Land and Geographic Information, an Important Part of the Infrastructure in Sweden

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Keywords: e-Governance, SDI, SIM

SUMMARY

Spatial Information, an important part of the infrastructure in Sweden Lantmäteriet is a Government agency. The mission is to give support for creating an efficient and sustainable use of Sweden's real property, land and water. The organisation has three main activities, which also form the organisational structure: Cadastral services, Land and Geographic Information Services, and Metria (working on a competitive, commercial basis). Swedesurvey is the overseas agency of Lantmäteriet. Land and Geographic Information Services include the analysis and establishment of demands and needs of geographic and real property information in society. It also includes the efficient collection, storage and administration of such information. The collection is carried out by Lantmäteriet itself or in co-operation with other public agencies or organisations in society. An important task is to make the information available and used by a broad spectrum of users thereby contributing to efficiency, improvement and renewal in the public as well as in the private sector. Dissemination of information is carried out through resellers. It is a demand of increased availability of our customer services via the Internet. Other demands are standardized interfaces and information models to enable network based resources of information. In my presentation I will give an overview of Spatial Information Management in Sweden. The benefits, important components and future trends will be highlighted. The conclusion is that good Spatial Information Management brings economic growth and wealth into a nation in a way few other institutional arrangements can do.

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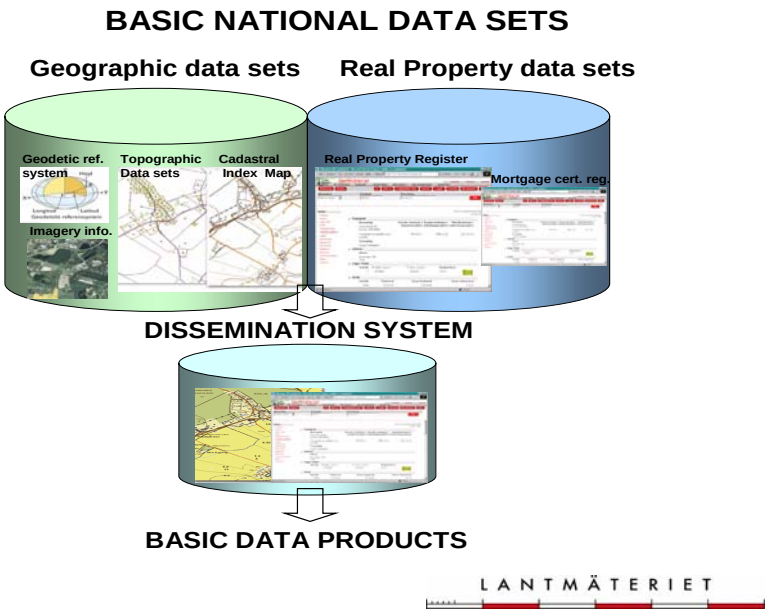
1. INTRODUCTION

Lantmäteriet is a Government agency. The mission is to give support for creating an efficient and sustainable use of Sweden's real property, land and water. The organisation has three main activities, which also form the organisational structure: Cadastral services, Land and Geographic Information Services, and Metria (working on a competitive, commercial basis). Swedesurvey is the overseas agency of Lantmäteriet.

Land Information in Sweden includes information in the real property register including the digital cadastral index map, the land register and the central registers for buildings, apartments, addresses, mortgage certificates and property prices.
Geographic Information comprises basic geographic data such as co-ordinate and height data, aerial photography, and land cover data.
These information components create the base for the Spatial Data Infrastructure (SDI) in Sweden.

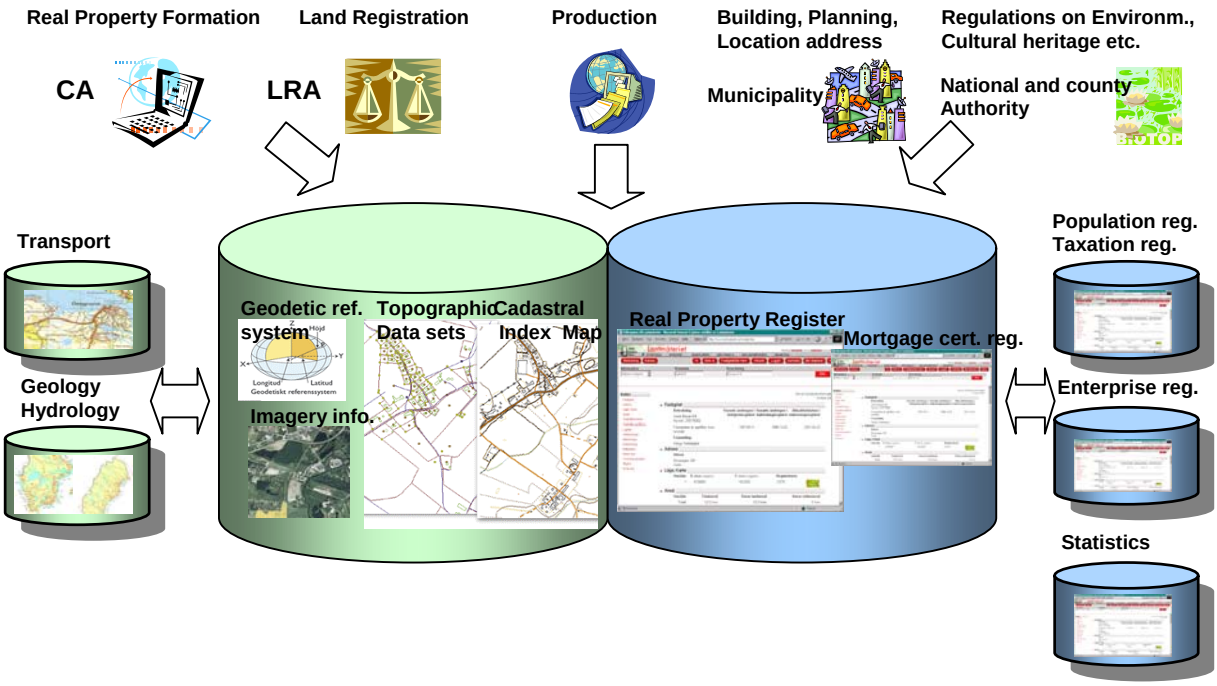
2. THE SPATIAL DATA INFRASTRUCTURE IN SWEDEN

The Swedish Spatial Data Infrastructure (SDI) is developed out of the Land Data Bank System, the Land Use Map and the Topographic Map, all based on the National Geodetic Network.
Sweden was one of the first countries to address Spatial Data Infrastructure matters and has during several decades developed one of the worlds most complete Spatial Data Infrastructures.
The overview of the infrastructure is shown in the figure.

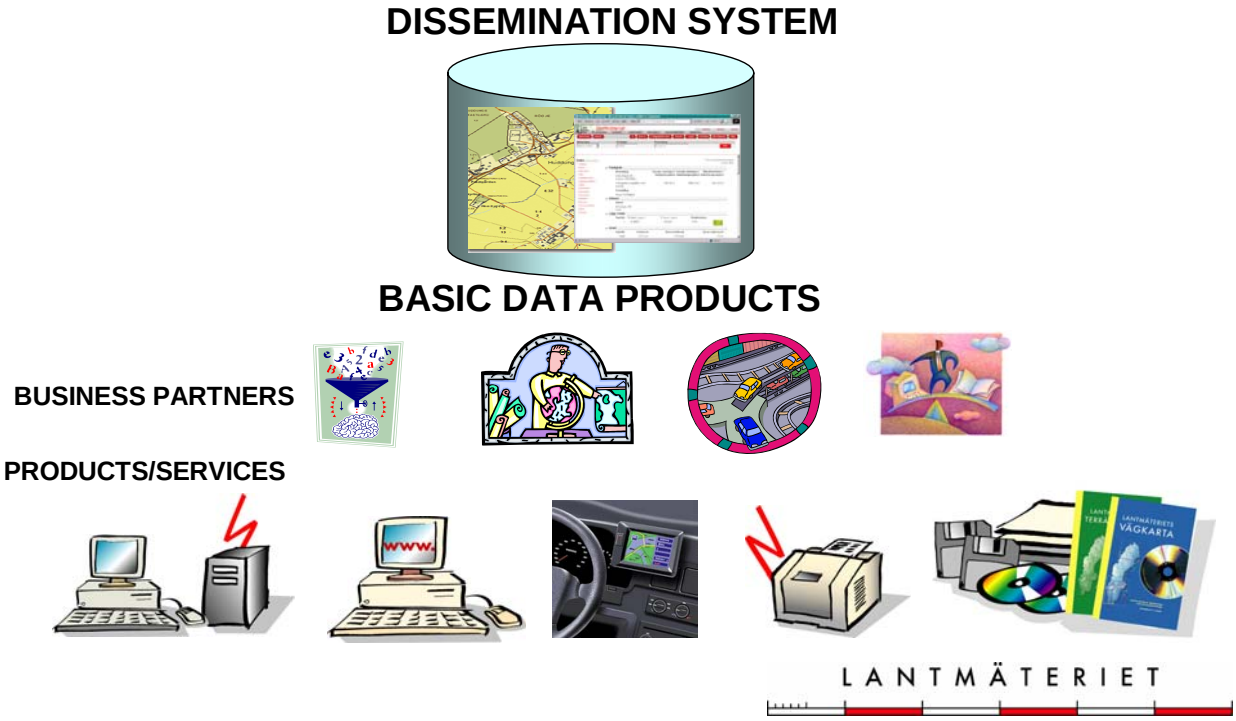


The structure of the Real Property Register and the establishment of the new Cadastral Index Map have given Sweden a modern system and the Real Property part of the Swedish SDI now fulfils all demands from the society and the market.
Lantmäteriet has also worked with other important parts of the reference data
The location address and the postal address for property units and buildings are stored and handled in the Address Part of the system for the Real Property Register at Lantmäteriet.
The transportation networks; streets, roads and railways, have always been a part of the information in the Topographic Map and the Land Use Map.

Land and Geographic Information Services include the analysis and establishment of demands and needs of geographic and real property information in society. It also includes the efficient collection, storage and administration of such information. The collection is carried out by Lantmäteriet itself or in co-operation with other public agencies or organisations in society. A more detailed description of the Geographic and the Land Information is shown in the figure below. The bodies responsible for the activities that create the information also update it in the SDI.



An important task is to make the information available and used by a broad spectrum of users thereby contributing to efficiency, improvement and renewal in the public as well as in the private sector. Dissemination of information is carried out through resellers. See picture below. The dissemination of base information, for instance via Internet, and the development of applications by service providers have lead to a widespread use of the information.
The services are delivered through a virtual marketplace, a one stop shop for information. As a result contact has been made with new, large customer groups exploiting new revenue sources.



3. THE BENEFITS OF SDI

The most essential objective for the SDI is to deliver information that can fulfil the demands from users in the whole society. The best way to evaluate the SDI is therefore to look at the users and their use of the information. Lantmäteriet carries out an annual survey about this and the result is used as a base for programmes for improving the activities. The main users of Land and Geographic information in Sweden are:

- State organizations
- Municipalities
- Business world
- Citizens

A decisive condition for reaching the benefits is to use the information and give potential users access to the information. The benefits of an effective SDI enables for example to:

- Develop and monitor land markets
- Produce statistical data as a base for social and economical development
- Facilitate land reforms
- Promote improvement of land, buildings and infrastructure development

- Improve urban planning
- Guarantee ownership and security of tenure
- Be the basis for land and property taxation
- Provide security for credit
- Reduce land disputes

4. FUTURE TRENDS

In Sweden the IT-supported Land Information processes and the many databases were created over a long period, in varied technical environments and for different users than today's main users. Interdependent systems on different platforms have created a complex IT environment, and system maintenance cost is high.

Never the less our systems have many positive qualities, e.g. they hold a large amount of information, important for many activities in society, and the quality is high. The information is accessible and is in great demand. The systems are secure and stable, with very few interruptions.

4.1 Vision

Our vision now is to create a more efficient and complete Spatial Data Infrastructure**.** We will be able to provide society with correct land information to a reasonable cost, using efficient processes - from collection to distribution.
The overall process of providing relevant land information to various users should be based on:

- cooperation with stakeholders for creation and development of information
- cost effective computer systems for exchange and storage of information
- a dissemination system giving easy access to information, for use and value added improvement

Integrated systems for storage and unified interfaces will lower the cost for system development and maintenance. It also facilitates easier handling of data by our users. Additionally, the conditions for integration of textual and geometric information will be enhanced.

Corner stones for a successful use and exchange of information are that:

- we (producers and users) have common concepts and definitions;
- we have identified common information needs for both base data and meta data;
- we have common definitions of the objects the information describes;
- we agree on how they will be identified;
- we have system independent models for information exchange and dissemination, models that also allow exchange of altered data only;
- we define a common technical interface, i.e. a standardized exchange format based on XML/GML.

4.2 e-government

Lantmäteriet, as with many government departments, face the demand for continuous access to information, driven by demands of the citizen and the push for e-government. To answer this challenge, Lantmäteriet have delivered a wide range of services via the web.

The information and services provide underpin many other services in Sweden, both in the public and the personal domains.
Web services are viewed as an efficient tool to deliver services in an integrated, coordinated and efficient manner.

4.3 European Activities

The general situation on spatial information in Europe is one of fragmentation of datasets and sources, gaps in availability, lack of harmonisation between datasets at different geographical scales and duplication of information collection. These problems make it difficult to identify access and use data that is available. Fortunately, awareness is growing at national and at EU level about the need for quality geo-referenced information to support understanding of the complexity and interactions between human activities and environmental pressures and impacts.

The Infrastructure for Spatial Information in the European Community (INSPIRE) should assist policy-making in relation to policies and activities that may have a direct or indirect impact on the environment. The INSPIRE initiative is therefore timely and relevant but also a major challenge given the general situation outlined above and the many stakeholder interests to be addressed.

There is an increasing interest in the real property financial market to be able to carry out international transactions. The EULIS service, now on line, aims at developing a European Land Information Service. The overall objective is to provide access to information across boarders via the Internet. Sweden is playing a key role in this programme.

EuroRoadS an EU-funded project, terminated August 2006, supports the fulfilment of EC policies within transportation, with focus on safer and cheaper transports and with less impact on the environment. EuroRoadS has defined common specifications for the quality assured provision and exchange of road data, carried out demonstrations and proposed implementation and exploitation activities.

5. CONCLUSIONS

Good Spatial Data Infrastructure brings economic growth and wealth into a nation.
A decisive condition for reaching the benefits, is to use the information and give potential users access to the information.

The UN-ECE Committee on Human Settlements has pointed out that to unlock that wealth, a nation must develop a framework of land and property laws, effective public institutions, secured procedures and processes and an effective information system.

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