Government) is consulting on a standard method for calculating how many new homes each English local planning authority should now plan for.

An ‘art-lite’ approach, at the very least. It is a no-brainer that something must be done to settle housing numbers quicker. Decades of deliberate underplanning have been building up a problem with unacceptable consequences for real people. Numbers are reluctantly brought forward by local planning authorities, using every trick in the book to keep them as low as possible: the homeless and badly housed are only recently a political force, and may not be in that locality anyway. At examination of the proposed Local Plan, the Home Builders...
Federation and developers would evidence the extent of underplanning. Protectionist groups would argue for a lower number. The examiner tries to push through the plan because DCLG wants more to be adopted. Much ‘art’ and little ‘science’, for ‘survey, analysis, plan’ doesn’t work if you fudge your ‘survey’ and ‘analysis’, and are scared of ‘plan’ in case it upsets those who vote!

Since RSSs were abolished by the coalition government after 2010, each planning authority must deal with its own arisings in terms of housing numbers, in a Local Plan. This is difficult as the accumulating backlog of need cannot be hidden any more, neither can the responsibility for dealing with it. Although neighbouring authorities in the same housing market area have a ‘duty to co-operate’ over the location of their joint housing requirements, few do this convincingly, agreements do not always stick, and the ‘duty’ has been weakened to the point that ‘co-operation’ can mean ‘agree to disagree’. That’s pointless.

The National Planning Policy Framework (NPPF) requirement is that, whatever the number, each local authority must have a deliverable supply of housing land for the next five years. This has had a good effect. It has impelled Local Plan making to lurch forward after years of prevarication. The current consultation document on the standard housing formula has caused a further frantic spurt in areas feeling threatened by housing growth, as Local Plans submitted for examination before March 2018 can use old housing numbers.

In an attempt to save time and money on the argument about housing numbers, at least, DCLG now proposes a standard formula. It has three components, as shown in Box 1 on the left.6

This is a courageous construction, as each sentence will no doubt be the subject of challenge one way or another. Even the starting point is contentious, because projecting household growth based on what exists makes no allowance for the unplanned migration of peoples that occurs between parts of England, and between England and elsewhere.

The proposed formula is said to be likely to have surprising and probably unwelcome consequences for many, upwards and downwards. An article by Jamie Carpenter in Planning Resource7 reports an exercise on the formula showing that:

‘for some authorities, using the most up-to-date data produces a significantly higher housing need figure than when the same proposed formula is applied to the previous sets of data (2012-based household projections, published in February 2015, and the 2015 house price to earnings ratios, published in March 2016).

‘For example, the local housing need figure for the Leicestershire district of Oadby and Wigston … is more than 80 per cent higher than the figure produced when the same formula is applied to the numbers in the previous sets of data (due, in large part, to average annual household growth projections for the district leaping from 60 to 1079 homes per year).

‘Need calculations for Oxford and Cambridge are both more than a third higher under up-to-date data compared to the previous data releases (although, interestingly, still substantially below existing assessments of housing need).

‘However, for other authorities, calculations of housing need…are significantly lower…For example, the figure for Hyndburn is more than a third lower (35.6 per cent), while the figure for South Ribble drops by 31.1 per cent and the housing need number for Preston is reduced by 28.9 per cent.’

DCLG proposes that, ‘to ensure stability and a consistent evidence base to inform plan-making’, local planning authorities should be able to rely on the evidence used to justify their local housing need for a period of two years from the date on which they submit their plan. But Carpenter comments:

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**Box 1**

**DCLG’s proposed standard formula for housing numbers**

*New approach consists of three components*
*Seeks to reflect market signals*

### Household Projections (the baseline)

- Uplift of 0.25% to projections for every 1% affordability ratio is above 4

### Adjustment for Affordability

- More than 40% above their current Local Plan figure, if that plan is **under five years old**; or
- More than 40% above their Local Plan or projected household growth (whichever is higher), if their plan is **over five years old**;

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6 Source: Based on a slide presented by Steve Quartermain at a Home Builders Federation conference.

7 Based on a slide presented by Steve Quartermain at a Home Builders Federation conference.
‘During the two-year period, the housing need assessment would not be rendered out of date if changes to the household projections or affordability ratios are published while the plan is being examined, the consultation proposes. The government’s proposed formula may be simple, but it appears that for some authorities the decision on whether to progress a plan will be far from straightforward.’

‘It is large-area design that must shape the pattern of our occupation of the land’

So an unintended consequence of this idea may be to delay Local Plan making just as the glacier had started to move because of the need for five years of developable land supply. Such joy for those who don’t want the houses. Such pain for those who are living in appalling conditions, miles from opportunities to work or the support of family or friends.

Our society will be arguing about housing numbers for years. It is the price of a degree of democracy, so get used to it, and provide the resources to get good survey data and the time and space to discuss them. A machine will not come out with a useful answer. But first we need to design large areas of territory for maybe 50 years ahead, to establish the accommodation of the broadly foreseeable extent of sustainable development in attractive places with good future prospects.

The changing assessment of numbers will inform the rate of change, and maybe who can be expected to move around, but it is large-area design that must shape the pattern of our occupation of the land.

That each authority will have to consume its own smoke in terms of housing need, like a type of mediaeval tithe, blind to the long-term design of their area, cannot be reconciled with the promotion of sustainable development, nor with local political realities. The losers will continue to be those in need of a home and a job.

Public consultation on the standard formula (and the other proposals put forward by DCLG in the same document) closes on 9 November. Get busy. People’s lives are at stake, literally.

David Lock CBE is Strategic Planning Adviser at planning and urban design consultancy David Lock Associates, and a Vice-President of the TCPA. He is a Board Member of Ebbsfleet Development Corporation. The views expressed are personal.

Notes
1 See, for example, D Lock: ‘Should development benefits outweigh neighbourhood plans?’. Town & Country Planning, 2017, Vol. 86, Sept., 334-6

2 Baroness Cumberlege of Newick & Another v Secretary of State for Communities and Local Government. Case Number: CO/16/2017. The Baroness and her husband challenged Secretary of State Sajid Javid in court over his decision in November 2016 to grant planning permission for homes on a site in Newark (DCS Number 200-005-811). DCLG did not defend, but DLA Delivery Ltd (a company owned by the writer’s employer) pressed on. Deputy High Court Judge John Howell QC pinpointed a ‘fatal’ inconsistency in Javid’s decision, that just a few weeks earlier he had reached precisely the opposite conclusion when considering an application to build 7 new homes near Ringmer (DCS Number 200-005-570). He said it was vital for DCLG to avoid ‘apparent and unexplained inconsistencies’. See ‘Tory peer wins legal challenge over ‘inconsistent’ homes approval’. Planning Resource, 7 Aug. 2017. www.planningresource.co.uk/article/1441412/tory-peer-wins-legal-challenge-inconsistent-homes-approval?bulletin=planning-daily&utm_medium=EMAIL&utm_campaign=eNews%20Bulletin&utm_source=20170807&utm_content=Planning%20Resource%20Daily%20(53):--www._planningresource.co.uk_art&email_hash= (available to subscribers)

3 Tom Curtin of Curtin & Co, political engagement and community consultation consultants, refers to NIMBYs (not in my back yard), NOTES (not over there either) and – do they really exist? – BANANAs (build absolutely nothing anywhere near anyone)

4 For example, Mr Justice Dove in the High Court heard a challenge to the Canterbury Local Plan, following a challenge (not yet decided at that time) to a planning permission for 4,000 homes at Mountfield Park, Canterbury (for which the writer’s employer was part of the consultant team). The charge in both instances was, in essence, that insufficient regard had been had to the impact on an air quality management area as required by the Environmental Assessment of Plans and Programmes Regulations 2004. The challenge was dismissed on 5 Sept. 2017. Case No: CO/690/2017. Neutral Citation Number: [2017] EWHC 2306 (Admin) Environmental Assessment of Plans and Programmes Regulations 2004


6 Thanks to Steve Quartermain CBE, Chief Planning Adviser at DCLG, for the slide he used at a Home Builders Federation conference in Birmingham on 20 Sept. 2017. His presentation is at www.housebuilder.co.uk/events/hbf-planning-conference-2017/

This Special Issue of *Town & Country Planning* focuses on green infrastructure. ‘Green infrastructure’ is a term that purposely reframes landscape and the natural environment, elevating it to a similar status as other essential infrastructure providing power, water, communications, and transport. Appropriately, this issue follows recent themed editions that have tackled some of the big contemporary challenges for planning – the crises in affordable housing, health, and energy, and the creation of large-scale new places. Green infrastructure has the ability to act as an enabling infrastructure to meet many of these challenges – facilitating greater urban density, improving environmental equity, promoting public health, and capturing carbon – as well as simply making great places in which to live.

While the terminology may be relatively new, there is an established history of good practice. Our towns and cities continue to rely heavily on far-sighted Victorian investment in infrastructure that, alongside roads and railways, drainage and sewerage, gave us some of our greatest municipal parks. Ebenezer Howard’s Garden City principles emphasised the structural importance of boulevards, avenues, parks and gardens as much as the value of productive landscapes, including new forests, pastures, allotments, and fruit farms.

Today, cities across the world continue to harness the power of landscape by investing heavily in green infrastructure. Singapore, for example, is creating new parks and Gardens by the Bay in a bid to become the most sustainable city on the planet. Christchurch, New Zealand, is again using its landscape to strategically restructure a more resilient post-earthquake urban form, while London is starting to explore what is required to establish the first ‘National Park City’ in the world.

Such opportunities are not without considerable challenges. Above money, probably the biggest obstacle is the need for a more holistic approach to planning that creatively integrates rather than compartmentalises green infrastructure with other forms of strategic investment. Capital and revenue funding need to be better joined up so that the cost of...
long-term management is properly addressed at the outset. This problem has only been exacerbated by austerity, as the maintenance of green infrastructure is heavily reliant on increasingly scarce public resources. Alternative and more sustainable financial models are now needed to capture the added value of landscape and share costs more equitably across its beneficiaries.

As Guest Editor, and working alongside the TCPA, we have commissioned articles that describe new research, initiatives and tools to tackle many of these issues. They highlight practice across spatial scales, from multi-regions to counties, cities, neighbourhoods, and individual sites. They explore key themes, including building business cases, reframing public health investment, supporting economic growth, and restructuring landscape management. As a means to identify and then capture value, there are techniques to benchmark quality, calculate the value of ecosystem services, and integrate natural capital accounting into the process of strategic planning. Fundamentally this work is helping move the perception of green infrastructure as a fixed asset and maintenance liability forward. There is now a much more sophisticated understanding of the value of dynamic natural processes that can be measured and harnessed through good planning, design, and management.

Tom Armour and Andrew Tempany from Arup make the case for mainstreaming green infrastructure in the development process, highlighting the need to move beyond simply promoting benefits to presenting green infrastructure as integral to the vital systems that cities need to thrive. Henry Smith describes recent progress with the TCPA-led and EU-funded PERFECT project, which aims to change attitudes to green infrastructure investment across Europe. And Venelina Varbova explains how Interreg Europe is transferring good practice and building better policies for green infrastructure.

Paul Nolan of the Mersey Forest sets out a compelling vision for a great Northern Forest to co-ordinate and align investment with other housing and transport infrastructure. A strategic environmental component of the ‘Northern Powerhouse’, this has the potential to create a multi-regional productive forest, not only providing biomass and future timber but also delivering many wider social and environmental benefits. At the county scale, Robert Lacey sets out how green infrastructure is essential to the Environmental Growth Strategy for Cornwall.

In a piece central to the current debate on public service reform, Ben Williams from the Centre for Sustainable Healthcare argues for the need to embed green infrastructure in the process of maintaining wellness and managing long-term health conditions. Danielle Sinnett and colleagues at University of the West of England set out proposals for establishing a new benchmark for green infrastructure: ‘Building with Nature’ comprises a set of core and thematic standards associated with planning, design and management that can be used to appraise the quality of green infrastructure.

Nick Grayson from Birmingham City Council describes the development of a ‘Natural Capital Planning Tool’ that is being trialled through a recent Natural Environment Research Council Innovation – Green Infrastructure grant. This is being used to quantify natural capital return from development to achieve a net positive gain.

At the borough scale, Jon Sheaff describes the use of natural capital accounting methods to guide and inform the preparation of parks and open space strategies. Sue France, CEO of the social enterprise Green Estate in Sheffield, explains the challenges and opportunities of reconfiguring amenity grasslands into ecologically diverse ‘pictorial’ wildflower meadows. This provides a concluding practical and visually compelling example of the transformative impact that green infrastructure can have at the site level.

It is this ability to transform the character, quality and function of places that is perhaps the greatest attribute that green infrastructure has above all other forms of infrastructure. For me, two projects demonstrate these qualities particularly well.

First, in less than five years the Queen Elizabeth Olympic Park in Stratford turned what was once a neglected and disconnected district into an ecologically rich green oasis. Gone are the polluted waterways, fridge-mountains and scrapyards, replaced by perennial meadows, woodlands and wetlands where in spring you can now delight in the song of reed warblers and buntings, not heard in this part of London for many generations.

Second is the BeltLine in Atlanta, which I feature in a following article. This shows what can be achieved by integrating public transit and green infrastructure into a connected and strategically planned network of open space. Not only has this unlocked the considerable development potential of under-utilised land and buildings, but it has drawn people out to walk, run and cycle across what until recently has been a city that was totally dependent on the car.

These examples, alongside many others featured in this issue, demonstrate the vast potential and value that can be gained from proactively and creatively planning with green infrastructure.

● Peter Neal is a landscape architect and environmental planner. He is an independent consultant specialising in urban parks, the public realm, and green infrastructure frameworks. The views expressed are personal. e: peter@peternealconsulting.co.uk
Tom Armour and Andrew Tempany consider how to better deliver green infrastructure in cities, for health and wellbeing, biodiversity, and climate change resilience.

Green infrastructure has been defined as ‘natural or semi-natural networks of green (soil covered or vegetated) and blue (water covered) spaces and corridors that maintain and enhance ecosystem services’. Much has been written in the last two decades about its benefits and why it is a good thing to have. This movement started many years ago and well before the concept had its current name, whether in the ecological approach to design pioneered by Ian McHarg in his seminal Design with Nature or in the positive approaches to green urban planning put forward by Nan Fairbrother in New Lives, New Landscapes.

Taking these ideas forward, ‘green infrastructure’ can be thought of as a design approach that considers...
the effects and problems of modern development. It promotes a sensibility that accepts the interwoven worlds of the human and the natural, and seeks to more fully and intelligently design human environments in harmony with the conditions of setting, environment, and climate change.

There is a growing array of green infrastructure research, policies and projects that are being developed and delivered, and of work undertaken for the EU that acknowledges the economic, social and environmental benefits of ‘nature-based’ solutions. However, most in the green infrastructure sector would admit that we have not been as successful as we would have liked in terms of rolling out green infrastructure more universally and bringing it into the mainstream of planning, design, and development.

Most indicators show habitats and species continuing to decline at alarming rates; health problems continuing to get worse, especially in our cities and urban areas; and the impact of climate change on the increase, and creating unacceptable and intolerable conditions for many in urban environments – with the consequent economic costs rapidly rising. Green infrastructure is a critical infrastructure for humans and for biodiversity – it is the natural systems that provide essential functions, and it needs to be planned and designed in equal partnership with other city infrastructure (energy, transport, water, waste, and digital). And it needs to be brought into the mainstream, to help build healthier city environments.

This requires a paradigm shift, so that planning for green infrastructure becomes as much second nature as for other forms of city infrastructure – brought about through communication of the lasting and added value that the green infrastructure approach can bring, in terms of both its cross-cutting impact that delivers more on an initial investment than ‘conventional’ infrastructure solutions and its enormous potential to effect positive social change.

Through research we know that the natural world, its biodiversity and constituent ecosystems are critically important to our wellbeing and economic prosperity. We know too that green infrastructure is consistently undervalued in conventional economic analyses and decision-making and in the planning and design of many urban strategies and projects. However, powerful and growing global research in this area is yielding an understanding of the significant social, economic and environmental benefits of green infrastructure in terms of its multi-functional qualities – engendering health and wellbeing for people, supporting biodiversity, and helping to tackle the effects of climate change. It is an essential building block of resilient and adapted cities for the future.

Changing the way we think about green infrastructure is critical to ensuring its greater delivery. Other terms exist, of course – the ‘natural environment’, ‘nature’, ‘ecosystem services’ and ‘natural capital’ to name a few. However, the term ‘green infrastructure’ is perhaps the best one we have to describe what we are all trying to do, and to increase appreciation among decision-makers, politicians and the public of its fundamental role in helping to deliver economic, social and environmental benefits.

The term also implies a precise and engineered approach to design, to respond to specific and identified problems and needs, as the best design always does. So we should talk about our trees, woodlands and wetlands, and our fabricated green spaces (such as green roofs, walls and rain gardens) as functional and useful products that provide essential services that can make people’s quality of life easier, healthier, happier, and more productive and can also provide an effective way of tackling the effects of climate change. It is a way to frame the issue for some of the people we need to convince.

As a society we don’t often dispute the need for investment in better and more efficient utility, transport or digital infrastructure; collectively, we understand its benefits. Perhaps part of the problem with mainstreaming an understanding of the need for
green infrastructure is the ‘fourth dimension’ – the timescales involved and the associated need to overcome short-term thinking among those with decision-making power. Many types of green infrastructure have their greatest impact as they mature over several generations and benefit ever widening and increasing audiences over time. Think of many of the London (and other city) squares, whose great value as urban green lungs and tranquil oases has sometimes been more than two centuries in the making (and what a wonderful legacy this is for progressive city planners to have left!). This makes it all the more important to plan now, whether for new green infrastructure or in succession planning for historic urban green infrastructure, which is often all of a similar age structure – as in a predominantly Georgian city such as London, for example.

Equally important in winning over decision-makers and developers is the fact that green infrastructure need not be difficult or expensive to implement, and can be delivered one step at a time when resources are available – the simplest or smallest-scale interventions, such as a pocket park or parklet or a piece of streetscape green infrastructure, can be as valuable as large green infrastructure projects in building the pieces of a network. Micro green infrastructure can arguably effect some of the most significant change in terms of use of and behaviour towards a space, and in creating clear solutions to an identified problem – for example creating a microclimate or opportunities for urban water management, creating an opportunity to experience a beautiful landscape, or creating community cohesion in high-density urban settings.

A starting point is to change people’s perception of the intangibles of what nature is – and green infrastructure (let’s call it) is not just valuable from an aesthetic point of view, but is essential because of its functional qualities, providing essential services for quality of life and climate change resilience. And this approach is most relevant in our towns and cities, where the majority of us live and work. The beauty and intrinsic value of nature is, of course, an inspiration for most, but maybe talking more about its functional qualities may, for now, prove to be the most persuasive way to bring the benefits of nature into sharper focus.

In terms of shifting the debate there are perhaps two main considerations:

- creating a convincing business case for green infrastructure; and
- presenting green infrastructure as an integral part of the city’s vital systems – as essential as the city’s transport, energy, water, waste and digital infrastructure, and planned and designed with equal prominence alongside these other vital services.

In order to develop a compelling business case for green infrastructure, its multi-functional qualities must come to the fore. We a need to move away from views that its value lies only in its aesthetic appeal – that is a given. To do this it is often helpful to look at green infrastructure in the context of the three pillars of sustainable development – environmental, economic, and social (as set out in Table 1) – which together form one of the ‘golden threads’ that run through all well evidenced spatial planning and investment decisions.

If well integrated into planning and design processes, green infrastructure can contribute many of the answers in our search for sustainable development, helping to fill the gaps and cut across conventional ‘siloed’ approaches, and helping to positively tackle many of the environmental and social problems that governments and decision-makers constantly grapple with. For example, the government’s clean air zone framework essentially focuses on low-emission vehicles and zones, without wider consideration of environmental improvements which can contribute to solutions –

<table>
<thead>
<tr>
<th>Environmental benefits</th>
<th>Social benefits</th>
<th>Economic benefits</th>
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<tbody>
<tr>
<td>Improved visual amenity</td>
<td>Encouragement for physical activity</td>
<td>Increased property prices</td>
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<tr>
<td>Enhanced urban microclimate</td>
<td>Improved childhood development</td>
<td>Increased land values</td>
</tr>
<tr>
<td>Improved air quality</td>
<td>Improved mental health</td>
<td>Faster property sales</td>
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<tr>
<td>Reduced flood risk</td>
<td>Faster hospital recovery rates</td>
<td>Encouragement for inward investment</td>
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<td>Better water quality</td>
<td>Improved workplace productivity</td>
<td>Reduced energy costs</td>
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<td>Improved biodiversity</td>
<td>Increased social cohesion</td>
<td>Improvement to changes through gaining planning permission</td>
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<tr>
<td>Reduced ambient noise</td>
<td>Reduction in crime</td>
<td>Improved tourism</td>
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<tr>
<td>Reduced atmospheric carbon dioxide</td>
<td>Reduction in time taken off work</td>
<td>Lower healthcare costs</td>
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not to mention the wider benefits that urban green space, tree planting and other green infrastructure interventions bring. The resulting daily contact with nature and the associated psychological benefits this brings are largely overlooked.

A common worry about increasing the green infrastructure resource concerns how future maintenance is paid for and carried out. A way to look at this is to consider the essential services, functions and benefits that green infrastructure provides, and the long-term nature of these benefits. In this way the cost of maintaining green infrastructure can be considered as an investment over time, rather than a burden. As a society, it would be unthinkable to not maintain other essential infrastructure such as drainage, traffic and energy systems, so why should green infrastructure be any different, as it too, is providing essential services?

**Summarising key principles**

Although delivery can be achieved in many different ways, there are some underpinning key principles:
- **At its heart, creating healthy places, especially in urban environments, is about better connecting people to the natural environment.** The pressures on space in denser urban environments is such that land for healthy and functional ‘green space’ has to compete with development and ‘grey’ infrastructure. Helping key decision-makers realise that we have to get the balance between competing demands right is a key requirement if we are to improve conditions for people and biodiversity and help to create effective climate change resilience in cities.
- **We need to plan and ‘design in’ our natural environment as a crucial and functional infrastructure component at the start of projects, in the same way that we plan and design our energy, transport, water and waste infrastructure – and see this through to construction.** We need to plan it proactively not reactively, so that green infrastructure is delivered in step with all other forms of city and municipal infrastructure. We need the right designers, too, and, given their diverse skills and training, landscape architects are best placed to lead and deliver green infrastructure planning and design. Effective planning and visioning of green infrastructure is a way forward. Creating a green infrastructure vision or roadmap for a city, district or locality generates a common aim behind which resources and funding can be focused. The plan can then be achieved economically through incremental investment over time, creating long-term social, economic and environmental benefits.
- **All components of the built environment need to ‘work harder’ and support more green infrastructure – open spaces, existing infrastructure, streets, road space, and building interiors, surfaces and roofs.**
- **We need to make more imaginative use of the city space we have, using redundant space and...**

Pilot schemes and temporary green infrastructure projects are a means of initiating wider change

Taking inspiration from New York’s programme of road diets, the #FitzPark pop-up park in London’s Windmill Street – created through partnership working by Arup, Fitzrovia BID, Vestre and the London Borough of Camden – made a street for people with green infrastructure and health at its heart.

Paul Carstairs
obsolete areas to retrofit the natural environment back into cities, as well as more fundamentally include it within new development. There is scope for economical implementation through ‘meanwhile’ and ‘pop-up’ spaces, with full and permanent realisation being achieved later, once the value delivered is widely appreciated (local pressure and support through social media can be invaluable here). Even small-scale improvements and spaces that make healthier and better places for people can have a huge transformative and positive effect.

- Tackling these huge challenges requires more joined-up thinking and integrated working, a longer-term view, and new ways of working in partnership, from strategy through to implementation.

Messages about opportunities and possibilities

Engaging people in the quest for healthier and more resilient urban environments is, of course, vital. The language used on the subject of climate change should perhaps be less about temperature targets and emission values, as many find these concepts distant and difficult to directly relate to. They do not really chime with what green infrastructure and nature can deliver in terms of shade, shelter and protection from the effects of climate change, all alongside better conditions to allow wildlife and nature to thrive to enrich our environments.

Messages about bringing people into daily contact with nature relate directly to the everyday lives of individuals and their friends and families, and are about what makes life worth living. And implementation need not cost a fortune. Healthy environments enable people to enjoy and contribute to the quality of their surroundings, enable them to do things that refresh their spirits, and engender physical and mental wellbeing. Messages, in other words, that appeal to us as citizens of villages, towns, cities and the planet that we know we need to urgently protect.

- Tom Armour is a Director and leader of Global Landscape Architecture at Arup and a Fellow of the Landscape Institute. Andrew Tempany is an Associate at Arup and a Chartered Member of the Landscape Institute. The views expressed are personal.

Notes


All London Green Grid – the strategic planning of green infrastructure can deliver a vision to help focus funding and resources, and also enables incremental implementation to make it deliverable.
making PERFECT sense of green infrastructure

Henry Smith explains how the TCPA-led EU PERFECT project is aiming to help change attitudes to investment in green infrastructure across Europe

The need for high-quality green space in our urban areas is a fundamental element of the TCPA’s ‘Garden City principles’. As urbanisation grows – worldwide – so does the evidence of the benefits to people of access to green space in towns and cities. The multiple social, economic and environmental benefits of green infrastructure\(^1\) are well established. However, there is a problem in translating this evidence into implementation, which requires decision-makers and politicians to be convinced of the need for investment in the delivery and ongoing maintenance of green infrastructure. If our cities are to thrive, we must plan for green infrastructure at the earliest stage.

This is the starting point for the TCPA’s PERFECT (Planning for Environment and Resource eFFiciency in European Cities and Towns) project,\(^2\) a five-year Interreg Europe\(^3\) funded project on securing investment in green infrastructure by making the case for its contribution to economic prosperity. The project builds upon the work of a previous TCPA-led EU project, GRaBS (Green and Blue Space Adaptation...
Attitudes to green infrastructure are clearly changing, but there is much more still to be done on this score. A survey carried out by the partners at the start of the PERFECT project found that, from a sample of 215 staff members and stakeholders across Europe, the highest-rated benefit of green infrastructure was improvements to mental health. This was followed by improvements to physical health, and reductions in overheating in urban areas. Biodiversity benefits were ranked fourth, indicating that the social benefits of green infrastructure are more highly valued than purely environmental benefits.

The respondents to the survey recognised that high-quality green infrastructure can bring economic benefits, but these benefits were ranked the lowest compared with other benefits. The challenge for the PERFECT project is to help change perceptions and help policy-makers to understand how other benefits from green infrastructure can lead to economic prosperity. The key here is to make the connection between benefits in health, climate change adaptation and biodiversity on the one hand, and economic prosperity and the jobs and growth agenda on the other.

PERFECT’s aims and operation

The PERFECT project involves eight partners across seven EU member states. The TCPA, as lead and advisory partner, is responsible for the management of the project and its activities. The other partners are:

- Provincial Government of Styria, Department for Environment and Spatial Planning (Austria);
- Social Ascention of Somogy Development, Communication and Education Nonprofit Ltd (Hungary);
- Municipality of Ferrara (Italy);
- City of Amsterdam (Netherlands);
- Bratislava Karlova Ves Municipality (Slovakia);
- Regional Development Agency of the Ljubljana Urban Region (Slovenia); and
- Cornwall Council (UK).

Each of these seven partners has particular strengths in delivering green infrastructure, from integrating green spaces with cycling strategies in Ferrara, to securing the health benefits of green infrastructure in Amsterdam. The PERFECT project is working to share partner experience and expertise and so build the capacity of staff members in local authorities to bring about change.

The project is driven by learning about policy and implementation – understanding what has worked in certain regions and how this can be replicated. The objective is to transfer some of the best examples across Europe to change opinions about how to improve our urban areas for the better. At a time of resource constraints within local authorities across Europe, this involves making the case for how green infrastructure can meet multiple needs and offer a cost-effective solution to urban problems such as flood risk, overheating, and the costs of poor health resulting from physical inactivity.

‘The project will produce the MAGIC (‘Multi-advantages of green infrastructure in cities’) matrix – a database of good practice to correlate information on the various benefits of green infrastructure and so help partners to highlight its potential to decision-makers’

Previous TCPA-led EU projects have demonstrated the potential of inter-regional learning. The GRaBS project involved transferring the use of the ‘Green Space Factor’ and the associated ‘Green Points System’ from Malmo in Sweden to the London Borough of Sutton and Southampton City Council. These planning tools can be used to increase the greening of the built environment by requiring developers to include a certain level of green space in new development. The Greater London Authority is currently considering taking on the tools to ensure that new development in London enhances the natural environment and maximises its potential, as highlighted in the draft London Environment Strategy.

The PERFECT project facilitates inter-regional learning through a structured approach to creating change within the regions involved. At an individual level, staff members attend workshops, expert presentations and study visits designed to help them understand how to successfully secure investment. External stakeholders – including politicians and private delivery partners – also attend these events and are engaged with by the partner through local events in their partner area. Partners undertake peer-to-peer working to learn from one another in a targeted way, by grouping those partners who are specifically seeking expertise in areas that other partners have.

The partners are all producing a ‘policy instrument’ – a key project output for each of the partners in their targeted area for improvement. For five of the partners this addresses a specific objective relating to the natural environment within their Structural Planning Our Green Infrastructure

for Urban Areas and Eco-towns), which highlighted the multiple benefits of green infrastructure in planning for climate change adaptation.

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Fund operational programmes. For the other partners, the policy instrument will be their spatial plan, with a view to influencing investment through land use decisions.

The partners have completed a baseline survey of their staff and stakeholders to identify how green infrastructure is currently understood and the opinions that are held within various sectors in the partner areas. Each of the partners has also undertaken a literature review of their policies and strategies currently in place, and a gap analysis of the data that they hold and where they need to improve. Leading on from this, partners have undertaken a SWOT (strengths-weaknesses-opportunities-threats) analysis of their partner areas, to better understand what needs to be addressed and which partners they can learn from.

At the partner meeting held in Ljubljana in September, partners discussed how economic arguments can be used to make the case for green infrastructure, supported by an expert presentation by Ece Ozdemiroglu from consultants Eftec and the UK’s Adaptation Sub Committee of the Committee on Climate Change. The partners then participated in a workshop that involved an interactive game designed to help them learn how to engage effectively with cross-departmental stakeholders to make the case for green infrastructure within existing and new developments.

**Next steps**

Using the learning from the project, partners will be producing actions plans that set out how they will influence investment plans to create new or improved green infrastructure. Partners will spend the final two years of the project monitoring the implementation of their action plans. The TCPA, as an advisory partner, is responsible for producing guidance for the partners. Expert papers will be produced on different aspects of green infrastructure and its socio-economic benefits – with the first paper currently being prepared on health benefits. Factsheets on various topics will be published to help convince policy-makers to invest in green infrastructure, along with guidance on the development of green infrastructure partnerships drawing on the TCPA’s experience of managing the Green Infrastructure Partnership.

The project will also produce the MAGIC (‘Multi-advantages of green infrastructure in cities’) matrix – a database of good practice to correlate information on the various benefits of green infrastructure and so help partners to highlight its potential to decision-makers. This will be based on the themes established by the European Commission, covering the environmental, social, climate change adaptation and biodiversity benefits of green infrastructure.

As the UK establishes its new, post-Brexit relationship with the EU, the need to share solutions and good practice will remain strong. The PERFECT project will run until 2021, with an ambitious programme of work planned over that period to improve investment across Europe in high-quality green infrastructure. At the early stages of the project, it is clear that green infrastructure is valued highly for its social and environmental potential, but its economic role is yet to be fully realised. The PERFECT project aims to help change this by disseminating learning on new approaches to assessing and promoting the economic benefits of green infrastructure, and so make it easier to secure high-quality green places for future generations.

*Henry Smith* is Projects and Policy Manager at the TCPA. The views expressed are personal.

**Notes**

1 Defined by the European Commission as ‘a strategically planned network of natural and semi-natural areas with other environmental features designed and managed to deliver a wide range of ecosystem services such as water purification, air quality, space for recreation and climate mitigation and adaptation’ – in ‘The forms and functions of green infrastructure’. Webpage. European Commission. [http://ec.europa.eu/environment/nature/ecosystems/benefits/index_en.htm](http://ec.europa.eu/environment/nature/ecosystems/benefits/index_en.htm)

2 Further information on the PERFECT project and its activities is available from the PERFECT project website, at [www.interregeurope.eu/perfect](http://www.interregeurope.eu/perfect), or by following #perfect_eu

3 See the Interreg Europe website, at [www.interregeurope.eu/](http://www.interregeurope.eu/)

4 Material from the GRaBS project is available from the ‘Green infrastructure for climate change adaptation’ page of the TCPA website, at [www.tcpa.org.uk/green-infrastructure-adaptation-in-europe](http://www.tcpa.org.uk/green-infrastructure-adaptation-in-europe)


8 See the Green Infrastructure Partnership website, at [www.tcpa.org.uk/pages/category/green-infrastructure-partnership](http://www.tcpa.org.uk/pages/category/green-infrastructure-partnership)

why a new northern forest is worth the investment

A new great, multi-regional ‘Northern Forest’ could not only provide biomass and future timber but also deliver many wider social and environmental benefits, while helping to co-ordinate and align investment in other housing and transport infrastructure, as Paul Nolan explains.

Fig. 1 The Northern Forest’s spine of five community forests, shown together with regional transport infrastructure

Over the next 25 years £75 billion worth of investment in housing and transport infrastructure is planned across the M62 corridor from Liverpool to Hull. New investment in cities and strategic investment areas such as Atlantic Gateway, connecting Liverpool and Manchester, is already under way. The new super-port in Liverpool is transforming both logistics and the wider landscape across the Liverpool city region. There are already 13 million people living in the project area. Around 650,000 new homes are projected to be built, and the population is due to rise by 9% over the next 20 years. Currently, over 1 million companies create 18% of England’s GDP in the area.

New governance, with city regions and two metro mayors in place, offers significant potential to change...
the way in which investment decisions are made across this diverse geography. For example, new planning frameworks are being developed that will set the agenda for strategic investment at the city region level. The government’s recent consultation on its Industrial Strategy called for integrated infrastructure investment, including green infrastructure, to secure increases in natural capital.

Currently there is no single plan or strategy in place for the natural environment that could sit alongside and complement the emerging plans for ports, roads, rail, airports and housing development and population growth at this multi-region scale. The Natural Capital Committee and the National Ecosystem Assessment (NEA) both called for significant new woodland planting to deliver a range of ecosystem services and an increase in natural capital in and around our towns and cities. Woodland cover across the M62 corridor is just 7.6% of the total area, well below the UK average of 13%.

In response, the community forests in the North of England have come together with the Woodland Trust to put forward a vision to secure significant green infrastructure and natural capital gains through the creation of a new Northern Forest. The plan for the Northern Forest is still evolving. It is being developed and promoted as a strategic environmental response to the ‘Northern Powerhouse’, or any future strategic, long-term programmes for the North of England.

A central component of the vision is to plant 50 million new trees over the next 25 years, creating a productive forest across the Northern Powerhouse area that will not only provide biomass and future timber, but will also help to deliver wider social and environmental benefits to improve the population’s health, reduce flood risk, tackle poor air quality, improve water quality, provide opportunities for recreation, tourism and leisure, and create attractive places in which to live, work and invest.

A target of 50 million trees equates to a trebling of the rate of planting in the area over the past 25 years, since the community forests were established. The scale of anticipated change in planning, infrastructure, resources, land management, demographics and climate also points to the target and the principle as being proportionate. It is not an overly ambitious response to the challenges ahead – it is an achievable target, with specific beneficial outcomes identified and evaluated.

Initial estimates put the cost of the Northern Forest at around £500 million, an average of £20 million per year over the next 25 years. The projected economic value is over £2.2 billion, with wider economic benefits, such as improvements to health and wellbeing, estimated at over £2.5 billion. Clearly, a key challenge will be how the Northern Forest will be funded and delivered.

**England’s community forests**

For the past 25 years England’s community forests have been delivering new woodland in and around some of the country’s major towns and cities. The English community forest programme emerged from a growing urban forestry movement in the late 1980s, and from the desire of government agencies to create urban fringe forests for recreation. In the wake of recession in the 1980s, a primary aim for the programme was the restoration and renewal of degraded urban fringe landscapes and increased access for urban populations to local green space, particularly in areas of limited quality and provision.

The 12 original community forests collectively shared four objectives:

- Economic regeneration (improving the image of areas);
- Economic development (employment and rural diversification);
- Social welfare (through education, health and recreation opportunities); and
- Environmental improvements (remediating derelict land, creating new habitat, and tackling climate change).

Collectively, over the past three decades the community forests have seen the planting of more than 14 million trees. More recently, stronger links into national planning policy have been established, providing a mechanism to work with and within Local Plans to deliver each forest plan. There is clear potential for a major step forward by extending such links into the Northern Forest. A review of the forests’ interaction with the planning system carried out in 2013 highlighted where individual forests were embedded within planning policy locally and identified key issues to be tackled if greater engagement with the planning system was to be achieved.

Together, the Woodland Trust and the community forests across the North of England are developing a plan for a Northern Forest. A spine of five community forests across the M62 corridor provide continuity of approach at a landscape scale from Liverpool and Chester to Hull (see Fig. 1):

- The Mersey Forest;
- City of Trees;
- White Rose Forest;
- South Yorkshire Forest; and
- HEYwoods.

**We are not planting enough new woodland**

At a time when there is increasing evidence for the importance of trees and woodland in providing a wide range of socio-economic and environmental benefits, tree-planting rates now stand at an all-time low in England. In 2017, 1,100 hectares were planted, compared with an official target of 5,000 hectares. It is likely that England is now deforesting, after decades of growth in woodland cover.
It is difficult to arrive at a definitive figure for net woodland cover, partly because of the way in which cycles of woodland management work. For example, areas that are felled can sometimes be left bare for several years before being replanted. However, a key issue is that there is no nationally collected data on loss of woodland for development or on areas that have been felled and never replanted.

Our urban forests and woodlands and individual trees in the heart of our towns and cities are also being lost. Cuts to local authority spending on non-statutory services and a reluctance to adopt new trees when they are planted by developers, together with an ageing urban tree population, means that in many areas we are losing more trees than we are planting. Again, this is in spite of growing evidence of the benefits of urban trees alongside wider green infrastructure investment, and despite the significant progress that had been made in planting new woodland and new trees in the last few decades.7

In 2015 the Natural Capital Committee argued that England needs an additional 250,000 hectares of woodland to be planted around its towns and cities – 625 million new trees. “Woodland planting of up to 250,000 additional hectares. Located near towns and cities, such areas can generate net societal benefits in excess of £500 million per annum.8

Furthermore, leaving the European Union creates a huge amount of uncertainty about how agricultural and forestry support might be delivered. There will undoubtedly be changes in priorities and levels of support, although it is extremely difficult at this stage to assess what they might be. This uncertainty strengthens the case for the Northern Forest, as it provides a strategic framework that could contribute to developing a programme for forestry for the future and could help a wide range of landowners to deliver public benefits. For example, it could provide a way to deliver payments for ecosystem services, which, while having a strong logic and evidence base, has been particularly challenging to achieve at scale in practice.

Planning for the Northern Forest

Two scenarios have been developed for the creation of the new Northern Forest. The first has been labelled ‘Nature@work’, as a direct reference to the UK NEA ‘Nature@Work’ scenario.9 This scenario is based on the belief that there is wide acceptance of the argument that the promotion of ecosystem services through the creation of multi-functional landscapes is essential for maintaining the quality of life in the UK. In the economic assessment of six possible NEA scenarios it was ranked first in terms of total economic value.

In developing this scenario those of us working on the plan to create the Northern Forest followed a very similar methodology to the one that has been used by the Mersey Forest for many green infrastructure plans, and in strategies such as the Liverpool City Region Green Infrastructure Framework and the Telford Green Infrastructure Framework document. The approach can be broken down as follows:

- **Identifying key issues:** Rather than starting with a focus on the forests and trees, we began with an assessment of the issues for which there is evidence that green infrastructure can make a positive impact. For example, such issues include:
  - reducing flood risk;
  - helping to adapt to and mitigate risks from projected climate change;
  - improving health and wellbeing;
  - increasing opportunities for access and recreation;
  - improving the quality of place; and
  - enabling increases to biodiversity and providing ecological networks.

- **Assessing policy:** Does existing policy support a green infrastructure approach and so support the delivery of the Northern Forest? Local, regional and national policy was assessed to address this question. Overall, we found that the policy framework is positive if the various terms and definitions used to describe environmental improvement are translated into common language. For example, we took any reference to green infrastructure, natural capital, ecosystem services, biodiversity, landscape quality, natural environment, and even nature-based solutions to be supportive of our proposals for a Northern Forest.

- **Gathering evidence:** We gathered evidence that a Northern Forest could help to tackle some of the key issues identified, supported by policy. This helped to develop a more robust case for investment in Northern Forest, and provided robust evidence that a Northern Forest will help us both to target interventions more tightly.

- **Identifying areas where planting should not take place – ever!** Using data on Sites of Special Scientific Interest (SSSIs), Special Protection Areas (SPAs) and other national and international protections, regulations and designations, we identified areas where tree planting would not be appropriate. We also omitted any area more than 400 metres above sea level, as this we considered to be our tree line.

- **Mapping areas of need:** We can identify broad areas of intervention to create a Northern Forest, in both urban and rural areas across the M62 corridor. To do this we have used GIS to map areas of, for example, flood risk. By combining a number of layers of need, and where appropriate adding specific locations for strategic investment based on policy and strategy documents, we can develop a Northern Forest strategy map.

Landscape character was also an important consideration in developing plans for the Northern Forest. Using the National Character Area (NCA)
mapping resource\textsuperscript{10} we evaluated the landscape capacity for new woodland and tree cover in each of the 55 NCA areas across the Northern Forest (see Fig. 2). Using the Forestry Commission’s national woodland inventory\textsuperscript{11} and Bluesky\textsuperscript{12} National Tree Map data which provide the most up-to-date, high-resolution aerial imaging for the UK on individual tree canopy cover, we were able to identify the existing percentage woodland cover in each NCA – and from this the capacity within each NCA for additional planting.

This long process of data analysis resulted in a target map for the first ‘Nature@work’ scenario for the Northern Forest (see Fig. 3).

Of particular interest in this scenario is the impact on reducing flood risk from increasing woodland cover in key catchment basins or areas of less than 100 square kilometres that are upstream of communities at risk (see Fig. 4). Detailed assessments of these catchments identified over 190,000 homes downstream of catchments where forest planting could play a valuable role in natural flood management. Reducing flood risk by as little as 1% in these catchments could cut costs associated with flooding by £60 million annually.\textsuperscript{13}

Delivering a better quality of life is another central aim of the Northern Forest mission. Planting plans will specifically target areas where trees and woodlands can have a direct impact on health and wellbeing. By facilitating improved air quality and increased physical activity, and through social prescribing and other mechanisms, the Northern Forest will develop specific interventions that target chronic health conditions. The Northern Forest research base has now amassed significant amounts of evidence showing that, for air quality in particular, street trees could make a major difference to the troubling levels of childhood asthma and respiratory disease\textsuperscript{14} found across the North of England.

In setting out plans for the Northern Forest, the community forests and the Woodland Trust have also established specific ways that the project can provide a boost for biodiversity and natural capital. Increases in woodland cover will reduce habitat fragmentation, improve the management of existing woodland areas, and help to link into the wider landscape to provide both space and networks for nature to thrive (see Fig. 5). In placing ancient and semi-natural woodlands and heritage trees at its heart, the Northern Forest will enhance and extend the existing ecological network as it develops.

‘Condatis’\textsuperscript{15} is a relatively new assessment tool that has been used to help to identify ecological network bottlenecks and show where the Northern Forest can help to reconnect existing woodlands.

A second scenario, which looked at how the Northern Forest might respond to a UK policy need to rapidly increase the sequestration of carbon, was...
also considered – the ‘Dash for carbon’ scenario, in which the criteria used for spatial targeting were very different from those used in the ‘Nature@work’ scenario.

In the ‘Dash for carbon’ scenario, lower-value land with potential for the planting of fast-growing species across large areas was established as the principal driver. The resulting map (see Fig. 6) is very different from that for ‘Nature@work’. The focus moves away from people, towns and cities, and the Northern Forest becomes a rural programme – in the main. Landscape capacity, again using National Character Area mapping, was also used to develop this strategy. Even with this dramatic focus on rural areas, the landscape character of the Northern Forest is sustained.

**Which trees?**

The forester’s and arboriculturalist’s response to the question ‘Which trees will be planted?’ is likely to be ‘the right tree in the right place’. While this has to be a guiding principle, it may also dodge the question.

The Northern Forest should be a productive forest; a mix of native and non-native broadleaves, and a mix of high-yield coniferous species, well planned and managed to produce a flexible array of products and services. Biodiversity increase and sound ecological principles can underpin the delivery of the forest. The Northern Forest can supply the wood processing industry as well as deliver all the services that have been identified in, for example, the ‘Nature@work’ scenario.

At a local level, there will always be debate about what types of trees ought to be planted where and for what purpose. Using tools such as the Forestry Commission’s Ecological Site Classification Decision Support System (ESC-DSS), we can make good choices about which trees to plant – choices that take into account projected climate change.  

The UK Forestry Standard provides the framework for new woodland planting and ensures that species choice, woodland design, delivery and management, as well community engagement, all contribute to sustainable forest management.

Our work to date sets out a high-level strategy. A transparent and inclusive approach to local delivery is a core value for community forests and the Woodland Trust, and we see that as forming a critical element of the delivery of the Northern Forest.

**Making it happen**

The £500 million price tag that has been estimated for delivering the Northern Forest poses a significant challenge, but with a benefit-cost ratio of 5:1 it compares favorably with the 2.3:1 calculated for HS2, for example.
A mix of traditional and new funding mechanisms and resources will be required. It will also be important to sustain the skills and knowledge that exist within the Woodland Trust and the community forests to develop, manage and deliver projects and programmes.

Arrangements for land use support, forestry and sustaining or enhancing natural capital will be crucial for the success or otherwise of the Northern Forest. An estimated £15 million per annum is currently spent from EU pillar I and pillar II agri-environment funding payments across the Northern Forest area – a significant amount of this is on agri-environment schemes under pillar II, with pillar I basic payments also including ‘greening’ measures. Can the Northern Forest act as a long-term plan to help shape the new arrangements for natural capital spending in these areas when the UK leaves the EU?

Aligning the Northern Forest with planned investment in housing and transport infrastructure
can also play an important role. A 0.5% investment in natural capital, as part of the £75 billion of planned investment in built infrastructure, has the potential to secure 70% of the funding required – and the approach is supported by the National Planning Policy Framework (NPPF).

New funding for forestry schemes that have a focus on locking up carbon (carbon sequestration) has already been launched by the Forestry Commission. These targeted programmes may continue and develop if, as seems likely, there is concern that the national targets for carbon reduction will not be met.

New mechanisms and ideas are also being explored to bring in new long-term funding to help deliver the Northern Forest. Ideas and mechanisms for ‘natural capital bonds’ and even ‘natural capital investment zones’ are being investigated.

We have also considered the technological changes that are taking place or which are likely to take place in the future. The use of drone technology to appraise land, plant and maintain trees, and even monitor and measure natural capital is within reach. A commitment to a long-term plan to create a new Northern Forest would enable investment in development to help test and pilot this technology.

There is an array of new biomass installations that are already on stream or in development across the M62 corridor. Collectively, these have an annual requirement for 7 million-10 million tonnes of biomass, generating around 10% of the UK’s energy. A Northern Forest could make a significant local contribution to the supply of these installations in the transition to 100% zero-carbon energy, creating new jobs and supporting long-term sustainable forest management. The aim for the Northern Forest will be to have all woodlands in some form of active management, including management for biodiversity increases and make use of the principles of ‘more, bigger, better and joined’ habitats laid out in the Lawton Report.

The transition to autonomous-drive vehicles over the next 15 years may also have profound implications for our road transport network. Recent work undertaken by WSP and Farrells shows how the transport network might be transformed to include more green infrastructure, creating areas for wildlife, water management, and a much improved aesthetic. Plans for the Northern Forest can play a role in helping to shape and deliver the changes to the transport network over the next few decades.

At the heart of the delivery of the Northern Forest has to be the community forest principle of working with local communities and creating high-value places that people will cherish; places that can become attractors for people to live and work, that support rich biodiversity, and that provide the natural
capital to enable sustainable growth to start to be a possibility. While technology, economies and social norms will all change over the next 25 years, as a species we continue to have an innate need for a good-quality natural environment – Northern Forest: it’s in our genes!

Paul Nolan is Director of the Mersey Forest Team. The views expressed are personal.

Notes

1 See the government’s Industrial Strategy webpage, at www.gov.uk/government/policies/industrial-strategy

2 Economic valuation has been carried out as part of the Northern Forest evidence and scoping work which will be published later in 2017


12 See Bluesky’s National Tree Map website, at www.bluesky-world.com/ntm?id=78

13 This calculation will be included in the published version of the Northern Forest evidence and scoping document


15 See the Condatis website, at http://wordpress.condatis.org.uk/

16 See the Forestry Commission’s Ecological Site Classification Decision Support System (ESC-DSS) webpages at www.forestry.gov.uk/esc


20 Details of the Forestry Commission’s ‘Project Carbon Sequestration’ are given within the Forestry Commission’s ‘Standard and guidance’ webpages, at www.forestry.gov.uk/forestry/infd-8jue9t


the adult health and social care crisis – green infrastructure as part of the solution

Rather than regarding green infrastructure as a burden on hard-pressed public finances, we should embrace it as an important part of an approach to sustainable healthcare, says Ben Williams

Linking green space to health outcomes is not a new idea, but it is one which is gaining renewed prominence as pressure on public services continues to mount and the imperative to ‘do more with less’ drives all but the most hard-line of traditionalists to think creatively about how they can deliver multiple benefits through service delivery.

Even without the bottom-line reductions in public sector spending, the increased cost of supporting an ageing population means that everything else is taking a de facto reduction. In 2016, dementia overtook coronary heart disease as the leading cause of death in the UK. The ‘graph of doom’ (see Fig. 1), originally articulated by the London Borough of Barnet, is something that has been facing local authorities with increasing severity since the onset of austerity, and it is approaching the critical point.

The House of Commons’ Communities and Local Government Committee Public Parks report, published January 2017, clearly recommends that: ‘[Local Authorities] should work collaboratively with Health and Wellbeing Boards, and other relevant bodies where appropriate, to prepare and publish joint parks and green space strategies.’

It doesn’t leap off the page, but the implications of this are huge in terms of driving localities towards a more integrated approach to planning for green infrastructure and health. Also significant within this debate is the rise of social prescription that links patients with wider support networks in the community. This provides an increasingly well recognised referral route through which green infrastructure benefits to health can be achieved.

In many areas green infrastructure is at the forefront of the debate on public service reform. Parks and open spaces services are perennially the first against the wall when another round of budget cuts is being proposed, and yet the evidence base for the positive impact of access to green space on health has never been stronger. The really critical long-term, quality-of-life-limiting conditions which lie
at the heart of much of the pressure on adult health and social care all have potential mitigations rooted in better access to and more regular use of green space.

The wider determinants of wellbeing and liveability and the effects of contact with nature are well documented. The ‘five ways to wellbeing’ – connect, be active, take notice, keep learning, and give – are all promoted through outdoor activities. The Health Foundation identifies ‘our surroundings’ as one of eight factors, outside of health care, that influence people’s opportunity to live a healthy life.

Initiatives such as the Conservation Volunteers’ Green Gym, Groundwork’s Target: Wellbeing, and Mind’s Ecominds have been quietly and effectively delivering health outcomes through green infrastructure for years. However, these interventions have consistently existed in the margins of service delivery, typically small scale, short term, and resourced through discretionary or external funding. Examples of green infrastructure interventions successfully penetrating into the heart of service provision are few and far between.

The green space sector now finds itself at a tipping point. Over the short to medium term, we will either see a paradigm shift in which green infrastructure becomes embedded in the process of maintaining wellness and managing long-term conditions, or we will continue with a biomedical approach to health and illness, and green infrastructure will continue to exist in the backwaters of public service delivery.

Aside from anything else, the challenge is a philosophical one. Do we continue to regard green infrastructure as part of the burden on public finances, or do we choose to embrace it as part of the solution?

If we are to achieve this paradigm shift, we need action in four key areas:

- access to green infrastructure;
- understanding what works where;
- investing in skills and capacity; and
- the will to change.

Access to green infrastructure

It goes without saying that in order to achieve health outcomes through green infrastructure, people need good access to good-quality green infrastructure. Effective planning and delivery of green infrastructure at all levels is vital if it is to be effective in delivering health outcomes – at the extreme local level, such as enabling people to see green from their office window or hospital bed; at median levels, such as enabling people to take five minutes in a green space to stretch their legs and refresh their heads; or to take regular exercise in a green space; and at the spatial level, creating localities and networks that are social, connected, walkable and bikeable, and where parks and countryside are accessible and attractive to all.

And in achieving this we will need planning policies that recognise, articulate and are prepared to defend the value of green infrastructure in all plans and developments, and which include clear standards for quality, quantity and accessibility that were lost with the revocation of Planning Policy Guidance 17 (PPG17): Planning for Open Space, Sport and Recreation and are now less explicit within the National Planning Policy Framework. The pressure on the UK to achieve housing targets is immense. Failure to plan, design and deliver healthy and sustainable communities that...
Experiencing nature

Interacting with nature

Understanding what works where

The evidence base for green infrastructure and health is challenged from all angles by clinicians and commissioners seeking cast-iron evidence of specific impacts on specific conditions. The bare fact is that the evidence for green infrastructure health interventions is not, and most likely never will be, at the standards expected by NICE (the National Institute for Health and Clinical Excellence) and many mainstream health commissioners.

Green infrastructure interventions are typically effective in complex, long-term, systemic conditions, and in areas where conventional medicine either has not been effective or is not an option that the patient wishes to take up. In these circumstances, delivering randomised control trials and longitudinal studies is simply not feasible, particularly considering the spartan resources typically associated with green infrastructure interventions. Rather than repeat this cycle ad infinitum, the debate on the health-giving aspects of green infrastructure needs to be reframed.

Everyone knows that smoking causes cancer, but definitively stating that an individual has cancer because they smoked is a much trickier proposition. In similar fashion, everyone will admit that engaging with green space is good for people’s health; but tying a positive progression in an individual specifically to a green infrastructure intervention is the tricky bit.

One methodology, developed by Care Farming UK, articulates both the depth of interaction with nature and the health outcomes sought. This provides a very useful ready reckoner to guide both service providers in shaping provision and planners in assessing what functionality within green infrastructure would have the best likelihood of supporting a given health outcome.

Being clear about the type of health outcome that is being sought – day-to-day, active promotion of health and a positive lifestyle, or a treatment option for a specific condition – is one prerequisite. The other is what type of connection with nature is desired (or possible). Ambient exposure to nature carries its own benefits, but there are also specific interventions that use an active connection to nature to achieve their desired outcome. This approach is well illustrated in Natural...
England’s publication Good Practice in Social Prescription for Mental Health – the Role of Nature-Based Interventions.

Initiatives such as Dan Bloomfield’s A Dose of Nature project both articulate the benefits of contact with nature for specific conditions and outline local partnerships and commissioning structures which enable these interventions to be commissioned at scale within a locality. The University of Sheffield’s Improving Wellbeing through Urban Nature research project, in which the Centre for Sustainable Healthcare is a partner, is seeking to go a step further, investigating what levels of contact, with what types of green infrastructure, are most effective at delivering benefit to mental health.

As the evidence base achieves greater granularity and detail, so the case for commissioning green infrastructure interventions for specific health outcomes grows.

Investing in skills and capacity

Providing good-quality and accessible green infrastructure is a vital part of the jigsaw, but helping people to realise its potential is equally, if not more, important. We know that simple exposure to nature delivers an ambient benefit to wellbeing. Cleaner air, light exercise and the sense of detachment that accompanies a visit to a green space all impact positively on wellbeing. A conventional talking therapy session is likely to have a more positive impact if held in a green space rather than in a consulting room. However, the long-term therapeutic outcomes of green infrastructure interventions require a much more structured and systemic contact with nature, which in turn requires a specialist set of skills and experience to achieve.

Forestry Commission Scotland uses its forests to deliver ten-week programmes helping people with early-stage dementia to build social networks and coping strategies. Professional therapeutic provision organisation eOE OUTDOORS delivers outdoor therapeutic interventions supporting the education of children with special educational needs and disabilities. Outdoor activities are increasingly recognised as a vital part of caring for older people.

And this thinking is beginning to penetrate into the mainstream. In Cheshire, the Mersey Forest is leading a programme of ‘health rangers’ developed as part of its Natural Health Service programme. Oldham Council has invested in ‘forest school leader’ training for staff in its parks department to build their capacity to deliver health outcomes alongside their core parks service. Both of these initiatives are positive responses to the ‘graph of doom’, adapting core services to address the health and social care pressure.

Currently there is no ‘core’ accredited, outdoor therapy training structure, and delivering this will be a pivotal step forward for the sector.

The will to change

The killer question in all of this is: does society have the will and vision to make this change?

A huge proportion of our society remains wedded to a biomedical model of healthcare – a pill for every ill. The number of hospital beds is a key performance indicator in the public consciousness. Public health or preventative interventions are frequently cast in the light of ‘for this money we could have x more nurses on wards’.

There is a natural tendency in commissioners, facing increased pressure on their resources through spending cuts and demographic change, to prioritise the tried and tested rather than invest in innovation. Without clear alternatives, clinicians will take the best decision on the options available to them. However, there is an often underestimated patient-led dimension as well. People want pills and potions. They have faith in the status quo, and in the absence of a concerted drive for widespread behavioural change they will continue to prioritise conventional clinical solutions.

Societal change takes time, but there are opportunities for increasing the scale of green infrastructure provision for health in the shorter term, and this is an area in which planners and designers of green infrastructure are well placed to respond. An outline understanding of local joint strategic needs assessments will give headline information on the key health priorities within a locality, and then cross-referencing this with resources such as the NHS Forest project’s evidence section, the Rethinking Parks project, or the Green Infrastructure Partnership’s Resource Library can readily stimulate ideas and debate within localities on where green infrastructure can support local health priorities, and on how to begin approaching this practically.

Precedents and pioneers are beginning to build up, with new models of green infrastructure management and delivery emerging in outposts across the UK. The Land Trust and the increasing numbers of parks trusts and other intermediary bodies able to finance and manage green infrastructure in ways not historically possible are driving innovation within the sector, and are crucially doing so in a way that de-risks the wider public sector during this crucial phase of development.

Coupled with this is the inexorable rise of social prescription – direct referral of patients to community-based activities as an integral part of their care package – as a mainstream option for the management and treatment of complex conditions; and within this, in hushed tones, the term ‘green prescription’ is beginning to be heard. Models and
...pathways through which commissioners and patients are connected to green infrastructure interventions are beginning to come to light, and in this way the cultural and organisational barriers to this pathway can be identified and tackled.\textsuperscript{10,11}

Accepting all this, however, there is no substitute for vision and political leadership. If we look north, NHS Scotland is working with Forestry Commission Scotland and Scottish Natural Heritage to create NHS Greenspace – ‘to promote better health and quality of life for people in Scotland through greater use of the outdoors for physical activity and contact with nature’.\textsuperscript{22} As recently as September 2017, the Scottish Government published \textit{A Nation With Ambition},\textsuperscript{23} outlining its programme for 2017-18, embedded within which is a hard core of policy objectives that promote the link between green infrastructure and health.\textsuperscript{24} In Wales, the Well-being of Future Generations Act\textsuperscript{25} requires each authority to ‘improve the economic, social, environmental and cultural well-being of its area by working to achieve the well-being goals’ – a similarly powerful political statement. In England, the NHS and local councils’ sustainability and transformation plans have wholly missed the boat on green infrastructure.

But in the meantime if we can collectively begin to reposition the narrative of green infrastructure away from being part of the burden on the graph of doom, to part of the solution, that would be a mighty big step in the right direction.

\textbf{Ben Williams} is with the NHS Forest and Green Space team at the Centre for Sustainable Healthcare in Oxford. The views expressed are personal.

\textbf{Notes}
7  See Groundwork\textquotesingle s Target Wellbeing website, at www.groundwork.org.uk/Sites/targetwellbeing
8  See Mind\textquotesingle s ‘Ecominds’ webpage, at www.mind.org.uk/ecominds
11  See the A Dose of Nature project website, at www.adoseofnature.net/
12  See the Improving Wellbeing through Urban Nature (IWUN) research project website, at http://iwun.uk/
13  See Forestry Commission Scotland\textquotesingle s ‘Forests and dementia’ webpage, at http://scotland.forestry.gov.uk/supporting/strategy-policy-guidance/health-strategy/forests-and-dementia
14  See the eQe OUTDOORS website, at www.eqeoutdoors.com/
15  See the Mersey Forest\textquotesingle s ‘Cheshire Natural Health Service’ webpage, at www.merseyforest.org.uk/our-work/cheshire-natural-health-service/
17  See the Centre for Sustainable Health\textquotesingle s NHS Forest project\textquotesingle s ‘Evidence’ webpage, at http://nhsforest.org.uk/evidence
18  See Nesta\textquotesingle s ‘Rethinking Parks’ project webpage, at www.nesta.org.uk/project/rethinking-parks
19  The Green Infrastructure Partnership\textquotesingle s Green Infrastructure Resource Library is available at www.tcpa.org.uk/green-infrastructure-research-database
20  The Land Trust\textquotesingle s website is at http://thelandtrust.org.uk/
21  See the ‘What is social prescribing?’ webpage of the King\textquotesingle s Fund\textquotesingle s website, at www.kingsfund.org.uk/publications/social-prescribing
22  See NHS Health Scotland\textquotesingle s ‘NHS Greenspace Demonstration Project’ webpage, at www.healthscotland.com/topics/settings/nhsgreenspace/index.aspx
Planning Our Green Infrastructure

improving policies through inter-regional co-operation – green infrastructure and beyond

Promotion of the role of green infrastructure is one of the objectives supported by Interreg Europe through its co-operation projects aimed at transferring good practices to build better policies and through its Policy Learning Platform, which any public authority can contact for tailor-made policy support, as Venelina Varbova explains.

Interreg Europe supports regional and local governments from 30 countries across Europe in their efforts to design and implement better policies for their environment, economy and citizens. The programme is financed through the European Regional Development Fund (ERDF) and provides co-financing for inter-regional co-operation projects that bring together national, regional and local organisations from the EU, Switzerland, and Norway. In doing so, it aims to reinforce the effectiveness of EU cohesion policy in reducing inequalities among regions in Europe and in encouraging job creation, competitiveness and investment.

The aim is to encourage learning by exchanging solutions with peers across Europe who face similar difficulties. Each project is focused on a specific shared challenge that is faced by each of the partner regions.

Through co-operation and exchange over a three-to-five-year period, policy-makers identify and transfer good practices and ideas about the way that public policies work, and through doing so find ways to improve their own policies. By doing this, regions maximise the impact of investment on the ground and, ultimately, contribute to EU strategic objectives related to growth and jobs.

As a thematic programme, Interreg Europe supports action in four policy areas:
- research and innovation;
- the competitiveness of small and medium-sized enterprises (SMEs);
- a shift towards a low-carbon economy; and
- environment and resource efficiency.

The environment and resource efficiency area includes the role of green infrastructure, and is the focus of this article.

Inter-regional co-operation for better environment and resource efficiency

Given the large number of initiatives in place all around Europe to support better environmental protection of the natural and cultural heritage and the transition to a resource-efficient economy, what is the added value of Interreg Europe? The answer lies in the programme’s focus on policy learning and policy improvement. By helping regions channel proven and well evidenced good practices into their policies, the intended result is more effective decision-making and investments for Europe’s economy and environment. Since the launch of the programme in 2014, 26 projects addressing environment and
resource efficiency have been approved, and more are expected to be approved soon. In spring 2018, the first wave of projects will reach the end of phase one – the period dedicated to the exchange of experience among partners. With the input of relevant stakeholders, each region will produce an action plan designed to channel the lessons learned into their mainstream regional policies. By closely monitoring action plan implementation over the following two-year period, each project should deliver measurable and lasting change on the ground.

So far, regions have identified dozens of solutions spanning the range of topics within the environment and resource efficiency area. These include practices on how to explore sustainable exploitation models for natural and cultural heritage assets, how to develop and integrate green infrastructure, and how to encourage SMEs and citizens to change their habits in favour of better disposal of waste and recycling.

Green infrastructure is an emerging concept in many European regions, where new ways to improve biodiversity conservation and ecosystem protection are combined with other land use objectives. The TCPA-led PERFECT project is currently the only Interreg Europe project directed at this theme, with a focus on the multiple benefits of green infrastructure.

As the projects have progressed, it has become clear that there is a need for greater knowledge on how to improve regional policies to better protect ecosystems and vulnerable landscapes, and on how to use resources more efficiently. Sharing information is also essential for a better understanding of ecosystems and ecosystem services, as gaps in knowledge hamper cities’ and regions’ ability to look beyond nature’s intrinsic values and recognise biodiversity as an asset in a wider regional economic and social context. Interreg Europe project partners identify good practices and share their ways of working – methodologies, approaches, and tools – with each other.

The Interreg Europe Policy Learning Platform

In order to help more regions and public authorities, and further disseminate the knowledge accumulated within the projects, Interreg Europe has developed the Policy Learning Platform. Erwin Siweris, Director of Interreg Europe, explained the thinking behind the Policy Learning Platform at its launch during the 2016 ‘European Week of Regions and Cities’:

‘The need to capitalise on the good practices collected by our projects was already identified during the previous funding period. We wanted to design a tool to make available all the good practices and knowledge produced by our projects. We knew that a collection of good practices on its own was not enough. So the Policy Learning
Platform will be brought to life by teams of thematic experts, to provide support to regions and local authorities to improve their policies, through a combination of knowledge on implemented good practices and specific thematic expertise.

The Policy Learning Platform creates a space – open to policy-makers both within Interreg Europe projects and beyond – to allow continuous learning to improve regional development policies in Europe. It enables the development of a community of like-minded people engaged in peer-to-peer learning, accessed through an online tool and facilitated by thematic experts.

Platform users are mainly policy-makers from regional, national and local levels, and especially the managing authorities of the EU Structural Fund programmes. Users can request advice or services from thematic experts, such as peer reviews, benchmarking, virtual meetings, and specific thematic workshops. They can also tap into the experience of other regions through the good practice database and share their knowledge for the benefit of others.

In addition, physical meetings are organised through the platform to facilitate direct exchange between policy-makers. The Policy Learning Platform on environment and resource efficiency organised the first thematic workshop in June 2017. This was the first opportunity for 11 projects working on the circular economy and resource efficiency to exchange experience and identify actions for future co-operation.

The intended end result of the Policy Learning Platform is the wider dissemination and uptake of good practices stemming from Interreg Europe projects, boosting programme results and increasing the impact of policy learning.

As part of the Policy Learning Platform for the environment and resource efficiency, a policy brief – Development of Green Infrastructure in EU Regions – has been produced explaining the importance of green infrastructure as a multi-functional means of meeting the needs of European regions for biodiversity protection, public health, and the jobs and growth agenda. Green infrastructure solutions are especially relevant in urban areas, in reducing energy demand, combatting social exclusion and providing appealing places to live and work.

The policy brief includes the findings of Interreg Europe projects, including the PERFECT project, and its emphasis is on the need for effective strategic planning and a place-based approach to green infrastructure, to ensure a holistic approach through engaging with multiple stakeholders.

The way forward

It is clear that local and regional authorities have an essential role to play in delivering better environment and resource efficiency policies, whether by leading by example, helping to build the knowledge base, setting clear framework conditions, or addressing regulatory and administrative barriers.

Interreg Europe aims to help regional and local governments across Europe in these efforts by stimulating knowledge exchange and policy learning through co-operation projects, and by providing a space for projects to share experiences and learn from each other through the Policy Learning Platform.

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Notes
1 See the Interreg Europe website, at www.interregeurope.eu/
2 See the Interreg Europe Policy Learning Platform webpages, at www.interregeurope.eu/policylearning/
4 See the Interreg Europe PERFECT project website, at www.interregeurope.eu/PERFECT
Cornwall is a county fixed in the popular imagination for its remoteness and its wild, natural beauty. But even in Cornwall there is recognition that nature is becoming more remote from people’s everyday lives and that contact with the natural world is diminishing for successive generations. This has arguably led to an ‘extinction of experience’,¹ as a loss of connection with nature compromises public health and wellbeing and leads to a cycle of reduced emotional affinity with nature and decline in pro-environmental attitudes and behaviour. Left unchecked, this can eventually result in disaffection towards nature, particularly in areas where environmental resilience is low, such as areas that are regularly flooded.

Despite being an overwhelmingly green peninsula with only around 5% of its land cover being urban, Cornwall’s environmental quality has actually been in an extended process of decline, partially as a result of its industrial heritage, but also as successive generations have failed to invest in the environment and have lost connection to the natural environment in both urban and rural areas. Whatever the underlying reasons, direct investment in green infrastructure remains relatively low, and good-quality accessible green space is in short supply when beaches are excluded from the calculation. This is often difficult to perceive in what is ostensibly a very rural area; investment in green infrastructure is a hard sell in an area with so much visible greenery.

Robert Lacey outlines the approach that Cornwall Council is taking and the challenges it faces as the UK partner in the EU-funded PERFECT project on attitudes to investment in green infrastructure.

embraced in Cornwall, with parish and town councils through devolved plan-making and management. And green space assets continue to be devolved, half of the 213 parishes in Cornwall are involved creating their own neighbourhood plans. There are bidders to take on local green space assets and towards influencing its delivery and maintenance for the creation of a coherent green infrastructure. This presents a significant challenge ranging from small play areas to wild spaces of several hectares. This presents a significant challenge for the creation of a coherent green infrastructure strategy, as each plan or asset will be managed directly planning and providing green infrastructure through devolved plan-making and management.

The localism agenda has been enthusiastically embraced in Cornwall, with parish and town councils bidding to take on local green space assets and creating their own neighbourhood plans. There are now nearly 100 plans actively being produced (over half of the 213 parishes in Cornwall are involved) and green space assets continue to be devolved, ranging from small play areas to wild spaces of several hectares. This presents a significant challenge for the creation of a coherent green infrastructure strategy, as each plan or asset will be managed locally rather than being directly in the control of the council.

It does, however, present a really interesting opportunity to directly engage town and parish councils in going beyond the call from communities for environmental protection to actively pursuing environmental growth. Plans have so far tended towards the protection of both designated and non-designated environmental assets, but increasingly they are looking for innovative ways of ensuring that future generations inherit a significantly better quality of environment and retain and enhance the links that Cornish culture and heritage plays in the county’s distinctive and iconic landscapes.

PERFECT progress? What have we learnt so far?

We at Cornwall Council were delighted to be invited to bid with the TCPA for the EU-funded PERFECT project. The purpose of the project – to embed green infrastructure thinking at the heart of everyday business, and to improve its presence in policy- and decision-making – builds on a growing agenda and a steady nudge towards embedding the concept of environmental growth into the popular consciousness of the public and private sectors in Cornwall. Indeed, in 2016 Cornwall was the first UK local authority to create and adopt an Environmental Growth Strategy. This commits Cornwall Council to a 50-year overarching vision for the environment and recognises that protection of the environment alone is not enough. In addition, the council’s Planning and Sustainable Development Service has the stated ambition to be ‘the most environmentally-friendly planning service by 2020/21’.

As part of the first-semester work package for PERFECT between January and June 2017, we carried out surveys with our senior members and officers from across the council and panels to gain a snapshot of attitudes to making investments in green infrastructure and reasons for doing so. In common with most of the PERFECT partners, we discovered that the health impacts of green infrastructure are generally understood, but the importance of green infrastructure in supporting economic success is still seen as less well founded, even when it is directly related to economic functioning (for instance through reduced sickness and increased productivity).

However, the quality and imagery of the natural environment of Cornwall increasingly forms a key part of the incentive to relocate put forward to prospective investors by ‘Invest in Cornwall’, part of the Council’s economic development offer. Recent campaigns have chosen to centre around the contrast between the inspiring landscapes, sandy beaches and beauty of Cornwall as a holiday destination, and the transformational changes and connectivity that have opened up opportunities for ambitious, visionary businesses.

While it is clear that we recognise the attraction of the landscape and natural beauty of Cornwall, investing directly in green infrastructure still falls lower in the priority list for investment.

Furthermore, the literature review undertaken at the very start of PERFECT has underlined the complexity of the current landscape of advice and guidance provided by the council and its partners, and the generally confusing terminology used. These all reinforce a misconception of green infrastructure as a concept and an alternative to everyday business, rather than a proven solution to a multiplicity of challenges, from flood prevention, to reducing inactivity, fostering better human and environmental health, and increasing the sense of place in a rapidly changing region. All too often green infrastructure is viewed not only as difficult to achieve and uncertain in effect, but also as an additional benefit to be secured on top of ‘tested infrastructure’, rather than a central and essential element of good development.

A multiplicity of actions

The initial surveys and literature review provide a useful context for the programme and underscore the depth of work that needs to be undertaken to embed green infrastructure into everyday business, and particularly economic development. The challenge ahead will be for the council to provide positive examples of where green infrastructure provision has added significant value to the economic functioning of schemes. This will be greatly improved through our involvement in PERFECT, but we will also be following two key schemes in Cornwall (described
Simple interventions such as planning for active travel have huge potential for healthier lifestyles below) to provide valuable local context and examples to help persuade communities, businesses and decision-makers of the multiple benefits of green infrastructure investment:

● **St Austell Bay Resilient Regeneration (STARR):**
  STARR is a project proposed in St Blazey and Par (near St Austell), areas with high deprivation, poor health, and a recurring flooding issue. All this has conspired to hamper good-quality economic investment in the past, not least due to flood risk, and has created a detrimental image of the area. Yet the towns are within a mile of beaches, a mainline rail station and the world famous Eden Project, as well as a wealth of green infrastructure and World Heritage assets.

  The project aims to make a significant investment in green infrastructure, ranging from swales and new Cornish hedges and other natural features to reduce surface water flows, to lowering of road carriageways and replanting street trees. We will work with businesses, landowners and communities to redesign the towns, streets and green spaces to work harder to keep water away from homes and businesses. This will extend into the catchment of the towns to reduce flood risk, to increase resilience, and importantly to reduce risks to investment in economic development.

  This will help to provide a powerful example of the potential of green infrastructure provision both to unlock economic potential and to increase resilience against climate change and reduce the costs of defending against flooding, by working with the environment to create solutions. There are also significant opportunities to improve the lives of residents by enabling the conditions for social, environmental and economic resilience through green infrastructure.

● **Green Infrastructure for Growth (GI4G):**
  GI4G is a direct approach to delivering a major green infrastructure investment in publicly owned and managed urban green space, including parks, closed churchyards, playing pitches and other amenity land in the towns of Camborne, Pool, Redruth, Penzance, Saltash, Hayle, and Bude. The project focuses on increasing their wildlife value, accessibility, and community enjoyment.

  Key elements involve facilitation of communities and local councils in developing and delivering plans for the transformation of intensively managed open spaces into wildlife-friendly solutions specifically tailored to suit different types of green space (see Box 1). Collectively, these initiatives will result in an increase in biodiversity while allowing a change to management regimes after the initial establishment period, enabling the spaces to be devolved to the communities and reducing long-term maintenance costs. The project is working in partnership with Exeter University to use best scientific knowledge and techniques to understand the multi-functional opportunities for improvements to tap into the benefits of high-quality green space, and to learn lessons for how assets should be managed in the future.

  Cornwall’s involvement in the PERFECT project will also influence the delivery of devolved asset management and plan-making to parish and town councils, to ensure that we can deliver Cornwall Council’s commitment to environmental growth. This will use the learning from PERFECT, STARR and GI4G in terms of examples of replicable models and interventions that will help communities become more socially, environmentally and economically resilient through green infrastructure planning.

  Early surveys and experience gained through supporting neighbourhood planning over the last five years have shown that while communities appreciate and want to retain their environment, they are unclear about the need to invest in green infrastructure and what the best interventions are for their area. Neighbourhood plans also lack a meaningful ‘larger than local’, detailed approach to green infrastructure that would help to inform how whole ecosystems that run beyond parish boundaries work. Recognising this, the council is developing a specific GIS mapping project across Cornwall to help build a more comprehensive understanding of how well our environment functions at present, what it is currently used for and its benefits, and the opportunities that exist within both individual parishes and wider areas to develop green infrastructure networks and benefits.
All of this takes time, and early work on the project, including workshop sessions held along with planning staff, has shown that although discussion of green infrastructure has been well rehearsed as a mainstream subject for at least a decade, knowledge and practice are still patchy, and the most effective interventions remain subject to debate. Some areas, such as sustainable drainage systems (SuDS), are well known and accepted, but the case for investment in the natural environment still appears hard to make and justify. There is still scepticism that planned investment in green infrastructure can replace ‘grey’ infrastructure, and this is perhaps reflective of a wider disconnection from nature described earlier in this article.

Of course, this all comes at a time of potentially huge change and uncertainty as the UK withdraws from the European Union – which potentially risks the loss or dilution of the growing importance that EU funding streams have been placing upon green infrastructure provision and ecosystem services as drivers for social and economic improvement. This itself is something that was only a distant possibility at the start of the PERFECT partnership, but now presents both an issue and an opportunity, depending on how successfully the project can make the case that investment in green infrastructure is essential to sustainable and inclusive economic growth.

We are confident that all of the challenges that we currently face, when combined with a Cornish willingness to innovate and the learning potential that our partnership with the TCPA and our European colleagues presents, will create the perfect conditions to embed green infrastructure at the heart of our everyday business.

Robert Lacey is a Principal Development Officer at Cornwall Council. The views expressed are personal.

Notes

1. A high proportion of people are becoming progressively less likely to have direct contact with nature in their everyday lives. More than 20 years ago, Robert M Pyle termed this ongoing alienation ‘the extinction of experience’ – see RM Pyle: The Thunder Tree: Lessons from an Urban Wildland. Houghton Mifflin, 1993


3. See the Invest in Cornwall website, at https://investincornwall.com/why-cornwall/

Green infrastructure (GI) is an essential component of liveable and sustainable places. There is a substantial body of research demonstrating the multiple benefits of GI for urban populations. Many local authorities now have a GI policy or strategy in some form, and its importance is recognised in national planning policy; but there is still considerable uncertainty as to how GI can best be delivered and maintained in practice. This article presents our work on developing a new benchmark for green infrastructure, Building with Nature, which is being developed collaboratively by Gloucestershire Wildlife Trust and the University of the West of England, Bristol.1

The challenges

There is now a considerable amount of guidance on the planning, design and delivery of GI. Despite this, what is delivered on the ground is extremely variable, and often opportunities for delivering high-quality GI are missed. During the early stages of the project we spoke to many of those in Gloucestershire and the West of England involved in GI planning, design and delivery about their experiences of the way that GI is incorporated into new development and the resulting quality. This, together with engagement with a range of stakeholders in England and Scotland, identified a number of challenges and the need for a benchmark to overcome them. Stakeholders included local authority planners and landscape architects, developers and their consultants, ecologists, and public health professionals, as well as NGOs and government agencies responsible for GI advocacy, delivery, and management. The challenges can be summarised as follows:

● There is uncertainty in what is required in terms of GI in new development, caused by variation in policy between local authorities and a lack of resources, skills and knowledge in the sector. Although numerous pieces of guidance exist, often from professional bodies, NGOs, or local authorities, such guidance is overwhelming and difficult to navigate, especially for those without the necessary expertise to balance competing demands from GI.

● Often GI proposed in new development does not respond to the local context; there is seldom a ‘one size fits all’ approach suitable for either local planning authorities or developers.

● Different components of GI are considered in multiple documents (for example water management, nature conservation, open space), which misses the opportunity to provide a coherent multi-functional network.

● GI is seen as less important than other objectives, especially in areas with a high demand for housing or those trying to attract investment through development.

● The quality of GI diminishes as a planning application progresses, so that, although the quality may have been high in the outline planning application, this is not represented in the final...
delivery. Coupled with this, there is often a lack of enforcement on the quality of delivery.

There is uncertainty and concern over maintenance and management arrangements.

We also conducted a review of how GI is considered in a range of existing built environment assessment systems (for example BREEAM Communities, Building for Life). This found that, although many contained some assessment related to GI, they often focused on one aspect (for example access to green space), or, in the case of the Green Flag Award, measured one type of GI (parks). None of the existing systems include an assessment of GI as a multi-functional network, or an assessment of delivery or maintenance. It is crucial that these challenges are addressed if GI is to deliver its potential benefits for people, the economy, and the environment.

Introducing Building with Nature

The Building with Nature benchmark has been developed in direct response to these challenges. The aim of Building with Nature is to clarify the expectations and raise the standard of GI over time. The broad themes that the benchmark should cover and the way it should operate were identified through a literature review and through engagement with stakeholders. The themes include aspects of the planning, design and management of GI seen as being critical to its success, and three framed around the services that GI provides for nature conservation, water management, and health and wellbeing. Each theme has a suite of standards that applicants would be expected to meet to be awarded the benchmark:

- five core standards, including the creation of a multi-functional network, consideration of local priorities and character, resilience to climate change, and provision of long-term management arrangements, including the governance and funding as well as the operational aspects of maintenance (related to the specific functions);
- six water management standards, including the need to minimise surface run-off and improve water quality;
- six nature conservation standards, including providing ecological enhancement and considering nature conservation at all stages of development; and
- six health and wellbeing standards, including ensuring the availability of accessible, high-quality spaces for all and contributing to a sense of place.

Building with Nature is flexible enough for use across different spatial scales and stages in the development process (for example at outline planning through to post-construction), and can also be used to assess GI policies. It is applicable to all components and functions of GI, including green spaces, soft landscaping, green walls and roofs, sustainable drainage systems (SuDS), and areas for nature conservation. The emphasis is on the creation or enhancement of a multi-functional network. Irrespective of when an application is made, the award would be dependent on a post-construction assessment. However, in recognition that some aspects of the planning and design of GI are set early on in the process and difficult to adjust retrospectively, applications can be awarded ‘candidate’ status at the pre-construction stages of development or for a draft policy. The full award would be granted after the scheme or, for phased developments, each phase is delivered, or the policy published.

To provide flexibility for applicants, each of the thematic areas of nature conservation, water management, and health and wellbeing are divided into two levels, with three standards in each (see Table 1). The ‘Achieved’ standards reflect the minimum requirement for high-quality GI, irrespective of scale or type of development. The ‘Excellent’ standards are representative of exemplary GI.

To be awarded Building with Nature ‘Achieved’, the applicant would need to demonstrate that they had met all five core standards and all nine of the ‘Achieved’ standards across health and wellbeing, water management, and nature conservation. To secure Building with Nature ‘Excellent’, applicants would need to fulfil these 14 standards as well as at least six out of nine of the ‘Excellent’ standards. This means that an applicant could chose to specialise in two of the thematic areas in the award by fulfilling all three ‘Excellent’ standards (for example in water management and nature

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<td>Core 1-5</td>
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(conservation) or spread across all three themes, fulfilling two out of the three ‘Excellent’ standards. The standards have been set at a level that is not so low that the benchmark would be awarded to all developments, but not so high that they would act as a deterrent to its use. This is to ensure that Building with Nature has broad appeal, as opposed to being seen as relevant only to exemplary schemes. Similarly, the evidence that is required to demonstrate compliance is equivalent to that already provided in planning applications, so as to ensure that the benchmark is not seen as too onerous.

**Building with Nature development**

Building with Nature has been under development since 2015 and is currently undergoing final testing on several live developments (including large residential-led urban extensions and a small infill development) and policies. The process for its initial development is outlined in Fig. 1 and briefly explained here. The requirements of stakeholders were used in conjunction with a review of existing standards and good practice guidance to produce a long list of potential standards. A workshop was then held with the research team and external advisors to consolidate the long list into a suite of draft standards.
Once a draft set of standards had been developed, they were tested against the requirements of stakeholders and the aim of the benchmark on two contrasting developments (‘A’ and ‘B’) in Gloucestershire. The developments were deliberately chosen to represent a contrast in the quality of GI. Both are strategic, residential-led, mixed-use greenfield developments of around 1,000-2,500 dwellings, with a range of community facilities and commercial premises.

A range of documents submitted as part of the application for outline planning permission were reviewed against the draft standards, including the GI strategy, the GI parameter plan, the sustainability strategy, and the environmental statement. Often, the quantity, location and quality of GI is set very early in the development process, so ideally an applicant would begin working towards the benchmark as soon as possible. This, coupled with the desire to ensure that the evidence required is not too onerous, meant that these documents were felt to be a sufficient test to ensure that the standards reflect the type of information available at this stage.

Overall, development ‘A’ performed poorly against the draft standards, and as a result would not be awarded the benchmark based on the application for outline planning permission. This was because the individual features of GI would not form a multi-functional network, and very little information was provided on the specific features of GI that would be included or how they related to the needs and priorities of the area.

For example, the GI consisted of a series of isolated open spaces that were seldom connected, and when connectivity was provided the corridors were too small to provide any useful function in terms of nature conservation, water management, or active travel. Similarly, there was no obvious connectivity through the development or to the surrounding landscape, including from a protected habitat on site. There was no consideration of the long-term management of the GI, and the opportunity to provide multi-functional GI was missed. Where aspects such as climate change adaptation, water management or health and wellbeing were included, the documents simply contained a reiteration of national and local policies, with no articulation of how the GI would respond to them.

Development ‘B’ would, however, be awarded ‘Candidate’ status based on the documents reviewed. The proposed GI was judged to be of sufficient quality to meet the ‘Core’ and ‘Achieved’ standards across all three thematic areas and some of the ‘Excellent’ standards. It was clear that the GI would form a coherent multi-functional network. The rationale for the GI approach was explained, as was the relationship between the relevant policies and the proposed GI. The consideration of long-term maintenance and management was particularly comprehensive, including the need for a GI management scheme. Options for including the community in the decision-making process, on-site activities, and long-term management were provided.

Substantial detail on the habitats within the development was provided, including their protection and enhancement through all stages of the construction process. However, it was not clear how these would contribute to wider ecological networks. A SuDS strategy provided an assessment of the sensitivity of receiving waters and the floodplain to development, and detail on the disposal of surface water run-off and water quality, as well as the provision of specific SuDS features and their performance. Clear links were made between local strategies for amenity use and the open spaces provided, including their accessibility.

The results of this testing were reviewed at a second workshop, where the standards and the level of the overall award were refined. Overall, the standards performed well in assessing the two developments. They appear to be set at an appropriate level so that the proposal considered to have relatively poor-quality GI would not be awarded the benchmark, whereas the application with well-thought-out GI and a high level of detail would. It was reassuring that a high-quality development that had not set out to be certified performed well, as this suggests that the standards are set at an appropriate level and are realistic. The documentation provided by development ‘B’ was generally sufficient to ascertain that the ‘Core’ and ‘Achieved’ standards had been met. This suggests that the application process for the benchmark would not be too onerous and that it should simply require a consolidation of existing evidence to respond to each standard.

However, it was relatively difficult to judge whether the ‘Excellent’ standards had been met based on the documentation reviewed. This is not a fair assessment as the developers did not set out to apply for the benchmark and so did not know that it would be necessary to provide this information. Some of this detail would not usually be provided for outline planning permission and would come later in the planning process, either in the full planning application or in reserved matters. Therefore no differentiation between ‘Achieved’ and ‘Excellent’ awards will be made in the initial pre-construction assessment, with applications only being awarded ‘Candidate’ status. Those aiming for ‘Excellent’ would work towards this as the planning application progresses (see Fig. 2).

At all stages of developing Building with Nature, the standards and associated technical guidance have been reviewed and iteratively refined with both local stakeholders and an external advisory group of experts drawn from across the built environment sector.2
Building with Nature is currently being tested in Gloucestershire and the West of England on policy documents, strategic urban extensions, and a small infill development. There is ongoing refinement of the standards through this testing and consultation with local stakeholders and the advisory group.

This work is also testing the process for awarding the benchmark; it is envisaged that a trained assessor will be embedded in the applicant team to provide guidance and compile and submit the application to a certification body. The assessor is likely to be an existing member of a development or policy project team (for example a landscape architect), working with the rest of the team to ensure that the GI is of sufficient quality to meet the standards in Building with Nature. The certification body will be an independent organisation responsible for the final assessment and awarding of the benchmark. This body will review the documentation provided by the applicant against the standards and, if appropriate, undertake a site visit. There will be a charge for undertaking this final assessment, which will be informed by the testing currently under way.

Following testing, the standards and technical guidance will be freely available in late 2017. Work has just begun to carry out further testing in Scotland, in collaboration with the Glasgow and Clyde Valley Green Network Partnership, and with support from the Central Scotland Green Network Trust, with completion expected in 2018.

So far, the results from the preliminary testing and the stakeholders suggest that the benchmark will provide clarity to the sector and ultimately achieve its aim of raising the standard of GI.

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**Notes**

1. The work is being carried out as part of a Knowledge Transfer Partnership funded by Innovate UK and the Natural Environment Research Council (Grant number 1011832) and an Innovation Fund funded by Natural Environment Research Council (Grant number NE/N016871/1). Further information will be made available in due course at www.buildingwithnature.org.uk

Planning Our Green Infrastructure

learning from the atlanta beltline

Peter Neal looks at how public transit and green infrastructure have been integrated into a connected and strategically planned open space network through the Atlanta BeltLine project.

Driving from Minneapolis to Memphis on a visit to several public park projects, I was encouraged by Alexander Garvin to continue on to Atlanta to see at first hand the emerging BeltLine project – an ambitious and visionary 22 mile long green public transit way that will circumnavigate Atlanta’s downtown and connect a myriad of neighbourhoods, new commercial developments, and a large number of public parks and open spaces. When there, I met with Fred Yalouris, Design Director of the project, who provided a full overview, while Garvin’s article, ‘Emerald necklace, southern style’,1 written for the American Planning Association, gives an excellent primer, sketching out the genesis of the scheme, its evolution, and the many challenges that have been faced in its early delivery.

Green infrastructure writ large

Fundamentally, this is much more than a green infrastructure network; it is about recentring a centreless city and reconfiguring the heart of Atlanta to become more public transit orientated, walkable, healthy, vibrant, and pedestrian friendly. It is a project driven by both vision and necessity, as downtown Atlanta, recently ranked eighth in the world for traffic congestion,2 has suffered decades of blight generated by industrial decline and low-density sprawl.

While the 1996 Olympics and the construction of the Centennial Olympic Park and the World Congress Centre sought to refocus development back to the city centre, the BeltLine is providing a far more significant catalyst for development and regeneration at a much larger scale. By embracing the industrial and cultural past, connecting historic preservation districts, repurposing old industrial buildings and restoring neglected bridges, it is creating a new human-scaled network to navigate, use and enjoy the city.

Fundamentally, this process is facilitating a modal shift in transit patterns, drawing people out of their cars to walk, run, cycle and commute along new paths.
Planning Our Green Infrastructure

and multi-use trails that lead through neighbourhoods, green spaces, public parks, woodlands, river corridors, abandoned transit corridors, and even a derelict quarry. Encouraging people to now ‘stay in the loop’, the BeltLine is having a direct impact on how people are choosing to locate and live in Atlanta.

The loop

The project focuses on the creation of a continuous and interconnected loop along 22 miles of historic and abandoned rail routes and industrial sites that encircle the historic core of Atlanta. It is organising and attracting growth around parks, transit and trails to change the pattern of regional sprawl and refocus investment back into the heart of the city. It is led by Atlanta BeltLine Inc. (ABI), whose website provides short films and a wealth of information on the project, including its strategic planning, its design development, maps and plans, annual reports, events, and the latest news on the increasing number of completed trails and parks. Further films on YouTube (search ‘Atlanta Beltline’) provide additional insight from the perspective of users and businesses on the impact of the project to date.

In numbers, the project is set to deliver 33 miles of multi-use trails, with an additional 28 miles of pedestrian-friendly rail transit over its lifetime. This will ultimately connect 45 in-town neighbourhoods; link 1,300 acres of new green space and 700 acres of renovated green space; remediate 1,100 acres of brownfield sites; deliver 28,000 new housing units, of which 5,600 will be affordable; and create 30,000 permanent jobs, along with 48,000 one-year construction jobs.

A strategic funding framework

ABI spun out from the Atlanta Development Authority in 2006 as a dedicated organisation to co-ordinate design, engineering and building on behalf of the city of Atlanta. It also leads on several associated social housing, cultural, commercial and project management programmes linked to the BeltLine, and is responsible for securing the funding from federal, state and local sources. Adopted in 2005 and prepared by EDAW and its partners, the Atlanta BeltLine Redevelopment Plan provided the initial strategic framework for passing the Atlanta BeltLine Tax Allocation District (TAD) legislation that will continue through to 2030.

A TAD, known also as tax increment financing, defines a set area within which property tax generated above a set threshold is used for a specific set of initiatives. The principle is to focus public investment within a specific, and generally deprived, district to stimulate economic growth. When properly managed, this generates a virtuous financial circle which produces additional tax income that continues to fund a project, or in some cases interest payments on bonds raised for the project, over a set period of time.

It is anticipated that in total the TAD revenues will generate around a third ($1.5 billion) of the $4.4 billion that is projected to be needed to complete the project. Of this, $2.3 billion will be used for transit, while around $550 million will be allocated to park development. By the end of 2015 it was calculated that the project had already generated nearly $3 billion in private development, representing almost a seven-fold return from $450 million invested from

Existing and new residential housing flank the Eastside Trail
public and private funding so far. The ultimate goal is to generate between $10 billion and $20 billion in additional investment over the 25-year life of the project to benefit the entire metro region.

Promoting the original vision

The project was first conceived by Georgia Tech student Ryan Gravel in his 1999 master's thesis in architecture and city planning (available online from the Georgia Tech Library). 'Traffic and pollution are sacrificing the things that made Atlanta attractive to investment in the first place,' Gravel wrote in his pitch to local councillors to gain the support of civic leaders and local citizens. His vision, which features on a TEDxAtlanta talk, gradually evolved into a grassroots campaign, before being adopted within the long-range plans of the Atlanta Regional Commission, emerging in time as a fully fledged strategic infrastructure project, reconfiguring the BeltLine into a 45-station public transit rail system. A key part of this process was the Emerald Necklace study commissioned by the Trust for Public Land and undertaken by Alex Garvin and Associates in 2004. This took Gravel's original loop and overlaid it with adjacent parks, open spaces and green infrastructure across the city. Over many months the team delved into the pragmatic detail of the project, scouring maps, aerial photographs and property records and walking countless miles to determine ownership, land values, and landmarks.

A significant shift in the strategy was the idea to tie together proposed and existing open spaces and trails along the 22 mile route to provide every Atlanta resident with a unique recreational resource. Furthermore, the study found that by connecting 46 separate neighbourhoods and three new MARTA stations (Atlanta's public transit system) the 20 mile long BeltLine Transit System could provide access to every major destination in the city, including several of the most prominent parks and several mixed-use destinations. This wider connectivity will be a key ingredient of its success, but as important was the discovery that most of the property and sites within or adjacent to the BeltLine were under-used, vacant, or abandoned. This added impetus to the economic regeneration case for public investment in the project.

Impact on commerce and communities

Walking along the Eastside Trail leading south from its connection with the majestic Piedmont Park, one is immediately struck by the popularity of the route, with large numbers of people walking, running, rollerblading, skateboarding, cycling, dog walking, and transporting young children in buggies and bike trailers – a sight far more characteristic of Copenhagen or Amsterdam than a car-orientated American city centre. Cost-effectively detailed with in-situ concrete slab panels, a standard 3.6 metre wide pavement is flanked by a green planted verge of varying width. This margin provides space for a wide variety of elements, including future transit infrastructure, significant tree planting creating a vast discontinuous linear arboretum, embankments, cuttings, bridges, wildflower meadows, perennial plantings, extensive public art, information and interpretation panels, way-finding signage, seating, and lighting. What is equally striking is the visible impact that the route has had on adjacent communities. New
mid-rise residential developments now purposely face on to the pedestrian corridor, while historic and refurbished buildings provide homes to new businesses and enterprises – cycle hire, cafes and restaurants, architects, micro-breweries, dentists and grooming parlours for dogs all jostle for position, with BeltLine access, to capture passing and growing trade. Alongside these fine-grained businesses that offer a good indicator of the health and vitality of adjacent neighbourhoods, much larger commercial developments have also chosen to re-orientate towards the BeltLine.

The Ponce City Market at the heart of the historic Old Fourth Ward district is one such enterprise. Weighing in at over 2 million square feet of development, this flexible and dynamic mixed-use scheme has been created from the restored Sears, Roebuck and Company premises. Incorporating food halls, boutique shops, cafes, coffee bars, apartments and businesses, it has recently been listed as one of the ‘world’s coolest new tourist attractions’. A key element of the redevelopment strategy has been to forge a direct connection with the BeltLine on an upper level that provides easy public access, bike storage, valet facilities and workrooms, alongside attractive meeting spaces. The scheme actively encourages visitors to arrive sustainably on foot or bike, with a further incentive of donating a dollar from every paid car parking session towards capital investment in the BeltLine.

Highlighting the importance of this connection, Matt Bronfman, CEO of Jamestown, the project’s developers, acknowledges that ‘the Atlanta BeltLine is a driving force in the urbanisation of Atlanta, transforming our city into a walkable, connected network of neighbourhoods’.

The BeltLine’s wildest side can currently be experienced along the $3.6 million Northside Trail and mile long spur that connects Ardmore Park and Tanyard Creek Park with Louise Howard Park, children’s play areas, and the nearby Piedmont Hospital. Here, the trail winds through mixed old-growth woodland and alongside Tanyard Creek, one of several rivers and streams found along this section of the BeltLine. These wetlands and associated floodplains provide an important attenuation facility for stormwater run-off as flooding is a prominent issue in this part of the city. Midway, this section of the trail passes through a covered timber bridge and under the distinctive historic railroad trestle that supports the still active CSX freight rail route above.

**Long-term delivery**

The 2030 Strategic Implementation Plan provides a flexible framework to complete the short- and long-term elements of the programme. The contents of the ten area masterplans have been adopted and the first of three defined implementation periods will come to an end in 2018. The Westside Trail and the Eastside Trail extension are under construction and near complete, with regular walking, bike and bus tours giving residents and visitors the opportunity to explore specific sections of the BeltLine which currently have limited public access.

A notable achievement includes the opening of the Aluma Farm, the first of several urban farms planned along the BeltLine. Located on the Westside, it began operating in 2015 and sells seasonal produce direct
from its site and at the Ponce City Market. One of the largest new open space opportunities is also on the westside: the restoration of Bellwood Quarry will see it redeveloped into Westside Reservoir Park.

This rebalancing of the provision of open space across the city, which has historically been biased towards the east with Piedmont Park and Grant Park, embraces wider principles of sustainable growth and equitable development that underpin the project’s planning. In encircling the city, the BeltLine passes through all types of districts, neighbourhoods and communities, and from the outset the project has endeavoured to ensure that economic, cultural and health benefits accrue to all communities and people at all income levels. The BeltLine Equitable Development Plan\(^1\) sets a commitment to measure development along the corridor at least four times over the project’s life, to enable all areas to experience healthy growth. By channelling TAD funding into both green and transit infrastructure to transform the urban fabric, the city is generating much wider economic and social benefit.

Certainly there are a number of other striking examples of repurposing redundant rail infrastructure and retrofitting new green infrastructure, such as New York’s celebrated HighLine, Chicago’s Bloomingdale Trail (The 606) and the Promenade Plantée in Paris. However, in combining transit, trails, existing and new parks, affordable housing, the restoration of historic buildings and the promotion of new development, none have the scale, reach or impact of the BeltLine, and through this there is much to learn and admire.

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**Notes**

5. R Gravel: ‘Building the city we want to live in’. TEDxAtlanta talk, 2010. Available at www.youtube.com/watch?v=Zfjxvt_834g
7. For further information on the Ponce City Market is available from the Ponce City Market website, at www.poncecitymarket.com/
For the past 18 months I have been seconded to the EPSRC (Engineering and Physical Sciences Research Council) funded Liveable Cities research programme – a five-year study of global cities and an examination of the systems that support them. The Liveable Cities programme operates under the following vision:

‘To transform the engineering of cities to deliver global and societal wellbeing within the context of low carbon living and resource security through developing realistic and radical engineering that demonstrates the concept of an alternative future.’

The programme involved systems thinking that considered a city as a system of systems. We were able to identify and evaluate some radical scenarios, one of which was: ‘What would an ecosystem-serviced city look like?’ In other words, how could all the potential benefits that can be derived from the natural environment be maximised through a synergistic approach with all the other key functions of a city? How would the view or future vision for a city alter if ecosystem services were to be prioritised over other outcomes or priorities. This ‘thought experiment’ allows one to identify just how dependent we are as a species on the natural environment, and how cities where their citizens can and do connect with nature on a regular basis score more highly on global quality of life indices and benchmarks.

Birmingham remains the only UK city in the Biophilic Cities Network, an international grouping of cities that aspire to enable their citizens to engage with nature on a daily basis through better place-making, secured through joined-up systems delivery (both engineered and natural). For nearly all the cities in the network this is a generational aspiration – a long-term goal – not merely a short-term flag-waving exercise.

The Liveable Cities programme effectively concluded that the aims of green infrastructure or park provision in cities should emphasise better quality of life and improved place-making for citizens.

Nick Grayson explains how the developers of the Natural Capital Planning Tool aim to make the contribution of natural capital and green infrastructure more visible within current planning processes.
This can stand as the definition of a ‘biophilic city’ – and what city would not sign up to that? In fact, it appears that the term ‘biophilic’ is itself the barrier; and yet those with long enough memories will remember that it took anywhere from eight to ten years for all the nature conservation and political organisations in the UK to accept and agree on the use of ‘biodiversity’ as a standard term. Today, no-one seems to question that.

Birmingham was invited to join the Biophilic Cities Network because the city is at the forefront of advancing natural capital and ecosystem services as a different approach to understanding and valuing urban green space.4

A better quality of life versus place-making

As noted above, in the Liveable Cities research we effectively concluded that parks and urban green space serve two purposes in cities: to provide a better quality of life, and to contribute to improved place-making. These two aims are often trotted out in the same breath as if they were synonymous, or at least as if one begets the other. But is this so?

A moment’s consideration leads to questions about who is involved in addressing these two aims. The picture starts to blur, often highlighting strong disconnects. There are ‘siloed’ organisational divides across the two agendas. And which professions or what areas of government – local, national, or international – are given responsibility for these two outcomes? This might seem like a subtle point – but it strongly impacts the way we live in, design and still construct cities.

The question comes back to one of systems. In many cities, it is possible to identify a central weakness or lack of integration across the three areas of municipal governance, finance, and planning. This key and important point has recently been emphasised by the United Nations in its New Urban Agenda framework, adopted at the Habitat III conference in 2016, which aims to help all global cities move to a better point of balance with themselves, their populations, and all global limits.

Ecosystem services provide a new scientific framework that gets behind the contribution that nature makes to all our lives, both individually and as a species. The vital connection between this framework and the emerging accountancy framework of natural capital helps to convert those scientific findings into a new language that is better understood by the financial directors of this world. This is the time in our collective history when we have to move from a period in which the source of all our wealth has been the natural world coupled with human ingenuity, in which ‘natural accounts’ have never been kept, to a point at which we recognise this dependency and start to properly account for it.

Greenery alongside city living apartments in Southside, Birmingham city centre
This is not to argue that we should merely put a price on nature, but it is to say that we should start to reveal its true value and move towards the derivation of different value chains. The contribution that the natural world makes to our lives in cities is hugely significant. Yet we are lacking the tools to make that contribution visible, especially as part of the planning process as it is currently configured.

Natural Capital Planning Tool

This is where the Natural Capital Planning Tool (NCPT) comes in. The NCPT has been devised over the past four years, starting with the Ecosystems Markets Task Force back in 2013. Work undertaken with industrial partners drawn from the UK Business Council for Sustainable Development and the government agencies of Natural England and the Environment Agency initially progressed through a grant from the Royal Institute for Chartered Surveyors Research Trust, which allowed the tool to be tested ‘in the field’ across the Midlands.

Now, thanks to the Natural Environment Research Council’s Innovation – Green Infrastructure programme, the NCPT partnership led by the University of Birmingham has been able to take the tool to a national trial.

The NCPT provides a bridge between the two government policies of the National Planning Policy Framework (NPPF) and the Natural Environment White Paper (NEWP). Developed using an Excel spreadsheet, the tool has been designed for ease of use and access. It has been pre-populated with the opinions of an expert group so that the user need not have expertise in ecosystem services. It is designed to be used by planners and developers alike to bring added value to the masterplanning and design phases of any major development.

The aim is a simple one – to achieve a net positive for natural capital across a site after a 25-year timeframe, as long as that is a viable proposition. Where it is not, following the mitigation hierarchy, the tool will quantify the value gap that needs to be compensated for off-site.

As set out in the Planning for Sustainable Land-Use: The Natural Capital Planning Tool (NCPT) Project report, the tool allows the user to measure the impact of any development upon ten ecosystem services. It leads the user through a series of indicators, each with criteria and benchmarks, with pre-formed thresholds and scores, that have built-in flexibility for local variation (but not wholesale re-write). The process is not time consuming, but does allow for more than one iteration of the scheme through design scenarios, each assessed and weighted, resulting in an overall development impact score (DIS) for each design option. Should the DIS be negative on the first attempt, the tool identifies each negative value that has occurred, outlining the reasons why, and offers positive suggestions on how these scores could be adjusted through design changes.

The most significant finding to date (the national trial continues until April 2018) is that it is often not necessary to request more urban green space to achieve a ‘net positive’ outcome. The beauty of the tool is that it measures individual services – however, it does not follow that each service requires an individual space allocation. The tool is designed to harness the power of the natural environment to deliver many or even all of these services across the same land area. The net result is that the land works harder – by offering more services – so that the development does not have to sit in a sea of ‘greenwash’ or bland landscape. So the resulting green infrastructure has to be well designed – but, as importantly, it will have to be well maintained to achieve those ‘net positives’ over the 25-year timeframe.

The national trial is testing the tool at all sorts of scales and in all sorts of scenarios. The seven main trials are being conducted with:

- Central Bedfordshire Council – a major urban extension;
- South Downs National Park Authority – a post-industrial site;
- Southampton City Council – an estate densification scheme;
- Birmingham City Council – a sustainable urban extension;
- Solihull Metropolitan Borough Council – a ‘garden village’ development;

*City centre trees in Birmingham*
• Skanska – industrial site green and blue infrastructure schemes; and
• Tarmac – a mineral extraction site.

Other sites are being looked at and might form part of the final assessment.

The Natural Capital Planning Tool is being supported by the Royal Town Planning Institute (RTPI) and the Royal Institution of Chartered Surveyors (RICS). There is real interest in how, if proven successful, the use of the tool can be taken forward through a national dissemination and continuing professional development (CPD) programme, with the potential for adoption as a new national standard. Certainly, this has generated a lot of interest internationally, as making the planning system more sustainable is not just a UK concern.

Rethinking our approach to urban green space

There is a global urgency to ‘fix’ cities, as highlighted by the UN Habitat III’s New Urban Agenda and the Sustainable Development Goals that set 10-20 year timeframes for change. If we simply take our own human health as a proxy for that, we would have to conclude that we need to do better, much better; and move much faster in making progress.

Urban green space is part of the solution to our urban ills. In order to reach the outcomes we seek we need to re-define what urban green space means, what its purpose is, and how we can value it differently. Ecosystem services and natural capital will become universal mechanisms for that. And the Natural Capital Planning Tool will be seen as an early experiment in this global paradigm shift.

It is the global system of valuing nature that has to change. The Natural Capital Coalition,8 based in the UK, is looking at the industrial and commercial implications of this, through its Natural Capital Protocol and a set of sector guides. The World Business Council for Sustainable Development has its Action2020 roadmap.9 The Natural Capital Committee10 is examining governance and policy implications, and is working with the Office for National Statistics to create a set of national natural capital accounts for 2020. The 2016 IUCN World Conference agreed to adopt the term ‘natural capital’ and the WWF (World Wide Fund for Nature) has worked with Credit Suisse to calculate the level of investment required to restore the major global habitats11 – the annual cost was revealed as just 1% of the total global investment market. So, how can all this be made to work?

Anyone looking at daily newspapers or the news media would be forgiven for thinking nothing is happening; yet the opposite is true. The world of research and enterprise is moving rapidly towards a greater appreciation of nature. Perhaps that will come to peoples’ attention through a shift in how we calculate the value of our city parks. That would then make the change in thinking very real for people. It would also enable cities to deliver on both local and global agendas.

Using these global mechanisms through a 25-year environment plan, all UK cities and regions could restore and maintain their urban green space in a sustainable way – with the multiple beneficiaries of urban natural capital investing in their quality, accessibility and provision, and through excellent place-making transforming cities into ‘biophilic cities’ with a dramatically improved quality of life. To allow this to happen, the systems of municipal governance, finance and planning need to be integrated to enable this change. This alone is the single greatest barrier to change in cities. The Liveable Cities research reveals that this an issue not just for the UK but across all global cities if they are to meet their acute 21st century challenges with all their in-built inter-dependencies; so taking a systems approach is going to be crucial – and this approach must fully acknowledge our dependency on nature.

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Notes
1 See the Liveable Cities website, at http://liveablecities.org.uk/
3 See the Biophilic Cities website, at http://biophiliccities.org/
4 See Birmingham City Council’s Green Living Spaces Plan webpage, at www.birmingham.gov.uk/greenlivingspaces
5 See the UK Business Council for Sustainable Development website, at http://ukbcd.org.uk/
7 Injecting a Natural Capital Tool into Green and Blue Infrastructure Management. NERC Innovation – GI Programme Award NE/N017587/1. http://gotw.nerc.ac.uk/list_them.asp?them=Innovation++GI
8 See the Natural Capital Coalition website, at https://naturalcapitalcoalition.org/
9 See the World Business Council for Sustainable Development’s Action2020 webpage, at www.wbcsd.org/Overview/About-us/Action2020
10 See the government’s Natural Capital Committee (NCC) webpages, at www.gov.uk/government/groups/natural-capital-committee
11 ‘Nature is being renamed ‘natural capital’ – but is it really the planet that will profit?’. The Conversation, 13 Sept. 2016. http://theconversation.com/nature-is-being-renamed-natural-capital-but-is-it-really-the-planet-that-will-profit-65273
Do we need to think again about how and why we value our urban parks? On the one hand, we all understand how important networks of green infrastructure are to successful cities. Think of any ‘world city’, from Singapore to Barcelona and from London to Chicago, and its public space will quickly enter the mind’s eye. And whether we are residents or tourists we flock to such spaces because they are part of the essence of place that defines each city. That sense of place is repeated within each city district, defining neighbourhoods and locking communities together.

Many of our cities are growing exponentially. In 1950, 79% of the UK population was living in cities. This percentage will rise to 92.2% by 2030, in parallel with an increase in overall population from 50 million to 71 million. Generally, our cities cannot grow fatter, so they are growing taller; and tall buildings do not offer city dwellers access to private open space. This places further pressure on the limited supply of green infrastructure within our cities. At the same time, the resources available to green infrastructure asset managers (overwhelmingly local authorities) have been significantly constrained. All local authorities have had to savage the budgets available to them to manage public open space. Cuts of 70% against 2010 levels are not uncommon; cuts of 100% are not unheard of. How can local authorities sustain the quality of the green space assets in their management for the benefit of increasing populations?

Over the past two years, we at Jon Sheaff & Associates have been working with two London local authorities that are trying to juggle with these competing pressures. Both Barnet and Barking and Dagenham are ‘edge of London’ boroughs, hitherto characterised as ‘leafy’, with a preponderance of low-density, low-rise housing and extensive green space assets. This is set to change – Barnet’s population will increase from 369,000 in 2016 to 431,000 in 2041 (a rise of just over 10%); Barking and Dagenham’s population will rise from 196,000 in 2015 to 274,000 in 2037 (a rise of 40%). These councils have appreciated the need for new strategies to consider how demand for green space will be addressed when budgets to sustain the quality of such spaces will remain under pressure.

This is where we return to the idea of value. The development of our urban public parks has been inspired by a number of factors, but democratisation has been one of them. Our very first publicly funded urban park (at Birkenhead) was designed using many of the principles that had informed the design of the country’s great private estates by Kent, Brown and Repton. These estates were not freely accessible to
the masses. But concepts of value underpinned both the estates and Birkenhead Park alike – the latter’s designer, Joseph Paxton, had a detailed understanding of the value of the space that he was designing for Birkenhead, and the Victorians were forced to address the consequences of rapid urbanisation when faced with the impact of epidemics and the need to address public health. It is worth remembering that the great cholera epidemic of 1854 killed over 10,000 people in London, and that the response was a programme of works to provide Londoners with clean sanitation, clean water, and clean air. One hundred and sixty years on, we are still grappling with the same issues, and our understanding of the value of green space seems to have become diluted.

In part, this could be a consequence of the way in which local authorities have assessed the value of public open space. Councils have traditionally used the historical-cost method to quantify the value of these assets (although more sophisticated modelling is now emerging). The early work undertaken by CABE Space on green infrastructure valuation highlighted the practice of ascribing a nominal value to a park (often a value of £1). This valuation does not account for the appreciation in value of the space in question over time (as it matures, so does its value), nor does it take account of the value of the benefits accruing to society from the use of this space or the positive outcomes that this space can deliver. Public space asset managers are saddled with a simplistic perception that parks are liabilities and cost money (which, of course, they do), and they are unable to express in financial terms the business case for carrying that cost.

But we are now replete with evidence that demonstrates conclusively quite how good parks are for us. We all understand that parks support economic success, are places where people act entrepreneurially, and where many people work. We flock to London’s Queen Elizabeth Olympic Park, to Chicago’s Millennium Park and to Singapore’s Gardens in the Bay to spend our tourist pounds. We all know that a daily brisk walk in the park can cut your chances of suffering from coronary heart disease and stroke by 50%. And we expect parks to limit the impact of climate change, control flooding, absorb pollution, and promote biodiversity. But where does this understanding appear in the balance sheet?

As part of the work Jon Sheaff & Associates have undertaken for Barnet and Barking and Dagenham, we have deployed a new approach to green space asset accounting developed by our environmental economist colleagues Eftec for the Natural Capital Committee (NCC). The NCC has been tasked by government to assess the significance of natural capital assets to the national economy and the national infrastructure plan. In order to quantify the value of these assets, the NCC has developed, through the work of Eftec, a corporate natural capital accounting (CNCA) methodology. It is this methodology that we have used to develop CNCAs for Barnet (the first for a London Borough) and Barking and Dagenham. Similar studies have been developed for London as a whole, for Sheffield, and for Manchester.
In simple terms, the CNCAs for Barnet and Barking and Dagenham typify the nature of each borough’s green infrastructure assets with reference to the national vegetation classification, and assess the quality of each of these assets to form a ‘natural capital asset register’. A series of accredited national and local datasets are then accessed across a range of economic, social and environmental indicators to quantify the value of the benefits that accrue from the natural capital asset register and so develop a ‘natural capital monetary account’. An assessment is then made of the cost of sustaining these benefits in perpetuity (i.e. the cost of maintaining the green infrastructure portfolio) in a ‘maintenance cost account’. Finally, a comparison is made of the value in perpetuity of the benefits accruing from green space and the costs of maintaining these benefits in perpetuity, and this information is presented in a ‘natural capital balance sheet’.

For both studies, the natural capital balance sheet demonstrates a significant rate of return on investment in green space assets. In Barnet, the balance sheet suggests a 13:1 return, and this is likely to be a significant underestimate. The Barnet study was based on a defined portfolio of green space sites but excluded green belt (which constitutes nearly one-third of the borough’s surface area) and a range of other green infrastructure assets not under council management (including private gardens) – all of which make a considerable contribution to the generation of positive outcomes, especially in respect of biodiversity and climate change adaptation.

So what is the value of this data, and how might it be used to secure the future of our public spaces? Given the financial realities of living in the seventh year of ‘austerity’, green infrastructure asset managers need to make a robust case for resources against many competing needs, but have always struggled to demonstrate the value of outcomes. The CNCA process monetises these outcomes, demonstrating a direct correlation between investment and outcomes across a number of sectors. Scarce resources need to be targeted as effectively as possible to deliver the best range of benefits, and CNCA analysis demonstrates where investment can be most effectively targeted to deliver the greatest benefits.

For boroughs such as Barnet and Barking and Dagenham which will experience significant population growth over the next 20 years, CNCA data is being used to justify effectively targeted investment in new and existing green space assets. And targeting also means considering how to deploy resources to capture the potential value of future benefits.

Through our analysis, we established that an increasing population accommodated in high-density housing will generate a significant number of additional visits to parks and open spaces. We fully understand the financial value of health benefits that could accrue from these visits (expressed and valued as the avoided cost of treating ill health), so how do we intelligently target investment in green space to encourage users to adopt healthy lifestyles? What other approaches do we need to adopt to deal with the barriers to adopting healthy lifestyles through the use of green space?

These questions are put into full focus by work that we have done to compare levels of childhood obesity across Barking and Dagenham with the levels of provision and the quality of green space. The correlations are stark – low levels of park provision and poor-quality parks coincide with high levels of obesity. Needless to say, poor health is the consequence of a complex interplay of factors, but local environmental quality can have a significant impact. Recent research carried out by the Institute of Health Equity at University College London suggests that a significant percentage of poor-health issues are driven by social factors. But our simple mapping provides health and green space practitioners with an evidence base for addressing some of the barriers to good health through investment in capacity, quality, and programmes.

Our modern epidemics reflect the lives we live and are a function of the environment around us, in much the same way as the great epidemics of the 19th century rose out of the environment of the time. The response now should be the same: an intelligent investment in the fundamental elements of city infrastructure – including green infrastructure, which is principally our great parks and open spaces.

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Notes

Urban living brings us many benefits. Unfortunately, lack of contact with the natural world is not one of them. We know that city living creates levels of stress and anxiety. In turn, these negative emotions can go on to make people vulnerable to a number of serious health problems. Much of this stress is generated at a very sub-conscious level, and this is not surprising considering that, in evolutionary terms, humans as a species have only just moved into this environment. We have developed for the most part in pure and managed wilderness, and at a genetic level still very much respond to complex and varied vegetation that not so very long ago would have provided us with many of the essential clues as to how do find shelter, safety, food, and medicine.

The recent Local Government Association report Being Mindful of Mental Health reinforces the value of positive contact with nature. In a period in which planning generally favours densification within urban environments, this puts even greater emphasis on the need for creative green infrastructure approaches if we want our urban areas to support a healthy and happy society.

All landscape has a value, but most would agree that this can differ greatly from place to place. Generally, our contemporary landscape styles have been a natural extension of our gardening tradition. Strong control over nature and the use of imported resources have historically demonstrated our wealth and power – resources to waste combined with our ability to ‘control the wild’. This approach has led to the use of more resource-hungry plants sustained in improved soils, often within habitats that they do not naturally perform well in. The outcome is a continual battle between the desirable ‘aliens’ and the far better adapted ‘weeds’. The greater the struggle we make this, the greater the resource needs required.

Seeded Cities

Sue France explains how urban amenity grasslands can be reconfigured into ecologically diverse ‘pictorial’ wildflower meadows, and looks at some of the challenges and opportunities involved.

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Now, many of these landscapes are spectacular and greatly appreciated. There is nothing wrong with them in terms of intent or impact. The threat comes where year-on-year reductions in public funding dumb down the original planting schemes or where new developments fail to adequately resource ongoing landscape management from the onset. Management and maintenance are not the same thing. Management is the long-term care of the green resource by trained professionals over a lengthy timeframe. Maintenance is what is needed now to deliver the long-term management. As budgets shrink, good management is the first to be jettisoned, if it ever existed in the first place. Maintenance then often fails to deliver what is really needed.

There is a move away from landscapes composed of the complex planting that we most respond to – from gardens to floral bedding, floral bedding to ground cover, ground cover to mown grass, and mown grass to hard surfaces. When trees, probably the single most beneficial economically effective and environmentally sustainable planting solution in our cities, start being managed by auditors as ‘economic units’, alarm bells should start to ring. Felling urban trees unnecessarily may rightly hit the press and get local residents up in arms. Incrementally removing lesser landscape features happens all the time and is rarely remarked on until they have all gone. As plants are removed, skills and knowledge are also lost. Managers, gardeners and the public alike quickly start to lack confidence in adopting new and different approaches. The outside environment can quickly become sterile, ugly, unloved, and often downright hostile. This decline not only increases stress levels but has a negative impact on social behaviour and tends to discourage active citizenship. We saw this cycle spreading across the UK in the 1980s and almost inevitably it is happening again as local authorities reduce or close down parks departments, and similar patterns are seen with street scene, housing landscapes, and the urban public realm in general.

Is there a new way?

Twenty years ago new approaches to seeded ‘meadow-like’ landscapes started to be explored. The concept of ‘pictorial’ rather than traditional meadows came initially from Professors Dunnett and Hitchmough at the University of Sheffield, who had a vision for a new style of landscape combining beauty and ecology. A range of literature describing this style has followed, such as Dunnett and Hitchmough’s *The Dynamic Landscapes*,¹ Rainer and West’s *Planting in a Post Wild World*,² and Reif, Kress and Becker’s *Cultivating Chaos*.³ These works helped to establish a new way of thinking in the horticultural, academic and design world, but would these ideas survive the move from protected spaces into the ‘strapped-for-cash’ large-scale urban landscapes?

Working closely with Sheffield University, Sheffield-based social enterprise Green Estate set about a project that resulted initially in the temporary
transformation of some 300 hectares of housing demolition land. Earmarked for future development, these once no-go areas were suddenly transformed through flower seeding in a way that changed our approach to how our inner city landscapes could look. The creation of an almost rural idyll set across hitherto blighted urban landscapes where previously burnt-out cars and fly tipped-rubbish predominated was extraordinary, and not only demonstrated that ‘beauty on a budget’ was possible, but brought an almost immediate uplift in quality of life for all.

From here, these transitory and temporary landscape solutions made a step-change into more ambitious seeded landscapes. Fifteen years ago, again in Sheffield, what is now called Manor Fields Park was a 22 hectare wasteland in what had been branded ‘the worst estate in Britain’. Alongside new private housing development, the site acted as a test bed for large areas of highly experimental perennial seeding work. A perennial plant is something that lasts for many years, and once established it can go on to create self-sustaining communities. This differed from many of the earlier schemes that used annual sowings – beautiful, relatively easy and cheap, but in need of renewal every year.

Today, the neighbourhood remains one of the most deprived in the country, but house prices rose substantially and the park is loved by local residents and visitors alike. Extraordinarily long flowering displays among which people play, walk and socialise are sustained and have improved year on year through relatively minimal interventions at a fraction of the previous costs. A winner of the Green Flag Award for the past three years running, this approach has demonstrated that there are credible and cost-effective alternatives to amenity grass and formal planting schemes even in the most challenging of neighbourhoods.

The idea of seeding great swathes of our new landscapes with flowering plants as opposed to planting shrub beds, flower borders and even turf is radical. Apart from our use of grass and grass-based conservation mixes we have no tradition of establishing large-scale urban landscapes through seeding. The critical difference to note is that this is not a ‘throwing down’ of any old ‘wildflower seed’ and believing blindly that somehow Mother Nature will offer up either a culturally acceptable or maintenance-free solution.

This new approach looks at assembling native and non-native plants together in designed and dense self-sustaining communities. Hitchmough’s newly released book Sowing Beauty now provides a highly detailed account of how designs are composed and seeding recipes are formulated. Much of the work of seed supplier Pictorial Meadows has been to find ways of making these designs commercially available, and at an affordable price. Once they are established, management requires at the very least one ‘cut and collect’ a year and one inspection and weed control visit, although the reality is that two of both is preferable.

Seeded landscapes are inherently cheaper to establish in the first place than traditional soft landscape schemes. In new developments, the opportunity to manipulate the soil substrate brings another dimension, as the same mix established over different soils will inevitably develop unique characteristics according to the prevailing nutrient and moisture levels, as well as exposure and aspect. Developing appropriate seeding solutions has taken many years to refine, but today we have a
good understanding about what creates both failure and success. All involved acknowledge that there is a lot more to learn, but the future possibilities in design terms are almost endless. Not everything survives everywhere, and not everyone responds positively to the inevitable cycles of seasonal growth and decay. However, by introducing different patterns of differential mowing and having compositions that really draw the eye in spring, summer and autumn, extraordinarily beautiful floral and structural arrangements can be achieved for a large part of the year. While some weed control to remove ‘ugly’ weeds is inevitable, the density and dominance of the desirable plants are also largely resistant to weeds after year three.

So what are the barriers?

The main barrier to seeing many of these now well developed ideas rolled out across our towns and cities is a reluctance to acknowledge that our landscapes are living, dynamic entities and that long-term and intelligent management is required to keep them in conditions that are acceptable to, and indeed enjoyed by, the majority of people. We are used to the idea that all infrastructure will be specified and assembled ready to work immediately as designed, that the green infrastructure will not change in any way afterwards, and that ongoing management will be largely routine and can be undertaken by operatives with low commitment or training.

This mentality is completely at odds with the approach needed if we are to benefit from what is essentially a new technology. In fact, what is essential to success is completely the opposite. Specifications need to be worked out between landscape architects, engineers and specialist horticultural designers (which are in short supply) from the beginning, and the end result requires that critical ingredient: time. Thought also has to be given to how the vegetation will be managed, especially the essential annual cut. Different machinery may need to be deployed, and cut material will need to be removed and recycled as green waste. A commitment to skilled landscape and responsive management over the long term is also essential.

While the overall landscape implementation costs are relatively low, precise specifications must be followed, as comparative seed costs to create these landscapes are relatively high. Establishment also requires attention to detail under the supervision of someone who can differentiate undesirable species from desirable ones and give instructions to nurture the developing compositions as they should be. An acceptance that it takes around three years from sowing to the start of a relatively stable system is needed, as in an understanding that change will continue to occur and will require responsive adjustments. This does not fit with our current contract mentality and feels deeply risky for most managers.

The creation of the Queen Elizabeth Olympic Park using annual and perennial seeded landscape techniques highlights some of the factors that made this such an extraordinarily beautiful and successful landscape. First, planting design and long-term planting management was thought about from the outset. There was a shared approach to risk-taking. The best team was assembled which combined the skills of Dunnett and Hitchmough with other planting designers, landscape architects, landscape engineers, ecologists, and soil scientists. On-site research and a good lead-in time was allowed. Weed-free soils were brought in. The design wasn’t ‘value engineered’ down at the last minute, which is all too common with soft landscape features. High-quality designed seed mixes were used, and great attention to establishment – especially the critical establishment year – was provided.

Much of the learning from the early work in Sheffield and the Olympic Park has been used to roll
out different approaches across the country and in different environments, from private estates through to social housing, parks, highways, and new developments. Seeding is not the only option, and other methodologies, including pre-grown Pictorial Meadows flower mats and container plants, are being used successfully in an increasingly wide range of schemes. What they have in common, though, is this concept of dynamic change, simple management, and long herbaceous flowering displays with self-sustaining seeding being encouraged.

Sheffield’s ‘Grey to Green’ infrastructure scheme, which opened in 2016 and which now forms an important part of the city’s inner ring road system, uses research originally developed in Europe but refined in Sheffield. It deploys container-grown plants and bulbs planted into deep gravel overlaid across sub-soil. This greatly reduces the quantity of imported weed seeds that come in largely through topsoil into new development sites. It also creates a hostile surface environment, making it more difficult for weeds to take a hold. The gravel is moisture retentive (good, as our summers get hotter and drier), but also dry on the surface, which allows a much wider range of plants that might not tolerate our damp cool conditions to co-exist happily and provide an extended flowering period. Again, managed simply but with intelligence, these flower-packed landscapes greatly enhance harsh urban landscapes for people and pollinators.

The value of long-season flowering, pollen and nectar-rich food supplies for urban pollinators is another area in which recent research shows evidence of the value of these approaches for wider ecosystem services. The fact that this scheme is also the UK’s largest retrofit SuDS (sustainable drainage system) scheme, designed to filtrate and balance surface water run-off from the highways, shows just how robust and multi-faceted these approaches can be.

This is still a new approach, and to date few people have had the chance to experience seeded and high-quality naturalistic landscapes specifically designed and managed for urban environments. Change will take time. The notion that the planting is likely to develop a life of its own and that seasonal and long-term change is to be celebrated and encouraged is challenging to our current grounds maintenance culture. There is no silver bullet when it comes to resources, either. No landscape is maintenance free, and this truth needs accepting. Some landscapes, though, offer up greater rewards for fewer resources. Confidence comes with experience, and there are sufficient examples out there and a growing body of engaged practitioners to help encourage others to take the plunge to support a healthier and far more satisfying environment for us all to live in.

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The views expressed are personal.

Notes
going local
After five years of neighbourhood planning, it often seems that everything is even more centralised and subject to groupthink than ever, says David Boyle

the IKEA floods and the perils of groupthink

When I bought my house a few years ago, on the edge of the South Downs, I was surprised to read in the survey that the chances were that it would not be flooded for about a thousand years. This seems to me a somewhat foolhardy promise, and one that I’m unlikely to be able to verify personally (perhaps the logical positivists will deem it ‘meaningless”).

It seems so partly because, if a thousand years ago I had lived a little further down the hill, I would have been right in the middle of what was then the Adur estuary; and partly because, in those days, my town was a thriving port. This all means that flood plains are important. It also means that they have been drained over the centuries, and consequently flooding is pretty disastrous every decade or so. It also means that some flood plains a little nearer the sea are still very well used as such.

That is why I have been pretty astonished by a planning application, which seems about to go through as I write, that proposes a new IKEA store and 600 homes on the flood plain at New Monks Farm near Shoreham Airport. This is not really a column on this particular development, about which there is information widely available. It is about why, under sophisticated and devolved planning, we still get foisted with potentially disastrous plans like this one.

It reminds me in this respect of the scandal of the Grenfell Tower cladding. Why do devolved organisations nod through cheap, inflammable cladding – and why do apparently devolved and responsible organisations get behind plans which will involve the flooding of Lancing, next door? Is it really because, in both cases, they turn a blind eye and accept the assurances from the promoters involved and because those who will suffer are less powerful and less adept at manipulating the system?

Why does a reputable and responsible company like IKEA get involved in a project like this one? Why does it accept the assurances on flooding – because it wants to, because the project is lucrative, or because some other peculiar blindness kicks in?

A similar question holds for why we are doing away with the hard shoulder on motorways. Because safety is just too expensive these days? Who takes these decisions? Why do those who sit on the committees agreeing these things accept the assurances they are given?

In short, what is the matter with the UK that, all down the hierarchy, committees adopt this credulous groupthink which undermines the kind of scrutiny that is needed? Is it because we treat those who stand out with contempt? Is it that public policy, and planning, is now so obsessed with its role as boosting economic growth that it cannot bring itself to express doubts? It is true that the promoters of the New Monks Farm plan claim benefits to the local economy of £11 million and a thousand new jobs. But these are precisely the kind of vacuous figures that get in the way of decision-making. What about the negative costs? What about the extra insurance costs for surrounding homes, sucking money out of the locality again? What about the costs of cleaning up after flooding elsewhere? What about the ruined air quality from the inevitable extra traffic (as those who live near the IKEA store in Croydon will know)? Or the health effects and premature deaths from pollution, or the time wasted on the clogged A27?

Probably some of IKEA’s executives will have this article pointed out to them and will seek assurances down the line, and will judge themselves satisfied. They should not – and would not if they could see the history of the area clearly. But the real point is just how much groupthink and wishful thinking gets in the way of devolved decision-making. Or is it that the decision-making is not devolved at all? Is it second-guessing the Secretary of State, who will call it in and then accept the assurances as well?

Perhaps the real problem is that groupthink and deference – a miserable combination – is more of a symptom of centralisation. Perhaps the real problem, after five years of neighbourhood planning, is that the whole system seems even more centralised, even more concrete, and even more subject to groupthink than ever. And it is local communities and families whose lives will bear the brunt of the failure to provide them with the powers they need.

David Boyle is co-director of the New Weather Institute and the author of The Berlin Affair (Endeavour Press). The views expressed are personal.
designing new communities for the 21st century

the art of building a garden city

The concept of the Garden City is perhaps the most radical and relevant legacy of British town planning and the utopian tradition. Its pioneers aspired to provide a blend of environmental sustainability, social inclusion and steely economics; a new kind of mutualised community with the highest standards of design accessible to all and profits of rising land values shared for the benefit of everyone. With the nation now facing an acute housing crisis, these principles are more relevant than ever.

Heavily illustrated with photos and case studies, this guide to the history of the Garden City movement and the delivery of a new generation of communities for the 21st century is essential reading for anyone involved in planning, designing or delivering new, Garden City-inspired communities at a range of scales.