

THE SWEDISH LAND DATA BANK

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ABSTRACT

The Swedish Land Data Bank System has been developed in order to rationalize handling of data on real properties and land. The system replaces earlier manual systems for property and land registration. It interacts regularly with other EDP-based information systems and serves as a land information system (LIS) in a broad sense. The system is being steadily extended to cover all parts of the country. The costs for design, implementation and maintenance of the system are covered by reduction of costs for property and land registration.

1. INTRODUCTION

With an area of 174,000 sq.miles (450 000 km²), Sweden is the fourth-largest country in Europe. Half its land surface is covered with forest. About 10 % is farmland. Lakes dot the countryside. A long mountain chain follows the border in northwest. Sweden has a population of 8,3 million, with 90% living in the southern part of the country, mainly in urban areas.

The country is divided into about 3,5 million real properties. Most properties are owned by private land owners, but also companies, municipalities, the Church and the State own land. Registration of the division of land into real properties (property registration), and of the owners (land registration), has a long tradition in Sweden. It has been performed in a systematic way, covering all kind of properties and every spot on the ground, since the beginning of this century.

No changes in the division of land can be made without having it registered at the local property registration authority. There are in all 55 authorities. They handle 50,000 registration cases per year. Transfer of ownership has to be registered in the same way at the local land register authority. The number of land register authori-

ties are 95. The number of land register cases, including applications for mortgages and similar, are 2 million per year.

In the early seventies the Swedish Parliament decided, on proposal from the government, to replace the earlier manual systems for property and land registration with a new, EDP-based system, the Land Data Bank System. The purpose was to improve the old systems and to make the registration process faster, cheaper and more effective. The Land Data Bank would at the same time serve as a land information system (LIS), storing easily accessible data on land. The Central Board for Real Estate Data (CFD) was established as a central agency under the government to develop and build the new system, and, later on, to implement and maintain the system.

The system was introduced as a pilot study in one county (Uppsala county) running parallel to the manual systems for a certain time. It was legally empowered to operate in that county from 1976. Since then it has been implemented step by step in other counties and cover for the time being 40% of the country. Recently it was decided to speed up the implementation process. Half the country will be covered in 1987 and the system will be implemented for the whole of Sweden in the beginning of the nineties.

2. SYSTEM DESIGN

Property and land registers serve basic functions in the society and have to be build upon well defined and stable regulations, which are uniform for the whole country. This has led to the creating of the Land Data Bank System as one system for the entire country. It has proved to be advantageous also to run the system on one computer. The structure of the data bases is, however, decentralized. This means that data from different regions (counties) are stored in physically separated bases, which operate independently.

The system comprises 15 logical data bases. A Swedish data base management system (DBMS) - AROS/ROSAM - is now being used. The DBMS is partly tailor-made for the purpose of the Land Data Bank System and therefore much more effective than standard products used in the beginning of the project. Also the application software is tailor-made to a great extent. In all, some 100 man years have been put into system design and development. These efforts have been fully compensated through a more effective system than what could be reached by standard products. The number

indicated includes penetrating of regulations, preparing of procedures and training materials, documentation, etc.

3. DATA CONVERSION

A major part of the data in the Land Data Bank is derived from the manual property and land registers. On an average 900 characters are captured per real property, 400 coming from the property register and 500 from the land register.

Experiences show that the data capture preferably should be performed by specialists, exclusively concentrating on the task. Preparation and cleaning up of the manual property register takes on the average 3 minutes per real property. Corresponding work for the manual land register is 5 minutes. Also the transfer to an EDP-readable medium takes 3 and 5 minutes respectively. A minicomputer system (key-to-disc system) is used for this purpose. Registration is performed by two independent operators. The system checks that the registered data is identical and plausible. There is no need for manual checking.

The total costs for the data conversion from the manual registers amounts to about 60 SEK per property. The figure includes costs for the development and maintenance of the data conversion system, and loading of the data bases.

Another 40 SEK per property are used in order to collect certain information which can not be found in the old registers. Examples are: coordinates and map references, street address of the property, assessed value of the property, plans and regulations affecting the property, and address of the owner.

The figure just mentioned also includes reformation of the identifiers of the properties. A uniform system is implemented. The identifiers consist of the name of the municipality as a first part, the name of the district within the municipality or the name of the block as a second part, and property number (lot number). Examples are: Stockholm Bromma 4:3 and Stockholm Mercurius 5.

4. USE IN PROPERTY AND LAND REGISTRATION

The Land Data Bank System replaces so to say over-night the manual systems. It is legally empowered from that time and the State guarantees the correctness of its registers.

The local property and land register authorities are connected to the system on-line via "leased circuit connections"

in the public telephone network. Handling of cases is carried out as a dialogue between man and machine, where the computer takes over routinework and check-ups. Diary sheets and other documents needed in the daily work are printed out on local printers. Official documents such as certificates, mortgage bonds etc., intended for the applicants are printed out at the central computer and distributed therefrom. Calculations of stamp duties and fees are automated.

For the people at the registrars' offices this means that the working environment has been improved. Heavy ledgers and register books are not needed any more. Boring matters of routine have disappeared. Type-writing etc. has been exchanged for decision-making.

For applicants and others interested in having cases handled without delay the system speeds up the process tremendously. In principle an application - say for a title or a mortgage - delivered at the registrar's office before noon will be dealt with and decided upon the very same day. Applications for extracts of the registers, mortgage bonds etc. are automatically printed out when ordered from a terminal. The applicant receives the results of his application by mail within a few days.

Banks, brokers, municipalities and other users of land information can have a direct access to the system by renting terminals from the CFD which are linked into network in the same way as the terminals at the register authorities. It is also possible to connect userown equipment, normally used for other purposes within the office, to get access to the Land Data Bank System. In this case "called circuit connections" in the Nordic public data network are used. A third alternative, so called VIDEOTEX-connections, will be available from July 1986. Users, who have a local terminal network of their own can get access to the system via a computer to computer linkage.

The user pays a rental varying from 2 500 SEK (leased line including equipment etc.) to 25 SEK monthly. In addition to this the user is charged a transaction fee, varying between 1,50-3,00 SEK per question.

5. LIS IN A WIDER SENCE

Terminal connection gives a direct access to the data in the data bases. The principal search arguments on-line are the identifiers of the properties. Also unreformed identifiers and street addresses can be used. In batch-processing, however, searching can be done on any information

stored. Coordinates are frequently used, for example to produce list of properties (and owners) within an specific area. The area can be delimited arbitrarily on a map. Coordinates can also be used for analyses of geographical data (distance analyses) and for presentation of statistical data (thematic maps).

In batch-processing also civic registration number or names can be used as search argument.

The Land Data Bank System interacts regularly with the Population and the Land Taxation registers - both are based on EDP - in order to update owneraddresses and assessed values of the properties. The connection offers possibilities to combine data in these registers with the coordinates in the Land Data Bank. Production of population maps and other kinds of thematic mapping is since long an established field of activity within the Land Data Bank System.

6. SECURITY AND INTEGRITY

In order to ensure good security in the Land Data Bank System there are several security systems operating independently. Physical protection of stored information is ensured through regular copying of the data bank. Backup copies are stored in several different archives.

Authorization to change data is checked on several levels. There are lockouts connected to the entire chain of databases, line network, offices, terminals and persons. For information retrieval there is a similar arrangement, even though the number of authorized persons is considerably larger in this case. Information retrieval in the data network can be done only unit by unit. Furthermore, retrieval can be performed only from a known terminal in a known place.

It is a basic principle in Swedish legislation that citizens have the same access to information as authorities have. The entire register content is open. The same rules apply to the Land Data Bank System as to the earlier manual registers. Also the right to use developed programmes is fundamentally open.

Another major principle is that programmes for data processing can be developed solely for the purposes the system is aimed for. This applies also to distribution of information.

In spite of the fact that the information in its entirety is public and accessible unit by unit on-line from terminals, there are limitations as far as retrieval of processed information is concerned.

The responsible agency - for the Land Data Bank System it is the CFD - has to carefully observe questions concerning security and integrity. Based upon the existing regulation system the CFD has the right to reject requests for compiled information and declare the requested compiled data secret. This means that the data itself is still open unit by unit but the compilation will not be executed. There has been no need for the CFD to use the right to declare data secret so far. Nor has up to now anyone lodged a complaint for integrity reasons.

Data law and other regulation systems developed for EDP-handling seems to have worked comparatively well for the Land Data Bank System. These questions must, however, be treated as parts of the development of a system of the kind the Land Data Bank System represents. Openness and easy accessibility to data must be a guiding ingredient when developing an information system. Otherwise it should be questioned whether the system shall be built at all. On the other hand, limits must be drawn in order to protect security and integrity. Existing rules and developed technique must balance one another in a concurrent system.

7. ECONOMY AND EFFECTS

The investments being made for the Land Data Bank System as regards development, data collection etc., are more or less twice as high as the annual cost of a manual system. In spite of these investments, the Land Data Bank System is profitable within a relatively short period. Savings are made through reduction of staff and reduced costs for premises at the register agencies. Considerable economic effects can primarily be seen at large agencies while short-term realization of profits at very small agencies is more difficult to achieve.

In a wider sense the system is economically beneficial to society as a whole by achieving a higher degree of service as regards accessibility of data, increased amount of information, shorter turn-around time and so on.

8. FUTURE STEPS

The property and land registers within the Land Data Bank System give fairly detailed information on the properties: origin, location, area, value, owner, mortgages, easements, survey measures, plans and regulations. It has been proposed to create a third register within the system, a register on buildings. The idea is mainly to automate manual registration procedures concerning buildings in the same way as property and land registration procedures have been automated.

One reason to use the Land Data Bank System for this purpose also is the close relationship between properties and buildings. Certain data on the buildings, e.g. coordinates, are already stored in the system. Another reason is that the registration process and flow of data are similar and that the experiences of that kind of system which has been implemented for property and land registration are so positive.

Investigations show that today's cost of registration and transfer of data can be reduced. Establishment of the building register, however, has not been decided so far.