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Institution: Queen's University, Belfast
Unit of Assessment: 16 Architecture, Built Environment and Planning
<p>a. Overview</p> <p>Planning, Architecture, and Construction Management form part of SPACE (School of Planning, Architecture and Civil Engineering), within a research-led University, committed to fostering an infrastructure and culture conducive to international, inter-disciplinary, and engaged scholarship. From two related research centres: the Institute for Spatial and Environmental Planning, and the Centre for Architecture and Construction Management, we seek to generate studies and designs, marked not only by their depth, diversity, and intellectual coherence, but also by their increasing global collaboration, reach and reputation. Each Centre is led by a Director of Research who, as a member of the School Management Team oversees the conception and delivery of research strategy, allocates resources, and nurtures partnership among the research clusters.</p> <p>In Planning research, our aim has been to focus on the two key dimensions of the discipline: (1) <i>Place-shaping</i>; and (2) <i>Mediating Space</i>. In Architecture and Construction Management research, our aim has been to focus on: (1) <i>Urbanism, heritage & sustainability</i>; (2) <i>Materiality and design</i>; and (3) <i>stakeholder engagement within the Construction sector</i>.</p> <p>b. Research strategy</p> <p><u>Developments from 2008</u></p> <p>In Planning's RAE 2008 submission, our strategic direction was informed by an emphasis on internationalisation and comparative empirical research. While our original three key research areas: <i>contested spaces</i>; <i>rural planning</i>; and <i>regulatory governance</i> remain important strengths of our work, our increased numbers of staff and PhD studentships have contributed greatly to an enhanced research capacity. Indeed, the mentoring of the doctoral students and early career staff is part of our wider development work of nurturing talent, and involving them in the identification of new research issues. The students are fully integrated into our cluster, and link their research to the strategic themes. This has enabled us to up-scale the research, especially on the impact of the political economy on spatial restructuring in divided cities; the regulatory environment; and exclusionary processes, especially in slum dwellings in the global south.</p> <p>Our research on <i>rural planning</i> has developed via work on the effects of migration to 'new destinations', the age shift, and the exploitation of the natural resource base, including renewable energy, national parks and community assets. The theme of <i>contested spaces</i> has moved beyond the empirical focus on Northern Ireland to embrace a wider set of professional skills challenges; comparative research on divided cities; and the impact of neoliberal practices on new forms of urban segregation. <i>Regulatory governance</i> has been increasingly critiqued via work on waterfront management; the regulation of slum developments and the undermining of planning enforcement and compliance regimes. These have strengthened our integration around the <i>urban age</i>, which has enabled a deeper analysis of contemporary processes and challenges including ageing, urban resilience, and urban struggles, particularly around expanded notions of sustainability. Awards from the ESRC, MRC, JRF, Leverhulme, and EU have built these themes into a more coherent and integrated approach, strengthening 'making and mediating place', and also our methodological convictions around engaged and participatory research, as evident in our impact case studies.</p> <p>Architecture and Construction Management were not returned in the last RAE, and thus have built their research capacity by employing a range of approaches, from a) the re-building of a new staff profile that is commensurate with a research-based design School; the creation of new structures that allow high quality research by design, to thrive alongside more conventional architecture research, such as historical studies and urban analysis; b) the creation of a new post-graduate economy, through a continuing investment in University-funded PhD studentships; c) investment in competitive research monies that allowed research sabbaticals and pump-priming; and finally d) the creation of a Directorship of Research for Architecture and Construction Management.</p> <p>During the present REF period, all three disciplines have expanded their research capacity considerably, as evident in: the extended range of research themes; their anchoring in an</p>

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international perspective; improved outputs as reflected in publication in high quality journals and books; prestigious international visitors; new international collaborations; and enhanced recruitment of PhD students. Queen's has invested significantly in successive Academic Plans in 2006 and 2012, particularly in the attraction and development of academic staff; research support; and capital development. Planning, Architecture, and Construction Management have been key beneficiaries of this strategic institutional enhancement, as evident in the following:

Investment in Staff: Architecture and Construction Management have seen major growth, with appointment of two Professors: (**Morrow**, 2009 and **Keeffe**, 2012); a Reader (**Boyd** 2013) two Senior Lecturers (**Clancy** 2010 and **Moore** 2010) and twelve lecturers (**Abdelmonem**, 2010; **Kacmaz Erk**, 2011; **Lappin**, 2008; **Martire**, 2010; **McAllister**, 2008; **Meng**, 2008; **Qin**, 2009; **Selim**, 2012; **Spillane**, 2011; **Von Meding**, 2010, **Marinelli** 2013 and **Konanahalli** 2013). Attention has been devoted to mentoring and linking them into inter-disciplinary networks for 'critical mass' research collaboration. Planning has five new lecturers (**Boland** 2009; **Price**, 2008; **Muir**, 2007; **Sengupta**, 2009 and **Flannery** 2013); and promotions to two Professorships (**Stockdale**, 2009; and **Ellis**, 2013). In short, the three disciplines have been strategically and significantly upgraded in capacity and coherence since the last research assessment exercise. Among other investments to facilitate our research, are: 'Architecture Incentives' - funded PhD studentships to support staff to develop their research.

Visiting Speakers: In our regular research seminar series, Architecture, Construction Management and Planning support a wide range of Visiting speakers, including: Professor David Perry, University of Illinois, Chicago; Professor Simin Davoudi, University of Newcastle; Professor Kim Dovey, Melbourne; Prof Christine Boyer, Princeton; Prof Murray Fraser, UCL; Prof Tom Jefferies, Manchester School of Architecture, and many prominent practitioners from the UK and elsewhere.

Current Research Focus

To provide a cohesive intellectual framework for their inter-disciplinary collaboration, Planning, Architecture, and Construction Management share the same strategic approach. Importantly, in seeking to globalise our research, we identify key contemporary global discourses, and then develop our research agenda to address the key themes that emerge from these and which are reflected in the priority agendas of Research Councils and related funders; and other sources of public commentary:

1. **Population** increase, composition, and migration;
2. The **Ageing** society;
3. The shift to the **Urban Age**, whereby for the first time in history, most of humanity now inhabits urban rather than rural settlement;
4. The extension of **Diversity**, and the related 'cultural turn' to issues of disputed heritage, identity and territory, and the attendant risk of conflict and insecurity around difference;
5. Holistic **Sustainability** of global and local environments, and the connection between both; and
6. The relevance of all these challenges for **Re-making governance** and the re-definition of participative citizenship and social inclusion.

These priorities translate into the research focus of the two centres as follows:

The Institute of Spatial and Environmental Planning (ISEP) (**Boland; Ellis; Flannery; Gaffikin; McAreavey; McKay; Muir; Murray; Murtagh; Price; Sengupta; Shirlow; Sterrett; and Stockdale**) addresses the socio-spatial aspects of key global challenges in various contexts. Its research programme relates to the concept of *spatial planning* -- a potential paradigm shift that may move Planning from a regulatory, development-control process, concerned mainly about land-use and zoning. This model addresses *place creation* and *space mediation* in a framework that is comprehensive, integrative and inclusive. It is proactive around building sustainable communities, cities, and regions, while also providing focus on the spatial implications of public policy. Consequently, much of the Institute's work is action-research, designed to work in partnership with communities, governments, and private and civic agencies, and geared to practical application and policy impact. In short, at various spatial scales, our research is concerned about:

- (a) *Place-making* that involves synergetic connection among the objectives of economic competitiveness; social inclusion and equity; and sustainable liveability, and

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(b) *Space mediation* that addresses issues of contested space; participative and ethical governance; and inter-sectoral and cross-spatial linkage that best achieves a balanced and polycentric urban system, within a more equitable urban-rural and global north-south relationship.

Thus, under **place-making**, research has been conducted related to population change, such as the socio-spatial impact of migration (**McAreavey**). Connected to this, and supported by a £220,588 Research Council grant, **Stockdale** has been addressing the issue of ageing and urban-rural migration, and associated issues such as rural gentrification. In a similar investigation, perspectives on ageing in changing community contexts have been analysed by **Murray**.

The advent of the Urban Age is considered through studies on housing and poverty in Kathmandu and Kolkata that link global north and south (**Sengupta**); the role of the informal city (**Gaffikin and Sengupta**); and the challenge of developing an equitable and sustainable regeneration that addresses issues of local identity, and imaging of people and place, but goes beyond place branding (**Boland**); and that offers an integrated development that confronts deprivation, while tapping into community participation (**Muir**). Alongside this work on the contemporary production of the urban, the challenges facing rural development are explored in a set of rural-based studies (**McAreavey, McKay, Murray, Price, and Stockdale**), while our work on the links between planning and well-being (**Ellis**) probes the influence of the built environment on health. For instance, **Ellis** is involved in the inter-disciplinary Physical Activity and the Regeneration of Connswater (PARC) project, funded to £888,000 by UK Research Councils to evaluate health impacts of major local regeneration schemes.

Under the broad theme of **mediating space**, issues of diversity, conflict and security are addressed through examination of how planning in contested space can inadvertently accentuate rather than ameliorate the underlying divisions, in a comparative study, taking in Belfast, Nicosia, Jerusalem, Chicago, New York, and English cities such as Birmingham and Nottingham (**Sterrett and Gaffikin**). This major enquiry, currently supported by £0.5 million European Union grant, is identifying effective solutions to key paradoxes in planning in divided cities, such as the way that addressing equity and inclusion can intensify problems around cohesion. Related work around identity, desegregation, and place restructuring (**Murtagh and Shirlow**); gender, patriarchy, and planning (**Price**); the role of social capital in a divided society (**Muir**); the ambivalences attached to cultural regeneration (**Boland**); and the acute socio-spatial polarisations that attend urban expansion in the global south (**Sengupta**) indicates the depth and spread of our investigation about the spatial implications of dealing with social and ethno-national difference.

Central to the consideration about mediating space is the regulatory and developmental role of government. Under this topic, studies are focussed on the characteristics of effective and ethical governance (**McKay**); the contribution of dialogic citizenship and deliberative democracy in models of participative planning (**Murray**); social economics and asset transfer (**Murtagh**); the issue of knowledge selection in inquisitorial planning practice (**McKay**); and the role of devolution in setting a changed political framework for development (**Murtagh and Shirlow**).

An over-arching framework, linking both main themes of *place-making* and *space mediation* is that concerning the creation of sustainable environments and communities. Included in this research arena are studies about renewable energy such as wind power (**Ellis**); stakeholder views on the environmental and resource dimensions of sustainability; using 'terrestrial planning' to understand the shaping of marine and coastal environments (**Ellis and Flannery**); sustainable development of national parks (**Stockdale**); and rural tourism within a critical analysis of rural development theory and practice (**McAreavey**). Finally, **Ellis, Gaffikin, Murtagh and Sterrett** have been developing their Research Council-funded studies about the appropriate knowledge and skill set needed to enhance community capacity for building sustainable communities.

The Centre for Architecture and Construction Management (**Abdelmonem; Boyd; Clancy; Kacmaz Erk; Keeffe; Konanahalli; Lappin; Larmour; Martire; McAllister; McGarry; Marinelli; Meng; Moore; Morrow; Qin; Selim; Spillane; Von Meding**) addresses the issues of architectural

and urban design in an increasingly globalised world, where factors such as sustainability and climate change, identity and heritage, and notions of craft and form create a complex context that architecture has to mediate. The Centre values both traditional and practice-based research. Stretching across the six discourses, the centre focuses its work in the following themes:

Urbanism: Urbanism focuses on work concerning urban sustainability, heritage and place-based analysis: **Keeffe's** work takes the contemporary city and develops new insertions that create innovative resilient futures based on differing energy scenarios: Bio-port, Liverpool, created a new carbon neutral future for the city based on algae production at a very large scale. Within heritage, studies of Ireland's architectural past (**Larmour**) have discovered a lost treasure of seminal buildings, many of which were in danger of demolition, which have been saved through a reading of their importance. More modern architecture has also been documented, eg arts centres (**Lappin**), but also the understanding of spatial and economic context through the waterside development studies of **Martire**. Further afield, the city as narrative has been researched through extensive work combining oral histories of historic neighbourhoods (in Cairo by **Selim** and **Abdelmonem**; Belfast by **Morrow**) with spatial studies of streets, houses and squares. Work on Film and the city (**Kacmaz Erk**), takes the narrative further, into a real-time understanding of motion in the city.

Materiality: Here, new technologies have been developed through the combination of art-based practice and building technology. The Tactility Factory (**Morrow**) is a research/commercial spin-off that has developed new ways of producing composite fabric and concrete panels, for both internal and external use, which challenge the perception of concrete as masonry. The 'factory' can produce composite panels of concrete faced with an integral decorative fabric, which ties together skills of the textile weaver with a performance product. Evidence of its application includes its products for a number of high profile buildings eg The Sunbird Pavilion, at Dreamspace, London. In addition, high quality research-based design is practiced. The award-winning House by the Lake (**Clancy** and **Moore**) is an essay in the expression and finish of in-situ concrete. The houses at Slievebawnogue, play on a different technology, that of wood. By utilising the timber cleared from the site, the houses play with space and technology to span complex ground, using innovative timber-framed construction. Work in School design continues with design guides for schools for children with ASD (autism). **McAllister's** work ties environment and materials in with education policy to develop a new framework for sympathetic school design.

Construction Management: the research focus ranges from confined site construction, dispute resolution, construction law to risk/disaster management, all within a framework of stakeholder engagement. Particular expertise has been developed in urban construction management, sustainable project management strategies, procurement methods, competence-based modelling, and post-disaster reconstruction (**Spillane** and **von Meding**). Impact lies in the strong links to leading industry practitioners, via such organisations as TAL, Kier Group, Buro Happold and Stewarts, among others, and this connection has been further developed within the remit of Building Information Modelling (BIM).

Generic Research Questions Across the Disciplines - the basis of Future Strategy

Though the empirical basis of these studies is partly grounded in Northern Ireland and the Republic of Ireland, our research is built on strong international, interdisciplinary and theoretical references. Thus, behind the particularity of individual studies, lies a set of generic research questions, with universal relevance, thereby improving the cross-disciplinary perspectives in the Unit. For instance: *What measure of social accountability of private development is desirable and feasible in the context of a more market-driven society?*

Given the new mixed economy of contemporary welfarism, how can governance of socially allocated capital be made more democratic and inclusive?

Since the big problems facing society are multi-dimensional and inter-disciplinary in character, how can planning and design interventions be made both achievable and proportionate to scale?

To what extent are socio-spatial inequities reducible by means of good design solutions?

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Beyond 2013, the research strategy will include:

A unitary centre involving merger into one organisation: **The Centre for Urbanism**, with strong emphasis on internationalisation; comparative empirical research; action research and design-based research:

Urbanism as a focus - strengthening our inter-disciplinary bond, with a view to making Queen's University a hub for internationally acclaimed scholarship in integrated urbanism, relevant to both global north and south, combining innovative design and agonistic planning for sustainable futures;

Focussed Recruitment. We will build our staff and doctoral student capacity to fortify clusters of research teams dedicated to the main themes in our research portfolio, identified above;

Inter-disciplinary Collaboration. Extend and consolidate the inter-disciplinary reach we currently exercise in Queen's University with colleagues in Politics; Law; Sociology; Psychology; Geography. For example, the Unit is funding collaboration with Sonic Arts through a joint International Symposium in 2014.

New Postgraduate Centre. A feature of the new centre will be a joint institute for post-graduate teaching and research, comprising over 30 staff, more than 200 full-time taught postgraduates, and over 40 PhD students, making it one of the largest such university Centres. Doctoral students will be selected systematically within our priority research themes, and attached to specific major research projects. Designed to foster inter-disciplinary research that combines rigorous design research with policy-driven studies in a comprehensive studio-based environment, it will allow a new critical mass to develop, helping both younger staff and post-graduate students to extend research capacity, and work creatively and innovatively alongside more senior staff.

Continued Internationalisation: The new Institute will be concerned to increase and improve **collaborative partnerships** with colleagues in strategically selected research-driven universities, mainly in North America, Europe, and Australasia, formally underpinned by memoranda of understanding. For example, the Unit is building connections in Berkeley and Cornell in the USA, Delft and Aarhus in Europe and Keio, Ningbo and Vietnam in Asia. Such networking will have targeted objectives in terms of joint publications, thereby enhancing our interdisciplinary and international reach, and citation rate. Developing a systematic **exchange programme** with colleagues in these partner universities, supported by Leonardo and Erasmus programmes, it will pursue major joint **research funding**, including Horizon 2020 bids.

Enhancement of Quality of Output. The international credentials and pertinence of our research are evident in the quality of academic publishers for our books (Blackwell and Routledge); and of the top journals that publish our articles (for example: Urban Studies; Environment and Planning A and C; Journal of Planning Theory & Practice; European Planning Studies; Sociologia Ruralis; Journal of Urban Design), and the Architectural Journals that publish our design research such as the Journal of Architecture, Domus and A+D. We will continue to extend this base. Moreover, we will establish an internal **publishing house** (preferably with other disciplines in Queen's with whom we share research themes) to distribute working papers, both hard copy and on-line, and intended as a complement to our publication in quality peer review journals that will assist inter-disciplinary engagement. **Queen's Architectural Press** has already two successful books: 'Stairs' and 'The Elaborated Window'.

Excellence in Design. Recently, the Unit created a series of 0.2FTE posts to attract highly-rated architectural practitioners to join the School, with a view to extending the design and research base of architecture and to developing collaborative work with the best practices on the island.

Beyond such particular focus, there will be deliberate effort to enhance the creative and innovative impulse of good research in contemporary academy. For instance, this will involve renewed emphasis on research as a rewarding enterprise, including: the elation of discovery; the satisfaction of contributing to the public good, as indicated in our Impact Statement (REF3a); the solidarity of collaborative practice; and the networking with the global community in knowledge-exchange. Alongside these core values, it will endorse the central objective of quality, engaged research with high social impact. In practice, this means continuing to foster a research culture that includes: focus on pastoral care of staff; staff being encouraged to take time to think; involvement of our growing PhD student body in the research cluster so that they develop significant networks early in their careers; and more opportunity being made available for the kind of informal social mixing among staff that can both nourish a spirit of collegiality and generate new ideas. All of this and more are important components of a vibrant research *culture*, without which even the best

structure cannot operate effectively. We see this as a central challenge for contemporary academy.

c. People, including:

i. Staffing strategy and staff development

The School has an annually reviewed strategic plan for future staffing up to 2016, designed to facilitate the targeted recruitment of staff to enhance our research capacity. As part of a systematic induction process, each new member of staff is mentored during their probation period to assist them in integrating into the research environment and in identifying appropriate research clusters for their participation. Members of staff are given a starting grant to seed their early research, and systematic financial support is accorded on an on-going basis for appropriate equipment, travel, and conference attendance from the annual research budget dedicated to each Centre (averaging £x per person per annum). Moreover, each new staff member can be drawn into the research environment, through various means, e.g. contributing to grant applications; appointment as second supervisors for PhD students; and as participants of regular staff seminar programmes, to which national and international scholars of renown are invited as keynote speakers.

As part of annual staff appraisal, the Director of Research in each Centre (**Gaffikin** and **Keeffe**) undertakes a development role in engaging each member about their research performance and future plans, thereby identifying customised opportunities for support; advice; networks for collaboration; grant calls looming, etc. Selective discretionary opportunities can be sought to reduce a staff member's teaching load, or to concentrate it into one semester, to facilitate their work in a research-intensive period. Sabbatical leave entitlement allows staff to plan for a period up to an academic year in another university worldwide, to strengthen their research collaboration. Within this review period, five staff (**Gaffikin**, **Larmour**, **Morrow**, and **Price**) have undertaken such leave, averaging 7 months each, while **Abdelmonem**, **Selim**, **Lappin**, **Martire**, and **Kacmaz-Erk** were granted teaching reduction for a semester. In this regard, it is worth mentioning that the School achieved an Athena Swan Silver Award, an indication of how our work practices and staff development are informed by equality of opportunity, and related flexible supports.

Regular research team meetings are convened within each Centre to share experience of our research findings among all staff, and to discuss refinement and delivery of our research strategy, and how that strategy relates to targets and priorities, established within the Institutional Research Strategy of Queen's University. Less frequently, staff from both Centres meet together to address the common research strategy, and to explore particular aspects, such as research impact.

With so many young staff, mentoring is a key factor in future success. The unit utilises not only the institutional mentoring system, but also encourages young staff through collaboration as part of PhD teams, and joint research bids, and lower teaching loads in the first year. This kind of close support has ensured that all of our early career staff have successfully progressed through probation. In a similar way, our research assistants are accorded extensive training opportunities, and are fully tied into our research clusters, with open access to relevant internal seminars and workshops, and opportunities for international conferences and joint research papers. This pattern of full 'integration' for research assistants is rooted in a Queen's 'concordat' for best practice regarding support for, and assimilation of, such staff, that has received an EU Excellence Award.

ii. Research students

Building from a low base, we have had 22 full-time and 12 part-time doctoral students. A dedicated, open-plan office space is used by PhD students and post-doctoral staff in Planning, with similar arrangements operating for Architecture. Deliberate steps are taken to include students in the research environment, minimising the study experience as an isolated solo one. For instance:

Direct link to specialisms: primary supervision comes from senior staff leading research projects relevant to their thesis topic, and students are involved in these projects in ways that ease access to their research arena, and facilitate adoption of methodologies such as participant observation;

Team-based supervision: students all have a second, and some a third, supervisor whose background/interest is as relevant as possible to the thesis topic;

Interdisciplinary grouping students from both Planning and Architecture are 'grouped' together

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under some of the key research agendas, and meet regularly in 'Reading Groups' to explore different theoretical and conceptual perspectives;

Financial Support: Studentships are supported with an annual grant of £700, which the student can use to purchase equipment or to travel and attend conferences where they are presenting.

Targeted Training: The Unit supports students with the option of attending modules in MSc and M.Arch courses, as well as university-wide dedicated PhD training courses; they are also offered a publication plan that guides them about how to produce peer-reviewed articles from their research;

Discussion Seminars: The *contested space specialism* operates a monthly inter-disciplinary discussion session, with students/staff from Sociology/Politics/Irish Studies/Architecture/ Planning;

International Networking: we have linked many of these inter-disciplinary doctoral students with their peers in cities such as Chicago and Pretoria, via video-conference sessions, which offer a *global classroom* to discuss the paradoxes of planning in contested cities;

International study trips: Our research students have participated in our India placement scheme, and such contact reflects our keenness for the students to engage in international study. Examples here include student study in Europe, US, Cyprus, and Israel/Palestine.

Annual Review system: PhD students go through a 'differentiation' panel after their first year and annual progress review panels thereafter to monitor their research quality and improve supervision.

Committee Representation: As part of their general integration, they have a voice in our Post-Graduate Research Committee, which plays an important part in our strategic thinking about research direction.

d. Income, infrastructure and facilities

Apart from important medium grants from sources such as ESRC, JRF, and RICS, we have achieved substantial funding, such as £220,000 (ESRC); £198,000 (Leverhulme) and £500,000 (EU) Our strategy for generating such research income includes:

- (1) Gearing our research focus to the main discourses and themes that are prioritised by funders;
- (2) Regular identification and dissemination of new relevant looming funding opportunities;
- (3) Successful completion and dissemination of current research projects, so that we are well-placed for further potential funding from that sponsor in the future;
- (4) Pump-priming research applications through 'seed funding' of preparatory/pilot work. For example, **Muir** and **Boland** have had such support, and **Boland** has recently secured a £198000 Leverhulme grant, while **Muir**, has attracted a series of grants, including from JRF and RICS;
- (5) Linking our research into partnerships with external agencies to optimise social impact, thereby attracting funding, which is increasingly linked to social outcomes. For example, **Gaffikin** and **Sterrett** have secured a £500,000 EU grant on that basis;
- (6) Participating in ESRC seminar series, as potential prelude to Research Council funding;
- (7) Developing our international collaborations for joint research funding bids. For example, **Muir's** connection with the University of Adelaide and Oxford Brookes has led to a current funding application to the Australian Research Council; **Keeffe's** connection with TU Delft has led to a successful Framework 7 Smart Cities bid 'CityZEN' with Amsterdam and Grenoble City councils.
- (8) Allocating funds to develop international collaboration and networking for young staff, whose authorship of research grant bids is facilitated through peer review of applications;
- (9) Building research grant applications into our workload model, and subsequent reward systems, such as status promotion and discretionary payments;
- (10) Encouraging the adoption of a systematic incremental approach to securing major funding, through the build-up of expertise in managing more micro projects in the first instance;
- (11) Being linked into international internet networks in the field, such as PLANET, as a means of identifying collaborative funding opportunities; and
- (12) Using the substantial expertise and networks of specialist staff in the University's Central Research Unit and International Office.
- (13) Working with national industrial funders such as Invest Northern Ireland, who have funded **Morrow's** Tactility Factory (£80,000).

Infrastructural Support: These approaches require a deliberate '**soft infrastructure**' of mentoring, peer collaboration, incentive, and encouragement, particularly for our Unit, given its high share of early career staff. This support is not only pastoral but also financial:

Start-up grants: Queens has a generous start-up research grant for new staff -- currently £10,000.

Focussed Budgets: Planning and Architecture operate their own annual research budgets.

In Planning, staff have benefited from allowances for conferences; attraction of international

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speakers and visitors; and temporary research assistants.

In Architecture, each member of staff is supported directly with a personal allowance of £1500 pa. Studio Teaching Buy out: To enhance research capacity, Architecture offers two staff per semester a teaching buy out: eg. **Abdelmonem** and **Selim** had teaching buy out in 2013 to author an international research bid on the role of Public Space in the evolution of the Arab Spring, and **Lappin** in 2012 to develop a collaborative bid with Sonic Arts.

Funding to link teaching and research: Each year £20,000 is put aside for a bidding process to encourage staff to link teaching and research: For example, in 2013, the cluster funded amongst others **Kacmaz Erk** a priming grant to facilitate connections in Berlin and Miami in 2012; monies for a book of studio-based research for **Abdelmonem** and support for the All Ireland Architectural Research Association, which is organised and hosted by the Unit. Further examples include funded study trips for **Larmour**; creation of a website for **Abdelmonem and Selim**; support for **Martire's** research in Heritage Mapping; and **Qin** has received Air quality monitoring equipment.

Facilities

Planning Studio: £20,000 has been spent on refurbishing the Planning studio and linked corridor.

Intra-disciplinary Studio: New post-graduate studio space has been developed, which connects post-graduate architecture and planning, in order to aid cross-disciplinary studio work.

Spill-over Capacity: on an adjacent site, there has been upgraded extra studio and office space.

New PhD Suites: Two new open plan offices for post-graduate research students have provided the basis for their collegial interaction and mutual support, as well as a logistical proximity to staff, thereby helping to integrate them into both the spirit and practical routines of the Unit.

Environmental Lab: £20,000 investment in a dedicated computer suite for environmental modelling.

Digital Fabrication Workshop: Research in Design and Materiality has been supported by a new workshop which includes new digital fabrication equipment for parametric design and manufacture. The unit has invested over £50,000 in new A0 laser cutters and 3D printers and scanners.

Dedicated workshop staff: This substantial investment in new facilities is complemented by dedicated technical/computer support staff, who are available to help staff and students with acquiring and mastering the latest appropriate equipment and software packages.

In short, emphasis is on building the basis for both vitality and sustainability. Again, we believe that good buildings and equipment are necessary but not sufficient. There is no substitute for staff and research students feeling valued and supported. This stress on human capital is reflected in our intentional staff recruitment from North and Latin America; all parts of Europe; Middle East, and Indian sub-continent, a diversity that both reflects and extends our global perspective and reach.

e. Collaboration or contribution to the discipline or research base

Our research outputs make a distinctive contribution to the discourses and knowledge-generation within our disciplines, and these credentials are evident in the quality of academic publishers for our books (e.g. Blackwell & Routledge); and of the top flight international journals that publish our articles (for example: *Urban Studies*; *Environment and Planning A and C*; *Planning Practice and Research*; *European Planning Studies*; *Sociologia Ruralis*; *Journal of Urban Design*).

Apart from our inter-disciplinary collaboration within Queen's as related elsewhere, our international networks are both extensive and productive, as indicated by some examples:

USA: British Council-supported student exchanges; collaboration with Prof David Perry and colleagues in University of Illinois, Chicago around the *contested city* and *engaged urban university*, resulting in staff exchange, book chapters and journal articles (**Gaffikin** and **Sterrett**); Strauch Visiting Professorship at Cornell University in Sustainable Architecture (**Keeffe**, Fall 2013); with Prof. Richardson, Univ. of S. California, on a book on *shrinking cities* (**Gaffikin** and **Sterrett**).

Europe: with Prof. Tovi Fenster, University of Tel Aviv on *planning in divided cities*; and with Dr Socrates Stratis of the University of Cyprus on *planning and design challenges in Nicosia and Famagusta*, resulting in joint research, conferences, and funding applications (**Sterrett** and **Gaffikin**); with Prof Andy van den Dobbsteven in the Climate Design division at TU Delft on a number of projects including cityZEN, (**Keeffe**); **Moore** and **Clancy** are recipients of ADAPT-r fellowships at Westminster, and Aarhus.

Asia: with Prof. Liu Ping Hui, East China Institute of Technology (**McKay, Murray, Murtagh**); with Prof. Ajay Khare, Bhopal, and Prof. Sridharan, New Delhi, in relation to *climate change and carbon management* (**Ellis**); with Prof Darko Radovic of Keio University, Japan, on city resilience (**Keeffe**).

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Australasia: Dr Oakley, University of Adelaide (**Muir**), resulting in joint research and conference work and funding application; and Dr N Argent, University of New England in Armidale (**Price**).

Contribution to the disciplinary research base is evident in journal editorships; peer reviews; conference organisation; membership of professional committees; and strong links with research users, including membership of significant advisory bodies, as indicated by the following examples:

Ellis is co-editor of the Journal of Environmental Policy and Planning, and has acted as an external examiner in nine UK /Irish universities. He has extensive and senior involvement in a range of civic and government advisory bodies, including: Director of Belfast Healthy Cities; Director and Secretary of Sustainable Northern Ireland; and Founding Member and Treasurer of the Irish Institute for Sustainability Education (2003-present). He is the National Expert for the Republic of Ireland on the International Energy Agency's Working Group on the Social Acceptance of Wind Energy Projects (Task 28). **Gaffikin** is a Senior Fellow in the prestigious Great Cities Institute, Chicago; He has been a senior government advisor on metropolitan and regional planning; urban regeneration; employability; and shared space. **Muir** has been a committee member of the Housing Studies Association (2006-12). **Murray** was awarded Honorary Professor by East China Institute of Technology in 2011; appointed to Editorial Board of Manchester University book series "Irish Society"; has been a Board Member of Irish Social Sciences Platform (since 2007), and was a member of the Rural Policy Evidence Advisory Group, Department of Agriculture and Rural Development, Northern Ireland; **Murtagh** was invited to sit on the Awards Panel for the joint ESRC/AHC programme on Connected Communities Engagement in 2012. **Stockdale** is a member of International Advisory Group for FORMAS Project at CIRCLE (Lund University, Sweden) 2012-2017, focusing on entrepreneurship, innovation and development in regions of varying economic densities; and a member of the ESRC Peer Review College 2010-2014. **Morrow** organised and Chaired the 2011 annual conference of the Architecture Humanities Research Association: *Peripheries*. She was Chair of PLACE, Northern Ireland's Architecture Centre between 2006-2009, and is currently a member of the RIBA Research Awards panel. **Keeffe** is part of the Technical Committee for Smart and Sustainable Buildings (CIB W116), and Urban Sustainability and Resilience. He is also Sustainability Advisor to the Northern Ireland Ministerial Advisory Group (2013-). **Lappin** is Chair of the Architectural Humanities Research Association (2013-) and Co-founder and Chair of the All-island Architectural Research Group (2010-). **Spillane** and **von Meding** are visiting scholars at the national University of Civil Engineering, Vietnam. **Spillane** is an advisor to Vietnam's Ministry of Construction, and **von Meding** serves on EU's ANDROID Disaster Resilience Network.

Recognition of this engagement and related achievement is evident in the following examples:

Clancy has been awarded honorary membership of the Concrete Society of Architecture. **Gaffikin** was awarded the Stukel Presidential accolade, under which he was based in the University of Illinois for the academic year 2008-09; **Morrow's** Tactility Factory, which produces fabric surfaced concrete has won a range of National and international awards, including being Shortlisted for the RIBA research award for university-based research (2011) and first prize in the Big Idea Award (Invest Northern Ireland). **Clancy** and **Moore** have received the Architectural Association of Ireland Downes medal (first award for a house in 15 years) in 2012 for their house in Slievebawnogue. They have also won a host of other awards from the RAIA, and the AAI: in 2009, their scheme for St Georges and St Thomas's Church was awarded overall prize by the RIAI. They also were the recipients of the 2009 Concrete Society Award for Architecture, for the Lake House. **Keeffe** won Paper of the Conference at Passive and Low Energy Architecture 2013 Munich, for his paper IDEAHaus. **Keeffe's** design for Liverpool, *Bio-port*, was exhibited in the Copenhagen Architecture Centre, during the World Climate Summit in 2009. **Clancy** is the current recipient of the Kevin Keiran Bursary for Architectural research from the Arts Council Ireland.

Overall, Planning, Architecture, and Construction Management constitutes a vibrant environment that encourages and supports radical research ideas to develop (including design-based research), grounded in a structure that creates real social impact within a growing international context.