Sustainable City Lab and Urban Development Research in BRE Dept.

Prof. Edwin H W Chan
Professor/ Associate Head (Research)
Chair, Sustainable City Lab Mgt Committee
Sustainable City Lab Booking Calendar:
https://www.google.com/calendar/embed?src=mv4g8hfnmhshb5ktn837situhpg%40group.calendar.google.com&ctz=Asia/Hong_Kong

Sustainable City Lab Booking Email:
Orianna.guo@polyu.edu.hk
Background of the Sustainable City Lab (SCL)

- Opening Ceremony on December 3, 2013
- Combination of high-quality audio signal, high-definition motion picture & video images, light control system, speak management, and live video and video tracking, and network sharing functions, operates at the highest international standards
- Supported with a full-time Scientific Officer assist teaching & research
- Aims to create a high-level laboratory for examining the sustainable development of HK
Research Disciplines of BRE Department

- Construction and Real Estate Economics
- Information and Construction Technology
- Urban Sustainability Policy
- Construction and Real Estate Management
Research Areas of BRE Department

**Construction and Real Estate Economics**

Construction and real estate economics, finance, planning, sustainability and the like.

**Urban Sustainability Policy**

Policy related to green buildings and sustainable urban development, the real estate market mechanism, economic analysis of regulations/policies related to construction and real estate, innovative contracting/disputes resolution strategies, land-use policy, urban governance, and institutional changes.
Research Areas of BRE Department

Information and Construction Technology

Technological principles and skills, including both information technologies and appropriate construction technologies, for the supervision of the construction of buildings and other structures.

Construction and Real Estate Management

Construction and real estate management aims to become the hub in the Region and develop close links with the industry in pursuing collaborative research and high-level consultancy projects.
Research of BRE Department

The strategy of BRE:

✓ to maintain and improve the quality and impact of research works, with a focus on Sustainable Urban Development (SUD)

✓ the Sustainable City Laboratory (SCL) as effective operation of a common research platform for research promotion and development of the Department’s research strategy and direction

Under Research Institute for Sustainable Urban Development (RISUD), the BRE Dept. takes leading role in the areas of Urban Planning and Management (1 of the 5 divisions). Leading 3 research groups:
List of Current Projects Related to the Sustainable City

Name (PI): **Prof. Albert P.C. CHAN**  
**Funding:** Block Grant  Except CRG  
**Title:** Effecting a Safe, Healthy, and Productive Environment (eSHAPE) for the Construction Industry  
**Grant:** HK $500,000  Expected Completion: 31-Dec-2017

Name (PI): **Prof. Heng LI**  
**Funding:** Hong Kong Government  
**Title:** Location-based Technologies for Asset Tracking and Risk Management  
**Grant:** HK $4,909,500  Expected Completion: 30-Jul-2016

Name (PI): **Prof. Francis K.W. WONG**  
**Funding:** Central Research Grant  
**Title:** Housing for the Elderly in Hong Kong - Affordability and Preferences  
**Grant:** HK $155,000  Expected Completion: 30-Sep-2016
<table>
<thead>
<tr>
<th>Name (PI):</th>
<th>Prof. Geoffrey Q.P. SHEN</th>
<th>Funding:</th>
<th>Block Grant except CRG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title:</td>
<td>A Study of Plot Ratio/Building Height Restrictions for Kai Tak Development Using 3D Spatial Analysis Technology</td>
<td></td>
<td></td>
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<tr>
<td>Grant:</td>
<td>HK $260,000</td>
<td>Expected Completion:</td>
<td>30-Jun-2016</td>
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<table>
<thead>
<tr>
<th>Name (PI):</th>
<th>Prof. Geoffrey Q.P. SHEN (Co-I): Prof. Edwin H.W. CHAN, Prof. L.Y. SHEN, Prof. B.S. TANG</th>
<th>Funding:</th>
<th>Hong Kong Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title:</td>
<td>Developing an Integrated Collaborative Platform for Sustainable Urban Renewal: A Pilot Study</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grant:</td>
<td>HK $600,000</td>
<td>Expected Completion:</td>
<td>31-Aug-2016</td>
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</table>

<table>
<thead>
<tr>
<th>Name (PI):</th>
<th>Prof. Edwin H.W. CHAN</th>
<th>Funding:</th>
<th>Block Grant Except CRG</th>
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</thead>
<tbody>
<tr>
<td>Title:</td>
<td>Flagship-Led Urban Renewal: A Catalyst for Change</td>
<td></td>
<td></td>
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<tr>
<td>Grant:</td>
<td>HK $250,000</td>
<td>Expected Completion:</td>
<td>31-Jan-2018</td>
</tr>
</tbody>
</table>
Name (PI): **Prof. Edwin H.W. CHAN**
Funding: **Block Grant Except CRG**
Title: **Comparative Study of Transit-Oriented Development and Urban Renewal in Dense Cities**
Grant: **HK $200,000** Expected Completion: 31-May-2016

Name (PI): **Prof. Edwin H.W. CHAN (Co-I): Prof. Craig LANGSTON**
Funding: **RGC General Research Fund**
Title: **A Framework for the Analysis of Embodied Carbon and Construction Cost of Heritage Conservation Projects**
Grant: **HK $716,659** Expected Completion: 31-Dec-2017

Name (PI): **Prof. Eddie C.M. HUI**
Funding: **Hong Kong Others**
Title: **Sustainable Urban Development in Greater China: Sustainability and Stability**
Grant: **HK $600,000** Expected Completion: 26-Aug-2016
Sustainable Urban Development Conference
organised by BRE Department with
Joint researchers from MIT, USA and Sun Yat-sen University, China

Urban Studies for Sustainable Density:
Planning, Design and GIS

Organised by: Prof. Edwin H W Chan and Lang Wei,
Building and Real Estate Dept, The Hong Kong Polytechnic University

Date: 12 June 2015
Time: 9:00 am – 6:00 pm
Venue: N003, Block N, The Hong Kong Polytechnic University, Hung Hom, Kowloon, Hong Kong

Opening Speech
Ir Professor Alex Wai, Vice President (Research Development), HKPU;
Prof. J. G. Teng, Chair Professor FCE and Director RISUD, HKPU;

Guest Speakers
Prof. T. N. Lee, Former Head of Department Urban Studies and Planning, MIT, US;
Prof. H. Y. Law, Professor of Urban Planning, The University of Sheffield, UK
Name (PI): Prof. Edwin H.W. CHAN  
Funding: RGC General Research Fund  
Title: Social Considerations in Planning Public Open Space to Integrate Elderly People in Urban Renewal  
Grant: HK $1,208,580  Expected Completion: 30-Jun-2016

Name (PI): Prof. Edwin H.W. CHAN  (Co-I): Prof. Ghani KHALID  
Funding: Hong Kong Government  
Title: Cost-benefit-analysis (CBA) for Implementing Green Buildings (GB) Promotion Incentives: With Transaction Costs (TCs) Considerations  
Grant: HK $1,206,695  Expected Completion: 30-Jan-2017

Name (PI): Prof. Edwin H.W. CHAN  
(Co-I): Prof. William H.K. LAM, Prof. Michael K.W. SIU, Prof. Tunney LEE  
Funding: Block Grant Except CRG  
Title: Study of Density and Community Facilities for Neighborhood Planning: Part of a Larger Research Project on Re-defining the Density of City  
Grant: HK $381,700  Expected Completion: 23-Dec-2016
## Selected Projects of BRE Department

### Other than Professors(1)

<table>
<thead>
<tr>
<th>Principal Investigator</th>
<th>Project Title</th>
<th>Funding Source</th>
<th>Grant</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. Daniel Chan</td>
<td>An Empirical Study of Construction Time Performance of High-rise Private Building Projects in Hong Kong</td>
<td>CIC</td>
<td>HK$996,457</td>
<td>2014-2015</td>
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<tr>
<td>Dr. Meng NI</td>
<td>Development of Novel Perovskite-type Cathode Materials for Low-temperature Solid Oxide Fuel Cells</td>
<td>CRG</td>
<td>HK$315,000</td>
<td>2015-2017</td>
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<tr>
<td>Dr. Patrick Lam</td>
<td>Critical Success Factors for the Development of Business Models in Integrating the Use of Renewable Energy in the Built Environment of the Pearl River Delta Including Hong Kong SAR</td>
<td>CRG</td>
<td>HK$320,000</td>
<td>2012-2015</td>
</tr>
<tr>
<td>Dr. Meng NI</td>
<td>Development of efficient and durable rechargeable batteries with bilayer oxygen ion conducting electrolyte and nanostructured electrodes</td>
<td>RGC</td>
<td>HK$692,894</td>
<td>2014-2017</td>
</tr>
<tr>
<td>Principal Investigator</td>
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<td>Grant</td>
<td>Date</td>
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<tr>
<td>------------------------</td>
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</tr>
<tr>
<td>Dr. Michael YAM</td>
<td>Local Web Buckling Strength of Coped Beams with Slender Web</td>
<td>RGC</td>
<td>HK$595,106</td>
<td>2016-2018</td>
</tr>
<tr>
<td>Dr. Ivy WONG</td>
<td>Urbanization of Rural China: an Empirical Study of Shareholding Cooperatives in Guangzhou Luogang District</td>
<td>RGC Early Career</td>
<td>HK$681,294</td>
<td>2016-2018</td>
</tr>
<tr>
<td>Dr. Yongtao TAN</td>
<td>A Fuzzy Logic Approach for Urban Sustainability Assessment and Simulation</td>
<td>RGC Early Career</td>
<td>HK$681,290</td>
<td>2016-2018</td>
</tr>
</tbody>
</table>
### Selected Projects of BRE Department Other than Professors (3)

<table>
<thead>
<tr>
<th>Principal Investigator</th>
<th>Project Title</th>
<th>Funding Source</th>
<th>Grant</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. Michael YAM</td>
<td>Local Web Buckling Strength and Behaviour of Double-Coped Beams with and without Web Stiffening</td>
<td>RGC</td>
<td>HK$645,500</td>
<td>2014-2016</td>
</tr>
<tr>
<td>Dr. Stanley Yeung</td>
<td>Restructuring of Obsolete Industrial Areas in Guangzhou: The Development of Tertiary Industries as a Case Study</td>
<td>CRG</td>
<td>HK$738,000</td>
<td>2009-2014</td>
</tr>
<tr>
<td>Mr. Stephen MAU</td>
<td>The Future Development of Arb-Med in Hong Kong</td>
<td>Block Grant except CRG</td>
<td>HK$300,000</td>
<td>2012-2015</td>
</tr>
<tr>
<td>Dr. Yongtao TAN</td>
<td>Best Practices and Critical Success Factors for Sustainable Urbanization in China</td>
<td>Hong Kong Others</td>
<td>HK$400,000</td>
<td>2014-2016</td>
</tr>
</tbody>
</table>
Research Plan/Proposal Related to Urban Development

Large Collaborative Research Project

(Submitted 2015/2016)

RGC-Collaborative Research Fund (CRF): Prof. Edwin Chan

Title: Event-based Flagship Project Sustainability and its Role in Urban Renewal (aim for 7 Million)

Research Proposal for Innovation and Technology Fund (ITF): Prof. Edwin Chan

Title: New Ways of Development for New Towns in Hong Kong: Social-Economic-Environmental Integrative Planning Systems for Community Building (aim for 10 Million)
Current Database of SCL:

- 2D Base Map covered whole HK
- Partial 3D data of HK (Level 1)
- DEM of whole HK (2 meter resolution)
- DOP of whole HK (Digital Orthophoto with 0.5 meter resolution)
Current Database of SCL:

3D Data of Kowloon (Level 1):
SCL to support BRE Research Activities

Mr. Richard Kennerley

Dr. Jorge Ochoa

Dr. Orianna Guo
Thank You!