

<b>Institution: University College London (UCL)</b>
<b>Unit of Assessment: 13 (Architecture, Built Environment and Planning)</b>
<p><b>1. Unit context and structure, research and impact strategy</b></p> <p><b>1.1 Overview: faculty context and approach</b></p> <p><b>The Bartlett is UCL’s Faculty of the Built Environment.</b> UCL is distinctive in devoting one of its 11 faculties to the built environment as a domain, placing the Dean within the Provost’s Senior Management Team, giving The Bartlett a voice in the direction of the university and conferring full budgetary responsibility to the faculty. This Environment Statement speaks to the work of the whole Bartlett research community including academics, professional services staff, doctoral students and external stakeholders – a chorus of voices from a broad set of disciplines, with the shared aim of building a better future together.</p> <p><b>The built environment is about the places where people exist – the spaces inhabited from day to day.</b> It includes physical structures such as homes, towns and cities, and the way people move, work, shop, learn, talk, eat, and sleep within them. The built environment also encompasses invisible structures: political and legal systems, professional codes of practice, financial frameworks, digital media and social norms, and understandings of the past, present and future.</p> <p>Research at <b>The Bartlett explores how these structures shape lives, and how lives influence the structures that are created.</b> It engages with, understands, and improves upon, the spaces that humans inhabit and influence, going beyond ‘the built’ to include natural, social and virtual environments. This expansive definition recognises that these ideas are interrelated, stimulating research that takes cross-cutting and interdisciplinary approaches to local, national and global challenges, whether these are in response to immediate concerns or built on issues spanning decades and even centuries.</p> <p>Across 11 schools and institutes, The Bartlett hosts a dynamic and forward-looking research environment that is thoughtfully developed and informed by <b>six research principles</b>:</p> <ul style="list-style-type: none"> <li>● <b>Diversity</b> – The Bartlett welcomes and creates a variety of methodologies, philosophies, ideas and people, giving everyone space to develop and flourish.</li> <li>● <b>Excellence</b> – the faculty values and challenges ideas of research excellence, confidently including experimental, alternative and non-traditional forms of research strategies and methodologies alongside the more known and established.</li> <li>● <b>Freedom</b> – schools and institutes have the autonomy and responsibility to support individuals to develop their research as appropriate, e.g. via space, study leave, or funding.</li> <li>● <b>Inclusion</b> – a research community that studies and influences the built environment should be representative of all those who live and work in it, so the faculty takes action to build scholarship and governance structures that directly tackle inequity.</li> <li>● <b>Partnership</b> – by engaging with partners in civil society, government, academia and industry, knowledge is advanced and informed by diverse perspectives.</li> <li>● <b>Reflection</b> – a self-reflexive environment emboldens staff and students to consider their own needs and aspirations, helping them contribute to the university and society at large.</li> </ul> <p>In line with these principles, The Bartlett has a clear <b>impact identity</b>, drawing on a diversity of voices. This is evident in the <b>12 Impact Case Studies</b>, which exemplify the faculty’s research across the built environment domain and beyond. Framed within the United Nations Sustainable Development Goals and <b>UCL Grand Challenges</b>, together they demonstrate how the faculty is tackling global health, sustainable cities, cultural understanding, human wellbeing, justice and equality, shedding light on challenges faced by both the Global South and Global North, and day-to-day threats faced by policy-makers, businesses and citizens.</p>

The cases have been selected to illustrate how the faculty produces impact, e.g. through consultation with professional practitioners, under-represented groups, stakeholders in decision-making institutions, building data users and other communities and publics.

**This context defines The Bartlett Faculty of the Built Environment, giving it structure, orientation and drive to build a better future.**

## 1.2 How research is structured across The Bartlett

Research strategy and governance structure are framed by UCL's institutional governance structures and policies, including the **UCL 2034 Strategy** and the **UCL 2019 Research Strategy**. The Dean of the Faculty is principally accountable for research, but delegates leadership to a Vice Dean for Research (VDR). The post-holders of Dean and VDR, respectively, are **Lindner** and **Glass**; **Penn** and **Fraser** held those posts until mid-2019. The VDR chairs **The Bartlett Research Advisory Group**, which brings together Directors of Research from schools and institutes. Research is supported by more than 20FTE research-related professional services posts (see **Section 1.4**), and stimulated through numerous cross-faculty and interdisciplinary mechanisms (see **Sections 2 and 3**).

For doctoral students, the Faculty Graduate Tutor (**FGT**) has delegated authority. The post-holder is **Marshall**, who chairs the **Faculty Research Degrees Committee**, attended by Departmental Graduate Tutors (**DGT**). The **VDR & FGT** work closely with Vice Deans for Education (**Borden**), Innovation & Enterprise (**Raslan**), Equality, Diversity & Inclusion, EDI (**Patel**), and International (**Allen**), and Faculty leads for Health (**Mills**), Impact (**Zerjav**), Policy (**Roll**) and Climate Action (**Hughes**).

Since REF2014, The Bartlett has grown. As of November 2020, it hosted 3,634 students and 729 academic and professional services staff; women represent 45% of its staff and 56% of the student body. The REF2021 submission is based on **290.69FTE eligible research-active staff** (up from 135.93FTE in 2014), from a headcount of 320. With more than double the FTE in 2021 compared to 2014, there are corresponding increases in key metrics, indicating a sustained degree of ambition in the faculty over the period (e.g. doctoral awards have increased from 138.5 to 357.82). Importantly, total research income has more than tripled (from £23.96m to £77.94m), with per capita research income increasing from £176k to £268k (see **Section 3.1**), indicating that Bartlett staff are well-supported and able to thrive in its research environment.

This growth and outcome has been influenced significantly by two key strategic decisions made by UCL, affirming its commitment to the vitality of built-environment research:

1. To stimulate collaborative research by investing in research infrastructure. This has included a £15.8m institutional investment, for the 6,000m<sup>2</sup> facility at **Here East** at the Queen Elizabeth Olympic Park, in Stratford East London. This expansion in laboratories and experimental spaces has led to several new research lines. For example, with civil engineers, computer scientists and biochemical engineers from **UCL Faculty of Engineering Sciences**, new research in advanced prototyping, automation, robotics, and bio-integrated design has been initiated, and new collaborations have led to significant funding, e.g. the **Global Disability Innovation Hub** (see **Section 3**).
2. To create new entities that build research capacity and diversify capabilities, and exemplify interdisciplinary research and scholarship. Having a single faculty of the built environment creates the opportunity to cover multiple aspects of the domain, so the faculty has worked strategically to identify areas which were missing, and to fill these primarily by establishing three new institutes: **The Bartlett Real Estate Institute (BREI)**, **UCL Institute for Global Prosperity (IGP)**, and **UCL Institute for Innovation and Public Purpose (IIPP)**. The Bartlett has funded more than 30FTE new academic and

research posts within these institutes, and financial sustainability has been leveraged by launching new postgraduate taught programmes, bringing fee income and creating a pipeline for doctoral students and staff.

As a result, the Bartlett has extended its research capabilities and increased its research capacity in key areas. The scale and scope of research has been boosted to create significant new opportunities.

**The Bartlett has 11 schools and institutes**, including the new research institutes (**BREI, IGP and IIPP**). These are all described below, noting the staff numbers (FTE and headcount) being submitted for REF2021. Gender and ethnicity of the submitted staff, including a comparison with the overall population in the faculty, is noted in **Section 2C**.

**The Bartlett School of Architecture (BSA; 67.69FTE, headcount 86)** produces experimental scientific and humanities-based research, with design-led scholarship and critical thinking across the core themes of: history and theory of architecture; building projects; sustainable urbanism; craft, technology and computation; histories and practices of ecology; and speculative and performative design. **BSA** hosts research groups such as the Space Syntax Lab, the Survey of London, and CLOUD – the Centre for London Urban Design. Research laboratories cover: design computation; interactive architecture; material architecture; urban morphogenesis; and bio-integrated design.

**The Bartlett School of Construction & Project Management (CPM; 40.0FTE, headcount 41)** covers core themes in: infrastructure finance and the economics of the built environment; programme, portfolio management and firms; construction and technology management; plus, climate change, economics and finance. Digitisation of projects is a strong growth area, following the merger with the **Institute for Digital Innovation in the Built Environment (IDIBE)**. Established in 2018, **The Bartlett Real Estate Institute (BREI)** joined **CPM** in 2020, expanding the School's capabilities on the non-financial aspects of value, and extending the scope of CPM's infrastructure delivery expertise.

**The Bartlett School of Planning (BSP; 34.7FTE, headcount 37)** hosts four departmental research groups: cities, governance and planning; real estate and economic development; sustainable transport and infrastructure; and urban design. Emergent groupings have formed around major research projects, such as: the China Cities Group; Circular Cities Hub; OMEGA; The Place Alliance; Socially Just Planning; The Socially Just Transport Network; and the What is Governed Network.

**The Bartlett School of Energy, Environment and Resources (BSEER; 88.6FTE, headcount 93)** is a grouping of four institutes:

- **The UCL Energy Institute (EI)** focuses on the challenges of climate change and energy security. Its research is structured into two domain themes (energy and buildings, energy and transport) and two cross-cutting themes (energy and environmental systems, energy and artificial intelligence). It has hosted the UK Energy Research Centre (UKERC4) since 2019.
- **The UCL Institute for Sustainable Resources (ISR)** has a mission to generate knowledge to promote the globally sustainable use of natural resources, drawing on economic modelling capabilities. Research focuses on sustainable economies, innovation, energy transitions, finance, development and the water-food-land nexus.
- **The UCL Institute for Environmental Design and Engineering (IEDE)** explores how different elements interact to create buildings and spaces where people can live healthy, fulfilling lives. It has five research themes: health, wellbeing and sustainability; light and lighting; energy, moisture and air quality; acoustics and soundscapes; and systems thinking.

- **The UCL Institute for Sustainable Heritage (ISH)** has four research themes: heritage risk and resilience; modern and contemporary heritage; heritage science and future heritage. It works at the interface of arts, humanities, social and physical science disciplines, and aims to advance heritage research theory, practice and policy.

**The Centre for Advanced Spatial Analysis (CASA;** 14.8FTE, headcount 16) develops novel analytical and modelling approaches to understand and visualise urban dynamics. It uses spatial analysis, digital technologies and data science across these research themes: urban sustainability, complexity, transport and mobility; health and well-being; and digitally connected environments.

**The Development Planning Unit (DPU;** 29.5FTE, headcount 31) has, for more than 65 years, been working on research towards economically sustainable, socio-environmentally just, and healthy cities in the Global South. It has four research clusters: environmental justice; urbanisation and resilience; urban transformations; diversity, social complexity and planned intervention; and state and market.

**The UCL Institute for Global Prosperity (IGP;** 8.4FTE, headcount 9). IGP was formed in 2014, and aims to: challenge the understanding of prosperity by developing alternative models and ways of thinking; use robust empirical evidence, innovative policies and emerging technologies to secure future prosperity; and develop broad and compelling public discussions for credible human future flourishing. **Moore** was recruited by The Bartlett to be Director of **IGP**.

**The UCL Institute for Innovation and Public Purpose (IIPP;** 7.0FTE, headcount 7). IIPP was launched in 2017. All research supports its mission to change how public value is imagined, practiced and evaluated, tackling societal challenges to achieve sustainable, inclusive and innovation-led growth. It has four research pillars (rethinking value, shaping innovation, directing finance and transforming institutions). **Mazzucato** was recruited by The Bartlett to be Director of **IIPP**.

### 1.3 Research objectives during this REF period and over the next five years, including a review of plans from REF2014.

The Bartlett's REF2014 submission stated two objectives: to '*invest in the excellence of our parts*' and to '*make the whole greater than the sum of the parts*' – to be delivered through cross-disciplinary research and research leadership, addressing major real-world challenges, strengthening links to practice, and increasing impact.

Throughout this Environment Statement, reference is made to the various new developments and adjustments to existing practices that have been made by the Bartlett during this REF period, to attend to these objectives. They include cross-faculty initiatives and major investments in people, infrastructure and support mechanisms, as explored in detail in **Sections 2 and 3**, and illustrate the extensive international reach of the faculty's research and impact over this REF period.

To give a sense of the ways in which these objectives have been addressed along scholarly and disciplinary lines, the Bartlett has been developing its research strengths across four areas (also stated in REF2014): 1. Energy and sustainability; 2. Digital technology for architectural design and urban analysis; 3. Governance, regeneration and property; and 4. Architectural history and cultural heritage.

Under **Area (1)**, success in energy and climate change research (e.g. in **BSEER**) leveraged external income, new partnerships and institutional support. For example, the £18m fourth phase of the **UK Energy Research Centre** – the flagship UKRI centre on transitions to sustainable, net-zero energy systems, with 20 partner institutions – moved to The Bartlett in 2019. **BSEER**

and **CPM** have expanded expertise in econometric analysis and macroeconomic modelling, and are influencing national and international energy and climate policy (see **Section 4**). Key appointments include: **Guan**, bringing expertise in climate change economics and low carbon transitions, and **Dalin**, who holds a NERC Fellowship on environmental sustainability of global food systems. **Heaviside** was appointed from a climate change leadership role in Public Health England.

In relation to **Area (2)**, research in the fields of digital design, spatial analytics and smart cities, has grown significantly in **BSA and CASA**, stemming in part from Space Syntax (a REF2014 impact case study). This research is influencing policy and practice on how urban street layouts affect socio-economic vitality, social exclusion, and physical and mental health. **Tewdwr-Jones** joined as Professor of Cities and Regions, and **Wilson** joined from Intel Labs Europe. **CPM** has extended its activity on digitisation and digitalisation of project operations and total asset management through the integration of **IDIBE**.

Working in **Area (3)**, **BSP** is tackling planning problems that are intertwined in governance, accountability, transparency, quality (notably in design environments), and finance/real estate. It won 33 externally-funded research projects to address financialisation and urban governance in Chinese cities, national sustainable infrastructure provision, and the governance and management of urban diversity. Staff are also driving the **UCL-University of Toronto Anchor Partnership**.

Under **Area (4)**, **ISH** has grown, opening up two novel areas for research: future heritage, and data science for cultural heritage. Its achievements are exemplified in the Academic-Heritage Partnership with Historic England, which tackles shortcomings in research and training in the field. **ISH** also secured the **EPSRC Centre for Doctoral Training in Science and Engineering in Arts, Heritage and Archaeology (SEAHA)** (noted in REF2014 as a centre for ‘*scientific cultural heritage*’) and hired **Sandford**, as Chair in Heritage Evidence, Foresight and Policy. In **BSA**, architectural history scholarship was boosted when the faculty welcomed **The Survey of London Group (SoL)**, which has since attracted new funding for its deeply-contextual research, e.g. £568k from AHRC for research on the diverse histories of Whitechapel (**Guillery**).

### Research plans for the next five years: Building a Better Future

**The Bartlett’s research is embedded in a long-term timescale, beyond the next REF, that frames a vision for a built environment that will be built, rebuilt and de-built, for hundreds of years to come. There is a strong, collective interest in being able to imagine radically new futures.**

The Bartlett is well-placed to build on its strengths and leverage its distinctive research base. In line with UCL strategy – the faculty will continue to undertake innovative, world-leading research and deliver enduring impact over the next five years, promoting the six research principles of diversity, excellence, freedom, partnership, inclusion, and reflection, which will remain a touchstone in the faculty’s research structure, orientation and drive.

The faculty has used a collaborative and experimental approach to inform and shape the development of its strategic objectives – with the express aim to reflect ‘what matters most’. In May 2019, an interactive exhibition called **The Next 100 Years** was hosted as part of The Bartlett’s centenary celebrations. Over two weeks, staff, students, visitors to the exhibition and social media followers identified what they thought were the big questions facing the built environment over the next century. From the hundreds of responses, 12 core themes emerged which are building blocks of The **Bartlett’s Commitment to Change**, called *Build a Better Future*. These covered climate change; resilience; equality; recycling and reuse; housing; public goods; design education; inclusivity; planning policy; nature; data and technology; and health and wellbeing. *Build a Better Future* is a suitable framing for the next five years and beyond, notwithstanding the additional urgency and significance of new challenges created by the Covid-19 pandemic.



The themes in *Build a Better Future* will be pursued through **four broad faculty priorities**, each advancing work on a combination of themes, recognising important interrelationships and sensitivities, and in some cases, co-mingled threats. The faculty priorities are:

1. **Action on the climate crisis.** Climate change and sustainability are already well-represented across The Bartlett's teaching, research and external engagement, as evidenced through related, significant research (**Section 3; UCLUoA13\_MDAV**, see **UCLUoA13\_ORE** and **UCLUoA13\_SMI**). This priority will connect deep, specific knowledge with broader interdisciplinary inquiry to activate future research. The Bartlett is crafting a climate change strategy to inform future research directions, taught programmes and operational plans, and a new leadership role, the **Faculty Lead for Climate Action**, to take this priority forward.
2. **Significant, collective engagement with policy and policy-making.** This will continue building on the portfolio of national and international collaborations (**Section 4** and **Impact Case Studies, e.g. UCLUoA13\_MAZ**), and contributions to policy-relevant debates with governments and other stakeholders. This priority will underpin efforts to develop the faculty's impact identity, by stimulating and cross-pollinating novel collaboration and engagement mechanisms. The **Faculty Lead for Public Policy** has a mandate to progress this priority. There is momentum to expand The Bartlett's influence into new policy spaces, so the faculty will support early and mid-career academics to be the next generation of policy influencers.
3. **Stimulating new thinking on the post-pandemic built environment.** The scholarly community is pivoting to consider new understandings of the built environment and its capacity to change. There is no more important time to be developing imaginative and radical visions, following a period when people's livelihoods, economy, behaviour, travel, energy use, and wellbeing have been so profoundly disrupted. The **Faculty Lead for Health** will play a key role in developing research in this area and how it relates to race and gender equality.
4. **Creating momentum on race and spatial justice.** The Bartlett has an established track record of user-informed research and engaged scholarship, and a shared sense of responsibility to be open, inclusive and receptive for the benefit of all those in the built environment. This priority underlines the faculty's commitment to the development of its scholarly community. With leadership from the **VD-EDI**, the faculty is taking steps to undo the harm of racism through its teaching, research and public engagement (**Section 2C**). The **Race & Spatial Justice** recruitment focus will attract new scholars working on race, space and equity.

Finally, as UCL's first cross-disciplinary hub in Stratford, **Here East** has been an influential testbed for **UCL EAST (Experiments, Arts, Society and Technology)**. The Bartlett will have a strong presence in research and teaching at **UCL East**, when the 180,000m<sup>2</sup> campus opens in 2022/23 academic year.

#### 1.4 Supporting and facilitating research and impact

**The Bartlett creates organisational infrastructure and opportunities for research and impact through various means.**

Operational responsibility for allocation of funding from the faculty's core budget to supporting research and impact lies with the Dean and the Director of Operations, who work with a Finance Business Partner to manage the fair and transparent distribution of QR income, and support directors of schools and institutes to configure annual budgets (including staff and non-staff expenditure for research, and research support initiatives).

The faculty allocates core funding for 22.5FTE **professional services posts** that directly support research and impact (approximately 1.0FTE per 13 FTE staff in this REF2021 submission) [this figure does not include posts funded wholly by grant income or centres for doctoral training]. These colleagues are based in this faculty, and are complemented in their expertise by groups of research facilitation staff located within **UCL Office for the Vice Provost Research and Research Services**.

Of these, two 1.0FTE Grade 8 staff are based in the Faculty Office, comprising the core faculty research and impact team. Together with the **VDR**, they initiate and support faculty-wide programmes and activities, and act as team leaders to other core-funded professional services staff in this area.

The **Faculty Research and Enterprise Manager (FREM)** works closely with **VDR** to promote a thriving, diverse and equitable research environment.

- **FREM** tracks funders' priorities, calls and assessment methods, and aligns these with Faculty research areas, as well as providing project management support, proposal development/review, and specialist advice, particularly for complex cross-faculty and multi-institution applications.
- One-to-one career development and support is offered to researchers at all career stages, particularly those applying for fellowships and first grants.
- The **VDR** oversees a portion of the core budget, including seed-funding worth more than £600k since 2014 (see **Section 3**). **FREM** is responsible for managing all stages of the distribution and management of these funds, from call preparation, panel recruitment and progress monitoring, to budget oversight and reporting.
- **FREM** is the key liaison point with **OVPR/BEAMS** Research Facilitators, augmenting their specialist support at Faculty level to help colleagues generate research income.
- **FREM** also coordinates local support via research managers/administrators (see below), developing this community through The **Bartlett Research Coordination and Support** group that facilitates information sharing and learning.

The **Faculty Impact Manager (FIM)** is a core-funded post (created in 2018), boosting The Bartlett's impact capabilities and helping to develop its overall impact identity. Strategic lead in this area is provided by the **Faculty Impact Lead (FIL)** – an academic enabling role, involving close liaison with the Dean, **VDR** and **VD-IE**, who oversee distinctive impact programmes in their own portfolios. The **FIL** post-holder (**Zerjav**) is supported by the **FIM** to coordinate the **Impact Case Studies**.

- **FIM** supports **FIL**, developing practical processes and co-ordinating faculty-wide impact initiatives, providing diverse, tailored training and support (e.g. through presentations, feedback on research proposals), and signposting to funding from **UCL Culture**.
- **FIM** has led over 20 impact sessions across The Bartlett, liaising with colleagues to provide insight and support across a variety of impact pathways (e.g. public engagement, community engagement, innovation and enterprise, outreach, and/or public policy engagement).
- **FIM** & **FIL** coordinate The Bartlett's **Impact Steering Group (ISG)**. **ISG** was formed in July 2019, and has representatives from across the faculty. It advocates for impact as a collective sense of purpose, to establish a consistent and creative approach to encouraging and evidencing impact, and to harness and promote The Bartlett's impact expertise.
- **FIM** established the university-wide **UCL Impact Network**, co-chairing this network with the central **UCL Research Impact and Curation Support** team. Initiated and co-chaired by the **FIM**, The Bartlett has also catalysed a **UCL Impact Network**. This emerging community of practice – with more than 50 members – is a peer-support space, sharing ideas and refining approaches to creating meaningful external impact.

Other research-related professional services staff are based locally in schools and institutes, with around half based in **BSEER** (reflecting the volume of externally-funded research project activity there). They are responsible for management, support, and coordination of research and impact activities, working closely with Directors of Research. There is a near equal split between staff grades, i.e. researcher manager posts and research administrator posts. Importantly, this staffing strategy enables: local operational agility to meet the needs of disciplinary communities; development of strong local working relationships; and progression opportunities in the faculty.

The presence and support of **technical staff** is vital to the pursuit of certain strands of research in the faculty, namely in **BSA**, and some in **BSEER** and **CPM**. More than 18FTE technical staff are located principally in the faculty's major laboratory and fabrication spaces in **22 Gordon Street** and at **Here East**. Design, fabrication, materials, and production research are directly supported by a variety of technicians, technical specialists and laboratory managers.

The Bartlett also funds six core-funded professional services posts to **support doctoral research** across the faculty (with a further 20+ colleagues in schools and institutes who have broad teaching and learning support roles, which include PhD cohorts). There are also 20 **communications and engagement** staff based across the faculty who support research and impact activities, as required.

**Recognition of achievements** is amplified through communication channels, such as *The Bartlett Annual Review*, newsletters and social media posts. Beyond the extensive record of recognition for research (see **Section 4**), colleagues are regularly nominated for impact and engagement award schemes. In 2020, **Bell** won a **UCL Provost's Public Engagement Award** for work involving communities with major infrastructure projects, and in 2019 **Grau-Bove** was nominated for the Mobile Heritage Laboratory. Others whose work have been recognised through this scheme include: **Apsan Frediani** (2016) and **Teh** (with a colleague from UCL Engineering Sciences, 2019).

### 1.5 Supporting and enhancing interdisciplinary research (IDR)

**The Bartlett adopts and sustains a sensitive and distinct interdisciplinary approach to studying the built environment.**

The scale and nature of some of the challenges faced in the built environment, such as social justice and climate change, require research that is not constrained by disciplinary boundaries. The faculty's expertise is founded on interdisciplinarity and a motive to collaborate with complementary disciplines.

Strong IDR emerges from the presence of The Bartlett's broader community of scholars – the faculty draws on the strengths of multiple disciplines to be '*greater than the sum of the parts*'. A full range of epistemologies, research methods, and practices are supported, so that staff can participate in various modes of co-production of research, including interdisciplinary inquiry, and there is a fertile ground for all. For example, **UCL Urban Laboratory**, led by **Melhuish**, supports urban research scholars from the Bartlett and three other UCL faculties, actively bringing disciplines together to collaborate on research, engagement and impact activities. Urban Lab has expanded during this REF period; it has launched a new journal (*The Urban Pamphleteer*) and has 11 affiliate interdisciplinary PhD students.

In line with The Bartlett's aim, in REF2014, to '*invest in research excellence*', new opportunities and spaces have been created for IDR. These include **Bartlett Synergy Grants** (see **Section 3**), conferences and other dialogue spaces (e.g. **Bartlett Research Exchanges**), to stimulate interdisciplinarity and develop new contributions to knowledge. It is also apparent in co-supervision and co-location of staff and doctoral students (encouraging them to practise interdisciplinary thinking and working).



The £15.8m investment in research infrastructure at **Here East** is host to **BREI**, enabling it to convene inter-sectoral (e.g. industry, health, education), as well as interdisciplinary research collaborations. The interdisciplinary vitality and sustainability of the research environment was substantially boosted by the other new institutes (**IGP and IIPP**). Focussing on engagement with policy, government, and community voices, they demonstrate that The Bartlett is initiating and hosting large-scale transdisciplinary research (i.e. where questions, as well as answers, are defined collaboratively). As an example of how the faculty stimulates this, **IGP** founded Prosperity Co-Laboratories (PROCOL) as a means to build up transdisciplinary teams with citizens, policy-makers, businesses, and NGOs. **The Bartlett Innovation Fund** (see **Section 3**) helped **IGP** to co-design a toolkit that would enable policy-makers to adopt and adapt the IGP Prosperity Index methodology to new PROCOL contexts (notably in Cuba, Kenya, Lebanon, Tanzania and Vietnam). The team established a time-limited cross-sectoral Community of Practice to co-design the toolkit, which is being used in collaborative partnerships with Camden Council and Liverpool City Council.

That all this is broadly effective as an approach may be inferred from the range of scholarly backgrounds represented within **REF2**. It is also evident across the faculty's projects, sources of funding and output destinations.

### 1.6 Committing to an open research environment

**Bartlett staff pursue appropriate open science routes towards their research and users, and take an expansive view on how audiences prefer to access research.**

UCL organises policy and support for open access (OA) and research integrity on the eight pillars of Open Science, as identified by the European Commission. UCL is a signatory of the San Francisco Declaration of Research Assessment (DORA), and The European Open Science Cloud (EOSC). Bartlett staff have access to extensive guidance and training on OA, research data, and bibliometrics. They are rewarded for engaging with Open Science through the **UCL Academic Careers Framework**. The faculty recognises the shift towards fully OA publication: as of December 2020, 95% of the 2,901 articles and conference proceedings accepted from 1 April 2016 (not only those submitted to REF) have been deposited in an OA repository or have an exception to the REF OA policy. That this is effective is illustrated in download data. Research on megaproject performance (**Denicol**) achieved the highest-ever number of downloads in *Project Management Journal*; an article on conservation of plastic and rubber (**Curran & Strlic**) achieved the second-highest-ever reads in *Studies in Conservation*; and **Huebner** edited a special collection of open data on occupants and the effects of climate change for *Nature Scientific Data*.

Findable, accessible, interoperable and reusable (FAIR) research data and outputs help lower barriers and facilitate others to realise new opportunities. The faculty embraces this via open, scholarly communication routes (e.g. blogs, podcasts and reports), which receive hundreds or thousands of views per month. As an illustration, in its first three years, **IIPP** published 127 blogs, 33 working papers and 13 policy briefs, achieving over 90k reads. The Bartlett is also driving scholarship, collaboration and citizen science in this area, for example:

- **BSA** pioneered fully OA design research in **The Bartlett Design Research Folios**. Since 2015, the 38 folios have been accessed by more than 50k people in 22 countries. The latest 28 folios expand the series to 66 volumes.
- **ISH** is leading the *Monument Monitor* project with Historic Environment Scotland, where citizen science supports heritage management of historic sites. Visitors submit photographs, which combined with other datasets, evaluate physical change, informing conservation and monitoring. A 'monitor from home' campaign was launched during Covid-19.

- Bartlett researchers work with stakeholders and funders to release urban and local city data: the underpinning research for the 'Colouring London' platform was undertaken in **CASA**; and in **BSA**, *Depthmap*, the analytic platform for Space Syntax, is available via GitHub and has been downloaded more than 100k times to date.

Staff are using UCL's online fully OA publishing facility, **UCL Press** to make their research accessible. For example, **Sheil** and colleagues published three proceedings of the *Fabricate* international conference, which have been downloaded over >123k times by users in 156 countries. Other authors with UCL Press publications include **Biel**, **Vaughan**, **Sendra Fernandez** and **Fitzpatrick**.

### 1.7 Sustaining research integrity and standards.

**Bartlett staff have played a leading role in informing, piloting and operationalising UCL's policy and approach on research integrity, and demonstrated significant leadership on ethics in the built environment as a discipline.**

Colleagues have extensive experience in carrying out research in geographical or cultural settings that warrant nuanced and sensitive research designs. Scholars develop expertise in 'situated ethics', for instance, when working with people living and working in risky situations. Illustrative examples include: KNOW: Knowledge in Action for Urban Equality (**Levy**); diversity, burials and *deathscapes* (**Beebejuan**); and corruption in construction companies and cartels (**Castro**). This kind of underpinning scholarship has informed how the faculty instigates activities around ethics, leading to a broader engagement with metadisciplinarity (where a discipline reflects back on itself through its theory and practice).

**The Bartlett's Ethics Working Group** generated ethical guidelines for built-environment researchers, reading lists, and a critical overview of relevant professional and institutional protocols and codes. Individual staff have made substantial contributions to ethics research and practice, which have been held up as good practice in UCL and beyond:

- **Rendell**, who, between 2015 and 2020, directed **The Bartlett Ethics Commission**, which considered questions of ethics in built environment research, in a discipline-sensitive way, through events, projects, reports and publications.
- **Roberts**, who received the RIBA President's Award for Research in 2018 for *Reflect Critically and Act Fearlessly: A Survey of Ethical Codes, Guidance and Access in Built Environment Practice*.
- **Shipworth**, who was the first person in UCL to be appointed as a **Director of Ethics**, has played a leading role in UCL reviews and committees, ensuring that UCL policy aligns with national requirements and professional frameworks. She created an exemplar local, low-risk ethics review process with a team of trained ethics reviewers, using innovative, comprehensive materials for speedy, rigorous and consistent ethics reviews.

UCL supports researchers to maintain the highest standards of research integrity by acting honestly, reliably, respectfully and being held accountable for their actions. Ethics approval for low-risk research is largely carried out locally, with high-risk and externally-funded research approved at **UCL Research Ethics Committee**, which is governed and steered by **UCL's General Code of Ethical Principles**. Within this, the safe and responsible management, access and security of research data is paramount.

Bartlett staff and students are supported to comply with legislation and funder requirements, and to make best use of resources, including the **UCL Data Safe Haven**, particularly for participant data relating to the nine protected characteristics.

## 2. People

### 2A: STAFF

#### 2A.1 Developing and supporting staff

**In line with the Concordat to Support the Career Development of Researchers, The Bartlett supports people through its environment, culture and development opportunities.**

**The Bartlett is afforded significant autonomy in the way in which it organises its support for research, and opts to do so through schools and institutes.** Across all of these spaces, the faculty takes a strong leadership position on dignity at work, mental health and wellbeing, anti-bullying and anti-racism (see **Section 2C**).

In line with **UCL 2019 Research Strategy**, The Bartlett strives to be the destination and home of choice for the very best researchers. The faculty is an attractive employer: between 2014–15 and 2018–19 it received 7,139 applications, shortlisted 1,038 and appointed 505 academics (research and teaching, research-only and teaching-only), a 7% appointment rate. In total, 101 academic staff achieved promotions over this period, more than 42% of whom were women.

The Bartlett approach considers individuals' needs and career ambitions, alongside support to progress through the **UCL Academic Careers Framework** (and equivalent for professional services). These emphasise promotion through achievement against universal criteria. The UCL Academic Career Framework establishes how staff are recognised and rewarded for research and achieving impact from research, doing so in an inclusive and expansive manner, with examples of appropriate ambitions for progression from Grades 7–10.

On appointment, staff are directed to the **UCL Welcome Space**, information on employee benefits (including work-life balance policies), staff support networks, and mandatory training. All UCL staff complete **mandatory training** (in diversity, unconscious bias, safety, information security and GDPR, freedom of information, and sustainability). Academic staff also cover: research supervision, e-learning, personal tutoring, and fair recruitment practices and policy. This is completed within six months and tied to probation. Completion is monitored by line and local managers who report 100% completion for The Bartlett since 2016. 100% of Bartlett staff have an **induction**. All academic staff and post-docs at Grade 7 or above are offered a **mentor**. Mentoring is an informal arrangement – managers can help to identify a mentor. BAME academic staff are encouraged to join a tri-university scheme called **BMentor**. Training needs are identified through annual appraisals and career conversations between appraisals, with signposting to local, faculty-wide and institutional programmes.

Strategic support, policy and governance for staff lies at university level, so liaison via **UCL HR & Organisational Development, Finance, and Research Services Business Partners** is also helpful in enabling staff to access and make best use of central services. Effective communication of research updates and policy developments is key, and DoRs and research coordinators at faculty and local levels work to ensure equity of access. This is a substantial task, supported by the **Faculty Communications Team** and the **Faculty Director of Operations**.

Beyond the faculty and university support structures described in **Section 1**, schools and institutes have a range of **local research and impact support mechanisms**, designed in consultation with their communities to best meet their needs and respond to emerging priorities. Different disciplinary norms, user audiences and contexts are respected, and funds are made available for projects, conferences, networking, travel, and training and development. Schools and institutes have autonomy to allocate **research allowances** as lump sums (e.g. to support interdisciplinary discussions and collaborative research in research groups and clusters) and/or as annual personal allowances to individual scholars (e.g. for conferences, training or software).

As an illustration of how one school approaches this, **BSA** has supported: 1) Architectural Research Fund, for research projects and PhD student projects (£450k). 2) Individual Research Fund, for academic staff (£400k). 3) Sabbatical Fund, for 32 sabbaticals (£235k).

Importantly, **for staff and research students with caring responsibilities**, individuals' needs are taken into account when travel approval is requested, before bookings are made. This enables those with childcare and other caring responsibilities, as well as physical disabilities and mobility impairments, to benefit from packages designed around their needs. The faculty has supported multiple requests in this way, improving researcher mobility by paying for childcare, and additional travel support or accommodation for staff with mobility or accessibility needs.

## 2A.2 Staffing and recruitment policy (including part-time and fixed-term staff)

**The number of staff submitted (290.69FTE) is more than double that of REF2014, which reflects the overall growth in The Bartlett staff and student population.**

Schools and institutes have substantial autonomy to propose new posts that attend to scholarly directions and long-term aspirations, so patterns of staff recruitment vary. Some areas have used succession planning to stimulate research activity, whereas others have widened interdisciplinarity. Many appointments have been made to secure academics who are emerging or established leaders in their fields, bringing expertise from disciplines such as: culture and philosophy, statistics, climate finance, sustainability science, economics of public value, machine learning, urban studies, and transport planning. Staff from non-academic backgrounds (practitioner-academics) have also been strategically recruited, acting as highly-valued interlocutors between research and impact.

The formation of three new institutes (**BREI, IGP and IIPP**) has created more than 30FTE new academic and research posts (and 22FTE professional service roles), and **BSA** has increased the size of its academic community, such that over 80% of its 67.69FTE submitted staff are active in research and teaching (i.e. HESA3).

The Bartlett's **demographic profile** had previously indicated a gender imbalance at some staff grades, as indicated in REF2014 (which included 64.32% men, based on 88.35FTE, and 35.68% women, from 47.58FTE). For REF2021, The Bartlett's submission includes 112.21FTE women (headcount 154). This is 2.3 times more women by FTE than in 2014, and a net increase in the share of women in the composition of the submission (to 38.6%). This is described further in **Section 2C**.

The Bartlett has been active in piloting and implementing new recruitment practices. In 2018, UCL created a **Fair Recruitment Specialists** (FRS) service, with a view to enhancing recruitment and selection of academic, research and professional services staff. FRS is a voluntary cadre of highly-trained BAME staff who participate in recruitment rounds. The Bartlett has engaged extensively with this service, making the most requests of any of UCL's 11 faculties, 83 in total. Further to this, in early 2021, The Bartlett launched the **Race and Spatial Justice** recruitment focus, bringing forward new posts to foster scholarship in this area, and take steps to undo the harm of racism through its educational offering and research activity, and public engagement – including through the use of positive action. The faculty continues to attend to the lower proportion of **women in senior posts**. Recent efforts to address underlying reasons have resulted in a 7% increase in the representation of women in senior academic positions by 2019, compared with 2016.

**There is parity between staff holding part-time (fractional) appointments, those with fixed-term posts, and colleagues with full-time, open-ended contracts – both in principle and in practice.**

UCL does not employ staff on fixed-term contracts of less than nine months (unless they work on a specific project, or are on secondment or maternity leave cover). The Bartlett does not use zero-hour contracts. Academic contracts are all open-ended/permanent. Research staff on fixed-term contracts are eligible for redeployment (into fixed-term or open-ended contracts) under **UCL HR policy**.

The faculty's REF2021 submission includes **31.69 FTE part-time/fractional staff** (62 by headcount). This is just over 10% of submitted staff by FTE and almost 20% by headcount, indicating the significance of this particular group among The Bartlett research community. The faculty is therefore deeply committed to understanding the challenges faced by people working in part-time roles (and those in fixed-term posts). The line management relationship is a key space to emphasise equity, regardless of contractual status, by supporting staff with advice, for instance, on the drive to publish, seek funding, and build a CV (fixed-term posts), and how to remain in contact with discipline trends and access skills development (part-time posts).

### 2A.3 Supporting and integrating individuals at the beginning of their research careers

**The Bartlett aims to support, integrate and develop early-career researchers (ECRs) across all its schools and institutes – giving them a voice and place in the faculty.**

The number of ECR in this submission by headcount is 68 (**61.92FTE**), up from 44 in 2014. ECR colleagues are a significant and vital feature of daily life in the faculty, acting as lead authors on 88 outputs and co-authors of 37 outputs in this submission. The faculty strives to give a voice to ECRs, for example, by seeking designated involvement and leadership in committees, so they are part of decision-making. ECRs benefit from a range of training and skills development opportunities covering the core elements of academic research.

All staff can access local funds for individual research and scholarship, and there is additional dedicated support for ECRs. A key example is **1-2-1 support for funded fellowship applications**. Individuals are mentored assiduously by the FREM and previous recipients, and The Bartlett has had several successes. For example, **Basiri** won a UKRI Future Leaders Fellowship (£1.2m) to collaborate with the Alan Turing Institute and industry on 3D models of cities (cited in UKRI's delivery plan as an example of capacity building for research leaders), and secured a Professorship in Geospatial Data Science at the University of Glasgow in 2020. In respect of **mentoring and peer support**, this is much valued and widespread. Senior colleagues provide mentoring and ECRs can access training on impact, writing skills, proposal development and career planning.

**BSP** makes a substantial investment in ECRs through **post-doctoral fellowships**. These allow consolidation (writing papers) and a programme of work that stimulates new research directions. A teaching component and a budget for conferences are included. **BSA's** ECR approach supports architects and part-time practitioner staff, through a **BSA Staff PhD Award**. Successes include: **Beckett**, who secured £202k from AHRC to explore bio-augmented design; **Claypool**, who received £75k from ESRC via the Transforming Construction Network Plus; **Matthews**, who won the Panufnik Composers' Scheme award; and **Bavister**, whose soundscapes won awards from the RIBA and World Architecture Festival.

The Bartlett commits to furthering ECR development internationally, e.g. through **InnoChain** – a research training environment examining how advances in digital design tools enable sustainable, informed and materially smart design solutions. **BSA** hosted three InnoChain researchers, including **Stefanescu**, who developed Speckle software – adopted by HOK, SOM, Arup and others, and being developed through a £1m award from Innovate UK, led by **Papadonikolaki**.



**ECRs are empowered and resourced to lead research and impact activities.** For instance, by providing: funding for ECR staff working without or between externally-funded projects; mentoring to be able to take the lead on running events; and skills development for particular audiences. Indeed, participation and dialogue are present throughout the ECR community via **research seminars**. While many focus on specific interests, cross-unit all-faculty events address broad or far-reaching themes, research methodology, and funding calls. ECRs in **DPU** have organised multiple online dialogue events, recently on the effects of Covid-19 in the Global South. Other ECR-led events have included:

- **Gasperin** and **MacPharlane** collaborated with the US Institute for New Economic Thinking's Young Scholars Initiative to host a workshop on *Rethinking the State in the 21st Century*.
- **Milcheva**, **Papadonikolaki** and **Zerjav** convened keynote lecture programmes on infrastructure and digital innovation, with speakers from Cambridge, LSE, Imperial, Penn State, Stanford, and industry (e.g. Arup, IBM, KPMG, and TfL).

In respect of access to **research-leadership roles**, while senior posts in The Bartlett (e.g. **VDR**, **VD-EDI**) normally require professorial level experience, post-holders of Director of Research roles, and the Deputy Directors of Research and Faculty Leads, can all be recruited from the Associate Professor pool, which includes early- and mid-career staff. Local research and ethics committees also include ECR staff.

**ECR colleagues trained at The Bartlett have taken up positions across the world.** The scale of transfer of this emergent research expertise is evidence of how ECRs are supported to thrive, sustaining the vitality of many academic disciplines. More than 30 PhD and ECR from **BSP** progressed to post-doctoral fellowships and lecturing posts. Around half secured posts internationally (e.g. University of Auckland, Nanjing University, Politecnico di Milano, Shanghai Jiaotong University, TU Berlin, TU Delft and the University of Hong Kong), and others were recruited by UK universities (including Oxford Brookes, Queen's University Belfast and Sheffield).

## 2A.4 Supporting the wellbeing of staff and doctoral students

**The Bartlett takes a wellbeing-first approach, drawing on a strong institutional culture around wellbeing in UCL, applied sensitively and creatively across the faculty.**

Wellbeing in the research environment is a broad term, encompassing work-life balance, health at work, physical and mental health, collegiality and a sense of community, as well as sustainability. For an individual, the wellbeing conversation starts at induction, and continues through line management and mentoring relationships – with signposting to **UCL staff and student policies (e.g. Staff Mental Health and Wellbeing Plan, Menopause Policy, and Dignity at Work)** and central support services.

Underpinning this, schools and institutes design and manage wellbeing concerns into **workload models**. By taking the view that everyone has equal opportunity to develop their research, workload can be shared such that staff can be supported appropriately. Responsibilities are spread as equitably as possible, with consideration of fractional posts and those working flexibly/remotely, e.g. by adjusting teaching to concentrate activities into specific days. Care is taken to enable everyone to participate in the life of The Bartlett. 100% of local and faculty meetings are held in **UCL core hours** (10-4pm) (vs. 89% in 2016) and social activities are considerate of staff with caring responsibilities, with a range of activities within and outside core hours.

Anti-bullying and harassment training (in line with **UCL Student Harassment and Bullying Policy**) is championed at The Bartlett. Since 2018, '*Where do you draw the line?*' workshops

have been held eight times, attended by staff and doctoral students. The faculty piloted the *Racialised Biases in Higher Education* workshop for senior staff and held *Taking the Lead* workshops for managers.

Staff and student access to **wellbeing support** has been boosted through: **mental health first aiders**, who connect people with wellbeing support services (such as **UCL Employee Assistance Programme**, and **UCL Report and Support**); and **wellbeing champions**, who disseminate information, arrange wellbeing events and convene training (e.g. on harassment and bullying).

All UCL staff have the right to request flexible/remote working as part of the **UCL Dignity at Work and Work Life Balance policies**. Options for **flexible working** include condensed working hours, early/late starts/finishes, job shares, and working from home, and with advice from UCL HR, schools and institutes develop creative and respectful local operational solutions. Staff have always been actively supported to work from home/remotely. UCL typically approves equipment requests for staff to work safely at home, allowing them to set up a healthy and suitable home workspace. Remote working overseas, e.g. for fieldwork, or to be with family, is also supported, on a case-by-case basis.

**The above principles helped shape an enhanced approach to wellbeing during Covid-19.** Schools and institutes adapted practices to instil a sense of belonging, and promote mental and physical health. This included adjustments to workloads/working hours, and adapted communications to enhance transparency of decision-making. In line with UCL's approach on equity and inclusion, the disproportionate (gendered and raced) impact of the pandemic was overtly recognised through the **UCL Covid-19 Career Support Scheme**, directing resources to those who were most disadvantaged.

## **2A.5 Supporting special and sabbatical leave for all staff at all stages of their careers**

**The Bartlett accords with UCL HR Policy on leave, drawing support from a dedicated HR Business Partner to aid with consistency, fairness, EDI and protected characteristics.**

UCL HR policy contains the overarching principles for **special leave** and **sabbatical/study leave** – empowering The Bartlett to support colleagues and respect individuals' aspirations. This gives schools and institutes in The Bartlett sufficient scope to develop management practices collaboratively, respecting each area's size, population and ambitions. Staff are supported through life events by local management teams, namely Departmental Managers and/or Directors.

**Study leave is vital to stimulate growth, collaboration and invention in The Bartlett's research.** This is available to all staff, irrespective of grade and percentage FTE. Doctoral research students can apply for study leave and permission to work away from UCL. These periods enable colleagues to extend research networks and collaborations, write books and papers, submit research funding bids, visit internationally-leading groups, and develop new research lines.

**A balanced group of 70 women and men, from all grades have taken study leave** (not including post-parental/post-carer study leave). There were more sabbaticals in larger, more established schools, compared to the smaller institutes, but this will gradually rebalance. Workload models help manage the sequence of **sabbaticals** and negotiate adjustments to roles and responsibilities in a fair, agile and transparent manner. Local arrangements are designed to suit schools and institutes: for example, flexibility underpins **BSA's** sabbatical model for design scholars, allowing them greater freedom, if delivering international exhibitions or projects with phased production schedules.

**The Bartlett follows UCL policy on cover and support during parental leave, which continually improves in its provision to parents.**

There is a growing normalisation of parental leave, especially paternity leave, as a result of awareness-raising exercises to foreground equality. The Bartlett adheres to UCL's package of family-friendly support before, during and after pregnancy and adoption, regardless of length of service. All schools and institutes have active **Inclusion Leads** who share notices of staff networks, e.g. **UCL Parents and Carers Together**. During the period, 32 academics took maternity leave with a 100% return rate (except in 2015/16 when one did not return). In line with UCL policy, academic staff are offered a one term sabbatical, without teaching, upon their return.

The faculty supports **working from home** and **time off to support caring responsibilities** during crisis points. Where funders place a cap on childcare and caring funds, **additional carer funds** are released to enable staff to travel and attend international conferences. Such funds also support the cost of care when staff are invited to universities outside the UK for extended periods of time, e.g., to undertake scholarly collaborations, research and networking. Considering **carer or parental leave**, and enabling those **returning to work** to have space to re-engage, there are many instances where staff with particular caring responsibilities have received customised and personal leave arrangements. These have included adjustments of responsibilities to enable staff to offer end-of-life care to relatives and extended periods of working remotely to maintain family relationships.

Formal procedures for staff and research students returning from periods of leave reside at college level in **UCL HR policy**. Staff on, or returning from, periods of leave due to ill health are supported by local management teams, along with **UCL Human Resources** staff, and expert advice is also sought from **UCL Occupational Health**.

## **2B: DOCTORAL STUDENTS**

### **2B.1 Creating a diverse, vibrant doctoral research community**

**If The Bartlett is a crucible for innovation, then its diverse, engaged cohort of doctoral students are at the heart of this.**

The Bartlett's research principles are strongly reflected in the research environment for postgraduate research (**PGR**) students, doctoral education and support. They are embodied in the annual **Faculty Doctoral Strategy**, which is curated by the **Faculty Graduate Tutor (Marshall)**. It is refreshed through extensive consultation across the faculty and takes account of college-level direction (from **UCL Doctoral School**) as well as the **UCL Doctoral Education Strategy**. The strategy focuses on delivering improvements to the doctoral training environment, paying close attention to The Bartlett's diverse research culture. For example, the 2019-20 Bartlett Postgraduate Strategy targeted actions on space, diversity, timeliness, supervision training, and visibility of doctoral achievement and impact. These themes arose from student feedback, captured via **PRES** and **New to UCL** student surveys, as well as strategic drivers in UCL's strategy, **UCL2034**.

The faculty offers 14 doctoral degree programmes, with an MPhil and PhD route. New PhD programmes were launched in 2017 on Global Prosperity (**IGP**), and Innovation and Public Policy (**IIPP**) and in Energy Resilience and the Built Environment, within the ERBE CDT (**EI**). More than 350 **doctoral awards** have been made in this REF period (see **REF4a**).

Doctoral students join The Bartlett from around the world, bringing knowledge and experience from a diversity of disciplines to the research culture. International students consistently account for more than a third of the faculty's PGR population. There is gender parity in the PGR community. There is no meaningful gender difference in PGR applications, offers and acceptances, nor in completion rates (47% female to 53% male for the period), although these

vary by year. Women accounted for 59% of doctoral awards in 2013/14 (20 individuals), and more than 65% in 2019/20. Importantly, the number has doubled, rising to 42 female award-holders, and outperforming the HESA national average by 8%. Viewed by ethnicity, UK-domiciled PGR are predominantly white women and men, with BAME women and men accounting for 32% of the faculty's UK PGR cohort in 2018/19 and almost 36% in 2019/20. This is better than the UK sector average, but The Bartlett's Athena SWAN plan aims to bring this figure in line with inner London's BAME profile (43%). **The Bartlett Promise** (see **Section 2C**) further aims to address under-representation of UK BAME scholars – from 2021-22, it will award five PhD scholarships (four years' fees and stipend), every year.

PGR recruitment and selection are largely managed within schools and institutes, or centres for doctoral training. Advertising occurs across many online channels to improve equity of access and maximise reach. Once applications have cleared checks (in **UCL Graduate Admissions Office**), they are assessed by local Departmental Graduate Tutors (DGT) and PGR support staff, and, if going forward, by at least two further members of academic staff. Applicants are interviewed by both prospective supervisors.

**The faculty recognises the potential inequities and privilege in the traditional PhD application process, and is taking multiple actions to address this.** For instance, **BSP** foreground research on race and spatial justice in its advertising; the **LoLo CDT** moved to a fully-anonymised pre-application process; and **CPM** re-designed its approach to interviews, convening them with renewed sensitivity to applicant needs and preferences.

**Targeted schemes to support under-represented groups exist across the Faculty.** For example, **DPU** offers opportunities to students from backgrounds and countries where there is little or no institutional funding, through the DPU60 scheme, which has awarded eight PhD scholarships (worth £800k). It also launched a new Health in Urban Development Scholarship in 2019.

## 2B.2 Securing studentships from a range of major funding bodies

**Beyond studentship awards from UCL block grants (from EPSRC, AHRC and other funders), The Bartlett has a stake in a number of major centres for doctoral training (CDT).**

- **BSEER** has hosted two CDT, led by **Low**. The £4.3m London-Loughborough **EPSRC Centre for Doctoral Training in Energy Demand (LoLo)** is recognised by UKRI peer reviewers as an '*effective collaboration*', leading to '*high quality doctoral students with excellent academic outputs and real world impacts*'. **LoLo** benefited from £300k cash from 16 partners, including Arup, BEIS, and Public Health England.
- **LoLo** was followed by the £5.7m **EPSRC-SFI in Ireland Centre for Doctoral Training in Energy Resilience and the Built Environment (ERBE)**. **ERBE** commenced in 2019, and has over £300k cash from 11 partners, including FeildenCleggBradley, Bentley Systems, and the Society for the Protection of Ancient Buildings.
- **ISH** holds a significant stake as lead of the £4.7m **EPSRC Centre for Doctoral Training on Science and Engineering for Arts, Heritage and Archaeology (SEAHA)**. It hosts 22 of the 36 students at UCL (partners Oxford University and the University of Brighton host the remainder). **SEAHA** has over £1.6m of support from the industry and heritage sectors; 73 of **SEAHA's** 87 UK and international partnerships are with **ISH**.
- **BSA** is a member of the **AHRC London Arts and Humanities Doctoral Training Partnership (LAHP)**. This supports eight higher education institutions across London. It grants 1-3 AHRC Doctoral awards to **BSA** per annum.



- The Bartlett is part of the **ESRC UCL, Bloomsbury and East London Doctoral Training Partnership (UBEL)**, led by UCL's IoE. The faculty's involvement has historically been in the '*Cities, Environment and Development*' pathway, and in 2020, faculty staff instigated a new '*Prosperity, Innovation, Technology and Politics*' pathway.

Schools and institutes have secured multiple studentships from **CDTs based outside the faculty**, evidencing collaboration and interdisciplinary activity. These include: AHRC Gardens, Libraries and Museums DTC (**IGP**); EPSRC Industrial Doctorate Centre on Virtual Environments, Imaging and Visualisation (**BSA**); EPSRC Urban Sustainability and Resilience DTC (**BSP**); Leverhulme DTP on the Ecological Brain (**BSA and CASA**); and Wellcome Trust DTP on Data Science and Health (**CASA**).

The faculty also attracts **support for doctoral research through government, policy-makers, and non-governmental organisations** (such as charities and trusts). More than £500k has been received from sponsors such as: BEIS, Commonwealth Scholarship Commission, DFID, European Commission, European Space Agency, Humanities in the European Research Area, and the OECD, and numerous charitable trusts and foundations.

Leveraging support from **UCL European Research & Innovation Office**, The Bartlett is partner of choice in Horizon 2020 Marie Skłodowska-Curie Actions. **Rawes, Sheil and Vaughan** have between them received over £800k to host five Marie Skłodowska-Curie scholars, stimulating collaborations with 14 universities (e.g. ETH Zurich, Hebrew University of Jerusalem, KTH Sweden, Politecnico di Milano, TU Delft, and TU Vienna). **Penner** hosted a scholar funded through the Humanities in the European Research Area, led by the Oslo School of Architecture.

Over £1.6m of direct funding has been secured from more than 25 **industrial and corporate/private-sector organisations** for part or full sponsorship of PGR research, including from: Architype, Atkins, Bouygues, BRE, Buro Happold, Costain, Cushman & Wakefield, Edf Energy, E.On, European Investment Bank, Llewelyn-Davies, Osram, Philips Electronics, and Skanska.

Many PGR are supported by **national government scholarships**. While these awards are not routinely disclosed to UCL, based on known amounts in the largest centres, **BSEER** and **BSA**, this is estimated at more than £2m, and includes funding from 24 countries, with multiple awards from Brazil, Chile, China, Colombia, Mexico, Portugal, Taiwan, and Thailand.

### 2B.3 Monitoring progress and successful completions

Overall responsibility for monitoring and completion rests with the FGT, who ensures that the extensive disciplinary and scholarly breadth in The Bartlett is reflected within related governance. While day-to-day decision-making rests with schools and institutes, DGTs come together with key staff at the **Faculty Research Degrees Committee** to monitor progress and share good practice.

The Bartlett encourages the use of **UCL Research Log** for recording and monitoring progress online, but many areas have also developed local approaches co-produced with students. An example can be found in **BSP**, where twice-yearly monitoring is based on a three-way meeting with the student and both supervisors. **BSP** also hosts a PGR day each June, where pre-upgrade students make presentations and those approaching completion present to the public at the **Annual BSP Expo**.

The faculty publicises completions via **@TheBartlettPhD** social media account and graduates are invited to write for the **Bartlett Doctoral Blog**. Doctoral projects are showcased in an annual exhibition and conference. Communicating success recognises and encourages timely completion, and enhanced by **recognition of doctoral research in national awards**. For



example, **BSA** students regularly feature in awards from the Royal Institute of British Architects: **Cheatle** (Highly Commended, 2014, Outstanding PhD Thesis); **Jordan** (Shortlisted, 2016, Research: History and Theory); **Capille** (Shortlisted, 2017, Research: Cities and Community); **Roberts** (Commended, 2017, Research: Ethics and Sustainable Development); **Pearson** (Shortlisted, 2018, Research (Design and Technical)); and, **Pachilova** (with **Sailer**), won the 2019 President's Award for Research (Building in Quality).

## 2B.4 Supporting skills development and career preparations.

### Responsibility for PGR development resides in UCL Doctoral School and UCL Organisational Development, bolstered by Bartlett programmes that provide a disciplinary lens.

The faculty supports PGR development through conference attendance and pedagogical or skills training to assist academic networking and career development. Targeted skills and career-related events, such as '*Lunch and Learn*' sessions, explain doctoral timescale and procedure. The Bartlett's Student Experience Manager convenes intensive writing workshops, called '*Shut Up and Write*', and the faculty organises heats of the **UCL Three Minute Thesis competition**. PGR students are supported through **The Bartlett Doctoral Hub**, a space for news, funding and networking opportunities. Bartlett students can also access multiple UCL-level PGR development programmes. For example, since 2018, more than 50 Bartlett PGR students have joined the **UCL SPERO Entrepreneurship Programme**, with eight going on to launch start-ups.

**Events** that promote collaboration and cooperation, emphasise inclusion, and foreground disciplinary interests are an important part of the calendar. With support from the faculty, **BSA**, for example hosts a major interdisciplinary conference where PGR students present their work and receive feedback from international guests, such as: Perry Kulper (University of Michigan), Lesley Lokko (University of Johannesburg), and Barbara Maria Stafford (University of Chicago).

The faculty allocates core funding to **Bartlett Doctoral Initiative Fund** (overseen by the FGT). This funds students to shape **Bartlett Doctoral Networks**, with themes like: *Culture*, *Socially Just*, and *Water*. Outputs include conferences, workshops and publications – all essential for building an academic profile. The fund has also supported **EDI** initiatives relating to decolonialising the curriculum and experiences of women researchers. Similarly, in **CPM**, PhD students self-organised *Scholarly Life*, which was the culmination of a programme designed to grow an inclusive, academic community.

Schools and institutes ring-fence resources to support PGR students to attend academic conferences. There are discretionary funds for fieldwork expenses, consumables, networking and training, and activities initiated by the PGR community. The faculty also provides teaching opportunities through the **PGTA Programme**: annually, about 30 PGTA posts are funded, and supported through teacher-training towards recognition by the Higher Education Academy, via **UCL Arena Centre**. No gender bias is apparent in the allocation of teaching opportunities for PGR.

PGR students benefit from funding and support for enrichment activities, internships and residency programmes. The university funds UCL-Yale Exchange Fellowships – four Bartlett students have won these awards, and BSA match-funds one PhD student per year to have a residency at the Canadian Center for Architecture. Students also take advantage of secondments and consultancy opportunities (e.g. with Department for Transport, HM Treasury Inter-American Development Bank, World Bank), and some secured internships (e.g. Alan Turing Institute, BEIS, Buro Happold, DNV-GL, and the International Energy Agency).

## 2C: EQUALITY, DIVERSITY AND INCLUSION

### 2C.1 Overview of EDI in the Bartlett

**The Bartlett is embedding gender and racial equity in teaching and research content, alongside operational processes, and including REF preparations.**

The university's thinking on EDI is captured in the **UCL Equity & Inclusion Plan 2020-21**. It offers a clearly defined approach and framework for pursuing equity and inclusion. These terms are key, and while both concepts promote fairness, **equality** achieves this by treating everyone the same regardless of need, whereas **equity** achieves this by treating people differently depending on need. **Inclusion** is being attentive to the impact of social identities and putting the most disadvantaged people at the centre of design and planning. Inclusion values 'difference' as an asset, but understands that it can require more thought, time and resources to accommodate meaningfully.

This thinking informs The Bartlett's path to acknowledge, understand, and tackle structural inequities and unjust social power imbalances that affect communities. Where UCL is taking an equity-based approach by targeting resources to those who are most disadvantaged by Covid-19, the **Bartlett EDI strategy** reflects this, by instituting **an ethic of care**. It is amplified by the Dean and leadership teams, who convey a flexible and empathetic approach to lower productivity, reduced availability, and other challenges arising from working at home.

The Bartlett's 2020 Athena SWAN Silver submission, which builds on an Athena SWAN Bronze awarded in 2016, echoes the need to embed EDI into the university by empowering everyone to advance equity and inclusion, while recognising the specific actions that are needed to progress our focus on intersectionality (gender and race equality). **The aim is for the research base that studies and influences the built environment to be representative of all those who live and work in it.**

As of November 2020, The Bartlett comprised 729 staff and 3,634 students. In brief:

- **On gender:** There were 562 academic staff, of which 38% were women; 167 professional services staff, of which 71% were women; and 379 PGR students, of which 53% women. In all, 45% of the faculty's staff were women and 56% of the student body. Of those appointed into academic roles, 36% were women, up from 27% in 2016, which aligns with numbers applying. Of staff promoted to professor (Grade 10), 46% were women (up from 43% in 2016). In 2020, 28% of The Bartlett's professors were women (up from 18% in 2016); the faculty aims to grow this to 40% by 2025 and 50% by 2030.
- **On race:** BAME women and men represented 8% and 7% respectively of faculty staff, which matches the sector average for staff. While the faculty's first BAME woman professor was appointed in 2017, by ethnicity, the proportion of BAME women academics has remained static at 6% since 2015. BAME women are under-represented at all stages of recruitment, with an application to appointment ratio of 3.3%, compared to 9.6% for white women. The faculty aims to improve BAME representation in the staff and student body, so the faculty EDI plan includes outreach, recruitment and scholarship actions to prioritise these groups.

The gender and ethnicity of staff submitted to REF2021 is outlined in **Section 2C5**. Since REF2014, progress has been made on EDI, and ongoing support will ensure it continues to be foregrounded.

## 2C.2 Supporting research, engagement and impact that foregrounds EDI

**The Bartlett has a strong academic profile and agenda in its research portfolio that is influencing broader debates of equity and social justice.**

Research that considers the wellbeing, representation and diverse histories of different communities can be seen across The Bartlett (see also **Section 4**). The faculty hosts many researchers whose work focuses on equity and issues that lie at the interstices of protected characteristics, inequalities and global societal concerns.

Research with partners from the Global South covers gendered experiences of climate change, intersectional policy development, how children are affected by displacement, and lived experiences of health, life and death. **Levy** leads the £6.3m UKRI/GCRF *KNOW: Knowledge in Action for Urban Equity* project, which is transforming urban equality in the Global South through the creation of urban learning hubs. The faculty's influence on equity in urban policy is evident in *DIVERCITIES*, a €6.7m EUFP7 project on relationships between diverse populations, social cohesion, and competitiveness; the UK team, led by **Raco**, has published a handbook on hyper-diverse cities.

**CASA** is exploring age and ageing, through interaction design, via exhibitions at the V&A and workshops with schools in London, Sheffield, Aberdeen and Cardiff. **Chrysiou** worked with Osaka University on *Design for Ageing: East meets West*, a study on the spatial policies for people in care, in two geographical contexts, and **Boys** created the *Matrix Open Online* feminist architecture archive, aiming to make practices more equitable. Supported with AHRC funding, **Rawes** and **Lord** produced an open access film, *Equal by Design*, and The Bartlett funded a conference on gender-neutral toilets, their politics and inclusive design.

Scholars in **DPU** and **IIPP** are working with *The AT2030 Life Changing Assistive Technology for All* (part of a £10m project funded by FCDO), exploring evaluation and market and innovation structures. The **Global Disability Innovation Hub** (based at **Here East**) coordinates delivery of AT to over three million people by testing new approaches and providing evidence of 'what works'. **Boys** also instigated the influential *Architecture Beyond Sight* project, which focused on design, prototyping and considering entry routes into the architecture profession for blind and visually-impaired people.

There is a strong programme of **engagement and engaged scholarship** around EDI and intersectional concerns. **Egbo** and **Campkin** won a Communities and University Partnership Initiative Award from the National Co-ordinating Centre for Public Engagement to study regeneration and diversity, comparing BAME experiences across three London boroughs. Aided by the **UCL East Listen and Respond** fund, **IGP** assessed how well BAME communities with multiple disadvantages were being supported with money, education, and advice during the Covid-19 pandemic.

## 2C.3 Leadership and originality in faculty EDI structure and practices

**The Bartlett's commitment to EDI is shown in its creation of a Vice Dean EDI role, a recurring budget, and strong governance and support structures.**

In 2018, The Bartlett was the first faculty in UCL to establish a **Vice-Dean for Equality, Diversity and Inclusion (VD-EDI)** role, supported by 1.2 FTE over four staff, across Grades 6-9. The impact of this post has been to formalise governance and reporting of equality work; secure recurrent funding from the faculty's core budget; and support senior leadership to pilot equity initiatives. The Bartlett beacons the possibilities of a VD-EDI, sharing the approach and job description with other faculties. Post-holder, **Patel**, was recognised in **UCL's 2020 Annual Inclusion Awards**, receiving the Sir Stephen Wall Award – Inspiring Role Model. During Covid-

19, the VD-EDI championed awareness of the gendered impact of the pandemic, lobbying for the disproportionate impact on women to be recognised. This resulted in a change to the UCL promotion process, adding an inclusive expectation for everyone to comment on how Covid-19 had impacted them.

The faculty has **four EDI Working Groups and a Coordination group** chaired by the **VD-EDI**. The 29 members of the faculty's EDI team include professional services staff and academics across all grades, and UG and PGT students. The Dean co-Chairs, with the **VD-EDI**, termly EDI meetings (open to staff and PGR students) to communicate progress and consult on actions for gender and race equity. Every part of the faculty has an active **Inclusion Lead**.

Driven by EDI leadership and working groups, many of The Bartlett's EDI initiatives go beyond institutional expectations, and in some cases are sector-leading. The most significant is **The Bartlett Promise**. This major investment from the faculty's core budget of over £1m (for the initial three academic years), addresses under-representation in the student pipeline. It aims to award full fees and stipend scholarships to 10% of all UG, PGT and PGR students. The first intake was in 2020, with 10 scholarships for UK/EU undergraduate students.

Further examples of the faculty's collaborative approach to embed EDI include:

- **B.Queer:** in 2020, the faculty launched this LGTBQA+ staff and student group founded on scholarship and lived experiences.
- **Bartlett BAME Network:** launched in March 2021, a faculty-wide support network for BAME staff and students.
- **Inclusive Spaces:** the faculty launched this monthly seminar series in early 2021, adding to the calendar of events convened at key points in the year, such as Black History Month.
- **Queering the Curriculum:** a cross-faculty project to think beyond gender binaries for gender equity.
- **Race & Space:** in 2020 a cross-faculty group of staff and PGR students published an open access curriculum designed for staff and student self-directed study.

**Individual scholars have pioneered EDI in relevant disciplinary or institutional settings, evidencing the faculty's commitment to beacon good practice.** For example: **Rawes** was UCL's lead on the *BAUHOW5* EDI knowledge transfer group, sharing awareness of institutional charters to good practices in gender, diversity and inclusion provision with peer universities (TU Delft, ETH Zurich, TU Munich and Chalmers); and through his leadership in the UKERC, **Watson** championed EDI in the EPSRC energy research community through a £1.5m *Whole Systems Networking Fund*, which supported 18 small projects (most led by women) and created a network of BAME researchers.

**The faculty embeds EDI in its support around research funding applications, highlighting fair access and inclusivity.**

Staff have access to internal funds for research projects and equipment, as outlined in **Section 3**. These seed-funds for research, impact, innovation and equipment are typically managed at the faculty level, coordinated by the **VDR** and **FREM**. They are very important to ECRs and those working in disciplines for which funding is not readily available. Fair access to funding, and fairness in the operation of panels which allocate funding, are strongly emphasised throughout the process, i.e.:

- Call documents are peer reviewed by a range of colleagues for clarity (particularly around evaluation criteria), inclusivity, and equity of opportunity to apply.
- Launch deadlines are checked for fairness and to avoid clashes with holidays, major institutional deadlines and marking periods.
- Applicant demographic data is collected after submission to inform future targeting.
- Selection panel members/reviewers are drawn from across the faculty, from a range of disciplines, career levels, and backgrounds, with gender and racial diversity in mind.

- A different mix of people is recruited for each panel to encourage a mix of views, share knowledge, and also share citizenship workload.
- Panels only review information provided in applications, rather than any contextual information, allowing fairer comparison of applicants.
- While evaluation follows criteria for a given scheme, at the point of ranking, protected characteristic data may be used in decision making if bids are equal on all other aspects.
- Research-related professional services staff may observe panel meetings, enabling them to better support staff preparing bids, and understand how EDI is framed within this setting.

## 2C.4 Preparing colleagues for promotion and reward, and leadership roles

### The Bartlett's practices around the inclusion of EDI matters in promotion and reward are informed by UCL Ways of Working and UCL Academic Careers Framework.

These UCL policies have EDI strongly embedded. The Academic Careers Framework recognises that individual scholars may develop different portfolios of work – it welcomes a variety of approaches to undertaking research and impact, and articulates the value of institutional citizenship. This approach, introduced in 2017/18, directly tackles potential bias within **progression** by removing metrics that are known to result in structural disadvantages, particularly for women. Indeed, since 2017, The Bartlett has seen more women being promoted – in 2020, 28% of professors were women (vs. 18% in 2016).

There are many **research-related leadership roles** within schools and institutes, the faculty, and UCL, and multiple, fair opportunities to participate in, and also to progress towards, these roles. Terms of office are defined carefully and appointments made using open recruitment processes. The proportion of **women in leadership roles** has improved. In 2020, The Bartlett had three women heads of department (of eight) (vs. one of seven in 2016), and four women Vice-Deans (of five) (vs. three of seven in 2016). There is an overall gender balance of 50:50 across the faculty's leadership.

### Protected characteristics vary from one person to another, so support is also designed around individuals, in the full knowledge that everyone has their own, multiple intersectionalities.

This is an important principle valued by The Bartlett – diversity in protected characteristics creates vitality and brings a diversity in research perspectives and scholarship. It is also strongly reflected in the way that **UCL Equalities Office** and **UCL Occupational Health** provide reasonable adjustments, specialist equipment and financial support to allow staff to work productively.

The nine protected characteristics, and associated obligations under the **Equality Act 2010**, underpin The Bartlett's approach for organising support for people in groups who may be characterised as a minority or under-represented in the faculty, or in society more widely. This helps schools and institutes develop annual EDI action plans and local support environments, and coupled with UCL's mandatory training, faculty staff are able to confidently recognise equality, diversity and inclusion in everyday practice and create safe spaces to work.

The Bartlett is committed to actively **tackling the effects of multiple disadvantage** which can prevent staff working productively on research, and focus efforts around specific intersections of the protected characteristics, such as **gender-race**, i.e. the under-representation of Black women in staff Grades 9-10 and BAME participation in PGR research. The faculty's 2020 Athena SWAN submission showed that women, notably Black/BAME women, continue to be disadvantaged in respect of academic career opportunities. In response, schools and institutes



have diversity action plans for local staff recruitment and promotion, and positive action waivers are being sought routinely.

Promotion for BAME women and men to senior levels is a priority matter, so The Bartlett is providing **targeted intersectional support**. In 2019, The Bartlett piloted a cross-faculty senior **Promotion Surgery** for eight academics from under-represented groups (self-identified BAME, women, disabled, LGBTQA+). All those who attended were promoted. In 2020, 18 academics from under-represented groups took part; the outcome will be known in August.

## 2C.5 Constructing the REF2021 submission

**Across The Bartlett, opening up inclusive and equitable conversations around research has been a vital step in engaging with individuals and groups in REF.**

The **UCL Code of Practice for REF2021 (CoP)** was an important point of reference, encouraging inclusive working methods. It aligned with the faculty's preference for light touch central governance, respectful of local arrangements. Extensive consultation led to a highly devolved day-to-day operating mode, with schools and institutes empowered to organise their work in the way that they felt worked best for their size, scale and discipline base.

**This engaged virtually all staff in REF preparations.**

The **CoP** reinforced inclusivity in staff selection. The faculty had grown substantially, a major part of which was in HESA 2 staff (researchers), so it was felt strongly that the submission should represent this community inclusively. The faculty developed a process to do so, based on a fair and inclusive assessment of individual researchers' contextual independence statements.

A **REF Review & Selection Group (RSG)** was designed to best reflect The Bartlett community. Membership was composed of 39 people from across the faculty, with a balance of gender and race, and a mix of academic and professional services staff, and staff grades. The **VD-EDI** was an invited member.

**The faculty embedded gender and race equality at all selection stages**, bolstered by support for staff with relatively fewer outputs (e.g. due to career breaks, parental or carers leave). Tactics to engage colleagues constructively in the REF preparations included:

- not using outputs as a criterion for selection;
- not using citation metrics as a criterion for selection;
- holding two EDI workshops with the Review & Selection group;
- hosting meetings with individuals, to understand their research context, contribution, and aspirations – whether or not they would ultimately be submitted; and
- organising peer reviewing of potential outputs in a way that actively included ECRs and those transitioning into academic positions.

UCL central REF team produced **Equality Impact Assessments**. The faculty team reviewed the initial **EDI Impact Assessment**, and shared the results with representatives from schools and institutes in the **Research Advisory Group**. The data were then discussed in **RSG**. At that point, colleagues were asked to consider staff selections in closer detail. This process led iteratively to the final composition, which is an improvement on The Bartlett's staff profile in REF2014.

The output distribution broadly reflects the overall profile of staff being submitted. Although outputs attributed to women are slightly less well represented, **the proportion of women academic staff in this submission matches the proportion of women in the faculty as a whole**. The selection of staff for REF2021, by gender, is 38% women and 62% men. It includes 3% more women compared to REF2014. **There has been a 4.14% increase in BAME**

**headcount** (male and female) since the last REF. While outputs attributed to BME men are more likely to be included, BME women are the least well presented. The faculty has committed to a number of race-equity initiatives to strengthen and expand the BAME community in coming years. Finally, the **number of European and international staff in this submission is more than double** that submitted to REF2014. With over 30% indicating their nationality as EU/EEA, and 20% from the rest of the world, The Bartlett research community has a strong global outlook.

### 3. Income, infrastructure and facilities

#### 3.1 Research income: generating a thriving, diverse research base

**The Bartlett stimulates growth, development and collaboration in research, leading to significant external research income.**

The research community is supported to pursue funding that attends to research problems in the built environment that span disciplinary boundaries, extend across multiple scales, and satisfy personal interests and goals. In line with its research principles, the faculty maintains a fair and expansive approach to the deployment of related support – all researchers are afforded the utmost respect for their identity and autonomy, both as individuals, and as groups of scholars working collaboratively. Overall, this creates a productive research community that is far *'more than a sum of the parts'*.

As evidenced below, and in **REF4b** and **REF4c**, the positive outcomes from this approach show that: 1) A range of subject, disciplinary and interdisciplinary interests are supported to grow and thrive – reflected in over 200 different funding sources, all with different core values and scope. 2) A range of scales of endeavour are being supported – illustrated by the range in project sizes, from £3k to £18m, from individual scholarship to multi-institution consortia. 3) Research is taking place in a range of settings – as shown in the distribution across local, regional, national and international locations.

As noted in **Section 1**, perhaps the most significant investment The Bartlett makes in stimulating research income is in seed-funding for research and impact (worth over £600k in this REF period). With strategic steer from the **VDR**, the **Faculty Research & Enterprise Manager (FREM)** manages the distribution of this core funding, via:

- **Bartlett Research Challenges Grants** (£70k, 2014-17) and **Bartlett Synergy Grants** (£90k, 2018-20): seed-funding for innovative cross-disciplinary collaborations involving at least two members of academic staff from different schools and institutes.
- **Bartlett Research Materialisation Grant** (£200k, 2013-19) has funded biannual awards of £50k, bringing together expertise from different fields for cross-disciplinary research.
- **Bartlett Research Grants Scheme** (£50k per annum, 2020-date): a pilot scheme of five awards of £10k, for ECRs, individually or in small teams, to kick-start new ideas, collaborations, and develop larger external research proposals.
- **Bartlett Innovation Fund** (£200k, 2016-date): the **Faculty Impact Manager** leads on this funding stream, with input from **FREM**, for activities which generate, or support: enterprise collaborations, impact-related activities, and innovation learning initiatives.

As an example of how such funds stimulate activity and generate research income, a **DPU**-led team that was awarded a £50k **Bartlett Research Materialisation Grant** (*ReMap Lima-Mapping beyond the palimpsest*), went on to secure £8m funding, from ESRC-GCRF, UKRI-GCRF and others. The project enabled local community mappers to influence policy-making and stimulate public debate, and by strengthening relationships with local partners in Peru (see **UCLUoA13\_ALL**).

**FREM** is also a key liaison point with UCL research support services (such as **UCL Office of the Vice Provost Research, OVPR**), augmenting their specialist support at faculty level and leveraging various mechanisms for local support for research (see **Sections 1 and 2**).

Colleagues developing collaborative proposals are supported by **OVPR Research Facilitators**, enabling them to draw on knowledge gained from the breadth of UCL's success in securing research funding. **OVPR** provides support for fellowship applications, large grants, and arranges mock panels and training on major funding schemes, and 1-2-1 meetings, for advice on any stage in a research application process.

**Research funding during the REF period exceeded £77.94m** (up from £23.96m in 2014); doctoral training centres are included within this figure (see **Section 2B**). Showing the growth of research at The Bartlett and the effectiveness of strategies to secure research income:

- the faculty has won 325% more research income in total, and 152% more research income by FTE since 2014;
- average research income per annum has more than doubled (from £4.79m in 2014, to £11.13m by 2021), and average research income per FTE over the period has increased from just over £176k in 2014, to £268k by 2021.

Over 60% (£46.98m) of research income came from UKRI, via a number of its research councils, principally AHRC, EPSRC, ESRC, and NERC, indicating clearly the breadth of subject coverage in the faculty. A further £15m was awarded from EU-funding sources (including the ERC and Horizon 2020). Income from industry, commerce and public corporations totalled over £5.75m; support from the UK central government (including local and health authorities) exceeded £5m; and a further £2.5m was secured from UK-based charities (through open competitive processes).

While it is not possible to provide a detailed account of the grant portfolio, the examples below illustrate The Bartlett's leadership and participation in major consortia and doctoral training centres.

- **The Bartlett hosts:** UK Energy Research Centre Phase 4 (£18m); UKRI/GCRF Knowledge in Action for Urban Equity (£6.3m); EPSRC UK Regions Digital Research Facility (£4m); EPSRC Platform on Complex Built Environment Systems (two phases, £3m); and ISCF Transforming Construction Network Plus (£2.5m).
- **It is a partner in:** The Centre for Energy Demand Solutions (£19m, led by University of Oxford); EPSRC AI for Science and Government (£38m, led by the Alan Turing Institute).
- **The faculty leads:** The London-Loughborough EPSRC Centre for Doctoral Training in Energy Demand (£4.3m); EPSRC-SFI in Ireland Centre for Doctoral Training in Energy Resilience and the Built Environment (£5.7m); and EPSRC Centre for Doctoral Training on Science and Engineering for Arts, Heritage and Archaeology (£4.7m).

**The Bartlett has also received over £5m in donations and sponsorship from charitable bodies, foundations, and corporates.** This further reinforces the faculty's role as an expansive and inclusive convenor of research and scholarly endeavour. Examples of this type of funding and in-kind are:

- In **DPU** an award from Comic Relief for the **Sierra Leone Urban Research Centre** (see **UCLUoA13\_WAL**) is improving lives in Sierra Leone through a permanent research centre for public debate on equitable urban development. More than 25 UCL staff have collaborated with SLURC, which has led to further collaborative international research.
- **IIPP** received £4m from funders such as The Open Society Foundation, William and Flora Hewlett Foundation, and the Omidyar Network, for work on innovation and mission thinking.
- **BSA** received funding from more than 30 organisations for lab-based research and individual scholarship, leveraging other funding sources. For example, £85k of materials and staff expertise enabled **Wilton** to leverage £190k EPSRC/Innovate UK funding to create the Cork House (which won multiple awards including the 2019 RIBA President's Award for Research, the RIBA Stephen Lawrence Prize, and was shortlisted for the 2019

RIBA Stirling Prize). Also, Culture Ireland, Department of Arts, Heritage and the Gaeltacht, Irish Arts Council, Royal Institute of Ireland awarded €340k to **Manolopoulou** and **McLaughlin** to build the Irish Pavilion at the 2016 Venice Biennale, drawing on their research on dementia.

- In **BSEER**, funding from the Sun Foundation, the Foreign and Commonwealth Office, and Chartered Institution of Building Services Engineers supported user and policy engagement events on energy epidemiology, indoor environment and health (see **UCLUoA13\_MUM** and **UCLUoA13\_ORE**).
- The Bartlett's expertise in applied urban informatics attracted the MacArthur Foundation to support **CASA** to translate new digital tools and technologies into practical applications in cities, leading to publications on new urban analytics.

### 3.2 Organisational infrastructure and investment

#### The distinctiveness and diversity of the organisational infrastructure at The Bartlett contribute to the vitality and sustainability of research.

Along with an overview of the faculty's research structure and support infrastructure, the creation of three new institutes, **BREI**, **IGP** and **IIPP** was described in **Section 1**. These have stimulated several new areas of research and impact activity, and taken in combination with investments in physical infrastructure (also noted previously) are contributing significantly to the change in the size and shape of the Bartlett as a research community since REF2014.

The Bartlett's expansion at **Here East** in 2018 enables **BREI** to initiate new interdisciplinary research in areas that are deeply-grounded in user communities (such as healthcare, learning environments and housing). **Here East** also includes a 2000m<sup>2</sup> high-bay laboratory space (including large-scale robotics, a motion capture arena and advanced manufacturing, metrology and testing facilities, used by **BSA** and **CPM**). There is a full-storey height environmental chamber, and an artificial sky, for studying the impact of the outdoor environment on building materials and the human experience of the indoor environment, benefitting research in **IEDE** and heritage scholars in **ISH**. More broadly, the facility enables scholars to explore new areas and collaborate readily, not least because research laboratories are co-located with event spaces and workshops. Examples led by **BSA** include bio-engineering (**Cruz**); robotics, dance and space (**Glynn**); and manufacturing, prototyping and production (**Sheil**). Early diffusion of research outcomes into taught programmes in the facilities is evident in the new MEng in Architectural and Engineering Design.

The £22m expansion of **22 Gordon Street**, completed in 2016 (see also next sub-section), has enhanced the vitality of The Bartlett's research community. It is also a demonstration of the integrated relationship between research and the places and spaces in which it is undertaken. The project won national industry awards, including Retrofit Project of the Year at the CIBSE Building Performance Awards 2020, which recognises excellence in both user satisfaction and building performance. 22 Gordon Street is the home of the Faculty Office and **BSA**, which as a result, has been able to both consolidate its research strengths but also extend its collaborations and capabilities. For example, in 2016, it established **The Centre for London Urban Design, CLOUD**, which carries out research with partners, such as Camden Council, GLA, and internationally with the Beijing Institute of Architecture and Design. CLOUD has secured an EU-funded Erasmus+ grant (with Chalmers University) to design structures using innovative clay construction.

### 3.3 Specialist research infrastructure and facilities

#### The Bartlett continues to invest in specialist research infrastructure, stimulating new research collaborations and supporting interdisciplinary investigations.



Laboratory and equipment design at The Bartlett is often a technical exemplar in itself, as evidenced in sector awards for the 22 Gordon Street refurbishment and extension (previously Wates House). The investment enabled **BSA** to create **The Bartlett Manufacturing and Design Exchange (BMADE)** in 2017 – one of the ‘innovative projects’, noted in REF2014. The 900m<sup>2</sup> BMADE@22GS Workshop is an integrated studio, workshop and laboratory space, supported by 5.0FTE core-funded technical staff. It houses full-scale prototyping and assembling experiments that underpin design research through the affordance of manufacturing, materials and process. Around £6m has been invested in **BMADE** facilities, including £4m for 3D printing, CNC machining, robotics, electronic systems and associated computational equipment. This facility was the centre for The Bartlett’s PPE production during Covid-19. **BMADE** opened up new lines in fabrication and structural research, leveraged by recruitment of practitioner-academics such as **de Rycke** (Bollinger + Grohmann) and **Solly** (Format Engineers).

The faculty receives a share of UCL’s Research England **Research Capital Investment Fund (RCIF)** for investment in research equipment. Since 2018-19, it has awarded £1m via open competition to equipment that supports cross-faculty, interdisciplinary research. A faculty panel, comprising reviewers with different disciplinary perspectives, aims to identify synergies between proposals and maximise access to equipment. For example, in 2019, two state-of-the-art gas chromatography-mass spectrometry systems were secured with £198k from RCIF to support research in **ISH** and **IEDE**. These systems form part of the **Heritage Science Laboratories** (at Here East and Bloomsbury), which are accessible to staff from UCL and other universities. The lab hosts analytical facilities for studying heritage material-environment interactions, co-located with specialised imaging (a unique 3D hyperspectral imaging system with robotic arm), and a Materials Reference Collection.

### 3.4 Collaborative use of research infrastructure

**The Bartlett is active in consolidating and expanding cross-HEI collaborations. Many are cross-UCL groups, and longstanding relationships and connections with other universities.**

There have been notable developments in urban and spatial data and analytics, principally involving **CASA** and **BSA**. This was stimulated by UCL’s involvement in the 13-university **UK Collaboratorium for Research on Infrastructure and Cities (UKCRIC)** and the **Data & Analytics Facility for National Infrastructure (DAFNI)**, championed by **Batty**, combined with expertise developed in ‘space syntax’. A £4m award from the EPSRC Digital Economy programme initiated the **UCL Urban Dynamics Lab**, led by **Penn**, explores the intersection of city and regional development and spatial analytics, data science and computing. It aims to create shared research infrastructure, leveraging multiple research IT infrastructures at UCL and project partners (e.g. Bank of England, Greater London Authority, and Intel). **Batty, Manley & Kandt** are involved in the £11m **ESRC Consumer Data Research Centre**. This social science data infrastructure houses a large array of consumer data, offering access to researchers, business and policy-makers. A further example is the faculty’s connection with the **Alan Turing Institute**, having hosted three Alan Turing Fellows.

There are many major collaborations in **BSEER**: 1) The **UK Centre for Moisture in Buildings** in **IEDE** is a collaboration with Heriot-Watt University and the London School of Hygiene and Tropical Medicine, and the Building Research Establishment. It aims to create a moisture-safe built environment in the UK by substantially improving the understanding of moisture risk. 2) **ISH** led a group of UK heritage science laboratories to join **IPERION HS**, a consortium of 24 partners from 23 countries establishing pan-European research infrastructure on heritage science. **ISH** became the UK national coordinator for the **European Research Infrastructure for Heritage Science** in 2017. 3) The **Smart Energy Research Lab** in **EI** hosts smart meter data from participating households, giving the UK research community access to a large dataset for energy



research. 4) **EI and ISR** organise and co-chair the **UCL Energy and Development Group**, which has enhanced the faculty's position to bid for major funds, and resulted in a central role in a £38m programme funded by the FCDO (Climate Compatible Growth).

### 3.5 Using infrastructure, facilities and expertise for impact

**The Bartlett brings together its infrastructure, facilities and expertise to ensure that research has the widest impact possible, on campus and beyond.**

There is a sustained, intensive utilisation of places and spaces, for a range of purposes, including exhibitions, public seminars and public lectures. The faculty communities are constantly reinventing how spaces are put to use to create dialogue and invention, and generate impact.

Numerous events are hosted **on campus** to open new disciplinary discourses and convene existing or traditional narratives, whether these are inspired by academic disciplines, or as a conscious and scholarly response to events in policy, industry, or society. These frequent and diverse interactions enable staff to identify radical new spaces for cross-disciplinary collaboration. Representatives from non-academic organisations are widely regarded as core stakeholders. Public lectures and events are held regularly, attracting large audiences from diverse groups and communities. On average, the faculty hosts more than 100 public events every year, stimulating knowledge exchange, public engagement in research, and accelerating impact.

The longstanding **BSA Summer Show** draws more than 8k visitors every year. It has been enhanced through the expansion of 22 Gordon Street in 2017. Having about 70% more space (8,887m<sup>2</sup>, up from 5,260m<sup>2</sup>) has also allowed design scholars to curate more exhibitions, starting with Peter Cook's *80 at 80* exhibition, and including ground-breaking activities such as *Architecture beyond sight*, a young people and future-city-making exhibition *Accelerate*, and *Look/Think/Do*, a short course considering architecture from the perspective of visually-impaired people.

During 2018-19, more than 2k people attended **BSEER's** public events, and since the launch of **BREI** in 2018, more than 3k people participated in events in **Here East**. Examples of **BSA** events hosted at Here East include the Design for Performance Interaction Project Fair and The Architects' Journal Student Prize Ceremony. Some events have led to **UCL institutional support** to develop capabilities, including the **UCL Islands Laboratory (Spataru)**, and the **UCL Off World Living Institute (Edkins)**, the latter having been welcomed into the **European Space Agency laboratory** at UCL in 2019.

Beyond campus, The Bartlett uses its infrastructure to bring research to diverse publics, supported by communication channels such as podcasts and social media. The faculty supports the **Mobile Heritage Laboratory**, which is a unique resource for impact and engagement, managed by **ISH**. It uses portable scientific equipment to engage the public- and heritage-sector stakeholders in research. By 2020, it had hosted more than 2k unique visitors, as part of over 100 events, across the UK, including in Belfast, Cardiff, Hereford, Oxford, Portsmouth, plus the British and Cheltenham Science Festivals.

In 2015, The Bartlett (with **UCL Faculty of Engineering Sciences**) established **The Engineering Exchange (EngEx)**, to enable staff, students and community groups to work together on engineering and built environment challenges. EngEx is a space for dialogue around disciplinary interests, and has created impact on topics such as air quality, transport and housing. It has become an important institutional lever, securing >£6m for research, impact and public engagement and enabling new connections with groups in the USA, Chile and Australia.

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

##### 4.1 Building scholarly research collaborations, networks and partnerships

**Leadership teams in The Bartlett encourage colleagues to pursue collaboration and to think of research as a collaborative act, while remaining deeply respectful of individual scholarship.**

The faculty's **Vice Dean International** (0.2FTE enabling post held by **Allen**) provides staff with advice on establishing links with international peers. The Bartlett has **Memoranda of Understanding (MoU)** with peer organisations, supported by **UCL Global Engagement Office** and **UCL Research Contracts Office**. These are instigated in response to international priorities and emerging opportunities, enabling schools and institutes to forge long-term collaborative relationships. For example, following extensive input to the United Nations Environment Programme International Resource Panel (**Ekins**), the MoU between UCL and UNEP stimulated activity to develop a *Strong Environmental Sustainability Index*, informing UNEP's Measuring Progress programme. Other MoU support mobility of doctoral students and postgraduate researchers, and are set up along disciplinary lines, e.g. **BSP** has MoU with urban studies centres (Paris and Leuven) and **CPM** has MoU with climate change experts (Beijing, Renmin, and Tianjin). Oversight lies with the Dean and **VDR** who approve risk assessments for global research partnerships, ensuring consistency.

**Honorary and visiting staff** are often the genesis of partnerships. Schools and institutes have hosted more than 50 early and mature stage scholars for research stays of up to one year. **CPM** has welcomed visitors from China, Australia and the USA; **BSA** hosted scholars from Australia, China, Germany, Iraq, Japan, and Spain. **DPU** was instrumental in the research exchange of 30 scholars to and from Asian universities, under the Urban Knowledge Network Asia scheme. Its visitors reflect the research focus on the Global South, coming from Brazil, Colombia, Mexico, and Somaliland.

The faculty has been instrumental in shaping **UCL's Global Engagement strategy**, based on the concept and practice of **partnerships of equivalence**, initiated by **Levy**. This has attracted support from **UCL Global Engagement Office**, which has awarded over £145k to 47 Bartlett staff to mobilise international links. More than three-quarters was won by early to mid-career scholars, enabling them to collaborate with partners across Africa and the Middle East, Europe, Latin America, Asia, and Australia. A further £222k has been awarded to the faculty to support more than 50 projects under the **UCL Grand Challenges** programme.

##### 4.2 Building relationships with key research users: influencing policy and practice

**Bartlett staff regularly engage with built environment professionals, policy-makers and civil society groups, and share knowledge through secondments.**

The faculty takes an inclusive and broad, values-based view of impact, such that as a whole, and in its constituent parts, enduring change can be created. Staff and doctoral students are supported to be able to recognise and interact with diverse publics. Relationships are stewarded by individuals or small teams, with cross-disciplinary activity flourishing, supported by hundreds of **engagement events** (more than 130 public lectures, keynote talks, etc, per annum). Each school and institute hosts a flagship lecture series (in 2019/20, more than 40% of speakers were women, up from 23% in 2015/16). **Advisory boards** in schools and institutes further encourage dialogue with stakeholders.

Staff participate in multiple external policy, industry, professional and advisory **groups or networks**, as appropriate to their discipline, expertise and personal motivations. For example: British Standards committees (**Glass, Raynham**); Construction Industry Council (**Pineo**); Mayor of London Smart London Board (**Wilson and Hudson-Smith**); Parliamentary committees

(**Davies** and others); United Nations Environment Programme (**Ekins**); World Economic Forum CEO Council on Transformational Megaprojects (**Dimitriou**); and World Health Organisation (**Davies**).

Staff have secured over £200k via **HEIF**, principally for knowledge exchange and innovation activities, and £1.1m from **UCL EPSRC Impact Acceleration Account**. The latter supported more than 50 projects in user engagement, public policy, business engagement and early stage commercialisation, including 11 policy and/or enterprise secondments.

The Bartlett pursues **secondments** to boost staff exposure, deepen collaborations with stakeholders and develop staff towards policy, advisory and impact roles. **Penn** was seconded to the Ministry of Housing, Communities and Local Government, as Chief Scientific Adviser, and other substantial secondments have been taken by more than 10 staff, many supported through **UCL Policy Secondment Scheme**. These included six posts at the Department for Business Energy & Industrial Strategy (BEIS) contributing to, for example: Grand Challenges, Industrial Strategy, National Housing Model, and the National Infrastructure Strategy (**Bennett, Broad, Cassar, Fell, Krystallis, and Symonds**). Others secured roles in the Alan Turing Institute (**Milton**), Department for International Development (FCDO) (**Tomei**), Institute for Government (**McDowall**), International Energy Agency (**Hamilton**), and the Tideway project (**Bell**).

As these secondments demonstrate, the faculty sustains multiple contact points with key research users, such as government departments, devolved administrations, international governments and agencies. Relationships with these beneficiaries are nurtured to develop a sense of shared purpose around national and international priorities, for example:

- **Energy and climate change:** The Bartlett hosts many scholars specialising in systems modelling. Having undertaken research to create the UK TIMES (UKTM) Energy System model, **EI** used the model to engage with the Department for Business, Energy and Industrial Strategy (BEIS) and the Committee on Climate Change (CCC). UKTM is used by BEIS and CCC for strategic policy modelling, and features in key policy documents, such as Net Zero emission report, and carbon budget reports (see **UCLUoA13\_DOD**). **Ekins** and **Watson** chaired UK Climate Change Committee Advisory groups on the macro-economic implications and the pathway to 'net-zero' respectively (see **UCLUoA13\_EKI**); **Ekins** co-chaired the UN Sixth Global Environmental Assessment, and chairs DEFRA's Resources and Waste Targets Expert Advisory Group; **Grubb** led the UK government's Panel of Technical Experts on Electricity Market Reform, and was lead author of the IPCC 6<sup>th</sup> Assessment Report; **Watson** is a member of BEIS panels on Fossil Fuel Price Assumptions and Heat and Buildings Strategy.
- **Industrial and economic strategy:** During the UCL Commission on Mission-Oriented Innovation and Industrial Strategy (MOIIS) in 2018, **IIPP** worked closely with BEIS. This was both a working relationship (where **IIPP** stood to learn from the BEIS Industrial Strategy team through implementation of mission-oriented policies), but also an influencing relationship. MOIIS was co-chaired by **Mazzucato** and Lord Willetts, former minister for science and innovation. **Mazzucato** also holds a number of global advisory and commissioner roles, including Chair of the WHO Council on the Economics of Health for All and Vice-Chair of the World Economic Forum Global Future Council – New Economic Agenda; she is a Special Advisor to the Prime Minister of Italy and the EC Commissioner for Research and Innovation (see **UCLUoA13\_MAZ**)
- **International development:** **ISR** has a close working relationship with the Department for International Development (DFID, now the FCDO). It is forming long-term relationships with key civil servants, and has opened up new opportunities for scholars to take part in funded research and knowledge exchange. **Watson** advised two major DFID energy research programmes, and was joined by **Tomei** to develop a DFID programme on Climate Compatible Growth; **Tomei** was seconded to the DFID climate and environment division in 2020.

The faculty has actively supported other colleagues to contribute as members or advisors to the following: All Party Parliamentary Working Group on Smart Cities (**Hudson Smith**); Cabinet Office Government Property Unit, Property Advisory Panel (**Marmot**); BEIS Consultative Committee on Construction Industry Statistics (**Kelsey**); DCMS Science Advisory Panel (**Cassar**); DEFRA Scientific Advisory Council (**Moore**); DFID Strategy Advisory Board, Cities and Infrastructure for Growth Programme (**Levy**); House of Lords Select Committee on National Policy for the Built Environment (**Carmona**); UK Government Building Regulations Part E Review (**Kang**).

#### 4.3 Contributing to economy and society: engaging with diverse communities and publics

##### **Bartlett researchers are situating their research in different settings and communities, working in support of local and regional agendas across the UK and beyond.**

The Bartlett takes a research approach that is both respectful of localities, and enables scholars to understand what matters most. The faculty has a lengthy track record of engagement with local communities and publics, documenting experiences and understandings of urban planning, place-making and regeneration, and informing national policy priorities, stimulating cross-fertilisation of ideas and interdisciplinary inquiry with scholars and policy-makers elsewhere. This is strongly demonstrated in **UCLUoA13\_HIC**.

Once in place, mechanisms to promulgate collaborations and relationships are legion, highly sensitive to context, and informed by what matters most to partners. Scholars working with ODA countries on a regular basis (e.g. in **DPU**) maintain links with networks of local researchers on the ground, who use knowledge of a local area to inform and shape the research. **IGP** is developing novel modes of collaboration and knowledge sharing, such as Citizen Science Teams, Citizen Observatories, and the London Prosperity Board. The Bartlett is also building scholarship around community-focused relationships and their formalisation, via collaborative mechanisms, such as the Prosperity Co-Laboratories (**IGP**) and the Just Space network (**BSP**). Outcomes from the latter have included the **UCL Just Space Research Protocol**, which empowers civil society groups to shape and influence the development of built environments; and, an open access book, '*Community-Led Regeneration: A Toolkit for Residents and Planners*' (**Sendra Fernandez** and **Fitzpatrick**), which supports social housing residents defending homes from demolition.

Staff are leading collaborations and conversations around many major societal and environmental issues (such as climate change, health, and social justice) in, and around, a diverse range of settings. For instance: **Ferm** is a member of the Greater London Authority, Economics Roundtable for London; **Tomaney** is a Commissioner to The UK2070 Commission – an independent inquiry into city and regional inequalities in the UK, contributing to policy development in cities in the north of England; **Watson**, one of four expert leads for the 2020 UK national citizens' assembly on climate change; and, **Milcheva**, who has reported to the National Housing Federation and Shelter on affordable housing, and provided evidence to the Welsh government and Kent County Council.

The faculty's **contribution across the UK's regions** is also shown in examples where local authorities are key partners:

- **CASA**, working with West Midlands Combined Authority and Greater Manchester, to analyse data on diverse topics (e.g. electric vehicles, green space, and leisure). A collaboration with Westminster Council was shortlisted for the Local Government Awards 2020.
- **O'Clery**, who supported the Greater Manchester Combined Authority and Sheffield City Region with knowledge of network modelling to map 'the potential of place'.



- **Dhanani**, invited by the Department for Transport to inform the 10-year walking and cycling infrastructure plans – his nationwide walkability model was trialled with six local authorities: Greater Manchester, Liverpool, Tees Valley, Essex, Plymouth, and Leicester.
- The mission and roadmap created by **IIPP** for the Greater Manchester Combined Authority, informing its five-year Environment Plan and approach for carbon neutrality by 2038.

On an international scale, the **UCL Cities Partnership Programme**, was launched in 2018 to develop sustainable, multidisciplinary research and teaching partnerships in a selected set of global cities. Faculty staff serve as Academic Directors for relationships with Paris (**Colomb**) and Stockholm (**Turcu**); **Raco and Moore** contribute to the **UCL-University of Toronto Anchor Partnership**.

**The Bartlett is committed to equitably draw in communities and publics to inform and shape research.** There is a shared aspiration to listen and hear, address and include, the voices of others, bringing diversity to research and engagement. Constituent diversity is defined carefully, along disciplinary, epistemological, theoretical, or other scholarly lines. This creates a subtle, nuanced, in-study construct of diversity – enduringly or temporally linked to issues of place, people or practices.

During the period, Bartlett staff and doctoral students have won £138k of funding for public engagement projects from **UCL Culture**, supporting bursaries, training, fellowships and festivals. In general, the engagement practices deployed by staff and students in The Bartlett are increasingly countering historic exclusionary practices, such that research becomes a voice for under-represented or excluded groups, e.g.:

- Targeting infrequently heard voices in the local general publics who live around major infrastructure projects, **Bell** pioneered community co-design, bringing together environmental, engineering, urban planning and organisational experts with institutional and industry stakeholders and citizens to co-develop approaches to urban water management.
- Supported by a **Bartlett Materialisation Grant**, **Hay** and **Vaughan** collaborated with artist Rachel Lichtenstein to produce the '*Memory Map of the Jewish East End*'. This lasting resource contains interviews, testimony and photos from Sandys Row Synagogue (the oldest Ashkenazi Synagogue in London), and essays by The Bartlett's **Survey of London** group.
- **Campkin** engaged with London's LGBTQ+ nightlife via performances, charrettes, public history conversations, and a community co-design workshop. **UCL Urban Lab's 'Queer Infrastructure'** priority area was created, raising the profile of protection of minority heritage and social infrastructure. The work has now extended to European cities, through a €200k award from Humanities in the European Research Area (led by the University of Leiden).

#### 4.4 Contributing to the built environment disciplines and disciplinary communities

**The Bartlett is convening thought and stimulating new debate in multiple disciplinary communities.**

Staff hold **leadership roles in scholarly and professional groups and associations**, chairing influential groups such as: The Place Alliance (**Carmona**) see **UCLUoA13\_CAR**; Society of Architectural Historians of Great Britain (**Fraser** and **Penner**); UK Indoor Environment Group (**Ucci**); and the Urban Affairs Association (**Beebeejaun**). **Broyd** was President of the Institution of Civil Engineers (2016–17) and Vice President (2015–16); **Orezcszyn** served as Vice President of the Chartered Institute of Building Services Engineers (2015–17); and, **Gallent** chaired the Royal Town Planning Institute's Partnership & Accreditation Panel from 2016–2018.



Many staff participate in **national and international working groups and committees**. For instance, colleagues in **EI** and **IEDE** lead or contribute to International Energy Agency Annexes on building energy epidemiology; building energy performance assessment based on in situ measurements; and, data-driven smart buildings. **Batty** contributed to a Royal Society Steering Committee (Rapid Assessment of Pandemic Modelling), leading on Human Dynamics in Small Spaces. The 2019 Royal Institution lectures featuring **Fry** were viewed by more than 2.3 million people.

**Early to mid-career staff** are encouraged to **chair committees and working groups in disciplinary areas**, such as: Architects for Health (**Chrysiou**); The Association of Project Management (**Addyman**); British Academy of Management (**Konstantinou**); IEEE Power and Energy Society (**Spataru**); International Project Management Association (**Denicol**); and the International Network of Transport and Accessibility in Low-income Communities (**Oviedo Hernandez**).

Staff are active in **reviewing and evaluating research proposals**, and chairing and participating in selection panels. This includes all UKRI councils, the British Academy, Innovate UK, and NIHR. Staff support assessment of research funded by the EC and ERC, as well as national funding bodies and science foundations in 27 countries, more than half of which are outside Europe. The Bartlett is present on **strategic advisory boards for research funding bodies**, e.g. **Batty** was an Executive Board member for the STFC Data and Analytics Facility for National Infrastructure, and **Watson** served on UKRI's GCRF Strategic Advisory Group.

Staff support a raft of disciplinary communities by **chairing and serving on scientific committees**. While these are too numerous to list, examples include: **Pineo** serves on the Programme Committee for The Lancet UK Public Health Science Conference, and **Rovas** chaired the 2019 European Conference on Computing in Construction. The faculty hosts **disciplinary conferences**, such as:

- 2014: 2<sup>nd</sup> Building Simulation and Optimization Conference (160 delegates)
- 2015: 10<sup>th</sup> International Space Syntax Symposium (250 delegates)
- 2015: International Research Network on Organizing by Projects Conference (130 delegates)
- 2016: Drawing Futures Conference (200 delegates)
- 2017: International Conference on China Urban Development (230 delegates)
- 2017: European Conference of Landscape Architecture ECLAS (400 delegates)
- 2019: UCL Urban Laboratory: Beyond the Frontiers of the Urban (192 delegates)

The Bartlett responds to changing priorities by **instigating new interdisciplinary networks**. For example: the Architectural Research European Network Association (ARENA) was co-founded in 2013 by **Fraser** to promote interdisciplinary research collaborations between universities and architectural practices – it now includes 33 institutions from 14 countries; **Borden** created the first international network and symposium for skateboarding, involving academics, industry, professional athletes, city authorities, charities and NGOs, supported by **The Bartlett Innovation Fund**; and, **Davies** founded the annual Megaproject Workshop in 2014, since held at UCL, Stanford and Tongji.

Recognition of **contributions to academic disciplines** include **best paper prizes** from: Administrative Science Quarterly, American Real Estate Society, Asian Real Estate Society, Association of European Schools of Planning, Chartered Institute of Building Services Engineering, International Conference of Asian Planning Schools Association, Institute of Marine Engineering, Science and Technology, Royal Institution of Chartered Surveyors. **Other awards have been received from:** Austrian Academy of Sciences, Complex Systems Society, Economic History Society, International Project Management Association, International Society for Photogrammetry and Surveying Regional Science Association Society of Architectural Historians of Great Britain and the UK Institute of Acoustics.

Several **BSA** colleagues have had research recognised through the **Royal Institute of British Architects** (RIBA) President's Awards – given within a research theme (**Grigoriadis, Penner, Rendell, Roberts, Sailer**); some went on to receive the highest accolade, the RIBA President's Medal for Research (**Denison** – 2016 and 2017 – see **UCLUoA13\_DEN, Sengupta** – 2019, and **Beckett** – 2020). In design practice, staff have won RIBA National Awards (**Barnett Howland** and **Wilton, Lucas, Manolopoulou, McLaughlin**) and international architecture competitions (**Chinchilla, Krolkowski, Miàs**). Staff in **BSP** secured the **Royal Town Planning Institute** (RTPI) Academic Award for Research Excellence in 2015 (**Carmona**, who also won the RTPI Sir Peter Hall Award for Engagement in 2016), and in 2018 (**Clifford, Ferm, Livingstone** and **Canelas**). In 2015, **Batty** received the Gold Medal of the **Royal Geographical Society**, followed by the Gold Medal of the **Royal Town Planning Institute** in 2016.

#### 4.5 Indicators of wider influence, contributions to, and recognition by, the research base

This final section presents a non-exhaustive **overview of achievements that speak to the significance, reach and impact of Bartlett research**. It further evidences how the faculty is forging new scholarly directions and influencing those outside of the research base.

**Editor-in-chief (or equivalent) positions** have been held at established journals, such as:

- *Architecture Beyond Europe* 2275-6639 (**Sengupta**)
- *ARENA Journal of Architectural Research* 2397-0820 (**Fraser**)
- *Atmospheric Research* 0169-8095 (**Dessens**)
- *Climate Policy* 1469-3062 (**Grubb**) Founding Editor, and EIC until 2016
- *Environment and Planning B: Urban Analytics and City Science* 2399-8083 (**Batty**)
- *Future Internet* 1999-5903 (**Hudson Smith**) Founding Editor
- *International Journal of Urban and Regional Research* 0309-1317 (**Wu**)
- *International Journal of Urban Sciences* 1226-5934 (**Son**)
- *Journal of Cleaner Production* 0959-6526 (**Mi**)
- *Journal of Facilities Management* 1472-5967 (**Pitt**)
- *Progress in Planning* 0305-9006 (**Rydin** and **Gallent**)
- *Structural Change and Economic Dynamics* 0954-349X (**Coffman** and **Mi**)
- *The Journal of Architecture* 1360-2365 (**Giamarelos**)
- *Urban Pamphleteer* 2052-8647 (**Campkin**)

The faculty stimulates new fields and interdisciplinary debate, by **founding new journals**, including:

- *Acoustics* 2624-599X (**Kang**, 2018)
- *Journal of Race, Ethnicity and the City* 2688-4674 (**Beebeejaun**, 2019).
- *Radical Housing Journal* 2632-2870 (**Cociña**, 2017).
- *Urban Planning* 2183-7635 (**Hudson Smith**, 2016).

Staff provide peer mentorship, as **associate and deputy journal editors**, e.g. for:

- *Applied Energy* 0306-2619 (**Guan**)
- *Energy and Buildings* 0378-7788 (**Mavrogianni**)
- *European Urban and Regional Studies* 0969-7764 (**Raco**)
- *Indoor and Built Environment Journal* 1420-326X (**Ucci**)
- *Intelligent Buildings International* 1756-6942 (**Mumovic**)
- *Journal of Mega Infrastructure & Sustainable Development* 2472-4718 (**Dimitrou** and **Ward**)

The Bartlett supports scholars at all grades to be **special issue editors and co-editors**. More than 60 special issues have been published, showing the faculty's breadth of disciplinary interests and foothold in multiple fields, for example:

- Architecture, buildings and the built environment: *Architectural Design, ACM Transactions on Computer-Human Interaction, Building Research & Information, Buildings & Cities, Built Environment, Historic Environment: Policy and Practice, Journal of Architecture*.
- Planning, cities, projects and development: *Environment and Planning B, European Journal of Development Research, Geoforum, Industrial and Corporate Change, International Journal of Geographic Information Science, Land Use Policy, Project Management Journal, Research in Transportation Economics, Travel Behaviour and Society, Urban Studies*.
- Energy, climate and sustainability: *Advances in Building Energy Research, Ecological Economics, Energy Policy, Environmental Research Letters, Journal of Cleaner Production, Mitigation and Adaptation Strategies for Global Change, Resources Conservation and Recycling*.

In addition, 80 staff have served as **editorial board members** for more than 150 academic journals.

**Awards for individual scholars:** **Moore**, Dame Commander of the British Empire for contribution to social science (2016); **Marmot**, Lifetime Achievement in Facility Management Award (2017); and, in 2019, **Mazzucato** received the All European Academies Madame de Staël Prize for Cultural Values, and the Wassily Leontieff Prize in Economics, for the book *The Value of Everything*.

**International honorary and visiting positions:** more than 90 positions held, around half by **early to mid-career colleagues**, who held posts at: CEPT, Chongqing University, Cornell University, Humboldt Universität zu Berlin, Tongji University, University of Auckland, University of California Berkeley, University of Johannesburg, Universidad de Los Andes, University of Melbourne, University of Tokyo, University of Toronto, and Vrije Universiteit Brussels.

**Honorary Professorships:** University of Amsterdam (**Lindner**), University of Hong Kong (**Gallent**), and the universities of Shenyang, Tsinghua, & Tongji (**Batty**).

**Visiting Professorships:** Two staff hold posts at Yale: Vincent Scully Visiting Professor of Architectural History (**Carpo**), and Lord Norman Foster Visiting Professor of Architecture (**McLaughlin**). Others have roles at: Aarhus School of Architecture, Chalmers University of Technology, China Academy of Arts, Hangzhou, TU Delft, University of Applied Arts, Vienna, Hong Kong Polytechnic University, National University of Singapore, Politecnico di Milano, Shanghai Jiaotong University, South China University of Technology, Stanford University, Tianjin University, Tsinghua University, University of Madrid, University of Malaya, University of Sydney.

**Keynote addresses at international policy-making fora:** the International Monetary Fund, Organisation for Economic Security and Development, United Nations Economic and Social Commission for Asia Pacific, United Nations Environment Assembly, UN Habitat's World Urban Forum; World Bank, and the World Economic Forum. **European level:** the European Commission, European Bank For Reconstruction And Development, and the European Investment Bank. **National authorities:** Argentinian Ministry of Science, Austrian Ministry for Transport, Innovation and Technology, Nordic Investment Bank, Norwegian Ministry for Climate and Environment, Spanish Ministry of Culture and Sports, and the National Climate Change Secretariat of The Singapore Government.

**Parliamentary presentations and oral evidence:** All-Party Parliamentary Group for Civic Societies, House of Commons Committees (Business, Energy and Climate Change, Environmental Audit, Science and Technology, Scottish Affairs, Treasury and Transport), Joint HMT-BEIS Roundtable on Analysis for UK Industrial Strategy Grand Challenges and Missions,

House of Lords Select Committee on Ageing, National Infrastructure Commission, and Treasury Select Committee enquiry on the economic impact of Covid-19.

**Keynote speeches and presentations:** including at: Aarhus University, Aalto University, Beijing Normal University, Chongqing University, Cornell University, Harvard, Leiden University, KU Leuven, Lund University, McGill University, Nanjing University, New York University, Peking University, Renmin University of China, Science-Po Paris, Seoul National University, TU Berlin, Tianjin University, Università di Torino, Universidad de Chile, University of Helsinki, University of Lisbon, University of Melbourne, University of São Paulo, University of Santiago de Compostela, University of Stockholm, University of Sydney, Yale University, ETH Zurich.