

# Building Integrated Land Information Systems and Development of NSDI

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**Key words:** Land administration, land information systems, property formation, spatial data infrastructure, Inspire, institutional cooperation.

## SUMMARY

Lantmäteriet – the Swedish agency being responsible for mapping, cadastre and land registry – has a long tradition working with important issues contributing to a sustainable use of real property, land and water resources and to security of ownership of real property. By that, the agency gives an important contribution to the development of the Swedish society.

Most of the activities are carried out in cooperation with central and local government agencies, the private sector and private persons. In Lantmäteriet's strategy document three strategic goals have been identified as being of specific importance:

- An organization that is well known, open and inspires confidence – other agencies, private enterprises and the public must know who we are, what we stands for and can feel confident that we act for the benefit of the entire society when we are carrying out our coordination role, repayment services and other activities.
- An attractive place to work – our success will rest wholly on our ability to recruit new staff, develop competence and retain qualified staff members.
- A leading service authority – Lantmäteriet has the necessary pre-requisites for taking a leading role in the development of the future e-Government by coordinating the handling of geodata and support co-operation with other bodies.

This paper informs about the establishment of the integrated land information system, the important role of the real property formation process in the Swedish context, the establishment of digital archives with maps and documents being archived since the setting up of the organization in 1628 and the development of the Swedish spatial data infrastructure.

The common denominator for these activities is co-operation. By working together, setting up commonly agreed visions for different activity areas, establishing efficient organizational, legal and financial models and to follow up achieved results we can reach far better results than by working without coordination

Other sessions during this FIG working week will give you more details about the activities I describe in this paper.

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## **1. A LONG TRADITION**

Lantmäteriet – the Swedish agency being responsible for mapping, cadastre and land registry can celebrate its 380 years anniversary this year. The organisation was established as a state agency when the King Gustav II Adolf on 4 April 1628 appointed the mathematician and cartographer Anders Bure as the first head of the organisation. His task was to set up the organisation and to employ and educate the staff with the aim to create a systematic surveying and mapping of the entire country.

The first years focus was set on mapping in larger scales (over villages, homesteads, and cities). After that an intensive period of mapping in smaller scales followed. During this period, which lasted until the beginning of the 1800's century, topographic maps and land-use maps over counties, parishes, road networks, and lakes and rivers was produced. From the middle of the 1800's century extensive land reforms took place in Sweden, which also meant that the land surveyors to a high degree were engaged in this work.

However, the systematic mapping continued and the results from the mapping activities are uniquely well preserved and documented in archives containing several hundred thousand maps and documents. Today, parts of this material can directly be accessed on the Internet and Lantmäteriet is rapidly making more and more of this information available in digital form.

Sweden has long experiences in the field of surveying. The Swedish surveyors have been in the forefront in developing and applying modern technology for surveying to the benefit of economic and social progress. Among others can be mentioned the consequent application of photogrammetry and orthophotos for land use and cadastral mapping and the computerisation of the real property and land registry, which started 1968 and now for long time have been in operation and contributed to a very efficient land administration based on electronic titles and mortgages and made the use of land information as a base for a broad range of activities in general in society very effective.

The Swedish surveyors have always been very active in the field of real estate economics. The mass appraisal real property valuation system that have been developed for real property taxation makes widely use of land information from the Real Property and Land Registry and involves extensive use of GIS technology based on digital cadastral maps. The systems support real property valuation in general and also the collection of considerable amounts in real property taxes.

The Swedish surveyors have also showed a great interest in international questions and tried to contribute to the development of the surveying international society, among others through an active participation in FIG.

## **2. THE INTEGRATED LAND INFORMATION SYSTEM**

All land in Sweden is divided into real property units. There are approximately 3.4 million property units in the country. The Swedish Real Property Register is an integrated register with information about properties, rights and values. Therefore, you can claim that Sweden has an integrated physical, legal and fiscal cadaster.

The maintenance of the information is carried out by several state agencies and the local authorities and the information is extensively used by a wide range of professionals, such as banks and other financial institutions, realtors, insurance companies and central and local authorities. The information is also open to the public for inspection free of charge and also available on Internet services.

### **2.1 The real property part**

The real property part of the Real Property Register consists of a register and a Cadastral Index Map. This part includes information about properties, plans, regulations and rights (servitude's/easements). i.e. the physical description of the real properties. It forms the basis for a number of important activities in society such as land registration, real property credit, property taxation, agricultural statistics, land surveying, population registration, and urban and regional planning.

The register is maintained by a number of cadastral offices throughout the country. Maintenance of the register is basically a task for Lantmäteriet, but there are also 38 local government authorities (out of 290), which have assumed responsibility for real property formation and maintenance of the real property register within their own jurisdiction. Lantmäteriet has a supervisory role also for these authorities.

### **2.2 The register land part**

The main purpose of land registration is to give publicity and legal protection for acquisition of rights in real property. An orderly, well-functioning land registration system is a prerequisite for guaranteeing security and facilitating economic transactions. The land register part includes information about title, leasehold, mortgage, rights and notifications, i.e. juridical information about real properties.

Since 1 June 2008 the land register is maintained by Lantmäteriet. Earlier it was a responsibility for seven land registration authorities being part of the general district courts and under the administrative supervision of the National Courts Administration. The land registration is still carried out by the same seven offices distributed throughout Sweden

### **2.3 The property assessment part**

The property tax assessment part includes information about assessed values and some characteristics needed for the valuation. This part is an extract from the Property Assessment Register managed by Swedish Tax Agency.

### **2.4 Other parts of the Real Property Register**

Other parts of the Real Property Register are the address part and the building part. A register with information on apartments is also just now being set up.

For valuation purposes there is a separate database with information about purchases. This database, the sales price database, is an extract from the Real Property Register and it includes information about purchases like price, seller, buyer, date of sale, type of property and characteristics about the sold property.

### **2.5 The mortgage deeds system**

The mortgage deeds system converts printed mortgage deed into digital mortgage deed, which results in decreased costs for storing the deeds and a significant increase in security. Today, most Swedish banks, credit institutions, real estate and insurance companies are connected to the system and more than seven million mortgage deeds, out of a total of approximately nine million, are now handled within the system.

In contrary to the above mentioned registers, the mortgage deeds system is not a public register. But, even if it is set up for the financial institutions, property owners can always make a request to Lantmäteriet for information regarding the identity of registered holder of their digital mortgage deeds.

## **3. REAL PROPERTY FORMATION**

Subdivision of land as well as other kinds of cadastral procedures, such as reallotment, property definition, amalgamation, partition, establishment of joint facilities and utility easement procedures, are in Sweden defined as "real property formation". The procedure of accomplishing the desired legal changes is relatively unique to Sweden. In Swedish the procedure is called *förrättning* and is characterised by co-operation between the interested parties concerned and the authorised officer who conducts the procedure. The procedure is considered to be an efficient way to solve land related issues, including decisions about compensation

The real property formation process includes administrative as well as technical work, such as investigation of the current situation, legal examination of the proposed changes, communication with neighbours, local authorities and other interested parties, field survey, production of a cadastral survey plan and other documents, decisions concerning the change in property

structure, servitudes, compensation, etc, and, finally, registration of the changes in the real property register (including the cadastral index map)

The real property formation is carried out by the state agency Lantmäteriet with one cadastral authority in each of the 21 counties and by the 38 cadastral authorities administrated by local authorities. The state organisation has also a number of local offices and are localised in some 80 places in the country. Around 20 000 new properties are formed each year

The process is supported by an advanced IT solution giving the cadastral surveyor easy access to information in the real property register, the historical archive and other sources of information. The system also integrates other kinds of sub-systems for surveying and mapping, handling of documents and handling of economic information.

Real property formation supports many kinds of activities in society. Traditionally, the building of new housing areas and the development of agriculture and forestry has been in focus. Nowadays, also a lot of other activities demands for property formation. Such an example is to secure transmission of electricity by utility easement procedures and handling of corridors along the transmission lines in forest areas. Another example is to improve road safety by giving rights for setting up wire railings or to arrange reallootments when a dangerous crossing road is taken away. A big issue for the time being is also to secure land use rights for setting up wind turbines.

#### **4. DIGITAL ARCHIVES**

Great efforts have been spent during the last years on digitizing the large volumes of maps and other documents in the archives being held within the 21 cadastral authorities and at the head office. In total the archives consists of more than 2.5 million individual acts with totally over 50 million pages and maps.

Each year over 200 000 acts are used within the property formation process. The digitalization of the archives and the setting up of efficient access tools creates cost savings within the real property formation process. Other reasons for investing in the digital archives are to satisfy the great interest from professionals and the public to get easy access to the information as well as to reduce the costs for archives and maintenance of the documents. The digitalization will be finalized during 2009.

#### **5. THE NATIONAL GEODATA STRATEGY**

The Swedish Government and Parliament has given Lantmäteriet an outspoken role as coordinator of the national spatial data infrastructure (SDI). The responsibility comprises coordination of production, cooperation, dissemination and research and development. The responsibility also includes coordination of the implementation of EC directives related to GI (such as Inspire and GMES).

The government has also decided to establish a high level advisory board (*Geodatarådet*) supporting Lantmäteriet in its coordination role. Furthermore, it has been decided to develop a national geo-data strategy covering all strategic issues related to the handling of geo-data in Sweden. The aim of the strategy is to give guidance to geo-data producers and users regarding development and use of standards and specifications, metadata and metadata-services, services for dissemination of information, policies for access and use, research and education as well as organisation and cooperation. Lantmäteriet is responsible to work out this strategy in close cooperation with the advisory board and other stakeholders. The strategy was presented by end of March 2007 and will then be annually updated. Thus the strategy was updated in March 2008 with a report on achieved results and description of planned activities for the coming year.

The development of the Swedish SDI outlined in the strategy document implies many challenges and needs for developments, both within the public and private sector. Several actions are also depending on activities being decided by third parties, such as the implementing rules for the Inspire Directive. Therefore, the realization of the strategy is based on the following approach:

- It is better to take several small steps than one big.
- It is important to follow up all actions being carried out, to learn from the experiences and be prepared for adjusting the plans.
- It is important to establish strong links with the users of data and services.
- It is important to constantly develop the cooperation within the network.

The implementation of the strategy is focused on eight action areas:

- Cooperation in a network as a basis for the infrastructure
- Structuring the information
- Technical infrastructure
- National metadata catalogue
- Geodetic reference system
- Research, development and education
- Legal framework
- Financing and pricing

The strategy will have an impact on all relevant stakeholders by supporting reduction of data collection and maintenance costs, improvement of data quality and consistency, added value through more easy combinations of data from different sources, improved access to data and development of e-Government.

In this connection it is important to stress that the implementation of the strategy not only will affect the public sector but also the private sector. The actors on the market are important and the strategy will support their activities by:

- Developing the market for value added products and services. One reason for this is that the strategy and its implementation will make the public undertakings more clear and by that help the market actors to evaluate the market potential and to take the risk to invest in product and service developments.

- Easier bringing basic geodata to the market (if they have such data) as the infrastructure will be open also for private actors.
- Being involved in projects related to the development of the infrastructure, such development of metadata services and the national geo-portal.
- Being subcontractor of services to public organisations being responsible for geodata.

## REFERENCES

Annual Reports from Lantmäteriet  
The Swedish geodata strategy

## BIOGRAPHICAL NOTES

### **Stig Jönsson**

Born 1946

Stockholm School of Economics - Bachelor of Science (Economics) 1970

Swedish National Audit Office, Stockholm - Trainee and Operational Auditor 1970-1974

Swedish Institute for Building Research, Stockholm and Gävle - Financial Manager 1974-1980

EM Elektro-Montage AB, Sandviken - Financial Manager 1980-1990 & CEO 1990-1991

Lantmäteriet, Gävle - Financial Director 1992-1997, Deputy Director-General 1997-2000, Director of the division Metria and Deputy Director-General 2000-2003, Director General 2003-

Other assignments - Chairman of the board of Swedesurvey AB 2005-

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