



Develop a Smart City through Survey and Mapping

CHANG Kwok-fai
Deputy Director / Survey and Mapping
Lands Department
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Smart City Blueprint

 <https://www.smartcity.gov.hk/>



- Smart Mobility
- Smart Living
- Smart Environment
- Smart People
- Smart Government
- Smart Economy



Development of Common
Spatial Data Infrastructure



Creation of 3D
Digital Map



Adoption of Building
Information Modelling and
GIS / BIM Integration



Transformation of Survey and Mapping Office

Driving Forces for Change

- Smart City Initiatives
- Advent of new technologies
- Changes in people's lifestyle with positioning services
- Changes in expectations on SMO's services
- Strategic repositioning of SMO



Extended Roles of SMO

Survey, Mapping and Spatial Data Office

To develop, support and manage a Digital Hong Kong (Digital Twin) with spatial data & data analytics

Land Status and Cadastral Office

To enhance land boundary records to an Updated cadastral system

Land Data Bank Holder & Geographical Information Office

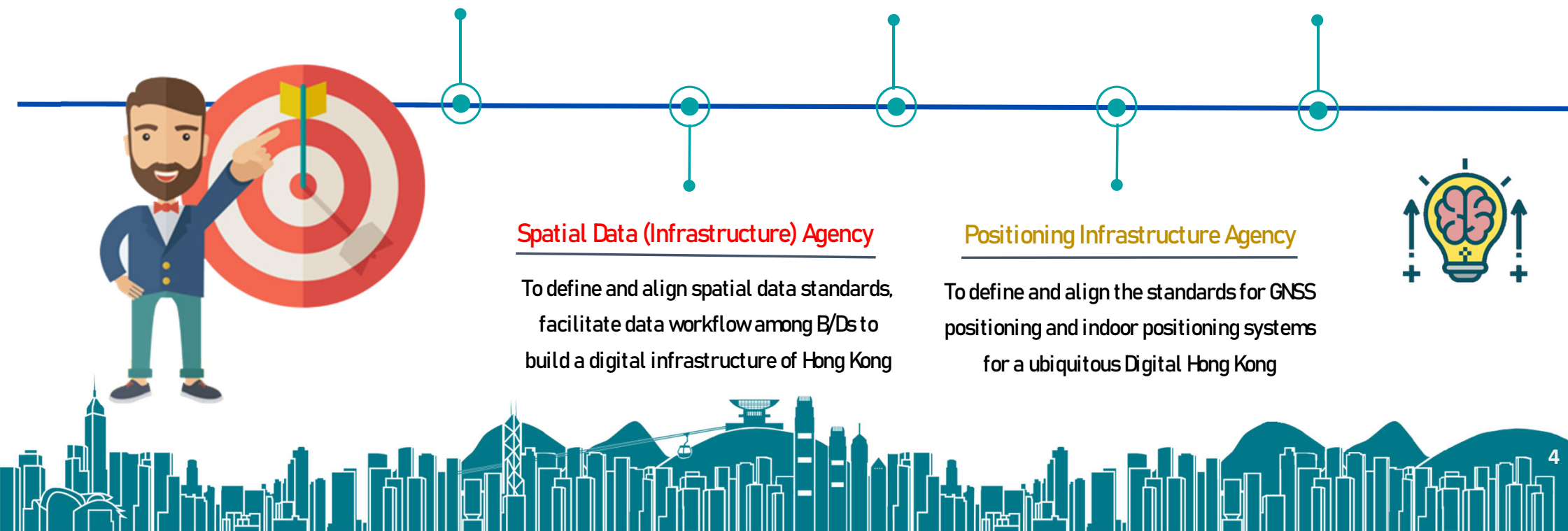
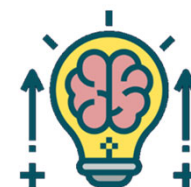
To gather and validate data for enhancing SMO's Land Information System

Spatial Data (Infrastructure) Agency

To define and align spatial data standards, facilitate data workflow among B/Ds to build a digital infrastructure of Hong Kong

Positioning Infrastructure Agency

To define and align the standards for GNSS positioning and indoor positioning systems for a ubiquitous Digital Hong Kong



SMO – New Vision and Missions

New Vision

- ✓ Bring Spatial Data to Life, Develop a Smart City through Survey and Mapping

New Missions

- ✓ Being the trusted authority of survey, mapping and spatial data services
- ✓ Define standards for spatial data & positioning infrastructure to facilitate effective discovery, sharing and use of spatial data by the community
- ✓ Empower the society through the provision of up-to-data, reliable and accessible spatial information
- ✓ Spearhead the creation of high quality geo-referenced spatial & land cadastral data for the development of Digital Hong Kong





Common Spatial Data Infrastructure



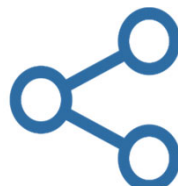
The Common Spatial Data Infrastructure

Vision

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



Improve
geospatial
capability



Enhance data
interoperability



Promote the use
of geospatial
intelligence and
applications



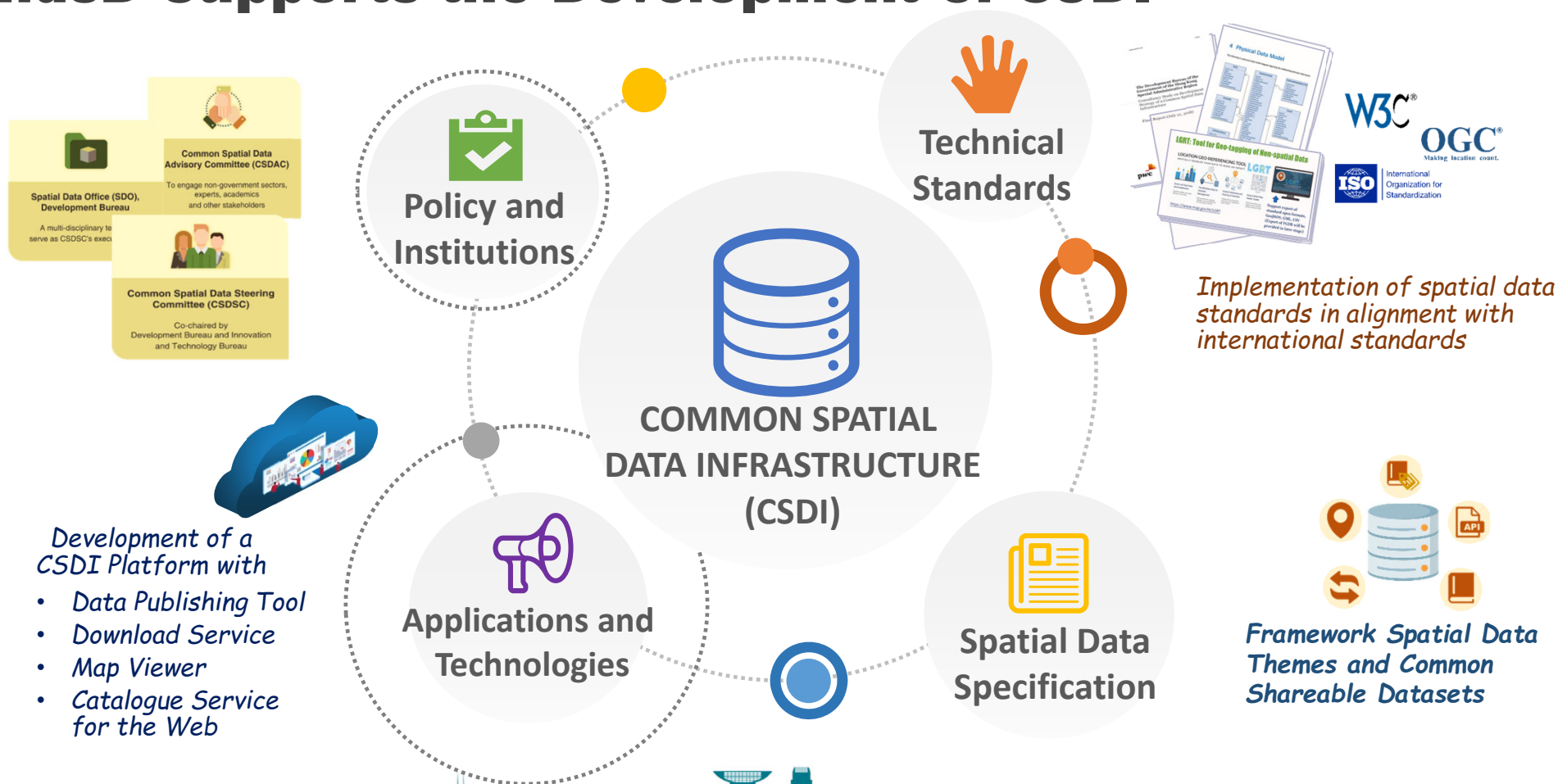
Increase
accessibility and
usability of spatial
data



Foster a
collaborative
culture



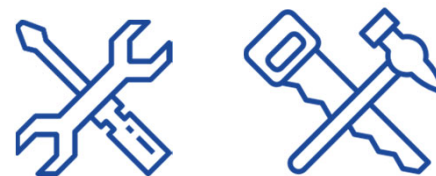
LandsD Supports the Development of CSDI



LandsD Supports the Development of CSDI

Provides technical Supports for

- ◆ Development of Framework Spatial Data Standards
- ◆ Designing, developing and implementing CSDI Portal/Platform
- ◆ Bureaux/Departments -
 - ◆ by providing technical advice in preparing standardized spatial data
 - ◆ Geo-tag tool, Metadata editing and extraction tool, validation service...





LandsD Supports the Development of CSDI



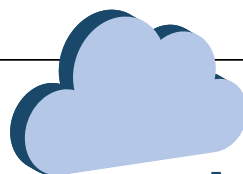
Oct 2021

Spatial Data
Publishing and
Validation System



Jan 2022

Commissioned a Data
Standards Consultancy Study
for New Framework Spatial
Data Standard



May 2022

for use first on a trial basis by
government departments



by end 2022

Release for public use with
500+ spatial datasets





3D Digital Map

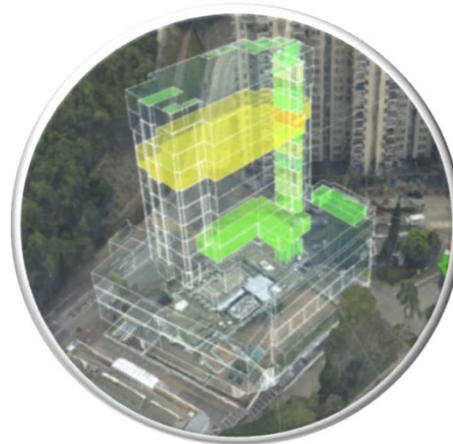


Hong Kong 3D Digital Mapping Project



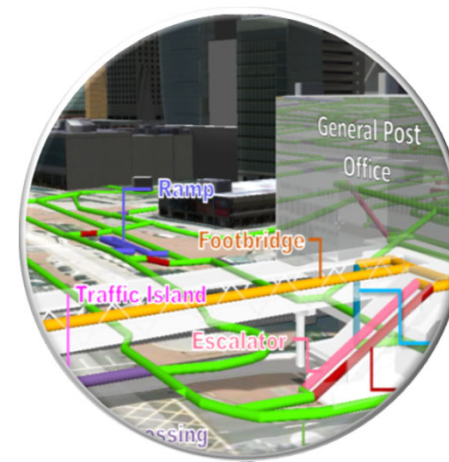
1

3D Visualization Map



2

3D Indoor Map
(1,250 buildings)



3

3D Pedestrian Network
"Accomplished (as at Sept 2022) !"



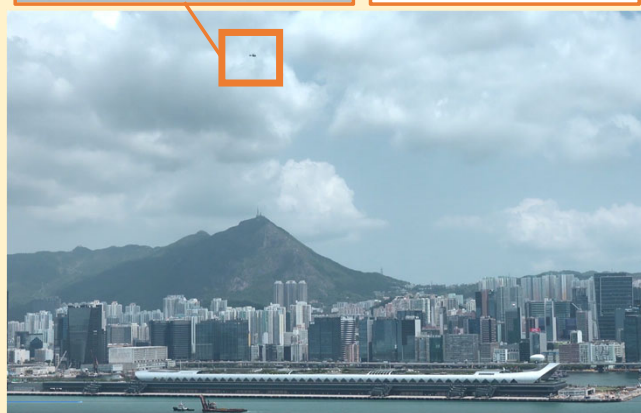


3D Visualization Map

Data Capturing

Aerial Survey

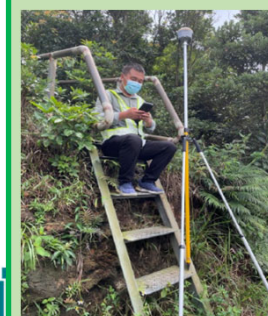
12 nos. of camera
(2 nadia + 10 oblique)



Mobile Mapping Survey (VMMS+PMMS)



Control Survey



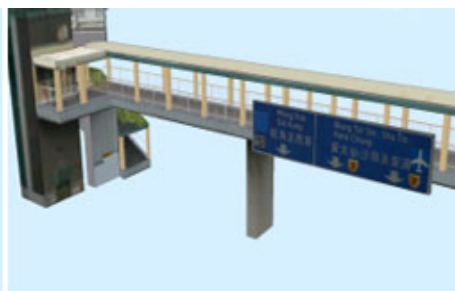
(Photo: Contractor)

3D Visualization Map

Deliverables	Format	Absolute Accuracy		Relative Accuracy	
		Horizontal	Vertical	Horizontal	Vertical
3D Individualized Photo-realistic Models	<ul style="list-style-type: none"> - Autodesk 3ds Max - FBX - c4D - VRML - DAE - glTF - KML 	0.30m	0.50m	0.20m	0.20m
Tile-based 3D Photo-realistic Models	<ul style="list-style-type: none"> - OBJ - OSGB - Cesium 3D tiles 	0.30m	0.50m	0.20m	0.20m



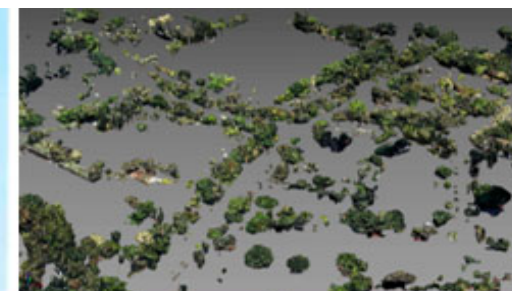
(a) Building



(b) Infrastructure (feature basis)



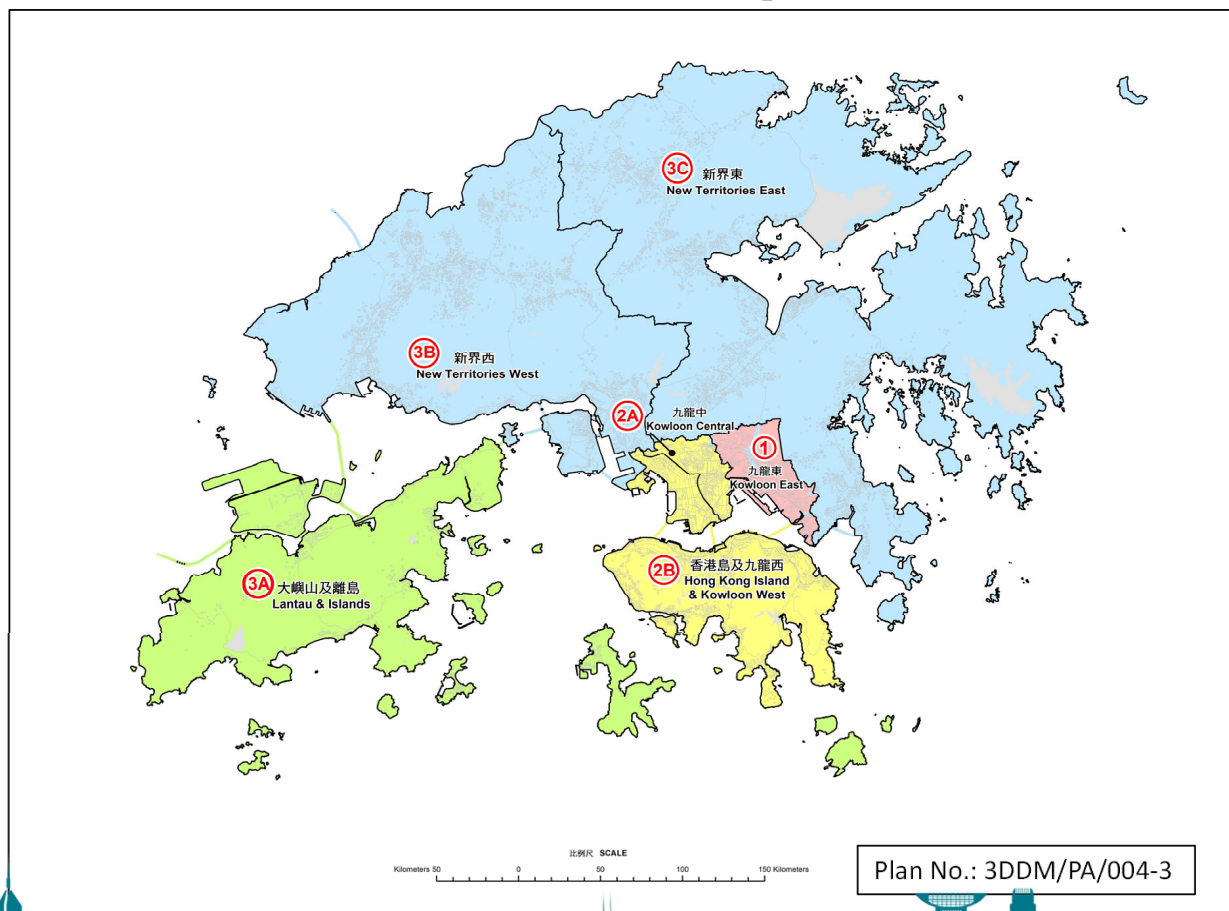
(c) Infrastructure – Road (tile basis)



(d) Vegetation (tile basis)



3D Visualization Map



Project Schedule

Phase I

1 - KE

Project Completed
(MAR/21 – JUN/22)

Phase II

2A - KC

Project in Progress
(NOV/21 – DEC/22)

2B - HKI & KW

Project in Progress
(JUN/22 – Q3/23)

Phase III

3A - IS

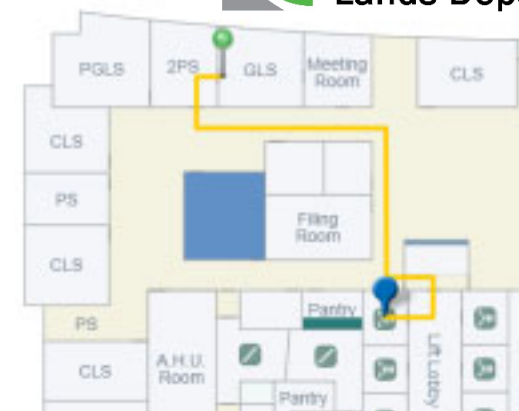
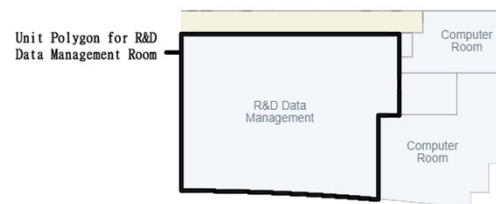
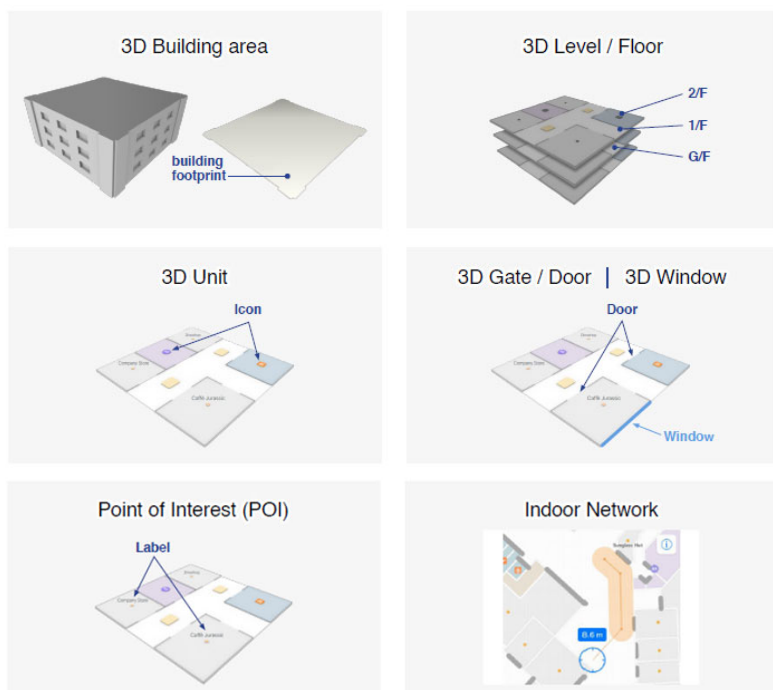
Tender in Progress
(OCT/22 – Q2/23)

3B - NTW
3C - NTE

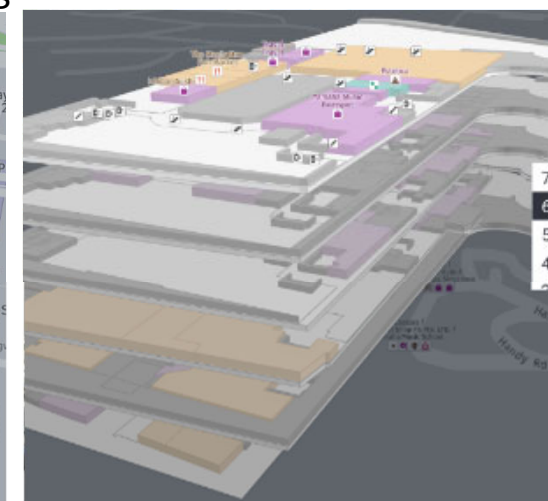
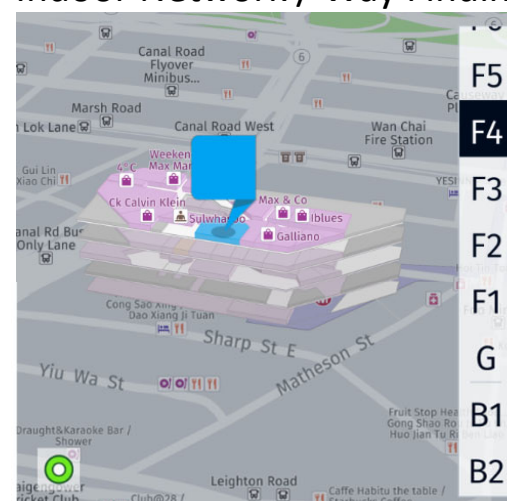
Tender Drafting
(Q1/23 – Q2/24)

3D Indoor Maps

3D Indoor Map



Indoor Network / Way Finding



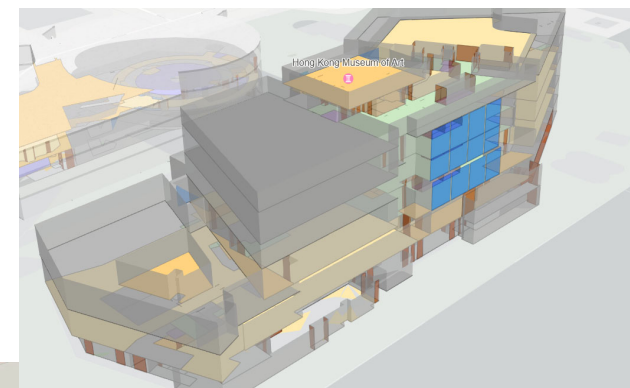
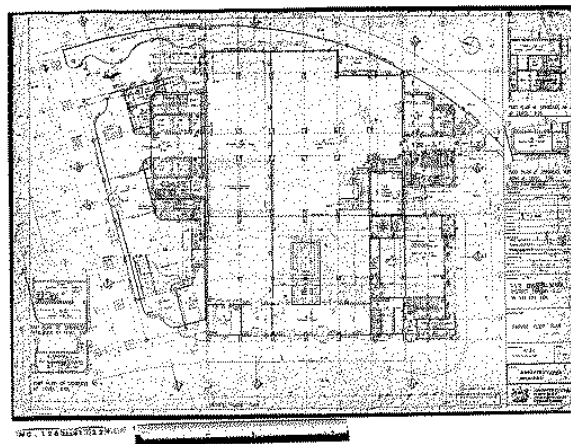
3D Indoor Maps

Data Sources –

Building Plans from BD, ArchSD,
HD, MTR...

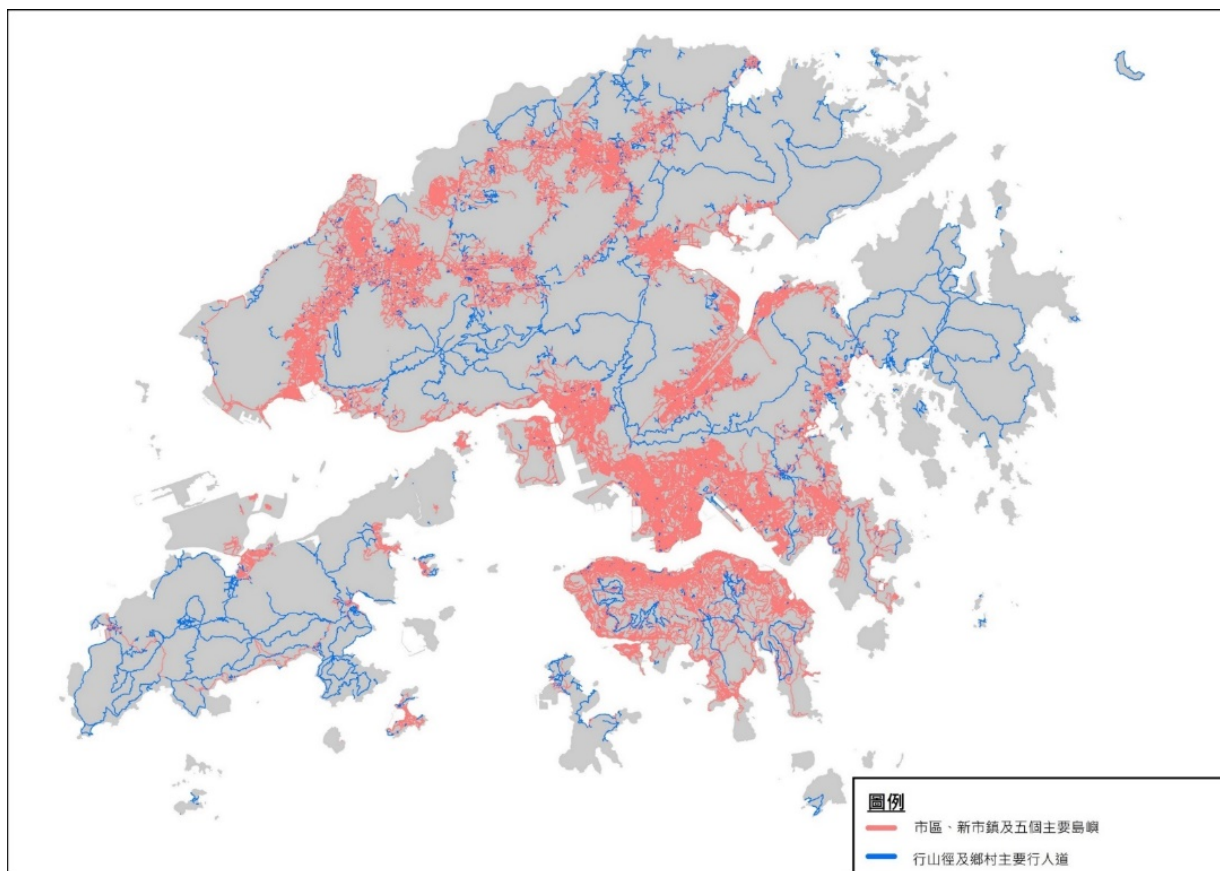
Project Schedule/Progress

- ◆ Kowloon East (Pilot) – 158
- ◆ Remaining area in Kowloon – 390
- ◆ Hong Kong Island – 420
- ◆ NT & Islands – 440





3D Pedestrian Network



- Total length: 9,100km
- Coverage:
 - Built-up areas
 - Rural villages
 - Hiking trails
- Horizontal +/- 1m, vertical +/- 2m



3D Pedestrian Network

KEY FEATURES

- Connect walkways, footbridges, staircases, road crossing, footpaths, tracks, subways, ramps, unpaid area in MTR stations ...
- Barrier-free access
 - Wheelchair access, lifts, ...
- 3D Geometry
 - Height and Gradient information



Barrier-free access facilities in public buildings



Escalators, ramps, stairs, lifts



Outdoor pedestrian walkway



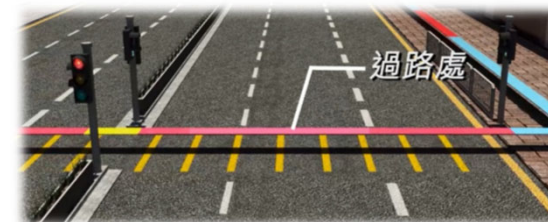
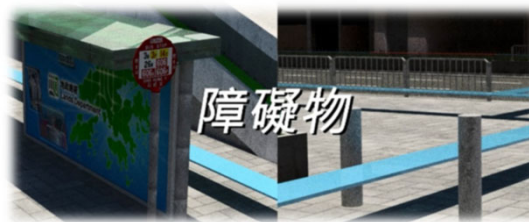
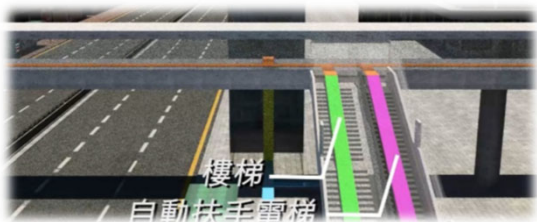
Indoor pedestrian walkway with free public access



3D Pedestrian Network

Released on 30 September 2022

Already available in Hong Kong
Geodata Store



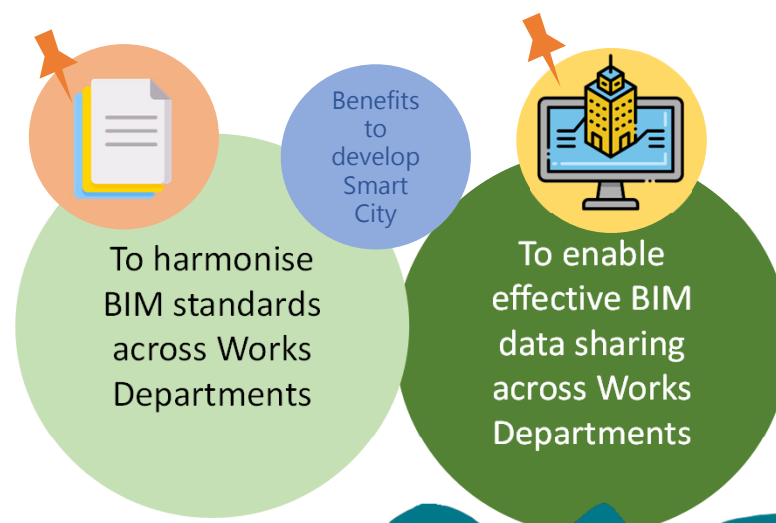


Building Information Modelling



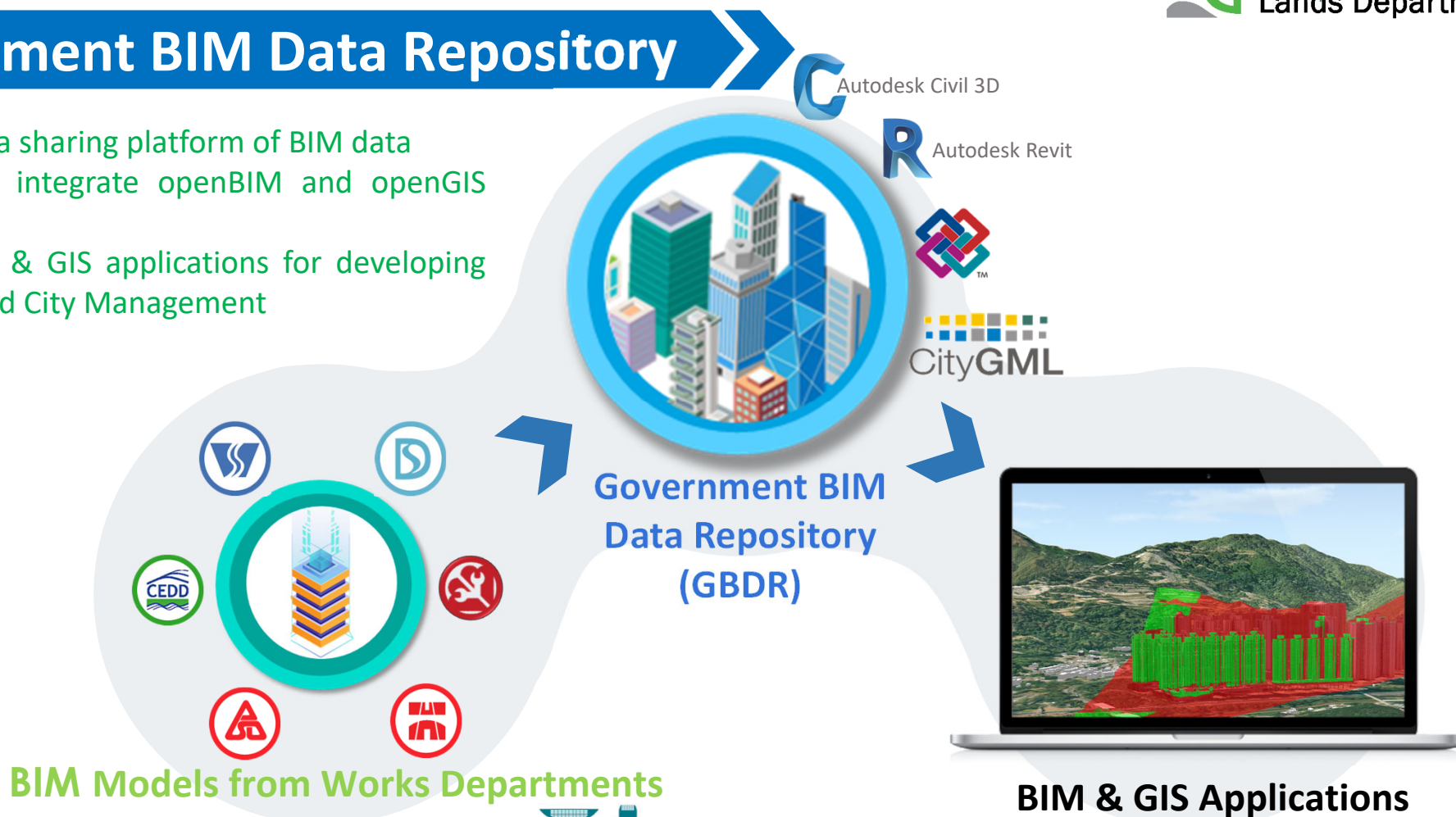
DEVB BIM Harmonisation Guidelines

- BIM Horizontal Harmonisation for the First Phase Development of Kwu Tung North and Fanling North New Development Area in December 2019
- This Guidelines
 - Provide aligned standards for consistent modelling approaches
 - Enable sharing, dissemination and maintenance of BIM models
 - Support sharing of BIM objects with CIC
 - Form the standards to support BIM Data Repository
- DEVB TC(W) No. 8/2021 was published in December 2021



Government BIM Data Repository

- ✓ Provide a data sharing platform of BIM data
- ✓ Develop and integrate openBIM and openGIS data
- ✓ Develop BIM & GIS applications for developing Smart City and City Management





Building Plan Checking Tools for General Building Plan (GBP) Submission

Motivate developers and building industry to adopt BIM in GBP preparation

Consultancy Study for Adoption of BIM
for Floor Area Calculation
by LandsD and BD

Common standards on
defining, computing, and
verifying the area
computations in the digital
GBP in BIM format files



Plug-in tools for 2 popular BIM software
for checking and retrieving the
computation of Gross Floor Area, Site
Coverage, Usable Floor Area and
Useable Floor Space



Guidelines for using BIM in GBP
submission and associated
software templates published by
LandsD

15 June
2022

**Soft-launch of 1st phase
deliverables for LandsD**
starting from 15 June 2022
for 12 months

Data Sources

Physical Asset



Digital Twin

Maturity Spectrum

Element 0

Reality Capture

Element 1

3D Model (Visualization Map)

Element 2

Connect to Persistent Data
and BIM (Data
Standardization)

Element 3

Enrich with Real-time Data

Element 4

Two-way Integration and
Interaction

Element 5

Autonomous Operations and
Maintenance



3D Digital
Map



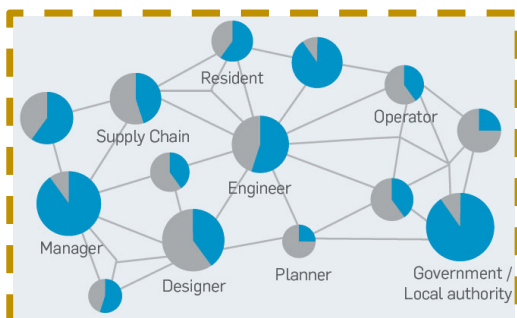
Government BIM Data
Repository & BIM/GIS
Integration



Data Access



Consumers and Stakeholders



Source: ATKINS (2019). "Digital Twin for the Built Environment"



Ensure accessibility, usability,
interoperability of
standardized spatial data



讓空間數據融入生活，
以測繪科技創建 **智慧城市**。
Bring Spatial Data to Life, Develop a **Smart City**
through Survey and Mapping.

Thank You

