

# POLYU JOCKEY CLUB “OPERATION SOINNO” 理大賽馬會社創「騷·In·廬」

SYMPOSIUM SERIES 研討會系列

# 10萬分1

from One Hundred  
One Thousand

Season 10 第十季：  
Enabling Smart Ageing with  
Health and Building Data  
利用健康和屋宇數據  
實現智齡生活

## Summary Report 總結報告



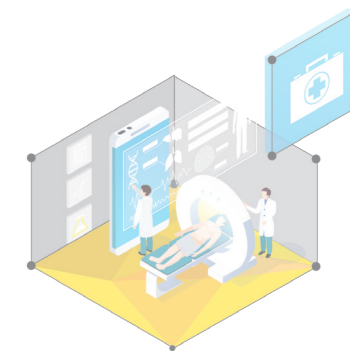
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## 前言 Foreword

科技日益進步，社會各界正努力探索創新和智能方案，以求應對雙老化帶來的挑戰，建設長者友善社區。為營造長者友善的用戶體驗，本季提倡建立數碼平台，把實用的知識和數據有系統地整合、分析和視覺化，藉此提升「年青長者 (young old)」進行自我評估的能力，為未來在社區「居家安老」作好準備。

理大賽馬會社會創新設計院 (JCDISI) 於2018年10月舉辦「理大賽馬會社創『騷·In·廬』」第一季「十萬分之一」社創研討會，以「過渡性社會房屋」為題，探討其作為創新的房屋類型的發展潛力。我們與不同持分者深入交流，過程中發現非政府組織與專業人士之間存有知識和溝通差距，阻礙了過渡性社會房屋的發展。因此，我們需要促進跨界別與學科的知識交流和相互理解，加強過渡性社會房屋項目中的多方合作。

第十季「十萬分之一」社創研討會以「利用健康和屋宇數據實現智齡生活」為題，邀請了跨界別和跨學科專業人士參與，集中討論如何利用現有的數據和地理資訊系統技術，評估老化的建築環境對長者身心健康的影響。

我衷心感謝演講嘉賓參與我們的討論。我相信只要大家積極支持、參與和努力，必定能發掘出一些新的創意點子，讓我們善用資訊科技，改善市民和長者的生活。

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賽馬會社會創新設計院總監  
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2021年4月



With technological advancements, various social sectors strive to find innovative and smart solutions to tackle the challenges caused by double ageing and to make the community and user experience more elderly-friendly. Season 10 promoted the building of a digital platform for systematic integration, analysis and visualisation of practical knowledge and data, so that the young old can better assess their ability in and prepare for ageing in place.

In October 2018, Jockey Club Design Institute for Social Innovation (JCDISI) launched the “One from Hundred Thousand” Season 1 Social Innovation Symposium under the “PolyU Jockey Club “Operation Solnno” project held seminars on social innovation. The first season focused on transitional social housing and discussed its potential as an innovative type of housing. In our detailed discussions with various stakeholders, we found that the wide knowledge and communication gap between the non-governmental organisations and the professionals hindered the development of transitional social housing. Therefore, we are obliged to foster the exchange of knowledge and mutual understanding between the members of various sectors and disciplines to strengthen their cooperation in transitional social housing projects.

In “Season 10: Enabling Smart Ageing with Health and Building Data”, we invited professionals from various sectors and disciplines to discuss in detail how the available data and geographical information system (GIS) could be used to assess the impacts of the ageing building environment on the health and well-being of the elderly.

We are indebted to the participation of our guests in our discussions. I believe that our active support, participation, and effort can bring about innovative ideas which can promote better use of information technology for making the life of the elderly and the people better.

Ling Kar-kan, SBS  
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Director, Jockey Club Design Institute for Social Innovation,  
The Hong Kong Polytechnic University  
April, 2021

# 項目背景 Project Background



## 項目背景 Project Background

### 利用數據紓緩雙老化影響 Mitigating the Effects of Double Ageing with Data

雙老化是指建築群和人口同時出現老化，整體而言會對居民的身心和社會福祉產生複合影響 (Ling & Lee 2020)。政府最近推出了「空間共享數據平台」(CSDI) (<https://csdi.gov.hk>)，提供多種開放的地理空間和建築資料，如果這些數據能以大眾易於理解的方式呈現，便可以成為對公眾有用的資訊。這些資訊包括建築的可及性，例如電梯通道位置和行動路線資訊，以及開放空間和社區設施的距離。此外，陽光照射時間（以小時計）和不同年代的建築分佈等資料，對於住宅內部和建築外部設計及地區的整體規劃（如社區設施的位置）都大有幫助。「空間共享數據平台」倡議創建平台讓公私營機構分享空間資料，使「規劃和土地使用」和「景觀、環境和保育」等資料更公開透明，並能被有效使用。為香港在智慧城市發展方面提出更好的建議。此外，香港綠色建築委員會 (HKG-BC) 的《香港智慧及綠色建築設計最佳作業方式指南》亦倡導整合智慧建築技術，改善人類的身心健康。

Double ageing refers to the ageing of building stocks and the ageing of the population. Its combined effect has compound implications on the physical, mental and social well-being of the residents (Ling & Lee, 2020). With the recent introduction of "Common Data Infrastructure Initiatives" by the government (<https://csdi.gov.hk/>), there is much open geospatial and building data available that, when presented in a readily digestible manner, can become useful information to the general public. This information include building accessibility such as lift access and mobility information, proximity to open spaces and community amenities. Other data such as the duration of sunlight penetration (in hours) or the distribution of buildings of different ages, can be useful for home interior and building exterior design, as well as the overall planning of the district (e.g. the locations of community facilities). The initiatives proposed by the Common Spatial Data Infrastructure (CSDI) aim to create a platform to share spatial data with the public and private sectors. The goal is to make the data on areas such as "planning and land use" and "landscape, environment and conservation", more efficient and transparent to facilitate better decision making in developing Hong Kong into a smart city. With its "Hong Kong Smart Green Building Design Best Practice Guidebook", the Hong Kong Green Building Council (HKGBC) is also advocating the integration of smart building technologies to improve human health and well-being.

### 利用地理資訊系統視覺化資料 Visualising Data with GIS

香港及數個城市的政府和組織已經開始建立地理資訊系統 (GIS) 平台，以視覺化方式呈現各種地理資料。美國有不少項目將陽光照射、建築陰影分佈等關乎健康或建築的資訊作視覺化處理。例如華盛頓特區的「Arlington Travelsheds」是一個主動的微型運輸移動行程規劃器，可以為使用者計算「步行分數」。再者，IMD 世界競爭力中心和新加坡科技大學 (SUTD) 的智慧城市指數 (SCI) 報告亦提出了類似的「評級系統」，按照世界各地城市在智慧城市各方面的表現（如健康和安全、流動性、工作和教育機會等方面），給予城市由C到AAA的評級。英國亦有類似的項目已經把人口資料作視覺化處理。

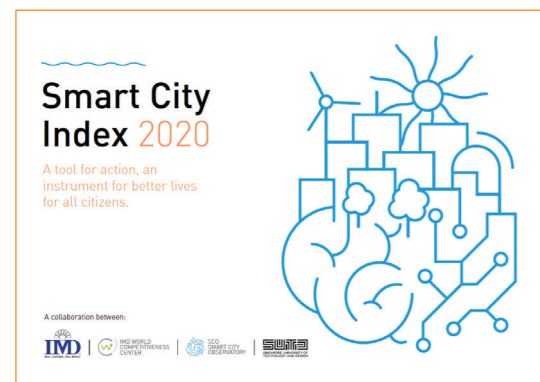
在香港，經視覺化處理的資料包括空氣質素、樓齡和物業估值等即時環境資料。不同平台的參考例子可見於附錄的清單。大數據和GIS分析亦廣泛應用於本地學的術研究。例如香港中文大學未來城市研究所的都市可持續性研究中心，研究了城市環境質素方面的數據，並探討建築環境對城市生活的影響。為了規劃

In Hong Kong and several overseas cities, Governments and organisations have set up geographic information systems (GIS) platforms to visualise various geographic data. In the US, there are many projects that visualise data such as sunlight penetration, building shadow distribution and other health or building-related information. For instance, Arlington Travelsheds, an active transits micro-mobility trip planner in Washington DC, can calculate the "walkscore" for its users. Similar "rating systems" on a wider level can be seen in the Smart City Index (SCI) Report by IMD World Competitiveness Center and Singapore University of Technology and Design (SUTD). In the report, cities around the world are given a rating ranging from C to AAA on smart city-related aspects such as health and safety, mobility, work and education opportunities. In the United Kingdom, similar projects have been done to visualise population and demographic data.

In Hong Kong, real-time environmental data tracking air quality, building ages and property valuation are some of the data that have been visualised. A list of some reference platforms can be found in the appendix. Big data and GIS analytics have also been extensively employed in local academic research. For instance, the Centre of Urban Sustainability of the CUHK Institute of Future Cities has conducted research on urban environmental quality data platforms as well as impacts of the built environment

長者友善的九龍城區，香港大學城市規劃碩士課程的學生利用地理資訊系統，將該區雙老化的情況作視覺化的繪製；並善用現有的數據資料，如樓齡和街坊的年齡分佈，為個別地區雙老化程度評分。這些發現均足以證明雙老化確實存在，並且奠定基礎，以便日後研究雙老化的相關度，以及雙老化對未來社會的影響。

on urban living. To plan for an age-friendly Kowloon City district, students from HKU MSc in Urban Planning programme have utilised GIS to map and visualise the patterns of double ageing in the district. Using available data such as building ages and age distribution by street blocks, a score on the level of double ageing in individual areas can be calculated. These findings are fundamental to attesting to the phenomenon of double ageing and laid the foundation for future research on the correlations and implications of double ageing to our future society.



Smart City Index 2020\*



Common Spatial Data Infrastructure\*

## 機會 Opportunities

香港有大量的資料可經地理資訊系統進行視覺化，幫助用家理解資訊。除了增加資訊量，亦可探討以下幾項範疇。

In Hong Kong, there is a wide array of data that can be visualised and made more digestible by GIS. Apart from this quantitative development, several more opportunities can be explored:

\* IMD-SUTD. (2021). Smart City Index 2021. PlanBe. Retrieved April 1, 2022, from <https://www.planbe.com.gr/news/smart-city-index-2021>

\* Administration's paper on development of Common Spatial Data Infrastructure and 3D Digital Map (Powerpoint presentation materials). (2019). the Bureau.

### 1. 利用資訊探索新發現

該平台除了顯示和分析一項或多項互不相關資料集外，平台還可以產生和建議有趣的資料集。數據集經整合後或能顯示新發現，例如可以利用數據計算出社區人口的平均年齡和社區醫療設施的使用量。其他可顯示的資訊包括，自然的可達度和建築的通風度。

### 1. Improve data insights

In addition to displaying and analysing one or multiple unrelated datasets, the platform can show and suggest interesting datasets that generate useful insights when integrated together. For example, the average age of people in a community and the capacity of community healthcare facilities can be identified. Other interesting data including access to nature and building ventilation can also be shown.

### 2. 評分系統

評分系統根據主題整合相互關聯的資料，為公眾提供易於理解和消化的評分。例如可以為適合長者居住的建築制定一項滿分為10分的評級系統。評分的考慮因素可包括建築的無障礙程度、樓齡、社區護理設施和開放空間的距離等。

### 2. Rating system

The rating system provides an easy-to-understand and digestible score for the general public based on a collection of interrelated data about a certain topic. For example, a 10-point rating system for buildings suitable for seniors, which may include data such as building accessibility, building ages, proximity to community care facilities and open space, can be developed.

### 3. 可用程度

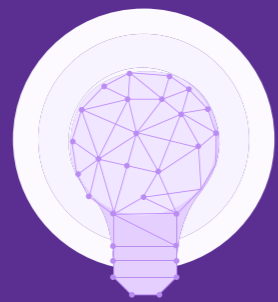
GIS平台的用戶界面應可按照使用者需要微調。例如長者使用的平台可採用較大的字型。持續探索平台的可用度，提高地理資訊系統平台的影響力。

### 3. Usability

The user interface of these GIS platforms can be fine-tuned to better fit the needs of their target users. For example, words designed with a larger font size can be displayed for elderly users. This aspect can also be explored to further the impact of these GIS platforms.

# 焦點小組討論

## Focus Group Discussions



## 焦點小組討論 Focus Group Discussions

### 技術焦點小組（2021年3月12日） Technical Focus Group (12th March 2021)

技術焦點小組探討了整合環境與健康數據的技術可行性和機會。討論的結果有助我們選擇平台的發展方向和方法。13位與會者來自以下組織：

- 香港中文大學老年學研究所
- 香港中文大學未來城市研究所
- 香港綠色建築議會
- 奧雅納工程顧問
- 香港理工大學建築及房地產學系
- 香港理工大學土地測量及地理資訊學系
- 香港理工大學康復治療科學系
- 市區重建局

技術焦點小組在2021年3月12日召開會議。與會者是來自建築、房地產、工程、環境科學和地理空間分析行業的專家，代表所屬的私營企業、非政府組織、政府部門和學術機構參與小組會議。小組首先提出城市居民都受到室內和室外微氣候影響，因此認為有必要結合室內和室外微氣候研究。香港的微氣候數據易於取得，可從本地平台和研究中抽取。監測、分析和收集資料時應採取不同的策略。香港

The technical focus group discussed the technical feasibility and opportunities of integrating environmental data with health data. The findings identified the direction and approach for our proposed platform. Participants included 13 representatives from the following organisations:

- CUHK Institute of Ageing
- CUHK Institute of Future Cities
- Hong Kong Green Building Council
- Ove Arup & Partners Hong Kong
- PolyU Department of Building and Real Estate
- PolyU Department of Land Surveying and Geo-Informatics
- PolyU Department of Rehabilitative Sciences
- Urban Renewal Authority

The Technical Focus Group held on the 12th of March 2021 consisted of experts from buildings, real estate, engineering, environmental sciences, and geospatial analysis industries. They were representatives of private firms, NGOs, government departments and academic institutions. The group first discussed the need to combine indoor and outdoor microclimate studies, as each aspect has its own unique influence on urban dwellers. Microclimate data is readily available in Hong Kong and can be extracted from local platforms and

這種城市的建築分佈密集而緊湊，如要了解當前城市的環境狀況，便需收集時間資料，並且追蹤數據的變化。由於香港樓宇密集，在改變樓宇結構之前，應按照實際情況進行內部和外部模擬，從而減輕財政負擔和解決其他潛在問題。

research. Different strategies should be adopted to initiate monitoring, analysis and data collection. To understand the current urban environmental conditions, we need temporal data and track their changes, especially in dense and compact cities like Hong Kong. As the housing in Hong Kong is densely packed, interior and exterior simulations of the actual conditions should be made before making structural changes. This will help alleviate the financial burdens and overcome other potential obstacles.







從技術角度來看，開發者和研究小組如要分析整合資料和製作合適的主題層，便需要可靠的底圖（base map）和伺服器平台。時態數據（例如時間使用資料）可以結合使用者的感測器資料，找出生活環境和用戶健康趨勢之間的關係，獲取更準確的讀數和估計，藉此評估活動水平、能力，以至健康建議和運動日程的成效。所有產生和收集的數據都會經加權系統作分析，並找出較優先和關聯度較高的數據。健康數據與環境及建築數據同樣重要。然而，收集健康數據與環境資料一樣會帶來私隱問題，加上追蹤功能的成本可能過於高昂。要克服困難，政府部門便應該發佈更多的開源資料，並推廣不同的製圖和空間分析技術，如數位結對、三維室內製圖和建築拓撲研究。

From a technical standpoint, developers and research groups will need to determine a reliable base map and server platforms to extrapolate and join the data and determine their thematic layers. Temporal data, such as time use data, can be combined with user sensor data to identify the relationship between the living environment and the ongoing health of the users. This provides more accurate readings and estimates on activity levels, capabilities, effectiveness of health recommendations and regimes. All data generated and collected will go through a weighting system to differentiate the priority and higher relationship correlations. Health data is just as essential as environmental and building data. However, similar to the environmental data, it poses privacy concerns and may be difficult to track without being too costly. To overcome this obstacle, government departments should release more open-source data and promote different mapping and spatial analysis technologies like digital twinning, 3D indoor mapping and building topology studies.

由於香港人口和建築群正迅速老化，加上長者可能對室內和室外微氣候的變化更加敏感，所以我們必須考慮長者的需要。因為長者各有所需，所以我們不應該把長者概括理解為一個用戶群體，反而應該關注不同長者的特殊需要。用家的回饋和意見有助確保策略和分析充份反映當前和未來用家的需要。這些資料能協助制訂更具體的方向，顯示現有的數據和技術可促進長者健康和鼓勵他們積極地居家安老。

As both the population and its building stock of the city are rapidly ageing, we must consider the needs of the older adults, as they may be more sensitive to the changes in the indoor and outdoor microclimates. Special attention should be given to different types of older adults, as they have specific needs and should not be generalized as one user group. Ultimately, as double ageing will continue to be an emerging topic of discussion, it has never been timelier to plan and prepare for ageing population and building stock to prevent future social and economic issues. User feedback and input can ensure that implemented strategies and completed analysis reflect the needs of current and future users. They can form more concrete directions on how the data and technology available can promote healthy and active ageing in place.



## 社區焦點小組（2021年3月19日） Community Focus Group (19th March 2021)

社區焦點小組從年齡友善的角度切入，重點探討各種數據平台的可用性和設計。研究結果發現不同的設計和功能如何促進年齡友善。16位出席焦點小組與會者來自以下背景：

- ESRI中國（香港）
- 醫念科技
- 香港理工大學設計學院
- 獨立的使用者體驗/使用者介面設計師
- 長者用家

第二場焦點小組會議於2021年3月19日召開。討論內容圍繞綜合空間和環境組成部分的社區和社會面向，所得觀點與之前的技術焦點小組截然不同。獲邀參與者包括用戶體驗設計師、開發人員、社會工作者和目標長者用家。他們探討了用戶的觀點、需要及對科技的熟悉程度。

The community focus group focused on the usability and design of various digital platforms from an age-friendly perspective. The findings informed us which designs and features would enable age-friendly usage. In attendance were 16 representatives from:

- ESRI China (Hong Kong) ESRI
- Medmind Technology
- PolyU School of Design
- Independent UX/UI designers
- Elderly users

The second focus group met on the 19th March 2021. Discussions revolved around the community and social aspects of integrated spatial and environmental components, providing a contrasting view to the previous Technical Focus Group. Invited participants included UX designers, developers, social workers and target older adult users. They discussed the perspectives, needs and the level of technological familiarity of the users.



焦點小組會議上，本地和海外的開發者首先展示了一些關於環境/建築和健康之間關係的地理空間平台。與會者先試用這些應用程式和平台，然後提供回饋。接著他們討論並分享對於應用程式的想法和見解，提出如何改良應用程式來鼓勵日常使用，以及如何利用程式來改善生活環境和用戶的福祉。

焦點小組關注應用程式和平台的使用難度。長者用戶學習使用新科技時仍感困難。即使按鈕和操作動作看似都很簡單，但是許多使用者無法理解如何使用程式來執行任務，亦不知道如何瀏覽應用程式。為了改善長者用家的體驗和平台設計，使用者體驗（UX）設計師、使用者介面（UI）設計師和開發人員討論創新的解決方案。社區團體、非政府組織、社會工作者和政府部門應為長者舉辦更多的科技應用工作坊和課程，提高他們的科技應用能力。另一項值得關注的重點是平台的資訊量。許多使用者認為有些資訊是不必要的，如果平台的功能和資訊較少，用家便能更容易完成所需任務。焦點小組為開發者、設計者和用戶帶來了許多實際意見，有助他們在不久的將來創造一些提升長者福祉的應用程式和平台。

The focus group began with a showcase and demonstration of the geospatial platforms about the relationships between environment/building and health by both local and overseas developers. Participants had the time to use and experiment the applications and platforms and were asked to provide feedback after the trial. They discussed and shared their thoughts and insights on the applications, how they can be improved to encourage day-to-day usage, and how they can be applied to improve the living environments and well-being of the users.

The prominent concern for the focus group was the difficulty in using the applications and platforms. Older adult users still had to overcome a steep learning curve when using a new piece of technology. Many users failed to engage with, perform tasks on or navigate through the app even the buttons and gestures were simple. User experience (UX) designers, user interface (UI) designers and developers discussed innovative solutions for creating user-friendly experiences and platforms for ageing users. Community groups, NGOs, social workers, and government departments should provide additional technology workshops and classes for the elderly to bridge their technological knowledge gap. Another area of concern was the amount of information on these platforms. Many users found this information unnecessary or redundant, so users could complete their tasks more easily if these platforms had fewer functions and carried less information. The focus group brought about many realistic insights for the developers, designers and users which can facilitate the creation of elderly well-being applications and platforms in the near future.

# 專題研討會 Symposium



日期 : 2021年4月9日

時間 : 下午2:30 - 5:00

地點 : 香港理工大學賽馬會創新樓12樓V1201室

舉行方式 : 網上直播

Date : 9th April 2021

Time : 2:30pm-5:00pm

Venue : V1201, Innovation Tower, PolyU

Format : Online Streaming



掃瞄二維碼觀看專題研討會重播  
Scan to watch the recap of  
the Symposium

# 專題研討會 Symposium

## 主題演講 Keynote Speeches



### 利用健康和屋宇數據實現智齡生活 - 數據應用於普通市民身上

JCDISI總監凌嘉勤先生指出「第十季：利用健康和屋宇數據實現智齡生活」是JCDISI多季研討會中技術含量最高的，並表達自己一向關注香港雙老化的問題。他介紹了社區現況，提出應如何展示數據，並將數據應用於市民和長者身上。他認為這項議題很值得加以探討，亦非常欣賞政府「香港智慧城市藍圖」由1.0升級至2.0的進展，並勉勵大家繼續努力。

凌嘉勤先生 銀紫荊勳賢

香港理工大學賽馬會社會創新設計院總監

### Enabling Smart Ageing with Health and Building Data

Mr Ling, Director of JCDISI, noted that “Season 10: Enabling Smart Ageing with Health and Building Data” was the most technically advanced season and expressed his ongoing concern about double ageing in Hong Kong. He described the situation in the community and suggested how data could be presented and applied to the people and the elderly. Mr Ling believed the issue had to be studied further and appreciated the effort of the government in upgrading the “Smart City Blueprint for Hong Kong” from 1.0 to 2.0. He called for more effort in this aspect.

Mr Ling Kar-kan, SBS

Director, Jockey Club Design Institute for Social Innovation, PolyU

### 推動智慧城市發展 - 提升長者生活質素

### Driving Smart City Development: Enhancing the Life Quality of the Elderly

副政府資訊科技總監黃志光太平紳士介紹《香港智慧城市藍圖2.0》裡為長者而設的。《藍圖》提出利用創新技術滿足人口迅速老化的需要，同時幫助長者實踐居家安老。《藍圖》提出的措施包括開放資料、資料分析和應用、支援醫療保健、WIFI連通城市、長者友善科技、長者的資訊和通訊科技方案、外展活動、培訓計劃及長者資訊科技學習網站。他闡述香港的不同持份者合作的戰略重要性，如非政府組織和醫院可以利用大數據和地理空間資料，有助提供更便利的服務、無障礙設施和地理科技平台。要合作取得成果，便須向長者提供資訊和通訊科技教育的方案和配套，這亦是各方不可或缺的紐帶。善用資訊能促進智慧城市的發展，提高長者的福祉和生活質素。

黃志光先生, JP

副政府資訊科技總監

Mr Tony Wong, JP, Deputy Government Chief Information Officer, introduced the initiatives for the elderly in the Smart City Blueprint for Hong Kong 2.0. The Blueprint aims to utilise innovative technology to meet the demands of the rapidly ageing population, while allowing older adults to successfully age in place. The initiatives outlined in the Smart City Blueprint for Hong Kong 2.0 include the opening up of data, data analysis and application, support for healthcare, Wi-Fi connected city, development of age-friendly technology, ICT programmes for the elderly, ICT outreach programmes, Enriched ICT Training Programme for the elderly, and the elderly IT learning portal. He elaborated on the importance of strategies on cooperating with different parties such as local NGOs and hospitals to provide convenient services, barrier-free facilities and geotechnology platforms by using big data and geospatial data. For these strategies to come to fruition, programmes and facilities must be shared with elderly users through education on the use of ICT, which also is the integral link between the concerned parties. Effective and practical use of information for smart city development can promote the well-being and quality of life of older adults.

Mr WONG Chi Kwong, Tony, JP

Deputy Government Chief Information Officer, Office of the Government Chief Information Officer





**利用地理資訊系統GIS技術—推動以人為本市區更新**  
**GIS Enabling Location Intelligence for People Centric Urban Renewal**

市區重建局的林少華先生介紹最近該局的工作如何實踐以下使命：1) 以人為先、2) 地區為本、3) 與民共議。為了解決建築群快速老化和住房短缺導致的問題，市建局發起多個項目，重建、修復、保護和活化數以千計的老化建築。由於許多建築需要翻新，市建局會利用定位情報工具和地理資訊系統裡的規劃系統製作繪製，擬定目前的更新重點。利用地理資訊技術，市建局可以將建築、環境和電子健康資料用於：a) 地區為本的長者護理分析，b) 提供便利服務，以及c) 預測性分析和健康提示。經分析的健康和社區資料有助實現智慧老齡化，並為非政府組織、學術機構和政府部門在社會和社區發展方面提供參考。

**林少華先生**  
 市區重建局規劃及設計經理

Mr Edmond Lam of the Urban Renewal Authority (URA) discussed the recent work Authority which has been intersecting with URA's mission of catering to the 1) people first, 2) being district-based, and 3) involving a public participatory approach. Of the projects that URA have been involved with, thousands of ageing buildings have been redeveloped, rehabilitated, preserved or revitalised to address the problems caused by rapidly ageing building stock and housing shortage. Since many building blocks require renewal services, the URA has utilised locational intelligence tools and the GIS-based planning system to map and determine the immediate renewal priorities. By using GIS-based technologies, the URA can use the building, environmental and e-health data for a) District-based Elderly care analysis, b) provision of facilitation services, and c) predictive analytic and health alerts. The results of the analysis on health and neighbourhood data lends itself towards Smart Ageing to inform the NGOs, academic institutions and government departments for social and community development.

**Mr Edmond Lam**  
 Planning and Design Manager, Urban Renewal Authority

**我們該如何更深入認識社區長者需要？**  
**How would we gain a better understanding of the needs of the elderly in the community?**

香港中文大學的李大拔教授討論全球人口當前和未來最普遍的健康問題，指出癌症等非傳染性疾病（NCDs）屬於頭號問題。隨著城市人口老化、生態變化、城市化和人口遷徙，各種新舊傳染病都會變得更普遍和難以管理。另一項新的健康問題就是精神健康問題。由於經濟增長和急速城市化，家庭結構和社區關係出現變化，加上科技進步，人際溝通和交往減少，導致精神的痛苦，個人情感變得更加脆弱。要減輕城市人口膨脹的潛在憂慮，便應著重建築環境。合適的環境可以改變人的行為，預防潛在的健康問題。

未來的建築環境設計應著重帶來社會改變。物理環境應該是四通八達和易於步行。被動的介入措施能以較低的成本改善大眾健康，惠及大眾。為了確定哪些社區應該得到改善，並了解人們的健康需要，我們可以利用深度

Professor Albert Lee, from CUHK, discussed the most prevalent health problems that global populations are facing today and in the coming future, as non-communicable diseases (NCDs) like cancer are the top contender. Due to the ageing of urban populations, ecological changes, urbanisation and migration, new and old communicable diseases become more common and more difficult to manage. Another emerging health concern is the increase of mental distress as a result of rapid economic growth and urbanisation, changes in family structure and community relations, technological advances, and the dwindling communication and interpersonal interactions. Individuals become more emotionally vulnerable. To mitigate the growing concerns of larger urban populations, special attention should be given to the built environment. Suitable environments can change human behaviours and prevent underlying health issues.

Future built environments should focus on bringing about social change. The physical environment should be well-connected and walkable. Passive interventions can bring about positive health impacts

學習演算法的社會生態框架，分析長者居民和社區的數據，評估基層醫療可採取的預防方法，同時倡導城市規劃政策和監管措施的改革。

**李大拔教授**

香港中文大學賽馬會公共衛生及基層醫療學院教授

香港中文大學健康教育及促進健康中心總監

at a lower unit cost and benefit a large population. To determine which communities should be improved and their health-based needs, deep learning algorithms can analyse data profiles of the older residents and communities in a social ecological framework. The resulting analysis assesses the needs for primary health preventions, while reforms on the urban planning policy and regulatory measures should be advocated.

**Professor Albert Lee**

Clinical Professor, School of Public Health and Primary Care, CUHK

Founding Director, Centre for Health Education and Health Promotion, CUHK

**實施綠色建築數據平台，支持智慧老齡化發展  
Implementation of Green Buildings Data Cloud Platform to Support Smart Ageing Development**

香港綠色建築議會（HKGBC）的周家明博士分享了BEAM Plus在過去十年的發展。繼BEAM城市綠色建築評估之後，HKGBC於2010年推出BEAM Plus。新計劃更能滿足可持續建築項目日益增加的需要和要求。BEAM Plus是一套評估工具，用於分析項目發展期間的整體規劃、建築設計和施工、施工後的善後工作、營運和裝修。進行每個建築階段時都要評估周邊環境、新建築、現有建築和建築內部的情形。隨著綠色建築項目越來越多，香港綠色建築議會設立資料庫，記錄和追蹤正在進行和已竣工的認證項目。香港綠色建築議會利用地理資訊系統和建

Dr Benny Chow of the Hong Kong Green Building Council (HKGBC) discussed the establishment and development of BEAM Plus in the last ten years. Following BEAM, the green building assessment of the city, BEAM Plus was launched in 2010 to better address the growing needs of and demands for new sustainable building projects. The assessment evaluates a project in its lifecycle - from master planning, building design and construction, post-construction and operation, and fitting-out. In each building stage, assessments are done on aspects like the neighbourhood, new buildings, existing buildings and building interiors. With the emergence of green building projects, the Hong Kong Green Building Council has developed a database to log and keep track of the ongoing and completed certified projects. With GIS and the locational data of the building

築項目的定位資料，分析鄰里和社區情況，評估城市發展的可持續性和宜居性，考慮居民整體的健康和福祉。為了提高資料的透明度和使用效率，香港綠色建築議會現正開發iBEAM，作為BEAM Plus的延伸，利用現有的建築數據實行智慧城市計劃，促進智慧安老。

**周家明博士**

香港綠色建築議會

projects, the Hong Kong Green Building Council is able to provide neighbourhood and community analysis to assess the progress on city's sustainability and liveability, including general health and well-being of its residents. For transparency and efficiency, HKGBC is developing iBEAM, an extension of BEAM Plus, which will use the available building data for implementing smart city initiatives and promoting smart ageing.

**Dr Benny Chow**

Hong Kong Green Building Council





主持：陸永康博士  
 講者：鄭世有博士  
 徐開源測量師  
 林少華先生  
 李大拔教授  
 周家明博士

Moderator : Dr Calvin Luk  
 Panellists : Dr Vincent Cheng  
 Sr Paul Tsui  
 Mr Edmond Lam  
 Prof Albert Lee  
 Dr Benny Chow

## 小組討論 Panel Discussion

小組討論開始時，專家小組成員便為現場觀眾解釋了一些健康、環境和地理空間資料的關鍵術語。「NEURON health」是指數據平台會利用人工智能或數據挖掘，將以前認為互不相關和缺少的元素聯繫起來。然後人工智能或數據採集系統會確定資料之間的邏輯關係，並提出解決問題的辦法和方向。任何能以X和Y軸繪製的事物都可以是空間數據，所以我們能利用位置、地點和社區的空間資料，深入分析空間，啟發創見。儘管我們很難改變所有的物理建築，但有了空間資料，地理資訊系統便成為不可或缺的智慧城市規劃工具。地理資訊系統可以評估建築群和街區之間的空間關係，找出工作的優次和區域，改善社區福祉。至於步行能力、流動性和可及性方面，地理資訊系統可以產生三維行人道網絡，有效計算出長者的步行距離，有助改善步行體驗，降低步行難度。

The panel discussion began with the expert panellists defining the key terminology used in health, environmental and geospatial data for the live audience. NEURON health refers to a data platform that links elements, previously thought to be unrelated and missing, through the use of AI or data mining. The AI or data mining processes will then identify the logical relationships between the data, and ultimately form a direction towards a solution to the identified problems. Anything which can be plotted along the x and y axis can be considered as a spatial data. In this vein, in-depth spatial analysis and insights can be produced through specific methodologies by using the spatial data on the addresses, locations and communities. With spatial data, Geographic Information Systems (GIS) have been mentioned as an integral tool in smart urban planning, as it is difficult to change all physical buildings. With GIS, building blocks, neighbourhoods, and their spatial relationships can be assessed to prioritise and identify areas for promoting urban well-being. For walkability, mobility and accessibility, GIS can generate 3D footpath networks to effectively calculate the walking distance covered by the elderly to enhance their walking experience and reduce walking difficulty.

## 概況及發現

### Summary and Finding

#### 1. 如何按照個人資料法規盡快向相關部門共用這些數據？(即基本結構、UIS資料、NEURON building data和健康數據)？

**How can these types of information be shared with relevant authorities as soon as possible, in accordance with personal data laws? (i.e., basic structure, UIS data, NEURON building data and health data)**

目前香港正大量收集不同方面的數據，但仍有很多缺漏。由於香港的建築物 and 人口密度非常高，所以社區和地區的空間數據集並不全面，相關的本地的空間分析亦因而有所侷限。

最近個人私隱、資料分配和收集引起了問題。此外，長者因較少使用資訊科技，其識別度於空間數據集中亦較年青用家低。為了克服數據方面的障礙，政府部門、機構和非政府組織一直努力善用現有數據，專注發展及使用3D資料和地圖，把香港建設成智慧城市。

Currently, a large amount of data remains missing or continues to be collected and acquired. In Hong Kong, with such high density of buildings and people, spatial datasets for communities and districts are not comprehensive. Local spatial analysis remains limited due to data gaps.

Recently, individual privacy, data distribution and collection become an issue. The elderly are less identifiable within the spatial datasets because of their limited use technology compared to younger urban dwellers. To overcome these data barriers, government departments, institutions and NGOs have been working towards building a smart city in Hong Kong by using the available data and focusing on the use of 3D data and mapping.

#### 2. 長者的居住環境條件（例如通風、日照、水電供應不足等）與慢性疾病息息相關。如果醫生可以取得使用者的生活環境資料，會否對診斷和醫療有幫助？

**The conditions of the living environment of the elderly such as insufficient ventilation, sunlight and water and power supplies are directly related to their chronic diseases. If doctors can have access to the user living environment data, will it be helpful for diagnosis and medical treatment?**

進入數碼時代之前，要收集大量數據可謂相當困難。當時，健康和建築之間的關聯亦未得到廣泛接納，因此難以取得數據作深入研究。不同案例顯示疾病及其來源往往可以追溯到周圍的環境。然而，由於缺乏數據（包括即時數據）、研究和長期監測，治療病人往往為時已晚。疾病的源頭不一

Prior to the digital age, it was difficult to gather a significant amount of data. The connections between health and buildings were also not widely recognised at the time, making it more difficult to collect the data required for further study. In various instances, the source of the disease or illness can be traced to their environmental surroundings. However, due to the lack of data (including real-time data), studies, and long-term monitoring, it is

定是導致疾病的直接原因，例如知道了糖尿病患者家中有沒有廚房，其實不能為診斷帶來有意義的見解。相反，收集到的環境數據可以用於建議病人如何預防疾病，長遠改善他們的福祉和健康。這一點尤其重要，因為今天年輕人較以往更有可能患上慢性疾病。

often too late to treat or cure the patient. The source does not always mean the direct cause of a patient's illness, for example, the absence of a kitchen in the home of a diabetic does not provide much meaningful diagnosis insight. Instead, the environmental data collected can be used to provide recommendations as preventative measures to the patients for their long-term well-being and health. This is particularly important as younger people are more likely to have chronic diseases today.

#### 3. 從技術層面而言，如果取得家人同意，是否可以與醫健通共用使用者資料，讓醫生更清楚了解家庭的健康狀況？

**Technically speaking, is it possible to share user data with eHealth for doctors to better understand a household's health, with the household's consent?**

目前，可利用現有的數據資料同時分析多個區域和地區的情況。如能更廣泛地收集數據，便可以進行各種詳細分析，提供更好的具體方案和策略，提升地區福祉。現在比以往更容易取得數據。透過繪製和分析單棟建築物，得出建築物內部結構資料，間接幫助長者實踐居家安老。

The data currently available can be used to analyse multiple regions and districts simultaneously. Extended data collection allows for a multitude of large and small detailed analyses which provide better solutions for specific strategies for regional well-being. Data has become more accessible.

建築物層面的數據能揭示很多有用的健康資訊，例如找出通風的黑點或日照最少的空間。許多健康問題都可以追溯到住宅和/或建築群的內部，只要有正確數據支援，改造內部環境便來得更加容易。GIS工具將繼續在以空間分析「醫療地理」方面發揮重要的作用；為疫情管理提供實時資訊的「2019冠狀病毒病-香港最新情況」平台就是最佳例子。

Individual buildings can be mapped and analysed for more interior information which can help older adults to effectively age in place. The building level data reveals valuable health information such as the ventilation black spots or spaces with the least sunshine. Many of these health concerns can be traced to the interiors of the home and/or building complexes, which can easily be altered with the right data. GIS tools will continue to play a large part in spatially analysing health geographies; a prime example is the Hong Kong COVID-19 dashboard which extracts real-time data for pandemic management.

要結合個人使用者及其生活環境數據，最大的障礙在於老年長者使用者可能無法貢獻資料。要取得他們的個人健康和居住數據，我們可能要依賴社區人士的幫忙，例如長者護理中心。

To merge the data from individual users and from their living environment, the largest barrier is the fact that old-old users may not have access to the means to contribute data, and we may heavily rely on communal facilitators such as elderly care centres to obtain their personal health and residential data.



**4. 我們每天都會收到大量資訊。如果平台能讓社福機構和有需要人士「一站式」取得一切所需的基本資料，那麼我們便可以比較個人的健康狀況，人們亦可以隨時了解附近的疫情資訊。我們要怎樣做才可以有效建立這種平台？**

**We all receive a lot of information on a daily basis. If there is a platform where social welfare agencies and people in need can obtain all essential data in a “one-stop-shop” format, then the health conditions of individuals can be compared and people can keep themselves updated on the current COVID-19 situation of their neighbourhood. How can we effectively build this platform?**

最直接的方法就是讓三大主要持份者參與，即政府、學術界和私營企業。高等教育機構將負責進行實證研究。私營企業應資助和促進研究項目和平台發展，鼓勵更多的研究和開發。政府部門需要協調持份者，並且制訂政策，幫助學術機構和私營企業克服困難。

The most straight-forward approach is the involvement of the three prominent stakeholders: the government, the academia, and private firms. Higher education institutions will be responsible for the bulk of the research using an experimental approach. Private firms should fund and promote the research projects and platforms to encourage further research and development. Government departments will be the facilitating stakeholder and formulate policies overcoming the obstacles and limitations identified by the academic institutions and private firms.

**5. 香港綠色建築議會（HKGBC）可以如何提高數據的透明度，方便公眾認識建築和居民的健康情況？**

**For the Hong Kong Green Building Council (HKGBC), what can the organisation do to make its data more transparent and accessible for the public to understand the health of buildings and people?**

與循證研究一樣，室內空間的重塑對人類健康極為重要。香港面對的挑戰在於缺乏房屋資源來應付不斷增長的人口。為了應對此難題，香港綠色建築議會正在與其他非政府組織和政府部門合作，提供數據資源，協助更新綠色建築認證和指南。另外，醫療衛生方面的持份者可以提供更多建議，鼓勵居民翻新和改造老化的單位和建築，建設更綠色和更健康的生活環境。

As with evidence-based research, the concept of restructuring interior spaces is essential to human health. Hong Kong lacks the housing resources for sustaining the large and growing population, so this becomes a challenge. To respond to the local crisis, the HKGBC is working with other NGOs and government departments on the data resources for updating the green building certifications and guidelines. Health stakeholders can provide more recommendations which can encourage people to renovate and retrofit their ageing flats and buildings for a greener and healthier living environment.

香港綠色建築議會亦會採用雲端計算等創新科技，以促進成本效益，力求

The organisation is also aiming to adopt technological innovations such as cloud computing for promoting cost-

在短期內滿足各持份者的共同目標。通過雲端計算，用家可以同時收到即時資訊，既可改善監測效果，亦能提升生產力和效益。

effectiveness and achieving the common goals of different stakeholders in a short period of time. With cloud computing, users can receive real-time information at the same time for better monitoring, productivity and effectiveness.

**6. 住宅的建築結構和部件直接影響個人健康。我們如何才能有效地向社區傳遞這項資訊，並且提高他們的認識？**

**Building structures and components of a home directly impact the health of the individual. How can we effectively deliver this message to the community and raise their awareness?**

首先，政府要擔當指導各行各業的角色，制定指導方針和落實政策。因為政府擁有大量數據，政府部門必須善用現有資料，與有關方面進行討論並應對不同問題。香港的人口預期壽命與綠色環境、空氣循環和通風程度、空氣污染和噪音污染等環境因素息息相關，如要提高預期壽命及促進健康的城市生活，這些方面的問題必須得到解決。由於城市中的房屋空間有限，故應該探索更多戶外和開放空間，鼓勵居民多到室外空間，追求健康生活。此外，多吸收陽光和新鮮空氣亦會改善居民健康和福祉。

First and foremost, the government must take charge and guide the industries by setting guidelines and enacting policies. With the vast amount of data that the government keeps, government departments must effectively use the data available to address and discuss the issue with relevant parties.

In Hong Kong, high life expectancy is highly correlated with the environmental factors like green environment, air circulation and ventilation, air pollution, and noise pollution. These factors must be mitigated to increase life expectancies and promote healthy urban livelihoods. Given the limited housing in the city, outdoor and open spaces should be explored to create more opportunities for urban dwellers to leave the confines of their humble flats for a healthier lifestyle. In addition, more exposure to sunlight and fresh air can improve one's health and well-being.

一些政府機構和部門（例如緊急醫療服務、警察和消防部門）已經積極採用地理資訊系統和空間分析工具於其日常工作中。以這些部門為例，我們可以採用共同平台，結合相關的環境、醫療、健康和建築數據，並進行精密的分析，然後把結果呈現給非專業的用家，提出易於理解的建議。就以醫健通為例，如果病人可以和醫療機構分享生活環境的數據，便能幫助醫護作診斷和提供早期治療。然而，使用者私隱的問題相當棘手，收集病人資料時須加以留意。

Some government organisations and departments such as the Emergency Medical Services (EMS), the Police and the Fire Services have actively embraced the use of GIS and spatial analysis tools. Taking these departments as examples in the case studies, a common local platform can be employed to link relevant environmental, medical, health, and building data together for complex analysis and render the results as digestible recommendations for layman users.

In the case of eHealth, the sharing of data between the patients and their health providers about their living environment will facilitate better diagnosis and earlier treatment. However, it remains a great challenge to address user privacy when collecting the data from the patients.

## 問卷回應 Survey Response

### 背景

為了評估城市居民對地理資訊系統的熟悉程度，認識他們在生活中使用地理資訊系統的頻率，我們在討論環節期間進行了線上投票，向現場觀眾提出了一系列調查問題。本報告概述和分析調查問卷的結果。

### 調查方法

即時投票是在研討會的討論環節進行。問卷回答者是從活動登記者和參加研討會的現場觀眾中招募。

問卷的問題是多項選擇題，受訪者只可選出一項答案。附錄一列出了問卷全部五條問題。

### 資料收集與取樣

我們在研討會當天收集了29位與會者的回應；其中13位是男性，16位女性。大多數參加者的年齡介乎30至54歲（17人）；6人在30歲以下；各有3人屬於55至64歲和65至74歲的年齡組別。

### 結果與分析

我們根據投票結果分析資料，以了解一般使用者對於地理資訊系統和空間資料的熟悉程度。我們通過他們的知識和使用水平，思考如何創造學習機會，幫助用戶學習科技。分析發現空間數據須緊密結合應用程式，才能促進智慧城市的積極老齡化。

### Background

To assess the degree of familiarity of the urban people with the GIS and understand how often they use the GIS in their life, a series of survey questions were directed to the live audience through an online polling during the discussion session. An overview and analysis of the survey poll results are presented in this report.

### Methodology

The real-time polling was conducted during the discussion session of the symposium. Participants were recruited through the online event registrations and from the live audience joining the symposium online.

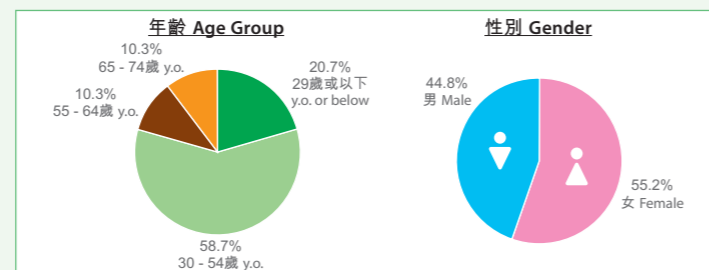
In the questionnaire, respondents answered the multi-choice and single-answer (unranked) questions. All of the five questions in the questionnaire are presented in Appendix 1.

### Data Collection and Sampling

We have collected responses from 29 participants on the day of the symposium; 13 of which were male participants and 16 females. Most participants aged between 30 and 54 years (17 participants); 6 participants were under 30; and there were 3 participants from each of the age categories of 55 - 64 and 65 - 74 respectively.

### Results and Analysis

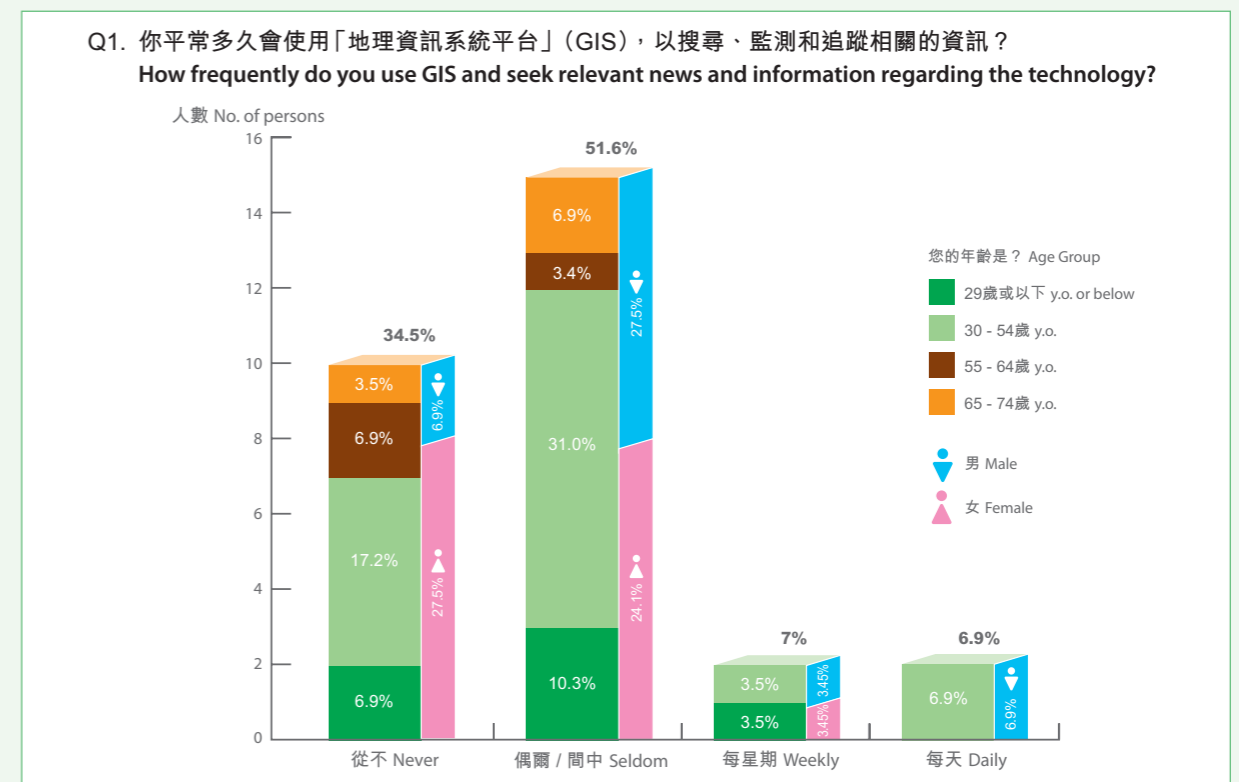
Based on the poll results, we analysed the data to understand the degree of familiarity of average users with the GIS and spatial data. By assessing their level of knowledge and usage, we can gain further insight on how to create the education opportunities that can make the users more technologically fluent. The analysis calls for better integration of spatial data into applications to better achieve the goals of active ageing in a Smart City.



## 1. 你平常多久會使用「地理資訊系統平台」(GIS)，以搜尋、監測和追蹤相關的資訊？ How frequently do you use GIS and seek relevant news and information regarding the technology?

大多數受訪者稱「有時」會使用GIS尋找相關的新聞和資訊，當中大多數受訪者，佔52%（9人）年齡介乎30至54歲之間。第二多選擇的答案是「從不」，佔35%（10人）；其中大部分年齡介乎30至54歲。大部分「經常」使用GIS的受訪者年齡介乎30至54歲。GIS在個人電子產品和應用平台中非常普遍，但29歲或以下的受訪者卻報稱自己較少使用GIS，情況相當有趣。GIS經常與其他應用程式結合，許多用戶（尤其是長者〔55-74歲〕）其實不知道自己曾經使用GIS，反映許多用戶或未有意識到自己用過或者尚未熟悉GIS系統和功能。

The majority of the respondents answered that they sometimes use GIS and seek relevant news and information, with most respondents (9) aged between 30 and 54. The second most selected answer was "never", reflecting 35% of the respondents (10); most of them belonged to the 30-54 age group. Those who always use and interact with GIS are also those from the 30 - 54 age range. GIS is very common in personal electronics and application platforms, so it is interesting that respondents aged 29 or below interact less with GIS. As the GIS is often subtly integrated with other applications, many users, especially the older people (aged 55 - 74), do not realize that they are using GIS. This finding may suggest that many users are not aware of and remain unfamiliar with GIS and its functions.

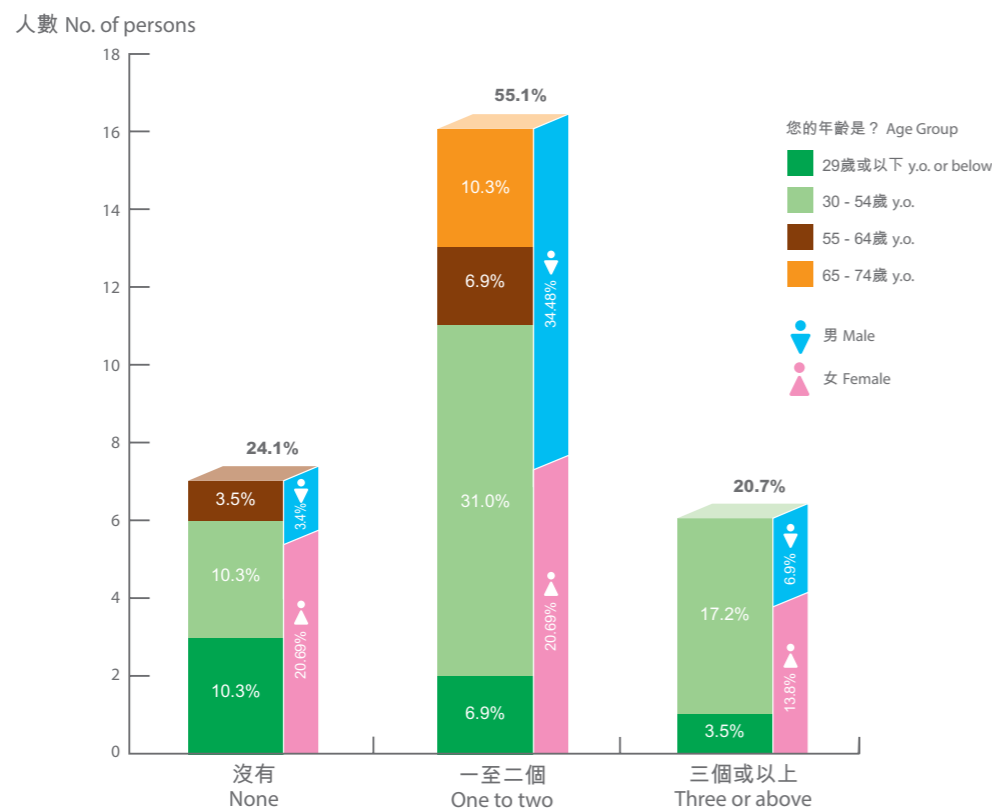


**2. 在你認識的「公共資訊平台」中（包括本地及海外），有多少個是對你的健康有直接關係？**  
**Based on your knowledge of GIS, how many applications you use are directly related to health and well-being?**

大多數受訪者回答「1-2個」，當中大部分年齡介乎55至64歲（9人）；所有來自65至74歲年齡組別的受訪者（3人）選擇這項答案。許多受訪者稱他們沒有使用任何健康和保健應用程式；他們都是29歲以下或30至54歲之間的年輕用戶（7人）。長者用家較多使用健康應用程式，可能反映出他們更有健康意識，比起較年輕和健康的人更重視健康。

Most respondents answered "1-2"; among these respondents, most were aged between 55 and 64 (9); all respondents from the 65 - 74 age group (3) indicated this answer. Many respondents said they did not use any health and well-being applications; they were the younger users under 29 or aged between 30 and 54 (7). The large number of older users of health applications may reflect that they are more health-conscious and attach greater importance to health as compared to those who are younger and healthier.

Q2. 在你認識的「公共資訊平台」中（包括本地及海外），有多少個是對你的健康有直接關係？  
 Based on your knowledge of GIS, how many applications you use are directly related to health and well-being?

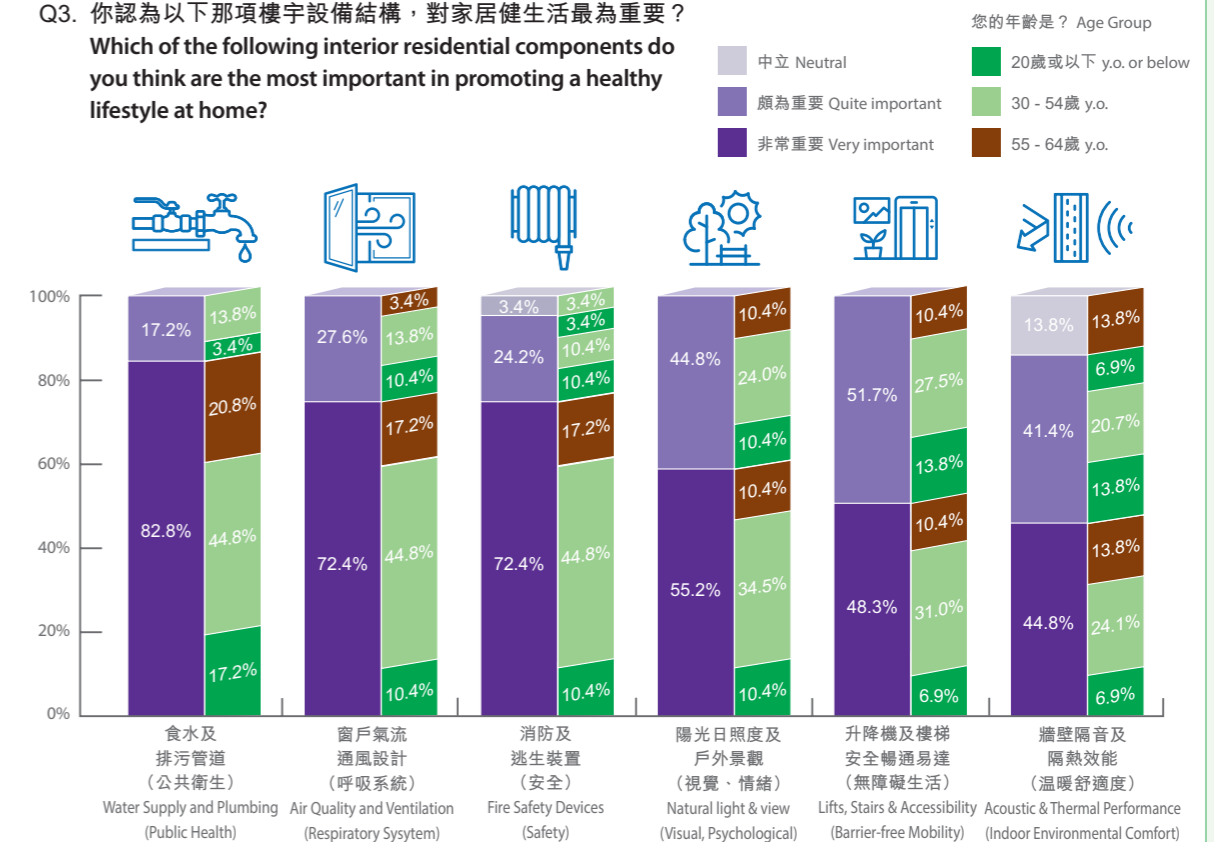


**3. 你認為以下哪項樓宇設備結構，對家居生活最為重要？**  
**Which of the following interior residential components do you think are the most important in promoting a healthy lifestyle at home?**

絕大多數受訪者稱「食水和排污管道」對健康最重要，其次是「窗戶氣流通風設計」以及「消防及逃生裝置」。大多數受訪者認為這些設備最重要的年齡介乎30至64歲，而29歲或以下的受訪者則認為這些因素對於健康較不重要。年輕的受訪者或經常離開生活空間，亦較少維護居所，故可能較少使用/考慮居所環境，較能容忍居所存在的健康風險。

An overwhelming number of respondents responded "water supply and plumbing" to be the most important to health, followed by "air quality and ventilation", and "fire safety devices". Most respondents who selected these components as the most critical were aged between 30 and 64, while respondents aged 29 and below did not consider these factors important to health. Younger respondents may have limited interactions with and/or considerations of their living environment. They may be often away from their living spaces and do not need to rigorously maintain them, so they are more tolerant of the health inconveniences within their place.

Q3. 你認為以下那項樓宇設備結構，對家居健生活最為重要？  
 Which of the following interior residential components do you think are the most important in promoting a healthy lifestyle at home?



## 討論環節 Discussion Panel

### 提供一站式資訊平台 推行綠色建築概念

儘管現在有很多不同的資訊提供給大眾，但要善用這些資訊，便要有一站式的平台整合資訊，供社福機構以及有需要人士使用。嘉賓一致認同雲端共享技術具備成本效益，亦希望香港綠色建築議會可以向市民和社福機構提供相關資訊，甚至幫助社區以更加簡單的形式實踐綠色建築概念。

### 善用醫健通查閱電子健康紀錄

醫健通可以讓公營和私營醫護機構互通紀錄。政府應該帶頭把平台做得更好，例如考慮如何整合來自不同公營及私營機構的數據，進一步改善平台。

### “One-stop” data platform for promoting green construction

Although there is much information available to the public, there has to be a “one-stop” platform which integrates the data for social welfare institutions or the people in need. Invited guests agreed that cloud sharing is cost effective and wished that the Council could provide more information for the people and social welfare groups. They suggested helping the community to achieve the concept of green building in simpler ways.

### eHealth electronic health records

eHealth enables the sharing of medical records between public and private medical institutions. In addition, the government should take the initiative to enhance the platform. For instance, the government should consider how to integrate the data from private and public institutions.

## 建議和未來發展方向 Recommendations & Way Forward

我們基於第十季焦點小組和研討會所得經驗和討論，提出以下建議，方便整合空間環境和建築數據，改善城市生活和福祉。

Inspired by the experiences and discussions held throughout the Season 10 focus groups and symposium, we put forward the following recommendations to integrate the spatial environmental and building data for better urban life and well-being.

### 1. 開發應用程式時需整合用家意見和積極接觸長者 Importance of user feedback integration and active engagement with older adults throughout application development

正如兩場焦點小組指出，積極收集目標使用者（特別是長者使用者）對平台的反饋意見非常重要。由於彼此（開發者與用家）的技術知識差距龐大，所以必須加以考慮和應對，並且要確保長者都能參與開發過程，確保平台充份滿足長者所需。

As identified by both focus groups, it is essential to actively collect feedback about the platforms from their target users, especially the older adult users. There is a large technology knowledge gap (between the developers and the users) that must be considered and catered to. Special attention is required to ensure that older adults are able to properly engage in the development process so that the platform can be more successful and address their needs.

### 2. 使用者資料的收集和私隱權 User data collection and privacy consent

使用者越來越重視私隱問題，既關注外界如何收集個人資料，亦擔心個人私隱遭到洩露。收集資料時若未得到使用者同意，而且用家對資料收集感到憂慮，那麼即使數據已經存在，空間的分析和平台的開發亦會出現延誤。開發者必須透過用家協作和參與開發，提高他們的信任和信心，因此我們必須在資料平台、研究、收集和開發中採取特別的措施，確保私隱和安全。

With growing concerns from users on how their data is being collected, and how much of their privacy is being compromised, much more emphasis has been placed on privacy. Without user consent, or with a general fear of data collection, potential delays in spatial analysis and platform development may be resulted, even if the data exist and is available. Trust and confidence from the users must be gained through user collaboration and involvement. Special measures must be put into place within data platforms, research, collection, and development to ensure privacy and security.

### 3. 確保應用程式易於使用和理解

#### Ensure applications are easy to use and understand for the targeted user groups

香港有大量未經使用的數據，只要將健康和建築/環境數據加以整合，有龐大潛力能提升長者福祉。研究人員和開發人員往往對數據的龐大應用潛力過於雀躍，並在應用程式裡盡量加入數據和資訊。然而這種做法會造成問題，如果應用程式整合過多資料，使用者或會感到不知所措。術語也會構成障礙，一般用家（特別是較年輕的長者）不理解資料的技術細節，寧願選擇更直接和簡單的方法來完成所需功能。如果平台的資訊和功能過多，用家或會感到混亂，阻礙他們日後再使用這些應用程式。程式的功能不但要緊貼用戶需要，而且要易於使用，否則程式便會收效甚微。

There is a vast amount of untapped data within local contexts that bring a wealth of opportunities to integrate both health and building/environmental data for benefit of the ageing urban population. Researchers and developers are often too excited by the prospect of the data availability, and overload the applications with as much data and information as possible. This becomes a problem as the immense amount of data integrated within these applications may overwhelm the users. Terminology is also a problem, as average users, particularly the young olds, do not understand the technical aspects of the data, and would rather prefer a more straight-forward and simplified approach to complete their tasks on the application platform. Information and functions provided should not overwhelm the users, which may deter them from using the applications. The functions must also be relevant and easily applicable for users; otherwise, the application will be unfruitful.

### 4. 建築物、環境條件和個人健康之間的獨特關係

#### Unique inter-relationship between buildings, environmental conditions and individual health

建築物、環境條件和個人健康因素關係互相影響，既有不少潛力尚待發掘，亦是應對雙老化挑戰的關鍵所在。香港建築群和人口正迅速老化，因此需要利用有限的房屋選項來改善健康和福祉。我們應該優先考慮有能力收集和整合最多資料的解決方案。醫療、環境和建築界的持份者應善用地理空間技術和智慧數據分析，解決雙老化的問題。

The unique inter-relationship possesses a lot of untapped potential and is an integral component in tackling the challenges caused by double ageing. Particularly in Hong Kong, both the building stock and population are rapidly ageing, so there is a need to improve health and well-being with the limited housing options. Thus, priority should be given to solutions that best acquire and integrate the data currently available. Stakeholders from health, environmental, and building industries to tackle double ageing should be engaged through the use of geospatial technology and smart digital analysis strategies.

# 關於理大賽馬會社創「騷·In·廬」 About PolyU Jockey Club “Operation Solnno”



## 關於理大賽馬會社創「騷·In·廬」 About PolyU Jockey Club "Operation Solnno"

由香港理工大學(理大)賽馬會社會創新設計院主辦及香港賽馬會慈善信託基金捐助,於2018年開展,計劃為期三年,以期匯集社會各方,以創新理念和務實可行的社會創新方案,應對多項社會挑戰,共同改善香港的生活。以應對香港「雙老化」(即人口老化及住屋老化)的複合效應為工作的策略焦點,聯合學術界、非政府組織、專業團體、熱心的社會人士、企業和政府,攜手構建創新方案,並按此制訂建議的實際行動。

Organised by the Jockey Club Design Institute for Social Innovation (JCDISI) at The Hong Kong Polytechnic University (PolyU) and funded by The Hong Kong Jockey Club Charities Trust, the 3-year social innovation project commenced in 2018 aims to innovate solutions, in collaboration with a wide spectrum of stakeholders, to respond to social challenges with a view to improving life in Hong Kong. JCDISI puts its strategic focus on tackling the combined impact of "Double Ageing" (ageing of people and building) in Hong Kong, the programme would engage the trans-disciplinary forces of academia, non-governmental organisations, professional bodies, members of the public, corporations and the Government to generate innovative ideas and practical actions.



### 項目四大範疇 The Four Pillars Of The Project



「十萬分之一」社創研討會 - JCDISI相信,假若每十萬人之中有一人,即香港七百多萬人口當中的七十多名市民,能貢獻時間、熱誠、知識與創意,攜手合作,定能為特定的社會議題帶來創新的解決方案。透過一系列的參與式研討會及工作坊,收集市民對社會議題的意見、促進討論,並共同設計務實和創新的方案。

"One from Hundred Thousand" — to organise a series of participatory symposia and workshops open to the public to collect views on social issues, facilitate discussion and co-create solutions. JCDISI names the platform based on the belief that if one person from every 100,000 people (i.e. 70+ persons from the 7 million+ population of Hong Kong) can sit together and contribute their time, passion, knowledge and creativity, they can innovate solutions for a specific problem.



社創行動項目 - 聯合非政府組織、專業團體和學術界,把「十萬分之一」社創研討會上衍生出來的創新理念,轉化成可以執行的設計及專案原型。

"Solnno Action Projects" — to collaborate with non-government organisations, professional bodies and academia for developing innovative ideas generated at "One from Hundred Thousand" into designs or prototypes.



啟迪創新習作 - 將社會創新和設計思維引入中學課程,培育青年成為社會創新推動者,內容包括為中學師生開設社會創新工作坊、製作多媒體互動教材等等。

"Solnno Design Education" — to introduce social innovation and design thinking into the curriculum of secondary school education to nurture students as social innovators. Social innovation workshops will be organised for students and teachers and multimedia interactive teaching kits will be developed in this regard.



社創知識平台 - 以不同形式(如學術論文、短片、設計與指引、個案報告、工作坊、地區及國際會議、展覽等),記錄是項計畫的各環節,包括社會創新過程、創造的方案與知識等等,並公開予公眾參考應用。

"Solnno Knowledge Platform" — to document and disseminate for public use the social innovation experience and knowledge generated from the programme through various formats, including academic papers, videos, design and practice guidelines, case study reports, workshops, regional and international conferences and exhibitions.

## 鳴謝 Acknowledgements

主辦單位 ORGANISER



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策略夥伴 Strategic Partner



學術夥伴 Academic Partner



支持機構 Supporting Organisation

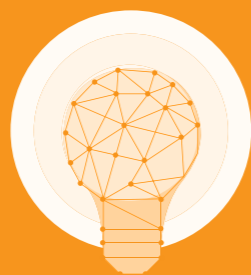


\*按英文字母順序排列 in alphabetical order





# 附錄 Appendix



## 本地及海外活動地理空間製作地圖平台 Local and Overseas Interactive Geospatial Mapping Platform 個案研究 *Case Studies*

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# 附錄一：個案研究

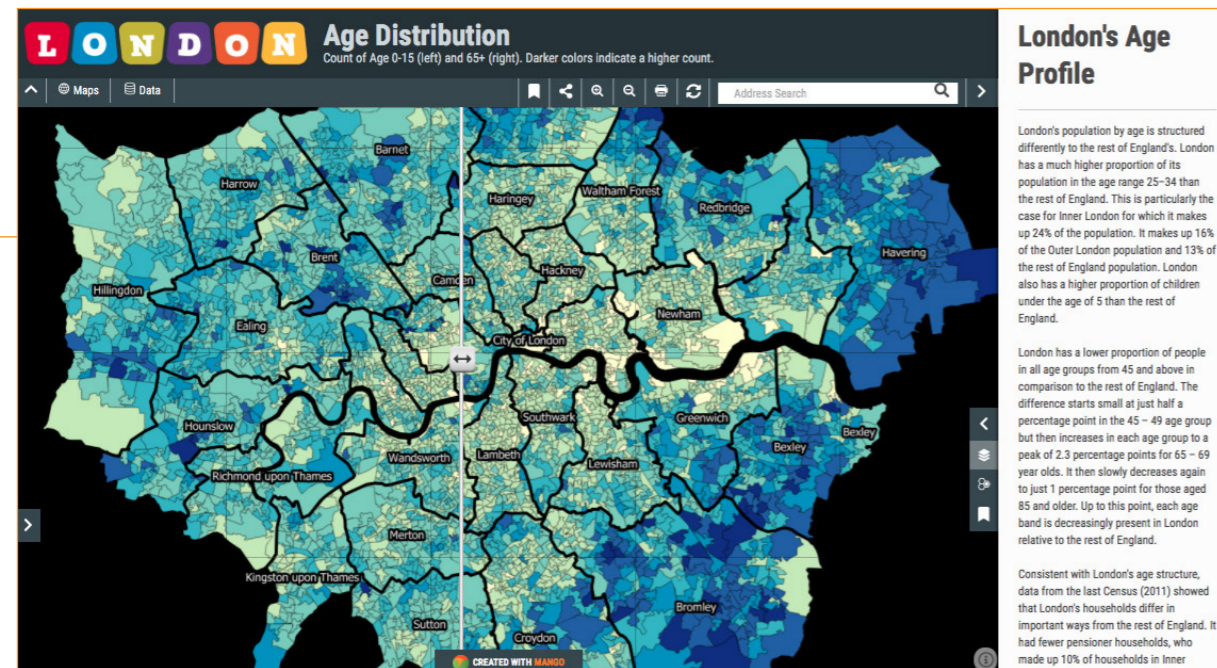
## Appendix 1: Case Studies

### 1. London Age Profile

*Greater London (UK), The Greater London Authority*

**Brief Description:**

Map depicting the age distribution of Greater London, featuring two dominant age groups; children (0 - 15 yrs) and older adults (65+ yrs). The darker colour shades indicate a higher population count of the corresponding age group.



Link: <https://mangomap.com/demographics/maps/50068/age-distribution#>

**Use:** Age distribution analysis

**Platform Used:** Mango

**Data Embedded:**

- population
- age demographics

**Special Features:**

- search and data refinement queries, able to search by address/district/region
- simultaneously view two map layers (two age groups)

**Organisations Involved:**

- The Greater London Authority
- Trust for London

**Key Takeaways:**

- Very easy to pick-up, use, and navigate
- Good contrasting colours and tool to effectively visualise the differences between the age groups
- Simple, with one clear functionality and objective

- Provides the suitable amount of text to provide context for users
- Different colour shades and palettes to showcase different population datasets

**Opportunities to Solve Double-Ageing Problem:**

- Compare two different datasets, and must have a clear objective/story
- May need to frequently update the data to provide the most up-to-date visualization at the time of access
- Datasets must be accurate, consistent, clean, and thorough
- Be mindful of colour contrasts, ensure a wide range of users are being accommodated to increase platform accessibility.
- Partner/collaborate with an NGO for a stronger story, data provision, and connection to the users' needs.

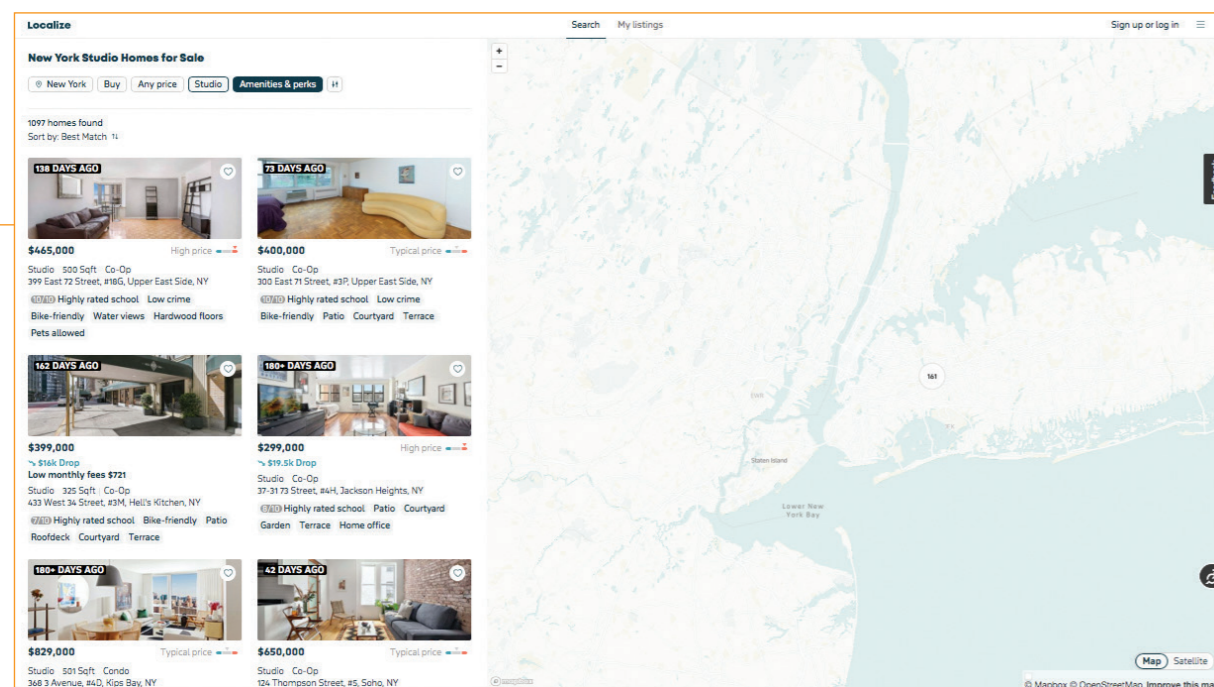
**Themes:** Health, Social

## 2. Localize NYC

### New York City (US), Localize.city

#### Brief Description:

A side tool to a real estate listing site, the tool helps users determine the amount of sunlight received (in hours) in the apartment depending on the season (summer and winter). The tool also indicates the direction and which part of the building gets the most amount of sunlight.



Link: [https://www.localize.city/nyc/for-sale/new-york-ny?filters=\\_\\_-0\\_\\_\\_\\_\\_](https://www.localize.city/nyc/for-sale/new-york-ny?filters=__-0_____)

**Use:** Sunlight time penetrated into the listing apartment

**Platform Used:** OpenStreetMap, Mapbox

**Data Embedded:**

- hours of sunlight (through equation model)
- misc. real estate data

**Special Features:**

- compares the amount of sunlight time received with the average of the neighbourhood
- analyses specific buildings, not certain if analysis is extended to specific flat
- supports satellite and map view
- bundled with other real estate listing information and queries

**Organisations Involved:**

- NA. private company
- Very easy to pick-up, use, and navigate

**Key Takeaways:**

- Integrates sunlight tool with other relevant feature tools as it relates to real estate
- If looking to specifically navigate to the sunlight tool, it is a bit difficult to locate due to the many variables and feature tools available. Can be a bit overwhelming and frustrating.
- Good integration of map interface with tools, the map directly responds to the tool changes.
- Sunlight feature not the highlight of the application, central focus has been shifted to finding the perfect real estate for users based on their preferences.

- Highly customisable for individual users to meet their needs

**Opportunities to Solve Double-Ageing Problem:**

- Highly integrated tool that ensures for smooth transition into the rest of the application platform, ensure that its use contributes seamlessly into the application.
- Ensure that each of the tools are available and easy to locate throughout the platform.
- To increase interaction between the user and the map platform, ensure that the design is visually pleasing and include interesting animated transitions
  - But will need to pay attention to the amount of movement and special effects, to accommodate for users and older adults with visual and limitations.
- Can consider merging with other features and tools to create a comprehensive mapping platform.
  - merging aspects from both ageing buildings and ageing population visually
- Stunning visuals (platform) as well as infographics to present data that attract users to explore the platform, hide the "data" aspect to increase engagement and foster curiosity.
  - integrate photographs to stimulate visual connection, especially in the case of individual flats/units

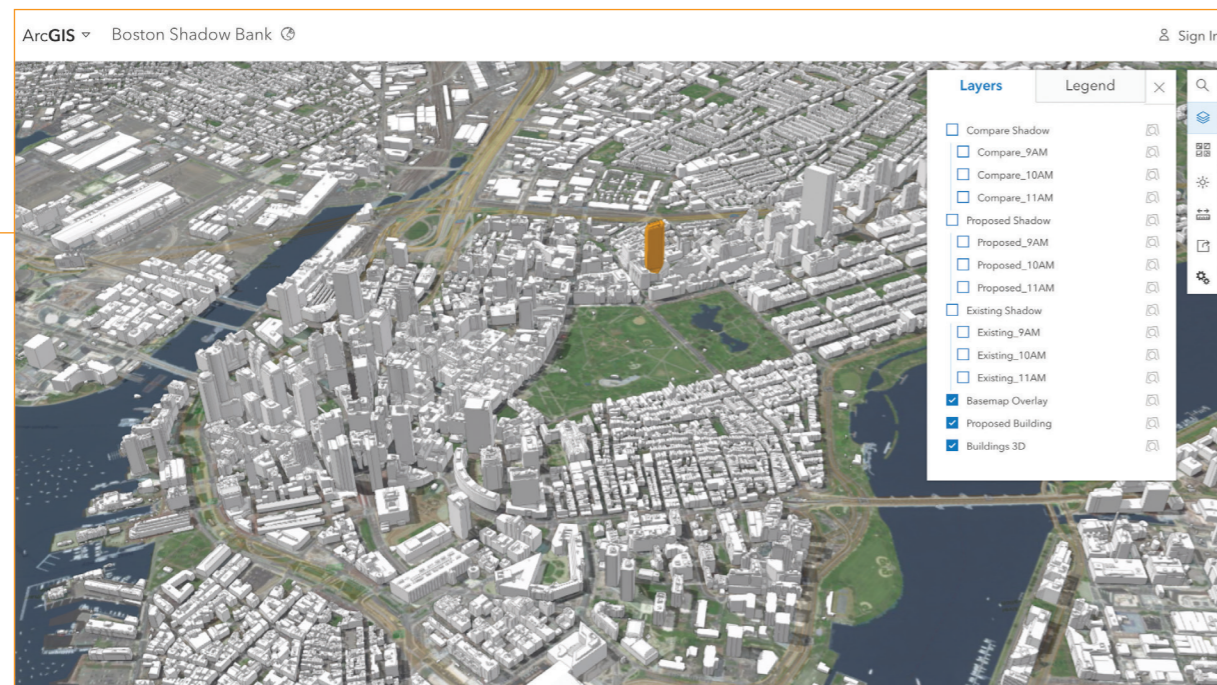
**Themes:** Health, Environment

### 3. Boston Shadow Bank

*Boston (US), Boston Planning and Development Agency (BPDA)*

**Brief Description:**

Shadow study featuring 3D buildings, including both proposed and existing developments in the map. Compares shadows of the proposed building developments as well as existing, by morning time of day.



Link: <https://www.arcgis.com/home/webscene/viewer.html?webscene=0589b97cb4e7481d892381fd0d2c8a21>

**Use:** Shadow distribution analysis

**Platform Used:** ArcGIS Online, with Urban bundle

**Data Embedded:**

- building footprint (3D)
- shadow analysis

**Special Features:**

- simultaneously compare existing and proposed building shadows
- view in 3D and with satellite basemap

**Organisations Involved:**

- Boston Planning and Development Agency (BPDA)
- City of Boston

**Key Takeaways:**

- Offers many perspective and time of day for easy comparison, and to provide a more comprehensive picture of the current and future affected areas
  - provides a few different methods to achieve the same end goal (slider bar, different layers, different maps)
- Visualises shadows either manually or through simulated effect
- Mainly one direct function, to study present and future building shadows
  - clear objective
- Visuals are a bit elementary, aside from the 3D buildings presented, very accurate
- Rendering not 100% smooth, may be due to the extent of the project, however, basemap can be changed to fit the needs and visual needs of the user

**Opportunities to Solve Double-Ageing Problem:**

- Involve live simulations for users to explore, better visualise the before and after of changes, such as before and after active ageing retrofits.
- Use of 3D buildings and satellite basemap imagery to allow for further realism to the users, as if they are really experiencing the environment and changes in-situ
  - individual buildings can be explored, linked with other general information
- Include many different options for users to test and explore variety, many features and settings for them try
  - but will need to make sure all the data is readily available and up to date
  - allow to explore the rest of the city, rather than just their own flat
- Can collaborate with architecture stakeholders, and include BIM/autocad data to integrate into 3D buildings for more comprehensive and realistic simulation of the city
  - digital twin
- Real time data will be beneficial in generating future analysis/extrapolating to predict the effects of future changes
- Can highlight different buildings of higher risk for older adults with different colours/shades, to warn about the safety concerns
- Consider reflection of buildings on to its surrounding area rather than just shadows

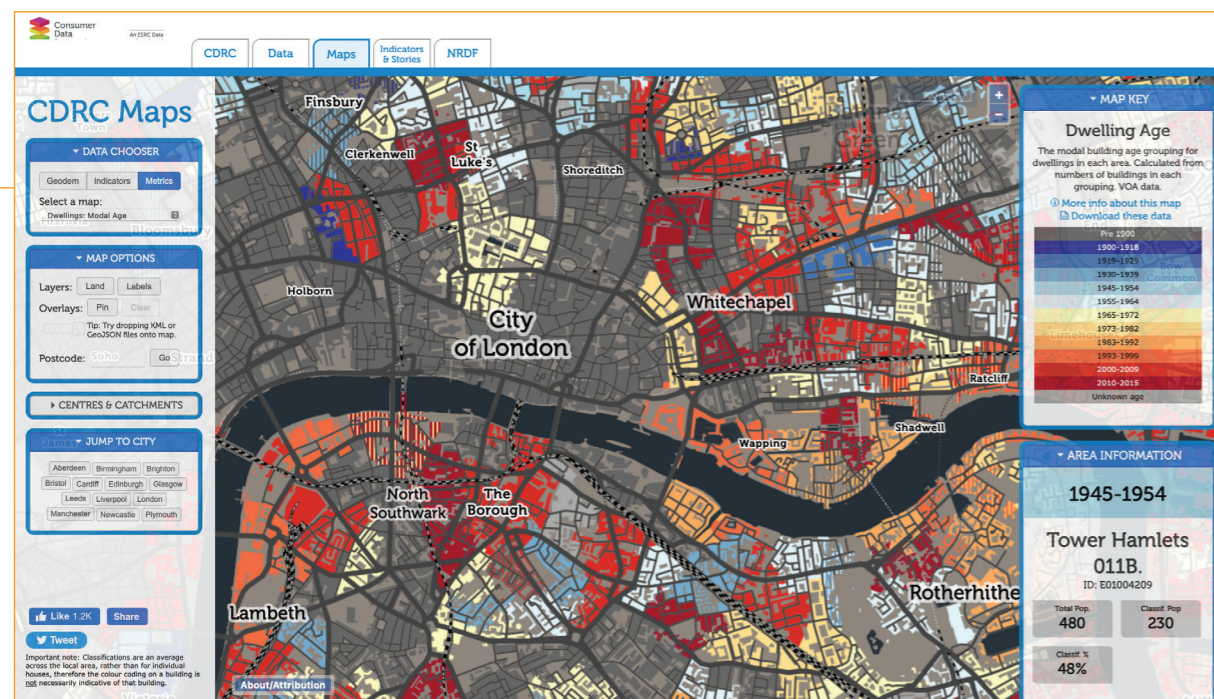
**Themes:** Environment, Health

## 4. CDRC Dwelling Map

Greater London (UK), Consumer Data Research Centre (CDRC)

### Brief Description:

Sorting by different eras of dwelling age, the map showcases housing age by block. Brief relevant demographic and historical/cultural information is included for each housing block. Other cities outside of the Greater London area can also be accessed (Aberdeen, Birmingham, Brighton, Bristol, Cardiff, Edinburgh, Glasgow, Leeds, Liverpool, Manchester, Newcastle, Plymouth).



Link: <https://maps.cdrc.ac.uk/#/metrics/dwellingage/default/BTTTTFT/14/-0.0806/51.5095/>

**Use:** Dwelling block age distribution

**Platform Used:** OpenLayers 3, JQuery Javascript framework, Mapnik 2

**Data Embedded:**

- Dwelling age (housing blocks)

**Special Features:**

- Analyses housing blockage in 10yr increments
- provides history brief and cultural significance of area
- integrates many metrics, indicators, and geological layers for comparison

**Organisations Involved:**

- Consumer Data Research Centre (CDRC)
- University of Leeds

**Key Takeaways:**

- Contains a lot of datasets and information, but is able to present to the users without overwhelming with information
- A one stop-shop for visualising geospatial social demographic data

- Colour contrast are a bit difficult to perceive, especially the dark grey backgrounds
- Integrates comparison and data from other nearby cities
- Can be a bit complicated to maneuver if not familiar with mapping platforms

**Opportunities to Solve Double-Ageing Problem:**

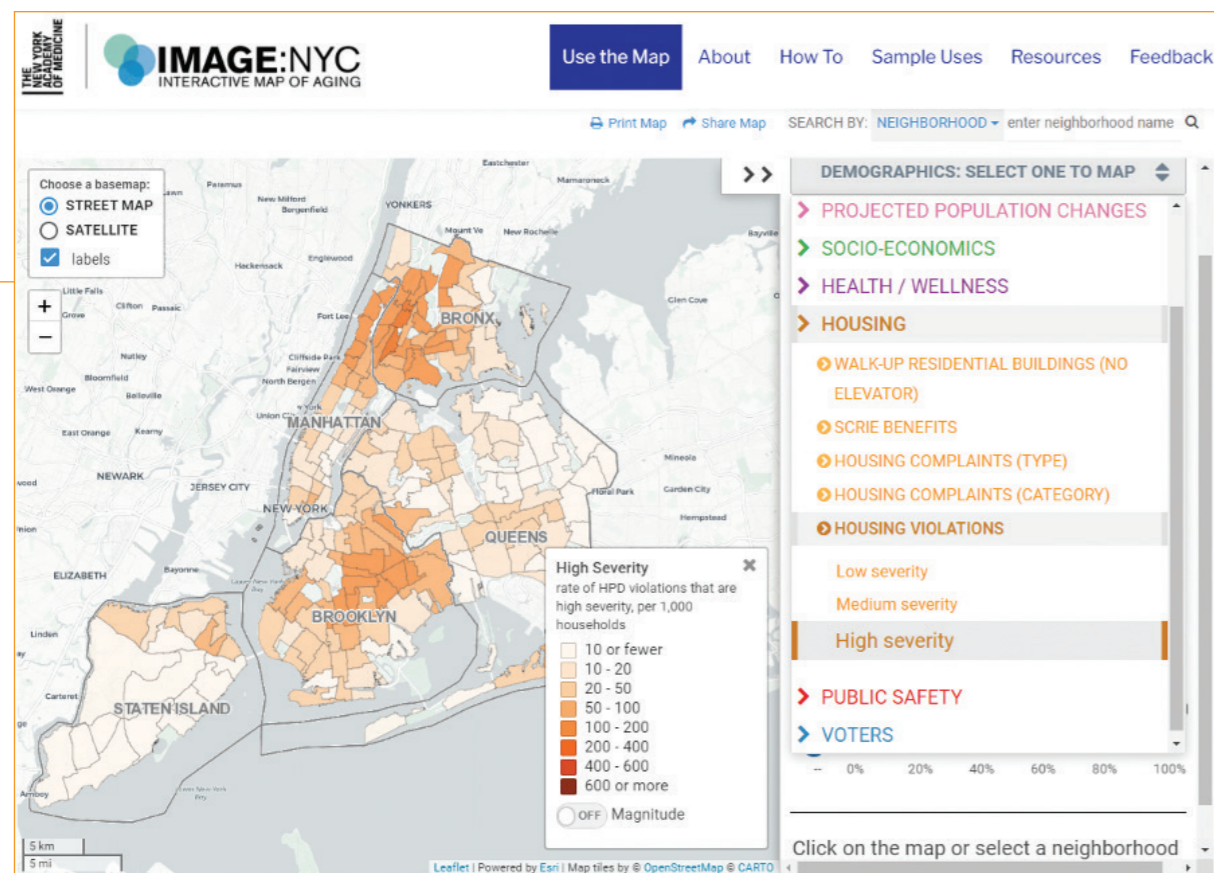
- Analyse at a neighbourhood scope and extent, if data is available can also visualise from an individual building block
- Can provide additional information of interest to users strategically on the side bars, or if hovered upon area/building of interest
- Able to share findings or interesting data explored onto social media, increasing user interest and marketing purposes
- Collaborate with academic institutions for innovative solutions and data sharing opportunities

**Themes:** Health, Social

## 5. Image NYC: Interactive Map of Ageing NYC (US), The New York Academy of Medicine

### Brief Description:

Compilation of data layers showcasing factors as it relates to older adult health and daily living within the city.



Link: <http://imagenyc.nyam.org/map/>

**Use:** indicators and layers effecting and surrounding ageing

**Platform Used:** Leaflet, ArcGIS Online, Carto

**Data Embedded:**

- Demographic (population, socio-economics, health and wellness, public safety, voters)
- Services & resources (age friendly areas, ageing services, health facilities, public safety, recreational assets, cultural institutions, housing, business resources, transportation)

**Special Features:**

- many themed layers as it relates to ageing, neighbourhood scale available

**Organisations Involved:**

- The New York Academy of Medicine
- City University of New York (CUNY)

**Key Takeaways:**

- Includes all available data as it relates to the health and well-being of older adults in New York City, caters to a wide range of users
- Simple, clean design and user interface, easy and straightforward for users
- Useful not only for older adults and family members, professionals, policy-makers, healthcare providers can also make use of the platform
- Extent analysis is limited by neighbourhoods

- Includes many levels of variations of analysis based on the user's needs, but remains uncluttered and easy to navigate for common users

- Makes use of multiple GIS platforms and hosts for a clean and user-friendly interactive mapping platform

**Opportunities to Solve Double-Ageing Problem:**

- Allow for notifications sent to users who sign up or pinned notifications/announcements as it relates to new service alerts for older adults (ie. COVID vaccines)
- Can provide additional information of interest to users strategically on the side bars, or if hovered upon area/building of interest
- Able to share findings or interesting data explored onto social media, increasing user interest and marketing purposes
- Collaborate with academic institutions for innovative solutions and data sharing opportunities
- Layer relevant layers of ageing buildings and older adult health indicators can be compiled to allow for layering on the platform
  - Mindful of simplifying data layering for common users and for users who are unfamiliar with navigating GIS mapping platforms

**Themes:** Health, Social, Mobility, Environment

## 6. Mapping the Shadows of New York City: Every Building, Every Block

*Boston (US), Boston Planning and Development Agency (BPDA)*

**Brief Description:**

Visual shadow study of the city differing between the 3 seasons (spring, summer, winter).



Link: [https://www.nytimes.com/interactive/2016/12/21/upshot/Mapping-the-Shadows-of-New-York-City.html?\\_r=0](https://www.nytimes.com/interactive/2016/12/21/upshot/Mapping-the-Shadows-of-New-York-City.html?_r=0)

**Use:** understanding shadows of buildings affecting the amount of sunlight received

**Platform Used:** NA, Unknown (potentially OpenStreetMaps)

**Data Embedded:**

- 3D Building models, footprints
- Building

**Special Features:**

- includes individual building height, and year of construction completion
- compares between 3 different solstices, providing time expected in shadows
- able to analyse shadows by individual building

**Organisations Involved:**

- New York University
- The New York Times

**Key Takeaways:**

- Simplicity of the interface encourages users to explore the maps, good UI and UX
  - Intersecting art with spatial analysis and data
- Presented in a format similar to a story map, generating curiosity among users upon reading and learning about the interface and its role in visualising/tackling the problem at hand
  - Embedded into the article are clear instructions on how to use and navigate the mapping platform
- Every individual building is being accounted for ie. Each building can be individually be analysed for its shadow by season, along with information such as its construction completion year.
- Includes many levels of variations of analysis based on the user's needs, but remains uncluttered and easy to navigate for common users
- Makes use of independent GIS platform and

equation to calculate and present analysis findings, generate user interest (topic is also very interesting and novel)

**Opportunities to Solve Double-Ageing Problem:**

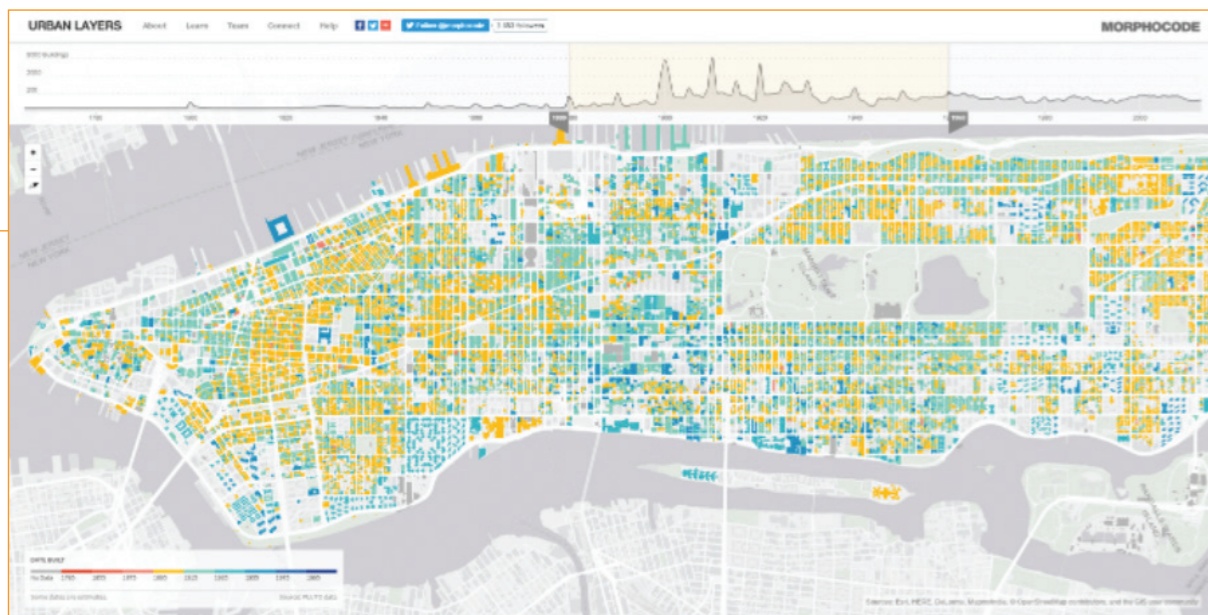
- Accompany mapping platform with article or story so that the users are able to connect on a person level and better understand the importance and how it effects them personally
  - Make sure to tell a story, so that the instructions are easy understand and retains the user's interest, encourage for explorations, generate curiosity
- Use of colour can be a powerful tool, less is more
  - less colours to act as contrast and accent colours to emphasize the important features and analysis
  - visuals are a very important factor in encouraging for the interactive nature among users
- Can integrate individual building and flat information when hovered
  - This type of visual analysis most useful for surrounding environment data, while tying into the individual ageing building analysis/data
- To increase level of uniqueness, better to create our own equation and model simulation to set apart from all other platforms
- Minor, general health layers can also be overlaid on top of the main analysis layer to help visualise its relation to the double ageing problem
  - Will need to be mindful on the additional layers being too complex or deviate too much from the main layer
  - Need to ensure for smooth and seamless integration

**Themes:** Environment, Health

## 7. Urban Layers Manhattan (US), Morphocode

### Brief Description:

Identify oldest buildings in the city and how it shapes the city the way it is now. Depending on the time period selected, building distributors and indicators changes, depicting the changing building distribution.



Link: <http://io.morphocode.com/urban-layers/>

**Use:** Explores Manhattan's urban fabric through age and history of building footprints

**Platform Used:** Mapbox GL JS, OpenStreetMap

**Data Embedded:**

- building footprint
- building stock (PLUTO)

**Special Features:**

- enables different time periods for urban fabric development analysis
- determines specific buildings and their built age
- contains number of buildings and timeframe built visual graph

**Organisations Involved:**

- Morphocode

**Key Takeaways:**

- Vibrant and fun colour scheme, very easy straightforward UI / UX design
- Intersecting art with spatial analysis and data
- Very inviting for users to explore and play with the platform
- Integrates user-friendly tutorial on how to use the mapping platform
  - Begins right as users open the platform, allows for skips if the user is already familiar with the platform
  - Highlights each feature and explains in layman terms on how to use and explore the datasets
- All data is embedded into a single layer, allowing for easy navigation
  - Simple to look at, but with many different data integrated within the layer it increases a level of complexity to the mapping platform
- Interactive nature stems from allowing users to select period of choice
  - periods and intervals are very liberal and determined freely by the user

- response times are very smooth and fast, can see immediate mapping analysis

- Makes use of a few simple datasets to create something more complex and interesting, showcasing the ageing building footprint and the change in the urban fabric

**Opportunities to Solve Double-Ageing Problem:**

- To cater to a wide of users, will need to create a basic tutorial on how to use the platform, introducing its features
  - Make sure to tell a story, so that the instructions are easy understand and retains the user's interest, encourage for explorations, generate curiosity
- Create one main layer and strategically integrates relevant data as to not overwhelm the users
  - All data used needs to be very clear on its relationship with the main layer and integral story that the platform is trying to portray
  - visuals are a very important factor in encouraging for the interactive nature among users
- Need to reduce the amount of technicalities and technical perspective from the maps
  - To allow for regular older adult users and those unfamiliar with mapping platforms, bland technical platforms will only increase frustrations and overwhelming nature, reducing the interactive functionality
- Weaving a story will be important to portray its importance and usefulness of the platform
  - Will help reduce the technical redundancies and minimise the disconnect from the target users and those interested

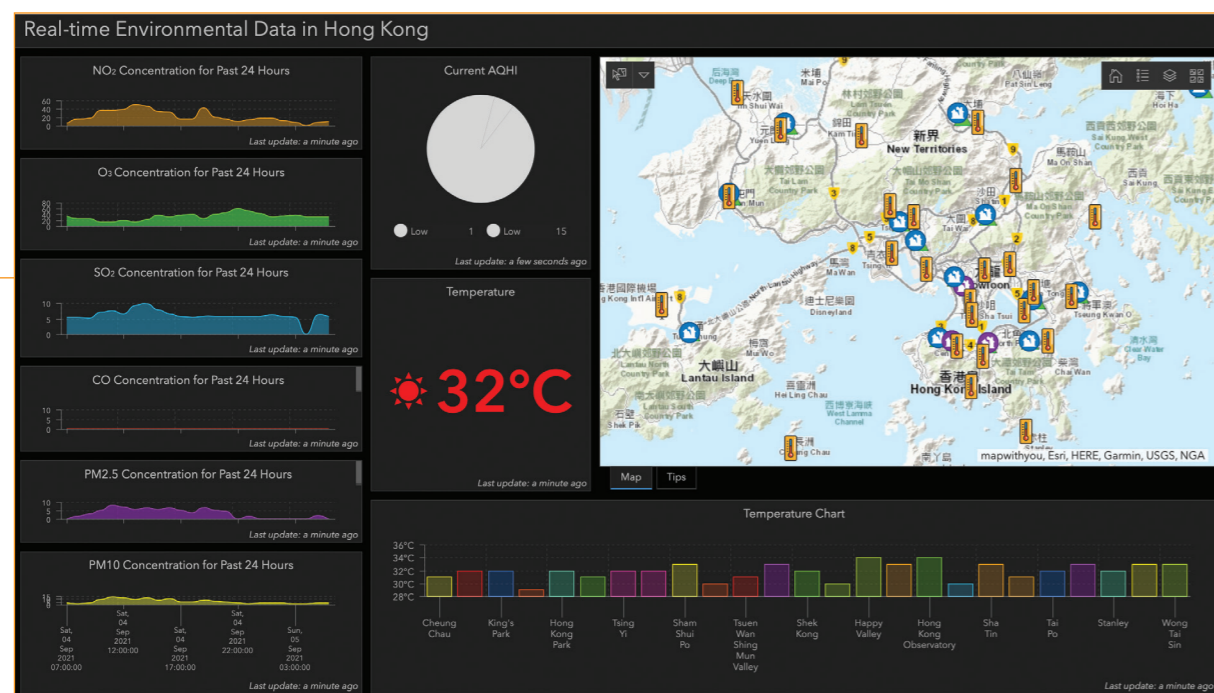
**Themes:** Health, Social, Environment



## 8. Real-time Environmental Data Hong Kong Hong Kong, ESRI China (HK) Ltd.

### Brief Description:

A dashboard containing real-time environmental data (primarily air quality and regional temperature), based on the air quality monitoring stations located throughout the city.



Link: <https://www.arcgis.com/apps/opsdashboard/index.html#/d427c744001d4c6f969d0e3fd1a5a86e>

**Use:** live temperature and air quality monitoring

**Platform Used:** ArcGIS Online, Real-time data

**Data Embedded:**

- Air quality (Air Quality Health Index)
- Regional temperature

**Special Features:**

- Data presented in visual charts and graphs, customisable to an extent
- Can view multiple real-time data at once
- Include map showcasing the distribution of real-time data providers

**Organisations Involved:**

- ESRI China (HK)

**Key Takeaways:**

- Can implement many variables into one platform through a dashboard interface design
  - Each variable or dataset is very distinctly different, offering a more comprehensive picture for the rest of the platform
- Offers live data and updates for users
  - Proving its relevancy and urgency

- Dashboard can be customised to the user's liking
  - Shifting widgets and variables around, or hiding irrelevant ones

**Opportunities to Solve Double-Ageing Problem:**

- Can create a dashboard to showcase all different types of ageing building and older adult health data simultaneously
  - Need to consider potential of overwhelming users of too much information
  - May need to consider how to best visualise data and analysis as widgets as to reduce the prior technical knowledge needed
- If availability permits, can consider the use of live data integration
  - Users can view real time data on the dashboard to better understand current conditions of their ageing building and the risks it brings
  - Can also consider the implementation of a real-time simulation on the effects of ageing buildings as it relates to health of inhabitants

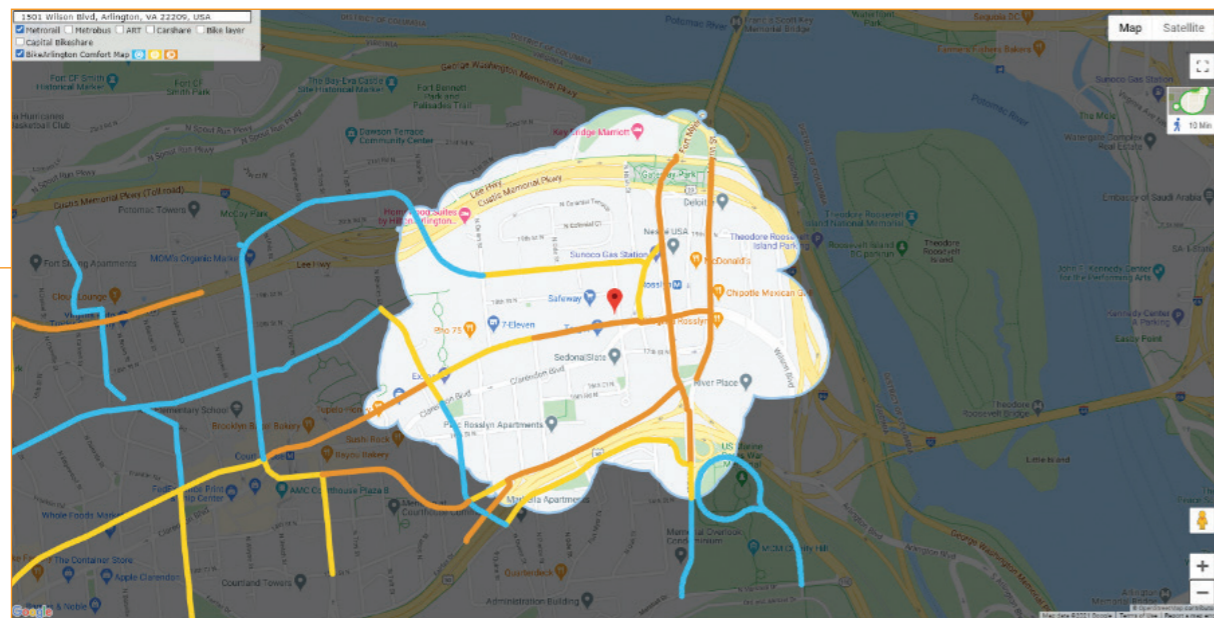
**Themes:** Environment, Health, Mobility

## 9. Arlington Travelsheds

Washington DC (US), Michael Schade

### Brief Description:

Tool allows users to find the most optimal route to travel to and from their destinations based on their mode of choice, and the time and distance allotted for the trip.



Link: <http://mvjantzen.com/mobility/walkshed.html>

**Use:** Active transit and micromobility trip planner

**Platform Used:** Google API

**Data Embedded:**

- Walkscore
- Transit infrastructure & routes

**Special Features:**

- Distance and travel time buffer to determine best route for users
- Choose between different micromobility and active transportation options
- Includes land markers and other places of interest within vicinity
- Basemap and interface powered by Google

**Organisations Involved:**

- Mobility Lab
- Capital Bikeshare

**Key Takeaways:**

- Simplicity and familiarity of the Google Maps platform
  - Greatly reduces the learning curve for new and first-time users
  - Very straight forward, and simplistic for quick use
- Revolve application platform around one feature: the travel score
  - However, still have ample amount of variations, allowing for more reason for users to use and explore the data

- Requires personalisation of settings to produce output, increasing interactive nature
  - Readily relevant for users, immediately connect with the application and its use
- Instant analysis results increase incentive for users to interact and learn more about the mapping platform
  - Result components are very clear to interpret and easy to differentiate

**Opportunities to Solve Double-Ageing Problem:**

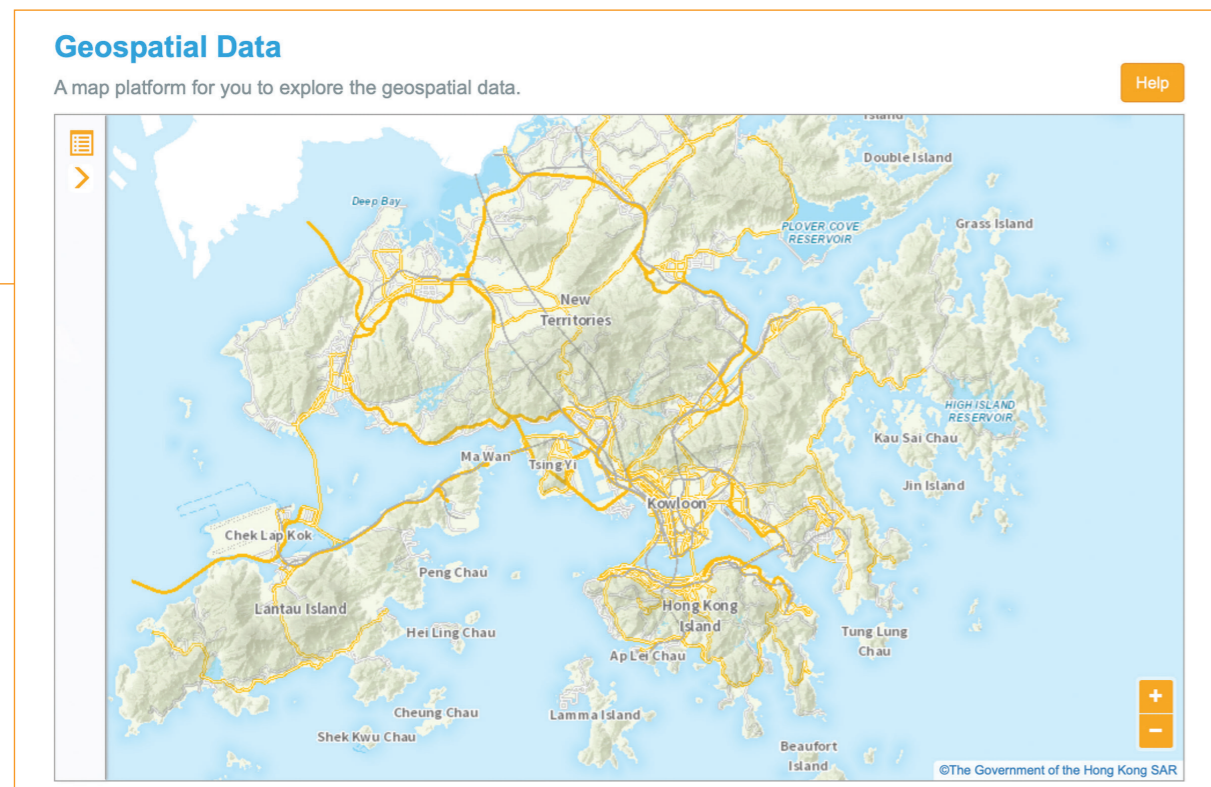
- Can host on a familiar mapping platform, such as Google Maps to decrease the user learning curve
- Consider simplifying the platform and data to ensure users understand the data and the spatial analysis presented
  - Backend (ie. Travel scores) can be more complicated, when presented on the platform for users, technical aspects will need to be hidden
  - Ensure that the analysis outputs are clearly highlighted for the users, may need to provide brief guide on how to make use of the results
- Allow users to input and personalise the analysis output with their own information
  - Increases platform interaction and creates better connection with the use and the application

**Themes:** Health, Mobility, Social

## 10. Hong Kong Government Geospatial Data Map Platform Hong Kong, DATA.GOV.HK

### Brief Description:

A mapping platform that showcases the City's public sector services and relevant information presented on map that enables multiple layers and datasets.



Link: <https://data.gov.hk/en/geospatial-data>

**Use:** Social services and facilities planning

**Platform Used:** ArcGIS Online

**Data Embedded:**

- Transport, population, health, development, social welfare, environment
- Other internal relevant attributes

**Special Features:**

- Apply locational/district clip to showcase and query data from specific area
- Allows users to preview and download geospatial datasets
- Basemap includes transportation networks and major transit hubs
- Basemap and interface powered by ArcGIS Online

**Organisations Involved:**

- Transport Department
- Census and Statistics Department
- Food and Environmental Hygiene Department
- Lands Department
- CLP Power Hong Kong Limited
- Department of Health

- The Hongkong Electric Company, Limited
- Social Welfare Department
- Environmental Protection Department

**Key Takeaways:**

- Simplified database platform, generally easy to navigate through
- Due to the high level of data availability, data has been categorised and sorted based on data provider or data category for clear navigation

**Opportunities to Solve Double-Ageing Problem:**

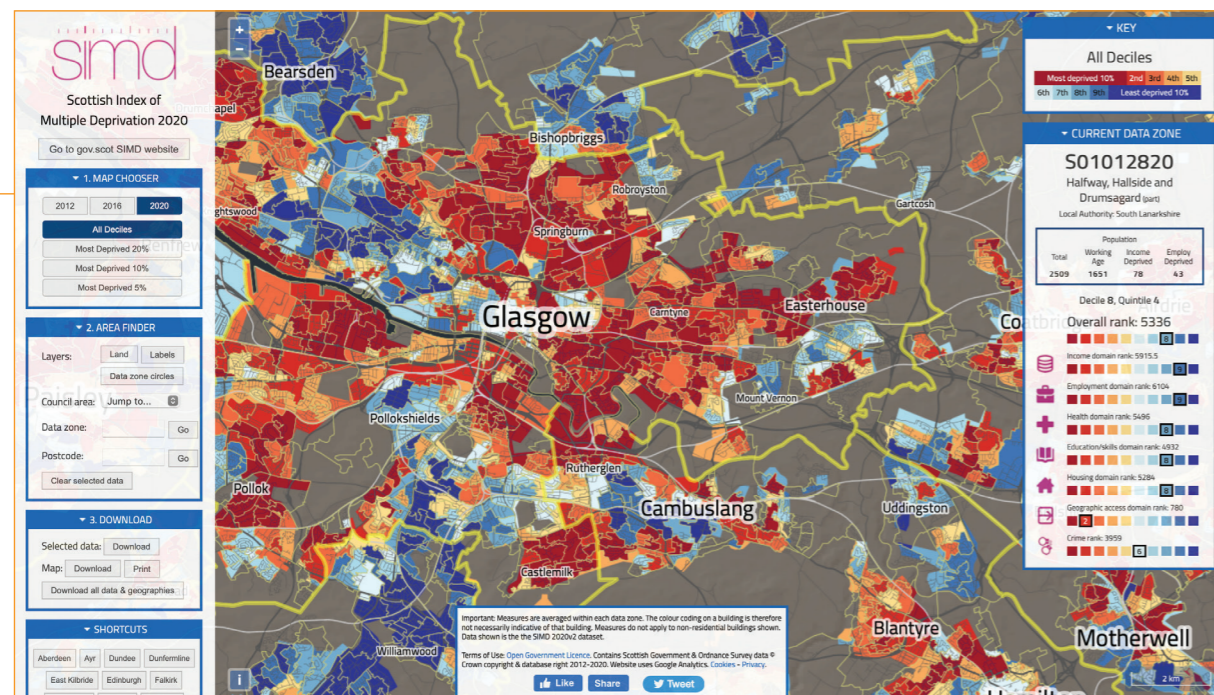
- Collaborate with other institutions for data sharing and analysis abilities
- Can build on this platform, but shift focus towards buildings and older adults
  - May need to reorganise and recategorise data for users
  - Will need to increase interactive nature of the platform
- Shift away from mind-numbing clicking
  - Upgrade how-to user tutorial

**Themes:** Health, Mobility, Social

## 11. Scottish Index of Deprivation Scotland (UK), Department of Work and Pensions

### Brief Description:

The interactive map showcases which communities are deprived of income, employment, education, health, access to services, crime and housing as a collective. Deprivation rates and visualisations on the map can be selected and customised for more comprehensive study. Specific cities within Scotland can also be queried and accessed.



Link: <https://simd.scot/#/simd2020/BTTTTT/12/-4.2033/55.8519/>

**Use:** Resource deprivation distribution

**Platform Used:** OpenLayers 3, JQuery Javascript framework, Mapnik 2

### Data Embedded:

- Income
- Employment rate
- Education level
- Health
- Access to services
- Crime distribution
- housing

### Special Features:

- Analyses different components simultaneously
- Determines area rank as it compares to the average within Scotland
- integrates many metrics, indicators, and geological layers for comparison

### Organisations Involved:

- Consumer Data Research Centre (CDRC)
- Department of Work and Pensions (Scottish Government)

### Key Takeaways:

- Contains a lot of datasets and information, but is able to present to the users without overwhelming with information

- A one stop-shop for visualising geospatial social demographic data
- Colour contrast are a bit difficult to perceive, especially the dark grey backgrounds
- Integrates comparison (rank) and data from other nearby cities
- May be a bit difficult to understand the relevance of data for users of the general public

### Opportunities to Solve Double-Ageing Problem:

- Analyse at a neighbourhood scope and extent, if data is available can also visualise from an individual building block
- Can provide additional information of interest to users strategically on the side bars, or if hovered upon area/building of interest
- Able to analyse based on several datasets to generate an interesting study result, pinpoint where double-ageing is most prevalent
- Collaborate with academic institutions for innovative solutions and data sharing opportunities

**Themes:** Health, Social

## 12. Centamap Hong Kong

### Brief Description:

Map depicting real estate information (ie. Available flats for rent or sale) while identifying surrounding amenities, services, places of interest, building, and public transit options.



Link: <http://hk.centamap.com/gc/home.aspx>

**Use:** Real Estate property identification tool

**Platform Used:** OpenStreetMaps

**Data Embedded:**

- population
- demographic
- food
- schools
- entertainment
- housing

**Special Features:**

- search and data refinement queries, able to search by address/district/region
- simultaneously view two map layers (two age groups)

**Organisations Involved:**

- Centaline Property Agency
- Lands Department

**Key Takeaways:**

- A one-stop-shop for all relevant data, useful for a wide range of users
- Colours and design may be difficult for some users, may seem intimidating with so much information and data layers

• With the immense amount of the detail on the map, may be difficult to make out features and words

**Opportunities to Solve Double-Ageing Problem:**

- Compare two or more different datasets, and must have a clear objective/story
- May need to frequently update the data to provide the most up-to-date visualisation at the time of access
- Datasets must be accurate, consistent, clean, and thorough
- Be mindful of colour contrasts and the amount of feature details, ensure a wide range of users are being accommodated to increase platform accessibility.
- Partner/collaborate with an NGO, private institution, or government department for a stronger story, data provision, and connection to the users' needs.

**Themes:** Health, Social, Mobility, Environment

# 技術焦點小組 (2021年3月12日)

## Technical Focus Group (12/03/2021)

### 討論問題

### Discussion Questions

#### Objectives

1. Discuss key opportunities and silos in sharing and integrating building and health-related data from different sources.
2. Open a dialogue for elderly-friendly UI/UX design and identify issues of existing GIS platforms.
3. Explore design and features of an elderly-friendly digital interface to enable the elderly to assess their health and the environmental attributes of their place of residence using technology.
4. Explore potentials to develop algorithms to calculate easily compressible scores and ratings that summarise interrelated health and building attributes for the general public.
5. Explore potentials for cross-sector and trans-disciplinary analysis, research and investigation on the correlation between built environment and the health and wellbeing of the elderly in residence.

#### Discussion

##### I. Data and Data Availability

1. What types of data (within your discipline) do you think would be useful for an interactive GIS platform that tackles the double-ageing (population ageing and building stock ageing) problem?  
*Please list 3-5 on the left column.*
2. What types of data (from other relevant disciplines) could provide interesting insights for the health and wellbeing of the ageing population if presented together with the data listed on the left column?

*Please list them on the right column respective of the data on the left column.*

a.	a1.
b.	b1.
c.	c1.
d.	d1.
e.	e1.

3. Please indicate the availability of the data suggested above using the following symbols:

- ✓ Data exists and are readily available to share/willing to share
- Data exists but will require further discussion/approval before sharing
- △ Data exists but will require further research/refinement/collection
- ? Unsure if data exists/data does not exists to my knowledge

4. What are the interesting insights or outcomes when the data suggested is presented or viewed together?

***Briefly describe each suggested combination.***

E.g. a + a1 can be viewed together to show...


5. For the data that are unavailable,

- a. What are the challenges and barriers to obtaining said data?
- b. How might we collect and analyse said data? What would the process look like?

--

## II. Platform Differentiation and Rating System

6. Any additional and relevant local or overseas case studies/examples that you are familiar with that may be useful to draw for inspiration?

7. How can we set our platform apart/differentiate our platform as something that is unique to Hong Kong?  
 a. Specific Hong Kong-only factors that we can look into through ageing buildings and elderly health?  
 b. Any unique approaches, data sources, or data platforms?

8. What are your thoughts on providing a rating or score to summarize the results of a collection of interrelated data, with the aim of making information more understandable and digestible for the general public?  
 a. How might we calculate or formulate such a rating or score (based on your suggested data comparisons)?

9. How would the score be formatted and integrated into the interactive GIS platform?

## III. Platform Design and Usability

10. How do we make sure that the interactive GIS platform's UI/UX remains easily accessible and usable for older adults across the board?

11. How can we maximise or encourage frequent use of the platform?

12. How do you envision the platform and its interface? (E.g. Dashboard, story map, interactive multi-layer map, etc.) Feel free to draft a mock-up.

# 社區焦點小組 (2021年3月19日)

## Community Focus Group (19th March 2021)

### 討論問題

### Discussion Questions

名稱	
專業 (或用法)	
可選：公司 (或年齡)	
相關專長或經驗	

### 項目背景

#### 運用屋宇和健康數據的現階段嘗試

- 在香港和許多海外國家，各政府和組織成立了不同的地理資訊系統平台 (GIS)，顯示各種地理和健康數據。
- 香港政府發展中的「空間數據共享平台」，旨在創建一個分享地理數據的平台。目的是加強各種數據的使用效率和透明度，讓香港城市發展能有更好的決策。
- 市區重建局建立的「市區更新資訊系統」，期望將不同來源和類別的數據資料儲存和整合起來，幫助同事處理和分析不同規劃資料。
- 「賽馬會e健樂電子健康管理計劃」透過在不同長者中心設立電子健康站，以監察和跟進長者的健康狀況。目的是應用電子健康管理科技以提升長者生活質素，並透過數據分析了解本地長者的健康狀況。
- 奧雅納 (設計、工程公司) 開發的「AI智能建築控制平台 NEURON」，是一個中央分析平台，可為建築物進行實時監控，提供運作分析以及對建築物系統作出微調，以提升建築物能源和其他室內環境方面的效益。

#### 方便用戶的使用者經驗/ 介面之更多機會與影響

- 儘管現時有大量可用的建築物和健康數據，但一般來說，這些數據不會同時顯示出其相關性及建築物設計對住戶健康的影響。例如，建築物外殼 (如牆、窗和方位) 會在不同層面直接影響住戶的健康，包括溫暖舒適度、日照 (晝夜節律)、聲音 (噪音影響睡眠)、景觀 (接觸自然) 和通風 (空氣污染)。這些影響尤其對患有慢性健康疾病的長者更為嚴重。(如呼吸道、皮膚過敏、失眠、抑鬱和癡呆。) 對個人住戶而言，即使可以從多個來源獲得這些數據，也難以理解這些數據對其健康的直接影響。

- 數據的展示形式、地理資訊系統平台的使用者經驗及平台介面設計也可進行改善，以滿足目標用戶的需求。
- 某些地理資訊系統平台中，亦嘗試整合互相關聯的數據，從而得出容易理解的評分，使公眾更易接收和理解資訊。

### 現時行為和認知

1. 您對日常使用的科技有多熟悉?				
完全不熟悉 <input type="checkbox"/>	有一點熟悉 <input type="checkbox"/>	一般熟悉 <input type="checkbox"/>	很熟悉 <input type="checkbox"/>	非常熟悉 <input type="checkbox"/>
2. 您在日常生活中會使用甚麼科技? 您會在甚麼時候使用? 使用的原因是甚麼?				
3. 你有多久會使用地理資訊系統平台，以搜尋、監測和追蹤資訊?				
從不 <input type="checkbox"/>	每星期一至兩次 <input type="checkbox"/>	每星期三至四次 <input type="checkbox"/>	每星期五至六次 <input type="checkbox"/>	每天 <input type="checkbox"/>
日常使用的地理資訊系統平台例子				
				
Google地圖和商場的電子地圖				
				
城巴和港鐵行程規劃應用程式				



4. 你所使用的平台是甚麼？你使用的目的是甚麼？				
5. 對您而言，得到有關自己的健康資訊有多重要？				
毫不重要 <input type="checkbox"/>	有點重要 <input type="checkbox"/>	一般重要 <input type="checkbox"/>	很重要 <input type="checkbox"/>	非常重要 <input type="checkbox"/>
你有多久會接收一次有關自己健康的資訊，接收的途徑又是甚麼？ (例如：每半年一次；身體檢查/ 求診)				
6. 你有多關注身邊的環境條件和樓宇或住所特徵？(例如溫暖舒適度、日照、噪音、景觀和通風。)				
毫不關注 <input type="checkbox"/>	有點關注 <input type="checkbox"/>	一般關注 <input type="checkbox"/>	很關注 <input type="checkbox"/>	非常關注 <input type="checkbox"/>
7. 你有多關注樓宇的設計和質素對你健康造成的影響？				
毫不關注 <input type="checkbox"/>	有點關注 <input type="checkbox"/>	一般關注 <input type="checkbox"/>	很關注 <input type="checkbox"/>	非常關注 <input type="checkbox"/>
8. 繼上題：如有關注，你最關注哪些樓宇和健康之間的關係？				

### 地理資訊系統平台

9. 經過測試各種本地和海外的地理資訊系統平台的例子，請選出與以下形容詞最貼切的平台，並寫下原因。	
資訊最豐富	
例子：	原因：

最有用	
例子：	原因：
最容易使用	
例子：	原因：
10. 你對這些地理資訊系統平台例子還有甚麼意見？	
例子：_____	
意見：_____	
例子：_____	
意見：_____	
例子：_____	
意見：_____	
11. 你會對甚麼類型的樓宇或健康數據感興趣？請列明。	
有關健康的數據	有關樓宇的數據

## 地理資訊系統平台

12. 你認為設計GIS平台時，應考慮哪些重要的因素/ 特徵，以使公眾（尤其是長者）可更容易地使用？

13. 有甚麼方法可以鼓勵用戶定期或頻繁使用該GIS平台？

## 平台的分別和評估系統

14. 您是否認識其他相關的本地或海外GIS案例值得參考？

15. 我們如何廣泛使用GIS平台，使其成為香港特有的平台？

## 查詢 Enquiry

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