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Spatial Data Sharing as a Smart City Infrastructure

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Hong Kong 2030+ Towards a Planning Vision and Strategy Transcending 2030



"The concept of a smart, green and resilient city should permeate all aspects of the built environment, from land use planning to transport, infrastructure and buildings to achieve a sustainable and future-proof city."

"The SGR city strategy embraces the proposed key approaches, key principles, governance, tools and benchmarks for promoting smart, green and resilient city development in Hong Kong. In gist, it aims to minimise demand for and use of resources, promote low-carbon smart economy and living, reduce carbon emissions, enhance city efficiency, promote business productivity, improve quality of urban living and enhance climate resilience."

A key action is to establish an integrated Common Spatial Data Infrastructure and ICT platform.





Hong Kong Smart City Blueprint

The Innovation and Technology Bureau published in Dec 2017 the Smart City Blueprint for Hong Kong setting out the overall framework and strategy for developing Hong Kong into a Smart City



Smart Government and Smart City Infrastructure



Spatial data play an essential role in driving Hong Kong's development as a Smart City.

The Smart City Blueprint includes the initiative to "develop Common Spatial Data Infrastructure (CSDI) by 2023 to facilitate sharing of geo-spatial data across government departments and government-to-business (G2B) applications, including the launch of CSDI portal and 3D digital map" as a key strategy for Smart Government and Smart City Infrastructure.



Spatial Data

GIS provides a way to use location to integrate and relate information



..... through 'core framework spatial data'



Spatial Data

Support applications across virtually all sectors of human activities.....





Without a Spatial Data Infrastructure (SDI)

Without SDI, enterprise data are disparate, scattered, compartmentalized, often not standardised, not geo-enabled, not spatially-comparable, not inter-operable, not discoverable, not sharable...



With Common Spatial Data Infrastructure (CSDI)

Policy framework, institutional setup, technical standards and operational platform for the co-ordinated and adaptive planning, development and management of spatial data

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

Govt Depts Professionals Developers Research Institutions G2C / G2G Applications Private Enterprises Public etc.

SDI Example – National SDI (NSDI) for the United States

TO AV



SDI Example – INSPIRE for the European Union

SDI Example – Abu Dhabi SDI



SDI Example – National SDI for Singapore





CSDI Vision, Mission & Building Blocks



To contribute to a liveable, competitive, innovative, sustainable and smart Hong Kong through the provision of convenient, easily accessible, high quality and up-to-date spatial information and services



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



Leadership & Governance

Themes for Common Sharable Data

Operating Model and Technology Funding and Charging Capacity Building, Outreach & Partnership

Five building blocks underpin the vision, mission and successful implementation of CSDI for Hong Kong



CSDI Operation and Technology

To provide a scalable, technically feasible and secured sharing portal for the exchange of quality and up-to-date spatial information and services in a convenient and easily accessible manner





CSDI Digital Framework





CSDI Development Supported by Lands Department

LandsD, as the land survey and mapping authority with its wealth of GIS expertise, gears its work in mapping, collecting, integrating and disseminating geospatial information and positioning infrastructure towards supporting CSDI development



CSDI Development - 3 Essential Areas



1. Establishing Data & Technical Standards 2. Platform Development & Application Facilitation

3. Capacity Building & Outreach



1. Establishing Data & Technical Standards

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LandsD leads the Data and Technical Standard Working Group

Consultancy study underway to establish the data exchange standards for core framework spatial data, and to devise the architecture and workflow of CSDI portal to facilitate spatial data sharing



1. Establishing Data & Technical Standards Deliverables of Consultancy Study

Description of current environment Orientation seminars for stakeholders Summary of interviews with stakeholders Data Specifications for Framework Spatial Data Themes Sample Datasets for Framework Spatial Data



2. Platform Development & Application Facilitation Land Information System (LIS)

A unified GIS backbone for the current 2D digital map



- Maintain large-scale 2D topographic map data and land boundary records
- Provide platform for survey data processing, data updating, spatial analysis, and plan production
- Support 400+ concurrent users in virtual desktop infrastructure
- Facilitate 500+ concurrent users in retrieving spatial data information on web



2. Platform Development & Application Facilitation Geospatial Information Hub (GIH)

A platform supported by LIS for integrating geospatial data from different sources within the government and sharing geospatial information across departments



- Data contributed by 33+ B/Ds
- 360+ datasets (90 more than GeoInfo Map for the public)

Example: continuous support to Food and Environmental Hygiene Department since 2000s



Submit Dengue Fever Case



Conduct Spatial Risk Analysis on GIH

Pest Control by B/Ds



2. Platform Development & Application Facilitation

3-Dimenisonal (3D) Digital Map

will form the basis for hosting various kinds of essential spatial data and supporting various public sector and private sector applications, including but not limited to built-environment applications.



3. Capacity Building & Outreach GeoInfo Map (https://www.map.gov.hk)

A common platform since 2000 to share with the public the latest information on public services and facilities released by government departments



- Data contributed by 29+ B/Ds
- 270+ types of spatial information on public services and facilities

3. Capacity Building & Outreach GeoInfo Map (map.gov.hk)

LandsD plans to share additional 14 types of data with the public through GeoInfo Map

- LandsD's Map APIs
- Lease Modification/Land Exchange transactions
- Private Treaty Grant (under planning)
- Short Term Tenancies (started)
- Private lot and Government Land Allocation boundaries (started)
- Vacant government sites available for application for greening or Government/Institution/Community uses (started)
- Provision of Open Space required under lease for use by public in private developments completed in or after 1980 (started)



3. Capacity Building & Outreach Hong Kong GeoData Store (geodata.gov.hk)

Alpha version of CSDI portal to facilitate discovery, integration, retrieval, sharing and application of geospatial data (initially by the Government)



CSDI Portal (alpha version)

ublic platform for exploring and downloading open spatial dat

Find datase

- Geodata available for download in open, machine-readable formats of CSV, GeoJSON, GML, and KML, as well as open geodata APIs
- Map tools as web services and APIs, e.g. Location Search API, Search Nearby API, and Identify API to facilitate 3rd-party application



Roadmap of CSDI Development



Launch of CSDI Portal to Public

Launch of first stage 3D Digital Map (visualisation)

Promulgation of Framework Spatial Data Specifications

Launch of Map APIs

2018

Launch of Hong Kong GeoData Store - CSDI Portal (alpha version) Launch of revamped GeoInfo Map - CSDI applications



Looking forward, we will support CSDI and Smart City development by ...



- Embracing new surveying, mapping and geospatial information technologies
- **Collaborating** with stakeholders within government and the industry/community
- **Establishing** necessary standards for spatial data exchange and 3D digital map
- Collating and integrating more spatial data to enrich GeoInfo Map and GeoData Store
- Building up the 3D city model progressively to facilitate applications of spatial data

