Science Meets Design

Future Cities Laboratory, Phase 2

Singapore, May 22, 2015 - Singapore's National Research Foundation awarded funding to ETH Zurich's Singapore-ETH Centre for a second five-year phase of the Future Cities Laboratory programme. The second phase commences in September 2015 and addresses the challenges of sustainable urban development from an Asian perspective.

Asia is one of the most rapidly urbanising regions in the world. How cities in China, India and Southeast Asia develop in the next 50 years will have a determining effect on environmental sustainability globally. Singapore is uniquely placed in this context as a city that is almost fully urbanised, and has managed that process with great success. As Singapore now strives towards higher standards of liveability, resilience and sustainability for its citizens, it also stands as a valuable case for responsible urban development for other regions in Asia. The Future Cities Laboratory engages directly with these diverse experiences of urbanisation. It will develop the new knowledge, technologies, and approaches to urban development that will be needed to balance energy and resource consumption with social equity and environmental quality in general, and with specific reference to Asia.

This is made possible with funding from Singapore's National Research Foundation (NRF), which supports the Singapore-ETH Centre and its researchers from ETH Zurich and collaborating institutions who come together within the NRF's Campus for Research Excellence and Technological Enterprise (CREATE) Campus.

In the past five years, the Future Cities Laboratory (FCL) has attracted researchers from Switzerland, Singapore, and 30 other countries, becoming a significant knowledge hub for international scholarship on urban forms, technologies, and processes. Collectively, this group shaped a distinctive research culture that encourages interdisciplinary inquiry, creative ways of working, and connecting science with design. Professor Peter Edwards, Director of the Singapore-ETH Centre remarks, "By bringing together researchers with stakeholders from government and industry, the FCL has pioneered new ways of conducting research that provide practical answers to some of the world's most pressing problems."

The second phase of FCL will strengthen this culture further, bringing together some 100 architects, designers, urban planners, transport planners, engineers, computer scientists, ecologists, psychologists, and urban historians. The research projects planned will be structured around three conceptual types of city: 1) The compact city (like Singapore, Amsterdam, and Taipei), characterised by high density and mixed use; 2) The responsive, or 'smart' city (like, Zurich, Singapore and Copenhagen) that makes full use of modern technologies to improve planning and management; and 3) The extended or horizontal mega

city (such as Jakarta, Bangkok, and Manila).

The programme comprises twelve individual projects on topics such as the development of sustainable energy systems that reduce electricity consumption and thus the carbon footprints of cities; the effective integration of green spaces in large-scale buildings to mitigate problems of high-density living such as: heat, poor air quality and noise; understanding the perception of space and human behaviour in the built environment; and the use of alternative building materials such as bamboo, grasses and waste for greater sustainability. Researchers in these projects aim to develop new technologies, planning approaches, and design scenarios that will promote sustainable urban development not only in Singapore, but also in other parts of Southeast Asia, India and China.

Researchers at ETH Zurich developed some of the new technologies that are now both studied at the FCL and applied to the special circumstances of the humid tropics. For example: The FCL's "3-for-2" project takes a low exergy approach to improving the efficiency of air cooling, while reducing the vertical space in a building needed for ductwork. As a result, three floors can be built within the same volume typically taken up by two floors in a conventional building. This collaborative research project, which embodies the meeting of science and design, was developed during the first phase of FCL and is being implemented as a living laboratory on the campus of the United World College of Southeast Asia in Singapore.

Similarly, an agent-based transport simulation tool developed at ETH Zurich with TU Berlin for urban and transport planning, is now being applied in Singapore. By providing a better understanding of the interactions between land use, travel demand, transport supply and travel behaviour, the MATSim Singapore digital tool will help planners improve the nation's transport systems.

Dr. Lim Khiang Wee, Executive Director of CREATE congratulates the Future Cities Laboratory for the successful renewal. "The renewal process had been a rigorous one. The team of Principal Investigators from ETH Zurich, École Polytechnique Fédérale de Lausanne, National University of Singapore, Nanyang Technological University, Singapore, and Singapore University of Technology and Design worked with stakeholders from public agencies to develop and refine a proposal that was well received at all stages of the review process," says Dr Lim. "We expect that the programme will provide Singapore with a generation of scientists trained in future city planning to provide scientific solutions that can be implemented by city planners in Singapore and elsewhere. I wish the Future Cities Laboratory success for its second phase."

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About Future Cities Laboratory

The Future Cities Laboratory was established in 2010 as the first project of the Singapore-ETH Centre (SEC), a joint initiative of ETH Zurich - the Swiss Federal Institute of Technology in Zurich and Singapore's National Research Foundation. It is housed within the Campus for Research Excellence and Technological Enterprise (CREATE), and works closely with École Polytechnique Fédérale de Lausanne (EPFL) and three Singaporean universities: Nanyang Technological University (NTU), National University of Singapore (NUS), and Singapore University of Technology and Design (SUTD), as well as government agencies and academic institutions in neighbouring countries. The second phase will continue on the basis of this institutional framework and will intensify academic relationships.

As designated project leader for the second phase of FCL, Professor Stephen Cairns of the Singapore-ETH Centre will work closely with the project coordinators in Zurich - Professors Kees Christiaanse and Dirk Hebel. The principal investigators include professors from the ETH Zurich Departments of Architecture, Civil Engineering and Environmental Systems Science (D-ARCH, D-BAUG, and D-USYS); from the EPFL, NTU, NUS and SUTD.

The Future Cities Laboratory (Phase I and II) is funded by the National Research Foundation Singapore under its Campus for Research Excellence and Technological Enterprise (CREATE) programme.

About Campus for Research Excellence and Technological Enterprise (CREATE)

CREATE is an international collaboration housing research centre set up by top universities. At CREATE, researchers from diverse disciplines and backgrounds work closely together to perform cutting-edge research in strategic areas of interest, for translation into practical applications leading to positive economic and societal outcomes for Singapore. The interdisciplinary research centres at CREATE focus on four areas of interdisciplinary thematic areas of research, namely human systems, energy systems, environmental systems and urban systems. For more information on the CREATE programme, please visit the CREATE website (www.create.edu.sg) and follow us on facebook and twitter.

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