

This is not an ADB material. The views expressed in this document are the views of the author/s and/or their organizations and do not necessarily reflect the views or policies of the Asian Development Bank, or its Board of Governors, or the governments they represent. ADB does not guarantee the accuracy and/or completeness of the material's contents, and accepts no responsibility for any direct or indirect consequence of their use or reliance, whether wholly or partially. Please feel free to contact the authors directly should you have queries.

National Spatial Data Infrastructure

2019. 10. 31

No, JONGILE



Name: No, Jongile

Department: Global Business Department(LX)

Contact: +82-10-5306-7494

E-mail: njl03@korealx.org

<Education Background>

- Geoinformatic Engineering at Inha University
- Geospatial and Mapping Sciences at Glasgow University

Contents

I . What is the NSDI?

II. Korea's experience

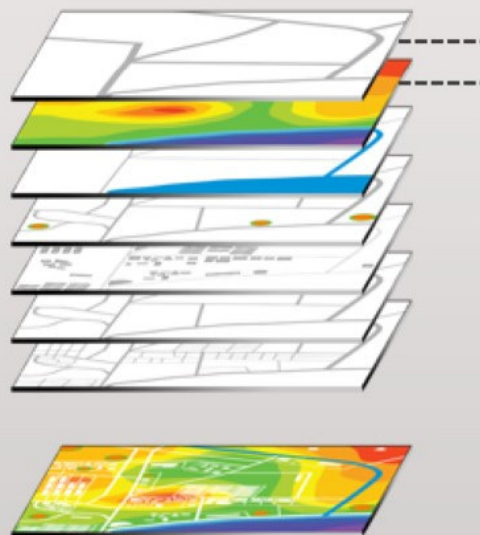
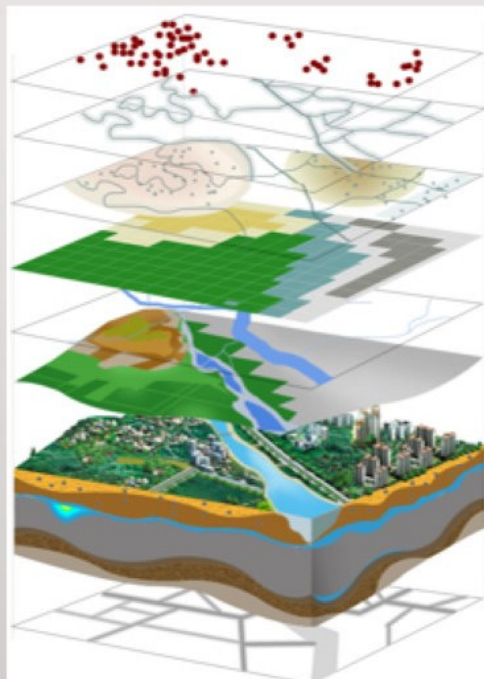
III. Cases of other countries



Korea Land and
Geospatial InformatiX Corporation

► 01 – What is Spatial Data?

- Spatial data contains location information and attributes of geographic features
- Map is a typical form of spatial data
(real world features → paper map or digital map)



Intuitive!

ID	Type	Year	...
1	Highway	1995	...
2	Interstate	2002	...
...

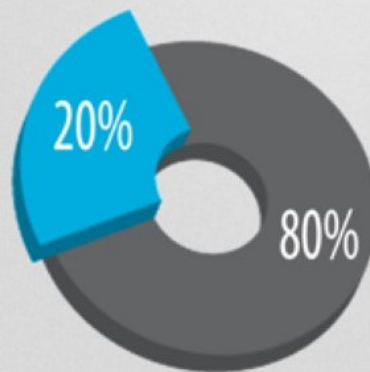
Integrated!!

Easy to understand and communicate!!!

► 01 – Why Spatial Data is Important?

- Approximately 80% of all data has a spatial(location) component
 - Used for various government services (e-Gov), disaster management, resource allocation, climate change, etc.
- Governments should produce and manage spatial data efficiently to serve their citizen and to facilitate their economic growth
- Spatial Data Infrastructure (SDI) helps government to produce, manage, access, and share spatial data

**80% of
Data is
Geographic**

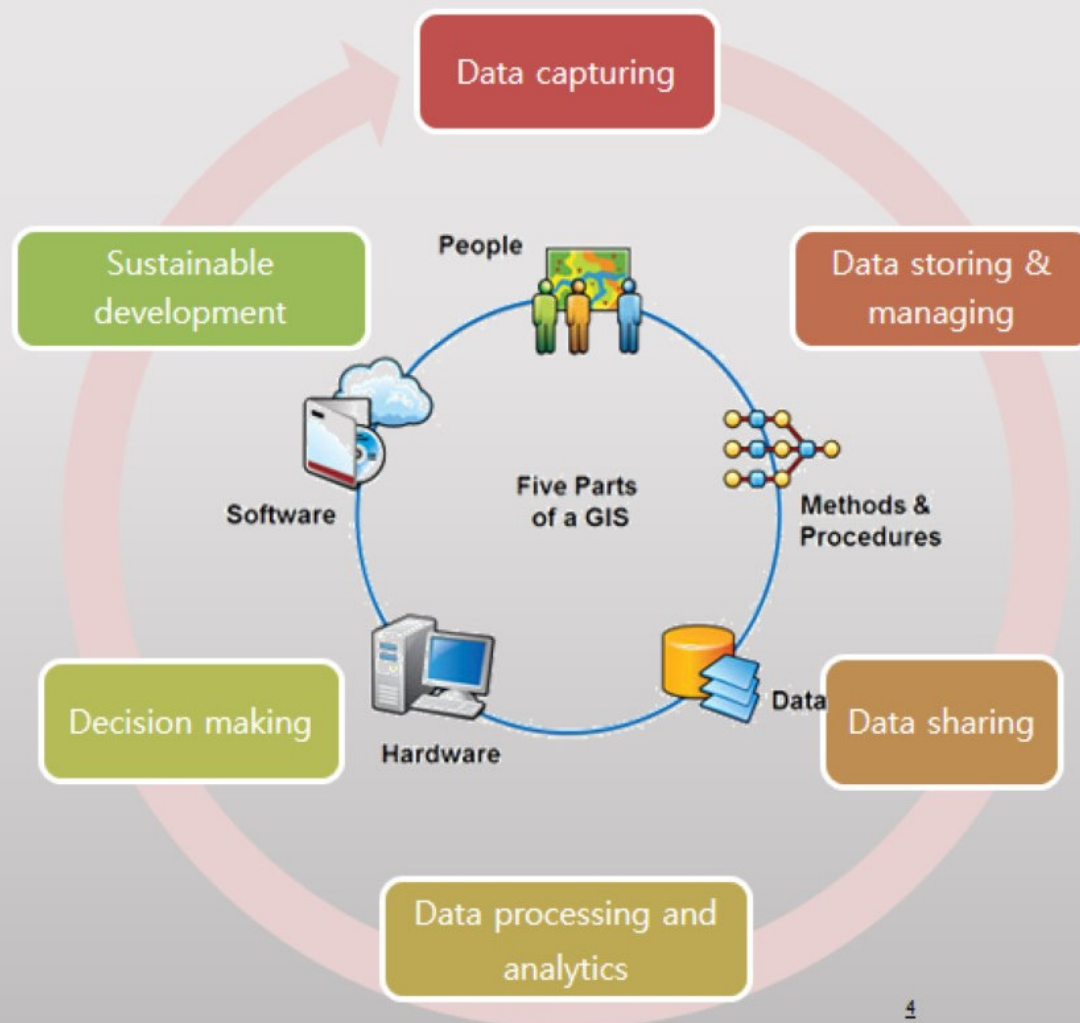


► 01 – Who needs and uses Spatial Data?



► 01 – Geographic Information System (GIS)

- **Geographic Information System (GIS)** is a system designed to capture, store, manipulate, analyze, manage, and present **(Geo)spatial data**



What GIS can do?

- ✓ Identify problems
- ✓ Monitoring changes
- ✓ Manage & respond to events
- ✓ Perform forecasting
- ✓ Set priorities
- ✓ Understand trends

► 01 – What motivates SDI as a National Policy?

- Case 1: Disaster prevention & management issues
- Case 2: Land disputes & management issues



Seoul gas explosion in 1994



Daegu gas explosion in 1995



Mismatched boundaries



Kobe earthquake in 1995

أحداث ارتداد الوحدة العقارية وفق القواعد الأولية									
رقم	خطة العقول	شماره	شماره	شماره	شماره	شماره	شماره	شماره	شماره
1	100	100	100	100	100	100	100	100	100
2	100	100	100	100	100	100	100	100	100
3	100	100	100	100	100	100	100	100	100
4	100	100	100	100	100	100	100	100	100
5	100	100	100	100	100	100	100	100	100
6	100	100	100	100	100	100	100	100	100
7	100	100	100	100	100	100	100	100	100
8	100	100	100	100	100	100	100	100	100
9	100	100	100	100	100	100	100	100	100
10	100	100	100	100	100	100	100	100	100

التوقيع على صحة البيانات المقدمة أعلاه	أسماء أعضاء الفريق المتاحين
أحمد عيسى الكفوي	1- أحمد عيسى الكفوي
صالح محمد النور	2- صالح محمد النور
جاسم مريز مالحو	3- جاسم مريز مالحو
م. س. محمد الزهراني	4- م. س. محمد الزهراني

No spatial data

► 01 – What is a Spatial Data Infrastructure (SDI)?

“The term Spatial Data Infrastructure (SDI) is often used to denote the relevant base collection of technologies, policies and institutional arrangements that facilitate the availability of and access to spatial data.”

“The word infrastructure is used to promote the concept of a reliable, supporting environment, analogous to a road or telecommunications network, that, in this case, facilitates the access to geographically-related information using a minimum set of standard practices, protocols, and specifications.”

- The SDI Cookbook



► 01 – Who adopted SDI as a national policy?

The first generation of national spatial data infrastructures

- Australia ALIC/ASDI 1986
- USA FGDC/NSDI 1990
- Qatar NCGIS/NGIS 1990
- Portugal CNIG/SNIG 1990
- Netherlands Ravi/NGII 1992
- Indonesia Bakosurtanal/NGIS 1993
- Malaysia NaLIS feasibility study 1994
- Korea NGIS 1995
- Japan NSDI 1995
- Canada CGDI 1996
- Britain NGDF 1996
- ... and many more

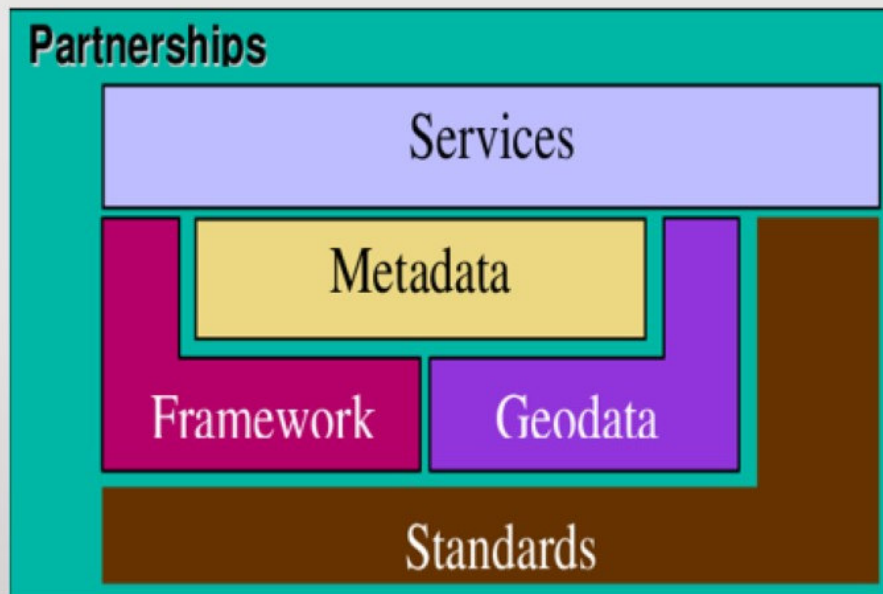
By Ian Masser



https://en.wikipedia.org/wiki/Spatial_data_infrastructure

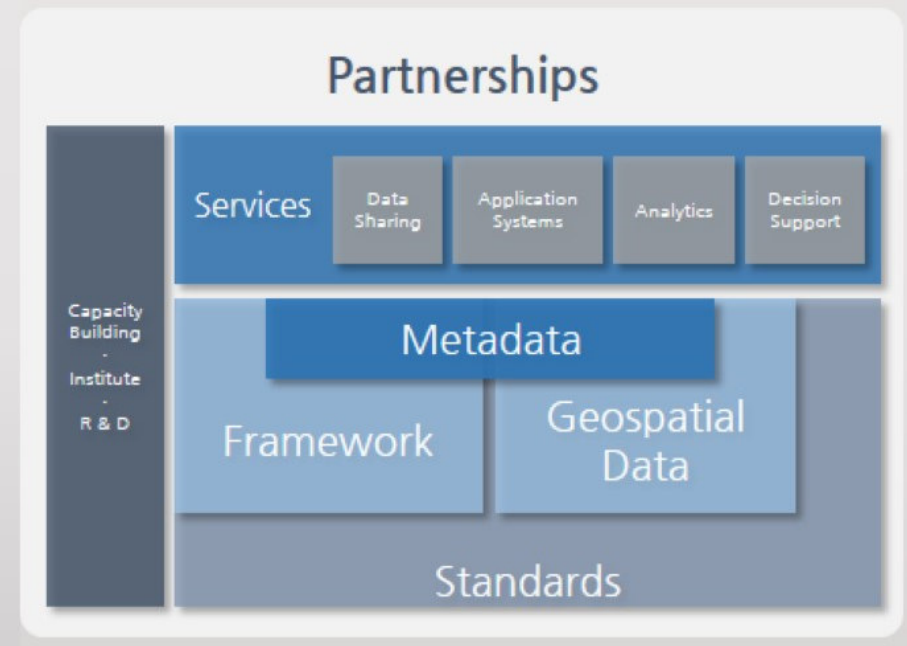
► 01 – Components of NSDI

USA



Source: www.fgdc.gov/components

Korea



~~Inconsistency~~

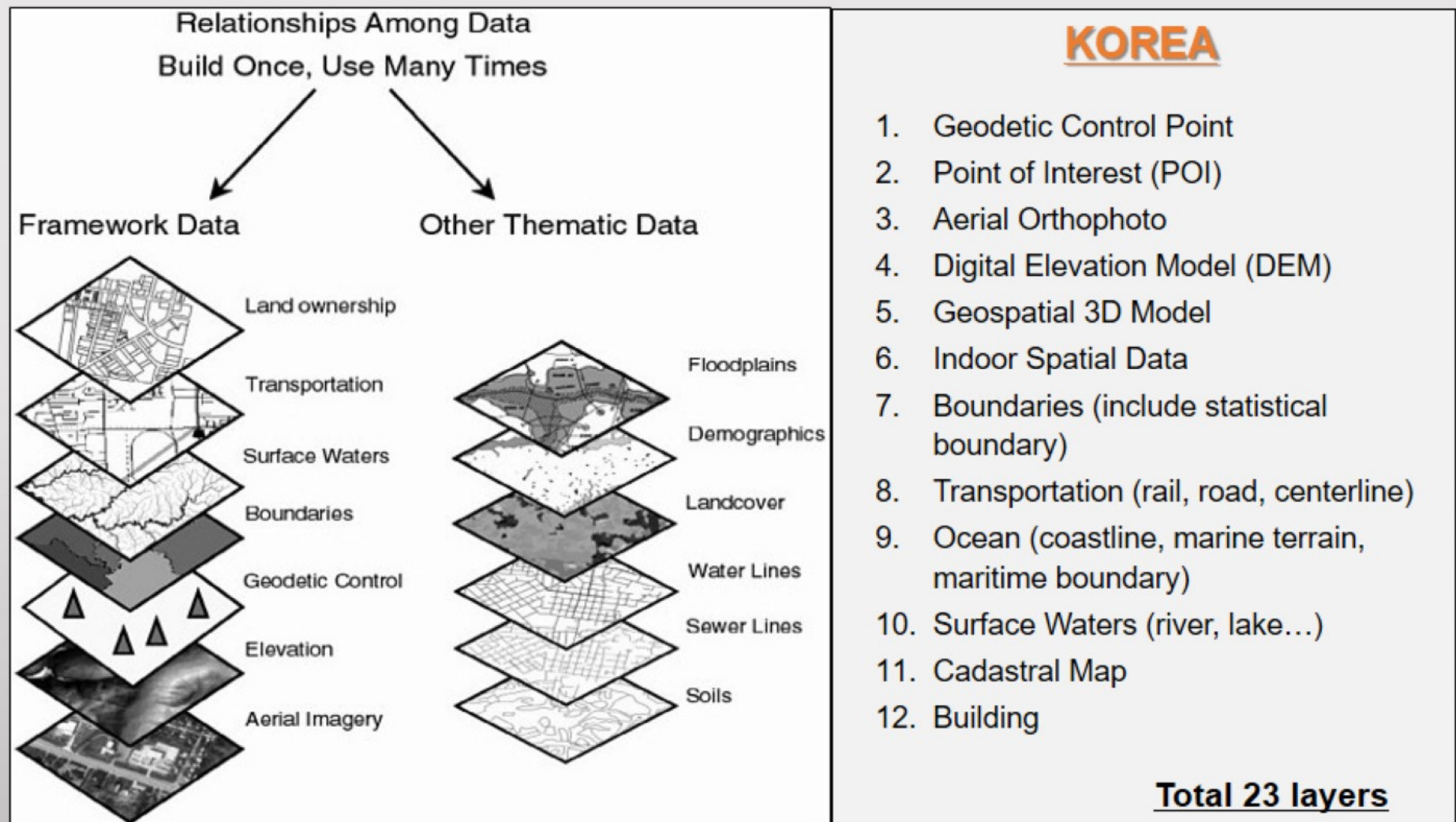
~~Duplication~~

~~Inefficiency~~

Interoperability

Sharing

► 01 – Components of NSDI : Why Framework Data?



► 01 – Components of NSDI : Why standard?



► 01 – Components of NSDI : Why Metadata?

Metadata is defined by the New Merriam-Webster Dictionary as “data that provides information about other data”. Geographic metadata is used to document the attributes of geographic data, e.g. database files and data develop within a Geographic Information System (GIS), in the same way that the nutrition label to the right documents the attributes of a food product.

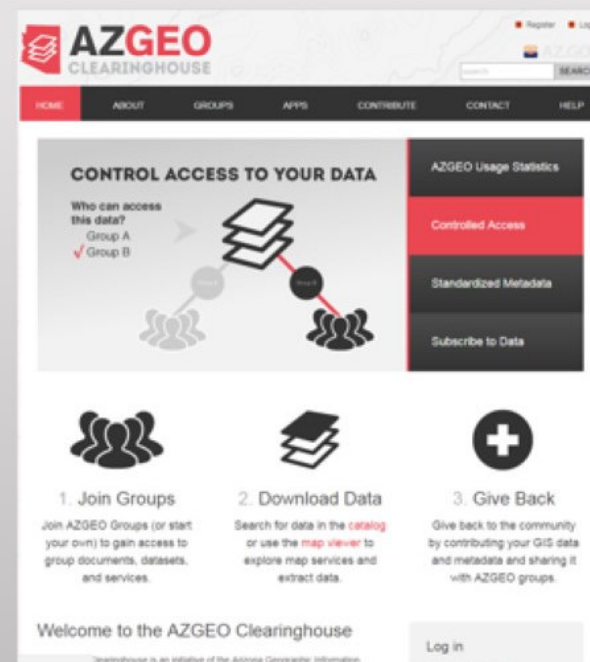
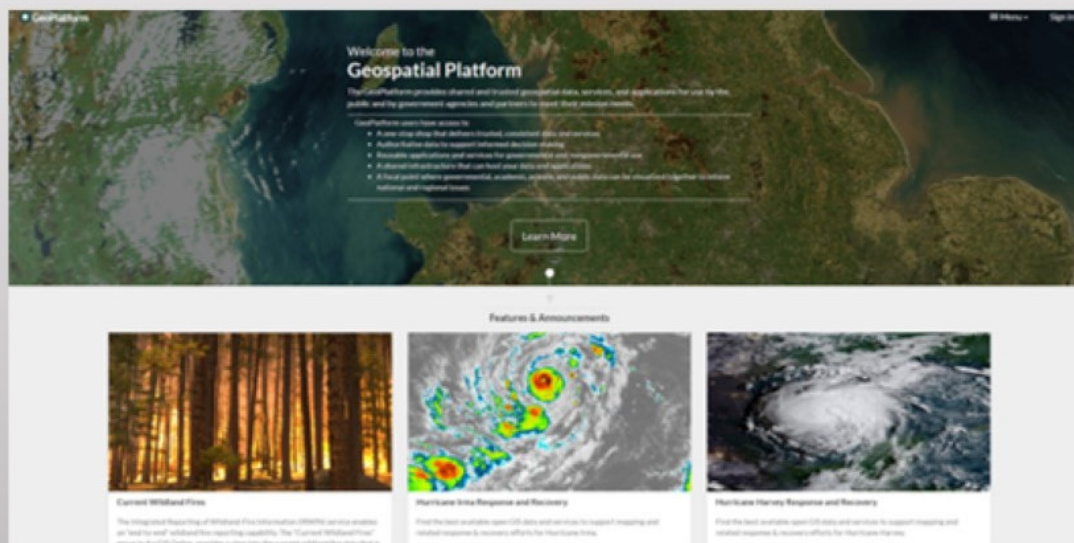
- [Geospatial Metadata Fact Sheet](#) by FGDC

The International Standards Organization (ISO) geographic metadata standard (19115)

Nutrition Facts	
8 servings per container	
Serving size	2/3 cup (55g)
Amount per serving	
Calories	230
% Daily Value*	
Total Fat 8g	10%
Saturated Fat 1g	5%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 160mg	7%
Total Carbohydrate 37g	13%
Dietary Fiber 4g	14%
Total Sugars 12g	
Includes 10g Added Sugars	20%
Protein 3g	
Vitamin D 2mcg	10%
Calcium 260mg	20%
Iron 8mg	45%
Potassium 235mg	6%
<small>* The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.</small>	

► 01 – Components of NSDI : Why Geoportal?

- Korea <http://www.nsd.go.kr/lxportal/?menuno=2679>
- United States <https://www.geoplatform.gov/>
- EU <http://inspire-geoportal.ec.europa.eu/>
- Philippines <http://www.geoportal.gov.ph/>
- UAE Abu Dhabi <http://geoportal.abudhabi.ae/geoportal/>
- Luxembourg <https://www.geoportail.lu/en/>



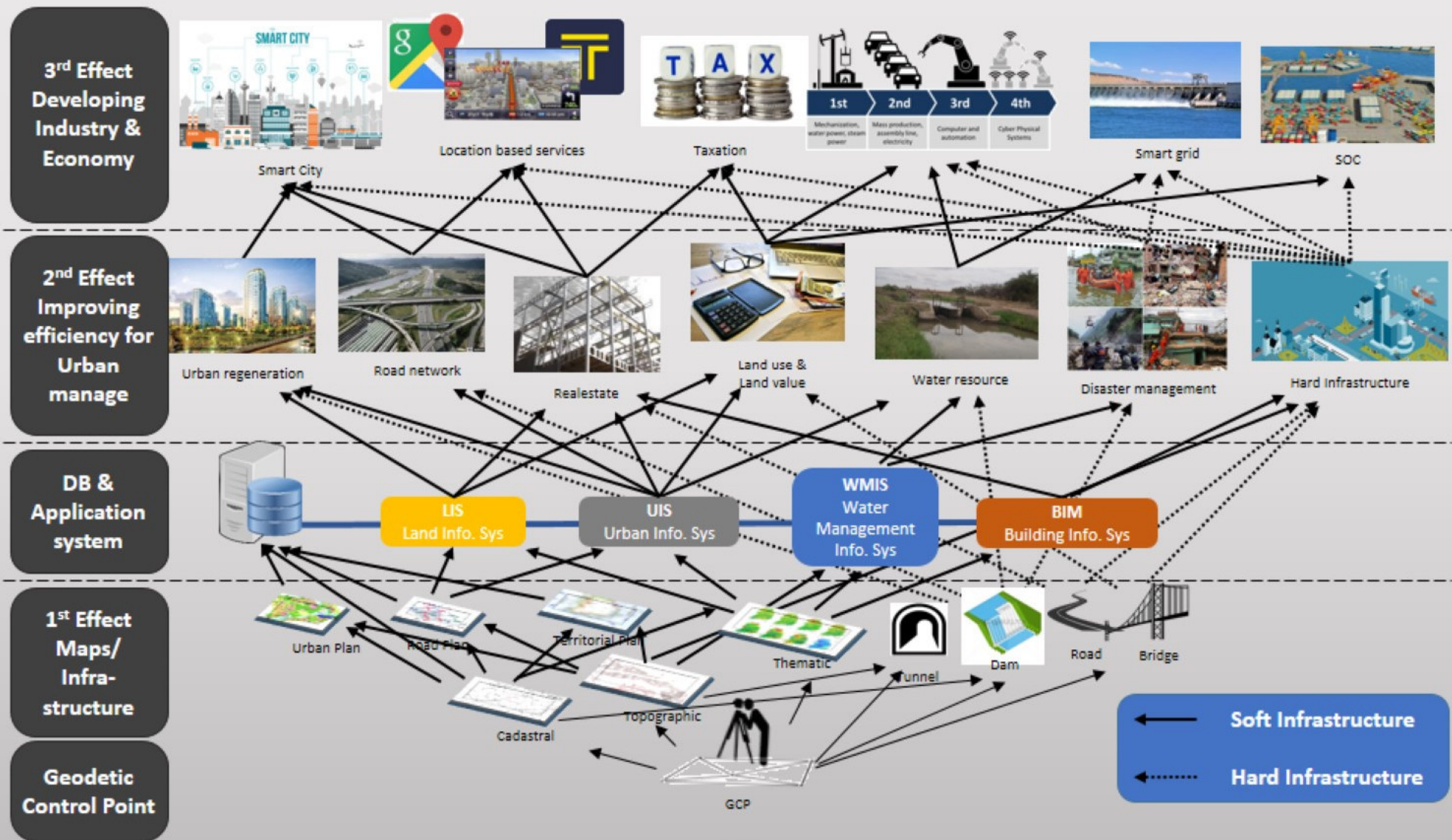
► 01 – NSDI in developed & developing countries

- Developed countries around the world have nation-wide policy, organizations and institutions for spatial data infrastructure
- Developing countries are setting up and developing their SDI

Phase of NSDI in developing countries

	Integration / Geospatial Platform	Korea, USA, EU countries
3 rd Phase	Application System	Vietnam, Kazakhstan, Turkey, Thailand, the Philippines
	Land Information System	
2 nd Phase	Thematic Map	Mongolia, Uzbekistan, Myanmar, Sri Lanka
	National Base Map	
1 st Phase	National Base Map	Cambodia, Laos, Bangladesh, Pakistan, Indonesia
	Establishment of GCP	

► 01 – How SDI can help developing country?



► 02 – History of KSDI

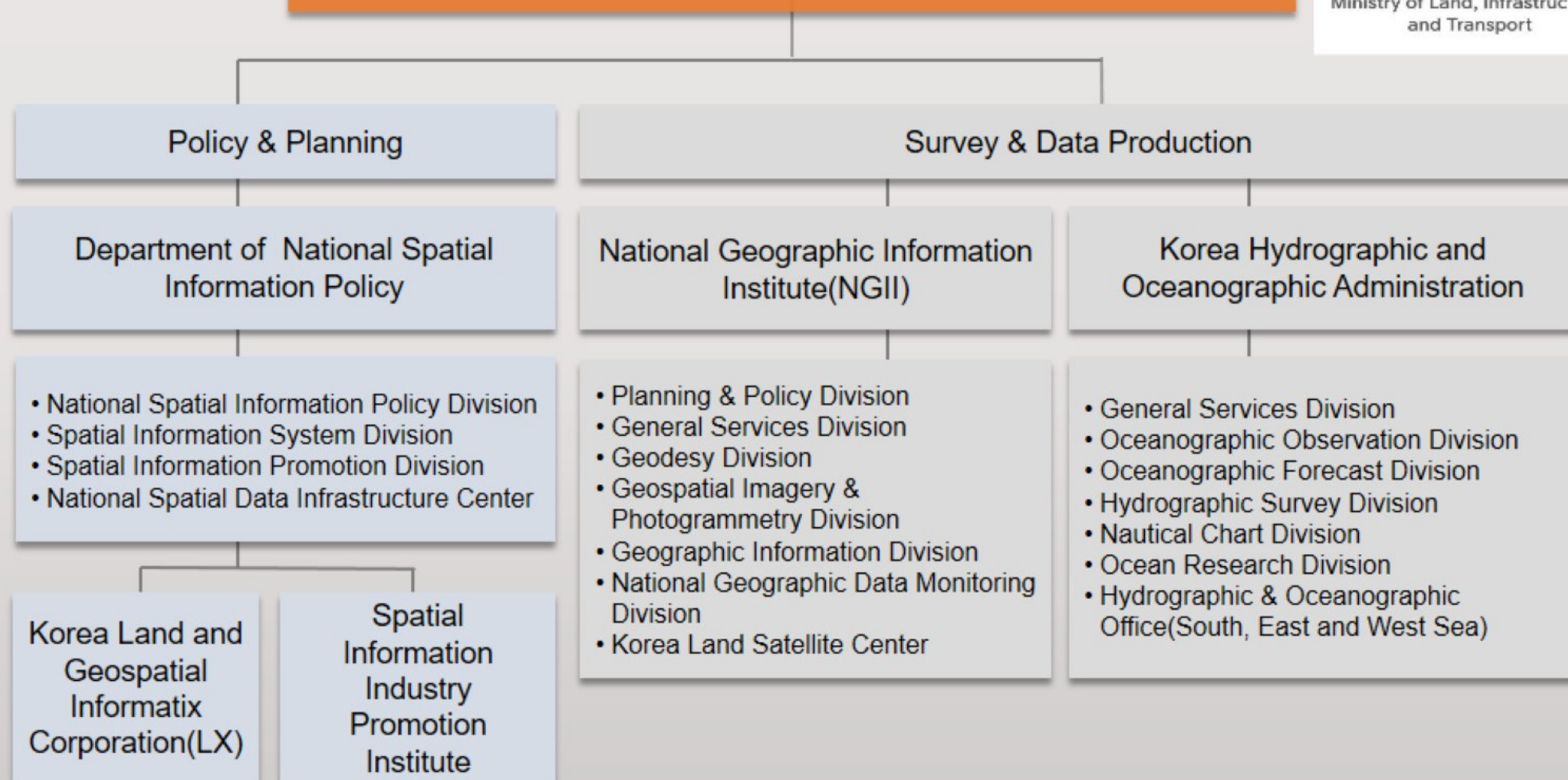
1995	Establishment of “NGIS Team” in Ministry of Construction and Transportation (MoCT) Establishment of the 1 st KSDI Master Plan
2000	Enactment of the NGIS Law Establishment of the 2 nd KSDI Master Plan
2006	Establishment of the 3 rd KSDI Master Plan
2008	Establishment of “Department of Spatial Information Policy” in Ministry of Land, Transport and Maritime Affairs (MLTM)
2009	Enactment of the ‘NSDI Law’ Enactment of ‘Spatial Industry Promotion Law’ Enactment of ‘Survey & Cadastral Law’
2010	Establishment of the 4 th KSDI Master Plan
2013	Establishment of the 5 th KSDI Master Plan
2015	Revision of the Laws related to Spatial Information
2018	The 6 th KSDI Master Plan

► 02 – Key organizations of KSDI

Ministry of Land, Infrastructure and Transport(MoLIT)



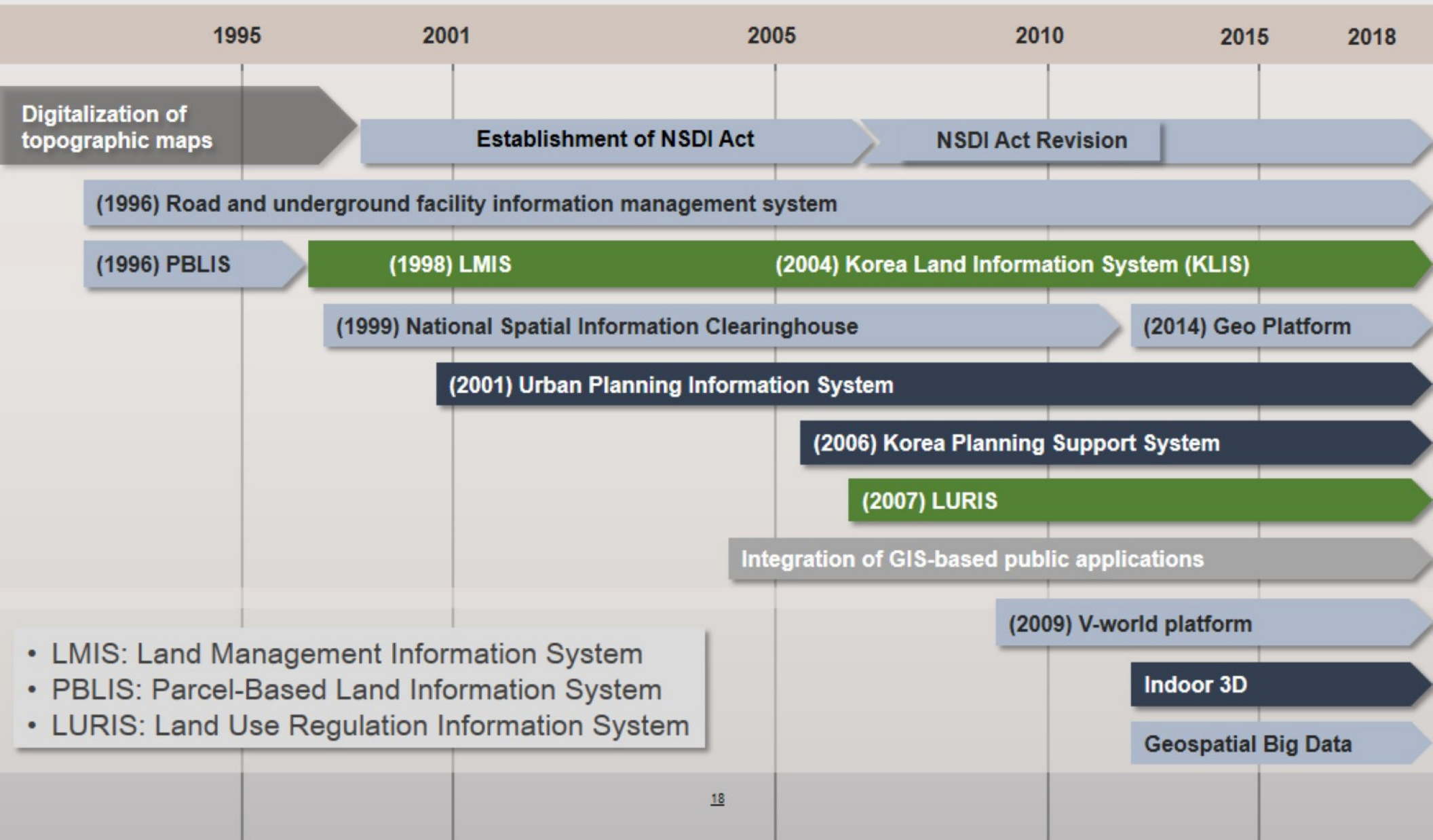
Ministry of Land, Infrastructure
and Transport



► 02 – Progress of KSDI

Phase	1 st Phase (1995~2000)	2 nd Phase (2001~2005)	3 rd Phase (2006~2010)	4 th Phase (2010~2013)	5 th Phase (2013~2017)	6 th Phase (2018~2022)
Objective	Initiating NSDI	Development of Application Systems	Expanding application systems	Integration of database & application systems	Government 3.0	Infrastructure for Smart Korea
Strategic Goals	<ul style="list-style-type: none"> • Enacting NSDI law • Organizing NSDI committee • Converting paper map to digital map • Managing and distributing spatial data 	<ul style="list-style-type: none"> • GIS applications for government services (ex, LMIS, facility management) • Establishing clearing house 	<ul style="list-style-type: none"> • System Integration • Strengthening partnership among all levels of government and private sectors 	<ul style="list-style-type: none"> • Establishment of 3D data for representing real world • Expanding integration of application systems 	<ul style="list-style-type: none"> • Open and share all public data • Establishment of Indoor spatial data • Provide on-demand spatial data • Convergence of spatial data with other data or contents 	<ul style="list-style-type: none"> • Value added spatial data • Activating Geospatial platform for sharing spatial data • Promoting spatial industry • Reorganizing governance system

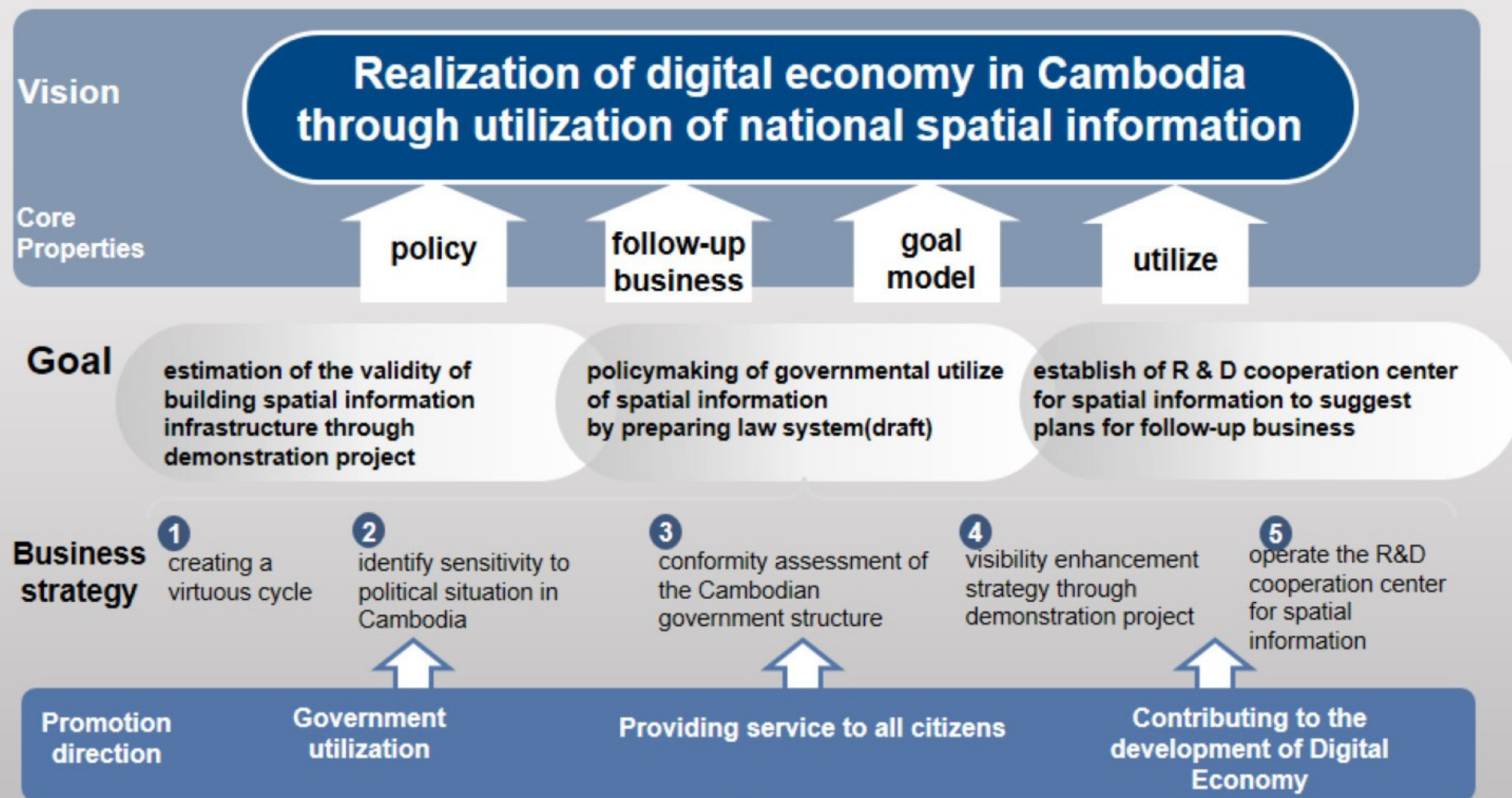
► 02 – Major application systems



► 03 – Master Plan on Spatial Information Infrastructure



Assist realize digital economy and sustainable economic growth by establishing to build a spatial information infrastructure Master plan for founding an efficient national land development plan and to support policy decision.



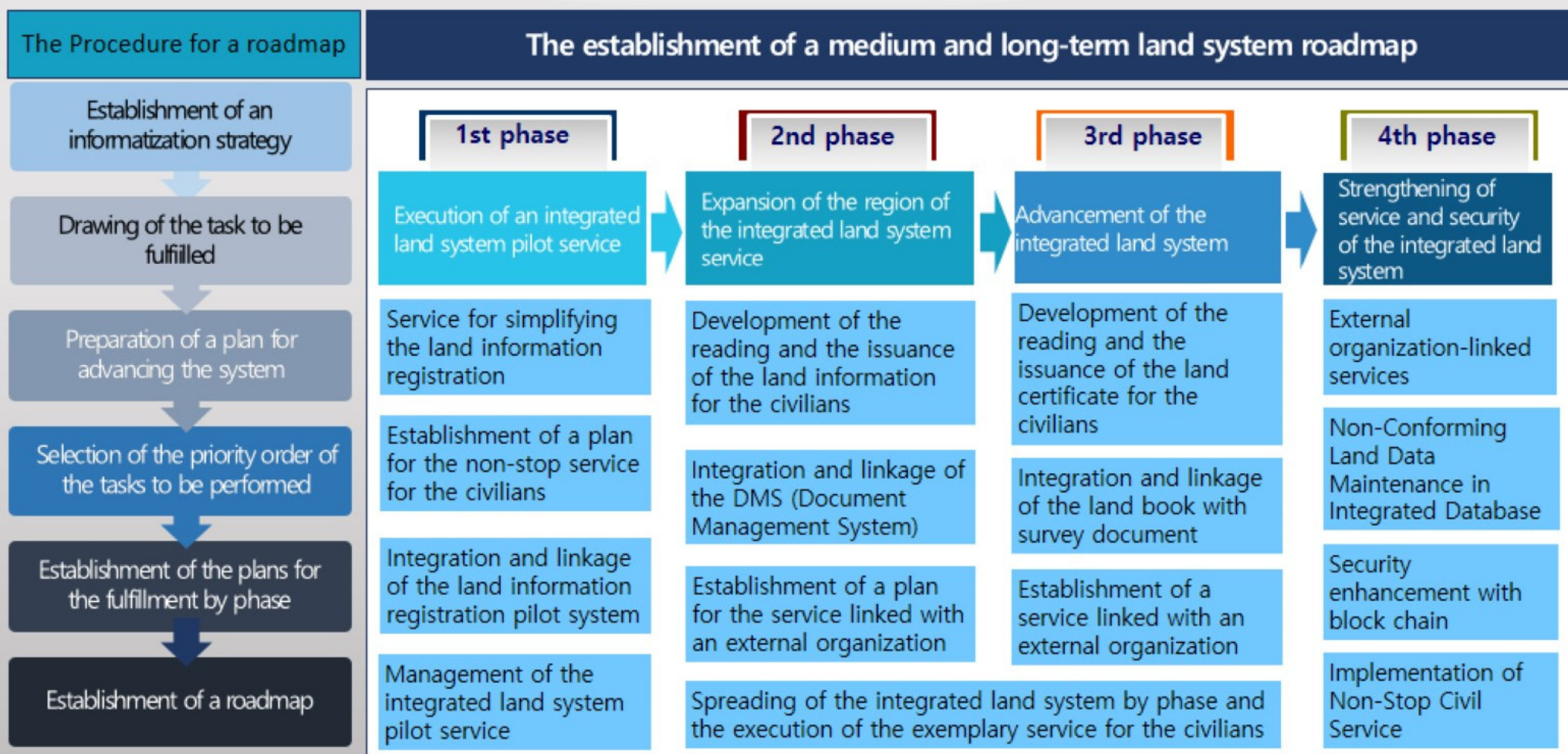
► 03 – Master Plan on Spatial Information Infrastructure



Vision	Construction of 'Smart Land Infrastructure' for building national economy basis			
Goal	Systematic land policy	Transparent land information	Efficient land administration	Autonomous capacity building
Strategy	Improving and strengthening legal system related to land information	Digitization of land registration and land information	Cloud platform for land administration, policy, sharing	Strengthening capacity through building education infrastructure
Task	Preparation of guide for land registration and management business	Construction of continuous digital cadastral map(urban, agricultural, forest)	Land information (Administration, Policy) System construction	Building professional educational institution for spatial and land information
	Complementation of the work manual related to land survey	Digitizing and updating land information	Land information coutilization system construction	Establishment of education system for public officials to improve job capacity
	Strengthening regulations on land tax and fee	Construction of the land information archive	Land valuation system construction	Modernization of instruments(UAV) for land survey and update
	Securing basis of land information sharing infrastructure	Advancement of spatial information such as land use and national land plan	Land information center(Cloud platform) construction	Nationwide establishment of CORS(Continuously Operating Reference Station)

► 03 – Master Plan on Spatial Information Infrastructure

The presentation of an integrated land system roadmap based on the results of the Status Analysis



Q & A