Heritage value, wars, pandemics and the passage of time

For those reading this elsewhere, Hong Kong is now in its own Covid darkest hour, having mistakenly thought it could escape, with our unvaccinated elders most at risk. It does not feel a good time to write either a light or a profound DRup focusing on what might seem irrelevant to Hong Kong colleagues making critical travel decisions, hunkering down and preparing for a war-time form of government public health intervention (mandatory city-wide testing with, rumour has it, curfew and restrictions on inter-district movement).

Instead, I will wish colleagues well in the coming weeks; note that it will hopefully be over soon, with signs of the global pandemic burning itself out; and take as a trigger, a question raised by two or three items in the sample of FoA work recorded in the following pages, which has by and large been conducted during the last 1-2 years of pandemic.

Life has gone on and will go on. We rarely, I suspect, appreciate that during WW2, many social institutions continued in one way or another. My own parents continued their high schooling, albeit forcibly relocated to rural locations far away from London's bombs. University professors over the age of conscription, tried to continue their scholarship.

Cecilia, Eunice and Ying and colleagues in the Built Heritage Research Collaborative (BHRC) have been thinking about how the interpretation of modern-era buildings changes over time. Lawrence Lai (REC) has long championed conservation of HK's many WW2 relics. At one stage, such relics were concrete monstrosities rapidly erected on some of the city's most beautiful, rugged and prominent natural topographical features. Look carefully and you will notice that the top of Mount Davis has an artificially flat-rectangular profile, hidden by trees but created by bunkers.

Acknowledgement: header photo by Ms Yuxin Ding, an MSc(Construction Project Management) student from the Department of Real Estate and Construction.

How long does it take for a building's social and cultural value to shift to 'culturally positive'? Is it inevitable? Do invasive military installations make the shift more quickly after a victory over foes? Do they quickly become symbolic rather than functional? BHRC will have a better idea than me about the factors that govern this dynamic in commercial, residential or government buildings, and infrastructure.

Anecdotally, I can think of buildings around the world that have accrued cultural heritage value in some part because of an infamous design. Does this reveal elitism in the conservation industry, with specialists convincing the powers that be, that a bad design should be preserved for posterity? Or does the general public grow fond of follies?

Can you think of a single building over, say 200 years, that is *not* endowed with high heritage value? If not, perhaps time itself, turns functional value into heritage value regardless of design, beauty, quality, craftsmanship and materials. As a methodological aside, that's a nice example of the power of the case study in refuting a hypothesis. If you could think of a single example of a 200-year-old building being demolished in a liberal democratic urban government context, you could perhaps reject the hypothesis that time itself is the value-maker. The only situation I can think of where this might happen, is where the building is demolished for structural safety reasons, being too expensive to rescue. And of course the quantity of buildings over 200 years old in a city, region or country, also factors into the progression of value.

If time is the predominant value-maker, urban planners and the designers of redevelopment schemes, should perhaps attempt to preserve a proportion of the old as a matter of policy, regardless of quality. Old buildings (I would guess roughly > 150 years old) and old neighbourhoods in Europe *always* add cultural, economic and real estate value to a city. In this context, it is a good thing that many urban villages (*chengzhongcun)* in China have now been taken off the demolition list. They are, perhaps, an equivalent to HK's post-war estates and old commercial neighbourhoods. Hold onto them and they will eventually yield heritage value, gentrification, new use value and premium investment value.

I am not convinced by Wanchai's famous Blue House model, notwithstanding its UNESCO heritage status, which attempts to retain a former, low monetary value use, while trying to enhance heritage value. If nothing else, the model seems generally financially unsustainable. There is also the issue of visitors' interests conflicting with residents' and the poor becoming part of a living museum. There is a time and place for preserving something less than 'highest-and-best' use by policy or by covenant/land lease (or in HK, by both). I predict that the Blue House function (use-value) will change in the coming years as its heritage value rises, and that its micro neighbourhood will more fully gentrify.

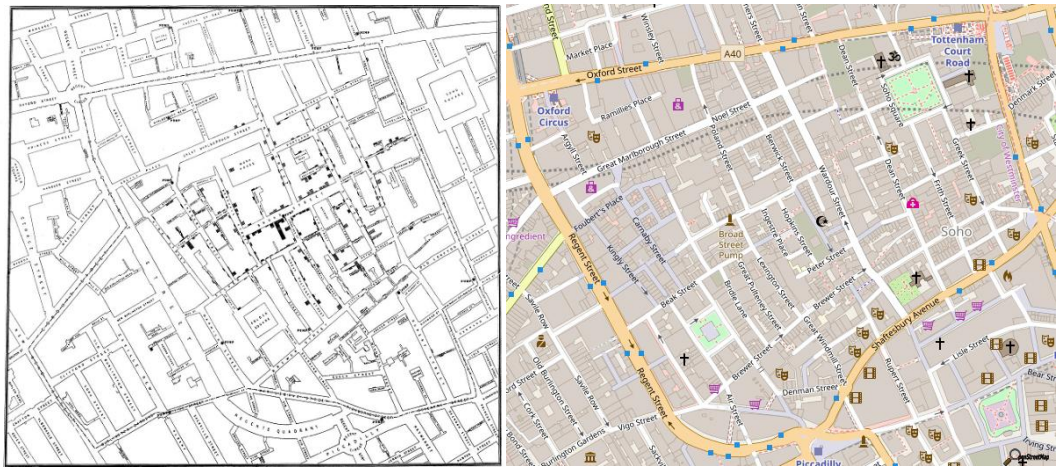
I once visited a beautifully restored low-income neighbourhood in Jeddah, Saudi Arabia, where the original families remained living in multi-tenancy arrangements in former inner city vernacular mansions. There was only one single sign of gentrification, where a famous architect had taken a huge financial risk and bought up an entire mansion to restore to its 18th century glory (I visited it). I suspect that it will take a huge and unsustainable public policy effort to retain the established use of the other buildings. The current snapshot is a transitional moment.

The most striking similarity to the Jeddah example I have seen in Asia includes the old colonial district along Kyee Myindaing Kanner Road in Yangon; the old overseas Chinese-owned mansions on Xiamen's Gulangyu island; and perhaps the hutongs in central Beijing. In Yangon, low-income multi-tenanted occupation sits side by side beautifully gentrified former colonial apartments and offices because of lack of capital in Myanmar's stalled progress out of post-war poverty. If ever Myanmar re-joins the global economy, the district will be the first in the city to uniformly upgrade.

When I last visited over 10 years ago, Gulangyu's bizarre colony of derelict mansions remained the homes of low-income families because of the complexities of pre-1949 inheritance laws. These have meant that ownership of any one mansion is now divided into hundreds of co-ownership rights but with no suitable legal mechanism to come to collective action – presuming you could trace all or a majority of owners scattered around the world since the 1940s and earlier.

When I last visited Beijing's hutong district, some of them were still occupied by multiple families under pre-1979 housing allocation rights. A friend of mine inherited and still 'owns', the right to a tiny one-room apartment with access to a shared kitchen in what used to be the hutong's beautiful courtyard and public toilet facilities serving what seemed to me, two adjoining hutong complexes. His father's brother had been allocated the room by his work brigade more than five decades ago. My friend is now its landlord.

Social and private value of the built environment constantly co-evolves. The pandemic will make very little difference despite all the talk about reducing densities and designing for pandemic resilient cities. The following graphic shows London's Soho district at the time of John Snow's 1854 prototypical GIS analysis, conducted during the world's 3rd wave of cholera pandemic. Alongside it is a 2021 map of the same area. The streets remain unchanged and the only difference is that the buildings are now higher and people live and work in the same streets at higher, not lower, densities. Land value and property rights nearly always trump all other determinants of built environmental evolution. The reason why Soho has not been comprehensively redeveloped since John Snow's day is its complexity of property rights, just like downtown Yangon and Gulangyu.



The same may be said of wars. There were surprisingly few comprehensive redevelopment schemes in London's East-end after WW2. Street alignment and the general urban configuration remained remarkable similar after the Blitz (intense bombing campaigns). Higher buildings emerged on individual building sites. The 18th century town house owned by one branch of my family on the edge of the Oxford Street's commercial neighbourhood was surgically taken out by a bomb, along with two of its neighbours, and is now a Harley Street clinic. The rest of the Georgian street still stands, providing London pied-à-terres for family members of minor Russian oligarchs and Middle-eastern Sheiks.

Congratulations to colleagues for the works mentioned below. Another good year for FoA's share of elite HKU Presidential PhD scholarships. Thanks to Weifeng for taking over the RPG portfolio so actively and effectively (I also note that it has been a bumper time for Weifeng's own scholarship – well done). FoA's scholarship goes onward and upward. Keep safe, those who are travelling to protect young children, and those who are staying.

Chris
Dean, FoA

Faculty of Architecture

1. Dr Kristof Crolla (ARC)

   - has been appointed to the post of Associate Dean (Special Projects) of the Faculty, for the period from 5 March 2022 to 30 April 2023.

     The position has been vacated by Dr Eric Schuldenfrei following his assumption of duty as the Head of the Department of Architecture. Thanks to Dr Crolla for his support to the Faculty.

2. HKU Presidential PhD Scholarship: Main Round of 2022/23

   - Our Faculty has been informed by the Dean of the Graduate School that the following PhD applicants have been awarded the HKU Presidential PhD Scholarship (HKU-PS):

Department	Name
ARC	Mr Jingliang Du
DUPAD	Miss Zixin Feng
DUPAD	Miss Scarlet Nga-chin Tong
REC	Mr Bokai Yang
DUPAD	Ms Yuling Yang
ARC	Mr Gong Zhang

     Out of the 145 candidates shortlisted by the HKU-PS Advisory Panel for interview in late January, they were among those recommended for receiving the HKU-PS, based on their academic qualifications, interview performance, and other factors such as research track record/potential and publication.

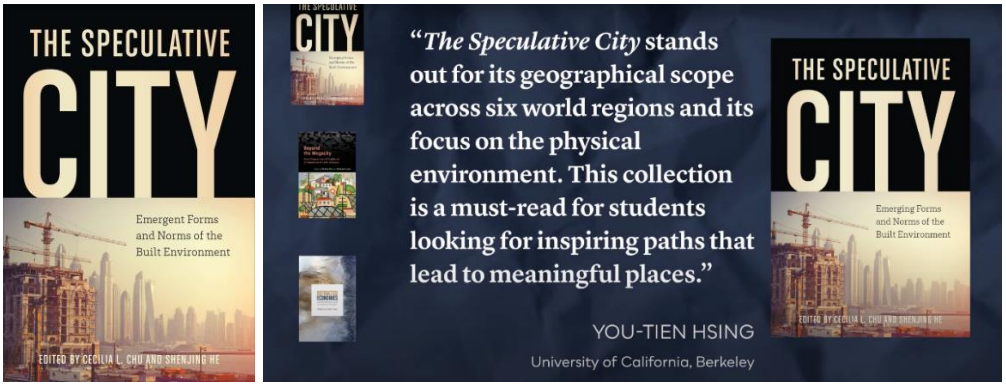
     The University established the prestigious HKU-PS in 2019, with the objective of attracting top candidates from around the world to pursue full-time PhD studies at HKU.

     About HKU-PS:
     https://www.scholarships.hku.hk/Scholarships/detail/622

2. Dr Cecilia Chu (DLA) and Professor Shenjing He (DUPAD)

   - have co-edited a new book titled *The Speculative City: Emergent Forms and Norms of the Built Environment*, published by the University of Toronto Press (UTP).

     The book has also been selected as one of UTP's featured titles at the 2022 American Association of Geographers Annual Conference.



Abstract: *'The Speculative City' explores property speculation as a key aspect of financialization and its role in reshaping the contemporary built environment. The book offers a series of case studies that encompass a range of cities whose urban fabrics have undergone significant transformation in recent years. While the forms of these developments share many similarities, their trajectories and social outcomes were contingent upon existing planning and policy frameworks in addition to the historical roles assumed by the state and the private sector in housing and welfare provision. By paying close attention to the forces and actors involved in property development, this book underscores that the built environment has played an integral part in shaping new values and collective aspirations, while also facilitating the spread of financial logics in urban governance. The essays in this collection show that these dynamics represent a larger shift of politics and culture in the ongoing production of urban space and prompt reflections on future trajectories of finance-led property speculation.*

Department of Architecture

1. Mr Maxwell Ho-chuen Lau (MArch graduate, Class of 2021)

   - won in the 2021 Royal Institute of British Architects (RIBA) Ideas and Sketches Students Competition (Asia & Australasia region), for his MArch thesis project '2061 Pabulum Odyssey', as announced by the RIBA on 23 February 2022.

     Under the theme of 'Reimagining Cities and Towns Post-COVID', the Competition invited architecture students worldwide to propose ideas for designing buildings, cities and towns of the future in the wake of the pandemic. A total of 73 entries were received from 20 schools across four international regions: Americas, Asia & Australasia, Europe, Middle East & Africa.

     Advised by Mr Christian Lange and Mr Kaicong Wu, '2061 Pabulum Odyssey' questions whether the role of technology in restaurants will increase over the next 40 years, as the transmission of viruses leads to less human contact. It envisions a machine-dominant future of virtual dining and serving food via drones in abandoned MTR stations.

     '2061 Pabulum Odyssey' is commended by the Evaluation Panel as 'progressive, showing dreams and aspirations whilst providing a clear vision for the future. The project is imaginative and provocative and at the same time grounded in reality. It touches on one of the most important activities in big cities, which is food and dining in a social context. It also introduces quality drawing and a creative way of presentation, demonstrating a deep understanding of the issues linked to buildings, cities, and pandemic … The images presented are expressive showing first class quality in its ideas, development, and structure.'

Find out more about the winning project:

https://www.arch.hku.hk/march-graduate-won-at-ribas-ideas-and-sketches-students-competition-2021/

https://www.architecture.com/knowledge-and-resources/knowledge-landing-page/reimagining-cities-and-towns-post-covid-results

2. Mr John Lin

- delivered a public lecture titled ‘Uncertainty’, on the use of models in design research, for the Department of Architecture at the National University of Singapore on 17 February 2022.

Division of Landscape Architecture

1. 2022 Landscape Architecture RPG Seminar Series

- provides a platform for MPhil and PhD students, visiting research scholars, and Faculty members from the Division to share their ongoing research projects. These talks are open to the public, offering an opportunity for our students to present their work to other landscape architecture students, Faculty members, and members of the broader academic community at HKU and beyond. More information: https://www.arch.hku.hk/event_/land-arch-rpg-seminar-series-2022

  Schedule:

  22 February 2022 (Tuesday) 13:00 – 14:15 HKT via Zoom *(completed)*
  Topic: **Materials and Methods for Novel Ecosystems**
  Speaker: Ms Jiali Li, PhD student
  Primary supervisor: Dr Bin Jiang
  Moderator: Ms Xueming Liu, PhD student

17 March 2022 (Thursday) 12:45 – 14:00 HKT via Zoom
Topic: **Remittance House in China: Migrant Workers' Journey of Manufacturing Hope**
Speaker: Ms Yiling Lin, PhD student
Primary supervisor: Dr Cecilia Chu
Moderator: Ms Ting Wang, PhD student
**Joint event with Department of Architecture's Research Seminar Series*

29 March 2022 (Tuesday) 13:00 – 14:15 HKT via Zoom
Topic: **Art Fairs, Urban Renewal and the Making of South Island Cultural District**
Speaker: Ms Wenxin Zeng, PhD student
Primary supervisor: Dr Cecilia Chu
Moderator: Ms Xinhui Chen, PhD student

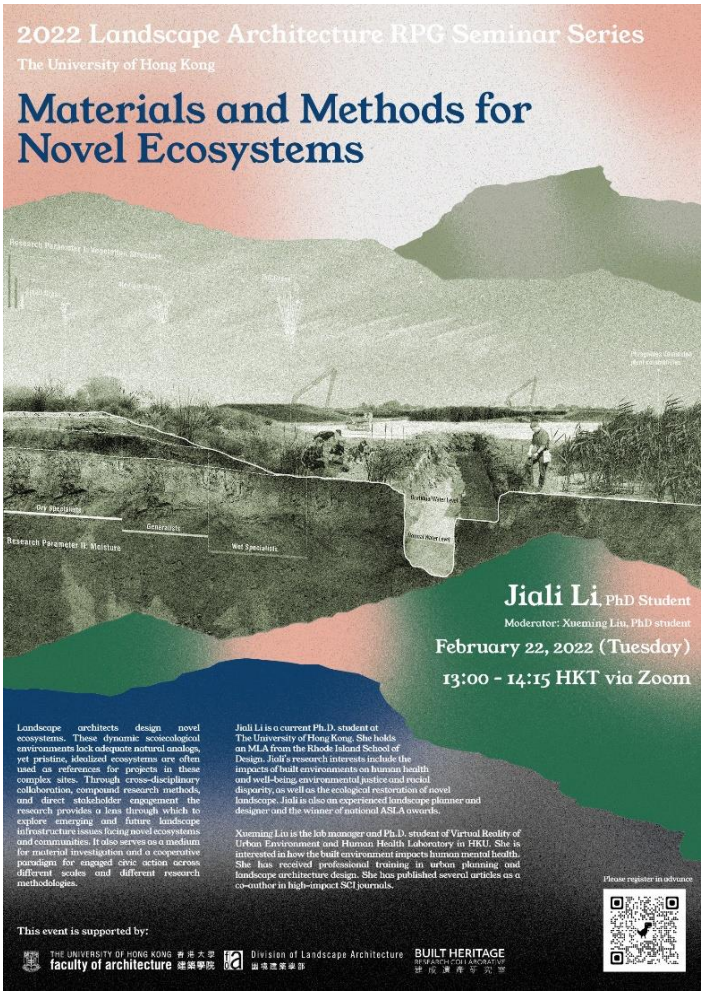
21 April 2022 (Thursday) 12:45 – 14:00 HKT via Zoom
Topic: **Examining Environmental Impact on Drivers' Mental and Physiological Status on Urban Roads**
Speaker: Ms Wenyan Xu, PhD student
Primary supervisor: Dr Bin Jiang
Moderator: Ms Yuwen Yang, PhD student
**Joint event with Department of Architecture's Research Seminar Series*

3 May 2022 (Tuesday) 13:00 – 14:15 HKT via Zoom
Topic: **Landscape Framework for an Adaptive Urbanism in Chiang Mai, Thailand**
Speaker: Ms Kanisa Sattayanurak, PhD student
Primary supervisor: Dr Xiaoxuan Lu
Moderator: Mr Yilun Li, PhD student

Pre-registration is required. Zoom link will be provided upon successful registration.

This event is supported by the Built Heritage Research Collaborative Lab, Division of Landscape Architecture, and the Faculty of Architecture.

2. Ms Jiali Li (PhD Student)



- delivered a seminar entitled 'Materials and Methods for Novel Ecosystems' on 22 February 2022. It was the first of the 2022 Landscape Architecture RPG Seminar Series organised for the spring semester.

  Abstract: *Landscape architects design novel ecosystems. These dynamic socioecological environments lack adequate natural analogues, yet pristine, idealized ecosystems are often used as references for projects in these complex sites. The project 'Design with Dredge' located on Hart-Miller Island in Chesapeake Bay, Baltimore is a typical case for novel ecosystem restoration. Through cross-disciplinary collaboration, compound research methods, and direct stakeholder engagement, the research provides a lens through which to explore emerging and future landscape infrastructure issues facing novel ecosystems and communities. It also serves as a medium for material investigation and a cooperative paradigm for engaged civic action across different scales and different research methodologies.*

  More information: https://www.arch.hku.hk/event_/materials-and-methods-for-novel-ecosystems

Department of Real Estate and Construction

1. Professor Kelvin Wong

   - was invited to join the Jury Panel for the Construction Management Awards 2022, organised by the Hong Kong Institute of Construction Managers.

2. Professor Lawrence Lai

   - was featured in an NHK news programme on 1 March 2022, in which he introduced war relics in Hong Kong.

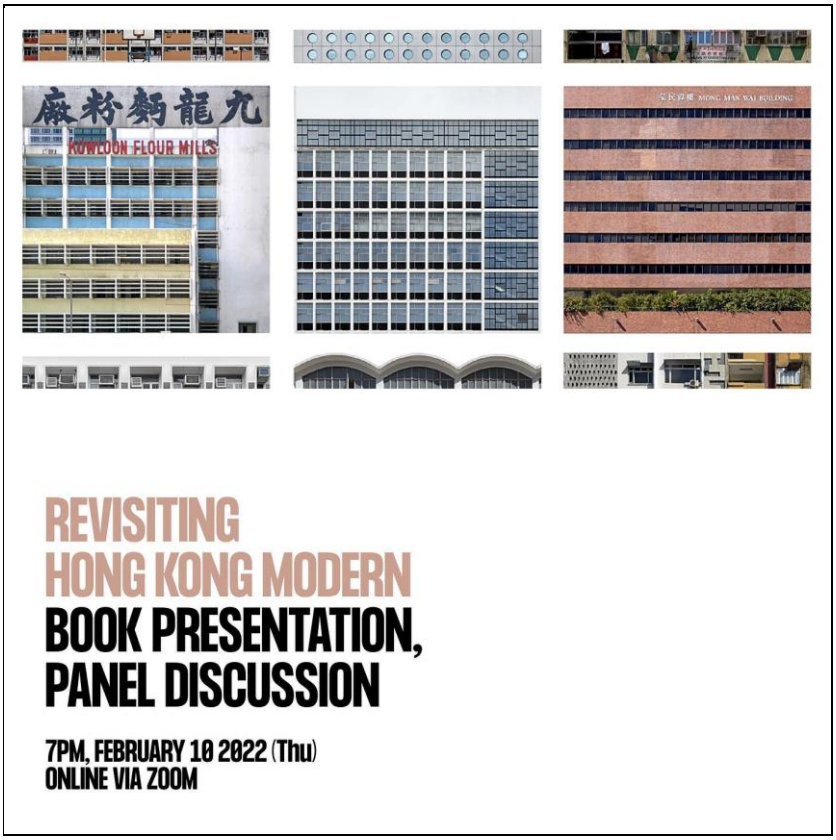
     Watch the full video:
     https://hkuhk-my.sharepoint.com/:v:/g/personal/viannwyy_hku_hk/EQ-ZlL_MjCNMhj17f3q-D38Bs8bcwPVBYVHpJqgFZlpqzQ?e=E600d8

Built Heritage Research Collaborative (BHRC)

1. Dr Cecilia Chu, Dr Eunice Seng and Dr Ying Zhou

   - were invited to participate in a panel discussion titled 'Revisiting Hong Kong Modern' （重溫香港摩登）at Goethe-Institut Hong Kong on 10 February 2022, to exchange views on the documentation and conservation of the city's modern architectural heritage.

     The event, which was co-organised by Docomomo Hong Kong, was one of the activities in support of the launch of the book *Hong Kong Modern Architecture of the 1950s-1970s* （香港摩登：1950 至 1970 年代建築）by Walter Koditek.



     Outline: *Postwar Hong Kong has long been narrated through heroic stories of modernization and progress associated with relentless building development. However, such narratives have begun to change in recent years amidst widening interests to protect the city's architectural heritage and enhance its urban identity. In this panel discussion, the author Walter Koditek and other panel members explore the changing interpretations of Hong Kong's postwar architecture and how documentation of these buildings might play a role in reshaping our relationships with the built environment and senses of history.*

Centre of Urban Studies and Urban Planning

1. Mr Alain Chiaradia

   - has published the following paper:

     Zhang, L., & **Chiaradia, A. J. F.*** (2022). Walking in the cities without ground, how 3d complex network volumetrics improve analysis. *Environment and Planning B: Urban Analytics and City Science.* https://doi.org/10.1177/23998083211070567

     Abstract: *Pedestrian route choice, wayfinding behaviour and movement pattern research rely on objective spatial configuration model and analysis. In 3D indoor and outdoor multi-level buildings and urban built environments (IO-ML-BE), spatial configuration analysis allows to quantify and control for route choice and wayfinding complexity/difficulty. Our contribution is to compare the interaction of the level of definition (LOD) of indoor and outdoor multi-level pedestrian network spatial models and complexity metric analyses. Most studies are indoor or outdoor and oversimplify multi-level vertical connections. Using a novel open data set of a large-scale 3D centreline pedestrian network which implement transport geography 2D data model principles in 3D, nine spatial models and twelve spatial complexity analyses of a large-scale 3D IO-ML-BE are empirically tested with observed pedestrian movement patterns (N = 17,307). Bivariate regression analyses show that the association with movement pattern increases steadily from R2 ≈ 0.29 to 0.56 (space syntax, 2.5D) and from R2 ≈ 0.54 to 0.72 (3D sDNA) as the 3D transport geography spatial model LOD and completeness increases. A multivariate stepwise regression analysis tests the bi-variate findings. A novel 3D hybrid angular-Euclidean analysis was tested for the objective description of 3D multi-level IO-ML-BE route choice and wayfinding complexity. The results suggest that pedestrian route choice, wayfinding and movement pattern analysis and prediction research in a multi-level IO-ML-BE should use high-definition 3D transport geography network spatial model and include interdependent outdoor and indoor spaces with detailed vertical transitions.*

2. Professor Rebecca Chiu

   - was invited to join the International Panel of Experts (IPE) of Singapore's Urban Redevelopment Authority (URA) for another term of three years, from 1 April 2022 to 31 March 2025.

URA's roles are to undertake long-term physical planning for Singapore, to formulate detailed land use plans, urban design and policies to guide the development of land in Singapore to meet present and future needs. IPE was established to gather insights from experts on international best practices and the latest global trends in planning and urban design strategies.

- was invited to give the first seminar of the International Seminar Series on Elderly Issues, for the Department of Housing and Interior Design of Kyung Hee University, South Korea, on 25 January 2022. Titled 'Compact Mixed-use Housing Estates: Implications for Older People's Wellbeing', the seminar was held to great response. It was presented based on Professor Chiu's related publication in *Planning Theory and Practice*.

3. Professor Rebecca Chiu, Dr Derrick Ho and Dean Chris Webster

   - have the following paper accepted for publication:

     Lum, T. Y. S.*, Chan, O. F., Liu, Y., Guo, Y., Lu, S., Chui, C. H. K., **Ho**, **D. H. C.**, Song, Y., Cheng, W., **Chiu**, **R. L. H.**, & **Webster, C.** (2022). Neighborhood built environments and cognition in later life. *Aging & Mental Health* [ranks Q1 in Geriatrics and Gerontology in 2020, according to SJR]. DOI: 10.1080/13607863.2022.2046697

4. Dr Weifeng Li

   - has published the following papers:

     (i) Guo, H., Li, X., Wei, J., **Li, W.**, Wu, J., & Zhang, Y. (2022). Smaller particular matter, larger risk of female lung cancer incidence? Evidence from 436 Chinese counties. *BMC Public Health, 22*, 344. https://doi.org/10.1186/s12889-022-12622-1

     ***Background**: Many studies have reported the effects of PM2.5 and PM10 on human health, however, it remains unclear whether particular matter with finer particle size has a greater effect.*

     ***Objectives**: This work aims to examine the varying associations of the incidence rate of female lung cancer with PM1, PM2.5 and PM10 in 436 Chinese cancer registries between 2014 and 2016.*

     ***Methods**: The effects of PM1, PM2.5 and PM10 were estimated through three regression models, respectively. Mode l only included particular matter, while Model 2 and Model 3 further controlled for time and location factors, and socio- economic covariates, respectively. Moreover, two sensitivity analyses were performed to investigate the robustness of three particular matte effects. Then, we examined the modifying role of urban-rural division on the effects of PM1, PM2.5 and PM10, respectively.*

***Results**: The change in the incidence rate of female lung cancer relative to its mean was 5.98% (95% CI: 3.40, 8.56%) for PM1, which was larger than the values of PM2.5 and PM10 at 3.75% (95% CI: 2.33, 5.17%) and 1.57% (95% CI: 0.73, 2.41%), respectively. The effects of three particular matters were not sensitive in the two sensitivity analyses. Moreover, urban-rural division positively modified the associations of the incidence rate of female lung cancer with PM1, PM2.5 and PM10.*

***Conclusions**: The effect on the incidence rate of female lung cancer was greater for PM1, followed by PM2.5 and PM10. There were positive modifying roles of urban-rural division on the effects of three particular matters. The finding supports the argument that finer particular matters are more harmful to human health, and also highlights the great significance to develop guidelines for PM1 control and prevention in Chinese setting.*

(ii) Guo, H., Li, X., **Li, W.,** Wu, J., **Wang, S.** (PhD student) & Wei, J. (2021). Climatic modification effects on the association between PM1 and lung cancer incidence in China. *BMC Public Health, 21*, 880. https://doi.org/10.1186/s12889-021-10912-8

***Background**: Nationwide studies that examine climatic modification effects on the association between air pollution and health outcome are limited in developing countries. Moreover, few studies focus on PM1 pollution despite its greater health effect.*

***Objectives**: This study aims to determine the modification effects of climatic factors on the associations between PM1 and the incidence rates of lung cancer for males and females in China.*

***Methods**: We conducted a nationwide analysis in 345 Chinese counties (districts) from 2014 to 2015. Mean air temperature and relative humidity over the study period were used as the proxies of climatic conditions. In terms of the multivariable linear regression model, we examined climatic modification effects in the stratified and combined datasets according to the three-category and binary divisions of climatic factors. Moreover, we performed three sensitivity analyses to test the robustness of climatic modification effects.*

***Results**: We found a stronger association between PM1 and the incidence rate of male lung cancer in counties with high levels of air temperature or relative humidity. If there is a 10 μg/m3 shift in PM1, then the change in male incidence rate relative to its mean was higher by 4.39% (95% CI: 2.19, 6.58%) and 8.37% (95% CI: 5.18, 11.56%) in the middle and high temperature groups than in the low temperature group, respectively. The findings of climatic modification effects were robust in the three sensitivity analyses. No significant modification effect was discovered for female incidence rate.*

***Conclusions**: Male residents in high temperature or humidity counties suffer from a larger effect of PM1 on the incidence rate of lung cancer in China. Future research on air pollution-related health impact assessment should consider the differential air pollution effects across different climatic conditions.*

(iii) Chang, Z., Diao, M., Jing, K., & **Li, W**. (2021). High-speed rail and industrial movement: Evidence from China's Greater Bay Area. *Transport Policy, 112*, 22-31. https://doi.org/10.1016/j.tranpol.2021.08.013

***Abstract**: In the context of location choice, firms face a trade-off between the increasing agglomeration benefits and the rising costs of doing business along the high-speed rail (HSR) corridors. This study examines the causal impact of the HSR extension on industrial movement patterns in China's Greater Bay Area (GBA). We analyze two firm-level datasets for the period 2007–2018 using the difference-in-differences method. We find that after the HSR extension, large-scale manufacturing firms exhibit a decentralization trend in the central GBA. We also find that the service sector shows a clustering pattern in the GBA. However, this pattern differs between the GBA and other regions, urban districts, and suburban counties, highlighting the redistribution effect of the HSR extension on industrial growth across regions. These findings have important implications for industrial policymaking, as they help decision-makers reflect on the potential industrial movement trend in relation to the impact of HSR expansion.*

5. Dr Weifeng Li, Ms Anqi Zhang and Mr Chang Xia (PhD students)

- have published the following papers:

(i) **Zhang, A.**, **Xia, C.**, & **Li, W.** (2022). Relationships between 3D urban form and ground-level fine particulate matter at street block level: Evidence from fifteen metropolises in China. *Building and Environment, 211*, 108745. https://doi.org/10.1016/j.buildenv.2021.108745

***Abstract**: Substantial efforts have been devoted to exploring the effects of urban form on fine particulate matter (PM2.5), but the complexity has been far away from being fully understood. The current remarkable inconsistencies with regards to measurements, ascertainment, and findings make the evidence across continents, regions, or cities be necessary to verify the robustness and generalizability of urban form effects. Besides, existing measurements of urban form are often unsystematic and limit analyses in both horizontal and vertical dimensions. In this paper, fifteen metropolises in China were selected to examine the relationships between three-dimensional (3D) urban form and PM2.5 concentrations at the street block level, using 3D spatial metrics and multivariate linear regression. Satellite-derived surface PM2.5 estimates of fine spatial resolution, building footprint, and multiple*

geographic open datasets were used. Our results demonstrated that urban form effects hold for the metropolises in China, and street accessibility, length of road segments, topography, urban vegetation, surrounding open and green spaces, and transportation facilities were found to be the influential factors of the concentrations of PM2.5. We also revealed the complicated and place-varying effects of urban form indicators, represented by the largely different or opposite effects of many urban form indicators in different cities. For example, building density, building height, and land use mixture have relatively limited and inconsistent effects in most cities. Results of this work suggest critical reflections on some of the current ideas that have been accepted to be vital for improving PM2.5.

(ii) **Zhang, A.**, **Xia, C.**, & **Li, W.** (2022). Exploring the effects of 3D urban form on urban air quality: Evidence from fifteen megacities in China. *Sustainable Cities and Society, 78*, 103649. https://doi.org/10.1016/j.scs.2021.103649

***Abstract**: Poor urban air quality, as a long-term and intangible health hazard, has drawn much attention worldwide. Current literature has revealed the significant effects of urban form on air quality, which, however, centers on two-dimensional (2D) features of urban fabric and lacks fine-scale investigations. The impacts of three-dimensional (3D) urban form on the concentration and dispersion of air pollutants, such as the height or volume of buildings, still remains unclear. The present work quantified 3D urban form based on Conzen's townscape framework and examined how and to what extent 3D urban form affects air quality at street block level using evidence from fifteen megacities in China. The average concentrations of PM2.5, PM10, NO2, CO, O3, and SO2 were calculated for different periods of the day, seasons, and years. Our results identified the varied effects of urban form indicators for different air pollutants and times and revealed neighboring effects of building height and density. In particular, accessibility, intersection densities, adjacent block pattern, building arrangement, building density, and land use function have significant effects, and the morphological categories of surrounding blocks tend to be related to different pollution levels. This study provides insights into how to optimize urban form to alleviate air pollution*

6. Dr Kyung-min Nam

- has published the following paper:

Li, X., & **Nam, K.-M.** (2022). Environmental regulations as industrial policy: Vehicle emission standards and automotive industry performance. *Environmental Science & Policy, 131*, 68-83. https://doi.org/10.1016/j.envsci.2022.01.015

Abstract: *In this paper, we examine a potential causal link between vehicle emission standards and local automotive industry performance, using a 42-country panel data set covering a 19-year period between 2000 and 2018. Our panel logit analysis shows that having a sizeable local automotive industry decreases the chance of adopting stringent vehicle emission standards, while the stock of automotive FDI increases the chance. This finding suggests that the primary motivations for vehicle emission standards may not be purely environmental. Our follow-up Granger causality test demonstrates that such non-environmental motivations have in fact translated into an actual industry-promotion outcome. Stricter emission standards in OECD member countries tend to promote local automotive output and international vehicle export with a 3-year time lag, while this causal link is limited to up-market exports for non-OECD panels. Automotive FDI hosts with large domestic markets and/or local-brand automakers also present a similar causal link, but in this case significant long-term industry-promotion effects appear only after a short-term negative shock. These results suggest that a regulation-induced short-term efficiency loss may be partly offset by a long-term productivity gain through advance/timely local adoption of cleaner technologies.*

7. Professor Anthony Yeh

   - has published the following paper:

     Chen, Z., & **Yeh, A. G. O.** (2022). Delineating functional urban areas in Chinese mega city regions using fine-grained population data and cellphone location data: A case of Pearl River Delta, *Computers, Environment and Urban Systems, 93*, 101771. https://doi.org/10.1016/j.compenvurbsys.2022.101771

     Abstract: *A functional urban area (FUA) is composed of nearby physical urban areas that have intense functional connections or linkages. This notion gains increasing popularity in recent decades. Like in many other developing countries, no official definition of FUAs exists in China despite a few scholarly attempts. The present study extends the literature by developing a novel method based upon fine-grained population data and cellphone location data to delineate FUAs in China. At a spatial unit of 1 km grid cells, the fine grained population data are used to infer population density to identify core areas of FUAs. Thereafter, cellphone location data are used to infer commuting flows to identify periphery areas that are economically integrated with the core areas. Using 9 prefecture-level cities in the Pearl River Delta of southern China as a case study, a total of 26 FUAs are identified.*

     The robustness of FUA delineation is validated based on three criteria, namely sensitivity, realisticness, and compactness. The present study unravels that prefecture-level cities in China are not good representation of FUAs. Some of the prefecture-level cities have multiple FUAs that are

functionally separate from each other, while some FUAs may surpass the administrative borders and be shared by two or more prefecture-level cities.

Through the empirical case, the present study contributes a rigorous method to delineate FUAs that is not affected by the spatial configuration of administrative boundaries at any scales, which can facilitate more precise understanding of regional spatial interactions and more effective measures in regional governance.

8. Professor Anthony Yeh and Mr Chang Xia (PhD student)

   - have published the following paper:

   Xia, C. & **Yeh, A. G. O.** (2022). Mobility as a response to environmental hazards in the urban context: A new perspective on mobility and inequality. *Travel Behaviour and Society, 27*, 192–203. https://doi.org/10.1016/j.tbs.2022.01.008

   ***Abstract**: In view of the increasing occurrence of urban environmental hazards which can threaten our quality of life and health outcomes, how citizens react to adverse environmental impacts is of great concern. Mobility, as an important part of urban everyday life, is a key concept in understanding individuals' experience in cities and the society; however, this notion has long been understudied with regard to avoiding the harmful effects of environmental hazards. By highlighting the research perspective of averting behavior, we conceptualize mobility as a response (MaaR) to environmental hazards to inform a new interdisciplinary dialogue for transportation, urban planning, and environmental health research. We review a variety of literature in environmental hazards, (im) mobility, and inequality and reveal the challenges posed by MaaR. MaaR would provide empirical evidence on whether, how, and to what extent the effects and social costs of environmental hazards are underestimated and existing environmental inequality are exacerbated. This article puts forward that MaaR is a promising analytical framework through which we can enrich our knowledge on the person-environment relationships.*

9. Dr Zhan Zhao and Mr Jintai Li

   - have published the following paper:

   Li, J., & **Zhao, Z.*** (2022). Impact of COVID-19 travel-restriction policies on road traffic accident patterns with emphasis on cyclists: A case study of New York City. *Accident Analysis & Prevention, 167*, 106586. http://doi.org/10.1016/j.aap.2022.106586

   ***Abstract**: Since the COVID-19 outbreak, travel-restriction policies widely adopted by cities across the world played a profound role in reshaping urban travel patterns. At the same time, there has been an increase in*

both cycling trips and traffic accidents involving cyclists. This paper aims to provide new insights and policy guidance regarding the effect of COVID-19 related travel-restriction policies on the road traffic accident patterns, with an emphasis on cyclists' safety. Specifically, by analysing the accidents data in the New York City and estimating three fixed effects logit models on the occurrence of different types of accidents in a given zip code area and time interval, we derived the following findings. First, while the overall number of road traffic accidents plummeted in the NYC after the stay-at-home policy was implemented, the average severity increased. The average number of cyclists killed or injured per accidents more than tripled relative to levels in similar times in previous years. Second, the declaration of the New York State stay-at-home order was significantly associated with a higher risk of accidents resulting in casualties. The number of Citi Bike trips in the area at the time overwhelmingly predicted severe risk for cyclists. Last, we applied the models to detect hot zones for cyclists' severe accidents. We found that these hot zones tend to be spatially and temporally concentrated, making it possible to devise targeted safety measures. This paper contributes to the understanding of the impact of COVID-19 travel-restriction policies on accidents involving cyclists, reveals higher risks for cyclists as an unintended consequence of travel-restriction policies, and provides an analytical tool for road safety impact evaluation should future travel restrictions be considered.

Heathy High Density Cities Lab

1. Ms Rong Zhang, Ms Ka Yan Lai, Dr Linwei Tian, Dean Chris Webster and Dr Chinmoy Sarkar

   - have the following paper accepted for publication:

     Zhang R., **Lai, K. Y.**, Liu, W., Liu, Y., Lu, J., **Tian, L.**, **Webster, C.**, Luo, L.*, & **Sarkar, C.*** (2022). Community-level ambient fine particulate matter and seasonal influenza among children in Guangzhou, China: A Bayesian spatiotemporal analysis. *Science of the Total Environment*, 154135. In press. https://doi.org/https://doi.org/10.1016/j.scitotenv.2022.154135

     ***Background**: Influenza is a major preventable infectious respiratory disease. However, there is little detailed long-term evidence of its associations with $PM_{2.5}$ among children. We examined the community-level associations between exposure to ambient $PM_{2.5}$ and incident influenza in Guangzhou, China.*

     ***Methods**: We used data from the city-wide influenza surveillance system collected by Guangzhou Centre for Disease Control and Prevention (GZCDC) over the period 2013 and 2019. Incident influenza was defined as daily new influenza (both clinically diagnosed and laboratory confirmed) cases as per standard diagnostic criteria. A 200-meter city-wide grid of daily ambient $PM_{2.5}$ exposure was generated using a random forest model. We developed spatiotemporal Bayesian hierarchical models to examine the community-level associations between $PM_{2.5}$ and the influenza adjusting for meteorological and socioeconomic variables and accounting for spatial autocorrelation. We also calculated community-wide influenza cases attributable to $PM_{2.5}$ levels exceeding the China Grade 1 and World Health Organization (WHO) regulatory thresholds.*

     ***Results**: Our study comprised N=191,846 children from Guangzhou aged ≤19 years and diagnosed with influenza between January 1, 2013 and December 31, 2019. Each 10μg/m3 increment in community-level $PM_{2.5}$ measured on the day of case confirmation (lag 0) and over a 6-day moving average (lag 0-5 days) was associated with higher risks of influenza (RR=1.05, 95% CI: 1.05-1.06 for lag 0 and RR=1.15, 95% CI: 1.14-1.16 for lag 05). We estimated that 8.10% (95%CI: 7.23%-8.57%) and 20.11% (95%CI: 17.64%-21.48%) influenza cases respectively were attributable to daily $PM_{2.5}$ exposure exceeding the China Grade I (35 μg/m3) and the WHO limits (25 μg/m3). The risks associated with $PM_{2.5}$ exposures were more pronounced among children of the age-group 10-14 compared to other age groups.*

     ***Conclusions**: More targeted non-pharmaceutical interventions aimed at reducing $PM_{2.5}$ exposures at home, school and during commutes among children may constitute additional influenza.*

Social Infrastructure for Equity and Wellbeing

1. Professor Shenjing He

- has received a grant from the Policy Innovation and Co-ordination Office (PICO) of the HKSAR Government, under the Strategic Public Policy Research (SPPR) Funding Scheme 2021-22, for her project 'Promoting HK Residents' Cross-border Healthcare Utilization and Cross-border Mobility in the Greater Bay Area: Recent Priorities and Long-term Policy Framework'.

  Project Number: S2021.A8.027.21S

  Funding Amount: HK$3,910,052.90

  Project Period: May 2022 – May 2025

  Team members: Professor Anthony Yeh and Dr Xiaohu Zhang of DUPAD, and other Co-Is from HKU LKS Faculty of Medicine, Sun Yat-sen University and Peking University.

- was invited to give the following public lectures:

  (i) 'The Rise of Education-featured Gated Communities in Chinese Cities: (Re)producing the Enterprising Self via the Entrepreneurial Local State-capital Nexus' at the Shanghai • New York Urban Research Forum, organised by New York University Shanghai on 24 February 2022.

  (ii) 'Towards Systems Thinking in Examining China's Residential Segregation: Combining Thick Data and Big Data' at the Department of Earth System Science, Tsinghua University, on 28 February 2022.

- has published the following papers:

  (i) **He, S.** (2022). The rise of education-featured gated communities in Chinese cities: (Re)producing the enterprising self via the entrepreneurial local state-capital nexus. *The Geographical Journal.* In press. https://doi.org/10.1111/geoj.12435

  ***Abstract**: Since the 1990s, an emerging form of gated communities (GCs) packaging K-12 schools with tailor-made residential services, termed education-featured gated communities (edu-featured GCs) by the author, has transformed the residential and education landscapes in Chinese cities. Encapsulating fundamental issues of urban entrepreneurialism, privatisation of public goods, social reproduction, education and housing inequalities, the rise of edu-featured GCs poses a series of unexplored research questions beyond education and housing/GCs per se. Drawing on an empirical investigation mainly in the birthplace of edu-featured GCs, Guangzhou, this*

research examines how the entrepreneurial local state leverages private investments and orchestrates the (re)production of the enterprising self to give rise to edu-featured GCs. Specially, the entrepreneurial state strategically forms nexus with private capital at different stages to serve different (re)development priorities and thus gives rise to various types of edu-featured GCs. Meanwhile, the enterprising self is forged by a process of neoliberal responsibilisation of individuals to produce a competitive labour force feeding into the needs of domestic economic restructuring and global capitalism. Middle-class households seemingly harvest a great fortune through their investment in education and housing markets, yet they are involuntarily being mired in a vicious circle of 'involution' that reproduces the enterprising self in a hypercompetitive manner. Foregrounding the indispensable role of the state in shaping the new residential form entwining housing and education choices, this study epitomises how education and housing offer critical prisms to examine broader and more profound urban and geographical issues. It enriches the scholarship of critical geographies of education through introducing a four dimensional—upward-, downward-, outward-, and inward-looking prism. Specifically, edu-featured GCs is shaped by both the powerful state-capital nexus (upward-looking) and individual choices for social reproduction (downward-looking), and links middle-class parents' expectations and choices of schooling (inward-looking) with the wider impacts on urban (re)development (outward-looking).

(ii) **Yan, X.** (PhD student), **Shan, L.** (PhD student), **He, S.**, & Zhang, J. (2022). Cross-city patient mobility and healthcare equity and efficiency: Evidence from Hefei, China. *Travel Behaviour and Society, 28,* 1-12. https://doi.org/10.1016/j.tbs.2022.02.001

Abstract: *Recent studies on healthcare accessibility have made use of medical records to study the actual patient mobility and its implications for healthcare governance. Drawing on 39,067 cross-city healthcare utilization records of Hefei residents in China between 2019 and 2020, this study extends existing research to examine patient mobility at individual level and its impacts on healthcare equity and efficiency in a hierarchical healthcare delivery system. The results show that 29.62, 30.63, and 39.75 percent of cross-city healthcare utilization was to access China's top 100 hospitals, Tertiary-A hospitals, and other hospitals respectively, with significantly different distance decay patterns. The multivariate regression models revealed that patient mobility leads to another dimension of social inequality associated with uneven distributions of healthcare resources. Females, older adults, and holders of Basic Medical Insurance of Urban and Rural Residents were disadvantaged in traveling long distances for cross-city healthcare. More inequities in gender and insurance type were found in cross-city utilization of low-level hospitals. The difference-in-difference analysis found that policies indirectly encouraging patient mobility*

produce mixed outcomes in healthcare efficiency, resulting in cost-saving for patients' utilization of China's top 100 hospitals but cost increase for the use of other hospitals. Conceptually, this study presents a novel and meaningful attempt to understand patient mobility, and underscores the need for context-sensitive and dynamic approaches to unraveling the mutual constitution between patient mobility and healthcare system.

(iii) Hu L., **He, S.**, & Su, S. (2022). A novel approach to examining urban housing market segmentation: Comparing the dynamics between sales submarkets and rental submarkets. *Computers, Environment and Urban Systems, 94*, 101775. https://doi.org/10.1016/j.compenvurbsys.2022.101775

***Abstract**: Submarket segmentation outlines an essential prerequisite for monitoring housing market and formulating urban housing policies. Although examining segmentation based on a posteriori knowledge rather than a priori knowledge becomes the mainstream, it follows a data-driven approach without a solid theoretical foundation and involves subjective interventions. Additionally, earlier studies have overwhelmingly examined the dynamics of sales submarkets while overlooking those of rental submarkets. This paper demonstrates a novel approach to segmenting the housing market by integrating the hedonic model, geographically and temporally weighted regression (GTWR), and machine learning, and further applies it to unpack the dynamics of sales submarkets and rental submarkets from 2018 to 2020 in Shanghai, China. More specifically, using the home-fixed panel data of housing sales prices and rental prices for each residential quarter, we first establish a series of hedonic models using GTWR and then aggregate the residential quarters into a number of submarkets using an affinity propagation clustering algorithm based on the produced spatiotemporally explicit coefficients. To validate the identified submarkets, we compare them to the static submarkets delineated by the real estate industry with respect to the performances of hedonic models. Finally, the Jaccard and Rand indices are applied to compare the magnitude of spatiotemporal dynamics of sales submarkets and rental submarkets. Results show that hedonic models based on the identified submarkets through our proposed method perform better than those based on the static submarkets delineated by the real estate industry. We also discover that the submarkets present a complex change over three years, especially in central urban areas. The dynamics between sales submarkets and rental submarkets are of significant differences. In particular, rental submarkets are more stable than sales submarkets. Our approach provides a practical and efficient tool for urban housing market segmentation. Our study highlights that differentiated policies should be formulated for regulating sales submarkets and rental submarkets in order to enhance housing affordability.*