

Institution: University of Cambridge
Unit of Assessment: 16: Architecture, Built Environment and Planning
<p>a. Context</p> <p>Architecture (School of Arts and Humanities) and Land Economy (School of the Humanities and Social Sciences) are distinct Departments at the University of Cambridge. Both focus on theoretical and empirical research that aims to apply research outcomes to the built environment and land use regulation with direct impacts on stakeholders. Relevant research users cover a wide spectrum, from international bodies, national and local government, NGOs, professional organisations and private business and industry, to community groups and the general public.</p> <p>By nature, research in Architecture is tangible and visible; this impacts directly on society, and the Department's research contributes to designing, improving and transforming buildings and cities to support their inhabitants' quality of life. All four of the Department's research groups – Sustainable Design; Urban and Regional Planning; Building Construction and Risk; and Cultures of Architecture and Cities – are subject to these fundamental concerns. Architecture has a substantial track record of funded, cross-disciplinary research (detailed in REF 5), enabling application of outcomes to a wide range of beneficiaries around the world: public/government, private, third sector and the general public. The scale of research has considerable range, from improving the urban systems of a whole city, e.g. Bilbao or Santiago (see: Case study), to influencing how hospitals face climate change (see: Case study); from clarifying how socio-spatial configurations influence extreme levels of urban conflict to contributing to saving lives in earthquake risk areas (CS-16Z-05). Research in sustainability is a major strength in the research profile that touches many aspects of Architecture's research groups, generating concrete environmental and economic impacts and influencing the design of real building and planning projects.</p> <p>Widespread impacts from research findings and a focus on practical application is embedded in much of the research in Land Economy. A substantial proportion of research is funded by international organisations, national and local government, NGOs and private sector organisations, bringing direct contact with user groups and stakeholders. The major Land Economy research centres, the Cambridge Centre for Climate Change Mitigation Research (4CMR) and the Cambridge Centre for Housing and Planning Research (CCHPR), have a direct focus on user engagement. The Rural Business Unit undertakes research for DEFRA and EU, with direct impacts on the agricultural business community and farming policy. In research clusters within Land Economy, the area of environmental economic policy has a strong focus on the practical application of rigorous research at an international scale; the applied element is formally included in funding applications (often involving direct involvement and collaboration with stakeholder organisations) and central to the research effort. Real estate finance researchers interact directly with industry and professions in ensuring the relevance and applicability of research findings.</p> <p>b. Approach to impact</p> <p>Architecture: Established in 1967 to undertake contract research, Architecture's Martin Centre has broadened its impact strategy, focusing especially on four areas:</p> <ol style="list-style-type: none"> 1. Interacting directly with stakeholders to inform policy and practice: Building on the earlier 'Cambridge Futures', Echenique's 'Solutions' (2004-8) studied the sustainability of planning policy over 30 years in three UK city regions, jointly with the Departments of Transport and Communities and Local Councils. Echenique's combination of academic research and consultancy has been central to transport and land use policies that have brought about regeneration in Bilbao, made possible by working with the Basque Country government, local businesses and community groups. Strategic plans for transport and land use development in Chile, with the Ministry of Public Works, the Regional Government of the Central Region and the municipalities in Santiago, has directly supported the establishment of strategic road and regional transit networks. Urban research is enhanced with the 'Applied Urban Modelling' annual international symposium (Echenique, Jin, 2011-) that brings together practitioners, government agencies and urban modellers in Cambridge. <p>Impact on international organisations, government, local authorities and NGOs has been achieved by contributions to public discussions and inquiries. As a member of English Heritage's Advisory Committee, Salmon (2012-) reports to the Secretary of State on historical architectural issues of</p>

Impact template (REF3a)

national importance; **Short** sat on NHS Trusts advising on Energy Efficiency (2008-10); **Steeemers** was consultant to UN Habitat's 'Adequate housing for all' (2011), and was a member of the International Advisory Panel on Clean Energy for the Singapore government (2008-9), as well as President of Passive and Low Energy Architecture, a global organisation with over 2,500 academic and practitioner members from 40 countries that organises discourse and dissemination on sustainable architecture and urban design (2005-11); **Pullan** served on the advisory panel to choose architects of the Cambridge Mosque (2009); and **Echenique** (2008) and **Steeemers** (2009-11) were members of the Design and Conservation Panel of Cambridge City Council. **Jin** advises the World Bank on appraising regional economic benefits of China's High Speed Rail programme.

CURBE, the Cambridge University Centre for Risk in the Built Environment (Spence, **So**) contributes to real-world applications in reducing the detrimental results of natural and manmade hazards; its research findings provide vital information to international government agencies and insurance companies involved in risk assessment and reduction. Several members of Architecture are involved in consultancies, especially through **Cambridge Architectural Research Ltd**, (CAR), a company that grew out of the Department in 1987. They contribute to CAR's energy and sustainability impacts such as the 'United Kingdom Housing Energy Fact File', London: DECC (2012). CAR's vulnerability-based approach has been used in projects ranging across the full spectrum of natural and man-made hazards which affect the built environment. Clients include the insurance industry, the petrochemical, aerospace and transport infrastructure sectors; and national, regional and local governments, EC, UN and OECD.

2. Influencing policy and practice by producing briefing papers/policy reports: Ten Briefing Papers were produced for 'Conflict in Cities and the Contested State', (**Pullan**, 2012) making key findings accessible primarily to non-academics; initial consultations with the FCO and Home Office are being held. An earlier briefing paper, 'Jerusalem: The Cost of Failure' (**Pullan** 2011), was Chatham House's most downloaded paper in the month it was posted. In Arts Council England's 'Guidance for Capital Arts Projects', **Short** wrote *Building Excellence for the Arts* (2009), a guide for undertaking arts capital projects. Short also produced 'Design Strategy for low energy ventilation and cooling of health buildings', made available to all interested stakeholders on the Department of Health website, as well as a film on hospitals and climate change (www.sms.cam.ac.uk/media/1446036). **Echenique** was a lead expert in Foresight's *Land Use Futures Project* (2010) for the Government Office for Science.

3. Inform architectural practice through buildings and experimental construction: Building projects include innovative designs in sustainability practices, such as **Short's** Future House, Beijing, China. **Ramage** is developing locally-based, environmentally sound materials and construction practices, as in Mapungubwe Interpretive Centre in South Africa ('World Building of the Year' 2009), the Bowls project, San Francisco, and lightly modified bamboo for structural application.

4. Informing public discourse/opinion: Research outputs have been disseminated to inform public opinion through exhibitions, media and publications. Selected examples include: Exhibitions: 'William Kent. Designing Georgian Britain' (**Salmon**, shown in New York 2013, London 2014, <http://vimeo.com/74823694>); 'Capturing Urban Conflicts' (**Pullan**; shown in Belfast 2011, Cambridge 2011, London 2011, 2012; Amsterdam 2013) Press: *Building Design* named **Steeemers** as one of 'the 50 most influential people in UK sustainability', a list including only five academics (2012); **Pullan** was interviewed on urban conflict (*Haaretz* 2008, *Independent* 2010, *Financial Times* 2010, *Guardian* 2013); Television: 'Weald of Kent Crossway House' *Grand Designs* Channel 4 (**Ramage**); 'Germany's government energy policy' ZDF Zoom <http://zoom.zdf.de/> (**Sunikka-Blank**); Radio: 'On the history and nature of bricks', *Today Programme* Radio 4; *Robert Elms Show* Radio London; *The One Show* BBC 1; *Excess Baggage* Radio 4 (**Campbell**); Websites: 'Cinematic Battersea Blog' (**Penz**, 2011-13). **Pullan's** 'Conflict in Cities' has been brought to public attention at Cambridge University's Festival of Ideas (2011, 2013) and the ESRC Festival of Social Science (2011, 2012).

Land Economy: Research is applied, with results translating into policy outcomes in public and private areas. The embedded nature of impact in our research can be seen in:

1. Direct interaction with stakeholders: **Kontoleon**, **Pascual**, and **Voors'** action-based research on environmental land use policies in China, Africa and the Americas impacts directly on stakeholders - e.g. **Pascual's** research on agro-biodiversity and PACS in collaboration with the US Dept. of Agriculture and Resource Economics and CIRNMA, Peru (2010) produced local impact and cross-national policy recommendations; **Kontoleon's** action research on deforestation and biodiversity

(seed funded by the interdisciplinary Cambridge Conservation Initiative with direct involvement of the Royal Society for the Protection of Birds, Bird Life International (2010 onwards) and the Gola Forest Programme in Sierra Leone (starting in 2012) involve field experiments with direct local impacts; **Kontoleon's** work on Chinese biodiversity regulation an initiative funded by the EU, the UNDP and the China State Environment Protection Administration 'Towards Improved Governance in China' (2008-2010) led directly to changes in government policy.

2. Direct collaboration with industry and Government organisations: The real estate and urban analysis group's research is applied and disseminated to market through frequent presentations at industry conferences (e.g. EPRA, INREV, IPD, IPF, ULI) and focussed seminars such as the Cambridge Property Research Club where industry heads of research meet to discuss key market issues. For example, IPF-funded research (**Alcock, Lizieri**) helped make the case for real estate investment in the aftermath of the GFC (with direct presentations to institutional investment committees). The Department organised a research-based workshop ('Long term real estate investment' 2012) for senior Sovereign Wealth Fund managers to shape future investment and research strategies. The Department's macro-economic research work has direct policy implications with **McCombie** acting as a Specialist Advisor in the House of Lords, on the EU Committee Inquiry into the EU Structural and Cohesion Funds, and as economic consultant to the World Bank and Asian Development Bank; **Arestis** was invited to join a group of experts in Paris including Stiglitz and Fitoussi, at the request of President Sarkozy, to build on the UN Commission on Reforming the International Financial and Monetary System (2011); he is an academic advisor to Government Economic Service (HM Treasury). In planning and land use, **Allmendinger** sat on the DCLG Housing Markets & Planning Expert Panel; **Hodge** is a member of DEFRA's Economic Advisory Panel (2012-); **Tyler** led an evaluation of the Single Regeneration Budget initiative and regeneration for DCLG, and was a member of the Government's panel evaluating 'Sure Start'; **Lizieri** sits on DCLG's expert panel on feasibility of land auctions (2013-) and was an advisor to the Barker Review of Land Use Planning. In legal matters, **Dixon** has been appointed senior legal adviser on property matters to the All Party Parliamentary Group on Honour Abuse (2013-); In environment and sustainability, **Crawford-Brown** served on expert panels of HM Treasury; DECC, US EPA and OFWAT; **Pascual** and **Kontoleon** contributed to DEFRA's National Ecosystem Assessment (the results published in *Science* in 2013). These involvements help shape policy in our fields of research.

3. Carrying out consultancy and expert witness work: **McHugh** has been engaged extensively throughout the REF period as an expert witness as set out in the aboriginal land rights case study; **Lizieri** was an expert witness in a \$75m Australian property trust class action (VID 1408 Modtech Engineering, concluding in 2013) and has appeared before the Upper Chamber in leasehold enfranchisement cases (e.g. in the precedent setting 2008 Sportelli and 2010 Erkman cases); **Monk** appeared as a witness on the Community Infrastructure Levy e.g. evidence to the GLA's Planning Committee (2012).

For applied consultancy work, **Cambridge Enterprise** and **Cambridge University Technical Services** provide a tailored process managing contractual and professional indemnity, allowing Departmental research expertise to directly benefit the industry and professions, through which Land Economy provides access to research (as an example, the Who Owns the City study (2011) funded by Development Securities via CUTS, and much of the work of the **CCHPR**).

c. Strategy and plans

In *Architecture*, a key priority of the Director of the Martin Centre/Departmental Research Committee is to identify research areas with significant impact potentials and to target and develop impact strategies from the outset of all current and future research projects. Specific plans include:

- Building on **Short's** success, create a major research centre on issues of **Hospital Design and Sustainability**, with the NHS as part of a wider health initiative..
- Building on 'Conflict in Cities', the creation of the **Centre for Urban Conflicts Research** (www.urbanconflicts.arct.cam.ac.uk, **Pullan, Sternberg**, launched 2013) continues links with ESRC, RCUK/GU, to raise the profile of cities and city research within their programmes.
- Develop the newly created **Natural Materials and Structures** group, which is starting to have a notable impact on Latin America's shanty towns through its EcoHouse programme (<http://www.ecohouseinitiative.org>, **Ramage, Hernandez**).
- Continue to develop the urban and regional research programme, led by **Jin**, as central to Departmental strategy, with huge potential impact for policy makers and the public

- Develop further methods in the **Digital Studio for Design, Expression and Communication** for communicating research outputs effectively and engagingly to a wide public, building on **Penz's** 'Cinematic Geographies' Website and Interactive App initiative.
- Develop early successes of **Cities South of Cancer (Hernandez, launched 2013)**, which has carried out building workshops in Indonesia and Colombia, worked with the mayor's office in Cali, Columbia and participated in building a community centre in Mexico.

In *Land Economy*, the embedded nature of impact in our research will be reinforced in four key strategic directions:

- Through the **Cambridge Land Economy Advisory Board** which provides direct industry contacts supporting the work of Department. Their research committee (chaired by former RICS president Robert Peto) is committed to identifying key built environment research needs, helping funding and disseminating findings.
- Establishment of the **Cambridge Centre for Real Estate Research** – pooling funding for industry relevant research and active dissemination and impact strategies. Appointment of visiting fellows with industry experience to strengthen outreach, relevance and knowledge exchange activities and industry and professional mentors for PhDs to help them identify business relevant resonances in their research.
- Continued active engagement with Government departments, international organisations & NGOs in pursuing applied research of direct impact on stakeholders and policy formation.
- Formalisation of financial support for dissemination and outreach activities to parallel more conventional research support ratified by Departmental Resource Committee.

University mechanisms are increasingly available to support research initiatives that promise impact in non-academic circles. They include the **Public Engagement Team** (for all media related activities); **Cambridge Science and Policy** (already in 2011-13 CSaP Fellows from Industry and Government had 30 meetings with members of Architecture and 84 meetings with Land Economy staff); **Cambridge Enterprise**, which supports innovation emerging from Cambridge research. Cambridge was selected by ESRC as one of three pilot centres for the Impact Acceleration Account (begun 2013). This will be particularly relevant for **Pullan's** ESRC-funded **Conflict in Cities** as well as work in **CCHPR** and the new **Real Estate Centre**, along with more general research linked to ESRC doctoral work. The **Cambridge Impact Fund** will help to generate impacts from social science research or supporting pilot activity, promoting non-academic secondments for researchers and academic staff, support for researchers and academics to hone approaches to engagement with non-academic stakeholders and training courses to equip academics with appropriate communication social media and dissemination skills to identify and enhance impact. The University has secured investment from the Philomathia Foundation to facilitate policy-related social science research engaging directly with public policy by recruiting outstanding post-docs to work on specific policy challenges.

d. Relationship to case studies

The three **Architecture** based case studies exemplify our outreach activities, revealing both direct interaction with the general public and informing policy, with relevance in the UK and internationally. The studies demonstrate direct interaction with stakeholders, especially **Echenique's** work on **Sustainable Urban Land Use** and **Transport Modelling and Policy**, and **CURBE's** research (Spence and **So**) on providing new interventions for disaster risk issues. **Short's** engagement with the NHS and hospital energy policy influences policy and practice by creating new government guidelines.

The two **Land Economy** based case studies illustrate policy engagement and international reach of our research. The **Affordable Housing** case, a policy project from **CCHPR**, demonstrates the success achieved by working closely with different stakeholders, ensuring that research findings could be implemented and that policy makers could make evidence-based decisions. The **Land Rights of Indigenous People** case arises from the freedom and encouragement given to academics to build strong and diverse networks and to apply research on a consultancy basis. Alongside work on environmental policy, climate change and sustainability, and commercial real estate markets, they emphasise a commitment to applied research that is relevant to a wide range of stakeholders in the fields of land and property management and regulation.