

Renewal of the Land Information System in Finland

Pekka HALME, Finland

Key words: land information system, cadastre, land register.

SUMMARY

The Finish law on the Land Information System and its information service came into force January 1 2003. On grounds of the law the National Land Survey of Finland (NLS) was nominated as the responsible organization for the administration of the present Land Information System (LIS).

The technical renewal of the system was started in 2001. Three projects have been started to plan the structure and the introduction of the cadastre component of the New Land Information System and to streamline the NLS systems and the municipal systems and their data contents with each other. The projects should have their task completed and thus the New Land Information System in production by June 1 2005. The system will technically be an extension of the NLS cadastre application.

The cadastre component of the LIS is maintained and updated by the NLS District Survey Offices and the 86 cities (out of 450 municipalities) that are in charge of their own cadastre upon real estate units in their city plan areas. The LIS contains information about 4,6 million real estate units out of which about 4 million are in the NLS cadastre and the rest in the cities' cadastres.

At present the 87 separate cadastres are the legal ones and the cadastre in the LIS a copy of them. According to the legislation the New LIS will become the primary and legal register for cadastral information when it will be introduced in June 1 2005. At the same time in the new system will also be included location information on all cadastral units.

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1. THE SITUATION TODAY

The Finnish law on the Land Information System and its information service came into force January 1 2003. On grounds of the law the National Land Survey of Finland (NLS) was nominated as the responsible organization for the administration of the present Land Information System (LIS). This meant the end of an era when the existence of the LIS was only based on a Government decision in principle and an agreement between the interested parties. Ministry of Agriculture and Forestry nominated a working party to prepare new legislation to regulate the activities in 2001. At the same time the technical renewal of the system was taking its first steps.

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2. THE LAND INFORMATION SYSTEM IS A PART OF THE FINNISH BASE REGISTER SYSTEM

Information about the basic units of society are collected, stored and updated in the Base Registers. The Land Information System is one of them. The Base Registers are

- The Personal Information System
- The Business Information System which is comprised of the Business Register, the Enterprise Mortgage Register, the Register of Enterprises and Establishments, the Association Register and the Foundation Register
- The Building and Dwelling Information Register
- The Land Information System consists of the Cadastre and the Land Register.

The Base Registers contain information that is of vital importance for the individuals (natural and juristic persons) and the society at large and thus guarantee for their part the functions of society. The characteristics of the Base Registers include broad coverage, reliability, versatility and data protection. Another characteristic is that law or statute has prescribed them. The figure below describes the integration possibilities between the different registers.

A well working and broadly covering base register system brings about many concrete economic and functional advantages. The largest application of the interconnection between the Base Registers is evident in census taking. Here there is no need to collect data through the use of forms; all data is available in the registers. The year 1980 was the last time a census

was carried out entirely by form-based data collection. The need has declined thereafter. Since 1985 censuses were conducted by register-based data collection. In addition, the cost of a census has dropped dramatically. The form-based census cost approximately 35 million euros. When carried out by registers the cost fell under one million euros. The reduction in cost and the continuously updated data have led to a situation where census taking can be done annually.

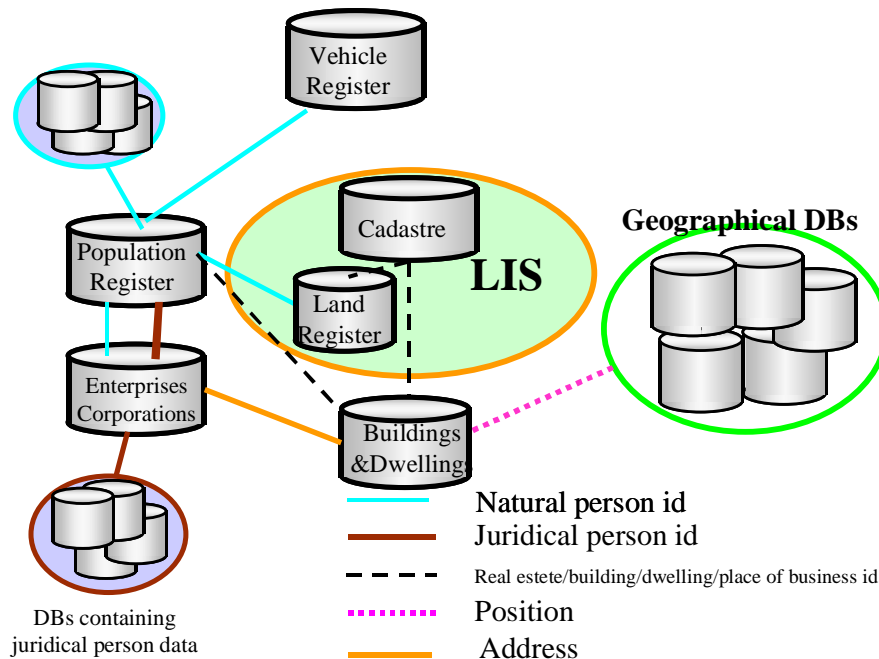


Figure 1

3. HISTORY

The present LIS has been in production since 1985. Before the system finally was put in action many working parties (the first ones as early as in 1968) had been tackling the issue and admitting their reports. A government decision in principle in 1979 can be said to be the starting point for the development of the system. According to the decision an integrated ADP-system that could be connected with other administrative systems flexibly should be created. There was a long process of developing a system ahead that involved many different authorities and required carefully planned and coordinated action, an appropriate organization and developing and testing new technical solutions.

Developing the LIS was based on the increase in and a growing need for real estate information and a need to intensify the use of existing information. The need for integrated information service had grown when several separate registers were created. These registers were kept up in different locations and by different authorities. The practice in registering information varied locally as well. Maintaining and updating information about same real estate units in different registers caused conflicts between registers and problems with legal protection.

The needs for information about real estate units and land-use rights and restrictions that were connected to these units had changed and become national instead of local and thus required standardization, which was regarded as one of the goals for the development. An integrated nation-wide ADP-system was necessary as a basis for a nation-wide information service.

In the 1990's several investigations on user needs for development of land administration and LIS services were conducted. All of them resulted in the fact that the data contents of the LIS should be widened. The most important message from the investigations was, that the digital cadastral index map should be included in the system. In most of the individual cadastres there is also a digital index map, but not in the nation-wide LIS. The second demand was the improvement of descriptions of land-use rights and restrictions (i.e. city plans, decisions). Also data about real estate ownership should be improved. As a fourth observation can be mentioned the growing interest in linking terrain data or other information with real estate information through location. The role of the Internet concerns all the viewpoints above.

Earlier information about real estate units was maintained in both the NLS and municipal cadastres. Data about them were also in the Land Register, taxation registers, population registers and different other municipal registers. These all were updated manually and data transfer between them was done by mail.

The Government specified the goals for developing the LIS by several decisions in principle and at the same time defined that LIS should be realized in the whole country by the year 1995. According to these decisions the LIS should comprise of

- The Cadastre
- The Land Register
- Land –use planning data
- In addition also some municipal real estate data systems could be linked to the LIS

Later parts of planned land-use planning data (remarks of confirmed master plans, town plans, building prohibitions etc.) were included in the cadastre because the planning data component in the LIS was not realized. This information indicates only which decisions concern each unit but not actual contents of these decisions; these data must be collected from other sources. After this the LIS was considered having nation-wide coverage in 1996.

The Government took in the same year 1996 a new decision that was in force until the end of year 2002, when the new law mentioned earlier was introduced. According to the decision the LIS should be developed further to meet the requirements the new legislation (The Code of Real Estate among others) set. Furthermore preconditions for developing the LIS as one of the base registers were created as well as possibilities to effectively resolve overlapping registration by different authorities.

Functioning components of the present LIS are the Cadastre updated by the NLS and 86 municipalities (cities) and the Land Register upon which the responsibility rests on the Ministry

of Justice. The data contents of the present LIS is based on the Law on Cadastre and the law on the register for titles and mortgages.

4. THE PRESENT LAND INFORMATION SYSTEM

4.1 Maintenance

The cadastre component of the LIS is maintained and updated by the NLS District Survey Offices and the 86 cities that are in charge of their own cadastre upon real estate units in their city plan areas. The LIS contains information about 4,6 million real estate units out of which about 4 million are in the NLS cadastre and the rest in the cities' cadastres. It must be noted that at present the 87 separate cadastres are the legal ones and the cadastre in the LIS a copy of them.

The District Courts are responsible for updating the Land Register. The courts enter titles, special rights and mortgages in the Land Register. All these registrations are connected to the identifier of a cadastre unit or a part of it (a share, lease area).

Parts of the functions of the LIS are outsourced. The system hardware is taken care of a private enterprise. The same company has also the right to offer LIS information service as a part of its own service package. It is, however, obliged to account for the LIS income to LIS authorities. Another company is doing invoicing and user administration. Both these partners were chosen on the basis of an open competition.

The Present LIS

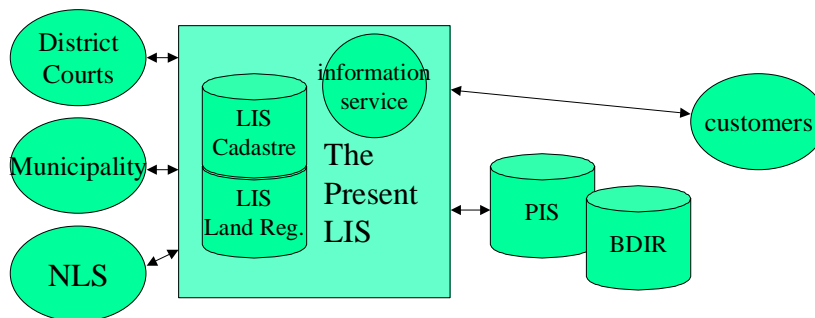


Figure 2

4.2 Access to Data

Access to data in the LIS is guaranteed. Everybody has the right to read and make notes about the contents free of charge. The more usual way of getting necessary information is by extracts and certificates or other printouts via an electronic interface. This would typically happen against a standard price. In addition to that the NLS can on grounds of an application give permission for the use of real estate information via technical connection for land-use planning, real estate business and mortgaging and purposes that are comparable to these.

4.3 Information Service

Each authority updates its own part of the database but can use all data in the system. Important users usually have a right to direct access either to the LIS or some of the primary cadastres.

The location of real estate units is usually shown in a cadastral map connected to each cadastre. The cadastre holders have different technical solutions. The LIS as such does not include map (location) information about register units for the moment (see chapter 5).

The most important form of information service is the use of official extracts and certificates by the register holders themselves and by customers. The unit identifiers are used as search keys. There are over 10 000 LIS-users. About 4,5 million printouts are taken annually and about 70 % of them are used for investigating applications for titles and mortgages. Over 1 million extracts are taken directly through a technical connection. The income was 5,3 million euros in 1999. The net service is delivered through both the private web site (see 4.1) and the LIS authorities' own site.

4.4 Services Between Authorities and Updating of Different Other Registers

In the present system there are only some applications that are based on direct operations and with which authorities can update information under another authority's responsibility.

The NLS cadastre updates the LIS every night. The municipalities do the updating at 1 to 5 day intervals. From the LIS cadastre component the updated information is transferred further to the Population Register and tax administration's registers.

The District Survey Offices send information about real estate transactions to the Local Courts from the Real Estate Price Register. This concerns only those transactions where an application for a title has not been made. Otherwise the court asks for an id for the area in question when the application comes in.

To the LIS Land Register component also data like owners' identification information and addresses are transferred and updated weekly from the Population Register or the Business Register.

The Population Register is a nation-wide ADP-register that contains basic information about the Finnish citizens and those who live permanently in the country as well as about buildings and dwellings. In addition to that also real estate data is stored in the register. This information is mainly collected from the LIS is needed for updating information about people's place of residence.

The taxation authorities use information from the LIS as the basis in their own real estate registers for conducting income-, property- and real estate taxation.

The environment authorities need real estate information in land use planning, building control and nature conservation activities.

4.5 The Involved Parties

Until 2002 the National Land Survey and the Ministry of Justice together were responsible according of an agreement for the development, maintenance and administration of the LIS. The NLS and the 86 cities had the responsibility for maintaining the cadastre in the LIS and the Ministry of Justice for the Land Register. There was also a group of 8 members from different organizations set by the Ministry of Agriculture and Forestry to keep an overall eye on the functions and principles of the LIS.

4.6 Funding

The NLS, the Ministry of Justice and the involved cities stand for the system costs. Every party is responsible for the costs for data transfer from its system to the LIS. The State assumes the overall ADP expenses.

The running costs for the LIS were about 2 million euros in 1999.

5. BEFORE THE FUTURE

5.1 Background Observations to Law-Drafting

Characteristic for the situation today is lack of unity. Information about a single cadastral unit is maintained at the NLS, at a municipality, in the LIS, at the Population Register Centre and at taxation authorities. This causes problems with reliability and overlapping data administration. Furthermore the NLS's and municipal cadastres have in practice overlap with the LIS.

5.2 The New Law on the Land Information System

One of the essential goals of the law making was to move from a situation that was regulated by an agreement to a statutory national register and information system on the one hand. In the government proposal to law it was emphasized that the state should bear the responsibility for maintenance and development of the system. It was also stated that the aim is to have faultless information and thus the emphasis should be put on improving the data quality.

On the other hand the maintenance and availability of real estate information should be organized so that it would be possible to get all information about real estate units from one integrated system. Access to LIS information should be open (The Act on the Openness on Government Activities) but protected (The Personal Data Act).

During the first stage the LIS would contain information according to Law on Cadastre and law on register for titles and mortgages. Later the aim would be to create a general register where all information connected to real estate units would be registered regardless of what law the production of data is based. This would mean data about land use planning in the first place.

Another goal was to secure that the information contents of the new LIS is up to date and of high quality. Furthermore one would intensify information service and availability of information. The producing authority has the responsibility for loading its data and updating it in the new LIS. The NLS alone would be the administrator and thus responsible for the foundation, maintenance, information service and development of the system.

Of utmost importance is that according to an amendment in the Law on Cadastre, which came into force simultaneously with the law on the LIS, the New LIS (NLIS) will become the primary and legal register for cadastral information when it will be introduced in June 1 2005. Until that date the cadastre in the LIS is only a copy of the 87 different primary cadastrals.

The new law has been in force about seven weeks when writing this. No administrative problems have occurred.

The three project groups started their work during the year 2001 by preparing requirement specifications and the project orders. During 2002 and 2003 the projects concentrate on specifying and planning the system structure. The final development phase for the first parts was started during winter 2002/2003. The whole system is planned to be ready in the beginning of February 2005 for the loading of municipalities' data. After that each municipality will start to update its data in the NLIS. Loading will be finished by June 1 2005 when the new information tools will be available as well.

The development work is done by the tool project in the NLS Development Centre. Its task is to specify, plan and build the necessary databases and applications. The introduction project is responsible for the introduction of the system. A separate working group is founded for developing and planning the necessary changes to different NLS's and municipal data systems. In this group there are members from the NLS and municipalities. All three projects work in close cooperation. The new LIS is technically realized as an extension of the NLS cadastre application.

6. THE NEW LIS

6.1 The Structure of the System

The 86 cities that have their own cadastres and the NLS maintain the New LIS. The register will be updated every night. The cadastre component of the present LIS will be kept operable and information in it updated from the New LIS every night. The data in both systems are thus identical during one day. This procedure is chosen, because a new Land Register will be attached to the NLIS in 2007 at the earliest. Until that the Land Register will continue operating in the present LIS. All other data updates will happen through the NLIS.

The digital cadastral index map is a part of the new system. Location information will be loaded both from the NLS's cadastre and the cities' cadastre maps. The NLIS will include consistent location information.

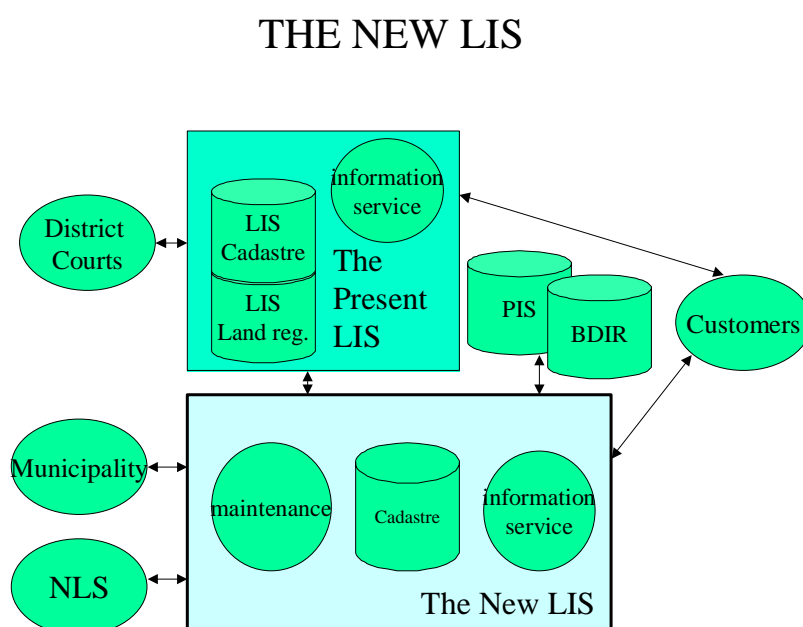


Figure 3

6.2 The Different Entities in the Application

Application entities for preliminary data control, loading as well as maintenance and information service will be included in the new system.

Possible conflicts in and inconsistency of data are checked with the control tool. The loading application is used for loading attribute information from the present LIS and geographical information from municipal cadastral map data systems. The cadastre component is updated with the maintenance tool. The register authorities can serve their customers with the information service tool. If certain conditions that are prescribed in the law are met, also other organizations can be allowed to use the information service application independently. It will

also be possible to connect external systems to the NLIS through application interfaces in the cadastre.

The updating authorities will be able to use a special entity in the information service tool, with which they can handle and register for example legal survey identification information when a survey is started.

6.3 Preliminary Inspections of the Data

It is necessary to check all data before loading it into the NLIS. In different municipalities and in the NLS the data contain references to other parties' data. In addition to that the data is partly overlapping. Location information for example at the boarder between two register authorities can be inconsistent or there may have occurred disturbances or other faults during data transfer to the present LIS.

To obtain the best possible data quality also quality controls are made to the transferred data. The municipalities have got instructions in spring 2002 about how to control and correct possible deficiencies in their map data. During spring 2003 the tool project will conduct automated quality controls to attribute data. The NLS data and LIS data as well as a municipality's data and LIS data are compared to each other. The emphasis is set on cross control of identifiers.

6.4 The Database

The database in the New LIS is developed on the basis of the NLS cadastre database, on which necessary changes and extensions are made according to NLIS specifications. It is planned that present data can be loaded as such but in the new system higher standard for reliability and consistency will be required in data maintenance. Some structural changes will be made in the NLIS so that both the NLS and municipal attribute data will get more consistent.

The situation is different with the geographical information. The data is very inhomogeneous. I.e. there are big differences between the ways the basic geometries (point, line, area) are stored. There will be only one definition for the structure of geographical information in the NLIS. Location information is given to register units, unseparated areas, town plans, building prohibitions as well as servitudes and other land use restrictions.

Planning of necessary changes in the NLS cadastre database is under way. The database will be altered to meet the NLIS requirements during 2003.

6.5 The Loading Application

The loading application is meant only for those who update NLIS. It is used for loading both attribute data and location data to the system. Attribute data will be loaded one municipality at a time from the present LIS with !-datasets. Location data is loaded from municipalities' systems using XML/GML-protocol.

The loading application will form a consistent entity of both attribute data and geographical data for each register unit. Location data from different municipalities and the NLS will be fit together. Municipalities have used many different coordinate systems and the measurements are bound in different control point networks. When a municipality's data is loaded it will be registered in the NLIS maintenance database. It is estimated that each loading will take between 1 to 4 weeks. After registration each municipality can start to update regularly its data in the NLIS.

Planning of loading programs will start this spring and test loading is planned to take place in summer 2004.

6.6 Data Transfer to Municipal Systems

Data transfer between the NLIS and municipal systems will happen using XML/GML-protocol through an interface. Loading of geographical data, maintenance and information service transfer is planned to happen according to a single NLIS -data transfer specification. Planning of interfaces is under way and the aim is to publish the preliminary XML-schema in spring 2003.

6.7 Maintenance

After its data has been loaded a municipality starts updating it in the NLIS. The leading idea in maintaining attribute data is that it is always first copied from the NLIS to the municipal system. Then the necessary operations and changes are done and the altered data is returned back to the NLIS. In question of location information the procedures will apparently vary from one municipality to another because of local reasons.

6.8 Information Service

The information service will be used by the authorities in their own tasks and by the service personnel in customer service points. Also professional users like banks and real estate agents will be using the service over the net. An additional functionality will be built in the service through which also external applications can obtain data from the NLIS. In these cases the added value service provider in question will build a corresponding functionality in its own application. When delivering certain products and data sets from the NLIS over net is not practical it can be done by a special order service application.

Small-scale maps can be used for orientation in information service as well as terrain raster and municipal guide maps as background information. The user can search using identifiers besides which he can also use different location based searches by defining a point, a line or an area on the map. The location of a cadastral unit can be viewed on a background map and different printouts can be made of it.

The system provides an extract of a cadastral unit, a cadastral map extract and a certificate from the Land Register as well as printouts of unseparated areas as official products and ser-

VICES. As other products can be mentioned a printout including cadastral map information on a background terrain map or an integrated map and attribute data printout. The information service will be connected to the Land Register and the Building and Dwelling Information Register where it is possible to get a cadastral unit id using the address of a building as a search key. An owner's address can be obtained either from the Land Register or The Personal Information System.

The specifications for the information service are under way. The plans will be done during year 2003 when also the realization begins. The connections to and from the service are planned and built during 2004.

6.9 Funding

The NLS stands for the system costs according to the new law. It has, however the right to cover the expenses by a share of the income through the information service defined by the Ministry of Agriculture and Forestry. All the interested parties cover the other costs according to a similar system. The surplus is divided between the parties. The estimated amount of income in 2003 is 7,2 million euros and it is supposed to increase in the future when different map-based products can be produced and delivered.

7. CLOSING REMARKS

Renewing the whole system is a very challenging task for all parties; the NLS, the working group on municipal system, municipalities, system providers and other authorities that are taking part in the project. The challenges refer to as well building the system as developing the municipal systems and the introduction of these. In this project overall many large data systems are put together and the functional processes of the NLS and municipalities are connected. The data stores as well as data systems undergo big changes.

The trust between the parties involved has not always been complete and many cultural barriers have had to be overcome. All the organizations have made concessions. The task is far from finished but at present the cooperation seems to work well.

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BIOGRAPHICAL NOTES

Jan 1999 - National Land Survey of Finland, Central Administration, Land survey unit, Chief Engineer

May 1998 – Dec 1998 Director of District Survey Office of Åland
Aug 1995 – Apr 1998 NLS, Central Administration, Chief Engineer
Aug 1991 – July 1995 District Survey Office of Turku, Land Surveyor
Oct 1988 – July 1991 Provincial Survey Office of the Province of Turku and Pori, Inspector
May 1984 – Sept. 1988 District Survey Office of Vaasa, Land Surveyor

CONTACTS

Chief Engineer Pekka Halme
National Land Survey of Finland
P.O. Box 84
FIN-00521 Helsinki
FINLAND
Tel. + 358 20 541 5384
Fax + 358 20 541 5005
Email: pekka.halme@nls.fi