

  **FIG Working Week**  
- Bridging the Gap Between Cultures  
Marrakech, Morocco  
May 18-22, 2011  
Under patronage of His Majesty King Mohammed VI

## Benchmarking Spatial Data Infrastructure Development in Hong Kong

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### Scope

This is a HKIS sponsored research study to

- provide a comparison study between the advanced SDIs and the current status of the Hong Kong SDI, and
- promote developments of Spatial Data Infrastructure in Hong Kong.



**GGIM**

United Nations Initiative on  
Global Geospatial Information Management

### **National Policies on Geospatial Information:**

Spatial Data Infrastructure, Regulatory Practices, Information Management Issues

- **United Nations initiative**
  - Dept of Economic and Social Affairs
- **Role of government – regulator, implementer**
- **legislation & regulatory framework**
  - Links to Australia, Bahrain, Brazil, Canada, Chile, China, India, Japan, Portugal, Korea, Spain & USA.

Web access from <http://ggim.un.org/sdi.html>

### **The Infrastructure (regulatory framework)**

- **Legislation + Government Administration**
  - USA, European Union, Japan, Korea,...
- **Government Administration**
  - Australia, Canada, China,...

## USA National SDI Policy

- 1994 President Decree - Clinton
  - [Executive Order 12906](#) established executive branch leadership for development of the coordinated National Spatial Data Infrastructure, and called for development of a National Geospatial Data **Clearinghouse**, spatial data **standards**, a National Digital Geospatial Data **Framework** and partnerships for data acquisition.
- Federal Geographic Data Committee FGDC
 

Chairman – Secretary of the Interior

Vice Chairman –  
DD of Office of Management  
& Budget

- Web access from <http://www.fgdc.gov/participation/>

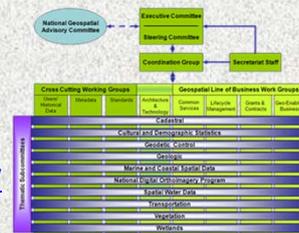


Figure 1: Structure of the Executive Order 12906



European Commission  
**INSPIRE**



- Legislation
- Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (INSPIRE) was published in the official Journal on the 25th April 2007.

Web access from <http://inspire.jrc.ec.europa.eu/>

## GIS law in Spain ( 2007 )

- Royal Decree 1545/2007, Chapter VI reorganizes the **NATIONAL GEOGRAPHIC HIGH COUNCIL**
  - Advisory group
  - Coordination of Cartography and GI
  - Representatives
    - ❖ 14 Ministries
    - ❖ 17 Regional Governments
    - ❖ 6 from Federation of Local Authorities
  - Technical Secretariat: IGN Spain



## GIS law in Spain ( 2010 )

- Law 12/2010  
Geographic information infrastructures & Services in Spain



Spanish NSDI ( IDEE ) Web access from [www.ideo.es](http://www.ideo.es)



## MINISTRY OF CONSTRUCTION AND TRANSPORTATION REPUBLIC OF KOREA

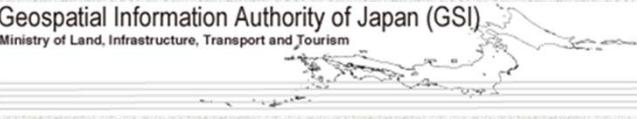
### GIS law in Korea ( 2000 )

- Implementation & Utilization of the NGIS
- Act ( 2000 April, Law No. 6201)
- Enforcement Decree (2000 July, President Decree No. 16890)
  - Establishment of Master Plan & Local Operation Plan, Management Committee, Executive Secretary, Subcommittees, Technical Support Agency, Fundamental GI, GI Database, Cooperative Council, Prevention of Overlapping, Investment, Distribution Management Organization, Meta Data, User fee, Security, Duplication.

Reference : GI Section, MOCT, Gwacheon-City, Gyeonggi-Do, 427-712, Korea



Geospatial Information Authority of Japan (GSI)  
Ministry of Land, Infrastructure, Transport and Tourism



### ❖ Basic Act on the Advancement of Utilizing Geospatial Information

## GIS law in Japan ( 2007 )

- The Geospatial Information Authority of Japan (GSI) is the only national organization that conducts basic survey and mapping and instructs related organizations to clarify the conditions of land in Japan and that provides the results of surveys to help improve this land.

Web access from <http://www.gsi.go.jp.html>

## Indonesia Geospatial Information Act ( 2011 )

- The House of Representatives of Indonesia passed the Geospatial Information Act. The GI Bill has been prepared in the 1990s.



Reference : [www.futuregov.asia/articles/category/government-gis/](http://www.futuregov.asia/articles/category/government-gis/)

## The Infrastructure (regulatory framework)

- Legislation + Government Administration
  - USA, European Union, Japan, Korea,...
- **Government Administration**
  - Australia, Canada, China, Singapore...

## Canada – SDI regulatory framework

- 1988 Inter-Agency Committee on Geomatics (IACG)
  - Steering Committee - Assistant Deputy Minister from 18 departments
  - Working Groups – Directors from 14 departments
- 1996 Canadian Geospatial Data Infrastructure Initiative
  - To enable timely access to geospatial data holdings and services in support of policy, decision making and economic development through a co-operative interconnected **infrastructure of government, private sector and academia** participants.
- 2001 Canadian Geomatics Accord
  - Canadian Council on Geomatics (CCOG)

**GeoConnections** > Mapping the future together online  
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## Canadian Geospatial Data Infrastructure

- Online access to government information
- National framework data
- International standards
- Data partnerships
- Data distribution - Supportive policy

*What are you looking for?*

**The Discovery Portal is your gateway for:**

- Datasets
- Raster Data
- Vector Data
- Web Map Services (WMS)

**Other Sources:**

- Maps (Atlas of Canada)
- Free Thematic Data (GeoGratis)
- Free Base Layers of Data (GeoBase)

Web access from <http://www.geoconnections.org/en/aboutcgdi.html>



**ANZLIC**  
the Spatial Information Council

ANZLIC - the Spatial Information Council is the peak intergovernmental organisation providing leadership in the collection, management and use of spatial information in Australia and New Zealand.

- Easy & cost effective access to spatial data
- Australian Spatial Data Directory
  - online metadata
- Standards
  - Content (data dictionaries, land use codes, ..)
  - Access (ISO TC211 GI series and information retrieval; OpenGIS Consortium & FGDC)
  - Exchange (Geography Markup Language, Scalable Vector Graphics, Uniform Resource Identifiers)

Web access from <http://www.anzlic.org.au/>



## 国家基础地理信息系统 National Fundamental Geographic Information System

- China provides 1:4,000,000 digital topographic data



- Data Dictionary
  - Data Layers
- Standard and Specifications
- Metadata
- Data Browsing
- Service
- Documents

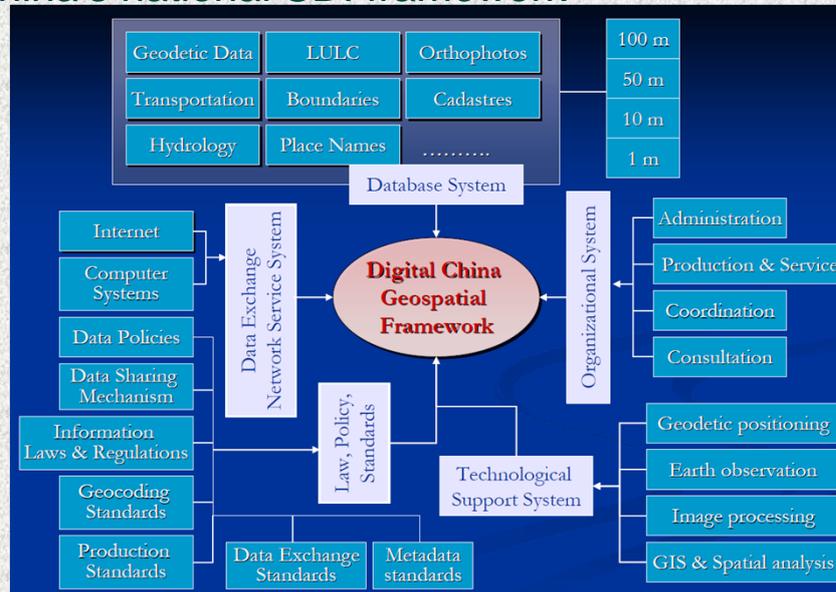
Web access from <http://nfgis.nsd.gov.cn/nfgis/english/default.htm>

## China's national SDI regulatory structure



Reference : [Ji, 2009]

## China's national SDI framework



Reference : [Ji, 2009]

## Singapore SDI regulatory framework

- 1984 Civil Service Data Administration Program
  - Land Data, Population Data & Business Data
- 1989 Land Data Hub
  - From CD rom data in 1990s to online delivery in 2004
  - INLIS – sale office
- 2007 LandNet web based
- 2010 Integrated Government



## NSDI – benchmark components

- Policy
  - Executive branches
  - Development plan
  - Fundamental Geographic Information (Data types)
  - Data sharing – partnerships
- Geospatial Data Clearinghouse
  - Data access through internet
  - Operating procedure
- Data Standard
  - Data collection, exchange, storage



**GGIM**

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### National Policies on Geospatial Information:

Spatial Data Infrastructure, Regulatory Practices, Information Management Issues

#### PARTNERS

	China	State Bureau of Surveying & Mapping
	China, Hong Kong SAR	"Survey and Mapping Office, Lands Department "
	China, Macao SAR	Macao Cartography and Cadastre Bureau

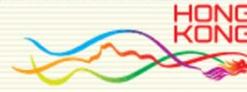
- SMO is the SDI government representative organization in Hong Kong

## Government SDI Policy (1)



**Development Bureau**

The Government of the Hong Kong Special Administrative Region



Final Report on Implementation of Data Alignment Measures for the Alignment of Planning, Lands and Public Works Data (March 2004)

- 2004 - Data Alignment Measures
  - Slope, Building, Lot, Road Contour line & TPU/SB

## Government SDI Policy (2)

Ref.: HPLB(P&L) 6-15/17

Housing, Planning and Lands Bureau  
Murray Building  
Garden Road  
Hong Kong

28 June 2007

**HOUSING, PLANNING AND LANDS BUREAU  
TECHNICAL CIRCULAR (PLANNING AND LANDS)  
NO. 2/2007**

**Administration of Digital Geographic Data**

- **Background**
  - A department may own several GISs
  - Still many GISs are developing
  - Data Alignment Measure for 15 departments
- **The Policy**
  - To appoint a GIS Manager for each department and a GIS Administrator for each GIS in the same department.
  - GIS Manager is to formulate and implement strategy for developing GIS.

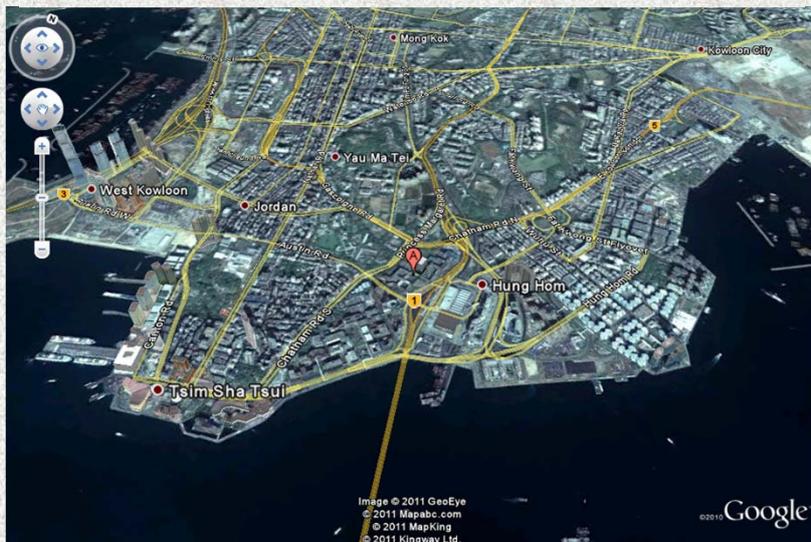
### Government SDI Policy (3)

- 14 May 2008
- Legislative Council Questions 15 : Spatial Data Infrastructure
  - In collaboration with the Lands Department, the Office of the Government Chief Information Officer(OGCIO) plans to provide geo-spatial information services to the public through GovHK supported by a **geo-spatial information hub**.

### By 2008, Google Maps are seen in HK

Google maps

Hong Kong Polytechnic University, Hong Kong



## HK Government launches open data portal

- Launched on 31 March 2011 ( 1.5 year pilot scheme )
- web-based open data portal - [data.one.gov.hk](http://data.one.gov.hk).
- The pilot open data initiative aims to encourage the wider **dissemination** of geo-referenced government facility **data** and traffic-related data across the community.



## Data.One GovHK 香港政府一站通



- **Data.One** is a portal to facilitate the dissemination of Public Sector Information (PSI) for value-added re-use.
- Geo-referenced data & real-time traffic data for free download.

Web access from <http://www.gov.hk/en/theme/psi/welcome/>



Supply image, not the map data



GeolInfo Map (地理資訊地圖)



## Data Download for Traffic Speed Map, Journey Time Indicators and Special Traffic News

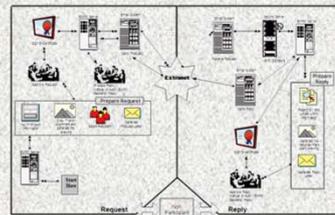
Type of Raw Data	Updating Frequency	Metadata	Source File	Schema
<p><b>Traffic Speed Map</b></p> <p>The traffic speed map provides you with the average traffic speed of the main roads in Hong Kong, Kowloon and the New Territories (South).</p>	Every 5 minutes			<p>In PDF format  (Last Update : 31.3.2011)</p> <p>In XML format  (Last Update : 31.3.2011)</p>
<p><b>Journey Time Indicators</b></p> <p>The journey time indicators provide you with average cross-harbour journey time between Hong Kong Island and Kowloon.</p>	Every 2 minutes			<p>In PDF format  (Last Update : 31.3.2011)</p> <p>In XML format  (Last update : 31.3.2011)</p>
<p><b>Special Traffic News</b></p> <p>The special traffic news let you know the latest special traffic and transportation arrangements through the territory in times of traffic incidents.</p>	As and when necessary			<p>In PDF format  (Last update : 31.3.2011)</p> <p>In XML format  (Last update : 31.3.2011)</p>

## Government Depts with SDI Data

- Architectural Services Department
- Buildings Department
- Census and Statistics Department
- Civil Engineering and Development Department
- Drainage Services Department
- Electrical and Mechanical Services Department
- Environmental Protection Department
- Highways Department
- Housing Department
- Lands Department
- Land Registry
- Planning Department
- Rating and Valuation Department
- Transport Department
- Water Supplies Department

## Facility Data

- **Electronic Mark Plant Circulation System (EMPC)** (2002)
- Joint project – 12 participants (facility corporations & government departments)
- **Computerized information exchange system**
- System development: Joint Utility Policy Group
- Mass Transit Railway appointed the contractor: UtilityINFO Limited



Reference : [Li & Cheng, 2010]

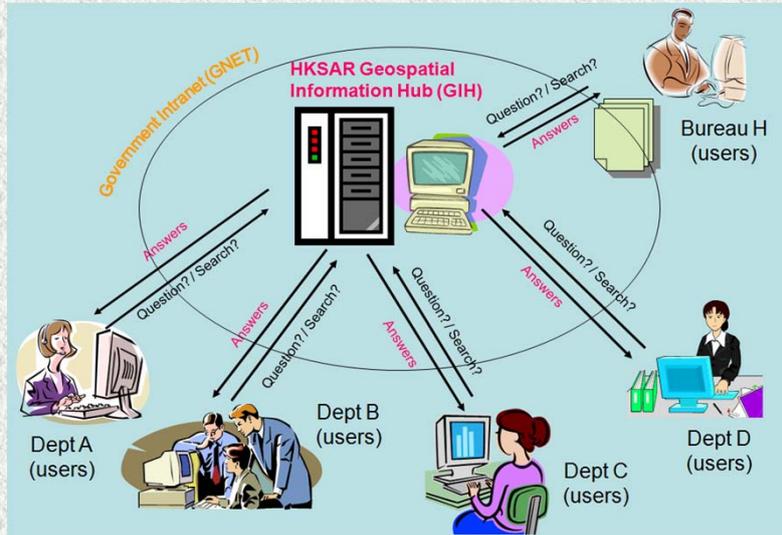
## Individual Departmental Databases

- Data with different structure, quality and standard.



Developed after [Seifert, 2007]

## Geospatial Information Hub data circulation within the Government



Reference : [Sung, 2007]

## HK SDI Development



## Data Integration

- Legal, institutional, policy & social issues amongst government departments and facility corporations (data providers)
- Technical Problems

Semantic heterogeneity	meaning/interpretation
Structural heterogeneity	data structure
Syntactic heterogeneity	search & query

Reference : [Mohammadi, 2007]

## Summary

- Hong Kong is a rich society with a wealth of SDI data.
- The policy on SDI is rather preliminary, as compared with the advanced societies.
- A legal structural development for SDI is preferable because it legally defines the data and settles the arrangement amongst data providers.

## References

- KRIHS (2007). Establishment of National GIS of Korea, Special Report Volume 8, Korea Research Institute for Human Settlements, ISBN 978-89-8182-528-7.
- Li, S. & Cheng, H. (2010). Develop a GIS-based Electronic Mark Plant Circulation system in a collaborative and end-user computing approach, pdf file on ppt presentation, MTRC\_Utility Info.pdf, accessed from [http://www.esrichina-hk.com/events/presentation/MTRC\\_Utility%20Info.pdf](http://www.esrichina-hk.com/events/presentation/MTRC_Utility%20Info.pdf)
- Mohammadi, H. (2007). Spatial Data Integration: a Necessity for Spatially Enabling Government, Towards a Spatially Enabled Society, Edited by Abbas Rajabifard , The University of Melbourne, p.333-341.
- Ji, M. (2009). China's National Spatial Data Infrastructure CNSDI: Current Status and Prospect, powerpoint presentation in the 4<sup>th</sup> International Symposium on NSDI, Tokyo, Japan, June 2009.
- Sung, H. (2007). "GeoSpatial Information Hub in HKSAR", Lands Department, HKSAR Government, ppt presentation in FIG Commission 7 Annual Meeting, Souel, Korea, 2007.
- Williamson, I. et al (2010). Land Administration for Sustainable development, ESRI Press Academic, Redlands, California, USA.

Thank You