

## Research Assessment Exercise 2020 - Impact Overview Statement

**University: The University of Hong Kong**

**Unit of Assessment (UoA): UoA 18 – Planning and Survey (Land and other)**

**Total number of eligible staff of the university in the UoA: 25**

(1) **Context.** UoA18 researchers in the Faculty of Architecture (FoA) focus on some of the biggest challenges facing cities in the 21<sup>st</sup> century, and do so from within the world's biggest mega-city region (the Pearl River Delta – PRD). Stakeholders include governments, the built-environment professions, the construction industry, civic society, corporates and entrepreneurs working in the 'smart city' space and many others. FoA brings focus to this agenda through HKUrbanLabs, which constitute its research arm. The labs draw together the research and outreach energies of scholars of architecture, conservation, construction management, housing, landscape, planning, real estate, surveying, transport, urban design, urban economics, urban studies and more. HKUrbanLabs provide an incubator ecosystem in which built-environment scholars from multiple disciplines explore, discuss, think out of the box, bid for funds, innovate, collaborate, prototype, build, test and disseminate. Being located at the epicenter of an urbanization experiment unprecedented in human history, the labs have a strong emphasis on research into high-density and rapidly growing cities, including rural-urban linkages and settlements in the hinterlands and heartlands of mega-city regions. As well as a research-nurturing environment, HKUrbanLabs are a platform for scaling-up HKU's urban research capacity. In this respect, in the first six months of 2019 FoA researchers submitted funding bids for three very large city research institutes (see below under Strategy). These will boost the various **modalities of impact** arising from UoA18 researchers' work, including: (i) Policy analysis and advice; (ii) urban design tools, advice, guidance and analysis; (iii) technical consultancy; (iv) analytical software tools; (v) value-added data sets and platforms; (vi) professional consultancy.

(2) **Approaches to Impact.** *Proactive engagement with government policymakers and industry:* FoA's Department of Urban Planning and Design (DUPAD) and its Department of Real Estate and Construction (REC) have a strong track record of blue-chip academic research grants and applied policy research. Out of the nine Strategic Public Policy Research grants awarded by the HK government, DUPAD-REC researchers have been Principal or Co-Investigators on three of them; and UoA18 researchers regularly win HK Government Public Policy Research grants. FoA encourages such research through, for example, seed funding and by organizing government-university symposia. As a result, FoA researchers are well represented in influential government, industry and civil society decision-making, in HK and beyond. For example, controversial press coverage in 2018 of REC's involvement in the high-stakes HK Land Supply Commission debate followed its research into land shortage and the effects on housing prices. Urban China research is a strong theme in the UoA18 group, opening up routes to influence in the Mainland. FoA's Dean Webster, for example, is Vice-Chairman of the Healthy City Academic Committee, Chinese Society for Urban Studies in Beijing. *Consultancy:* NGOs, industries and governments regularly seek FoA's advice through research and service contracts. DUPAD's urban environmental researchers, for example, provided software and simulation services in 2018 to measure the thermal performance of alternative big-block layouts in major housing schemes being developed by the HK Urban Renewal Authority. The same lab had a 2016 contract to forensically detect heat loss in the underground community heating systems of a city in the cold NE of China, using FoA's novel heat and energy simulation software. FoA provides generous support, such as seed funds, rolling-over Research Assistant contracts, scientific software and app development; all helping researchers build capacity to move from scholarly research to social impact. *Pro-bono partnership with NGOs and urban government agencies* in low-income countries is another path to impact. In 2017, for example, a DUPAD team of One Belt One Road (OBOR) researchers visited Bangladesh to advise the Dhaka government on how to design innovative land policy to capture land value from the mega-project Padma Bridge, to plough back into low-cost housing at no cost to the city. Such projects are funded by a mix of FoA research and engagement funds, General Research Fund (GRF) grants, National Science Foundation of China (NSFC) and

donor funding. Another OBOR outreach project in 2019 was a study of the implementation of the China-funded Ethiopian Mass Transit Authority in Addis Ababa, co-funded by FoA seed funds, GRF and the Shenzhen Metro Authority. **Community-focused and public-education knowledge exchange** has always been important to FoA's UoA18. An example is the Architectural Conservation Program's relentless lobbying, public lectures, activism, NGO-advising and community-based consultancy on built-heritage conservation. FoA has a generous budget to encourage community outreach programs. **Technology invention:** Both REC and DUPAD are active in delivering impact through technological innovation, including software, apps, data platforms, and 'internet of things' tracking systems. These come from a mixture of early-stage speculative research heavily underpinned by FoA seed and equipment funds, followed by government support, such as Innovation and Technology Funds. In 2018, FoA won its second gold medal at the International Exhibition of Inventions Geneva, one of the oldest and most respected innovation fairs in the world. Other tech activity includes: patents held by FoA academics for Geographical Information Systems (GIS) and Building Information Modelling (BIM) technologies; prize-winning software for urban analytics (featured in our walkability case study); and a commercialized real-estate stock-market index. **Partnering with flagship global health and environmental agencies to create unique strategic data platforms:** FoA's Healthy High Density Cities lab, working jointly with the faculties of medicine at HKU and Oxford University, has achieved significant impact in healthy-city science and practice. This has involved developing innovative data platforms (UKBUMP) and linking up with national biobank large-number health cohort studies to create novel, high-resolution, objective built-environment measures for hundreds of thousands of cohort members, thus enabling a new genre of gene-environment (built, natural, social) models of population health. This work has been recognized by several prizes and nominations from the UK's Royal Town Planning Institute and is regularly featured in UK and international media. The Sustainable High Density Cities lab is a core partner in an international consortium creating the World Urban Data Access Portal Tool (WUDAPT), which it uses for academic and contract work on urban climate performance modeling. The impact of the lab's work was recently endorsed by a new global network in Heat and Health, partnered with the World Meteorological Organisation (WMO) and World Health Organisation (WHO). One of FoA's strategic research plans is to plough investment funds into strategically important data platforms to support its own research and to attract significant partners to research big questions.

**(3) Strategy and plans.** The FoA's strategy is to continue using the impact delivery models outlined above and to strengthen them. One way of strengthening is to scale up. Four examples illustrate. First is a ten million RMB R&D contract signed with a township (Chang'an) government (one million population) in Dongguan City in the Pearl River Delta (PRD). This illustrates the strategy of forging closer connections with urban governments in the PRD to help Mainland China tackle major urban challenges. Second, a much bigger version is currently being negotiated with another PRD government (for a 2.5 billion RMB Urban Institute). Third, focusing on architectural science (30 million RMB), is being negotiated with the world's largest development corporation and illustrates the FoA's strategy for connecting more closely with industry as well as governments. A fourth is a 600 million HKD proposal led by FoA for a smart cities and AI research institute on the HK Science Park.

**(4) Relationship to case studies.** The heat stress case study is more singularly focused on one industry and its stakeholders in healthier and smarter construction. Underlying research was funded variously by GRF, industry organization research and consultancy contracts. It resulted in vital changes in practices on HK's construction sites and was also recognized by industry awards. The spatial design network analysis case study is multi-modal in its impact pathways, involving university seed money for basic research and partnership with a government agency in which DUPAD researchers created a value-added pedestrian route model for the whole of HK and sold it back to the Hong Kong Special Administrative Region (HKSAR) Lands Department. Several 'active travel' NGOs also partnered this work to disseminate and lobby policymakers. Two awards evidenced industry recognition of this work, one for smart-city technology and the other for a smart commercialization idea.