

## 국가기본도 구축 체계 합리화 방안 연구

A Study on Rationalization of the National Base Map Database System

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SUMMARY

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The system related to intellectual property in South Korea since the modern era began with the enactment of the “Intellectual Property Law” on December 1, 1950. The regulations regarding map creation trace back to the “Surveying Law” enacted on December 31, 1961. Evolving through revisions and amendments, the current framework is based on the “National Spatial Information Basic Law” and the “Law on the Establishment and Management of Spatial Information,” aimed at advancing the spatial information system. The concept of spatial information has transitioned from a static and abstract form to a digital-centric spatial database. The paradigm shift involves real-time provision of information reflecting and interacting with reality, incorporating concepts like Digital Twin and Metaverse. Despite the quantitative expansion of various spatial information, there is a deficiency in data convergence based on data fusion. The study proposes establishing the role of the national base map and formulating strategies for constructing an integrated spatial information system based on the national base map. Additionally, it suggests improvements in the system for the advanced development of the national base map. Examining the history of the national base map system reveals its transformation from map production based on scale to a spatial information system allowing detailed analysis. However, the current definition confines the national base map to a framework resembling a conventional map, necessitating institutional improvements to enable its role as a spatial database encompassing diverse spatial information.

Reviewing the utilization status of the national base map, laws and regulations

mandate the use of topographic and numerical maps with a scale of 1/5,000 or larger in 71 statutes and 109 articles. The application areas of the national base map cover land planning, urban and regional development, rural areas, forestry, port and river conservation, and other domains. Based on the national base map, various agencies, including central and local government bodies, public institutions, and research centers, have constructed and managed 109 spatial information systems, encompassing a total of 102,178 spatial information items. However, challenges arise due to duplication of basic spatial information construction and management across multiple agencies and variations in information standards.

Examining overseas cases related to the national basic map, the United States has established and operates the National Spatial Data Infrastructure (NSDI). The legislation related to NSDI construction, enacted in 2018 under the Geospatial Data Act, encompasses strategic plans for the national spatial information infrastructure, standardization, and provision. Most data produced by federal government departments is mandatorily utilized for NSDI construction, classified into seven themes and serviced through GeoPlatform.

In Japan, under the “Basic Law for the Promotion of the Utilization of Geographic and Spatial Information,” they have constructed and operate a national land map. This map includes diverse attribute information such as GIS location standards, surveying data, disaster response, etc. It shares institutional specifics regarding scale-based approaches similar to those in Korea. However, it explicitly mentions the creation of digital data. Moreover, owing to the frequency of disasters, Japan combines national land map data with various disaster-related information to operate and service an integrated disaster information system called DiMAPS.

The United Kingdom, in accordance with the Infrastructure for Spatial Information in the European Community (INSPIRE), established The INSPIRE Regulations 2009. These regulations address the scope of application for spatial information sets and services, regulations for building information networks, and information dissemination. Furthermore, the UK has produced and operates OS MasterMap, comprising four themes: terrain, integrated transport network, address, and imagery. OS MasterMap distinguishes itself from other countries by assigning Terrain Object Identifiers (TOID) to each object, enhancing mutual compatibility. Though sharing similarities with UFID included in the national basic map, there are differences in distribution and utilization aspects

In summary, foreign countries leverage their national base maps to provide diverse spatial information for policy development and related services. In contrast, Korea's national base map primarily disseminates physical attribute information, requiring integration of human, social, economic, and safety-related spatial information for advanced development. Analyzing the current state of spatial policy and related projects at the national and local levels is crucial for deriving the role of the national base map. The study emphasizes the need to establish a foundation for constructing and linking integrated spatial information through a systematic analysis of government initiatives.

The national base map serves as the fundamental unit for spatial information and plays a role as a standard for expanding spatial information through integration with various fields via digital platforms. Therefore, examining the direction of the advanced development of the national base map through national and local spatial information policies and projects is essential.

The government pursues various national tasks for the improvement of citizens' safety, quality of life, and efficient national development. Initiatives such as establishing an advanced disaster safety management system and supporting efficient growth strategies for national spatial growth are included in the current administration's 120 national tasks. Moreover, comprehensive plans for smart cities, encompassing safety, environment, and welfare services, are devised for major urban areas. The provision of such services relies on data linkage, and the government proposes an integrated platform where individual national tasks are interconnected, and all public data is linked and available.

Examining the central government and local government projects outlined in the National Spatial Information Policy Implementation Plan reveals that 76 projects related to spatial information construction and utilization are underway in 11 central government agencies. Among local government projects, 62 projects involve substantial information construction and operational activities, with a particular emphasis on spatial information in the physical field. This reflects local governments' efforts to comprehensively construct and utilize various information for urban and administrative services.

A national base map linked with high-precision electronic maps or three-dimensional maps will serve as a foundation for digital twin development and will gain increased value as basic data when various public information is additionally

linked. To achieve this, it is deemed necessary to integrate information from various fields such as humanities, society, culture, economics, and the environment, sequentially connecting the required data in a systematic manner.

This study derives four criteria that the national base map should meet through an analysis of the institutional changes, production environment, overseas cases, and utilization in domestic spatial information-related policies and projects in response to social changes. First, it should be constructed as spatial information covering the entire country, serving as a reference for location and orientation. Second, it should adhere to standardized specifications. Third, its accuracy should be uniform. Fourth, it should meet the quality management standards as a national standard dataset. To achieve these criteria, it is proposed to establish a spatial information database under Article 15 of the “Law on the Establishment and Management of Spatial Information,” including new provisions for the reference and quality management requirements of spatial information as its location. Additionally, it is suggested that the national base map should incorporate items in line with its definition from spatial information databases built under spatial-related laws, and new provisions regarding the “National Base Map Information System” should be added under Article 15 of the “Law on the Establishment and Management of Spatial Information.”

**Keywords :**

National Base Map, Information System, Spatial Information Database