

Case for Support: 1 Expertise for NERC KE Urban Fellow position: Prof Scott is a geographer and applied academic in environment and spatial planning with expertise in undertaking interdisciplinary/transdisciplinary research projects. He is a chartered planner (Royal Town Planning Institute: MRTPI). His research focus on improving policy and decision making through the fusion of ecosystem science and spatial planning equips him theoretically and practically to respond to the opportunities and challenges within this timely urban Green Infrastructure (GI) fellow call. Specifically: (1) The call sits within Northumbria's Bioeconomy multidisciplinary research theme, which Scott leads for the department. (2) He led the UKNEAFO (2012-2014) (NERC part funded) package on developing a tools framework for mainstreaming ecosystem services in policy and decision-making with GI exemplars included (e.g. Birmingham, Bridgend¹). (3) He is communication adviser for the built environment in NERC BESS² and Esmee Fairbairn Biodiversity Planning toolkit³ projects. (4) He has a critical appreciation of UK/English spatial planning and is recognised as an academic/policy expert and media champion across the built environment. (5) He has successfully managed 4 complex RCUK funded research projects championing co-design/co-production research models. (6) He is currently a CI on 2 NERC funded projects involving the explicit use of GI in different spatial planning settings. (i) As part of the Natural Capital Planning Tool project⁴ he has completed a desk policy review of GI strategies and policies in local plans across 7 planning authorities (London, Birmingham, Southampton, Central Bedfordshire, South Downs, Shropshire and Solihull; all potential case study for this project. (ii) In the Urban Living Programme Birmingham pilot,⁵ he is leading a WP to cultivate citizen-led innovation on how GI can be embedded within natural city ecosystem within SMARTer city system thinking.

2. Rationale: GI has been the focus of academic and policy research that has consistently highlighted its potential to address a range of environmental, economic and social challenges in urban placemaking. However, its potential has been hindered by a lack of definitive evidence and quantification of claimed benefits; its perceived environmental jurisdiction and characterisation and its lack of political prioritisation in the UKs rapidly changing governance frameworks. The resulting institutional landscape is now crowded and complex, predicated upon economic growth with siloed agency remits covering different geographies and sectors, in an increasingly disintegrated picture (Scott et al., 2013⁶). Consequently, the values and benefits of GI often remain hidden and unaccounted for in planning proposals and decisions where conventional cost benefit assessments and resource economics are used in their appraisal. This has made GI vulnerable to loss or neglect particularly given pressure on local authority budgets and developer profit optimisation. So whilst there is strong GI policy guidance within the National Planning Policy Framework (NPPF (par. 114) and Natural Environment White Paper NEWP (par.1.18; 2.80), this is readily trumped by viability (NPPF par. 173) and economic growth (e.g. BEIS Industrial strategy 2017) considerations nationally and locally⁷. Progress is being made, however, within NERC's research agenda through natural capital and ecosystem service assessments and within recent VNN projects on health and well being⁸ and 14 targeted GI innovation funded projects⁹, signalling much needed investment in aspects of the GI evidence base.

It is against this challenging and changing context that the NERC KE urban fellow needs to operate delivering impact and changing the way GI is viewed and used by key agents involved in policy and decision making processes and ensuring that any mechanisms or outputs are accessible and usable across all planning practice. This demands a significant shift from the production of complex models and tools for GI towards more pragmatic outputs which can be mainstreamed across planning practice. Thus a multimodal approach is promulgated that is rooted in a comprehensive

¹ UKNEAT tree <http://neat.ecosystemsknowledge.net/birmingham2.html> accessed 27th April 2017

² NERC BESS project <http://www.nerc-bess.net/> accessed 4th April 2017

³ Biodiversity Planning Toolkit project <http://www.biodiversityinplanning.org/> accessed 4th April 2017

⁴ Injecting a Natural Capital Planning Tool into Green-Blue Infrastructure Management NE/N017587/1 http://gotw.nerc.ac.uk/list_full.asp?pcode=NE%2FN017587%2F1&cookieConsent=A NERC 2016-2018

⁵ Urban Living Programme Birmingham Pilot Accessed 4 April 2017

<http://www.birmingham.ac.uk/schools/business/research/research-projects/urban-living-birmingham-project.aspx>

⁶ Scott, A.J., Carter, C.E., Larkham, P., Reed, M., Morton, N., Waters, R., Adams, D., Collier, D., Crean, C., Curzon, R., Forster, R., Gibbs, P., Grayson, N., Hardman, M., Hearle, A., Jarvis, D., Kennet, M. Leach, K., Middleton, M., Schiessel, N., Stonyer, B., Coles, R. (2013) Disintegrated Development at the Rural Urban Fringe Disintegrated Scott (2011) : Re-connecting spatial planning theory and practice Progress in Planning 83 1-52

⁷ Select Committee on National Policy for the Built Environment (2016) Building Better Places

<https://www.publications.parliament.uk/pa/ld201516/ldselect/ldbuilt/100/10002.htm> accessed 10 April 2017

⁸ <http://valuing-nature.net/health-wellbeing-research-projects> [accessed 20 April 2017]

⁹ <http://www.nerc.ac.uk/funding/application/outcomes/awards/2015/green-infrastructure/> [accessed 20 April 2017]

understanding and application of both the science and practice of the English spatial planning as it impacts upon GI. **As a knowledge exchange fellow I see my role as a catalyst integrating multiple planning policy and practice viewpoints across key stakeholders who use/shape the planning system. These participants will co-produce the projects outputs within a managed process that is developmental, pragmatic and peer reviewed; delivering a suite of guidance, tools and resources that mainstream GI in policy and decision making thereby embracing the government's economic growth and quality of life agendas.**

To achieve this I will create and manage safe and effective learning “spaces” for key spatial planning stakeholders within a coherent, transparent and flexible project framework. Here, innovation, creativity and knowledge exchange is cultivated integrating workshops within an applied policy Delphi model to learn lessons building upon an evidence base of previous/extant and emerging GI NERC-relevant science and policy exemplars/experiments¹⁰ within which co-production methods can be situated. In support of this approach, I have teamed up with the Town and Country Planning Association TCPA, a recognized NGO champion and thought leader in GI innovation, policy, research and practice in a 3 year secondment. In particular, their leadership of the Green Infrastructure partnership (GIP) and the EU Interreg PERFECT project provide key resources for the project to draw upon. Reflecting from my own GI research experience thus far, in conjunction with policy partners, I have identified 4 GI challenges which underpin my proposed work. **(1) What constitutes success in the provision and delivery of GI in the planning system? (2) How can we translate existing NERC science associated with the value and benefits of GI into fit for purpose delivery tools for policy and practice? (3) How can we evaluate the added value of GI planning policies and interventions? (4) How can we change/influence behaviour(s) of key actors in the planning arena regarding their valuation and use of GI?** These challenges are addressed through 7 objectives, linked to 7 workstreams (WS) with associated deliverables which are unpacked in the workplan.

- To provide improved intelligence and guidance on GI as a multifunctional natural asset to support planning interventions at multiple scales WS1 WS2 WS3 WS4 WS5 WS6
- To understand the needs of different audiences in the formation, delivery and evaluation of planning interventions to target more effective GI interventions and promote behaviour change WS2 WS3 WS4
- To learn lessons from past and present NERC research and policy practice interventions that apply to successful/failed GI delivery and decision making WS1 WS2
- To co-design and implement effective and fit for purpose tools and delivery mechanisms for the incorporation of GI in decision-making in different spatial planning settings WS3 WS5 WS6
- To inform and influence the future direction and content of national/local legislation, policy and guidance affecting GI at multiple scales (EU, national, sub-regional, local authority and neighbourhood plan) WS2
- To inform and influence current NERC projects and impact pathways through sharing of project outputs and to help scope additional areas for future NERC research on GI and the planning system WS1
- To develop an accessible web portal with dedicated key audience pathways to enable users to navigate the key messages and outcomes of the project and apply them in their own urban settings from neighbourhood to national scales. WS7

The methodology is both fluid and flexible given the nature of a KE fellow. However, it should form a coherent and developmental project framework. 7 workstreams (WS) collectively tackle the challenges, aims and objectives outlined above. To ensure that tools and delivery mechanisms are “oven ready” the work is focussed within England's planning system (the UK now has different planning systems in each of the 4 jurisdictions). However, a dedicated devolved government user group in WS3 will ensure that the outputs will be directly transferable to their situations.

(1) What does success look like in the provision and delivery of GI in the planning system? The key to unlocking this challenge is the securing and sharing of different viewpoints from multiple participants who actively shape and use the planning system within a consensual vision of GI covering policy, delivery and decision-making aspects that is bold, pragmatic and proportional (WS3 and WS5). Developing a better understanding of the breadth and depth of UK spatial planning (SP) science and practice, which is often interpreted in rather narrow and negative landuse terms, forms an

¹⁰ E.g. Lennon, M. (2015) Green infrastructure and planning policy: a critical assessment. *Local Environment. The International Journal of Justice and Sustainability*. 20 (8) 957-980: Sinnott, D., Calvert, T., Martyn, N., Williams, K., Burgess, S., Smith, N. and King, L. (2016) Green infrastructure: Research into practice. Report. University of the West of England.

important prerequisite here¹¹. SP is a positive process forming part of a wider set of integrated outcomes for improved placemaking and economic growth. It operates across multiple scales (Global, EU, National, Strategic, Landscape, Local and Neighbourhood) and across multiple sectors (e.g. economic growth, landscape, housing, environment, community) requiring integrated policy and practice approaches in effective partnerships. This challenges silo mentalities and disintegrated development (Scott et al., 2013¹²) and imposes challenges on the way government departments work towards developing shared goals and agendas; National Infrastructure Commission, Defra (forthcoming 25 year environment plan) and BEIS (Industrial Strategy) National Planning Policy Framework (NPPF) and associated guidance (NPPG). It raises questions of how new layers of governance interface with extant layers and geographies. For example, the way Strategic Economic Plans of Local Enterprise Partnerships intersect with statutory local plans and neighbourhood plans. Indeed, the way that GI is framed within these plans/policies has critical implications for its weight in investment and development management decisions. This includes, initial design aspects of projects and masterplans, largely in the private sector; pre-application guidance and subsequent planner/specialist negotiations/consultations; planning tools and techniques used to secure GI outcomes (e.g. section 106 agreements, conditions, community infrastructure levy, natural capital assessments and ecosystem services assessments, environmental impact assessments, tax incremental financing) and post-decision processes (appeals, inquiries and enforcement) as explored in WS4. There is also a need to examine the role of building regulations (building services) covering use of SuDs, green roofs and greywater systems etc. The incorporation of building services functions and staff into this project in examples addresses a significant research/practice gap.

(2) How can we translate existing NERC science associated with the value and benefits of GI into fit for purpose delivery tools for policy and practice? This challenge is about harvesting the rich research reservoir of past/extant NERC and other RCUK science and applying/translating it to develop viable GI delivery mechanisms/functional tools for planning practice (WS1). At present, there is a significant disconnect between research and associated outputs being suitable for mainstreaming in planning policy and practice. Often the tools created are bespoke and/or expensive using software that is not present/compatible/usable across planning authorities. NERC are partly addressing this gap through their recent support for 12 NERC GI innovation projects with strong impact pathways. Furthermore, 3 recent VNN projects deal explicitly with urban GI value and benefits (e.g. mental health, well-being and old age) whilst the NERC Urban BESS programme offers intelligence on using urban ecosystem services within planning for the Milton Keynes/Bedford region. The 5 RCUK urban living pilot projects also have significant GI components to unpack. Thus it is important to capture the science, tools and lessons learnt therein and, access the wider NERC network, through a process of active engagement with NERC Fellows and PIs/CIs. Desk study and phone interviews will be used to inform a lessons learnt workshop and report that identifies potential impact and product pathways for planning policy and practice. A parallel process is used to investigate and capture best practice policy and practice interventions and lessons learnt in WS2. Here the work of Sinnott et al., 2016: TCPA (2012)¹³ together with my own NERC 2017 policy reviews are built upon through our policy and practice networks to identify and interview key thought leaders and practitioners in reflexive modes to capture both good and problematic GI spatial planning practice. This evidence will be supported by the 2017 annual TCPA GI conference. WS1 and WS2 outputs inform the selection of 6 in depth “living laboratory” case studies across different GI planning settings which capture and assess critically the way current actors engage with GI in the planning process. A combination of observation, interview and participant reflexivity techniques is proposed (WS4). In WS3 a hybrid Delphi post-workshop model¹⁴ involving specialist user panels (Planning Academics, Councillors, Professional bodies, PINS, DCLG, Public, Private and Voluntary sector and UK devolved governments) is used over 4 rounds with outputs shared within and across each group as the Delphi process evolves. This runs in parallel with an integrated TCPA Green Infrastructure Partnership group (WS5) which is synchronised into the Delphi (see workplan). Both WS5 and WS3 co-produce a workable set of guidance, tools and mechanisms that can be delivered on the ground. Pilot testing (WS6) using 3 different case studies allows for robust testing with the production of a final set of output materials in a web portal (WS7).

¹¹ See footnote 6

¹² See footnote 6

¹³ Footnote 10: TCPA (2012) Planning for a Healthy Environment, good practice guidance for green infrastructure and biodiversity, Wildlife Trusts: TCPA: London

¹⁴ Glass, J.H., Scott, A.J., Price, M.F. (2013). The power of the process: Co-producing a sustainability assessment toolkit for upland estate management in Scotland. *Land Use Policy*, 30(1), 254-265.

(3) How can we evaluate the efficacy and additionality of GI planning policies and strategies? This challenge is about establishing a baseline from which the success of any GI intervention can then be monitored. Additionality can only partly be measured, however, given the time delays for policy and practice interventions to feed through into the system (WS4). Thus developing agreed universal indicators for use in planning performance is a key goal. This will be done via WS3 and a WS5 dedicated workshop. Currently the monitoring and evaluation of GI policies and strategies is poor and usually bolted on retrospectively (Scott et al., 2017)¹⁵. Thus we need to develop an evaluation tool that measures policy and practice impacts and placemaking benefits/outcomes. Here, the different types and qualities of GI, the different demand and supply profiles affecting GI resourcing and resulting impacts on urban investment priorities and the different GI interventions and associated impacts on ecosystem services and natural capital; all need to be considered .

(4) How do we change/influence behaviour(s) of key actors in the planning arena regarding the value and use of GI? Behaviour change is difficult to achieve in practice. In this project, I argue we need the involvement of key stakeholders and users of the planning system in all its phases. Consequently, the project actively uses multiple groups with a stake in planning policy and decision making (WS5 WS3) to co-design, peer review, test and validate the emerging project outputs. Engendering this kind of ownership within the project through a coproduction model with participants being paid for involvement (see JOR), helps build meaningful and resilient relationships within a new social learning environment which takes participants outside usual work boundaries thus creating the conditions within which a behaviour change agenda can be pursued. My role as a catalyst creating “safe” spaces within which knowledge exchange and social learning occurs is key to success (McMorran et al., 2014)¹⁶. The combination of face to face workshops supported by a Delphi mode of iteration with shared intelligence, exposes participants to NERC science and evidence and its subsequent translation and verification across multiple viewpoints and through my active summarisation of materials, helps signpost areas of consensus from which to build viable policy interventions and delivery mechanisms. It is from this WS fusion that new insights and GI potential will be created, shared and contested and validated enabling pragmatic change within existing governance frameworks by “punching the edges of the box” rather than the more populist and idealist notion of trying to “think outside the box”.

Impact Pathways flow directly from meeting the 4 GI challenges incorporating the evidence/ideas/views of multiple stakeholder perspectives who are key to the successful operation of the planning system. Here the recruitment of key individuals across the user groups as project champions presents a key operational requirement to build the impact pathways. Crucially I am able to access participants through my current planning research on GI as well as exploit my RTPi and university networks and TCPA partner networks. Their involvement through key project phases and the subsequent KE and social learning will enable project participants (65 people minimum) to become project champions/ambassadors within their own networks thus building a powerful legacy component. Crucially this project engages with representatives from public, private and voluntary sectors and key decision makers that is indeed rare and reflects a wider goal to produce a transferable method that acts as an example for wider spatial planning practice. The secondment with TCPA as a project partner provides ready access to the 1000+ membership of Green Infrastructure Partnership network with proposed TCPA publications in their journal and a final project report. Working with professional institutes opens up key impact pathways through their own professional networks through bespoke policy briefings that draw upon the projects results. In addition the project has other impact strands through the WS'. WS1 identifies new impact pathways from NERC science whilst WS2 captures best practice in past/current GI policy and practice. Thus both provide core evidence to inform and respond to emerging policy and legislation as it happens over the next 3 years through policy briefings and formal consultation responses to government and/or committees. The project, however, seeks primarily to influence and update NPPG and building regulations content on GI as perhaps its key impact pathways. The rigour of the co-produced outputs fashioned by key planning stakeholders helps maximise the chance for our evidence to be accepted/used to guide the daily work practices of built environment professionals in England. This is then applied through the involvement of devolved UK governments within separate impact strands to their own planning systems. The web portal is a powerful KE and legacy component designed with dedicated pathways for key user groups and publics to navigate GI resources according to their particular working priorities and needs.

¹⁵ Scott, AJ, Sadler J and Holzinger, O. (2017) *Making Plans for Green Infrastructure in England: Review of National Planning and Environmental Policies and Project Partners' Plans*, Report to NERC NE/N017587/1

¹⁶ McMorran Scott A.J and Price, M. (2014) Reconstructing sustainability; participant experiences of community land tenure in North West Scotland, *Journal of Rural Studies* 33 20-31