Institution: Oxford Brookes University

Unit of Assessment: 16 Architecture, Built Environment and Planning

a. Overview

Since 2008 Oxford Brookes University has undertaken a substantial restructuring of its former eight schools into four new faculties that became operational in September 2010. The Built Environment disciplines, located in the School of Architecture, Department of Planning and Department of Real Estate and Construction, are now part of the Faculty of Technology, Design and Environment (TDE). This restructuring has maintained the integrity of the Built Environment disciplinary grouping and has enabled a greater focus on multidisciplinary and trans-disciplinary research. The Faculty also hosts School of Arts; Department of Computing and Communications Technologies; and Department of Mechanical Engineering and Mathematical Sciences.

Research groups are organised horizontally and engage in both disciplinary and collaborative, interdisciplinary, activities. All groups are either within, or aligned to benefit from the Oxford Institute for Sustainable Development (OISD). OISD was founded in 2004 and has become one of the UK's largest research institutes dedicated to sustainable development in the built and natural environments. The Institute comprises eight groups drawn from across the Built Environment disciplines: Low Carbon Building; Place, Culture and Identity; and Architectural Engineering (joint UoA 15 and UoA 16), Spatial Planning, Environmental Impact Assessment, Urban Design, Construction and Project Management, and Real Estate and Land Policy. These groups are complemented by two specialist units: the Centre for Development and Emergency Practice (CENDEP) and the Design, Theory and Practice (DTP) group which extend activities into broader, but associated fields.

b. Research strategy

In line with the University's over-arching research strategy, the Built Environment disciplines are committed to producing externally recognised world-leading research that impacts beneficially on the welfare and quality of life of local, national and international communities. Staff engage with a wide range of issues from a variety of disciplinary perspectives, with the aim of ensuring: an outstanding research and knowledge exchange portfolio, high levels of external income generation, a strong and productive research community, and robust and demonstrable links between teaching and research.

Research is driven by the ten research groups (identified in section a.). Within the OISD umbrella each research group has a distinct agenda, and maintains leadership and depth in identifiable areas. This depth is complemented by intentional synergies, and degrees of complementarity between groups, which ensure breadth and the capacity to engage with complex fields in a holistic fashion. OISD has succeeded in enhancing interdisciplinary activities and has provided a high profile platform for external collaboration, representation and dissemination. This was acknowledged in a 2008 HEFCE report into sustainable development in higher education in England suggesting that OISD is one of the key players in sustainable development research. OISD groups have contributed to major Research Council programmes such as Living with Environmental Change, Energy Research, Sustainable Urban Environments and Design for Wellbeing through various research council projects. Since 2008 these include: 'Evaluating Low Carbon Communities' (EVALOC) (ESRC), 'Retrofit 2050' (EPSRC), 'Suburban Neighbourhood Adaptation for Changing Climate' (SNACC) (EPSRC), 'Understanding Walking and Cycling' (EPSRC) and Promoting Independent Cycling for Enhancing Later Life Experience (Cross Council), as well as major TSB and EU projects.

Since the RAE 2008, refinements have been made to the configuration of research groups to enhance strengths, grow critical mass, integrate new and existing staff and respond to emerging priorities. The outcome is a thematically focused adaptable structure with development and progression opportunities for staff. Future research strategy will further consolidate existing areas

of work reflecting three key themes: **designing and planning for resilience and climate change; people, energy and buildings; innovations and energy transitions; spatial planning and mobility; and inclusive communities and livelihoods**.

Key features of the research environment in the UoA are as follow, (items introduced in response to specific developmental ambitions noted in the RAE2008 are included in *underlined italics*):

Management:

- A Faculty Associate Dean, Research and Knowledge Exchange, and Departmental Research Leads that coordinate and manage all research activities.
- A Faculty Research and Knowledge Exchange Committee (RKEC) that is responsible for all matters of research policy and strategy, and which reports to the equivalent University RKEC committee.
- A Faculty Research Degree Sub-Committee (RDSC) that oversees the PGR programmes and PGR provision, and reports to Faculty RKEC, and through RKEC to the University RDSC.

Support:

- An enhanced and centralised Faculty research administration team.
- Graded workload planning research tariff allocations (between 160 and 640 hours p.a.) depending on levels of research activity.
- Use of annually updated and agreed 3 to 5 year research plans supported by annual monitoring involving meetings between research leads and individual staff.
- An *internal Grant Panel* through which tailored packages of mentoring are arranged in conjunction with the research leads. This particularly supports early career and developing researchers, but also arranges support for more experienced staff as appropriate. The panel also reviews applications to ensure the quality prior to submission.
- Embedded processes for *succession planning* (recently manifest in two professorial and eight readership promotions detailed in section c).
- A competitive scheme aimed at accelerating the progress of the most promising researchers. This provides increased research time and funded PhD studentships to help facilitate research and career development ('Next 10' programme).

Approach:

- A policy to appoint high quality researchers whenever possible and to align these with groups and strategic development needs.
- An average annual research income for the period 2008-13 of 498k including a *range of major grants* (as described in section d).
- Commitment to 'close to industry' and third sector activities resulting in high levels of external income, significant investment in infrastructure through HEIF funding, and a large portfolio of high 'impact' activity.
- High levels of *collaborative working*. Prime examples include the recently won JRF funded project on Planning Obligations, the EPSRC Retrofit 2050 project, the UK-Brazil Urban Research Network, the EIB-funded project on social sustainability in Europe, EU funded projects FloodProBE, STACCATO, BATIMASS and TABASCO, as well as a number of smaller projects involving PIs/CIs from research groups in the three departments.
- Support of *pedagogic research*. Examples include research undertaken in the HEFCE funded Centre for Excellence in Teaching and Learning (CETL) programme, the architectural 'live projects' supported by a Higher Education Academy Award, a Churchill Trust Fellowship, and a Doctoral Training Programme funded by the University (Urban Futures).

The remit and engagement of individual groups is as follows:

OISD Research Groups

Low Carbon Building (LCB) Du, Gregg, Gupta, Humphreys, Nicol, Sassi, Barnfield, Hipwood, Kapsali**.**

The LCB group is a global leader in the fields of carbon counting and carbon reduction from buildings, building performance evaluation, advanced low-carbon refurbishment, climate change adaptation and low carbon communities. The group's carbon counting research has influenced policy development at both national and international levels. These include: development, testing and refinement of UNEP's Global Common Carbon Metric protocol and tool (currently developed into an ISO standard) and the British Standard's Institution's *PAS 2060 standard on demonstration of carbon neutrality*. The cutting edge building performance evaluation research of the group has helped initiate, steer and develop the TSB's £8m national research programme on building performance evaluation.

The group has attracted £1.2m external research funding including a £1.14 million (Oxford Brookes University £544k) ESRC/RCUK funded 3-year project on *evaluating impacts, effectiveness and success of low carbon communities on localised energy behaviours (EVALOC)* which involves leading a team of researchers from University of Oxford's Environmental Change Institute. The group's EPSRC funded *Suburban neighbourhood climate change adaptation (SNACC)* project has influenced Government reports on overheating in housing and led to a briefing document on assessing overheating risk by UKCIP and DEFRA for Green Deal assessors. The Technology Strategy Board (TSB) funded advanced low carbon refurbishment of an Oxford Victorian terrace has led to over 80% reductions in actual energy consumption, whilst the Group's low energy refurbishment of a 1990 terrace in London was awarded the AJ Retrofit award 2011 (with Penoyre and Prasad Architects).

Place, Culture and Identity (PCI) Beech, Orbasli, Vellinga, Webster, Carless, Gaskin, Piquard, Troiani.
The Place, Culture and Identity group was established in 2011 to bring together researchers from a number of disciplinary backgrounds researching ways in which places embody local cultural identities. Current areas of engagement include vernacular architecture, anthropology of architecture, urban conservation and heritage management, architecture and conflict, and cultures of multidisciplinarity. Members of the group have produced over 40 publications during the REF period, including key books on Architectural Conservation (**Orbasli**) and Pierre Bourdieu (**Webster**), a special journal issue on architecture and violence (Piquard), and documentary/short films (Troiani). The group organised the 20th Conference of the International Association for the Study of *Traditional Environments*, together with the University of California, Berkeley (supported by the British Academy). It hosts the *Paul Oliver Vernacular Architecture Library*, the largest collection of resources on traditional forms of architecture in the world, the contents of which are being made available online (**Vellinga**). Other significant recent projects include *Building Sumud*, a project focused on the rehabilitation of Palestinian architecture; and a collaborative project on *cross-cultural architectural theory* with the Aboriginal Environments Research Centre at the University of Queensland (**Vellinga**). Through the EU funded Asia Lot 11 Erasmus Mundus Programme it has recently begun to develop research collaborations with universities in Malaysia, Indonesia, Sri Lanka and Bhutan (Piquard).

Architectural Engineering (AE) Kendrick, Whitehouse, Ogden (UoA 15), Wang (UoA 15), Beale (UoA 15) Godley (UoA 15) Baiche, Heywood, Walliman.
The interdisciplinary Architectural Engineering group is based in both the School of Architecture and the Department of Mechanical Engineering and Mathematical Sciences. The group specialises in 'close to industry' high impact activities, with a broad portfolio of pure and applied research. Areas of research activity include: the development of vacuum and high performance insulation systems, building performance simulation using advanced computational techniques, structural performance of light steel frames and light steel building cladding systems, design and performance of scaffold systems, flood resilience of buildings, high performance transpired solar collectors, effective use of fabric thermal storage in buildings, low carbon building technology and combined operational /embodied energy analysis for minimum carbon standards. Staff are drawn from architecture and building physics backgrounds as well as from mechanical, structural and production engineering.

The group has EU funded projects (combined value approximately £750K) including FloodProBE (Technologies for the Cost-Effective Flood Protection of the Built Environment), STACCATO (Sustainable Technologies and Combined Community Approaches Take Off), TABASCO (Thermal Bridging Atlas of Steel Construction for Improved Energy Efficiency of Buildings) and BATIMASS (Building in Active Thermal Mass into Steel Structures). It is a strategic research partner of Tata Steel Europe with a major recurring annual research funding currently £110k p.a. (total £500k since 2008, and £1.2m since commencement in 2002). The group maintains a dedicated structures and building physics laboratory which serves the off-site, building envelope and light structures sectors. Industrial funding associated with testing and accreditation is currently circa. £200k p.a.

Spatial Planning Group (SPG) Brownill, Carpenter, Cooke, Jones, Marshall, Simmie, Valler, Ward, Mbiba, Smith, Wragg**.**
SPG incorporates three major research areas: Planning Thought and Governance; Economic Development; Innovation and Regeneration; and Accessibility, Transportation and Migration. Particular strengths of this broad grouping are in evolutionary economics, regional innovation systems and transition economies (**Cooke, Simmie**); planning for major infrastructure (**Marshall**); planning policy, governance and urban regeneration (**Brownill, Carpenter, Valler**); active mobilities (**Jones**); and planning history (**Ward**). The group has produced over 75 publications during the REF period, including leading books on Infrastructure Planning (**Marshall**), Regional Planning (**Marshall**), and Complex Adaptive Innovation Systems (**Cooke**). Major research projects include: Planning Obligations (**Brownill**, **Cho**) JRF, Understanding Walking and Cycling (**Jones)** EPSRC with Lancaster and Leeds; Promoting Independent Cycling for Enhancing Later-Life Experience and Social Synergy through Design (**Jones**) Cross-Council with Southampton, Reading and UWE; Infrastructure and Spatial Planning (**Marshall**) ESRC Fellowship; Urban Regeneration Governance (**Carpenter**) EC Marie Curie Fellowship; and 'Banlieue' Network: Care for the Future of Segregated Urban Communities (**Carpenter**) AHRC Research Network.

Impact Assessment (IA) Glasson, Therivel, Wilson, Chadwick, Durning, Elwin, Piper, Wood.
IA's research and publications are influential in environmental assessment policy and practice at international, national and local levels. Introduction to Environmental Impact Assessment (**Glasson**, **Therivel** and Chadwick, 2012, 5th edition) is the most cited text on EIA. The group is taking forward its work on the socio-economic impacts of major energy projects, such as nuclear power stations (both new and decommissioned), and wind farms. It is also currently researching issues in carbon accounting in EIA at a European level. Work on environmental assessment at the strategic level (for plans and programmes), with publications such as Strategic Environmental Assessment in Action (**Therivel**, 2010, 2nd edition), has influenced the framing of the UNECE SEA Protocol. The IA group has undertaken research for the EU on the implementation of the EIA and Habitats Directives, and on policy for biodiversity under climate change (BRANCH and MACIS projects); and for the UK on the planning response to climate change, leading to publications such as Spatial Planning and Climate Change (**Wilson** and Piper, 2010). IA has also enlivened the discussion of theory in EIA, particularly with articles (such as Weston, 2011) on risk and values in environmental decision-making.

Urban Design (UD) Butina-Watson, Cooper, Kropf, Lim, Novo de Azevedo, Reeve, Thomas.
UD is one of the largest UK providers of research expertise in urban design and has a long-standing international profile. Major research areas include: sustainable urban design; community development; heritage-led regeneration; place identity and place making; children and the built environment; chaos and fractal theories; master planning and urban design; and aesthetics of urban design. Key research projects include Long Term Evaluation of the Townscape Heritage Initiative Programme of the Heritage Lottery Fund (Reeve, HLF); Retrofit 2050 (**Butina-Watson**) EPSRC with Cardiff, Reading, Salford, Durham and Cambridge; 2nd evaluation of Poundberry (**Butina-Watson**, Dutchy of Cornwall and West Dorset D.C); UrbanBuzz Rootscape (**Butina-Watson**) HEFCE; Review of the Qatar National Framework (**Butina-Watson** and **Glasson**). Recent initiatives have embraced the use of mobile technologies in research and teaching (Novo de Azevedo, funded by CEBE). The group has research partners in Slovenia, Holland, Italy, Russia, Vietnam, Brazil, Australia, New Zealand, USA and Canada.

Real Estate and Land Policy (RELP) Cho, Keivani, Nase, Cao, Dent, French, Roberts, Shiers, Sims, Stubbs**.**
RELP brings together work on the operation of land and property markets, real estate development and housing and land policy. RELP's research has extended understanding of the different dimensions of sustainable real estate and urban development as well as broader market based fundamentals on appraisal smoothing and valuation. The work has also contributed to the understanding of UK low income housing policy, land markets and urban transition in emerging and developing economies, social sustainability, and corporate social responsibility in property markets and urban development. During the review period the group has secured external funding of circa £261K. Significant projects include: Planning obligations (**Brownill**, **Cho**) JRF, UK-Brazil Urban Research Network (**Keivani**) involving three universities in Sao Paulo and six universities and research institutes in UK, funded by University of Oxford; Comparative social sustainability in Europe (Dixon, Shiers) European Investment Bank; Future take up of low cost home ownership (**Cho**) CLG; The role of property markets in supporting social and economic development in China (Cao, **Keivani**) RICS and Impact of power installations and wind turbines on land and property values (Dent, Sims) RICS. In addition, work on BREEAM and the Code for Sustainable Homes and development of the Green Guide to Specification (Shiers) BRE has contributed to understanding of environmental impact methodologies as well as directly informing Government policy (UK Strategy for Sustainable Construction, BIS/DEFRA, 2010).

Construction and Project Management (CPM) Abanda, Cheung, Keivani, Kurul, Tah, Vidalakis, Zhou, Austin, Bloomberg.
CPM undertakes research in the following areas: Building Information Modelling (BIM); integrated and intelligent knowledge-based decision support; knowledge creation and diffusion; risk management; supply chain management; and sustainable construction. The group undertakes both fundamental and applied research that informs industry and policy makers of emerging and innovative decision support tools and solutions for planning, procuring and delivering construction projects and services sustainably. This work fuses insights drawn from computer science, mathematics, economics and the social sciences with construction management and engineering to nurture and maintain a vibrant and fundamentally interdisciplinary research culture. In the review period the group has secured circa £267K of external research awards. Significant projects include activities in the areas of integrated carbon, waste and cost modelling for the design of low impact buildings (**Tah, Cheung, Kurul**) TSB/EPSRC; BIM-enabled collaborative platform for innovative low impact school procurement (**Kurul, Cheung, Tah**) TSB; and green job creation through sustainable refurbishment (**Keivani, Tah, Kurul, Abanda**) ILO. The group works closely and collaboratively with industrial and international partners.

Complementary Groups

Centre for Development and Emergency Practice (CENDEP) Carver, Sanderson, Burnell, Davis, Flinn, Hamdi, Parrack, Piquard.
CENDEP is a multidisciplinary centre that engages in development activities in relation to: chronic poverty (mostly in poorer countries), emergencies ('natural' disasters and conflict) and practice (the practical implementation of humanitarian initiatives). CENDEP's current areas of engagement include: shelter after disaster; 'Small Change'; International Human Rights Institutions; and architecture and conflict. Members of the group produced over 40 publications during the REF period, including key books on shelter after disaster (**Sanderson**, Burnell) and place making (Hamdi), as well as various reports for Government agencies and NGOs (Davis, Flinn and **Sanderson**). Key projects include a £40,000 ELRHA funded project with the NGO Care UK focused on improving learning and practice in the NGO shelter sector (Flinn and **Sanderson**) and research for the Disasters Emergency Committee into member agencies' responses to the earthquake in Port au Prince, Haiti in January 2010 (**Sanderson**). CENDEP is also involved in various projects including work with the UK charity Multistory, community artists and local councils; together with research that explores the potential of the 'Small Change' community development approach as pioneered by CENDEP's Emeritus Professor Hamdi, (Burnell). Emeritus Professor Davis has been active as a member of the Inter-Governmental Panel on Climate Change (IPCC),

and was lead author of the 2012 Special Report on Managing the Risks of Extreme Events and Disasters to advance Climate Change Adaptation (SREX).

Design, Theory and Practice (DTP) Grindley, Nash, Prasad, Harriss, O'Donnell, Rose-Casemore, Assis-Rosa.
DTP was established in 2011 in the School of Architecture to investigate the complex ways in which architectural design, theory and practice interrelate. Group members work individually, or in close collaboration with partners from other universities or architectural practice, on design-led research projects. The research aims to explore the possibilities of designing sustainable buildings and landscapes, using a variety of research methods, including drawing, computation, installations and live projects, as well as more conventional methods of architectural history and theory. Members of the group have been involved in various arts and architectural design research projects around the world, funded by a range of funding bodies including the Arts Council of England, EU and the Higher Education Academy. The group includes a large number of members who are active in architectural practice and industry. Their membership of the group facilitates the exchange of knowledge and expertise between the group and practice, whilst enhancing innovation and the group's impact. Group members' work engages with a variety of research themes, including contemporary learning environments (Rose-Casemore), sustainability and environmental design (**Prasad**), innovative timber and steel technologies (**Grindley**, **Nash**) and Live Projects pedagogy (Harriss).

c. People, including:

i. Staffing strategy and staff development

All academic staff are given workload planning allowances for research and knowledge exchange activities in line with current University tariffs. Externally derived research income can be used to increase the proportion of time spent by individuals on research/knowledge transfer activities. A 'Next 10' programme in TDE was introduced from 2012 to identify and support outstanding researchers in the Faculty and accelerate their associated publication and research bidding activity. In the first call, **Valler** (Planning) received support under the programme, including enhanced research hours and a funded PhD student. Additionally, QR and Brookes Central Research Fund are used to support the salaries of early career, contract and post-doctoral researchers. Calls for support occur on an annual basis. The University offers a dedicated training programme for early career researchers which includes coaching and mentoring in the areas of research management, formulation of funding applications, and PhD supervision.

Part-time staff are supported through appropriate work load planning and collaborative working. Staffing policy is similarly supportive of requirements for long term leave of absence and sabbaticals with two members of staff taking extended maternity leave during the review period. There is a substantial level of diversity at all levels both in terms of gender and ethnic balance with 36% female academic staff and 20% with non-white British ethnic origin. In addition 50% and 17% of staff respectively are under 50 and 40 years old. Following the departure of some staff since the 2008 RAE (Jenks, Swenarton, Burton, Dixon), a succession strategy has been implemented which has involved the appointment of high quality researchers (e.g., **Vidalakis**, **Abanda, Du, Beech**). Professorial promotions since 2008 include **Gupta, Sanderson**. Promotions to Reader include Piquard, Shiers, **Orbasli, Vellinga, Keivani, Brownill, Marshall,** Reeve.

ii. Research students

The Built Environment disciplines benefit from a vibrant PhD research community. There have been 53 PhD completions in the census period and two MPhil awards.

Research students are represented on the Graduate College Steering Committee, University and Faculty Research and Knowledge Exchange committees and University and Faculty Research Degrees Committees in order that their views can be properly reflected in decision making processes.

Research student supervisory teams typically comprise an experienced Director of Studies with a strong track record of successful completions, and one or two supervisors, all of whom have been

through University supervision training. They are also supported by a dedicated Faculty Research Administrator and Departmental postgraduate research tutors who oversee their progression. The University's Graduate Office provides the central administrative support for all research students from enquiry and admission through to conferment.

Postgraduate student training supports the 'researcher development framework' and is delivered jointly by the University's 'Research Degrees Team' and by the Faculty. Students are expected to commit approximately 70 hours per year to training activities which typically include regular seminar series, postgraduate conferences (where students from across the Faculty and University present their work), research methods training, support in writing and publishing, networking events and careers development organised by the University careers service. All students must attend a compulsory assessed research methods course consisting of four modules and have access to a wide range of other training courses such as those offered by the Oxford Centre for Staff Learning and Development (OCSLD). These courses include, for example, leadership and management, personal development and modern languages. IT skills can be developed through courses run by 'Computer Services' and the library also offers specialist training in library skills.

Full-time PGR students are allocated a working space in dedicated research rooms, and part time students have access to 'hot desks'. Where possible PhD students are given the opportunity to be involved in teaching and tutoring on taught programmes. All students who wish to be involved in teaching undertake a compulsory 'First Steps in Teaching' course run by OCSLD. Students undertaking substantial teaching also have to complete an 'Associate Teachers' course which leads to Associate Membership of the higher Education Academy.

The 'Urban Futures' doctoral training programme, funded by the University, is based within TDE, with the Faculty of Health and Life Sciences as co-partner. The programme forms part of Oxford Brookes's ambition to develop a site of excellence for doctoral training provision, offering a truly interdisciplinary focus designed to address the key challenges of global urban growth. Six students have joined the programme since its initiation in 2009. It includes a substantial training element in research methods and futures methodologies drawing on the existing MRes and a seminar series bringing together students and key researchers in sustainable futures. The programme places particular emphasis on understanding environmental and technical challenges; behavioural and policy context; futures thinking; and societal impact.

d. Income, infrastructure and facilities

In the period 2008-13 external research income averaged £498k per annum and totalled £2,491,924 to the end of financial year 2012/13. In the census period eight major grants were secured from EPSRC, two from ESRC and four from the European Commission. The remainder came from various funders including JRF, TSB, British Academy, CLG, RICS, CEBE, Heritage Lottery Fund, together with substantial funding from Tata Steel Europe, Berkley Group, Crest Nicholson, Good Homes Alliance and a wide variety of other funding sources. £2.5m of QR funding has been invested. This has facilitated strategic research opportunities (including priming areas that will go on to be self-sustaining), and maintained and improved the research environment. Investment has been made into (i) facilities and activities, (ii) supporting staff time and bridging funds for contract and post-doctoral research assistants, and (iii) research studentships. Additional University support is provided through HEIF funding of research related business development, marketing, commercialisation and proof of concept. Since 2008 this has amounted to a further circa £250k of strategic investment.

A major campus re-development programme (current estimated value £130m), has included the extension and refurbishment of buildings accommodating disciplines within the UoA (adding 900m^2 of additional space). The project has collocated Built Environment subjects into common accommodation comprising teaching and social learning spaces, staff offices, PGR offices, and dedicated laboratory and workshop facilities. It has provided a major boost for academic and research activities, and includes a state of the art research hub used by PhD cohorts.

The new Faculty has provided important opportunities for the development of powerful inter- and

trans-disciplinary research axes beyond the core built environment disciplines. There include:

- Sustainability, where the OISD research groups are juxtaposed with groups in UoA 15 dealing with sustainable transport engineering.
- Computing and Informatics, where specialisms in the Departments of Architecture and Real Estate and Construction relate to work in the Department of Computing and Communications Technologies. For example, the TSB/EPSRC project in integrated carbon, waste and cost modelling was an OISD collaborative project with participation of Duce from the Department of Computing and Communication Technologies.
- Architectural Technology, where research in the School of Architecture has combined with areas in the Department of Mechanical Engineering and Mathematical Sciences to create a powerful interdisciplinary research grouping with shared infrastructure.
- Arts and Culture, where Architecture is collaborating with the School of Arts in the fields of practice-based research by design. For example, the design of a new piazza for the main Headington Campus, undertaken collaboratively by staff and students from both schools.

The Faculty is committed to building on these initiatives and will continue to develop cross disciplinary 'orthogonal' themes as a framework to enhance collaborative working.

e. Collaboration and contribution to the discipline or research base

Research Collaboration:
Previously mentioned activities involve collaborative projects with the universities of Oxford, Heriot-Watt, Lancaster, Leeds, West of England, Reading, Cardiff, Cambridge and Salford. Other projects have involved partnerships with UK and international collaborators including the University of Osaka on brownfield regeneration, convening of three British Council and RICS India sponsored UK-India conferences (2008, 2009 and 2010) on urban sustainability and low carbon buildings in India by the LCB group, development of land markets in China and developing countries, the UK-Brazil urban research network leading to two international workshops in Sao Paulo and Oxford, CENDEP work on post disaster recovery in Haiti, a social sustainability programme of research with the European Investment Bank involving local authorities in Barcelona and Amsterdam, a collaborative project on cross-cultural architectural theory with the Aboriginal Environments Research Centre at the University of Queensland, and an EU funded Asia Lot 11 Erasmus Mundus Programme research collaborations with universities in Malaysia, Indonesia, Sri Lanka and Bhutan, collaboration with the University of Cambridge co-hosting the International Vacuum Insulation Symposim at the Royal Institution in 2009, and collaboration with Aachen University on building physics research (including two major EU RFCS projects, BATIMASS and TABASCO) with two visiting chairs and other arrangements in place to promote active co-working.

Journals/Publications:
Keivani is editor of a newly established journal 'International Journal of Urban Sustainable Development' (Taylor and Francis). Nick French is editor of Journal of Property Investment and Finance. Troiani is joint Editor-in-Chief of Architecture and Culture: The AHRA Journal (launched November 2013). Staff across BE disciplines are on editorial boards of a range of peer reviewed journals and have acted as guest editors of special editions of Cambridge Journal of Regions, Economy and Society (**Simmie**), European Planning Studies (**Simmie**), Regional Studies (**Valler**), Planning Practice and Research (**Brownill**), Environment and Planning C (**Valler**), International Journal of Low Carbon Technologies (**Gupta**), Journal of Architecture (Piquard), Environmental Hazards (**Sanderson**), Architectural Histories (**Vellinga**), Traditional Dwellings and Settlements Review (**Vellinga**), Construction History Society Magazine (**Beech**). New research-based books have also been authored, co-authored and edited by Dent and Sims (2013), **Glasson** et al (2012), **Marshall** (2012 x 2), **Nicol** and **Humphreys** (2011). **Webster** (2010), **Therivel** (2010), **Wilson** and Piper (2010), **Keivani** (2009), **Orbasli** (2008).

Representative Roles:
In 2010 **Glasson** and **Therivel** were appointed UK Commissioners for the UK Major Infrastructure Planning Unit. **Glasson** was also appointed as one of the two expert advisors to the UK Nuclear Decommissioning Authority (NDA) on Environmental Assessment for the Deep Mined Disposal of

Radioactive Waste. **Gupta** is a member of the ESRC and EPSRC peer review colleges, steering group member of DECC's English Housing Survey Modelling project, UNEP's Sustainable Social Housing Initiative (SUSHI) and a strategic advisor on TSB's £8m Building Performance Evaluation Programme. **Tah** is a member of the CIOB Research and Innovation Panel, a member of the EPSRC College of peer reviewers and has also reviewed proposals for the European Commission. French is member of the Professional Board of the International Valuation Standards Council and member of DTZ Research Institute team. **Keivani** is a member of the steering group for the UN-Habitat World Urban Campaign and of the UN-Habitat Private Sector Working Group. **Jones** is professional member of the Public Health Programme Development Group for the National Institute for Clinical Excellence (NICE) guidance on Walking and Cycling. Shiers is a member of CIB Working Commission W116 on Smart and Sustainable Built Environment. **Butina-Watson** is an Academician at the Academy of Urbanism (Urban Design/Planning). **Abanda** has been appointed as IPCC working group 3 science assistant. **Beech** is a member of the Centre for the Study of the Production of the Built Environment and Construction History Society. **Orbasli** is a member of the ICOMOS International Training Committee. **Vellinga** is a member of the advisory board of IASTE, and a member of the ICOMOS-Vernacular Architecture Committee and the Hungarian Academy of Sciences Vernacular Architecture Committee. **Sanderson** is a member of CARE International UK, Article 25, Humanitarian Initiatives Fund.

Collaboration with Industry:
Examples include TSB/EPSRC funded projects on integrated Carbon, Waste and Cost Modelling (with Best Foot Forward, ZEDfactory, Designbuilder Software and ItSoWorks), a TSB funded project on BIM-enabled collaborative platforms for innovative low impact school procurement (with Willmott Dixon, Atkins Global and Scape System Build), TSB Retrofit for Future projects (with Ridge and Leadbitter); TSB Design for Future Climate project (with BDP, Penoyre & Prasad, Medical Architecture, Farrells, Hyder Consulting and Cherwell District Council); TSB *Building Performance Evaluation* projects (with Sanctuary Housing, Thames Valley Housing, Swindon Borough Council, West Sussex Council); EVALOC project (with Low Carbon West Oxford, Hook Norton, Kirklees, Easterside, Sustainable Blacon, Awel Aman Tawe) and Green Guide to Specification (with BRE). The Architectural Engineering Group is a strategic partner of Tata Steel Europe and maintains a dedicated structures and building physics laboratory serving a wide range of research and industry needs as described in section b.

Awards:
French: ERES 2012, RICS best paper award in valuation for 'UK freehold reversionary properties: valuation practice revisited', published in JERER 6(2).
Gupta: selected as one of the international stars in Building Science, 2013, BRE (Building4change).
Kurul, et al: International Journal of Architectural Engineering and Design Management best paper award (Innovations in Sustainability) for 'Does the UK Built Environment Sector have the Capacity to Deliver sustainability?' presented at the 6th International Conference on Innovation in Architecture, Engineering & Construction, 2010.

Sims: Emerald LiteratiNetwork 2011 outstanding paper award for 'The cost effectiveness of refurbishing Polish housing stock: A case study of apartments in Olsztyn' co-written with Mirolsaw Belej, published in the Journal or Property Management, 28(5).
Simmie: AESOP 2013, award for the best published paper in European planning journals for 'Path dependence and new technological path creation in the Danish wind power industry'.
Vidalakis, Tookey, J.E. and Sommerville, J.: the Emerald LiteratiNetwork 2011 outstanding paper award for 'The logistics of construction supply chains: the builders' merchant perspective', published in Engineering, Construction and Architectural Management, 8(1).
Wang (UoA 15), Kendrick, Ogden (UoA 15) and Walliman: Howard Medal from the Institute of Civil Engineers for the paper 'VIP and their applications in buildings: a review'.
Whitehouse: MBE awarded 2009 for services to the building industry.