

Institution: Oxford Brookes University

Unit of Assessment: 13. Architecture, Built Environment and Planning

1. Unit context and structure, research and impact strategy

Research context and structure

UoA13 at Oxford Brookes comprises 47 submitted staff (41.41FTE) in the Schools of Architecture (SoA) and Built Environment (SBE) within the Faculty of Technology, Design and Environment (TDE). The disciplinary specialisms of staff across the UoA are diverse, including planning, urban design, real estate, construction management, architecture, conservation, architectural technologies and engineering, as well as cognate subjects such as history, geography, law and anthropology. TDE also includes the School of Arts and the School of Engineering, Computing and Mathematics. Faculty research activity is overseen by the Associate Dean for Research and Knowledge Exchange (ADRKE). Dedicated administrative support is provided by the Faculty Research Support Office (RSO), headed by a Faculty Research Manager (RM). Each School has research groups and a Research Lead (RL) responsible for strategic leadership and coordination.

Since 2014, there has been a step change in the scale, ambition, scope and impact of research in UoA13. Research spend has trebled across the period from c.£2.490.000 in REF2014 to c.£7.755.000. Significant changes have been introduced in departmental organisation, research groups, support structures and processes. SBE was formed in 2015 by a merger of the former Departments of Planning and Real Estate & Construction, reinforcing complementarities and the sustainability of research activities. From 2019, five former research groups in SBE have been reorganised into three new interdisciplinary groups: Land, Design and Development (coordinator: Shirazi); Planning, Policy and Governance (Valler); and Smart Construction and Impact Assessment (Kurul). These operate alongside five research groups in SoA: Architectural Engineering (Resalati); Low Carbon Building (Gupta); Centre for Development and Emergency Practice (CENDEP, Brun); Design Theory and Practice (Sworts); and Place, Culture and Identity (Vellinga). Together the eight groups contribute to the Oxford Institute for Sustainable Development (OISD, led by Gupta), which serves as an umbrella organisation to facilitate interdisciplinary networks and external engagement, and to promote sustainable development research. Additional changes include the introduction of a Faculty Doctoral Training Programme (DTP) in 2016, the implementation of School sabbatical schemes, and the establishment of a Faculty-wide Peer Review College.

UoA13 has delivered strongly on its strategic research priorities set out in REF2014. These emphasised the future consolidation of research in: (i) designing and planning for resilience and climate change; (ii) people, energy and buildings; (iii) innovations and energy transitions; (iv) spatial planning and mobility; and (v) inclusive communities and livelihoods. Significant progress has been made in each of these areas, as exemplified in the following projects and impacts under each theme:

In (i) designing and planning for resilience and climate change '*Care provision fit for a future climate*' (**Gupta** et al, JRF, 2016) provided an innovative interdisciplinary examination of how far existing care homes and other care provision facilities in the UK are fit for a future climate, with a focus on overheating. Findings from the JRF study have been used in the UK's National Adaptation Programme and Climate Change Risk Assessment 2017 to emphasise the need for research in health and social care. The JRF project led to the NERC-funded research initiative on '*Climate resilience of care settings'* (*ClimaCare*) in 2019 (£252,000 in total, 2019-2021, £97,300 to OBU) led by UCL and including LSHTM, bringing together an interdisciplinary team of architects, engineers, social scientists and health scientists to develop a better understanding of the factors that contribute to summertime overheating in care homes in London and the subsequent negative health impacts. In May 2020, ClimaCare research was expanded nationwide through the NERC-funded project '*Governing the Climate Adaptation of Care Settings*' (£758,352 in total, 2020-2022, £289,385 to OBU) also led by UCL to address climate related heat risks in care settings. These NERC-funded projects are part of the UK Climate Resilience Programme.



In (ii) people, energy and buildings, **Gupta** has led a Building Performance Network (BPN) funded study to lead the first-ever '*state of the nation review on low energy housing performance and resident experiences of the indoor environment*' (£30,000, 2018-2020). He is lead academic on a c.£1,200,000 (total funding, £186,000 to OBU) BEIS thermal efficiency innovation grant (T-cosy) on '*deep energy retrofit of a 1960s block of flats using innovative insulation and ventilation technologies*' (2018-2021); PI of a c.£1,300,000 UK-India EPSRC/DST project on '*residential building energy*' (RESIDE, 2017-2022, c.£773,000 to OBU) and lead academic of a £703,000 BEIS-funded domestic demand side response project (BREATHE, 2019-2022, £220,000 to OBU).

In (iii) innovations and energy transitions, **Resalati** is Oxford Brookes lead on three major H2020 funded projects concerning innovative cladding solutions with a focus on advanced insulation materials, energy generation, energy storage and next generation thin film solar cells. '*Innovative multi-functional Vacuum-Insulation-Panels (VIPs) for use in the building sector' (INNOVIP)* (Total Grant €5,800,000, 2016-2020, c.€330,000 to OBU) designs and develops innovative vacuum insulation panels with lower environmental impact, easier workmanship and lower production costs. '*Highly advanced modular integration of insulation, energising and storage systems for non- residential buildings' (POWERSKIN PLUS)* (€5,900,000, 2019-2023, c.€412,000 to OBU) is developing and scaling-up eco-innovative, cost-effective and smart material solutions to renovate existing facade systems of both double skin and advanced integrated curtain walls. '*Disruptive kesterites-based thin film technologies customised for challenging architectural and active urban furniture applications' (CUSTOM-ART)* (€7,000,000, 2020-2024, c.€214,000 to OBU) aims at developing the next generation of building and product integrated photovoltaic modules (BIPV and PIVP respectively), based on earth-abundant and fully sustainable thin film technologies.

Resalati also leads the Building Physics and Structures Laboratory which provides 'close to industry' consultation to a broad range of clients including steel manufacturers such as Tata Steel Europe, housing developers such as Berkeley Homes, modular fabrication manufacturers such as Fusion Systems, and innovative building solutions companies such as Sapphire and Shoeck. The value of the consultancy projects since 2014 is in excess of £1,000,000.

Additionally, **Gupta** is leading a number of major research projects in smart local energy transition. He is Co-Investigator on a c.£13,740,993 Innovate UK-funded '*smart local energy demonstrator*' (Local Energy Oxfordshire-LEO, 2019-2023, £759,000 to OBU) – one of the four national smart local energy systems (SLES) demonstrators. **Gupta** is also Co-I of the c.£9,063,172 EPSRC-funded '*EnergyREV-Core consortium*' (2018-2023, £400,421 to OBU) of 20 universities that seek to provide the evidence for scaling up smart local energy systems. He is also Co-PI of EPSRC funded '*EnergyREV-Plus project*' (£382,572 total grant, 2019-2023, £320,914 to OBU) on user influence tools for enhancing user engagement with SLES, leading a team of researchers from the Universities of Oxford and Exeter. LEO and EnergyREV projects are part of the 'Prospering from the Energy Revolution' strand of the Industrial Strategy Challenge Fund (ISCF). These projects build on the ESRC-funded '*evaluating low carbon communities'* (*EVALOC*) project led by **Gupta** (c.£1,144,509, 2011-2015, c. £600,000 to OBU) and Innovate UK-funded '*smart storage of domestic solar electricity'* (ERIC, £812,075 total grant, 2015-2017, £73,996 to OBU) project which also received two Energy Awards in 2016.

Also in (iii) innovations and energy transitions, Durning et al's 'Socio-economic impact of the European Offshore Wind Deployment Centre (EOWDC)' was funded by Vattenfall UK to study the impacts of the Aberdeen Offshore Windfarm (£298,000, 2017-2020). This provides a robust evidence base of actual socio-economic impacts at local and regional scales, helping to reduce uncertainties in future assessment practices. **Sibilla's** Marie Curie fellowship (€183,000, 2017-2019) was focused on the development of an innovative learning platform (i.e. C-mapER) dedicated to knowledge exchange and transfer among Built Environment disciplines. The Platform deals with inter- and transdisciplinary knowledge exchange practices, promoting the emergent topic of energy retrofit as a tool for low carbon transition.

In (iv) spatial planning and mobility, the '*cycleBOOM*' research project (**Jones**, **Spencer** et al, with Universities of Reading, Cardiff and West of England; EPSRC c.£1,200,000 total grant, 2013-2016,



c.£400,000 to OBU) has influenced policy towards age-friendly environments and technologies for cycling and helped shape the debate on the positive role of e-bikes as part of a healthy, low carbon transport system. The project won the Academic Award category at the 2017 RTPI Awards for Research Excellence and forms a key element of the impact case study 'Co-Creating Age Friendly Cities for Cycling'. Subsequently '*Healthy Urban Mobilities*' (Jones, Brownill, Keivani, Butina-Watson) was funded under the ESRC Newton Fund Healthy Urban Living programme (2016-19, £336,000 to OBU plus £300,000, FAP-DF match funding, for three partner institutions in Brazil). This study aimed to understand the impact of everyday (im)mobility on health and wellbeing with a variety of social groups living in different neighbourhoods in Brazil and the UK, and also to explore the potential for participatory mobilities planning with local communities to support and develop solutions for healthy urban mobility.

In (v) inclusive communities and livelihoods, projects include: **Brownill** et al's '*Planning obligations*: what factors deliver affordable homes and what alternatives are there?' (JRF, £75,000, 2014-15); **Carpenter's** 'Social Sustainability and Urban Regeneration Governance: An International Perspective' (SURGE, H2020, 2017-2020, £220k); **Brownill/Carpenter's** (2017-2020) 'Co-creation" research and knowledge exchange in the field of socio-spatial segregation and urban territorial stigmatization' (H2020, Marie Curie RISE programme, c.£450,000); **Cho** et al's ESRC UK-Japan Network 'Enhancing housing affordability and social care in Japan and UK - comparative evaluation of policy and practice' (£48,000); **Shirazi's** '(Un)Just Neighbourhoods: Socio-Spatial Justice in Urban Neighbourhoods' (H2020, Marie Curie Global Fellowship 2017-2020, c.€269,000) and **Shirazi** (2015-2017) Contribution of Compact Neighbourhoods to Social Sustainability (H2020, Marie Curie Fellowship c.€309,000).

Drawing on this research, SBE is currently seeking support for a new initiative – the 'Oxford Urban Justice Lab' (OxLab). This is a proposed cross-university, community-oriented research, practice, and teaching unit focusing on urban justice and urban equity. OxLab will establish active collaboration with RIKE networks at Brookes, and aims to promote a holistic and integrative approach to urban equity, establishing long-term action-research collaboration with local authorities, research organisations and communities, and contributing to programmes that address socio-economic and environmental disparities.

Beyond these priority themes, new areas of work including 'Health, Disability and Design' have emerged in the intervening period in response to ongoing societal challenges and evolving disciplinary research agendas. While other long-standing areas of engagement such as spatial planning and development, urban design, vernacular architecture, historic conservation, architectural regeneration, and humanitarian and emergency practice, have continued to grow and develop. Notable projects include: Brun's 'From education to employment? Trajectories in protracted displacement for young people in Lebanon' (ESRC, 2018-2021, c.£382,000 to OBU); Brun/Parrack's 'Self-recovery housing for development: Scaling up crisis preparedness and humanitarian shelter response' (EPSRC, 2019-2021, c.£690,000; £123,000 to OBU); Carver's 'Does torture prevention work' (Association for the Prevention of Torture, 2012-2016, US\$1,222,947; not HESA returnable income); Akerkar's 'Age and Disability Capacity Project' (DfID and OFDA, 2014-2018, £73,000; not HESA returnable income); Vellinga's 'Encyclopedia of Vernacular Architecture of the World (EVAW2)' (Bloomsbury Publishing, 2015-2022); Baker's Proceedings in Parliament 1624: The House of Commons; Vellinga's 'Erwin Anton Gutkind: Architect and Scholar' (British Academy, 2014-2016, £6,600); Orbasli's 'Communityled Heritage Regeneration in India' (AHRC/ICHR Newton, 2016, £24,250); and Valler's 'Global Science 'Scapes: Dimensions of Transnationalism' (Leverhulme Trust, 2014-17, c.£118,000).

Two new awards exemplify the evolution of these research areas. A new grant-giving programme on Endangered Wooden Architecture (**Vellinga** and **Orbasli**, 2021-2026) will start in 2021, building on the UoA's portfolio of work on vernacular architecture (Arcadia Fund, £5,000,000). **Rowden's** '*Virtual Justice: Enhancing accessibility, participation and procedural justice in family courts and tribunals during the COVID-19 pandemic'* (ESRC Covid-19 funding, Total grant c.£262,000; led by University of Oxford; £ 69,256.00 to OBU).

Interdisciplinarity is central to research strategy, structures and projects. Innovative disciplinary combinations include: (i) building science, social science, computer science (*RESIDE; EVALOC*); (ii)



epidemiology, psychology, planning (*cycleBOOM, HUM*); (iii) building science, environmental science, social science, business and finance (EnergyREV); and (iv) architecture, anthropology, geography and history (*EVAW2*). Research funding schemes have been introduced to enhance interdisciplinary working both through direct seed funding for projects, and PhD scholarships crossing research groups and disciplines in the university. For example, SoA has established an Income Acceleration Fund that aims to support the development of funding bids around clearly identified emerging multidisciplinary research themes such as Conflict (lead: **Brun**) and Health, Disability and Design (**Akerkar**). Beneficiaries of joint PhD scholarships, funded by the University, include **Keivani** and **Vellinga** bringing together three groups in **OISD** for a PhD scholarship, and **Gupta** and **Keivani** bringing together two groups from **OISD** with Dawes (Faculty of Health and Life Sciences; UoA3) under the Housing, Indoor Environment and Health (HIVE) initiative. UoA13 has also been active in OBU's strategic RIKE Networks: **Cho, Spencer** and **Gupta** are respectively co-network lead, RF and Steering Group (SG) member for the university-wide networks on Healthy Ageing and Care; **Akerkar** is on the SG of the Inclusion, Diversity and Gender; **Brun** is on the SG of the Migration and Refugee and **Gupta** is SG chair and **Kurul** co-network lead for Sustainable & Resilient Futures.

Future research strategy focuses on further consolidating the existing five strategic priorities, extending interdisciplinary working around University, Faculty and School initiatives, and ensuring ongoing support for research within disciplinary specialisms. Emerging thematic priorities are identified as: (i) healthy urban environments; (ii) urban justice, conflicts and crises; and (iii) integrated architectural design and practice. These established and emerging priorities are underpinned by the new research network initiatives across OBU and the revised departmental and research group structures within UoA13. Additionally, core research objectives in terms of achieving and sustaining major research grant income streams and world-class published outputs in these priority areas will be supported by the following strategic emphases: developing and mentoring of early- and mid-career staff; supporting new internal and external collaborations; increasing knowledge transfer and public engagement activities; and enhancing PhD students' experience and contribution to School activities.

Key delivery mechanisms currently underpinning these emphases include: the establishment of a Faculty-wide Peer Review College to facilitate internal review of all external funding proposals; the appointment of Research Fellows (RF) to support research working across relevant themes, including Healthy Ageing & Care (**Spencer**, subsequently made permanent), Construction Informatics (**Oti**, **Perez**), Sustainable Construction (**Sibilla**); Real Estate and Planning (**Moreira de Souza**), and Healthcare and Design (**Ricchi**); the introduction of the Faculty-wide Doctoral Training Programme, and the appointment of three Professional Practice RFs in SoA (**Blackburn, Taylor** and **Tollit**) to strengthen links with practice and enable the development of knowledge exchange (KE) and impact activities.

Research impact strategy and cases

Commitment to improve the design, quality and management of the built environment is integral to UoA13. Research seeks to understand and enhance policy and practice, shaping places and spaces across multiple scales. Research impacts on public policy outcomes and processes, professional practice and commercial activities and there is ongoing engagement with stakeholders across the public, private and third sectors. UoA13 impacts can be broadly situated within three interlinked 'arenas': (i) developing and exploiting new technologies and evaluative techniques; (ii) evaluating and influencing policy processes and regulatory frameworks; and (iii) shaping practice, capacity building, and changing behaviours.

Across these arenas impacts are generated variously through commercial exploitation and technology transfer; the development of guidance, metrics and internationally recognised standards, together with associated KE/capacity building; outreach and engagement activities such as exhibitions, festivals and blogs; and indirect impacts that are more subtle and intangible in character but which are nonetheless influential in terms of advising, informing, and shaping the policy landscape. UoA13 researchers engage actively with OBU's 'Impact Tracker', an online tool developed to capture information on how research has been used, and to log supporting evidence.



The four impact case studies (ICS) returned by UoA13 demonstrate these main types of impact and exemplify key aspects of the approach to impact within the UoA: Direct engagement with users; the place of impact in research design; the exploitation of strong networks; and the range of University support. First, the *Green Guide to Specification* (**Shiers**), cuts across arenas (i) and (ii), enabling architects, building owners, property managers and policy makers to select the best environmental choices for their building projects and thereby reduce embodied and operational climate change impacts and negative effects on ecosystems and human health. The *Green Guide* has been part of the BREEAM (Building Research Establishment Environmental Assessment Method) certification system since 1998, with more than 558,200 BREEAM certified buildings worldwide and some 2,260,300 projects registered for BREEAM assessment.

Second, integrating all three arenas **Gupta's** RIBA award-winning model DECoRuM® is a Geographic Information System (GIS)-based domestic energy mapping software with the capability to rapidly and accurately identify appropriate dwellings for area-based energy retrofits at a neighbourhood or city scale. By combining a spatial mapping-based data-driven approach with innovative data reduction techniques, DECoRuM® creates energy models and predicts the potential for energy retrofit measures on a house-by-house level and aggregated to an urban scale. The model has provided a range of environmental, public policy and practice benefits to low carbon community organisations, local authorities, householders and architects, through the refined global common carbon metrics approach of UNEP, BSI standard, public engagement and achievement of real energy and CO₂ emission reductions (>50%) from deployment of energy retrofit measures in existing housing.

Third, predominantly in arenas (i) and (iii) **Glasson** has pioneered research on the local socioeconomic impacts of major power station projects, introducing new planning techniques and associated mitigation measures used by a wide range of stakeholders including developers, local communities, local authorities and other agencies. More informed decision making and a stronger evidence base underpins better local outcomes including for example more use of local labour and less disruptive impacts on local transport, housing markets and services such as health and policing. Recent projects include nuclear new build (NNB) at Sizewell C (SZC) (Suffolk) and Wylfa (Anglesey), offshore North Sea wind farm projects, and the early stage monitoring of the construction of Hinkley Point C (HPC).

Fourth, Co-Creating Age Friendly Cities for Cycling (**Jones**) works across arenas (i) and (ii) to influence the ways local and national government, the voluntary sector and industry develop actions to promote cycling for the environment and public health and wellbeing. This has influenced policy and programmes towards more age-friendly environments and technologies for cycling, as well as helping to shape the debate on the positive role of e-bikes as part of a healthy, low carbon transport system.

In line with the University strategic commitment 'to enhance the impact of research in its broadest terms and widen dissemination of the benefit of local, regional and global communities, including staff and students', the UoA supports research impact activities through the deployment of QR funds, access to wider OBU resources, and capturing evidence for research impact. For example, under the TDE Impact Acceleration Account in 2018 **Jones** received QR funding (£10,000) for *Co-CAFÉ* (Co-Creating Age Friendly Environments for Walking and Cycling) to propel the impact of the EPSRC *cycleBOOM* project findings, and Brownill/Cho received £7,500 to extend research impact activities on the delivery of affordable housing, building on their previous JRF research on affordable housing and planning obligations. The *Oxford Human Rights Festival* is an annual TDE-funded event (£5,000), currently in its 19th year, which comprises lectures, films, exhibitions and podcasts that actively engage a wider, global audience. Other public engagement events funded from QR include the exhibition '*Architecture for All: The Photography of Paul Oliver*' at the Pitt Rivers Museum, Oxford, in 2015-2016.

Research integrity and access

UoA13 research operates within the institutional parameters set by the OBU Research Improvement & Integrity Steering Group, incorporating arrangements for data management, open data and open access. Research outputs are lodged in the institutional repository (RADAR) to enable appropriate public access, and the Converis (CRIS) research information system. A dedicated university fund



provides support for open access publication where appropriate. In line with OBU's Research Data Management Policy all newly awarded research projects include research data management plans or protocols that explicitly address data capture, management, integrity, confidentiality, retention, sharing and publication.

Staff are encouraged to lodge books, monographs, and original data in the public domain through open web resources. Examples include the *Paul Oliver Vernacular Architecture Library Images* collection (POVALi) (**Vellinga**), currently the largest open access image resource on the University's repository, and one of the largest in its subject area in the world, and the *Live Projects Network* (**Anderson**), an online resource that aims to connect students, educators, clients, practitioners and researchers involved in architectural live projects. The *Proceedings in Parliament 1624: The House of Commons* (**Baker**) is accessible in a free and fully searchable online edition via British History Online, itself a world renowned resource for historical research. Housing energy data produced by the ESRC/EPSRC EVALOC project (**Gupta**) is available through the UK Data Archives.

Ethical research conduct is overseen by the OBU Research Ethics Committee (UREC), which reviews all research undertaken by staff and research students that involves human participants, data or material. All funded research must seek ethics approval. The School implements Faculty procedures led by a Faculty Research Ethics Officer (**Durning**) and an annual report is made to UREC on ethics review in the Faculty, and in turn to the University RKE and the Board of Governors.

2. People

UoA13 employs a diverse range of staff in terms of demographic, disciplinary and career profiles. Of the 98 academic staff in UoA13, 47 (48%) have significant responsibility for research (SRR). These comprise 8 Professors, 8 Readers, 18 SLs, 1 L, 2 senior (S)RFs and 10 RFs. 31% of profs/readers are women. Ten staff are ECRs (6 men, 4 women),18 are BAME and a further 12 are from international backgrounds, making for a highly international profile. The gender mix of the return is less even, comprising 34 men and 14 women, a position which is clearly acknowledged and which forms a key focus for future strategy. However, there was no significant difference in the individuals with SRR by gender (44% of women and 50% of men have SRR); BAME staff were more likely to have SRR (56%) than White staff (45%).

Advancing equality of opportunity for all researchers, and a concern for equality and diversity, is embedded into our University systems and structures as detailed in our Code of Practice and the IES. UoA13 Schools have been active in operationalising these values and also in ensuring that we reflect on the outcomes of these systems – for instance reviewing our award of study leave to confirm that it was awarded equally between men and women and also in reviewing our allocation of research time. The process of preparing for the REF has highlighted the importance of responding to issues of equality and diversity. Action has been taken to support equal representation in the selection of outputs, including ensuring as far as possible a wide range of work from early career and more established researchers and across genders as shown in the EIA, where there was no significant difference in the selection of outputs by any of the protected characteristics. Nevertheless, the Schools that comprise the UoA acknowledge that more remains to be done in terms of reflecting diversity and securing equality.

Following a successful application for an Athena SWAN Bronze Award in 2016, TDE is currently preparing for renewal in November 2021 (postponed from April 2020 due to Covid-19). Athena Swan initiatives across TDE, SoA and SBE include: Annual Promotion of Women in Property Awards; ensuring gender representation amongst student ambassadors for recruitment activities, e.g. interviews, Open Day events; high-profile and world-leading women academics as role models within the subject area (e.g. **Brownill, Brun,** Butina-Watson, **Orbasli**). UoA13 has also been active in promoting the Aurora scheme for women seeking to explore leadership and management positions in higher education, with around six participants per year over the REF period. Additionally, work is ongoing on WLP tariffs to ensure enhanced research time for colleagues returning to work following parental leave.



Over the REF period, SBE has moved through a period of significant staff transition, most notably in Planning with the retirement and phased FTE reduction of senior research active staff (Butina-Watson, **Marshall**, Simmie, **Ward**, Wilson). New academic appointments across the UoA have prioritised research activity, ensuring the addition of research-active members of staff (**Akintola, Al-Mukhtar, Baker, Brun, Davison, Dericks, Lim, Ricchi, Rowden, Shirazi, Wragg**) who have helped to strengthen the research culture. New recruits are provided with a research and training allocation of up to 640 hours for their first three years. Subsequently this is consolidated to 480 hours for fully research active staff. They also join one (or more) of the research groups in the UoA, (see Section 1), which provide a supportive and collaborative environment.

QR funding is deployed to support the appointment of fixed-term RAs and RFs. These appointments enhance research capacity and underpin a succession strategy whereby new contract researchers are nurtured towards more permanent roles. Examples include **Gregg**, **Henshall**, **Spencer** and **Shirazi** who have progressed from fixed-term contracts to permanent positions and in the case of **Shirazi** subsequent promotion to Readership. Bridging funding is available to support the employment, in certain circumstances, of academic-related research staff between fixed-term contracts (for example **Ricchi**).

UoA13 implements the University's distinctive 'Your First Three Years' (YFTY) training and development programme for new appointees, to support the development and mentoring of early- and mid-career staff. YFTY includes up to 120 hours for studying for the Postgraduate Certificate in Teaching in Higher Education. Research skills training is provided through annual university programmes, along with training in career development, PhD supervision, and diversity and equalities training. The University runs a Staff Research Mentoring Scheme that is open to all research active staff at any level of academic seniority. UoA13 has had increasing engagement with the mentoring scheme in recent years, as detailed in Table 1. Additional informal mentoring takes place both within research groups and the UoA as a whole, through informal discussions, the development of working papers, lunchtime 'Spark sessions', 'GrantsLabs' and monthly research seminars in both schools.

| | 2018-19 | 2019-20 | 2020-21 | |
|-------------|---------|---------|---------|--|
| SoA Mentors | 3 | 5 | 5 | |
| SoA Mentees | 3 | 1 | 5 | |
| SBE Mentors | 4 | 6 | 9 | |
| SBE Mentees | 1 | 3 | 5 | |
| Total | 11 | 15 | 24 | |

Table 1: UoA13 engagement with University mentoring scheme, 2018/19 to 2020/21

Research workload allocations for academic staff range from 320 (Cat C) to 480 (Cat B) and 640 (Cat A) 'notional hours' per year (all of which equate to SRR). All research-active staff are required annually to produce 3-year Personal Research Plans (PRP), setting out main research outputs, impact activities, and funding applications. PRPs are formally reviewed in individual meetings with School Research Leads, allowing RLs to maintain an overview of research in the Schools, allocate resources, and monitor staff research performance. Since 2018, the PRP has been integrated into the more general, Personal Development Review (PDR) process.

The UoA seeks to enable periods of full or partial sabbatical leave for staff in support of significant research income-generation, production of high-quality research outputs or establishment of academic and/or industry networks and partnerships. QR funding is made available to release staff from all or part of their teaching and administrative responsibilities for one semester. Schemes are designed to be flexible and responsive to individual circumstances. All members of staff with Category A, B and C



research hours and with a minimum of 3-years' service are entitled to apply. Sabbatical schemes are competitive and entitlement is not automatic, but is based on the merits of the proposal submitted in line with adopted research strategies. Sabbatical awards during the REF period include **Orbasli** (2018), **Carver** (2018), **Resalati** (2018), **Parrack** (2019) and **Baker** (2019). Additionally, a number of sabbaticals have been awarded from the university's Central Research Fund (CRF) including **Vellinga** (2016) and **Troiani** (2017).

Seed funding for research projects is provided through the university CRF and also Faculty and School level QR funds. UoA13 has won 8 CRF Research Excellence/GCRF awards (Vellinga; Troiani; Jones, Carpenter, Sibilla, Cho et al; Ward; Gupta and Keivani; Valler, Brownill and Ward). Under a new initiative from 2020 the three research groups in SBE each have a dedicated annual budget of £2,500 from School QR funds to support seed corn/pilot research, bidding activity (including building external research links), or to ensure high-quality publication outputs. This is subject to a competitive bidding process in each research group, held tri-annually (but on hold during the Covid-19 period). In SoA, all research groups receive an annual allocation of £15,000 from School QR funds to support the preparation of publications, funding bids, and impact, knowledge exchange and dissemination activities. A dedicated conference fund that allows staff to attend conferences and symposia is also available in both schools.

Doctoral Students

PhD students, including visiting students, form an active part of the research culture, collaborating on projects and proposals and taking part in seminars, discussions, network meetings and other research activities. A Faculty Doctoral Training Programme (DTP) was introduced in 2016 to provide structured training provision in line with guidance from the UK Research Councils. This supports the development of academic, transferable and employability skills, builds on the combined teaching and research strengths in the Faculty, provides research methods training at three levels (core, strand and tailored) to reflect the diversity within the Faculty and to meet students' individual needs, and delivers an improved research environment and a high-quality student experience. The DTP brings research students together as cohorts to provide mutual support and structured training.

This occurs at two levels; at the Faculty level, 70-90 students from Arts, Architecture, Engineering, Computing and Built Environment interact in social activities, a shared introductory course to research methods and philosophy and an annual Research Students Conference. This latter event is organised by students themselves to enable them to acquire skills in conference organisation and from 2018 students have overseen the publication of peer-reviewed conference proceedings. Training in viva preparation and getting published is also provided at the Faculty level. Secondly, at the UoA level, students are automatically enrolled on the Environment and Society Strand of the DTP. This brings together c.30 students in the UoA and consists of weekly lunchtime seminar sessions and a tailored methods course on research techniques and debates within the Built Environment. Research active staff are encouraged to engage in this programme to integrate students into the research environment of the UoA. Career progression for PhD students is supported by involvement in teaching and by the provision of training in teaching methods.

From 2020, PhD students have been organising their own weekly online writing group for strand members, which enables students to work virtually with others, set writing goals and provide mutual support. The DTP and the writing group have proved invaluable in keeping students engaged during the pandemic. Weekly lunchtime Zoom sessions have been held as part of the DTP and formal teaching has moved online. All formal sessions at Faculty and Strand level are video captured and made available on the DTP Moodle site. In addition, students have been asked to keep a Covid-log which is used to chart the impact of Covid on their programmes with the possibility that extensions and arrangements can be made where necessary. The Faculty has financially supported doctoral students hard hit by COVID restrictions, in particular where changes to fieldwork and data collection have been required.

Enrolments have declined over the REF period with a related, but smaller decline in the cohort size in the UoA (Table 2). A factor in this has been the pattern of University Research Student Scholarships.



The '150th Programme' ran in 2014-15 and 2015-16 to celebrate the 150th anniversary of the University and accounts for the larger numbers registered in the following years. Subsequently there has been a reduced level of University support, although TDE has continued to fund 1-2 studentships per year, some of which have come to UoA13. Another factor affecting numbers is the availability of supervisory capacity, especially in SoA where we are working systematically to strengthen capacity both through appointments and by strategically building supervisory teams. Recent appointments across the UoA have prioritised those with research and supervisory experience, and ECRs are encouraged to take the comprehensive PhD supervisor training provided by the University.

Where needed, ECRs in the UoA have been encouraged and supported to pursue PhDs and more senior staff have been supported to obtain PhDs by publication. Staff who have pursued their PhD with support from the Schools include **Carver**, Assis Rosa, Anderson, Halliwell, Sadeghi-Movahed, Kjelstrup-Johnson and Sarfatti. We are also working to increase the number of new PhD students in other ways, including exploring a PhD by Practice in SBE to enable practitioners to undertake Doctoral level studies. This is specifically focused on the area of Urban Design, which has experienced a decline in new students following the retirement of key staff. This will require validation by the University, which is expected in the academic year 2021/22.

| Academic Year | No of FTEs Registered on PhD Programmes in the Faculty | Architecture | Built Environment | Total FTEs |
|------------------|---|--------------|----------------------|---------------|
| 2013-14 | 77.5 | 7 | 20 | 27 |
| 2014-15 | 83 | 12 | 20.5 | 32.5 |
| 2015-16 | 68.5 | 11 | 22.5 | 33.5 |
| 2016-17 | 91 | 12 | 24.5 | 36.5 |
| 2017-18 | 83 | 14.5 | 16.5 | 31 |
| 2018-19 | 83 | 14.5 | 15 | 29.5 |
| 2019-20 | 79.5 | 13 | 14 | 27 |

Table 2: UoA13 FTE Registered on PhD Programmes (DTP Cohorts)

REF2014 had a total of 53 conferments for this UoA, while REF2021 has a total of 46 (Table 3). While the number has slightly reduced, the UoA has been prioritising completions by continuing students, particularly those that had been registered for some years. Successful completions are reflected in lower cohort numbers as completions have not been matched by new students. This is especially notable in 2019-20, which saw a large number of completions against a declining cohort and the timely completions of the 150th cohort. This in turn is evidence of the value of the DTP, which has been improving the research experience and the training of our students.

Table 3: Research doctoral degrees awarded – UoA13 Architecture, Built Environment and Planning

| Academic Year | Number of research doo degrees awarded | ctoral Research-based professional doctorates. |
|---------------|---|---|
| 2013-14 | 6 | 0 |
| 2014-15 | 5 | 0 |
| 2015-16 | 7 | 0 |
| 2016-17 | 11 | 0 |
| 2017-18 | 4 | 0 |
| 2018-19 | 3 | 0 |
| 2019-20 | 10 | 0 |



3. Income, infrastructure and facilities

Research income and support

Research spend for UoA13 has trebled from REF2014, rising from c.£2,490,000 to c.£7,750,000. This includes funding from EU Government Bodies (c.£2,170,000), Research Councils (c.£2,342,00), UK Govt/Local Authorities (c.£1,854,000), UK industry (c.£850,000) and UK Charities (c.£349,000). Funding success reflects a strategic commitment to achieve 'high levels of external income generation' stated in REF2014, appointment of excellent research staff, effective Faculty grants panel review procedures, and efficient and supportive Faculty and University research offices.

A robust support structure has been put in place to help generate external research income. TDE has a dedicated Research Support Office (RSO), comprising 4 FTE: a Research Manager, two Research Grants Officers and one Research Administrator. RSO provides support for all issues related to external grant income, including the identification of potential funding bodies, dissemination of funding calls, and costing. Clear procedures are in place to ensure that each grant application is properly costed and approved. An online Intent to Submit form provides the RSO and management with the details required to approve workload planning allocations. Special arrangements are in place to expedite applications when deadlines are short. All proposals are costed using Worktribe and undergo a rigorous and structured peer review process. This provides a firm foundation for the University's strategic objective to increase the value of all RKE-related income to 20% of total university income by 2035 (and to 14% by 2025).

A Faculty-wide Peer Review College (PRC) has been established to facilitate internal peer review of all external funding applications in order to ensure the quality of applications and improve funding success rates. It allows applications to receive more than one review, facilitates debate and discussion of proposals, and provides a developmental opportunity for less experienced academics to familiarise themselves with peer reviewing processes, which may in turn contribute to their own grants writing. The PRC consists of 30-40 members of staff and is chaired by the Grants Panel Chair (**Vellinga**). College members include both early career and more experienced researchers from all Schools in the Faculty. Two PRC members are assigned to each grant application seeking Grants Panel approval. Both reviewers complete a Grants Panel Review Form, prior to meeting up with the PI to discuss issues that have been identified or suggested revisions.

PIs are expected to respond to recommendations put forward by the reviewers. Wherever possible, to provide developmental opportunities, each application is assigned an 'experienced' and an 'early career' reviewer, with the two reviewers being cross-referenced against Faculty and RBDO data on PIs who already hold (or have held) awards from the funder in question. In cases where more in-depth reviewing is required, for instance where the PI is an ECR, or due to a lack of experience with research grants applications or a low success rate, reviewing may take the shape of mentoring meeting(s) between the reviewers and the applicant. Additionally, following good practice of UoA5, a 'GrantsLab' series was introduced in 2019 to provide an open, informal space for funding applicants to present and discuss their projects with colleagues and refine their proposals.

Infrastructure and facilities

In terms of infrastructure and facilities, SoA has design studios incorporating 120 high-spec PCs that contain 150+ software packages, various multi-solution printers and Apple Mac mini screens, accessible 24/7 (post-covid, all PCs have been made accessible remotely). SoA also has its own print room, run by a dedicated, full-time member of staff, which offers wide-format printing, fine art printing, 3D printing, 3D scanners, photographic equipment and technical support. The Architecture Workshop caters for both analogue and digital processes, enabling a hybrid approach toward design development and fabrication. The workshop contains a series of general fabrication machines, including bandsaws, disc sanders and pedestal drills. Alongside these, the workshop has a comprehensive approach to digital fabrication. This is supported by 3 medium format laser cutters, a large format CNC Router, and an enclosed 4 axis CNC router. With regards to 3D printing, the workshop covers a range of techniques, including FDM printing, laser sintering and powder



processing. To enable a reduction of modelling barriers, the workshop includes both laser and optical 3D scanning processes.

A dedicated Structures Lab is used mainly by the Architectural Engineering group, containing a large structural reaction frame, a structural test rig and associated sensors and data acquisition equipment, as well as a cleanroom constructed to industry standards for vacuum testing (to 10-7 mbar). The lab is also equipped with state-of-the-art solar panel recycling machinery, a solar simulator, and a hotbox. The LCB group hosts a Building Performance lab with state-of-the-art equipment for measuring building performance, including building fabric thermal performance (high-spec FLIR thermal imaging camera) and indoor environment including indoor air quality (high precision GrayWolf sensors).

The University Library has extensive print and e-resources collections and dedicated library staff provide specialist support to individual Schools. The library hosts three special collections related to architecture. The *Paul Oliver Vernacular Architecture Library* (POVAL) is a unique multidisciplinary collection of books dealing with vernacular architecture worldwide. Collected over a period of more than 50 years by the late Professor Paul Oliver (MBE), it includes works by architects, geographers, architectural and art historians, planners, folklorists, archaeologists, conservationists and anthropologists. The POVAL collection provides an unparalleled and indispensable repository of the knowledge gained about the vernacular traditions of the world up to the present, serving as a basis for continued research on vernacular architecture, including the EVAW2 project (**Vellinga**). It includes an open-access image database (POVALi), comprising over 20,000 digitised photographs, as well as Professor's Oliver's personal archive.

The Oxfordshire Society of Architects Collection contains some 650 books and 65 periodical volumes held on permanent loan from the OSA. The collection includes treasured antiquarian books from the seventeenth century onwards, including a much sought after 1839-49 edition of Joshua Nash's Mansions of England in Olden Time, and fine examples of early twentieth century titles.

Finally, the Ian Davis Collection consists of books related to shelter and housing after natural disasters. Professor Ian Davis was one of the first people to study this subject, and he went on to become one of the most influential authors on the role of housing in disaster risk reduction. The collection comprises his personal resources and continues to underpin research in the UoA, for example the **Brun/Parrack** project *'Self-recovery housing for development: Scaling up crisis preparedness and humanitarian shelter response'*. All three collections are frequently used by scholars from around the world.

PhD students are provided with desk and storage space, a dedicated laptop or desktop, and appropriate software. Full access is provided to lab and workshop space, printing and photocopying facilities. Financial support is available for conference attendance.

4. Collaboration and contribution to the research base, economy and society

UoA13 has delivered substantially on University and Faculty strategy to 'extend external collaboration with academic, professional, business and community partners, including internationally'. Close professional links are maintained with the RTPI, RICS, and RIBA through partnership boards. Research collaborations have been extended significantly with both UK and international institutions (including India, Brazil, US, Lebanon, Africa, China, Turkey and Europe), funded through the Newton Fund, British Academy, RCUK (AHRC, EPSRC, ESRC), RAEng, EU Horizon 2020, United Nations, and Leverhulme Trust, as well as internal GCRF QR support. Our research groups are closely linked to the professions, industry, public bodies and major international organisations, and the commentary in this section is organised by group in order to clarify aspects of collaboration and disciplinary contribution as appropriate.

In <u>Low Carbon Building</u>, **Gupta** has led a series of Newton Fund Indo-UK projects (2017-2021) that address energy-related societal challenges in the Global South. These have included leadership (PI) of EPSRC/DST Newton Fund project on residential energy demand reduction (*RESIDE* 2017-22, see Section 1, was ranked first amongst 22 proposals), RAEng Newton Fund project on customising building performance evaluation for India (*Learn-BPE*, 2017-2019, £50,000) and a United Nations project on mainstreaming sustainable social housing in India (*MaS-SHIP*, 2017-2019, £150,000).



These research initiatives have led to strong international collaborations and partnerships with leading universities in India (IIIT Hyderabad, MNIT Jaipur, IIT Chennai), think-tanks (TERI, Development Alternatives) and international agencies (UN-Habitat, UN Environment). As part of EU funded projects - HERON project on socio-economic aspects of energy efficiency (€951,000 total grant, 2015-2017, €130,000 to OBU) and Zero Plus project on zero energy settlements (€3,600,000 total grant, 2015-2020, €327,000 to OBU), **Gupta** and **Gregg** have built up collaborations with academic institutions in Cyprus, Estonia, France, Greece, Israel and Italy.

Gupta and **Gregg** have regularly won best paper awards at international conferences that include: Building Simulation & Optimisation (BSO) Conference 2020; SEEDS 2020 and 2019 conferences, and PLEA 2014 Conference. In 2016, the *Low Carbon Group*'s Innovate UK funded research project Energy Resources for integrated communities (ERIC) received two national Energy awards -*Innovation Energy Project of the Year* and the *Residential Energy Project of the Year*. **Gupta** is on the editorial board of *Energy and Buildings* journal (IF: 5) and was scientific chair of the international Architectural Science Association (ASA) 2019 conference held in IIT Roorkee attended by 200 delegates. He is a member of the UKRI Future Leaders Fellowship Peer Review College, and was jury member of the RIBA President's Award for Research 2019. **Gupta** was grant panel member of EPSRC call on End Use Energy Demand: Technology 1 and Technology 2 calls in 2019 and 2020. **Gupta** and **Gregg** have collaborated with Ridge and Partners (**Blackburn**) on the delivery and evaluation of an innovative low energy refurbishment of a historic town council building (Garth House) in Bicester Oxfordshire, underpinned by a systematic building performance evaluation approach pre- and postrefurbishment. The project was a shortlisted entry for RIBA President's award for research 2016.

In <u>Planning, Policy and Governance</u>, **Jones** led the ESRC Newton Fund project Healthy Urban Mobility (*HUM*) in the UK and Brazil (see Section 1) in collaboration with three major universities in Brazil (Federal University of Rio Grande du Sol, Federal University of Santa Catarina and the University of Brasilia). **Brownill/Carpenter**'s EU project *Co-Creation* led a collaboration of six partner organisations: three NGOs in the EU (European Alternatives, Paris; City Mine(d), Brussels; Tesserae, Berlin); and three Universities: University of Bath, University of PUC-Rio (Rio de Janeiro, Brazil) and the National Autonomous University of Mexico (UNAM, Mexico City). **Carpenter** held a global fellowship from the EU's Horizon 2020 programme (2017-20) 'Social Sustainability and Urban Regeneration Governance: An International Perspective (*SURGE*)' (£220,000) in collaboration with the University of British Columbia, Vancouver; **Valler's** Leverhulme International network '*Global Science Scapes: Dimensions of Transnationalism*' (Leverhulme Trust, 2014-17, £118,000) was with partners at University College London, Stanford University, National Taiwan University, Korea University, University of Twente and the National University of Singapore.

Brownill presented evidence to the House of Commons PAC on public consultation and was a part of a DCLG roundtable group on neighbourhood planning. She has presented evidence from her JRF project on planning obligations and affordable housing to the House of Lords Economic Affairs Committee, The Lyons Review on Housing, The London Housing Commission and the GLA Planning Committee. **Brownill** was on the judging panel for the Guangzhou Urban Sustainability Awards in 2015. She is also a member of the Oxfordshire Community Land Trust which she chaired from 2014-2018 and she is on the editorial panel of *Urban Policy and Research*. **Jones** is expert advisor to the National Institute for Health and Care Excellence (NICE,), Peer Review Group member of the ESRC Global Challenges Research Fund and steering group member of the Oxfordshire Local Transport and Connectivity Plan.

Mbiba is on the editorial board of the journal *Town and Regional Planning* (South Africa). He was appointed researcher and lead author of the UN "HABITAT III Regional Report for Africa (2016) and contributed urbanisation expertise to the OECD's flagship report "African Economic Outlook 2016: Sustainable Cities and Structural Transformation. DFID appointed **Mbiba** as Senior Advisor on urbanisation and cities (2016-2020). He has also acted as expert evaluator for EU Horizon 2020 projects on four occasions between 2014 and 2021. **Spencer** is a member of The British Society of Gerontology and founder and co-ordinator of the Special Interest Group for Transport and Mobility. He is also a member of the Academy of Urbanism. **Valler** is Fellow of the Regional Studies Association and Chair of the RSA London and South East Branch. He is also an editorial advisory board member



of *Local Economy*. **Ward** is former President of the International Planning History Society and remains a member of its governing Council. He is a member of the editorial board of *Planning Perspectives.*

In Land, Design and Development, Cho currently leads an ESRC-funded networking project Enhancing housing affordability and social care in Japan and UK - comparative evaluation of policy and practice' (£48,000) bringing together the Universities of Tokyo and Osaka and Oxford Brookes. Keivani is founding Editor-in-Chief of the journal International Journal of Urban Sustainable Development. He is on the steering board of the UN-Habitat World Urban Campaign and the Global Network for Sustainable Housing. Keivani is a member of the ESRC GCRF and UKRI Future Leaders Fellowship Peer Review Colleges and has been a grants decision panel member on the ESRC Urban Transformations programme. Shirazi held a Marie-Curie Intra-European Fellowship (2014-2016, €310,000) from FP7-PEOPLE programme titled 'Contribution of Compact Neighbourhoods to Social Sustainability'. This was followed by a Marie Skłodowska-Curie Global Fellowship (H2020, 2018-2020, €270,000) which established a collaboration with the Institute of Urban and Regional Development (IURD), UC Berkeley. Shirazi also produced the documentary film 'Never Surrender' released in 2020 that documents a community fight for environmental justice in Bayview-Hunters Point (SF) that continues to be screened in a variety of arenas. Lim, Almukhtar and Austin have worked on the project 'Establishing a Virtual Design Studio in Teaching and Research for International Collaborations' (2019-2020, £13,000, not HESA reportable). This Virtual Design Studio currently accommodates the live project 'Post-conflict development in Mindanao, Philippines' that allows OBU staff and students to work on projects in challenging environments. As part of KE and impact activities, Cooper has developed the 'ViewCue' cloud application in collaboration with Holistic City Ltd, which provides visual intelligence that helps increase the accuracy of property valuation, maximises place value and enhances the visual quality of development. Davison has been involved as an unfunded collaborator in the research project 'Improving Outcomes for Apartment Residents and Neighbourhoods' (2019-2020, AUS\$144,000) funded by the Australian Housing and Research Institute (AHURI).

In <u>Place, Culture, Identity</u>, **Vellinga** is Editor-in-Chief of the second edition of the *Encyclopedia of* Vernacular Architecture of the World, a world-leading resource and collaborative project which brings together the work of 19 international editors (including at Harvard, St Andrews and University of Queensland) and over 800 contributors from a range of disciplinary backgrounds worldwide. **Vellinga** is on the editorial boards of Vernacular Architecture and Traditional Dwellings and Settlements Review, and on the editorial advisory board of Architectural Histories. Orbasli and Vellinga are members of the AHRC Peer Review College; **Vellinga** is a member of the UKRI Future Leaders Fellowship Peer Review College.

Orbasli is a member of the AHRC Strategic ODA (Official Development Assistance) Peer Review Panel. She was also an expert evaluator for the EU Horizon 2020 call 'TRANSFORMATIONS-04; was a jury member of the RIBA President's Award for Research 2018; and was one of 40 delegates invited to attend the meeting convened to mark the 20th Anniversary of the UNESCO Nara Document on Authenticity and draft the Nara+20 declaration. **Orbasli** received AHRC and Indian Council funding for Historical Research support (£24,250) to study Community-led heritage regeneration in Agra, India, working in collaboration with the Delhi School of Planning and Architecture and a local NGO. She also received support from the Newton Fund (£9,350) to work on issues around cultural heritage management in Turkey together with Anadolu University.

Orbasli and **Vellinga** edited *Architectural Regeneration* (Blackwell, 2020), which includes contributions by group members Wedel, Karmowska and Gaskin. From 2021, they will also direct the 'Endangered Wooden Architecture Programme' (Arcadia Fund, £5,000,000) in collaboration with CyARK. **Proto** organised the symposium "Extending Baudrillard: Space, Image, Representation" with the Museum of Contemporary Art in Rome in 2018. **Proto** also organised the 2nd International Conference on Baudrillard Studies, "Applied Baudrillard" (Oxford, 2018) with the University of Paris IX 'Nanterre', Columbia University and Swansea University. **Proto** is on the editorial boards of *The International Journal of Baudrillard Studies* and *The Journal of Philosophy*. Orbasli is an expert member of the ICOMOS International Scientific Committee on Cultural Tourism (ICTC) and Education (CIF). **Vellinga** is a member of the ICOMOS International Vernacular Architecture Committee (CIAV).



In the <u>Centre for Development and Emergency Practice (CENDEP)</u>, Brun received funding from ESRC (c.£383.000) and the International Development Research Centre (£47,000) to study youth trajectories in Jordan and Lebanon's refugee crisis, working with the Lebanese American University and partner organisations Al Jana, Lil Medina. Brun and Parrack run a project on 'Self-recovery housing, crisis preparedness and humanitarian shelter response' (UKRI, £123,000), working with 7 partners (CARE UK International, Habitat for Humanity, Catholic Relief Services, International Federation of Red Cross and Red Crescent, British Geological Survey, CraTerre, and the Overseas Development Institute). Brun participates in the project 'Holding Aid Accountable: Relational Humanitarianism in Protracted Crisis (AidAccount) (£70,000) with the Norwegian University of Science and Technology, Makerere University in Uganda, Rako Research and Communication Centre in Hargeisa, Somaliland and the Centre for Migration Research and Development in Sri Lanka. She is also Co-I on the NORDFORSKfunded project 'Effects of Externalisation: EU Migration Management in Africa and the Middle East' (£145,000), working with the Christian Michelsen Institute, the Danish Institute for International Studies, and the University of Manchester. As an independent researcher Carver worked with 20 colleagues in 16 countries around the world on his torture prevention project funded by the Association for the Prevention of Torture (\$ 1,223,000). **Akerkar** leads a project on enabling inclusive humanitarian responses for the Age and Disability Capacity Programme (ADCAP), in partnership with HelpAge, the International Federation of Red Cross and Red Crescent, Christian Blind Mission, Humanity and Inclusion, RedR, DisasterReady, Christian Aid, Islamic Relief, and Concern Worldwide, in Kenya, Pakistan and the UK (£73,000, DfID and OFDA, not HESA returnable). Piquard co-leads a British Academy funded project (£284,000) titled 'Upskilling for future generations (Gen-Up) in Cameroon and Sierra Leone', with the Don Bosco Technical Schools network, the Catholic University of Central Africa, and Njala University in Sierra Leone.

Brun is a member of the ESRC Peer Review College, and a reviewer for the Norwegian, Dutch and Finnish research councils. **Parrack** is on the organising committee for the UK Shelter Forum and working groups for the Global Shelter Cluster on Environment, Promoting Safer Building and Shelter Projects. Carver is co-editor of the *Journal of Human Rights Practice*. He is also a visiting professor at Arba Minch University in Ethiopia. **Akerkar** and **Brun** are founding members of the Disability Hub based at the Center for Lebanese Studies (CLS), Lebanon. **Akerkar** is also a Technical working group member for 'Inclusion of people with disabilities and older people in humanitarian response' for ELRHA.

In <u>Smart Construction and Impact Assessment</u>, **Kurul** led the project 'BIM-enabled Collaborative Platform for Innovative Low Impact School Procurement' for the Technology Strategy Board in collaboration with Willmott Dixon and Scape System Build Ltd (2013-16, £109,000). **Vidalakis** led 'Future Fit Build Assets – Delivery of BIM workshops/training to SMEs' for the ERDF South East European Regional Development Fund Programme (2013-16 £150,000) and also 'Energy Performance Programme Analytics' for Innovate UK (TSB), a KTP in collaboration with Virtus Consult (2015-17,£131k). Durning led the EOWDC project funded by European energy company Vattenfall (see Section 1, £298,652). Durning also received funding from Suffolk County Council (on behalf of the New Nuclear Local Authority Group) to carry out a 'Study on the strategic effects of the construction of Hinkley Point C Nuclear Power Station and other Nuclear New Build over time' (£31,759). **Tah** led 'Building Information Modelling (BIM) in Offshore Wind Farms – Feasibility and scoping study for the Offshore Renewable Energy (ORE) Catapult (2017-18, £25,000).

Tah has been a member of the EPSRC College of peers continuously since 1997. He is also a Member of the American Society of Civil Engineers (ASCE) Global Computing Committee and has served as a member of the Expert Panel for the R&D workstream of the Centre for Digital Built Britain at Cambridge University. The group's collaborations include **Kurul** hosting Sibilla's Marie-Curie Fellowship (C-mapER, 2017-2019) and **Kurul**'s links with the Energy Systems Catapult, the Active Building Centre and SMART-KLUB Itd which culminated in a UKRI-funded (OBU value: £ 57,000k) research project, which is led by **Sibilla** and includes the University of Southampton. The pair further secured an OBU QR GCRF Collaborative Research Award (£12,000, 2017-18) to work with Tsinghua University and Xi'an Jiaotong-Liverpool University-XJTLU in China. Currently, they are part of an international consortium funded by the Erasmus+ programme (Integrating climate resilience in EU



higher education – *INCLIMATE*, Total grant €299,000, 2020-2022, €58,248 to OBU) including organisations from five European countries: Aristotelio Panepistimio Thessalonikis University (Greece), Universitatea De Architectura Si Urbanism Ion Mincu Din Bucuresti (Romania), Universidad Pablo De Olavide (Spain), Universita Degli Studi Roma Tre, (Italy) and the Malta Intelligent Energy Management Agency (Malta). **Abanda** is a strategic board advisor of BIM Africa and has previously acted as a Chapter Science Assistant for the Intergovernmental Panel on Climate Change (IPCC). He has recently been nominated an Expert Reviewer for the Second Order Draft (SOD) of the contribution of Working Group III to the Sixth Assessment Report (AR6) for the IPCC.

SCIA makes substantial contributions to policy and practice. **Glasson's** impact case study (see Section 1) is associated with SCIA, and **Glasson** serves as an examining Inspector for Major Projects in the Planning Inspectorate. In this role, he was an examiner for Hornsea 1 Offshore Wind Farm (OWF), lead examiner for Hornsea 2 OWF, and Acceptance Inspector for several projects between 2010 and 2016. He also acted as a socio-economic expert adviser to Hitachi/Horizon re EIA of Wylfa Newydd nuclear power station (2015-17).

In <u>Architectural Engineering</u>, **Resalati** is the OBU lead for three H2020 funded projects on innovative cladding solutions, with a focus on advanced insulation materials, energy generation, energy storage and next generation thin film solar cells (INNOVIP (€330,000, 2016-2020), POWERSKIN PLUS (€412,000, 2019-2023), and CUSTOM-ART (€214,000, 2020-2024)). **Resalati** also led the RFCS funded HAIR project (€194,000, 2017-2020). These projects are in partnership with multiple European businesses, universities, and research institutes, including the Polytechnic University of Catalonia and IREC in Spain, IPN and Polysyc in Portugal, Fraunhofer in Germany, VTT in Finland, and Tata Steel Europe in UK and the Netherlands. **Resalati, Henshall**, and Heywood have participated in various close to industry R&D consultancy projects, averaging c.£150,000/annum in the last few years.

Henshall led the UKSA NSTP3-GEI-012 funded project '*Small thermal vacuum chamber for low cost testing of spacecraft components*' (£16,700, 2018). This was presented at VentureFest 2018 and led to collaboration with RAL Space. **Henshall** also led the EPSRC funded collaborative incubator project '*Enhancing the Future of Transport and Urban Infrastructure: How to engineer smart, sustainable and healthy cities*' (£15,000, 2020). **Resalati** is a member of the Energy Institute and a member of the expert evaluators of the EU H2020 Framework Programme for Research and Innovation, and has contributed to developing calls for the H2020 programmes as a topic expert. He is also the coordinator of the H2020 AMANAC Cluster LCA community, with 38 projects and over 200 partners. **Henshall** is a member of the Institute of Physics (IOP) and registered as a Chartered Physicist.

Whitehouse has received an MBE for his contribution to the building industry. He has initiated and piloted BOPAS, a Quality Assurance scheme for the offsite sector, and served on UKCES advisory board Offsite Construction skills. He has recently contributed to the new Buildoffsite publication *Reset and reinvent': New research shares learning from COVID-19 and design management in the construction industry*. Whitehouse, in collaboration with other members of the group and LDN Collective is developing research proposals for a new housing settlement, comprising 6,500 new homes at Harrington, plus an integral National Centre of Excellence for MMC and sustainable, green technology.

In <u>Design Theory and Practice</u>, **Rowden** is Co-I for the 'Virtual Justice: Enhancing accessibility, participation and procedural justice in family courts and tribunals during the COVID-19 pandemic' project (ESRC £69,256.00 to OBU), led by the University of Oxford. Prior to joining OBU, **Rowden** was Co-I for 'Design and Due Process: facilitating participation in the justice system' (Leverhulme Trust, 2014-2016, £132,000) working with colleagues at the London School of Economics, and Chief Investigator for the 'Just Spaces: security without prejudice in the wireless courtroom' project (Australian Research Council, 2013-2015, AU\$205,000), a project that spanned six institutions internationally, and seven industry partners. **Rowden** also led various research consultancy projects on courthouse design for the NSW Department of Justice and Courts Services Victoria (total value AUS\$182,000), each involving collaborations with various universities.



Placidi, **Ricchi** and Sarfatti are collaborating with colleagues at the University of Surrey on a project investigating the design process and therapeutic programme of the Maggie's Cancer Care Centres. Collaborating with colleagues at Chelsea College of Arts, Anderson is co-founder of the Live Projects Network, an online, open access and international resource to connect academics, students, practitioners and local community clients involved in live projects. The Network involves various collaborations with colleagues at TU Berlin, Germany, and Dalhousie University, Halifax, Canada. **Rowden** has acted as research consultant for the Ministry of Justice (UK) and the Howard league for Penal Reform. Sworts is a member of the American Institute of Architects (AIA) and the Environmental Design Research Association (EDRA).

Finally in this section, in terms of collaborations during the REF period, the UoA has hosted 42 international visiting PhD students and a total of 22 international visiting researchers from Brazil, Egypt, France, Hungary, Italy, Japan, Malaysia, Mexico, Portugal, South Africa, Sweden and USA. UoA13 staff have also contributed to the various disciplines through more than 20 editorial and advisory board memberships in the period, over 30 keynote addresses and well-over 100 invited presentations.

To conclude, UoA13 at Oxford Brookes is very well placed in terms of its disciplinary specialisms, national and international connections, and highly impactful research activity to contribute to the sustainability of respective disciplines and to respond to national and international priorities. Within Brookes our portfolio of research activities finds strong support within the University's emerging strategy (OBU 'Strategy 2035') which emphasises *inter alia*: (i) enhanced collaborations with regional and global partners; (ii) increased capacity to drive forward sustainable innovation, knowledge exchange and enterprise; (iii) support for research centres and networks which address societal needs, support sustainable economic development and promote health and wellbeing; and (iv) a target of at least one-fifth of university income generated by research, innovation and knowledge exchange. More widely our research focuses on issues of global strategic significance – climate change, energy crisis, healthy living, emergency practice, immigration, inequality/diversity, and sustainable development – which will be of ongoing importance to UKRI and a wide range of other national and international research bodies.