



空間數據共享平台  
Common Spatial  
Data Infrastructure

地理空間實驗室  
Geospatial Lab

發展局  
Development Bureau

營運機構  
OPERATED BY



東華三院  
Tung Wah Group of Hospitals

支援機構  
SUPPORTED BY



合作夥伴  
COLLABORATING PARTNER



# 空間數據共享平台大獎2023 CSDI Awards 2023

空間數據推動城市向前邁進  
Propel Our City with Spatial Data



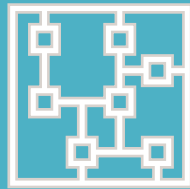
22.2853° N  
114.1593° E



22.2879° N  
114.1518° E



22.2856° N  
114.1529° E



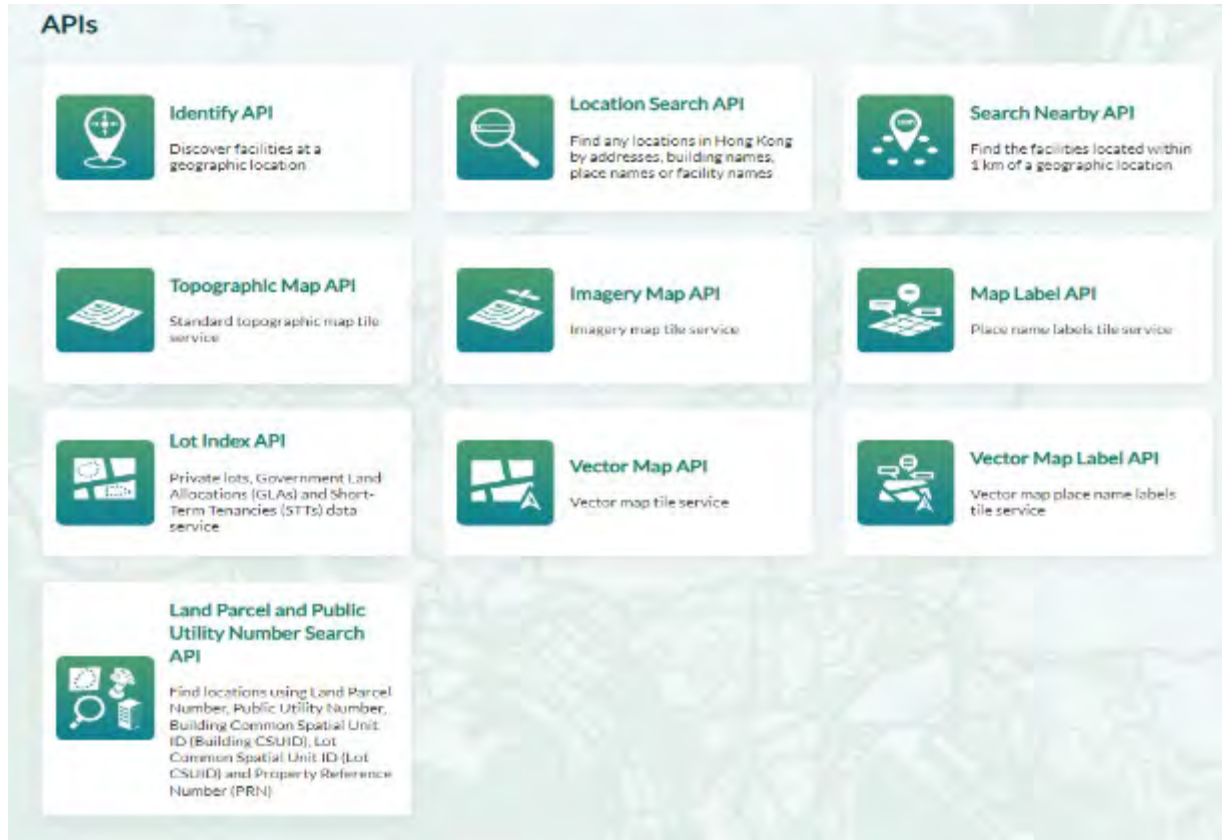
# Introduction to CSDI Portal

# Spatial Data Available on CSDI Portal



- It is a **map-based digital infrastructure** and **one-stop platform** to open and share the Government's spatial data.
- It provides **over 500 spatial datasets** from various government departments for free searching, viewing and download. APIs are also available.
- Possibilities for application development will be **opened**, the digital economy **boosted** and quality of life **improved**.

# More APIs Available



- More APIs are available for **free use** by the public
- API enables the public to **access the latest topographic, imagery map and other location information** through an interface to request map services in a convenient way instead of acquiring a set of raw map data
- This significantly **reduces time and efforts** required in processing the raw map data



# Spatial Data Available on CSDI Portal

Category (Examples)	Datasets (Examples)	
Development	<ul style="list-style-type: none"> <li>• Buildings</li> <li>• Land exchange</li> <li>• Lot extension</li> <li>• Lease modification</li> </ul>	<ul style="list-style-type: none"> <li>• Land sale</li> <li>• Valuation by land use and district</li> <li>• LiDAR</li> </ul>
Geography	<ul style="list-style-type: none"> <li>• Topographic maps*</li> <li>• Artificial Reef Deployment Limits</li> <li>• 3D Spatial Data 3D-BIT00</li> </ul>	
Transportation	<ul style="list-style-type: none"> <li>• Parking vacancy data</li> <li>• Container throughput</li> <li>• Bus route</li> <li>• Metered parking spaces and occupancy</li> </ul>	<ul style="list-style-type: none"> <li>• Road network*</li> <li>• 3D pedestrian network*</li> <li>• Land boundary control points vehicular throughput</li> <li>• Junction blacksite list</li> </ul>
Recreation and Culture	<ul style="list-style-type: none"> <li>• Country park water filling station for general public</li> <li>• Campsites in country parks</li> <li>• Country park visitor centres</li> <li>• Barbecue areas (LCSD)</li> </ul>	<ul style="list-style-type: none"> <li>• General information of major attractions in Hong Kong*</li> <li>• Declared monuments with image</li> <li>• Sites of archaeological interests in Hong Kong</li> <li>• Recreation grounds</li> </ul>

\* To be highlighted below.

Enter relevant  
keywords

# Search Criteria

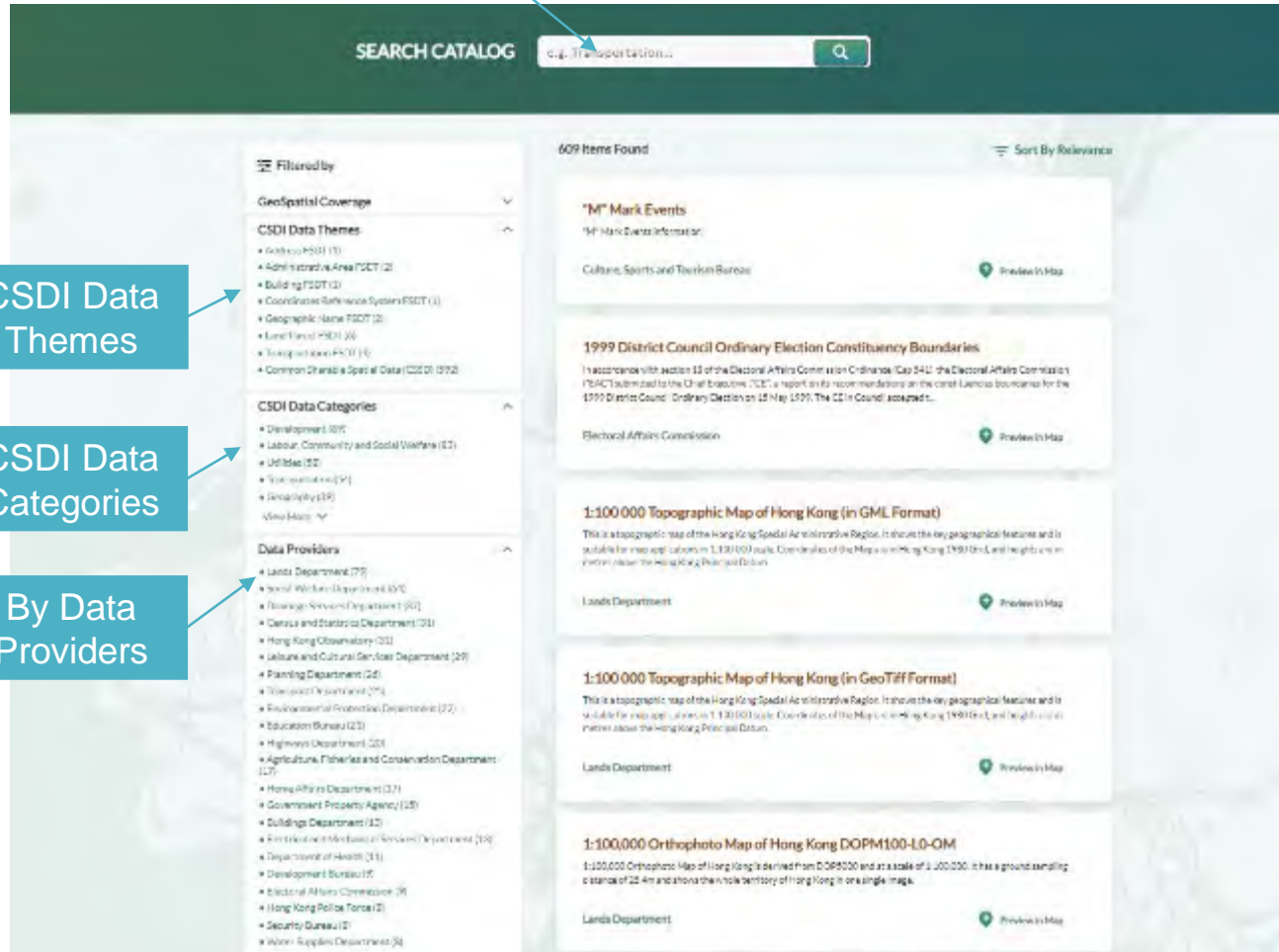
To find relevant datasets, here are the search criteria on the Portal:

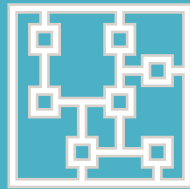
- By Framework Spatial Data Themes/Categories
- By Data Provider
- By Keywords

CSDI Data  
Themes

CSDI Data  
Categories

By Data  
Providers





# Introduction to GIS

# What Is Spatial Data?

- Spatial data is like any data, except it is **geographically referenced**, i.e., attached to a unique location.
- It can be used to:



## Display Locations

Locations of Junction Blacksites in Kowloon for future improvement of these blacksites and deployment of stronger surveillance

*Screenshot taken on the CSDI Portal*



## Market Analysis

Demographic, socioeconomic, and energy determinants are displayed by location, to better analyse market gaps



## Facility management / risk assessment

Housekeep current slopes records throughout Hong Kong and maintenance history for risk assessment

*Image from CEDD*

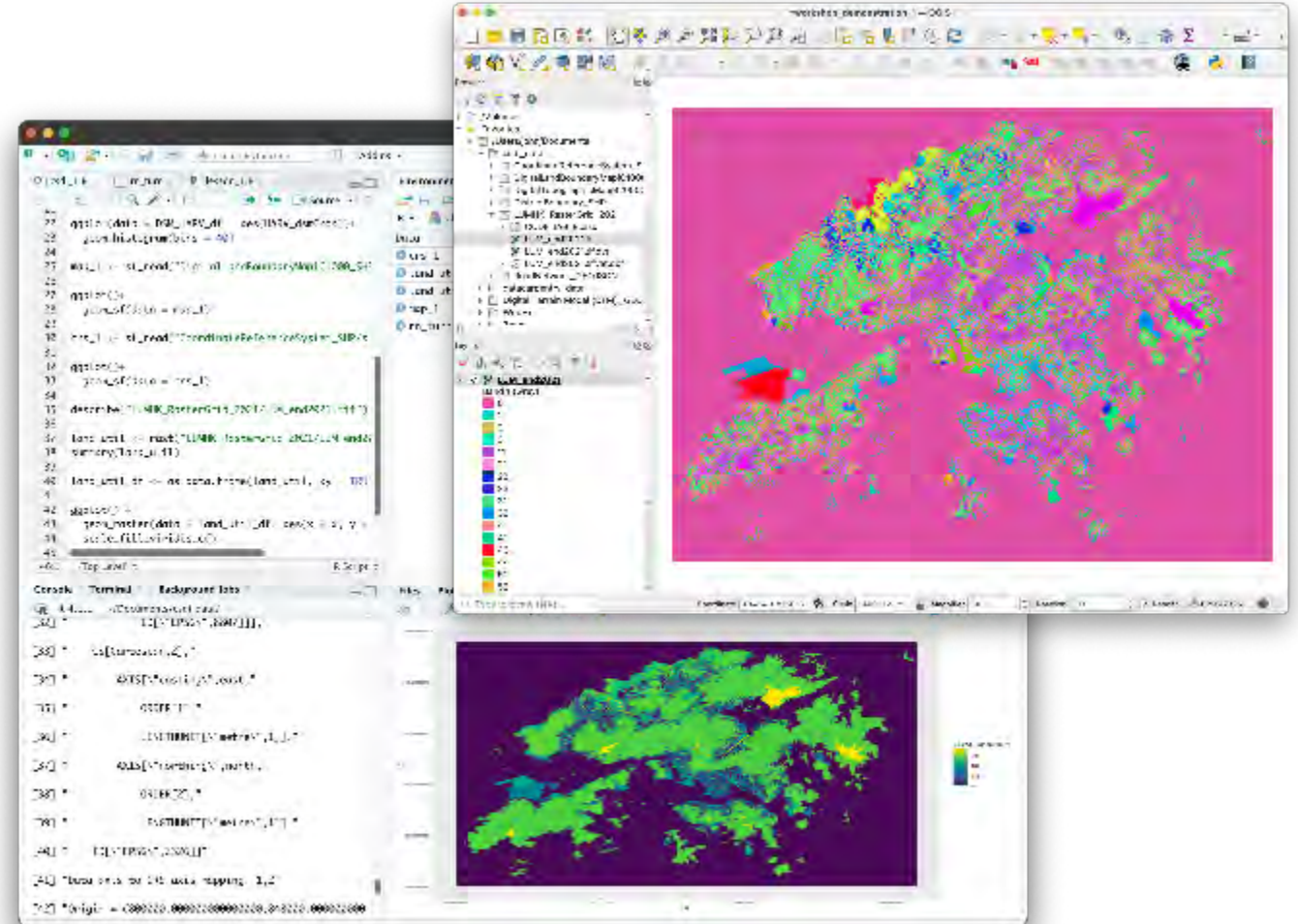
- Special software tools are needed to read, display, and analyse spatial data files.



# Geographic Information System (GIS)

GIS is computer-based tools used to manipulate, analyse, and display spatial data. Some of the key features of GIS include:

- **Spatial analysis:** analysing geographic patterns and relationships between different geographic entities such as land use patterns or population density
- **Visualisation:** creating maps and other visual representations of geographic data
- **Geo-coding:** assigning geographic coordinates to addresses or other location-based information



# GIS: Interface Options

	GIS Applications	Programming Languages
<b>Defining Characteristic</b>	Users interact with GIS applications using <b>graphical user interface</b> . Navigation and functions are associated with buttons and menus.	Users write <b>code</b> in a coding interface to conduct analysis and visualization. Common languages are all open-source.
<b>Examples of Tools</b>	<ul style="list-style-type: none"><li>• ArcGIS</li><li>• QGIS (open-source)</li><li>• Etc.</li></ul>	<ul style="list-style-type: none"><li>• Python + “shapely” GIS package</li><li>• R + “sf” GIS package</li><li>• Etc.</li></ul>
<b>Benefits</b>	<ul style="list-style-type: none"><li>• Tools are laid out in buttons and menus.</li><li>• Graphical interface may be more intuitive tool for interacting with map files.</li></ul>	<ul style="list-style-type: none"><li>• Each action you do is typed out and can be easily tweaked or replicated.</li><li>• Easier to integrate with software development stage.</li><li>• Can leverage functionalities from ArcGIS and QGIS through bridging packages (e.g., “ArcPy” for Python).</li></ul>

Today, we will conduct a quick demonstration on QGIS.



# Introduction of Geospatial Lab





# Nurture a Spatial Community to Use Spatial data

## The Establishment of Geospatial Lab

10 May 2021 – Soft Launch

30 July 2021 – Opening

Established  
and funded  
by DEVB

Operated by  
TWGHs

Supported by  
SCC

發展局  
Development Bureau



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# Start-ups

(Mobile application developers)



To provide a platform to nurture a spatial community by encouraging the **young generation, start-ups** and **creative minds** to discuss, explore and exchange ideas for harnessing the potential of spatial data, thereby **improving quality of life and promoting business opportunities.**

# Goals of Geospatial Lab

The Geospatial Lab aims to:



- Engage our youth or students to get to know what spatial data is and its application



- Encourage the youth, students and start-ups to share and explore ideas on spatial data development



- Promote the use of spatial data in different sectors of society



- Provide support on topical research to assist youth, students or start-ups on their projects by using spatial data and Spatial Information System (GIS)



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# Geospatial Lab Facilities

Meeting Room



Multi-purpose Area



Communal Area



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Common working space

Units 915-918, 9/F, Tower 1,  
Millennium City 1, 388 Kwun  
Tong Road, Kwun Tong,  
Kowloon

## Opening Hours

Monday to Saturday

09:30 am - 1:00 pm

2:15 pm - 5:30 pm





# Geospatial Lab Key Services

- ✦ Provide **on-site advisory and consulting services** to develop prototypes for proof-of-concept by using spatial data
- ✦ Provide online and offline events such as **webinars, forums, workshops, talks and school visit**
- ✦ Provide **venue with equipment** for discussion
- ✦ Provide exclusive services for Awards participants
  - ✦ GIS consulting services
  - ✦ Meeting Room booking
  - ✦ Computer device booking



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# Talks

## Talks for the **general public**

- Introduction to spatial data and Geographic Information System (GIS)
- The Application of Digital Maps
- Using spatial data for car-racing games
- Introduction to Remote Sensing
- GIS in 3D Urban Modelling using CityEngine

**More and more, Stay tuned!**



# Theme Talks x Workshops

Organise a series of talks and workshops under a special theme /topic including:

- Environment and Health
- Planning and Development
- Tourism and Hospitality
- Transportation and Mobility

**以資源規劃角度探討生態旅遊 (講堂)**  
Ecotourism: A Resource Planning Perspective (Talk)

**客席講師**  
Guest Lecturer  
**王君傑博士**  
Dr. Frankie Wong

2023.03.25 (星期六 Saturday)  
10:00 - 12:00  
名額 Quota 30

**GIS於可持續旅遊規劃中的應用 (工作坊)**  
The Application of GIS in Sustainable Tourism Planning (Workshop)

2023.04.15 (星期六 Saturday)  
10:00 - 12:00  
名額 Quota 25

**客席講者**  
Guest Lecturers:  
- 王麗娟博士 Dr. Pauline Wong  
- 黃國興先生 Mr. Sebastian Chu  
- 林耀強先生 Mr. Tony Lam  
- 譚潔雲女士 Ms. Belva Tong

**報名** Registration: QR code  
**對象** Interested Audiences: All  
**語言** Language: Cantonese  
**查詢** Enquiries: 2339 2222

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**城市規劃與發展**  
Urban Planning and Development

2022.10.08 (星期六 Saturday)  
10:00 - 12:00

**GIS於城市規劃與發展中的應用**  
GIS Application in Urban Planning and Development

2022.11.05 (星期六 Saturday)  
14:30 - 16:30

**疾病測繪和環境監測**  
Disease Mapping and Environmental Monitoring

2022.09.24 (星期六 Saturday)  
10:00 - 12:00

**客席講者**  
Guest Lecturers:  
- 王麗娟博士 Dr. Pauline Wong  
- 黃國興先生 Mr. Sebastian Chu  
- 林耀強先生 Mr. Tony Lam  
- 譚潔雲女士 Ms. Belva Tong

**報名** Registration: QR code  
**對象** Interested Audiences: All  
**語言** Language: Cantonese  
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# 地理空間實驗室 Geospatial Lab




Member Registration



 Geospatial Lab

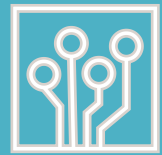


 geospatial\_lab\_hk

## Website :

<https://csdigeolab.gov.hk/en/>





## **Session 2 – ESG Challenges**

# This Year's Theme for the Awards

## “Environmental, Social and Governance” (“ESG”)











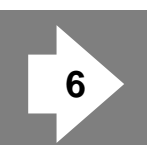

- **E** : Allocating resources to initiatives that eliminate environmental impacts
- **S** : Improving the quality of life of residents
- **G** : Relevant examples are information transparency and responding to those in need

## Why ESG?

- Incorporating ESG principles in the development process can propel our city and enhance its sustainability, resilience and diversity.
- Key issues in ESG bear spatial dimensions and provide the opportunity for problem-solving using spatial data.

# Suggested thinking process

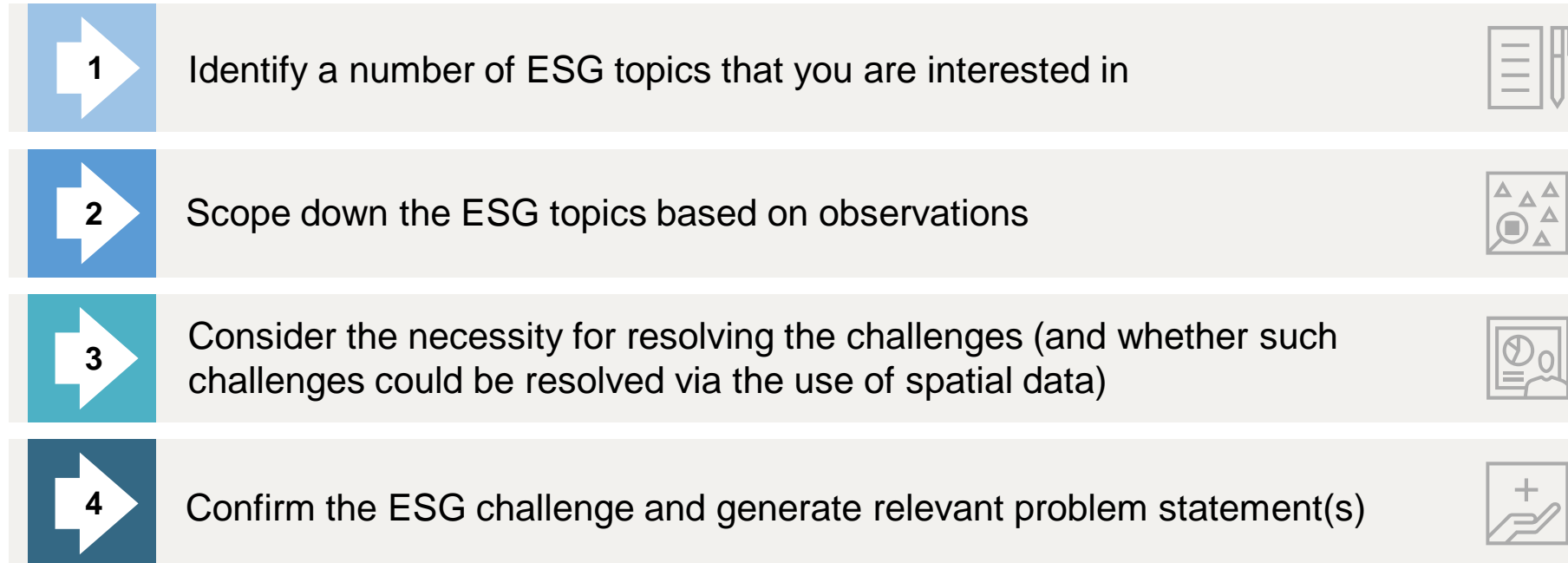
## How to Prepare for the Proposal?

-  Identify a number of challenges under the ESG theme that you are interested in 
-  Consider the spatial dimension of the identified challenges 
-  Consider the necessity for resolving the challenges (and whether such challenges could be resolved via the use of spatial data) 
-  Confirm the ESG challenge 
-  Formulate the solution to the identified challenge 
-  List out the anticipated beneficiary(ies), expected benefits / impacts, relevant spatial data and technology(ies)/ tool(s) to be adopted 

# Identify ESG Challenges

- **City ESG challenges** refer to unaddressed environmental, social and governance issues that would affect the city's sustainable growth.

## How to identify ESG challenges?





# Example

1

Identify a number of ESG topics that you are interested in



## Interested ESG topics

- City hygiene
- Energy management
- Community engagement

2

Scope down the ESG topics into potential city ESG challenges



Interested ESG topics	Potential city ESG challenges/ Observations
<ul style="list-style-type: none"><li>• City hygiene</li></ul>	<ul style="list-style-type: none"><li>• Insufficient waste management monitoring system</li></ul>
<ul style="list-style-type: none"><li>• Energy management</li></ul>	<ul style="list-style-type: none"><li>• Inefficient energy use</li></ul>
<ul style="list-style-type: none"><li>• Community engagement</li></ul>	<ul style="list-style-type: none"><li>• Low community engagement rate for city operations</li></ul>

# Example



Consider the necessity for resolving the challenges (and whether such challenges could be resolved via the use of spatial data)



Potential city ESG challenges	Necessity for resolving the challenges / Expected benefits	Relevant Data availabilities on the CSDI portal
• Insufficient waste management monitoring system	• Reduce environmental impacts caused by overflowing bins and enhance city image	
• Inefficient energy use	• Optimise the energy use • Reduce the energy cost	• Not as much
• Low community engagement rate for city operations	• Enhance citizens' sense of belonging	• Not as much



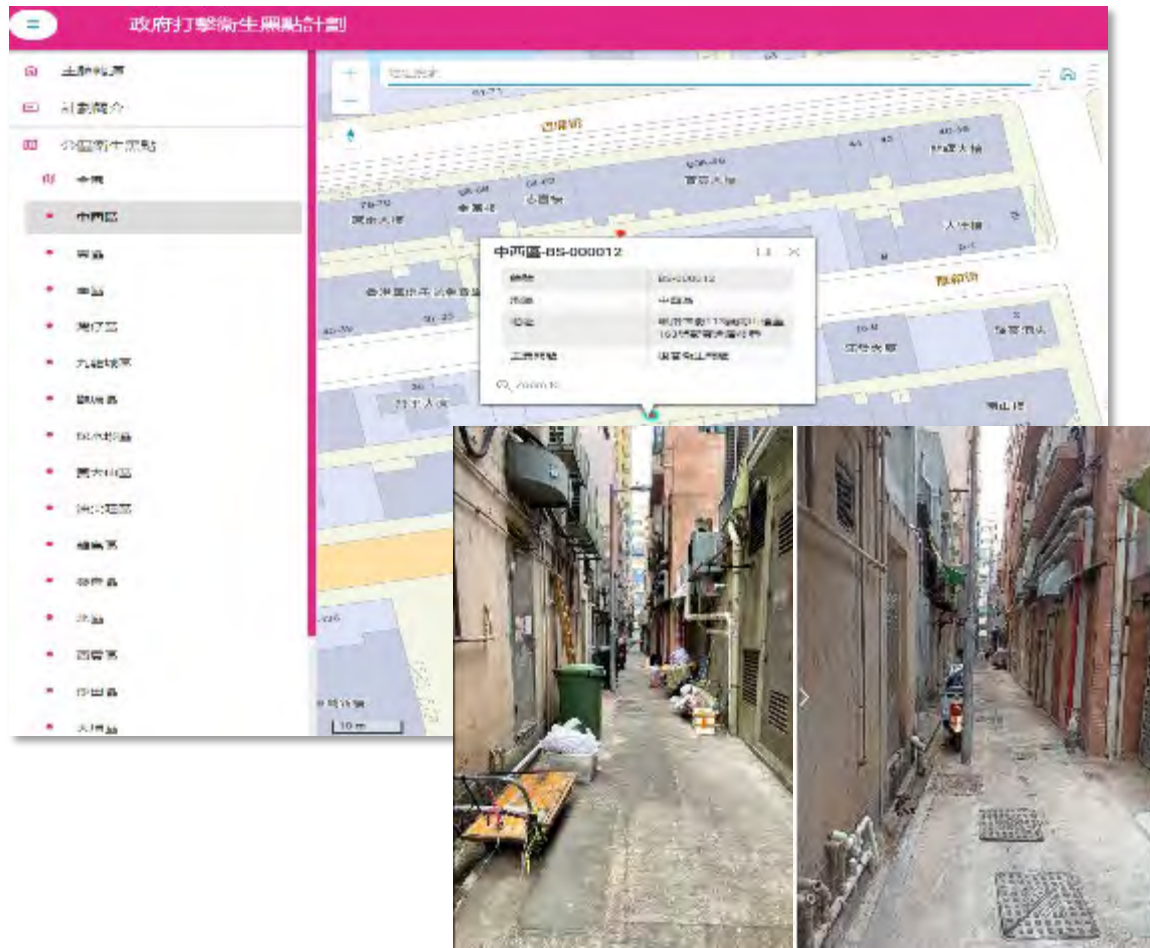
Confirm the ESG challenge and generate relevant problem statement(s)



## Relevant problem statements for example:

- What are the ways to improve the cleanliness of Hong Kong?
- How to raise public awareness of the hygiene issue in Hong Kong?
- How to galvanise the public to combat hygiene blackspots together?

# Case Study: Hygiene blackspot



## Tool

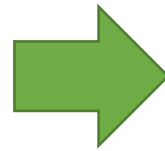
The HKSAR Government launched a new website that features an online map listing more than 700 hygiene black spots in various districts of Hong Kong, in an effort to enhance the transparency of a public hygiene programme.

# Solution: Hygiene Black Spot website



## Functions of the website (for the public)

- Provides an overview of the **distribution** of hygiene black spots across Hong Kong.
- Allows citizens to **witness and monitor** the effectiveness of the efforts made by Government (by comparing the situation of the hygiene black spots **before** and **after** cleansing operations conducted by the authorities).
- Allows the public to **report** new hygiene black spots.



## Expected benefits

- Increase **transparency** of the Government-led public hygiene programme.
- Expose the hygiene blackspots – a **deterrent effect** to litterers.
- Raise **awareness** of the public by providing an overview of the distribution of hygiene black spots in Hong Kong.
- Encourage the public to combat hygiene together by implementing a **public reporting** function.

Relevant spatial data sets: e.g. Waste Management Facilities, Street Names, Buildings

N.B. Your proposed solution may tackle more than one potential city ESG challenge(s)



# Instructions: What are we doing now?



Pick interested ESG topics from the table



Think of anything related to the selected topics based on your daily observations



Infer the cause of the observations (i.e., identify the potential city ESG challenge(s))



Link the challenges with the cue cards with data set(s) from the CSDI Portal



Confirm the ESG challenge you'd like to address



Think of potential solution(s) for the confirmed ESG challenge

# ESG Topics



## Brainstorming time....

- Any examples on ESG topics you can think of?



## Examples of ESG Topics

Environmental	Social	Governance
<ul style="list-style-type: none"><li>• Climate change adaption and mitigation</li><li>• Air pollution control</li><li>• Energy management</li><li>• Waste management</li><li>• Biodiversity</li></ul>	<ul style="list-style-type: none"><li>• City hygiene</li><li>• Accessibility to basic services</li><li>• Management of drinking water and sanitation</li><li>• Transport systems</li><li>• Support for the elderly and disables</li></ul>	<ul style="list-style-type: none"><li>• Community engagement</li><li>• Population distribution</li><li>• Information and data transparency</li><li>• Compliance management</li><li>• Urban planning</li></ul>

Work Package Design		
CSDI Awards		
Team Name		
Team Members		
Key Challenge(s) to be Addressed Under the Theme of ESG	Proposed Solution	Beneficiaries of the Solution
Expected Benefits of the Solution	Spatial Data Used/to Be Used	Key Technology/Tools to Be Adopted



## Wrap & Close

# Submission Requirements and Enquiries



## Submission Requirements

- Phase 1 Proposal and Phase 2 Work Brief to be sent to: [csdiawards2023@csdigeolab.gov.hk](mailto:csdiawards2023@csdigeolab.gov.hk)
  - Phase 1 Proposal : please specify “CSDI Awards 2023 – Proposal” in the email subject
- \*\*\*Please submit your proposal as an attachment (maximum email size: 100 MB and 20 pages long) through email by the deadline (30 April 2023, 11:59 pm Hong Kong Time)**
- Phase 2 Work Brief: please specify “CSDI Awards 2023 – Work Brief” in the email subject



## Enquiries

- Hotline and WhatsApp : 6206 9226
- Email : [csdiawards2023@csdigeolab.gov.hk](mailto:csdiawards2023@csdigeolab.gov.hk)





**Thank you!**