

NSDI Business Plan and Related Activities of Japan

Minoru AKIYAMA

Director, Geographic Department,
Geographical Survey Institute, Japan

1. Liaison Committee of Ministries and Agencies Concerned with GIS

A Liaison Committee of Ministries and Agencies Concerned with GIS was established in September 1995 to promote efficient development and effective utilization of GIS within the Government under close cooperation among Ministries and Agencies. The Cabinet Councilor's Office, Cabinet Secretariat, is designated as the secretariat of the Liaison Committee with assistance from the Geographical Survey Institute (GSI) and the National Land Agency (NLA), now under the Ministry of Land, Infrastructure and Transport. The Committee has two task force groups, i.e. Spatial Data Framework Task Force Group and Basic Spatial Data Task Force Group, each of which has a few working groups to discuss more specific topics in detail.

1) Long-term Plan for the Development of NSDI in Japan

The Liaison Committee formulated a Long-term Plan in 1996 for the development of NSDI in Japan. The Plan specifies actions to be taken by the Government during the two-phase period starting in 1996 up to the beginning of the 21st century. The first phase focuses on the definition of the NSDI in Japan as well as standardization of metadata and clarification of the roles of the Government, local governments and the private sector, rather than actual spatial data development itself. The implementation of NSDI including spatial data development for NSDI is expected in the second phase. Approximately three years are allocated to each phase, i.e. the first phase (1996-99) and the second phase (1999-2001).

2) Interim Report on the Implementation of Long-term Plan

The Committee compiled an interim report on the activities during the first two years of the first phase of the Long-term Plan. The report reviews the subjects specified in the Long-term Plan and the actions actually taken by the Committee. It also clarified the issues to be focused by the Committee during the final year of the first phase. The report was published and distributed to the public at the end of March 1998.

3) Final Report of the First Phase

The Committee adopted Final Report of the First Phase of the Long-term Plan on March 30, 1999. The Final Report entitled "Standards and Development Plan of National Spatial Data Infrastructure" includes two standards of Japanese NSDI (i.e., a technical standard that is based on ISO/TC211 standard drafts, and a list of data items adopted as the framework data) and a development plan for the second phase

of the Long-term Plan.

The technical standard included in the Final Report was elaborated through collaborative research between the Geographical Survey Institute and 53 private companies during the three-year research period starting in 1996.

Table 1 shows the list of data items for the Japanese framework data.

Table 1. List of Data Items for Spatial Framework Data

Geodetic Control Points	National and Public GCPs
Elevation	DEMs
Transportation	Road Network, Road Boundary, Railroad Network
Rivers, Coastlines	River Network, River Boundary, Coastlines, Low Tide
Land	Parcel Boundary, Forest Boundary
Building	Public Building, Privately Owned Building
Georeference	Geographic Names, Address, Administration Boundary, Census Boundary, Standard Cells

4) Interim Agreement of Implementation of Second Phase

The Liaison Committee agreed upon its targets and specific action to facilitated development and utilization of GIS. The first target is a digitalization of geographic information and its provision service through internet. GSI develops Digital Map 2500(Spatial Data Framework) by FY 2000 for urban planning area and Digital Map 25000(Spatial Data Framework) by FY 2001. NLA develops georeferencing data for districts. The target year for starting internet service is, FY 2000 for georeferencing data, FY 2001 for Digital Map 2500(Spatial Data Framework), and FY 2002 for Digital Map 25000(Spatial Data Framework).

The second goal is development of metadata, the one whose digitization is delayed, in parallel with basic geographic information and establishment of clearinghouse for data-sharing within the government to minimize redundancy and also to enable an easy access from private sectors. The governmental clearinghouse started in March, 2001.

The third point agreed upon is standardization of geographic information developed by GSI and private sector in accordance with the Japanese Industrial Standard.

In January 2001, National Land Agency was integrated into the Ministry of Land, Infrastructure and Transport by the recent government restructuring.

2. Geographical Survey Institute

1) Research on GIS Standardization

Based on the need to develop a GIS standard of Japan, which complies with that of ISO/TC211, GSI started researches on GIS standard of Japan in 1996. This study was also intended to provide a technological backbone to the Japanese SDI standard discussed in the Liaison Committee of the Government. Fifty-three private companies were involved in this three-year research project funded by the then Ministry of Construction, now the Ministry of Land, Infrastructure and Transport, as one of the collaborative research projects with the private sector. Two kinds of standards will be developed through

this research: spatial data exchange standard and spatial data development standard. Six working groups were established to discuss 8 work items including data structure, data quality, georeferencing, metadata, and cataloguing. Spatial data development standard includes a guideline to develop specifications for spatial data development contracts. The final draft of the standard was completed at the end of FY 1998 and adopted as part of the NSDI Standards by the Government Liaison Committee.

2) Research on Development of Geographic Clearinghouse

The Long-term Plan developed by the Government points out the necessity of National Spatial Data Infrastructure and specifies the need of establishing a clearinghouse system for spatial data.

GSI has been engaged in a Geographic Information Directory Database (GIDD) construction as a five-year project since April 1994. This database was designed to provide directory information (i.e., metadata) of spatial data through computer networks, and to function as a clearinghouse node by developing a search environment of distributed databases.

The metadata standard, which was used in the GIDD, was developed as one of the work items of Spatial Data Exchange Standard of "Research on GIS Standardization" described above. This standard could be considered as the Japanese adaptation of ISO/TC211/WG3 15046-15 (now 19115) Metadata by making modifications on, for example, spatial reference, addressing, and language (i.e., Japanese). This standard was determined as Japan Metadata Profile (JMP) after additional necessary modifications.

A prototype of GIDD with limited search capability was under the process of practical testing. This prototype provided 229 experimental metadata of Digital Map 10000 (Integration) in Japan. GIDD had an ability to make a query using 12 attributes such as title, keyword, longitude, latitude, and producer as well as the combination of these attributes by using logical operators.

Based on the result of those trials, we enhanced its search capability and support distributed environment. Concretely, we adopted ISO 23950, which specifies the information retrieval application protocol and has provided metadata search through the Japanese domestic gateway based on this protocol specification standard since March 2000. At the same time, GSI added a clearinghouse ISO 23950 node server to the international geographic clearinghouse coordinated by the Federal Geographic Data Committee (FGDC). In addition, GSI asked the other Ministries and Agencies concerned with geographic information to prepare metadata and clearinghouse node server. As a result, government geographic information search service is available to the public since March this year. The URL of this clearinghouse gateway is <http://zgate.gsi.go.jp/>.

3) Development of Digital Map 2500(Spatial Data Framework) and Digital Map 25000(Spatial Data Framework)

Digital Map 2500(Spatial Data Framework) is used as basis for GIS. Major items expressed in large scale map, among which are administrative boundaries, coastal lines, roads, rivers, railroads, buildings, control points and so on, are digitized and structured. It has been finished by FY 2000 for urban planning area.

Digital Map 25000(Spatial Data Framework) is used as basis for GIS. Major items expressed in 1:25,000 Topographic Maps, among which are administrative boundaries, coastal lines, roads, rivers, railroads, buildings, control points and so on, are digitized and structured. The development term is two years, from FY 2000 to FY 2001 for all of Japan.