Development Bureau of the
Hong Kong Special Administrative Region Government

For All and By All – the Spatial Journey of the Common Spatial Data Infrastructure (CSDI) of Hong Kong

Sharing Session

March 6, 2026

空間數據共享平台
Common Spatial Data Infrastructure

pwc

Agenda

Topic	Speaker(s)
Welcome and Introduction	Mr. Kevin Leung
Context for CSDI	Dr Albert Wong, Mr. Kevin Leung
Relevance to Financial Services Sector	Dr. Albert Wong, Mr. Kevin Leung
Looking Ahead – Future Roadmap for CSDI	Dr. Albert Wong, Mr. Kevin Leung
Value of Spatial Data for Selected Industries	Dr Albert Wong, Mr. Kevin Leung
Q&A Session	Mr. Raymond Choi, Dr Albert Wong and Mr. Kevin Leung
Closing	Mr. Raymond Choi

The session is about 1 hour and 15 min. from 3 pm to 4:15 pm. No recording.

In the Room Today

Mr. Raymond Choi
Head of Spatial Data Office
Development Bureau
HKSAR Government

Dr. Albert Wong
Partner, Government & Public Sector Consulting
PricewaterhouseCoopers

Mr. Kevin Leung
Director, Government & Public Sector Consulting
PricewaterhouseCoopers

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Journey Leading Up to CSDI

Context Leading Up to CSDI

What is Spatial Data and Why It Matters

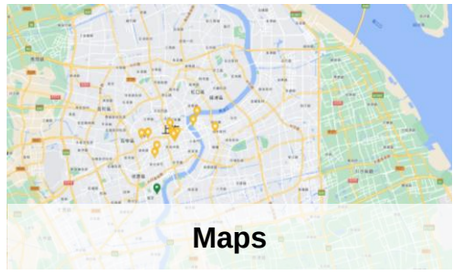
Definition

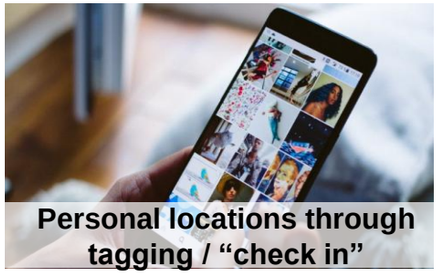
Spatial data is information that describes objects, events or other features with a location on or near the surface of the earth.

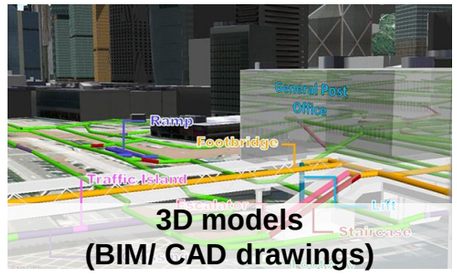
Spatial data typically combines the following information:

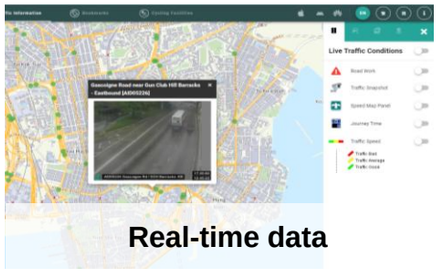
- ***Location information*** - coordinates on the earth
- ***Attribute information*** - the characteristics of the object, event or phenomena concerned
- ***Temporal information*** - the time or life span at which the location and attributes exists

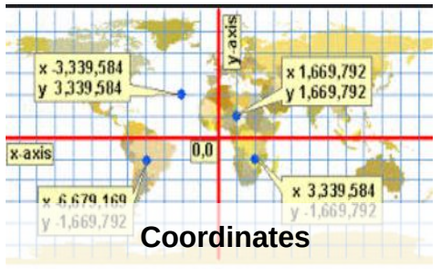
Examples of Spatial Data

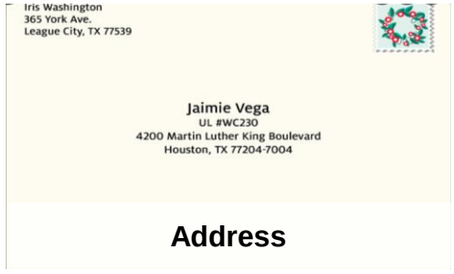






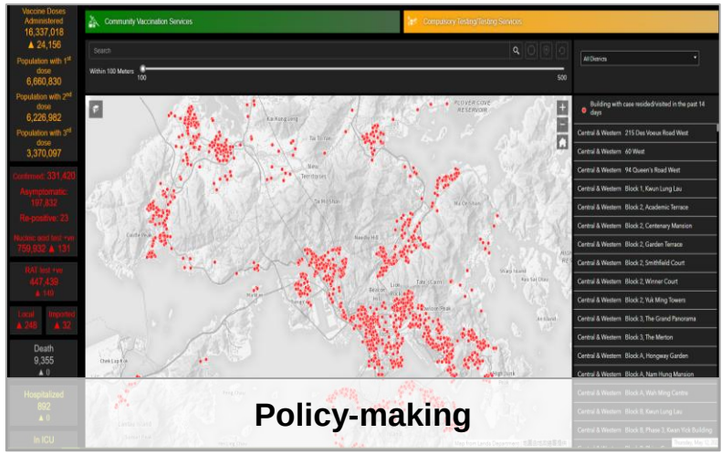






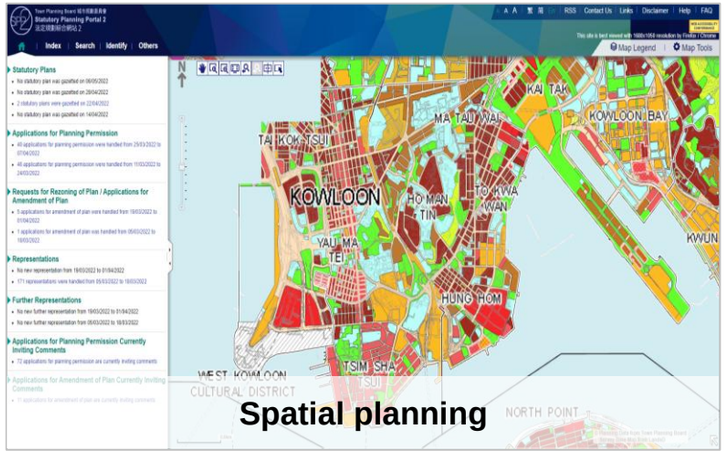
Context Leading Up to CSDI

Putting spatial data to good use brings convenience in life and generate insights for policy making / business decision



Policy-making

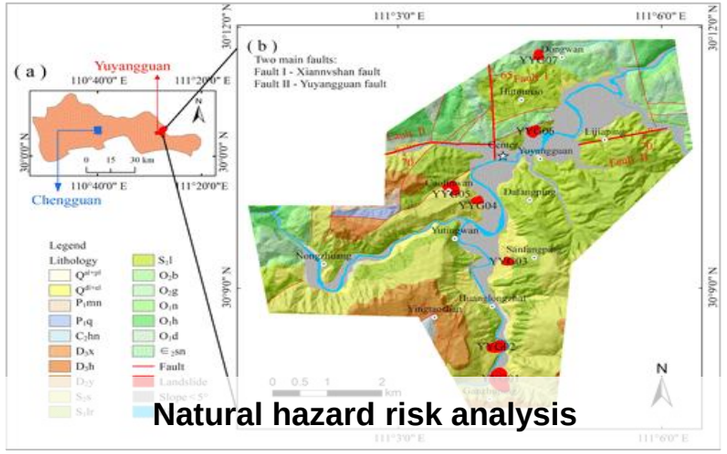
Navigation



Spatial planning

Logistics / delivery

Land valuation



Natural hazard risk analysis

Context Leading Up to CSDI

If relevant data are available, we can easily answer the **WHERE**, **HOW** and **TO WHAT EXTENT.**

BUT the availability of up-to-date, easy to access and standardized spatial dataset is to be improved:

Technical Challenges

- Multiple sources of data, lack of single source of truth
- Data not in digitally available format
- Dataset come in different format, standards, level of details
- Lack of interoperability
- Lack of definition of data / metadata

Bureaucratic Obstacle

- Data are expensive
- Data are not made for sharing
- Process of obtaining data can be difficult
- Data are provided in piecemeals

Changes in Mindset

- Data owners do not see value of their data to others
- Data users have no skills to use or interpret data
- Level of awareness is low – obstruct wider data usage and sharing

Call for a practical solution to address the above challenges

Context Leading Up to CSDI

The Client appointed PwC to carry out a consultancy study to formulate the most effective CSDI development strategy for Hong Kong and address the issues facing sharing of spatial data.

Vision of CSDI

To contribute to a liveable, competitive, innovative, sustainable and smart Hong Kong through:

Provision of convenient, easily accessible, high quality and up-to-date spatial information and services.

Mission of CSDI

Maximise innovation, knowledge and value creation for Government, business and community.

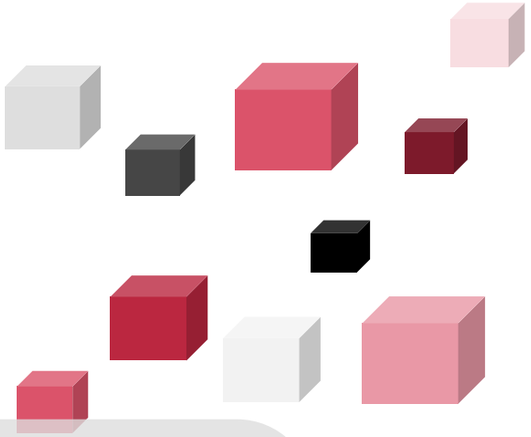
Key Components

- Spatial information and services sharing portal
- Data and technology
- Funding
- Capacity building, outreach and partnership
- Effective governance framework

Context Leading Up to CSDI

CSDI's applications are far-reaching, spanning across policy framework, institutional setup, technical standards and operational platform for the coordinated and adaptive planning, development and management of spatial data.

WITHOUT CSDI

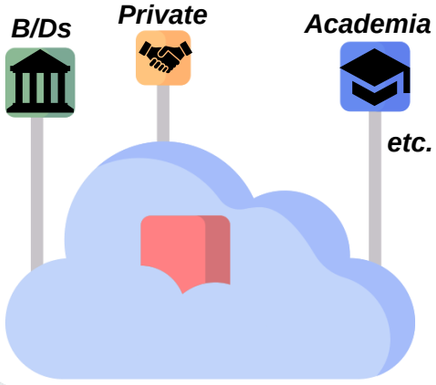


Data are disparate, not standardised, not spatially-comparable, not geo-enabled, not inter-operable, not discoverable, not sharable…

WITH CSDI

Geo-enabled enterprise systems based on core framework data and common technical standards

Individual systems within secured framework export essential data with common spatial reference for sharing



CSDI as a clearing house and gateway portal for dissemination, discovery and API access of spatial data

Context Leading Up to CSDI

CSDI is not just a data infrastructure

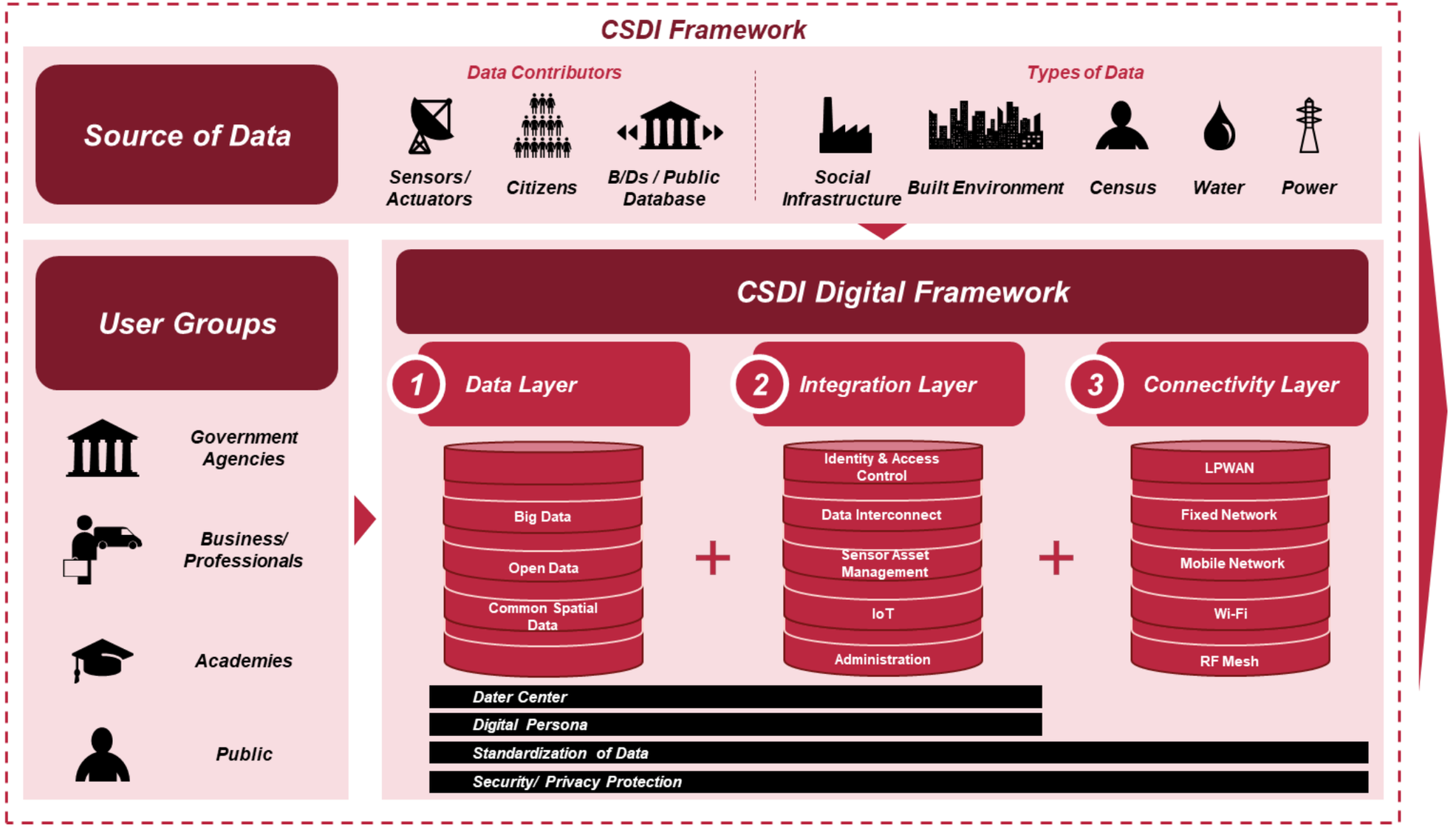
It is a holistic strategy covering governance arrangement, technical architecture, implementation plan, data structure, funding arrangement and partnership arrangements.

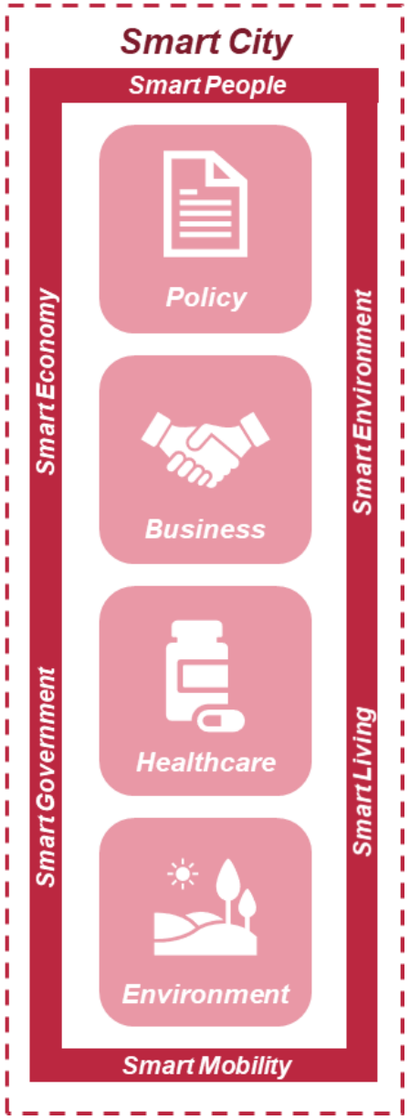
Key priorities:

- Establish a dedicated project office to drive the development of CSDI
- Develop the technical infrastructure
- Formulate business rules and procedures for sharing spatial data
- Set up data standards
- Invest in promotion and awareness raising across different sectors of HK

Context Leading Up to CSDI

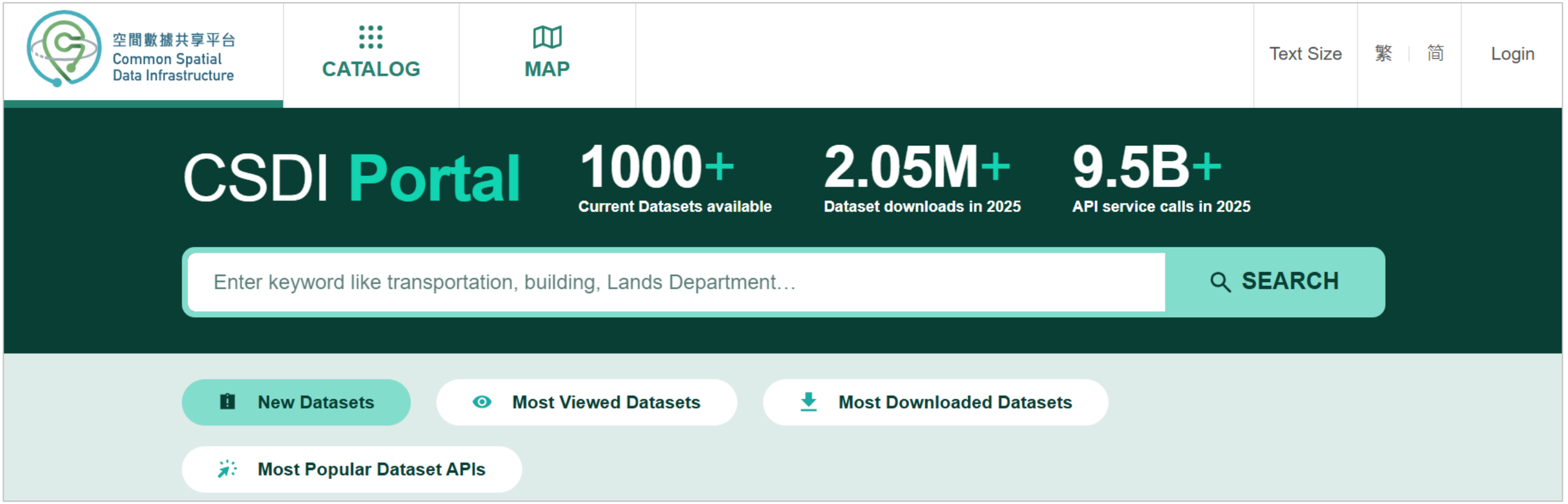
The success of CSDI in driving Smart Hong Kong is governed by an ecosystem of users, data, software and hardware.





Context Leading Up to CSDI

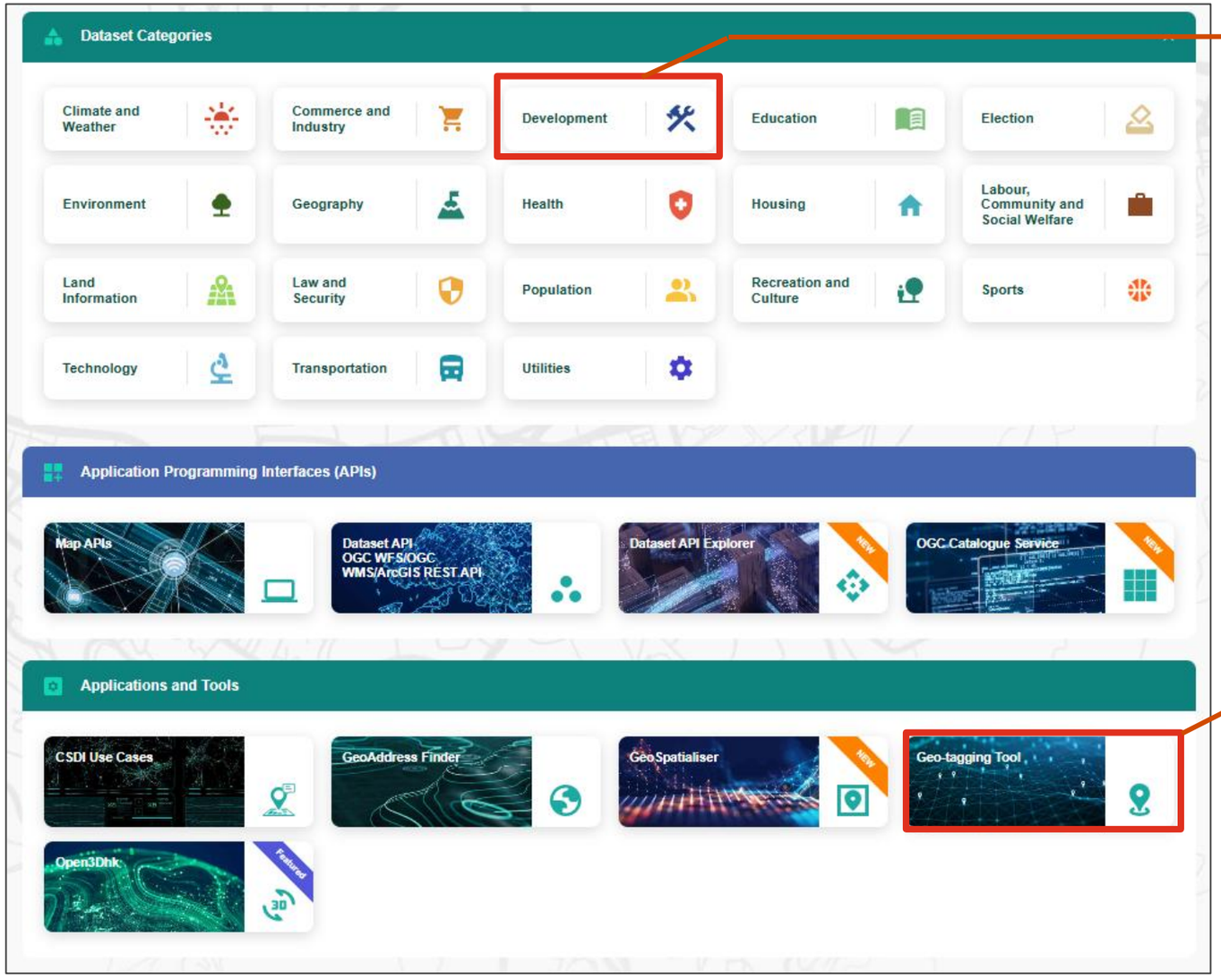
CSDI Portal is now live with over 1,000 spatial datasets available for free download

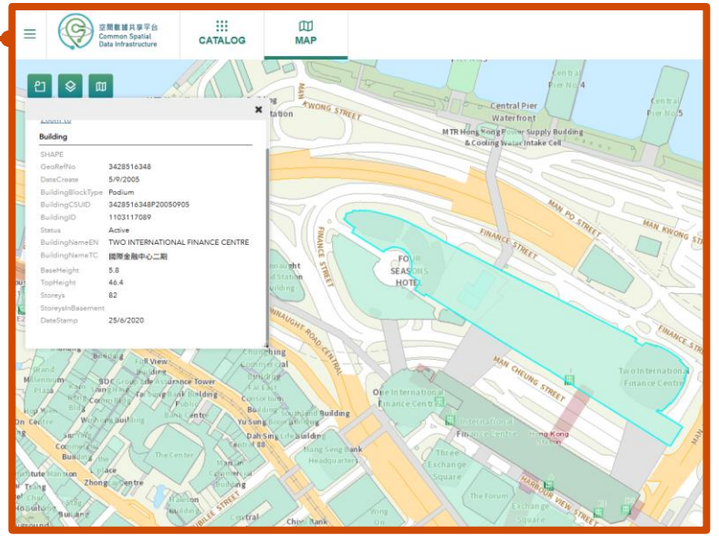


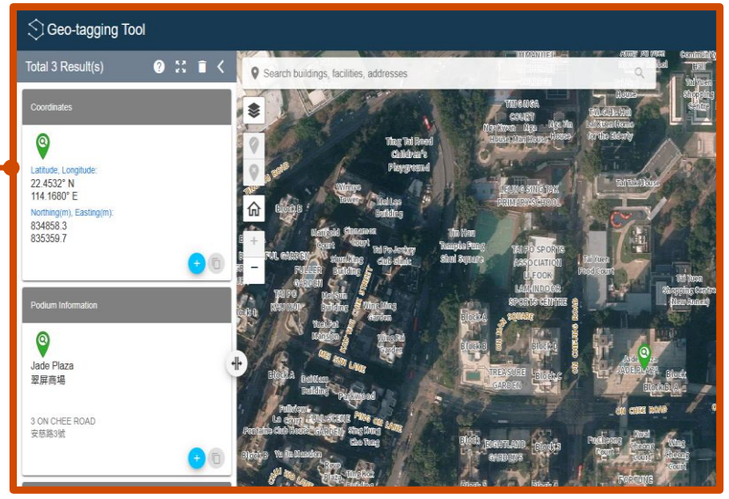
CSDI Portal: https://portal.csdi.gov.hk/csdi-webpage/

Context Leading Up to CSDI

Key features of CSDI Portal include spatial datasets organized by categories, APIs and geospatial applications are available







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Relevance to the Financial Services Sector

Relevance to Financial Services Sector

Spatial data are widely used in financial services (FS) sector locally and globally – technology availability and breakthrough, digitization, cross-discipline innovation and sustainability are driving forces behind the trend

Key Applications of Spatial Data in FS sector:

Spatial Finance and ESG:

- Geospatial data to monitor ESG metrics / for due diligence, identifying risks related to climate, supply chains, and physical assets.

Risk Analysis and Management:

- High-resolution location data helps banks and insurers analyze risks from natural disasters and monitor physical infrastructure to prevent fraud or assess loan collateral.

Location Intelligence:

- Integration of GIS with CRM tools to analyze customer demographics and spending habits relative to branch proximity, driving better service placement and financial inclusion.

Asset Mapping:

- Spatial data allows banks to create 360-degree customer profiles and analyze the precise location of corporate assets for better decision-making.

Relevance to Financial Services Sector

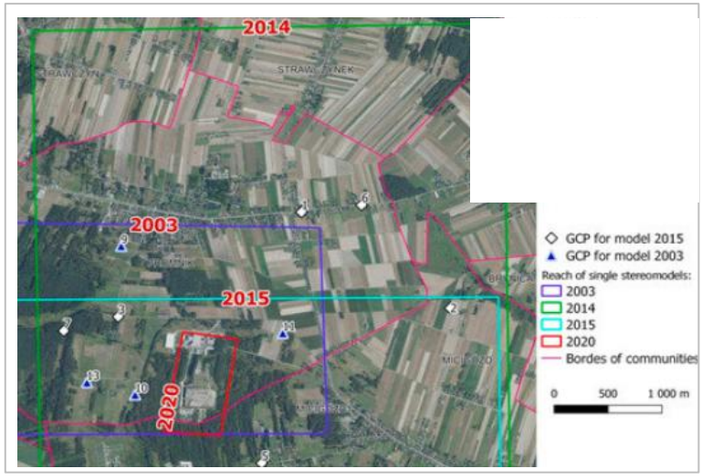
A few examples of use case of spatial data in FS sector

Spatial Analysis of potential ATM locations

- Identification of optimal ATM locations based on criteria such as demographics, cash utilisation and competitors

Insurance for Natural Disaster

- Identification of hazard-prone areas (or potential areas affected by natural hazard)
- Assessment of risk of hazards and assess the claims based on estimated economic loss
- Selection (or deselection) of market for certain insurance products



Valuation of Assets

- Comparing value of assets in proximity
- Factoring in conditions that may affect the valuation in the analysis
- Presenting findings visually for easy comparison

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Looking Ahead – CSDI Future Roadmap

Looking Ahead – CSDI Future Roadmap

Guardrails for future CSDI development

One Government Approach

Promote more innovative uses of spatial data

- Encourage further collaboration among stakeholders
- Make spatial data relevant to daily life and businesses

Development of an ecosystem

- Foster stronger ties with relevant stakeholders (both government and non-government) to explore innovative use of spatial data
- Maximise the value of spatial data

Promulgation of Digital Twins

- Leveraging on 3D digital maps, BIM and CSDI to promulgate Digital Twin
- Development of Northern Metropolis as an opportunity for exploring potential use cases for Digital Twin

Expansion of sources of spatial data (including from private sector)

- Means to encourage private sector to contribute spatial data
- Ways for government B/Ds to continue data sharing
- Obtain more types of spatial data (e.g. BIM, IoT and real-time)

Ensure of cybersecurity / digital security

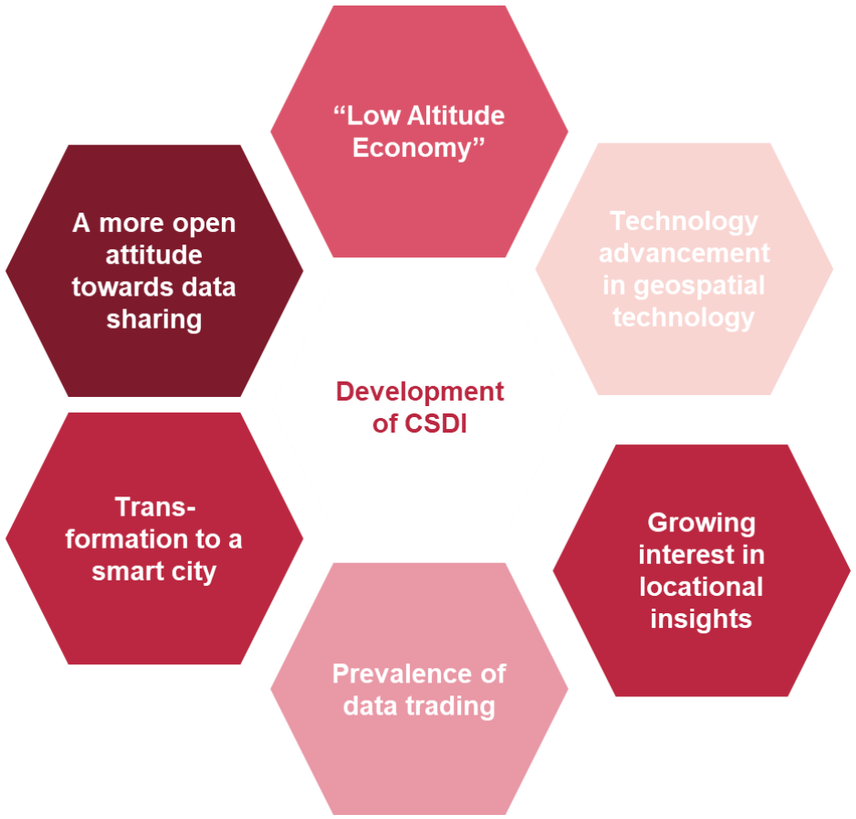
- Staying relevant to latest technology trends while maintaining high level of cyber / digital security

Additional considerations for the way forward

Looking Ahead – CSDI Future Roadmap

Major trends that have shaped the context of CSDI development

Changes in the market landscape



Increasing provision of spatial data and downloading of spatial data via CSDI Portal

Looking Ahead – CSDI Future Roadmap

Reference for Hong Kong

Latest policy and legislation to develop SDI

SDIs are regarded as a strategic digital infrastructure (all)

Governments lead the work of setting principles, policies and partnership development (all)

More matured jurisdictions are driving development of applications and taxonomy (UK)

Resources and support are key promoting wider use of SDIs and spatial data within governments and for private sector (UK/SG)

Organisational development to propel and promote SDIs

Centralised body (e.g. a commission / office) to drive the development of SDIs and use of spatial data (all)

Capacity building activities are critical roles of centralised body (SG)

More application / theme-based approach to drive the development of spatial data applications and SDIs (UK/SG)

Mechanism for data sharing within government and with non-government users

Use of a “data agent/trader” to help address the need for spatial data in the private sector (AU)

Reliance of partnership model for expanding the source of spatial data (UK/SG)

Developing a glossary for terms and definitions of geospatial data elements to facilitate easier communication (UK/SG)

Encourage intra-government departmental cooperation to simplify administrative processes and accelerate platform development (UK/SG)

Application of spatial data in analytics and wider uses

All jurisdictions are keen to explore the use of Digital Twin and / or CIM - all start with pilot and proof-of-concept (all)

To better ensure readiness, more policies and use cases are being explored through studies and pilot cases (all)

Management arrangement for spatial data

Mandatory sharing of data of importance, such as Underground Utilities data (UK/ CN)

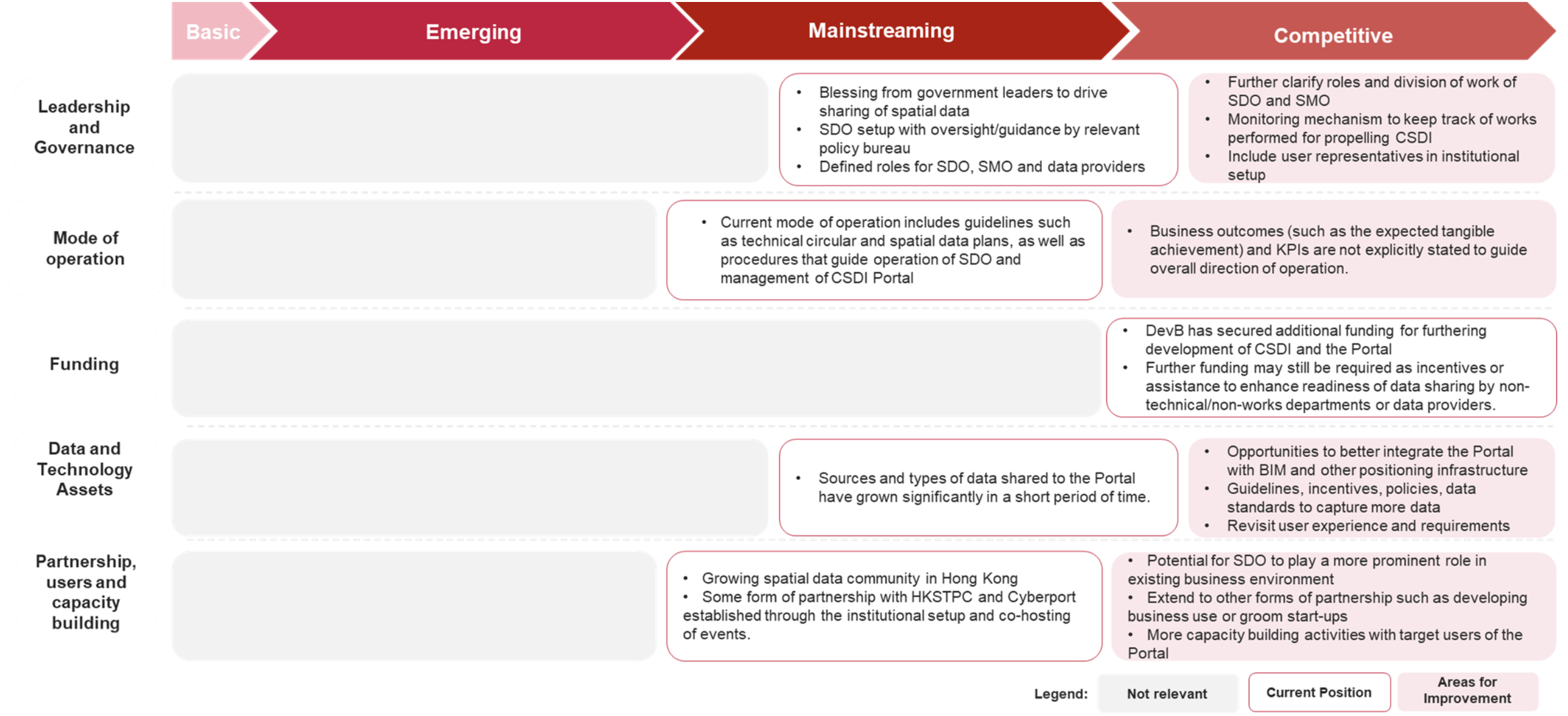
Data standards to be applied more flexibly subject to domains and types of data (UK/SG)

Technology trends and integration of spatial data with other technologies

BIM / AI / IoT / geo-analytics as value-adding services / features, and where SDI bring synergies (all)

Looking Ahead – CSDI Future Roadmap

We have assessed the development stage of CSDI as a whole in terms of the five building blocks



Looking Ahead – CSDI Future Roadmap – Key Recommendations

Based on the stakeholder views and assessment of CSDI development, the following illustrates our key recommendations for the way forward

Leadership and Governance

The DevB continues to serve as the "home" for CSDI and SDO to continue the momentum and upholding / improving established mechanism, which also aligns with overseas experience

- DevB plays the role as a governing body **and a dedicated office to push the momentum of CSDI's development**
- Ensures a **consistent and coherent approach** in the continuous development of the CSDI platform and spatial data initiatives

Potential inclusion of representatives from relevant non-government stakeholders (from academia, NGOs, commercial sector) in relevant committees and working groups

- **Inclusive approach to recruit non-governmental sector players** will be conducive to the long-term development of CSDI
- Strategies and initiatives could be better tailored to diverse users and **engender more data sharing opportunities or creation of use cases**

Looking Ahead – CSDI Future Roadmap – Key Recommendations

Based on the stakeholder views and assessment of CSDI development, the following illustrates our key recommendations for the way forward

Fundamental and Common Sharable Data

Sharing of spatial data could be by theme or by policy outcomes, which would provide a purpose to data contributors and mandate for sharing

- **Provide a purpose** to data contributors and **motivation** for sharing relevant datasets for value creation

- Data contributors will understand how their **collected data will fit into the broader narrative**, fostering **closer engagement and ownership**

SDO could follow a theme-based approach and collaborate with industry organisations to collect aggregated data that are being shared within the businesses

- A theme-based approach helps aligning goals with the private sector to **gather high-priority datasets**

- Businesses may be more receptive in sharing spatial data if they perceive the potential benefits in creating theme-based initiatives that may **in return benefit themselves**

Looking Ahead – CSDI Future Roadmap – Key Recommendations

Based on the stakeholders views and assessment of CSDI development, the following illustrates our key recommendations for the way forward

Operation and Technology

Provide more value-adding services (e.g., data cleaning and manipulation, spatialise data) for Government B/Ds; and encourage partnership with external service provider(s) (potentially of a data agent) as a way to assist data owners and data users in the private market

- **Foster a more sustainable approach** to data management and processing with external help

- **Facilitate smoother data access and sharing for private market players** with external data agent acting as a mediator to communicate and standardise data

And / OR

Funding and Charging

Funding support to non-works B/Ds to incentivise data sharing and improve readiness for sharing

- Provide **resources and / or funding support** for B/Ds who are less familiar with the use of spatial data to help with the preparation of spatial data

- Aims to **promote and cultivate a collaborative environment** that drives information sharing

Looking Ahead – CSDI Future Roadmap – Key Recommendations

Based on the stakeholders views and assessment of CSDI development, the following illustrates our key recommendations for the way forward

Capacity Building, Outreach and Partnership

Identifying opportunities to demonstrate or build network with industries that are likely to use or benefits from spatial data, such as financial services industry, social welfare services or hospitality;

- Leverage **established synergies with various partnering organisations**, such as universities, HKSTPC, Cyberport, to organise events / promotional exhibitions for promoting the use of spatial data

Set up a showcase section to share real-life use cases and applications to demonstrate existing achievements of using CSDI datasets

- By **curating and sharing use cases**, the public and the private sector may be inspired to use optimise the use of CSDI datasets for fostering innovation

Identify within the Government, user departments that would be willing and able to conduct joint promotion with DevB or the SDO to promote CSDI from a user perspective

- **Identify key champions and partner with user government departments** could enable a more effective approach to create new practical applications or use cases to highlight the value and impact of spatial data

Looking Ahead – CSDI Future Roadmap – Key Recommendations

KPIs are proposed to measure the performance of CSDI in terms of impacts

Measurement in terms of economic impact

Quantifiable economic value-add to demonstrate contribution to economic activities

Follow the funding application cycle

Measurement in terms of user experience

Collection of user feedback and usefulness of data available to track level of satisfaction

Could be done annually or at appropriate interval

Types and number of beneficiaries / contributors

The reach of CSDI to various users in non-government sector

Number of active users of CSDI to determine user base

Could be done annually or at appropriate interval

Measurement in terms of productivity gain / savings

Savings from data discovery, formatting etc.

Follow the funding application cycle

Note: Operational performance is also important, data such as number of outreach activities, number of registered users, number of products or tools developed etc. should also be captured

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Value of Spatial Data for Selected Industries

Value of Spatial Data for Selected Industries

We have tailor-made a framework to understand the quantifiable benefits and cost that are brought by the CSDI platform to selected industries in the context of Hong Kong's economy

Quantifiable Benefits brought by the proposed CSDI strategy to selected sectors in the economy of Hong Kong

Tangible Economic Benefits:

1. Total economic impact contributed by revenue generated / increase in the private sector organisations as a result of using spatial data from the CSDI
2. Cost reduction for operating with better business planning / investment decision with spatial data provided by the CSDI

+

Other qualitative benefits that may not be articulated in numbers such as enhanced accuracy at work

VS.

Quantifiable Cost of providing spatial datasets on the CSDI, and maintaining and developing the platform

- Manpower involved in the whole data cycle (from data collection, cleansing, standardisation and integration to fine-tuning datasets upon publication on the CSDI platform)
- Manpower involved in the maintenance and the updating of the CSDI platform

Input for calculations

- Our framework referenced the experience and impact assessments conducted by other countries in estimating the **economic and social benefits** brought by geospatial data or related initiatives
- Based on the **inputs by respondents in the survey** and the information provided by the DevB on manpower costs, the quantifiable benefits and costs are calculated respectively to understand the impact of CSDI to the economy

Value of Spatial Data for Selected Industries

The survey results have provided valuable insights into the impact created from the use of spatial data and the CSDI platform, in which we have tailored a framework to extrapolate their contribution to selected industries in value-added terms (GDP contribution)

Economic Impact from the Use of Spatial Data

Direct Impact

- % of revenue increased / enabled as a result of using spatial data in business operation

Indirect Impact

- Additional economic impact generated as a result of the organisation's direct economic impact, in which the beneficiary organisation will also purchase goods and services as inputs into production within the local economy

Induced Impact

- Impact arising from the expenditure and beneficiaries (throughout the supply chain) on other goods and services in Hong Kong from direct and indirect impact

Calculation of Value Added in Selected Industries (GDP-by-industry)

Economic Impact from the Use of Spatial Data

With the average **revenue increase collected in our survey for each industry, the % will be used for calculating the economic impact** generated by organisations of different sizes in the industry

x

CSDI Contribution Factor (%)

The overall contribution factor of CSDI across different industries gathered from our survey will be multiplied

x

Extrapolation Factor to the Wider Industry

Number of Establishment		% of Orgainsation Using Spatial Data
The number of organisations based on their organisaitonal size in the industry will be multiplied	x	Assumption on the proportion of organisations using spatial data will be applied
% Using Spatial Data Experience Revenue Increase		**% Using CSDI Spatial Data**
Gathered from survey results, the overall % of organisations experiencing revenue increase across industries of using spatial data will be multiplied		A conservative estimation that 10% of organisations will adopt CSDI spatial datasets in their business operation

Value of Spatial Data for Selected Industries

Based on our stipulated methodology and the inputs collected from the survey results, we have extrapolated the results to understand the GDP contribution of spatial data and CSDI platform to the selected industries

Key Inputs

- The categorisation of respondents are in accordance with the **C&SD definition**, in which relevant statistics are benchmarked for the calculation of annual revenue growth of respondents (% of revenue growth obtained from survey) and the **extrapolation of the industry's value add**
- Real, estate activities; and architectural, surveying and engineering services are grouped together under the building, construction, and real estate sectors since they fall under the same umbrella sector
- The economic contribution of spatial data and the CSDI platform is pivoted against **the value-add (in GDP terms) of the respective industries**, in which the last column illustrates the % of GDP enabled by the CSDI

Industry	Total GDP Enabled by Spatial Data (A)	Total GDP Enabled by CSDI (B)	Total GDP in the Industry (C)	% of GDP Enabled by spatial data (A ÷ C)	% of GDP Enabled by the CSDI (B ÷ C)
Information and communications	$6,644,302,525	$234,029,515	$102,858,746,000	**6.46%**	**0.23%**
Transportation, storage and courier services	$14,374,340,076	$506,301,425	$217,775,671,065	**6.60%**	**0.23%**
Utilities (Electricity and gas supply)	$971,661,533	$195,568,181	$34,873,575,000	**2.79%**	**0.56%**
Building, construction and real estate sectors (incl., real estate activities; and architectural, surveying and engineering services only)	$791,229,959	$27,869,165	$134,097,015,000	**0.59%**	**0.021%**

Value of Spatial Data for Selected Industries

A similar exercise has been conducted to understand the cost saving benefits that are brought by spatial data and the CSDI for the respective industries

Key Inputs

- Comparatively, the magnitude of contribution in cost savings is **less impactful than its enablement in revenue growth**, given the spatial data's versatility in application and service development or support
- Relevant statistics are benchmarked from the C&SD data for the calculation of cost savings of respondents (% of cost savings obtained from survey) and the **extrapolation of the industry's operating cost**
- Similarly, the total cost reduced as a result of using spatial data and the CSDI platform is **pivoted against the industry operating expenses of the respective industries**, in which the last column illustrates the % of operating cost reduced by CSDI

Industry	Total Cost Reduction by Spatial Data (A)	Total Cost Reduction Contributed by CSDI (B)	Total Operating Cost in the Industry (C)	% of Operating Cost Reduced in the Sector by Spatial Data (A ÷ C)	% of Operating Cost Reduced by CSDI (B ÷ C)
Information and communications	$812,738,331	$28,626,746	$122,280,724,000	**0.7%**	**0.023%**
Transportation, storage and courier services	$5,373,229,175	$189,259,025	$551,532,366,419	**1.0%**	**0.034%**
Utilities (Electricity and gas supply)	$688,439,940	$138,563,627	$45,895,996,000	**1.5%**	**0.30%**
Building, construction and real estate sectors (incl., real estate activities, architectural, surveying and engineering services only)	$5,792,573,184	$204,029,406	$486,390,746,000	**1.2%**	**0.042%**

Value of Spatial Data for Selected Industries

There is still much untapped economic potential to be materialised in other industry sectors through further improving the adoption and use of spatial data to which CSDI can be an effective and authoritative conduit

Continue to deliver relevant, accurate and high-quality CSDI datasets

Showcase the benefits of CSDI datasets through use cases

Explore collaboration with the private sector to encourage **data sharing**

Encourage the public and private sector **utilisation and adoption of CSDI datasets**

5

Q&A Session