
Current Status of NSDI and IGIF in Republic of Korea

– IGIF Regional Seminar –

2024. 11. 27.(Wed)

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I

NSDI Implementation in Republic of Korea

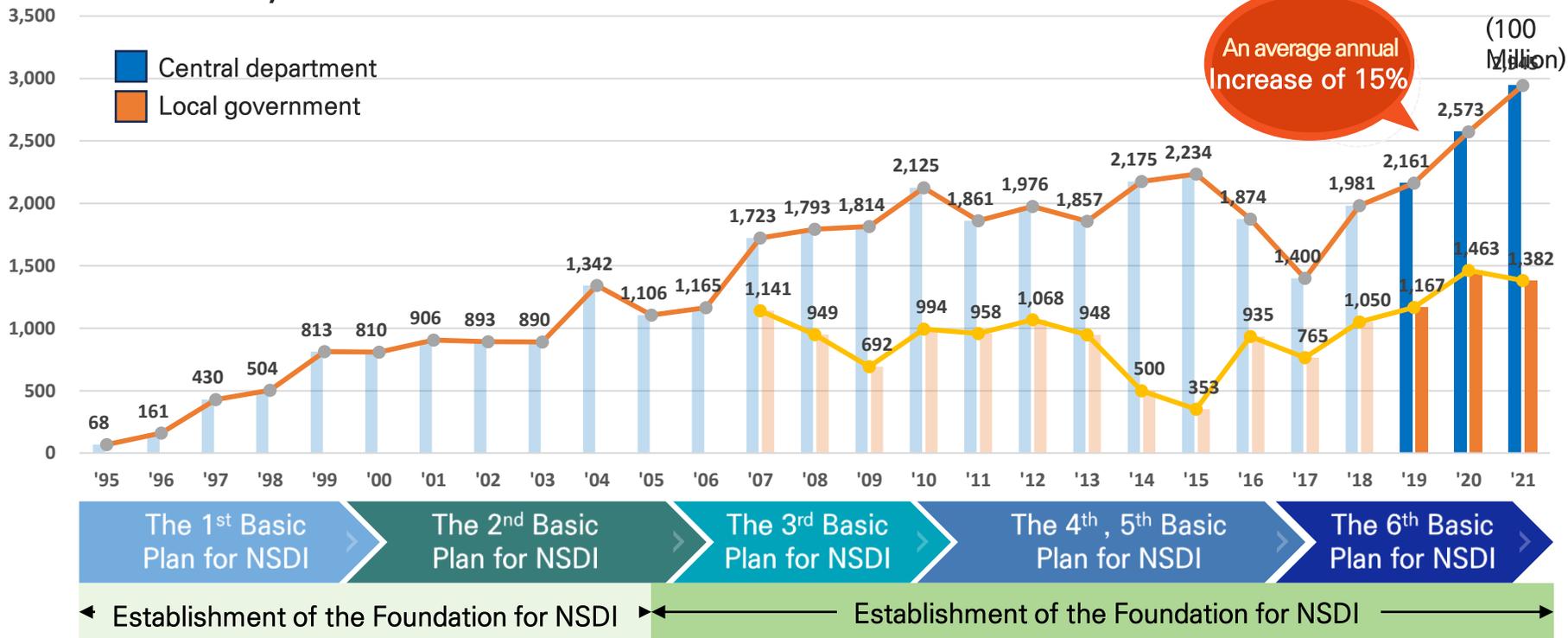
01 · NSDI Implementation in Republic of Korea

Progress of Implementation

“ Promotion of GIS Adoption Policy ”
in Korea Due to Increased Demand
for Digitalization of Facilities



Current Status of the National Spatial Information Policy



01 · NSDI Implementation in Republic of Korea

Main contents of the 1st to 6th Basic Plans for NSDI

The 1st Basic Plan for NSDI

▶ Foundation Establishment('95~'00)

- Digitalization of Topographic and Cadastral Maps
- Development of Thematic Maps such as Land Use and Subsurface Facility Maps
- Development of Mapping Technologies, DB Tools, and GIS Software



The 2nd Basic Plan for NSDI

▶ Foundation Expansion('01~'05)

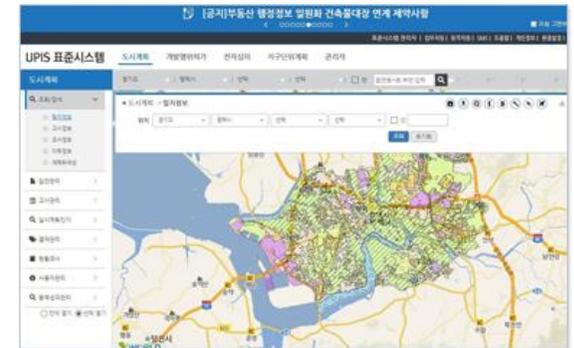
- Establishment of Basic Data such as Roads, Sewage Systems, and Buildings
- Promotion of GIS-based Systems for Land Use, Subsurface, Environment, Cultural Heritage, Marine, Agriculture, and Forestry
- Development of 3D GIS and High-Precision Satellite Image Processing Technologies



The 3rd Basic Plan for NSDI

▶ Utilization and Diffusion('05~'10)

- Establishment of National Base Maps, Marine Base Maps, and Aerial Imagery
- Promotion of Utilization Systems for Integrating 3D National Geospatial Information, UPIS, KOPSS, and Buildings
- Improvement of National Spatial Information Network



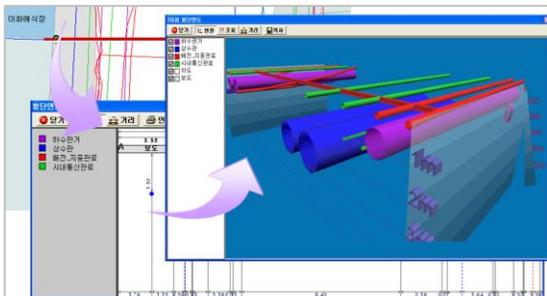
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Main contents of the 1st to 6th Basic Plans for NSDI

The 4th Basic Plan for NSDI

Integration and Linkage('10~'12)

- Establishment of Maintenance, Management, and Utilization Systems for Geospatial Information
- Development of Digital Cadastral Systems
- Establishment of 3D National Geospatial Information
- Development, Commercialization, and Distribution of Domestic GIS Solutions



The 5th Basic Plan for NSDI

Convergence and Utilization('13~'17)

- Establishment of Basic Spatial Information System
- Expansion of High-Precision 3D and Indoor Geospatial Information development
- Gradual Opening of All Geospatial Information, Except for Special Cases such as National Security
- Improvement of Systems for Sharing Geospatial Information Created by the Private Sector



The 6th Basic Plan for NSDI

Value creation('18~'22)

- Production of Geospatial Information that Creates Value
- Promotion of Innovation Sharing through Geospatial Information Platforms
- Fostering the Geospatial Information Industry to Create Jobs
- Creating a Collaborative Policy Environment through Participation

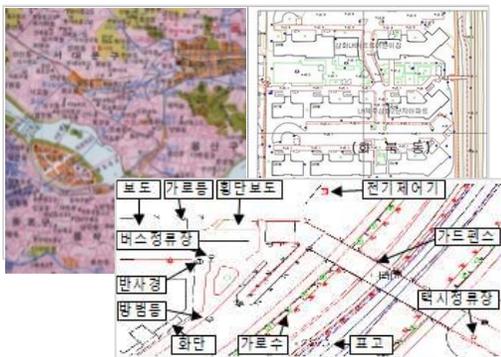


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Main Achievements of the 1st to 6th Basic Plans for NSDI

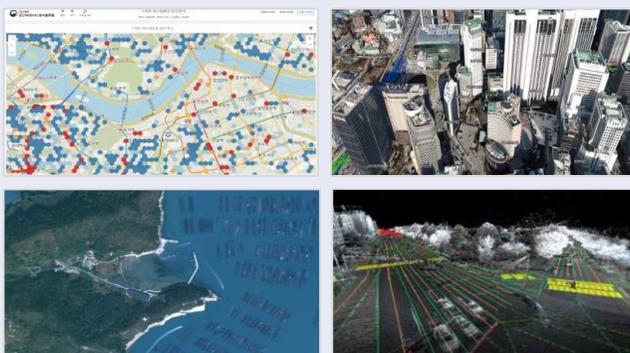
Changes in the Geospatial information production system

▶ Evolution from Paper Maps to 2D/3D Digital Geospatial Information Production Systems



- Started with the Computerization of Paper-based Printed Maps

Development of Various Forms of Geospatial Information



- Including National Base Maps, Thematic Maps, Subsurface Facility Information, 3D Geospatial Information, and High-Precision Road Maps for Autonomous Driving

Establishment of Legal framework

▶ 3 Geospatial information Laws

- Framework Act on National Spatial Data Infrastructure
- Act on the Establishment And Mangement of Spatial Data
- Spatial Data industry promotion Act

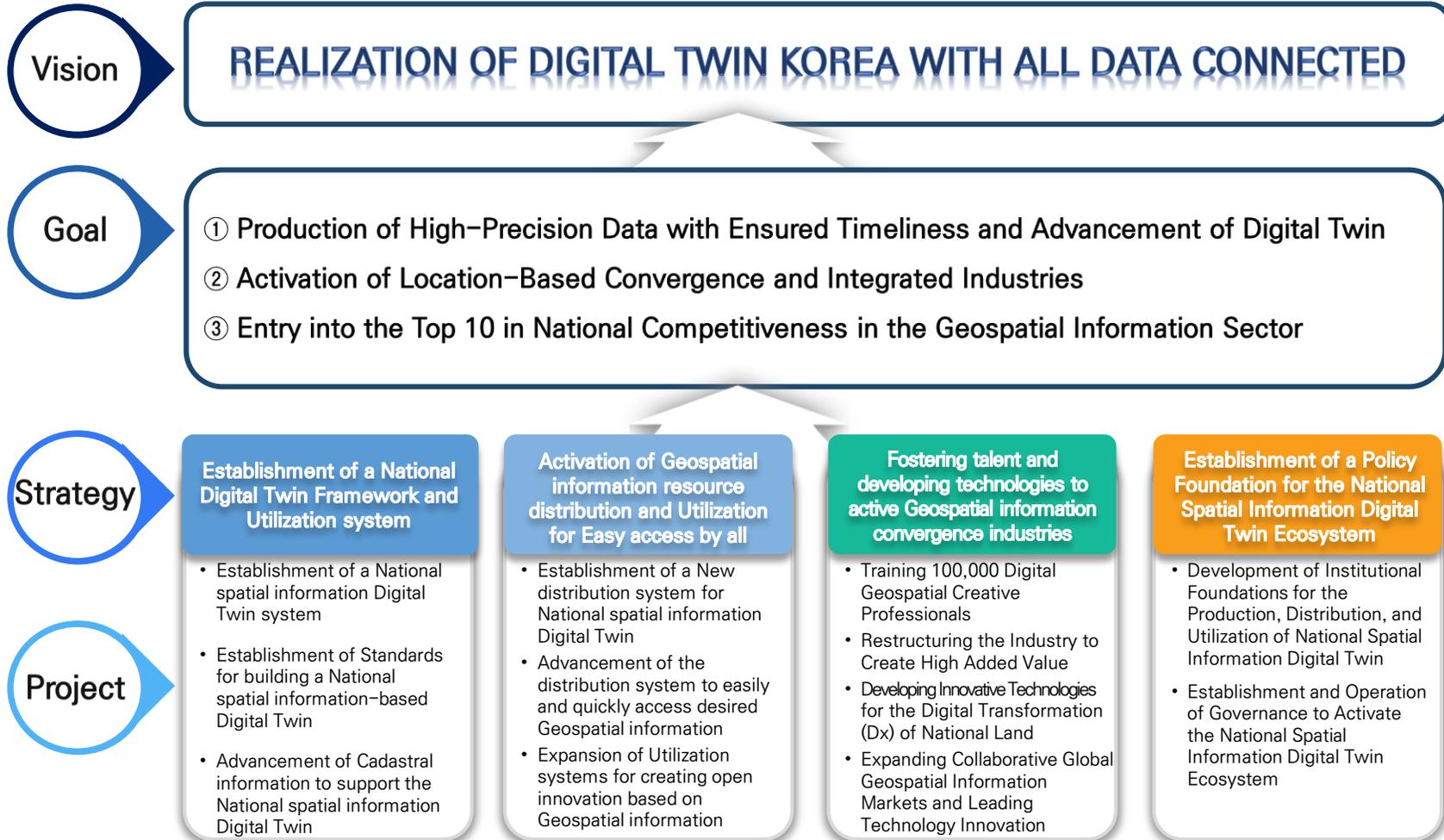
Establishing basic laws that form the basis of spatial information

Since 2013, the geospatial information industry has grown at an average annual rate of approximately 7.8%



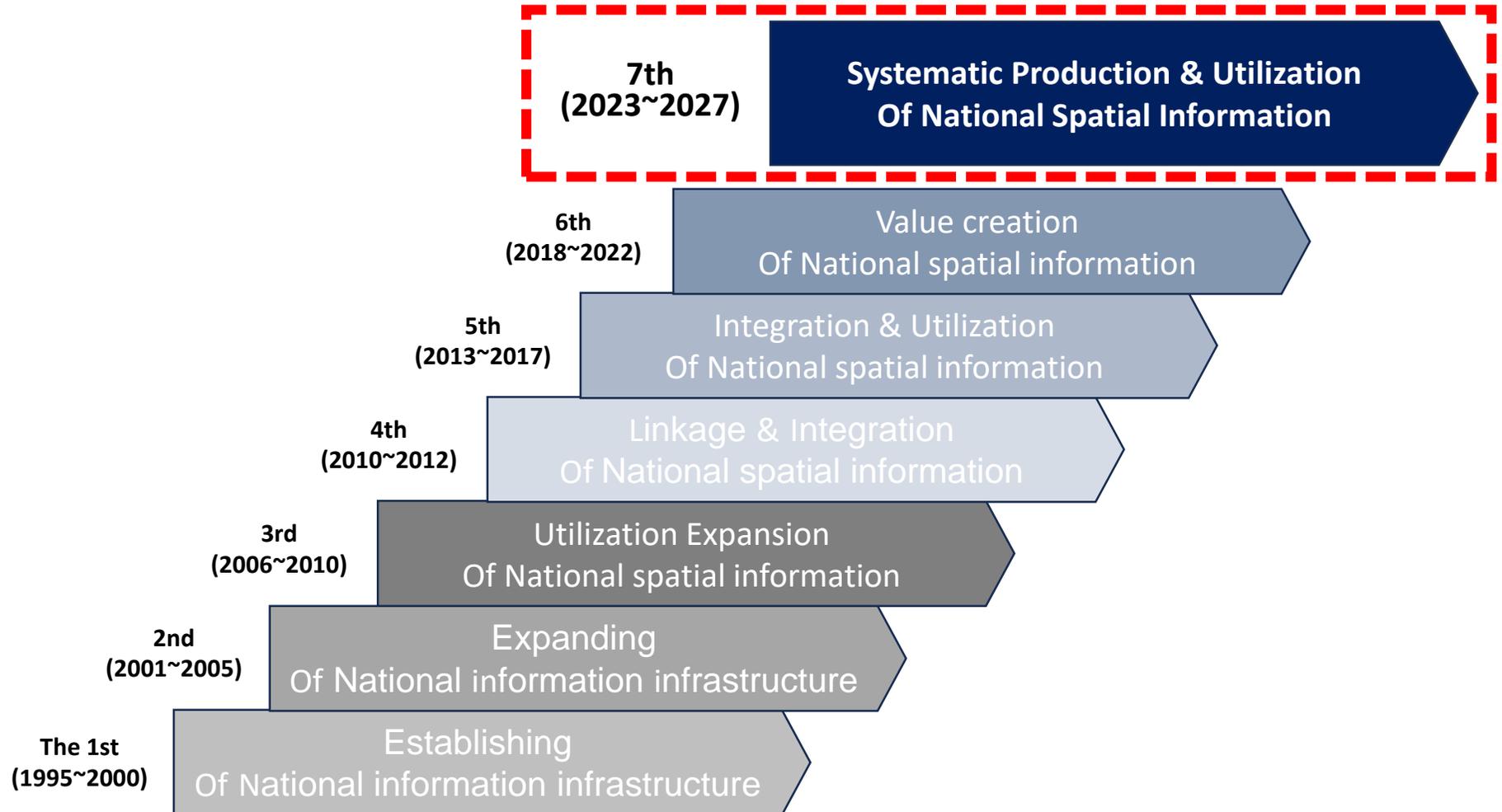
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The 7th Basic Plan for NSDI



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The 7th Basic Plan for NSDI



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National Spatial Data Committee

Outline

▶ The Ministry of Land, Infrastructure, and Transport has established the National Spatial Information Committee to deliberate and coordinate matters related to the National spatial information policy

Relevant Legislation

- 「National spatial information basic Act」
- 「Enforcement decree of the National spatial information basic Act」

Major role

- ▶ Deliberation on the National spatial information system and Policy sectors
 - Establishment, Revision, and Evaluation of the National Spatial Information Policy Basic Plan and Implementation Plan
 - Matters Related to the Promotion, Distribution, and Protection of Geospatial Information Utilization
 - Efforts to Prevent Redundant Investments in the National Spatial Information System and Improve Investment Efficiency
 - Coordination of Major Policies on the Establishment, Management, and Utilization of the National Spatial Information System

- Chairperson : Minister of Land, Infrastructure, and Transport

Composition

- Ex Officio Members: 30
- Appointed Members: 15
 - (8 from local government,
 - 7 from the private sector)



National Spatial Data Committee

Expert Committee

Policy and Coordination

Database Development and Utilization

Standard Technical Criteria

Distribution and Systems

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Three National Spatial Information Laws

Framework Act on National Spatial Data Infrastructure

▶ Outline

- Provisions on the Efficient Establishment, Comprehensive Utilization, and Management of the National Spatial Information System

▶ Objective

- Provide the foundation for developing Korea's NSDI
- Promoting rational use of land and resources to contribute to the advancement of the national economy

▶ Main features

National-Level spatial information management

Integration of spatial information at the national level
standardization of spatial information

Ensuring the public accessibility and transparency of
spatial information

Establishment of a national spatial information
system

Promotion of the spatial information industry

Utilization of spatial information for sustainable
development

Act on the Establishment and Management of Spatial Data

▶ Outline

- Provisions on survey standards and procedures, cadastral records, and the preparation and management of comprehensive real estate records

▶ Objective

- Efficient operation and management of surveying information
- Contributing to the effective management of national land and the protection of citizens' property rights

▶ Main features

Systematic development of spatial information

Standardization of spatial definitions

Establishment of spatial information infrastructure

Emphasis on public accessibility and data
transparency

Enhancement of international competitiveness

Support for private enterprises and industries

Spatial Data Industry Promotion Act

▶ Outline

- Fostering and developing the spatial information industry while establishing a foundation for its growth

▶ Objective

- Enhancing the competitiveness and advancement of the spatial information industry to contribute to national economic development and improve the quality of life for citizens

▶ Main features

Promotion and Support of the spatial information
industry

Encouraging the development of spatial
information-related technologies

Nurturing talent in the field of spatial information

Expanding the utilization of spatial information

Establishing a legal framework for industrial
advancement

Strengthening international competitiveness

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Framework Act on National Spatial Data Infrastructure

Division	Main contents
General Provisions	<ul style="list-style-type: none"> • Outlined the fundamental principles and general provisions of the 「National spatial information Basic Act」.
The Implementation Framework for National Spatial Information Policy	<ul style="list-style-type: none"> • It defines the implementation framework for spatial information, including the role of the National Spatial Information Committee and the structure of the Basic Plan for National Spatial Information Policy.
Korea Land and Geospatial Informatix Corporation(LX)	<ul style="list-style-type: none"> • It stipulates the roles of institutions in supporting the establishment of spatial information systems, conducting research on spatial information and cadastral systems, developing technologies, and performing cadastral surveys.
Establishment of the National Spatial Information Infrastructure	<ul style="list-style-type: none"> • It outlines regulations on standardization requirements, the establishment and operation of the National Spatial Information Center, and other measures to lay the foundation for the efficient management and utilization of national spatial information.
Establishment and Utilization of the National Spatial Information System	<ul style="list-style-type: none"> • It stipulates measures for the efficient establishment and utilization of data, including the construction and management of spatial information databases, utilization strategies, and obligations for information disclosure.
Protection of National Spatial Information	<ul style="list-style-type: none"> • It defines provisions to prevent the leakage of information that is restricted from disclosure during the construction, management, and utilization of spatial information or databases.
Penalty	<ul style="list-style-type: none"> • It stipulates provisions for penalties in cases of unlawful actions or conduct related to this legislation.

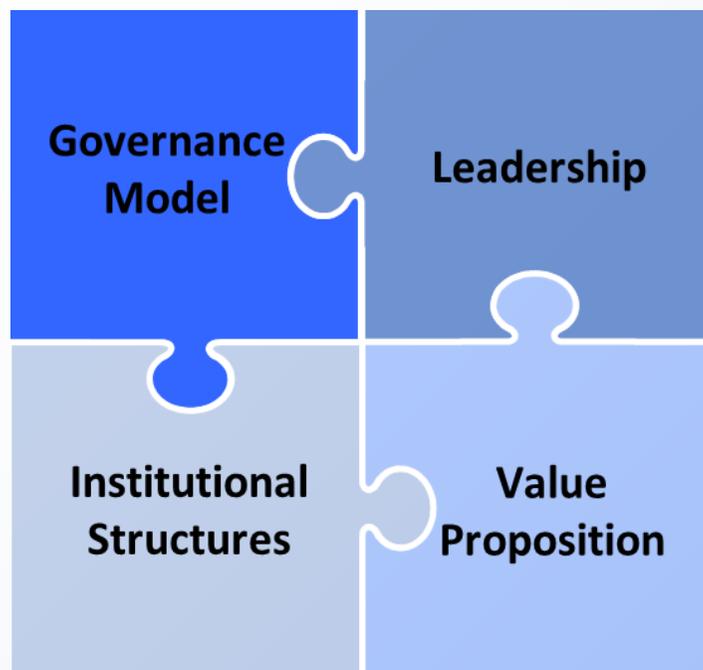
Chapter

II

UN-IGIF in Republic of Korea

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Governance



The Basic Plan for NSDI provides a consistent structure and forms a collaborative system with similar institutions through detailed legal and institutional frameworks

▶ Governance Model

- The Ministry of Land, Infrastructure, and Transport is the lead agency responsible for implementing strategies and action plans related to NSDI
- Organizational Structure: Ministry of Land, Infrastructure, and Transport's Director of National Spatial Information Policy, National Geographic Information Institute, etc.

▶ Institutional Structures

- In 1995, with the initial development of the national topographic map, the NSDI Committee was established
- The NSDI Committee and its subcommittees oversee and coordinate the development of the NSDI strategy and Basic Plans
- The Korea Land and Geospatial Informatix Corporation (LX) provides technical consultation and support for the national data framework
- The SpaceN supports the expansion of data and industry through demand-based services

▶ Leadership

- Under the Framework Act on National Spatial Data Infrastructure, the Minister of Land, Infrastructure, and Transport serves as the Chairman of the NSDI Committee

▶ Value Proposition

- Through the 5th Comprehensive National Land Plan, the Ministry of Land, Infrastructure, and Transport is developing policies focused on three main agendas for 2040: regional balanced development, smart regional development, and innovative growth

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Law&Policy

Provide a systematic foundation for the development of Republic of Korea's NSDI
Offer specific strategies related to technology and industry for the development of NSDI



▶ Legislation

- 『Framework Act on National Spatial Data Infrastructure』: It defines matters related to the implementation framework of spatial information systems and the establishment of national spatial information infrastructure
- 『Act on the Establishment and Management of Spatial Data』: It provides guidelines on surveying standards and procedures, matters related to surveyors and technicians, as well as the utilization and management procedures for cadastral maps and spatial information
- 『Spatial Data Industry Promotion Act』: It stipulates matters concerning the development and management of spatial information-related industries and support for relevant institutions

▶ Norms, Policies, Guides

- The Ministry of Land, Infrastructure, and Transport, under the coordination of the NSDI Committee and its subcommittees, drafts development guidelines and policy proposals
- 『Framework Act on National Spatial Data Infrastructure』 stipulates overall matters related to the development of the NSDI

▶ Data Protection and Licensing

- 『Framework Act on National Spatial Data Infrastructure』 stipulates matters related to the protection of national spatial information
- 『Act on the Promotion of the Provision and Use of Public Data』 is a regulation under the Ministry of the Interior and Safety, which defines the scope of data made publicly available by public institutions. And data that falls outside the scope of this law and is privately owned is protected under the 『Copyright Act』 of the Ministry of Culture, Sports and Tourism

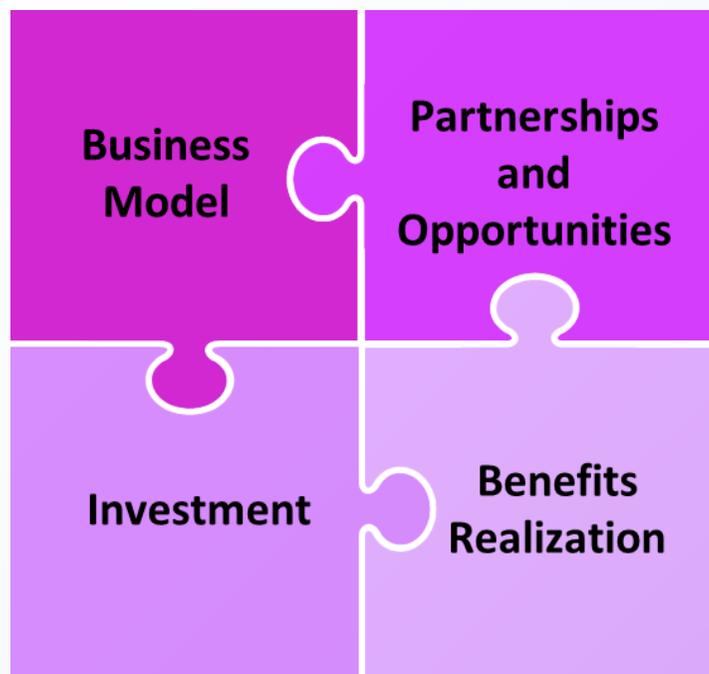
▶ Implementation and Accountability

- The NSDI strategy framework is promoted by the NSDI Basic Plan and is revised every five years
- The NSDI action plan provides detailed implementation guidelines, including project implementation, project investment, funding, and project oversight plans

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Financial

NSDI in Republic of Korea publicly provides data for free in accordance with the law
Although the government provides financial support, there is a lack of specific business



▶ Business Model

- Currently, the NSDI is based on the budgets of central and local governments
- The budget for national basic spatial information is allocated by the central government
- Other spatial information-related budgets are funded by local governments, depending on policy and financial condition

▶ Partnerships and Opportunities

- The 7th NSDI Basic Plan promotes key strategies, including the establishment and activation of partnerships between government ministries and agencies, universities and R&D centers, as well as central and local governments, and the development of public-private partnerships

▶ Investment

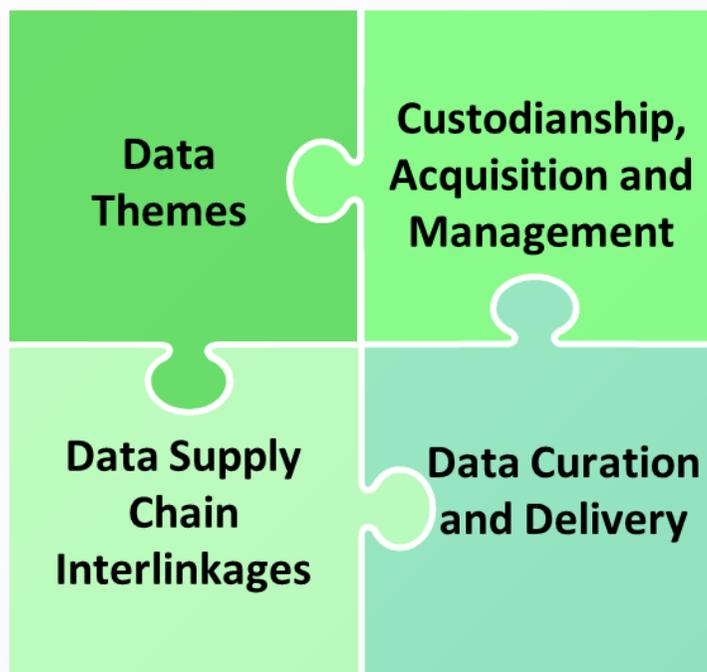
- The government investment costs for the construction, maintenance, and updating of national basic spatial information data were recorded as 388.1 billion KRW in 2022 and 486.9 billion KRW in 2023 and planned budget for 2024 is 562.7 billion KRW, and the plan is currently being implemented

▶ Benefits Realization

- Including technological innovation in SDI development, the creation of jobs related to spatial information data construction, and the expansion of smart city and Industry 4.0 programs are expected to bring about various value-added effects

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Data



「Framework Act on National Spatial Information」includes provisions to prevent the replication of data

▶ Data Themes

- 「Framework Act on National Spatial Information」 defines core datasets (National basic spatial information) and stipulates that they must be established and Managed within the 'Basic Spatial Information Database'

▶ Custodianship, Acquisition, and Management

- Under the 「Framework Act on National Spatial Information」 the Ministry of Land, Infrastructure and Transport is the administrator of all national basic spatial information, and Each dataset is created by the relevant ministries and agencies, and is collected and managed through central systems such as KLIS, K-Geo platform, and V-world from systems at the city/provincial and local government levels
- Overall, coordination among data producers is strongly implemented; however, there is relatively insufficient coordination between the public and private sectors in the process of data procurement

▶ Data Supply Chain Interlinkages

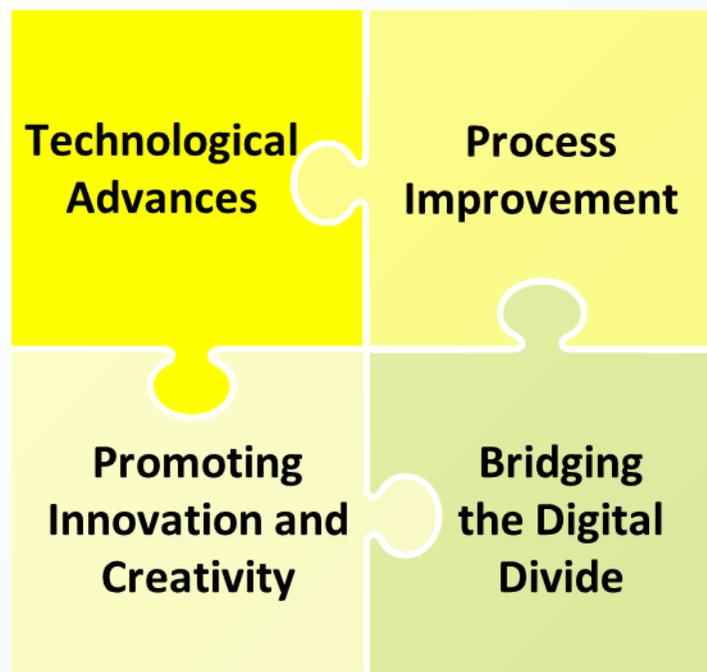
- The system is categorized into three types: provincial storage systems, municipal storage systems, and central systems and Data procured and processed by central ministries and agencies are directly imported into the National Spatial Information Program, while data procured by municipalities are stored in local GIS systems. These are then aggregated at the provincial level and integrated with the central system

▶ Data Curation and Delivery

- Under the 「Framework Act on National Spatial Information」, data constructed at the regional level, except for major programs directly connected to the National Spatial Information Integrated Platform (K-Geo Platform), is selected from the regional integrated database and transmitted to the National Spatial Information Program for public access

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Innovation



Korea's NSDI provides a foundation for spatial innovation
There are challenges due to overlapping support between the government and the private sector

▶ Technological Advances

- Numerous innovations are being driven in various spatial information sectors, including the Fourth Industrial Revolution and smart cities
- The National Geographic Information Institute produces various national terrain data, such as 3D data and orthophoto image databases, through aerial photography technology
- In the private sector, advanced technologies like AI are being used to predict real estate prices, build spatial information data for autonomous vehicle infrastructure, and promote various technological advancements

▶ Process Improvement

- The 7th NSDI Basic Plan is promoting the activation of the distribution and utilization of spatial information resources for the digital twin of cities and the nation. It is also focused on establishing data alliances that enable connections between public-private and private-private sectors

▶ Promoting Innovation and Creativity

- The government has established SpaceN to contribute to the promotion of the spatial information industry by participating in various activities, including the management of the V-World platform, the revision of spatial information-related policies, and research in the field
- Academia and the private sector contribute to the spatial information industry by participating in research on innovative frameworks such as spatial policies and spatial information technologies

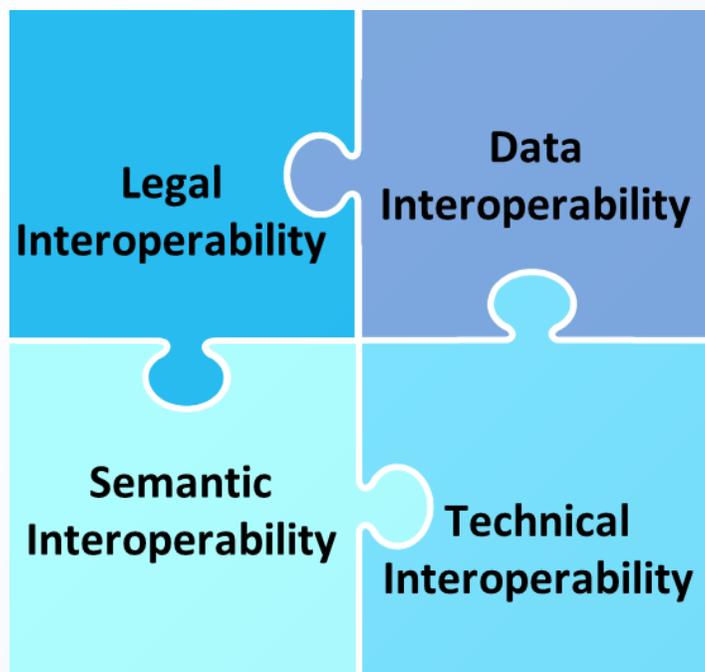
▶ Bridging the Digital Divide

- The government is actively working to bridge the systematic gaps between different spatial data systems managed by various ministries, agencies, and public-private entities

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Standards

『Framework Act on National Spatial Information』provides the foundation for national standards and policies
The systematic specification of policies and regulations regarding national standards



▶ Legal Interoperability

- 『Framework Act on National Spatial Information and 『Industrial Standardization Act』, which pertains to government standard technical regulations, specify policies and regulations related to national standards.
- These laws establish Basic Plans for the establishment, maintenance, and development of the national standard system, as well as the overall coordination of policies and national standards

▶ Data, Semantic and Technical Interoperability

- 『Framework Act on National Spatial Information』 stipulates that the NSDI Basic Plan should consist of research on national standards and management policies for technical regulations
- The specifications of spatial information standards (KS, TTA, ISO, OGC) used in the procurement of national basic spatial information are regulated
- The process of the NSDI Basic Plan and the operation of the national standard system, involving all ministries, ensure interoperability through coordination by a review committee For national standards
- Based on international standards, Korea has established its own standards for metadata (KS X ISO 19115-1) and data quality (KS X ISO 19157), ensuring the technical interoperability of national basic spatial information

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Partnerships

Guidelines for partnerships among government agencies, local governments, the private sector, and academia are provided
International partnerships provide simple guidelines and define the roles of participating organizations

Cross-sector and Interdisciplinary Cooperation

Industry Partnerships and Joint Ventures

Community Participation

International Collaboration

▶ Cross-sector and Interdisciplinary Cooperation

- The NSDI Basic Plan establishes cross-sector SDI projects and actively supports partnerships between different departments by implementing the role of the NSDI Committee, which includes public institutions such as LX and SpaceN as key coordinating bodies

▶ Industry partnerships and joint ventures

- Through the 6th Spatial Information Basic Plan, a framework for a job-centered spatial information industry, including industry partnerships and joint investments, has been Established
- Through the 7th NSDI Basic Plan, efforts are being continuously made to promote investment in the activation of spatial information convergence industries, including talent development, technological advancement, and the establishment of collaboration systems with private enterprises

▶ Community Participation

- The private sector is actively participating in spatial information development, but its involvement is limited to data production
- Open data platforms, such as cloud sourcing, have not been actively promoted in the public sector

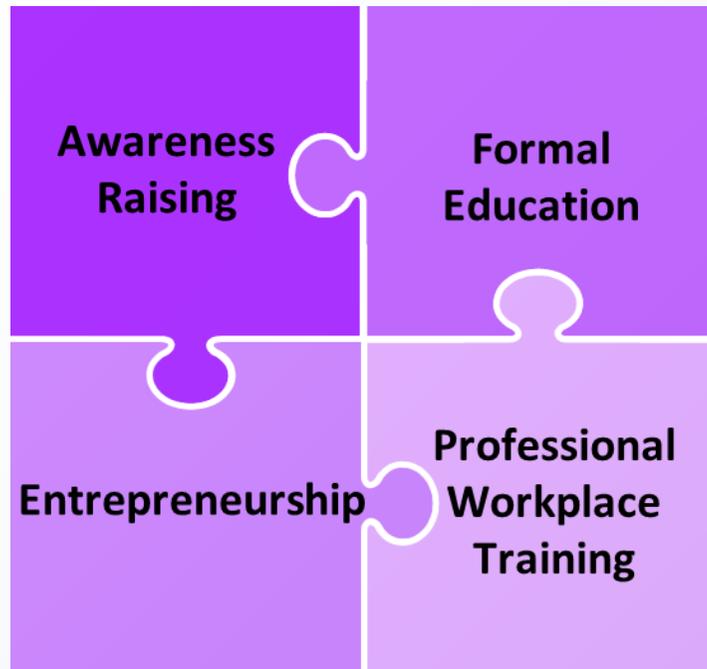
▶ International Collaboration

- Global collaboration activities are being promoted through platforms such as UN-GGIM, UN-GGIM-AP, the World Bank Annual Meeting, the ESDI Conference, and K-GEO Festa
- The NSDI Basic Plan provides a roadmap for the future direction of international cooperation

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Capacity & Education

Development of nationally-led spatial information education programs and talent development
While spatial information practical training is offered at universities, there are limitations in the spatial information courses



▶ Awareness Raising

- Aiming for knowledge sharing and educational programs on innovative spatial information technologies, efforts are being made to enhance industry-based education, cultivate creative future professionals, and establish smart educational environments, as well as to promote various awareness-raising activities on spatial information technology

▶ Formal Education

- Republic of Korea is conducting spatial information-related education across various majors in undergraduate, graduate, and doctoral programs. The government-supported spatial information expert training programs are actively being implemented, strongly promoting the development of professionals in this field

▶ Entrepreneurship

- Through the 『Promotion Act on Spatial Information Industry』 the government stipulates support for the business foundation related to national spatial information data industries. This includes the provision of free spatial data, the sharing of spatial information-related research results, and various forms of support related to legal frameworks, taxation, accounting, and other business foundations

▶ Professional Workplace Training

- The government is implementing spatial information talent development programs through the SpaceN

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Communication & Engagement



Establishment of processes for transparent decision-making
Providing guidelines for stakeholders' participation in the development of NSDI

▶ Stakeholder Identification

- Key institutions responsible for NSDI development include the Ministry of Land, Infrastructure and Transport, the National Geographic Information Institute, and LX
- The private sector is involved in NSDI development by participating in data construction projects
- Institutions such as the Korea Research Institute for Human Settlements and various universities also participate in NSDI projects

▶ Integrated Engagement Strategies

- The NSDI Activity Plan provides specific guidelines on how stakeholders can participate in NSDI development
- Through partnership strategies outlined in the NSDI Basic Plan, various ministries and departments participate in national projects related to the establishment and management of national basic spatial information
- 「Framework Act on National Spatial Information」 specifies support for the spatial information system development, technology development, and cadastral surveying related to NSDI, with particular emphasis on public enterprises like Korea Land and Geospatial Information Corporation (LX)
- 「Promotion Act on Spatial Information Industry」 defines the role of the SpaceN in actively engaging in NSDI-related research and promoting the activities of small and medium-sized enterprises in the spatial information sector

▶ Planning and Execution

- The Ministry of Land, Infrastructure and Transport, along with the NSDI Committee and its subcommittees, are the main implementing agencies
- The NSDI Basic Plan is revised every five years, and the required budget is discussed and agreed upon by the central and local governments

▶ Monitoring and Evaluation

- NSDI development is monitored annually based on six criteria: appropriateness of strategies, investment efficiency, expert opinions, redundancy, openness and connectivity, and the opinions of the NSDI Committee and Annual reports are published to provide updates on progress

THANK YOU