## Common Spatial Data Infrastructure and 3D Digital Map for Smart Hong Kong

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Keynote

Smart Cities Seminar Session





#### Land Resources in Hong Kong

<u>City</u>	Average Population Density (person/km²)
Hong Kong SAR	26,100
Singapore	10,900
Seoul	8,900
Los Angeles	2,300
New York	1,700

Source: Demographia World Urban Areas 15th Annual Edition: 201904

Land Area : 1,108 km<sup>2</sup>

#### Sea Area : 1,649 km<sup>2</sup>

About 20% of land is steep slopes (ie  $\geq$  30° in gradient)

Built-up Areas 24%

Country parks: 443 km<sup>2</sup> Marine parks: 24 km<sup>2</sup>

Source: Planning Department, HKSARG







Acceptance of BIM Format for General Building Plan (GBP) submission

Study on integration of BIM/GIS



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Collaboration with Construction Industry Council (CIC)

#### Setting up a BIM Data Repository Prototype



Mandatory use of BIM of Works Project over \$30M







#### **3D Map**

#### 3 Stages of 3D Digital Map Development





3D Maps for Visualization









3D Maps for Unit-based Indoor Applications

3D Maps for City Modelling

## **3D Data Standards and Modelling** OGC CityGML & IndoorGML







- Urban Planning / Operations
- Emergency Mgt / Response
- Transportation / Routing / Logistics
- Indoor navigation
- Retail Site analysis
- Sustainable / Green Communities
- City Services Management
- Noise abatement
- Telecommunications placement
- Many other uses...

Source: http://www1.nyc.gov/site/doitt/initiatives/3d-building.page



## Creation of Comprehensive 3D Map Objects

#### **Scanned Copies of Building Plans**

- Provision of hardcopies
  - Scanned to pdf format
- Provision of scanned copies in pdf format





#### **Digital Building Plans**

In CAD format

#### **Building Information Modelling Models**

In BIM format such as Revit and AECOsim Builder





#### **3D Map**



**Comprehensive 3D Map Objects** 

#### **3D Data Applications**





#### **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



## **CSDI Vision, Mission & Building Blocks**



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

#### **CSDI Development - 3 Essential Areas**





## **CSDI Digital Framework**



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21

## **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



## **Roadmap of CSDI Development**

Data contributed by **30+** B/Ds with **270+** public services and facilities data for public



#### **CSDI - Common Spatial Data Infrastructure**

# Science Content of Content of Content of Content of Content (Alpha Version)

# Our goal is to develop Hong Kong into a spatially enabled world city



#### Smart Hong Kong with Digital Twin

**Increasing** accessibility and usability of spatial data

**Using** geospatial intelligence and shared applications

**Enjoying** an enabling eco-system to support innovation and the creation of valued-added spatial products

