

REPORTS ON THE CADASTRAL SYSTEMS  
OF THE E.U. MEMBER STATES:

ESTONIA  
LITHUANIA  
LUXUMBOURG  
DENMARK  
ROMANIA  
PORTUGAL

OVERVIEW ON THE CADASTRAL SYSTEMS OF THE E.U. MEMBER STATES - PART III.

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LANTMÄTERIET



# CADASTRAL INFORMATION SYSTEM

a resource for the E.U. policies

OVERVIEW ON THE CADASTRAL SYSTEMS OF THE E.U. MEMBER STATES  
PART III.



PERMANENT COMMITTEE ON CADASTRE IN THE EUROPEAN UNION

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PERMANENT COMMITTEE ON CADASTRE IN THE EUROPEAN UNION



# LANTMÄTERIET



In your hand you are holding the third edition of the PCC document on the Member States cadastral systems – “Cadastral information system: a resource for the EU policies”. The editing of this book has been one of Lantmäteriet’s (the Swedish mapping, cadastre and land registrations authority) tasks during the Swedish PCC-presidency.

The first document included eight monographs written by experts of the national cadastral institutions of Austria, Belgium, Czech Republic, Germany, Italy, Slovakia, Spain and Sweden. In the second editions six monographs were provided by the experts from Cyprus, Finland, Greece, Hungary, Poland and Slovenia.

In this third edition we have collected the monographs of further six cadastral institutions from the following countries: Estonia, Lithuania, Luxembourg, Denmark, Romania and Portugal.

The PCC will continue to take great care of this collection and in carrying on this work for the purpose of providing complete information on cadastral systems throughout the European Union.

Gävle, December 10th, 2009

**Stig Jönsson**

Director General of Lantmäteriet –  
the Swedish mapping, cadastre and  
land registration authority  
President of PCC

1<sup>st</sup> July – 31<sup>st</sup> December 2009



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# THE CADASTRAL SYSTEM IN ESTONIA



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MAA-AMET  
Estonian Land Board

<http://www.maaamet.ee>

September 2009

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# **1 INTRODUCTION**

## **1.1 History and the purpose of the cadastre**

Estonia was placed on the world map at the beginning of the 13th century when the extensive crusade reached the eastern coastline of the Baltic Sea. Then the predecessor of the Estonian land cadastre "bushel-book" (vakuraamat) was established for necessity to take an inventory of peasants' duties to manor. At the beginning of the 19th century the Livland Board of Audit was created and the main purpose of it was to gather the bushel-book materials and surveyed land unit maps from all counties and to finish land valuation in manors.

Slightly after the Estonian independence was declared on the 24th of February 1918, the Ministry of Agriculture, and as part of it, the Cadastral Office were founded. The first challenge was to carry out land reform to distribute land that was dispossessed from manors. The structure of the Cadastral Office was quite similar to that of today's land cadastre regarding both the institutional structure and content.

After the 17th of June 1940, when the Soviet Union occupied Estonia, all land was nationalized. 210,000 cadastral units had been registered in the cadastre up to that time. After the re-establishment of Soviet control all registration was stopped until 1990ies.

The land reform process has been ongoing in Estonia since 1991 including restitution, privatization and land compensation. The Land Board, being the authorized processor of the Land Cadastre, maintains the system for registering and managing cadastral data. In addition to supporting the traditional tasks of cadastral unit registration and land valuation data collection, the system facilitates data queries and analysis. After the implementation of the system, the Land Board has become an even more important partner in the national development process, and has been able to provide better services to its customers and users. The integrated spatial data have outlined the Land Board as a leading force in the national GIS community and made it a central institution in the development of the Estonian National Land Information System (LIS).

## **1.2 Development of the institutional and organizational structure**

The Estonian Land Board (Maa-amet) was established in 1990 for the implementation of the land policy of the Government of Estonia. On the 12th of October 1994 the Land Cadastre Act was adopted and this is the basic legal act for the foundation of the Land Cadastre. The chief processor of the Land Cadastre (Maakataster) is the Ministry of the Environment.

The Land Board is responsible to the Minister of Environment for the maintenance of the Land Cadastre, co-ordination and execution of land reform in the conformity with valid laws, supervision, organization and co-ordination of the activities in the field of land consolidation, land assessment, geodesy, cartography, geographical information. The Land Board also manages contracts for cadastral and geodetic surveys, and for topographic mapping. The activities of the Land Board are financed 100% from the state budget; all revenue earned by the Land Board goes back to the state budget.

The Land Board has set itself the following objectives:

- Will capture, maintain and deliver data to the community about the nation's most important geospatial features;
- Will make land-related data available for the public;
- Will become recognized as the best know-how centre in our fields of activity;
- Will ensure good and timely execution of land-related national programmes;
- Will remain an effective and well-functioning government agency.

The Land Board is a governmental agency and its fields of activity and functions are confirmed by basic regulations and acts. The Department of Land Cadastre is divided into five regions and consists altogether of fifteen Local Cadastral Offices (Katasribüroo).

The main obligations of the Department of Land Cadastre are to provide the technical support to the cadastral register and to maintain the local cadastral archive:

- To provide the technical support of cadastral register to Cadastral Office. To administer hardware and software, to keep them update and configured, to coordinate classifications and other important regulations, to propose amendments and introduce them.
- The Department of Land Cadastre is also responsible for recording cadastral units and archiving them.
- According to the Land Cadastre Act and the Land Register Act, the Department of Land Cadastre is responsible for supporting the Land Register with cadastral data. Basic connections between the Land Cadastre and the Land Register are regulated by the Land Register Act §77 and the Land Cadastre Act §4. The Land Cadastre Act provides legal basis for the Land Cadastral Information System.

The main obligations of the Cadastral Office are:

- Maintenance of the cadastral register and others registers that are needed for the cadastral registrar;
- Registration of cadastral changes;
- Maintenance of cadastral map and others useful maps for supporting cadastral registration;

- Maintenance of local and central cadastral archives;
- Issue of the basic data for cadastral surveying.

## **2 CONTENT OF THE CADASTRE**

The Land Cadastre is a database consisting of cadastral register with cadastral maps and cadastral archive in the conformity with the Land Cadastre Act. Although the cadastral map is not any more a correct term and the maps have already been replaced by online services and user-guided products, and in the context of database it can be referred to as a part of spatial data. The Land Cadastre is a database that is a part of the National Land Information System, which is based on modern GIS technology, as it will be described in chapter "Technological infrastructure".

The Land Cadastre Act, adopted on the 12th of October 1994, is the basic legal act for the foundation of cadastre. Based on this act "Procedure for the Maintenance of the Cadastre" and "Procedure for Cadastral Unit File Formation" were adopted. The first procedure regulates the content of data, the rules for the management and recording of documents, and for the registration of cadastral units. It also sets out the rules for making corrections in cadastral entries, how to enter restrictions to the database; the rules for document exchange; the rules for extracting and inspection of information about cadastral units; and the basic rules for the central cadastral archive. Land cadastral data are public.

The procedure for cadastral unit file formation is regulated by the technical and accuracy requirements for creating cadastral unit or property boundaries.

Below are the most important definitions from the Land Cadastre Act:

- Land cadastre - means a database consisting of cadastral register with cadastral maps and the cadastral archive;
- Cadastral register - means a collection of data pertaining to cadastral units which are registered and maintained;
- Cadastral maps - means maps in the cadastre for graphic presentation of information entered in the register (boundaries, location of objects which give rise to restrictions, data on quality of land, etc.). Cadastral maps, restrictions maps and land quality and valuation maps are maps;
- Cadastral area - means an administrative unit or a part thereof, which is taking into consideration boundaries of local governments;
- Settlement - means a part of a cadastral area used in the cadastre consideration of existing settlement patterns;

- Cadastral ID-code - means a numeric code, which is used to identify cadastral units and to relate data to other registers;
- Cadastral unit - means a plot of land registered in the cadastre as an independent unit;
- Plot of land ("land unit") - means a delimited part of land or water;
- Land coverage - means the use or uses of a cadastral unit permitted by legislation;
- Boundary point - means a point on the external border of a land unit that has coordinates. Procedure established by legislation and boundary point location in the field can, if necessary, be determined;
- Boundary marks - means a mark of a boundary point in the field, the location that can be restored;
- Land use type - means a part of a cadastral unit, which has the same, intended economic use and/or natural status and with no boundary mark delimitation;
- Maps on which cadastral maps are based - means maps which contain topographic information, which are used as the bases for cadastral maps and which are not parts of the cadastre.

## 2.1 Cadastral register

About a cadastral unit the following data is contained in the cadastral database:

- The cadastral ID-code. It is a code for each cadastral unit and it is unique consisting of three parts up to twelve numerical symbols. It contains the cadastral area, the settlement and the number of cadastral unit. The territory of Estonia is divided into cadastral areas that are characterized by five digits. Cadastral registrar divides these cadastral areas into settlements and these have three digits. The code of cadastral unit is a four-digit code and is given to the land plot that is registered in the cadastral register. Levels of code are separated by using ":" (xxxxx:xxx:xxxx) when registering the new cadastral unit in the register. The unit gets the first new unused ID-code and it will be unique;
- Cadastral unit name (or address in the towns), if this exists;
- Location;
- Name of the local government;
- Intended use;
- Total area;
- Cadastral code or codes from which the cadastral unit is formed
- Area by land use type and intended use.

About cadastral surveying the following data is contained in the cadastral database:

- Number of the cadastral unit formation file;
- The cadastral ID-code;

- Name of surveyor;
- Mode of surveying;
- Used coordinate system;
- Date of surveying;
- Level of surveying accuracy.

About of boundary points the following data is contained in the cadastral database:

- Cadastral ID-code;
- Number of the cadastral unit formation file;
- Numbers of boundary points;
- Type of boundary points;
- Type of boundary;
- Coordinates;
- Level of surveying accuracy.

About the property owner the following data is contained in the cadastral database:

- Cadastral ID-code;
- Name, address and personal identification code of the owner or superficiary in the case of a legal person, the seat, postal address and registration number;
- Register part number of the immovable property. Date of registration in the Land Register;
- Name of state owned land manager.

About real property restrictions the following data is contained in the cadastral database:

- Cadastral ID-code;
- Type of the restrictions for use;
- Name of the restrictions for use;
- Legal basis and date of the restrictions for use;
- Range of the restrictions for use and the reduced rate of taxation.

## **2.2 Cadastral maps**

Below are described several products that can be served on demand from the National Land Information System. These products can be provided online or as printed versions and are designed to meet the requirements set out in the Land Cadastre Act.

Cadastral map is produced from the cadastral database, administrative units database and topographic database. The most important layers that should be presented in this package are

following:

- Cadastral unit boundary;
- Cadastral ID-code;
- Administrative unit boundary consisting of county, municipality, village and small towns' boundaries;
- Name of administrative unit;
- Base Map or orthophoto layer.

Restrictions map is produced from the cadastral database, real property restrictions database and topographic database. The most important layers that should be presented in this package are following:

- Cadastral unit boundary;
- Cadastral ID-code;
- Restriction causing objects;
- Restriction zones and areas;
- Name of restriction causing object or zones;
- Base Map or orthophoto layer.

Land quality and assessment map is produced from the cadastral database, land productivity and assessment database and topographic database. The most important layers that should be presented in this package are following:

- Cadastral unit boundary;
- Cadastral ID-code;
- Value zones;
- Productivity zones;
- Base Map or orthophoto layer

## **2.3 Cadastre plan**

A cadastre plan is the source document for making an entry in the Cadastre for proof of the location of boundaries. A sworn land surveyor or person with a corresponding license compiles a cadastre plan. One copy of such a plan shall be included in the cadastral unit formation file.

Cadastre plan should contain:

- Cadastral units boundaries;
- Structures (buildings and constructions);
- Location of objects which give rise to restriction;
- Data on the area of each land use type shall be marked on a cadastre plan;
- Cadastral units codes.

## **2.4 Cadastral archive**

The cadastral registrar shall maintain a local archive for use of the cadastral register and cadastral maps and the storage of documents that constitute the basis for entries. Original documents shall be copied and digitalized. All copies shall be stored in a separate central archive.

## **3 TECHNOLOGICAL INFRASTRUCTURE**

The starting point for the maintenance of the cadastral register was the year 1991. From 1990 until 1996 all spatial data was recorded in the paper format. After a while alphanumeric data was recorded by using Microsoft Access database that had simple user connection. The starting point for designing the cadastral register was 1993 and recording the real property data started in 1995. The software came into use in February 1996 (version 0.99) and the initial name of this database was the Immovable Property Information System IPIS.

The next implementation of the system (MR2.1) was built up as a set of local office databases. Each Cadastral Office had its own database and it was not linked to the databases of other offices. The central database was just a periodic replication of local databases and included only a few additional reports. MR2.1 software provided support for the electronic cadastral unit registration, but an important part of the functionality – an integrated handling of spatial and alphanumeric data - was missing.

Since the end of the year 2001 the Land Board has been maintaining the Land Cadastre as a database that is part of the Estonian National Land Information System (LIS). LIS is a technologically modern GIS, which is the combination of hardware, software and data and makes it possible to capture, store, analyze, manage and present data that is linked to location. The main LIS server is located in Tallinn at the building of the Land Board and is built upon Oracle RAC database architecture. Local offices use terminal services and all data are treated digitally.

Although all databases that are integrated into LIS are not maintained with the same GIS software, the data representation and analyses are jointly treated. Besides using software developed by the Estonian company Datel ([www.datel.ee](http://www.datel.ee)), the Estonian Land Board maintains LIS for the actions of different level using well-known GIS software's like ESRI ArcGIS, Safe FME Desktop and Intergraph Geomedia. In provided services the main emphasis has been laid to Web Map Service (WMS) and Web Feature Service (WFS) using the specification published by the Open Geospatial Consortium (OGC).

The main databases in the Estonian National Land Information System are:

- Cadastral database;
- Topographic database;
- Land productivity and assessment database;
- Real property transactions database;
- Real property restrictions database;
- Geodetic points database;
- Administrative unit database;
- Mineral resources database.

The Land Register database is not integrated as part of LIS and is administered by the Centre of Registers and Information Systems ([www.rik.ee](http://www.rik.ee)) working under the Ministry of Justice.

The cadastral database is divided in two parts: production service and presentation service. Collecting the cadastral data through cadastral unit registration event is carried out under the production service. The key part of that is the event-based logging to satisfy in optimal way data exchange with other systems.

The cadastral database presentation system is more integrated into the common LIS presentation system. The key part of that is a presentation model that can be administrated in a way that it would be possible to create any kind of cadastral services. Most of services are designed using OGC WMS and WFS standards and can be accessed via the Estonian Land Board's geoportal (<http://xgis.maaamet.ee>).

The main data exchange is a complex of rules from the production and presentation systems to feed the Estonian data exchange layer X-Road ([www.ria.ee](http://www.ria.ee)). X-Road is a platform-independent secure standard interface between databases and information systems to connect databases and information systems of the public sector. By this way the Land Cadastre and the Land Register are connected for data exchange and are able to provide joint services via X-Road. This is an excellent example where the use of technological capabilities helps to present legally separately located registers as a unique system for customers.

The Estonian Land Board's main goal in developing LIS is to integrate more GIS based databases from the public sector into LIS. The challenge of nearest future is to integrate the databases of the Estonian Environmental Register.

## **4 UPDATING PROCEDURES**

The main cadastral activities are:

- Creation of a new unit;
- Division of a unit;
- Amalgamation of units;
- Adjudication of a unit;
- Reallotment of units;
- Closing of the unit.

The daily work of cadastral office can be divided into 5 main steps. Those procedures are:

1. Receiving applications and keeping the logbook,
2. Checking the application documents and entering new data on the cadastral database,
3. Signing the certificates and records,
4. Informing municipalities and applicants about the status of registration,
5. Preparing documents for archiving.

The starting point of the cadastral procedure is the provisional estimation of the landowner's application for property formation. The applicant has to indicate his/her desires and shall also indicate the property unit or units that he/she requests to be created. He/she has to supplement the application document with personal data and shall sign the document. A sworn land surveyor or person with a corresponding license shall carry out the cadastral surveying for the formation of a cadastral unit based on the unattested written application of the landowner. This application is transmitted to the surveyor. He/she has to get all basic data from the cadastral register and from the municipality before starting surveying. The sworn land surveyor or person with a corresponding license prepares a cadastral unit formation file pursuant to the procedure provided by legislation and submits the file pursuant to the procedure provided by legislation to the cadastral registrar for registration of the cadastral unit. Surveyors are responsible for the accuracy and legality of the cadastral unit formation files that they compile. In a cadastral survey, the location of boundary points of the cadastral unit shall be connected to control points of the national or local geodetic network. Upon registration of a cadastral unit, the cadastral registrar shall document the areas of the land use types and the intended use or uses thereof in the cadastre. The intended use of a cadastral unit shall be determined by a comprehensive plan in a low density area and a detailed plan or comprehensive plan in high density area as specified in the Planning Act or, in the absence of a comprehensive plan for a low density area, by a land readjustment plan in accordance with the Land Readjustment Act.

The cadastral unit formation file is delivered to the municipality. The municipality approves the cadastral unit formation file and assigns the type of land use according to the Planning Act as well as the name and total area of cadastral unit. The Land Cadastre receives the cadastral unit formation file from the property owner, municipality or the surveyor. All documents are entered into the logbook of the cadastral register and put in a waiting list for registration. All incoming and outgoing documents are registered in the logbook. Every document gets a number and the incoming (outgoing) date. The cadastral registrar shall control every document's conformity to legal regulations. The applicant shall indicate data about himself, legal basis of application, information about the affected cadastral unit and the date of decision. As basis for the formation of the cadastral unit serves the cadastral unit formation file in accordance with legal rules. The cadastral registrar shall make his decision within a one-month period.

Cadastral Offices create cadastral unities in one of the two ways:

1. Digital data import of the file provided by a local government or surveyor;
2. Manual input by an official.

Verification of the spatial data includes checks whether the corner points of neighboring cadastral unit coincide within a certain tolerance and whether the border integrity is ensured. Cadastral unit boundaries must also coincide with the boundaries of local municipalities.

Implicit "check sums" must be calculated. Although surveyors provide data about the length of the cadastral unit boundary and area, these data must be verified. Output from the register is following:

- Cadastral plan with cadastral unit ID-code,
- Protocol of boundary
- Certificate of receiving a record.

The cadastral registrar can delegate the right of registration. Entry to the cadastral register is made by accredited persons and in accordance with the adopted rules. The accredited registrar, who records the cadastral unit, shall give the cadastral unit ID-code to the land plot and format the cadastral unit formation file to the archives file. Previous record is saved for the history when owner needs a new cadastral unit formation.

## **5 PROVIDED SERVICES**

The Estonian National Land Information System (LIS) represents most of the data stored in the Land Cadastre using OGC WMS and WFS standards and also the Estonian data exchange layer X-Road services. These technological issues cover all the needs of online services. All

X-Road services can be divided into free parts depending on the data flow target. These are X-Road services for public servants, entrepreneurs and citizens. Technologically it is important to identify services built upon user interface browser services or direct XML data flow services for information systems that can be specified via queries. Browser based services are integrated into the state portal ([www.eesti.ee/eng/](http://www.eesti.ee/eng/)) and can be accessed by all interested persons who have the Estonian ID card.

List of the Land Cadastre services via X-Road:

- Cadastral database, cadastral unit query – data flow and browser interface;
- Cadastral database, cadastral unit changes query – only data flow;
- Administrative unit database, administrative unit query - only data flow;
- Administrative unit database, administrative unit changes query - only data flow;
- Real property restrictions database, cadastral unit restrictions query - data flow and browser interface;
- Real property restrictions database, cadastral unit restrictions query with printed plan - data flow and browser interface;
- Real property restrictions database, restrictions analyses log query - data flow and browser interface;
- Real property restrictions database, restriction causing object relations query – only data flow;
- Land quality and assessment database, transactions data update service - data flow and browser interface.

The Estonian Land Board offers also OGC WMS and WFS based services using specially developed web map application X-GIS. Most of these web map solutions are publicly accessed and are gathered into the Estonian Land Board's geoportal. Some of the services are directed services for public servants and include virtual office. These virtual offices are applications for data editing, importing and exporting from LIS.

- Estonian Land Board geoportal (X-GIS browser): <http://xgis.maaamet.ee>
- Public WMS in EUREF-EST97: <http://kaart.maaamet.ee/wms/alus>
- Public WMS in geographic coordinate system: <http://kaart.maaamet.ee/wms/alus-geo>
- Public KMZ for Google Earth: [http://www.maaamet.ee/data/maaxamet\\_wms\\_geo.kmz](http://www.maaamet.ee/data/maaxamet_wms_geo.kmz)

Data layer	X-GIS	Virtual office	Public WMS	Google earth
Cadastral unit (CU) border	Published		Published	Published
CU surveying data	Published			
CU legend data	Published			
CU intended purpose	Published			
Surveying initial task	Published	Editable		
Administrative unit data	Published		Published	Published
Land value zones	Published			
Land productivity zones	Published			
Geodetic control marks	Published			
Real property restrictions	Published	Editable		
Orthophoto	Published		Published	Published
Estonian Basic Map	Published		Published	Published
Estonian Base Map	Published		Published	Published

## 6 LINKS BETWEEN CADASTRE AND LAND REGISTRY

The Land Register operating under the Ministry of Justice and maintained in courts is a legal register (register of title). Making entries in the Land Register creates, amends or extinguishes real rights.

The Land Cadastre maintained in the Land Board and operating under the Ministry of Environment is a more technical register – it reflects the data regarding the description of land units within an area.

Entering a new entry in the Land Register, a notarized transaction is entered into and must be formalized at a notary. Upon amending or deleting a Land Register entry the role of the notary is less significant being normally confined to notaries authentication of signature. If making, amending or deleting an entry will concern the rights of a third person entered in the Land Register, the entry cannot be made except on the basis of such person's notarised consent. The Land Register public services are available at [www.rik.ee/land\\_register](http://www.rik.ee/land_register)

Registers exchange data through the data exchange layer X-Road, all data queries are online and there is no need for data replication in both databases. Although according to the Land Register and Land Cadastre Acts some of the data must be replicated.

After the entry in the Land Register it shall submit the data pertaining to owners, registered immovable property numbers, the date of registration and the information of merger or division

of registered immovable. The Land Cadastre shall submit after the entry the data pertaining to the area and the intended use of a registered immovable.

## **7 LINKS BETWEEN CADASTRE AND REAL ESTATE EVALUATION SYSTEM / REAL ESTATE TAXES**

In 1993 Estonia introduced a land tax. The Estonian Land Board is responsible for land valuation. The National Tax and Customs Board is responsible for tax collection. Local governments collect taxpayers' information and they also calculate taxable value of land plots. Land tax is a local tax - 100% of revenue goes to the local governments' budget and tax rate is within limits (annually decided by local councils) 0.1 - 2.5 % (rates for agricultural land are: 0.1- 2.0 %).

Land tax is based on the assessed value of land. The result of valuation is zoning. So far three assessments have been made: in 1993, 1996 and 2001. The Department of Real Estate Valuation has a responsibility to arrange valuations, prepare methodology, support education, co-ordinate valuations, etc. County Cadastral Offices have to carry out actual valuations. Private valuation experts have been involved in valuation too. The assessment for land tax covers the whole country and these results have been in use also for rationalizing the land reform process (for example privatization). Legal base for assessment is the Land Valuation Act. There are two governmental decrees regulating the procedure and methodology of assessment.

From 1997 the Land Board collects real estate transaction data into the real property transactions database (transactions database is part of the Cadastre). The last assessment in 2001 was based mainly on the information collected in this database.

Valuation results are available on our homepage. Two new layers were added into CIS in the beginning of 2002: land price zones and productivity zones. Land valuation for the whole country was done in the second half of 2001. Land price zones (ca 1000 areas) and productivity zones (ca 5000 areas) were created and edited directly in digital format by valuers in the Land Board's County Cadastral Offices and it took just some weeks to feed all spatial information into CIS' Oracle Spatial database. Using this information landowners can calculate exactly the taxable value of their lands.

# THE CADASTRAL SYSTEM IN LITHUANIA



<http://www.registrucentras.lt>

September 2009

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# **1 INTRODUCTION**

## **1.1 History of the Real Property Cadastre and Register**

This chapter covers the milestones of the development of Real Property Cadastre and Register in Lithuania.

In the XIII-XIV centuries land was considered as a primary symbol of power and the most important form of property. The rights to land were mainly enjoyed by the grand dukes whose authority was unrivalled. The grand duke disposed of all his land in Lithuania as he saw fit: if he wished, he could grant land to his subjects, and he could take it back, if he changed his mind. Small individual landholdings or laukai, kiemai were the main forms of land possessed by individuals. The average peasant landholding in the XIII-XIV centuries may have comprised 17 hectares of arable land along with ca. the same amount of meadow, pasture and wood. Individuals had the right to inherit such private property, but the grand duke could intervene when owners sought to alienate their land.

In the late XIV century, after official Christianisation of Lithuania, the Grand Duke Jogaila granted Catholic boyars with their first charter, which recognised their right to alienate their patrimonial land in return for a duty to provide military aid to the monarch at their own expense. Later, the Grand Duke Vytautas distributed large estates of land once owned directly by the grand dukes to his faithful noble followers on condition that the boyars provide him with a number of requisite armed soldiers and battle horses. In this way he gave impetus to the growth of a secular large landowning class.

In the XV century, the famous Horodlo Act of 1413 confirmed land rights for the gentry. The aristocracy became entitled to alienate not only their patrimonial land but also the property granted to them by Jogaila and Vytautas, which could be sold, mortgaged or otherwise transferred to another owner only after obtaining the permission of the ruler or his local representative.

In 1447, the Grand Duke Casimir issued a charter containing the rule that land confiscation could be applied only by a court following the norms of Catholic law. In 1492, the Grand Duke Alexander issued a charter adding that inheritance of land was guaranteed only for subjects of the Grand Duchy and the right was granted for the owner's close kin to purchase borrowed, mortgaged or otherwise temporarily transferred property.

In 1529, the First Lithuanian Statute legally defined property relations. It stated that the proof of property could be shown by authentic (written) documentation and the testimony of sworn

witness. Land remained the most valuable form of property and ownership was granted only to aristocracy, while members of other estates (burghers, peasants) enjoyed more limited rights. Peasant property rights were further restricted by the expanding practice of serfdom. The Statute also dealt with arguments over land boundaries. All attempts to expand boundaries at a neighbour's expense had to be resolved at law, with each party presenting 18 witnesses. The legitimacy of boundaries was examined by on-the-spot checks by the court.

**Figure 1. Document dated 1518 on the sale of three vacant land parcels**



In 1547, land reforms were initiated by the Grand Duke of Lithuania Sigismund August, with the aim to restructure grand-ducal estates; to increase income from land; to distinguish between private and state (grand-ducal) land; to evaluate the quality of newly measured land in a kind of Domesday book. The reforms resulted in the separation of lands in terms of their ownership (land possessed by the noblemen, peasants and the Grand Duke). The size of the land parcels allocated to peasants was based on valakas (measurement unit equal to 21 hectare). In the late XVI century, valakas and its components became official measurement units that remained unchanged until the early XIX century. With such a division, peasants were under obligation to carry a heavy burden for land use.

From that period also comes the first evidence of the existence of surveyors who formed part of Chwalczewski's valakas measurement group, carrying out technical tasks. Such a late appearing

of the surveyor's profession could be explained by the fact that while there were no large demands from the ruler for land measurement, it was sufficient in everyday life to measure out land according to the common tradition.

In the middle of the XVII century a solid study of theoretical and practical land surveying was introduced in the Jesuit University of Vilnius. At that time, registration, use and administration of land depended on the size of property and the social status of the owner. Peasants still worked in return for use of land, which was recorded in estate inventories and this was the only legal proof of the existence of peasant parcels of land. Inventories recorded the distinction in peasant holdings of allotted farmstead land (subdivided into parcels for which taxes and service duties were paid), supplementary land and meadows as well as land cadastres, the type and size of feudal dues, the peasant's household and its members.

Burghers held an intermediary position between the aristocracy and the peasantry regarding real property. Burghers, who were endowed with Magdeburg Law, enjoyed rights of personal freedom and restricted property rights. Burger property contracts were recorded in the magistrate's register. A burgher's house and land within the city was his personal property and he was able to sell, mortgage, donate or otherwise dispose of it.

In the XIX century, after Lithuania came under control of the Russian Empire, Russian measures of land came into force to be followed by the metric system. During that period, administration of land inventories containing data on estates as well as records on land for taxation was a common practice.

In 1863, after the abolishment of serfdom, the first private farmers emerged. The subsequent land reform enabled peasants to buy out the land from the estate owners.

In 1905, the Stolypin's agrarian reform was initiated, which prompted the emergence of free land market. Local self-government bodies became entitled to resolve land issues. A farmer could own legally recognised property and transfer it by testament.

In 1918, after Lithuania became independent, the land reform was undertaken aiming at introducing a new land administration system that would further encourage development of private ownership, restore the national economy and bring benefits to the society-at-large. Creation of a systematic land cadastre led to the establishment of boundaries of the state and private property, and re-parcelling of former estates to the new owners. Cadastral identification was used to support the land ownership and land transfer system.

In 1940, after Lithuania was announced a Soviet Republic, land nationalisation began. Any buying and selling, mortgaging, granting, leasing and transferring of land were prohibited. Private ownership did not exist. The cadastre system served for central planning and promoted development of collective farms. Since the cadastre was oriented towards the purpose of land use, land was valued on the basis of its agricultural attributes – soil type, climatic conditions, rainfall, etc. Cartographical maps were mainly used for building of roads and settlements, irrigation projects, allocation of meadows and pastures, etc. Land inventorying comprised the analysis, identification and description of land attributes. Cadastral data remained simplified and generalized. Such a system was evidently unable to meet expectations related to legalisation of private property ownership, which started in early 1990s.

In 1991, after re-establishment of the State independence, a process of restoration of ownership rights to real property as well as privatisation started. The Republic of Lithuania gradually adopted laws on the restoration of ownership rights to real property and other legal acts that allowed overcoming the consequences of the centrally-based economy, by regulating property relations and creating a system of legal registration of the restored property and rights thereto.

1992 marks the establishment of the State Land Cadastre that began legal registration of land parcels restored or privatised during the land reform.

In 1994, the Law on Land was adopted providing a general framework for regulation of land ownership, administration and use.

In 1996, the Seimas of the Republic of Lithuania adopted the Law on Real Property Register, which regulates registration of land, buildings, other real property, rights thereto, and legal facts; defines the status, establishment and administration of the Real Property Register, data and information provision. The Law states that the Real Property Register is public, and ensures security of registered rights and property as well as accuracy of data registered with the Register. It provides for the amendment of the Register data and possible compensation for the losses incurred. This Law was one of the major achievements in terms of legalisation of a unified cadastre and register system.

In 1997, a modern real property administration system was introduced by merging registration of land and structures and rights thereto in one organisation. On 8 July 1997, the State Land Cadastre and Register (from 2003 – the State Enterprise Centre of Registers) was established, to whom from 1 January 1998 the Administrations of County Governors delegated their functions related to land cadastre and registration.

In 1998, data on land parcels and buildings, flats and engineering structures were transferred to the central databank of the Real Property Register. Establishment of this databank enabled to integrate data on the registered structures and land parcels, to create a computerised on-line network linking 11 branch offices with other servicing offices, and promoted computerisation of all real property registration procedures. In the same year, regional GIS groups were established in the State Land Cadastre and Register, with the aim to compile a consolidated land cadastre parcel map using GIS database, digitise administrative boundaries of land parcels in cadastral areas and graphically draw these boundaries after preliminary or precise survey.

In 2000, the Law on Real Property Cadastre was adopted. It contains the rules on real property formation and procedures for compiling and updating of cadastral data on land parcels, buildings and other real property, establishes the procedure for entering of the real property data into the real property database, and defines the legal status of Real Property Cadastre.

In 2001, all of the cadastre and register data on real property objects, which were previously held in cadastral surveying (inventory) files, have been loaded to the central databank of the Real Property Register. Manually drawn plans were replaced by digital layout plans of buildings and premises, the descriptive part was computerised. Paper file of cadastral surveying was also supplemented with its electronic form. Soon the on-line real property registration was launched.

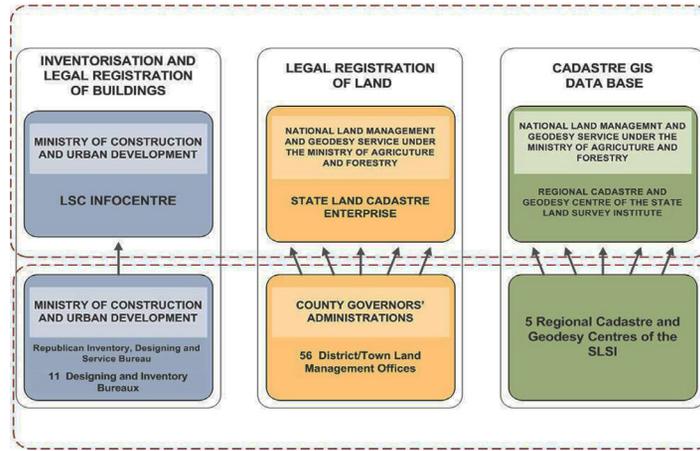
In 2002, the State Land Cadastre and Register started accepting orders through the Internet, which is being used more frequently for servicing customers and improving customer services. Lithuanian modern real property cadastre and register system is effective, transparent, public, customer-oriented and based on the concept of multi-purpose application. It secures the registered rights to real property; supports lawful conveyance of real property; is considered as a tool for national real property policy; encourages and supports the development of real property and credit market as well as e-society.

## **1.2 Development of the institutional and organisational structure**

In 1990s Lithuania aimed at making transition from the centrally-planned towards market-based economy, which brought to light inability of the former soviet cadastre system to meet expectations related to legalisation of real property ownership. The process of the restoration of ownership rights to real property needed to be accelerated. It was also necessary to establish an appropriate legal basis that would regulate property transferring to private owners and ensure security of ownership rights. An absolutely new real property cadastre and register system had to be designed, which would have promoted the development of market economy and was oriented towards both public and private sectors.

From 1991 to 1997, Lithuanian Real Property Cadastre and Register was administered in the following manner (see Figure 2):

**Figure 2. Administration of Real Property Cadastre and Register in Lithuania from 1991 till 1997**



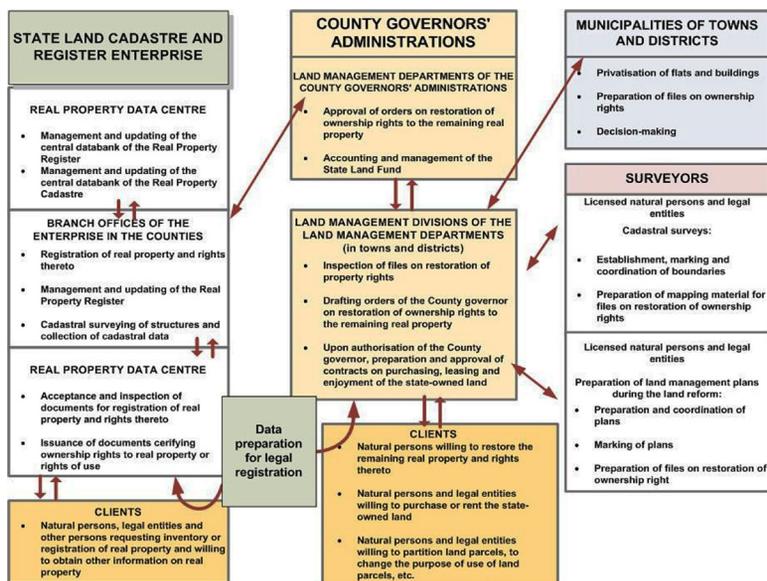
During that period, Lithuanian real property cadastre and register system operated in the framework of the former soviet institutional infrastructure, which separated administration of land and buildings. Until 1997, Lithuania had two different real property administration systems: a system of legal registration of land, and a system of inventoring and legal registration of structures (buildings). Such administration methods posed a lot of obstacles in the way of legal registration of property, because citizens were obliged to visit two or three institutions whose conclusions were often contradictory. Databases of different data processing centres did not ensure appropriate linkage between buildings, land cadastre and ownership. Issues relating to the restoration of ownership rights to the remaining real property needed to be resolved, and other land reform measures had to be implemented. So, it was necessary to elaborate one concept of Real Property Cadastre and Register and establish one data collection and processing centre.

Having merged the State Land Cadastre with the State Enterprise Republican Inventory, Designing and Service Bureau, according to the Resolution No 742 of the Government of the Republic of Lithuania as of 8 July 1997, a new enterprise – the State Land Cadastre and Register – was established. The functions of the enterprise founders were assigned to both the Ministry of Environment and the Ministry of Agriculture of the Republic of Lithuania.

Important economic reforms, restoration of ownership rights, privatisation and a newly created real property administration system influenced changes in the institutional structure of real property cadastre and register system in Lithuania.

In the course of land reform, which was further pursued with the aim to implement the right of Lithuanian citizens to land ownership, as well as to create legal, organisational, and economic preconditions for the development of agricultural production by freely chosen forms of farming, the Real Property Cadastre and Register were administered in the following manner (see Figure 3):

**Figure 3. Administration of Real Property Cadastre and Register during the land reform in Lithuania.**



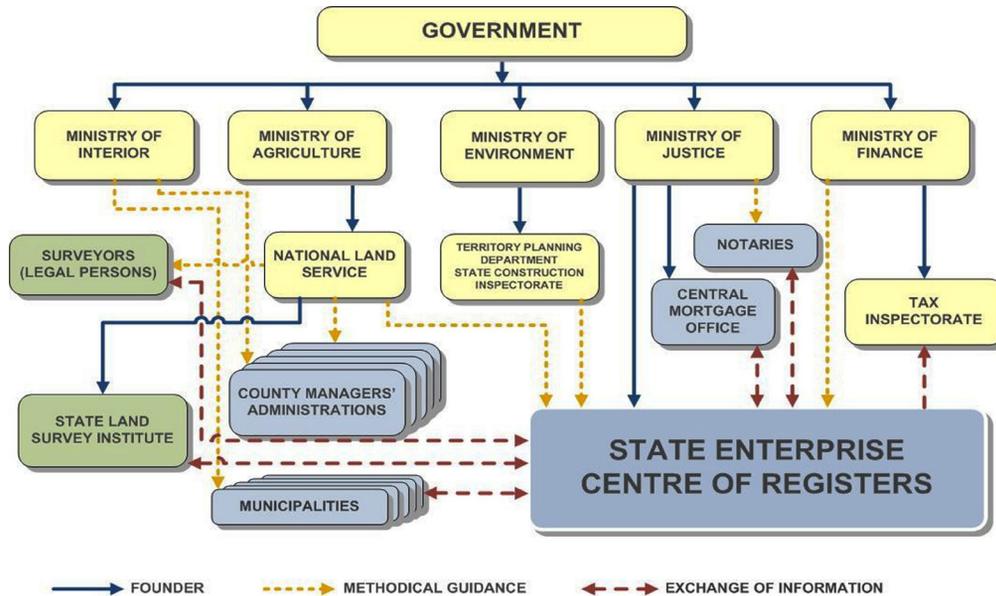
In 1999, the State Land Cadastre and Register was entrusted to administer the State Register of Administrative Units, Residential Areas and Streets of the Republic of Lithuania, which in 2004 was restructured into the Address Register.

According to Resolution No 1571 of the Government of the Republic of Lithuania as of 21 December 2001, the functions of the enterprise founder were transferred to the Ministry of Justice of the Republic of Lithuania.

In 2002, the State Land Cadastre and Register was mandated to execute the function of the chief administrator of the Register of Enterprises. The subsequent resolutions adopted by the Government of the Republic of Lithuania enabled the enterprise to become responsible for keeping the database on registration of other legal entities. On 1 January 2004, the Register of Legal Entities started its operation by merging the registration of legal entities and enterprises without the status of legal entity, which was previously performed by the Ministry of Culture, Ministry of Health, Ministry of Education and Science, Ministry of Justice, Ministry of Agriculture, the Bank of Lithuania, Department of Statistics to the Government of the Republic of Lithuania, ten Administrations of County Governors and sixty self-government institutions.

In 2003, the State Land Cadastre and Register was renamed as the State Enterprise Centre of Registers, which is one of the major institutions involved in the real property administration. The current institutional structure of real property administration is presented in Figure 4.

**Figure 4. Institutional structure of Lithuanian real property administration system.**



The Ministry of Agriculture exercises the State administration functions related to land, food, fishery and rural development, and implements the State policy in this field.

The National Land Service under the Ministry of Agriculture pursues the State policy in land management and administration as well as land reform, land cadastre, geodesy and cartography. It issues licenses to the surveying companies that undertake various surveying activities: cadastral surveying of land, inventory of structures, development of detailed plans, topographical and engineering photos, consultations on real property issues, etc.

Geodetic and mapping activities are performed as follows: Vilnius Gediminas Technical University (Department of Geodesy and Cadastre, Geodesy Institute) develops methodologies for geodetic network; the National Centre of Remote Sensing and Geoinformatics (GIS-Centras) performs the small and medium-scale mapping; the Institute of Aerial Geodesy is responsible for topographical mapping in Lithuania. Private and public companies are involved in land reform projects and other projects relating to formation of land parcels.

The Ministry of Environment formulates and coordinates the implementation of national policies for environmental protection, forestry, use of natural resources, geology and hydrometeorology, territorial planning, construction, provision of housing and utilities. Its State Territorial Planning and Construction Inspectorate exercises State supervision and control over territorial planning and construction.

The Ministry of Justice drafts laws and governmental resolutions, organises their implementation, oversees institutions such as the State Enterprise Centre of Registers and the Central Mortgage Office, and supervises the activities of notaries.

The Central Mortgage Office administers the Mortgage Register, the Register of Property Seizure Acts, the Register of Wills, the Register of Marriage Settlements, the Register of Contracts, collects data on leasing contracts, sale and purchase by instalment contracts, provides information from the registers under its management.

Lithuania has a private notary system. Notaries attest transactions and mortgages, issue inheritance certificates, authenticate copies and extracts from documents, certify signatures on deeds, and draw up documents or certify the authenticity of information transferred to the Register of Legal Entities.

The Ministry of the Interior is in charge of public security, guarding State borders, civil defence, control of migration, public administration and government reform, development of local self-governance and regional development. The Ministry is responsible for the Population Register.

The Ministry of Finance drafts the State budget and municipal budgets. It is in charge of State investments, taxes, duties, national coordination of financial support from the European Union, tax administration policy, etc. Its State Tax Inspectorate is the central tax administrator. It estimates tax payments and other contributions to the State (municipal) budget, recovers unpaid taxes, imposes fines on taxpayers pursuant to tax laws, etc.

County governors, who head the county administrations, implement State policy on regional development, social security, education, culture, health care, territorial planning, land use, environmental protection and other areas. They are responsible for State and inter-regional programmes in their counties, for the land reform, and for the privatisation and sale of the State-owned land.

Self-governing municipalities are responsible for issuing construction permits, territorial planning, setting of addresses and making any changes to them.

The State Enterprise Centre of Registers administers the Real Property Cadastre and Register, the Address Register, the Register of Legal Entities; creates, implements, develops and manages information systems of the mentioned and other registers, keeps register archives; performs mass valuation of real property, cadastral surveying; provides the official information stored in the registers, updates cadastral map.

### **1.3 Financial and organisational issues**

The State Enterprise Centre of Registers is a public legal entity of limited civil liability incorporated on the basis of the State-owned property. It belongs to the State by the right of ownership. The Ministry of Justice of the Republic of Lithuania is the institution exercising the rights and obligations of the owner of the Centre of Registers.

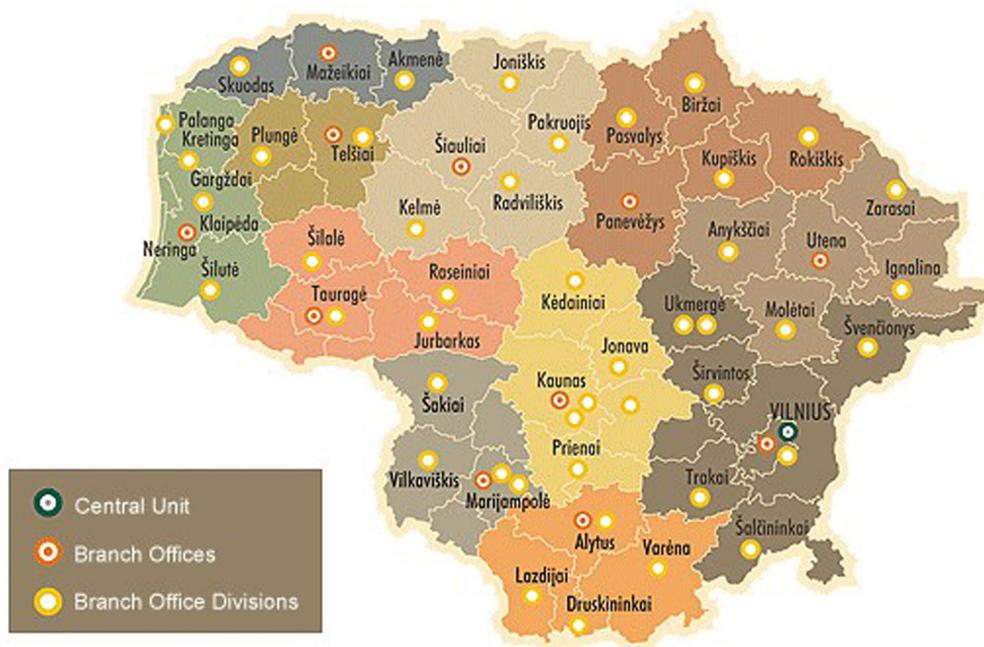
The objectives of the Centre of Registers are to implement the Law on Real Property Register of the Republic of Lithuania, Law on Real Property Cadastre of the Republic of Lithuania, Law on the Register of Legal Entities of the Republic of Lithuania, regulations of the Government of the Republic of Lithuania regarding administration of the Address Register; to analyse the real property market; to organise real property valuation; to prepare data for real property taxation; to design information systems on land and other real property, systems of the Register of Legal Entities, and other information systems.

The State Enterprise Centre of Registers is not financed from the state budget, but is self-financing on the basis of income earned from the provided non-commercial (public) and commercial (non-

monopolistic) services. Fees for monopolistic (non-commercial) services are determined and approved by the Government of the Republic of Lithuania. Fees for non-monopolistic (commercial) services are approved by the Director General of the Centre of Registers taking into account situation on the market. Income from the provided services is used for the system development, financing of activities, streamlining of services, with respect to the needs of customers.

The State Enterprise Centre of Registers consists of a Central Unit and local territorial units – 11 Branch Offices and 39 Branch Office Divisions (see Figure 5).

**Figure 5. Units of the Centre of Registers and their location**



The Central Unit, located in Vilnius, administers activities of registers, designs, introduces and operates the register information systems, provides guidance to and controls activities of regional units.

11 Branch Offices, operating in county centres and in Mazeikiai City, register real property and rights thereto, register legal entities, accept documents and data supplied by legal entities for registration, provide data from registers, perform cadastral survey, mass and individual property valuation, market research, keep property formation archives, organise activities of Branch Office Divisions.

39 Branch Office Divisions, operating in regional centres and towns, accept documents for registration of real property and rights thereto, accept and issue documents supplied by legal entities for registration, issue documents verifying the right of ownership or use, provide information services.

## 1.4 Involvement of the private sector

The involvement of public and private sectors in the real property management activities is presented in a table below (prepared by the National Land Service):

Public sector	Private sector
<b>Detail planning</b> <b>Land reform projects</b> <b>Cadastral surveys of land</b> <b>Cadastral surveys of buildings</b> <b>Property registration</b> <b>Mortgage registration</b> <b>Mass valuation</b> <b>Individual valuation</b> <b>Topographical surveys</b> <b>Base mapping</b>	<b>Detail planning</b> <b>Land reform projects</b> <b>Cadastral surveys of land</b> <b>Cadastral surveys of buildings</b> Property registration Mortgage registration Mass valuation <b>Individual valuation</b> <b>Topographical surveys</b> Base mapping
<b>RED</b> – very high presence; <b>BLUE</b> – monopoly; <b>BLACK</b> – shared; <b>GREEN</b> – little presence; <b>GREY</b> – no presence	

### 1.4.1 Cadastral surveying

Cadastral surveying of land and buildings is carried out by public and private sectors represented by surveying companies and individual surveyors operating only through licenses issued by the

National Land Service under the Ministry of Agriculture. Private surveying companies are also engaged in the topographical, geodetic, designing activities. Requirements for private surveyors are set forth by the licensing regulations, orders on cadastral surveying of real property objects.

Supervision and control over cadastral surveying activities are exercised by two institutions – National Land Service under the Ministry of Agriculture, responsible for the issues related to formation of land parcels, and the Ministry of Environment, responsible for preparation of territorial planning and supervision of construction works.

As of 3 July 2009, 1029 certificates on surveyor's qualification and 296 certificates on expert surveyor's qualification have been issued. Surveyors are employed by 480 licensed companies.

Cadastral surveying of land is predominantly performed by private surveying companies, while surveys of buildings are mostly done by the public sector (Centre of Registers). For efficient administration of cadastral surveying of structures, the State Enterprise Centre of Registers has recently designed information system "Surveyor" ("Matininkas") intended for surveyors of structures.

When surveying structures, a surveyor forms real property object and prepares cadastral data file. By using the system "Surveyor", a surveyor enters vector plans of structures and attribute cadastral data of structures specified by legal acts, establishes values of structures and prepares electronic cadastral data forms. Having prepared the documents on Real Property Cadastre (drawings, cadastral data forms, etc.), a surveyor will soon be able to sign these documents with his own electronic signature and pass them to the Cadastre Administrator (State Enterprise Centre of Registers). In its turn, the Cadastre Administrator verifies cadastral data of the surveyed structure and, if there are no errors or mismatching with legal acts in force, validates the cadastral data with electronic signature (coming soon), and enters these data into the Real Property Register during the real property registration process.

Technically, a system "Surveyor" is based on Internet technologies and server-client architecture, and has a centralised database and server program. At his workplace, a user employs 2 programs – Internet browser and drawing program, which are both connected to the server program. A drawing program is a common program of Autodesk inc. and the State Enterprise Centre of Registers designed with Autodesk technologies.

Currently, the system is used by over 100 companies performing cadastral surveying of structures, on a daily basis – by over 600 surveyors and cadastre administrators.

## 1.4.2 Real property valuation

Private companies (purchasers and sellers of assets, banks, insurers, real estate brokers, privatisation agencies, etc.) were the first to engage in real property valuation and to incorporate a professional association – the Lithuanian Association of Property Valuers, which was established in 1994 as a non-governmental professional organisation.

The Association analyses experience of property valuation in other countries and applies it in professional activities of property valuers of the Republic of Lithuania; organises a qualified system for valuation of different property and capital; takes care of training of specialists for valuation of property and capital; accumulates and provides methodical and other assistance including information on valuation issues.

Individual property valuation system initially ensured application of market principles in the process of property valuation for property mortgaging, taking property for public needs, development of real property business, etc. However, individual valuation could not be used as a method of property valuation for taxation and other public needs, mainly due to the large work amount and high costs. From 2002, mass valuation system is under development, which is closely linked to the development of digital and multi-purpose real property register and cadastre system.

The current real property valuation system is:

- The field of activity, which is regulated by national legal acts and international standards;
  - Law on the Basics of the Property and Business Valuation, 1999, No VIII-1202;
  - Government Resolution on Property Valuation Methodology, 1996, No 244;
  - Terms and Conditions of Granting the Qualification of Valuer (Government Resolution 1998, No 1157);
  - The Code of Professional Ethics of Valuers (approved by the Board of the Lithuanian Institute for Audit, Accounting and Valuation, the General Assembly of Lithuanian Association of Property Valuers);
- Market-based valuation methods are used in practice;
- Well-developed valuation practice (property transactions, mortgage, taxes, insurance, financial accountancy, bankruptcy, courts of justice, etc.);
- Certification system (since 1996) based on education and professional experience criteria;
- Obligatory professional indemnity insurance;
- Recognition of valuer's profession in society.

At present, the individual property valuation business is undertaken by both public and private sectors on fair competitive basis. There are ca. 300 qualified valuers and ca. 370 valuer's assistants in Lithuania.

Most of individual valuation is performed by the private sector. Mass valuation for taxation is within the competence of the State Enterprise Centre of Registers.

## **2 CONTENT OF THE REAL PROPERTY CADASTRE AND REGISTER**

Lithuanian real property administration system is a methodically arranged national system for collection, processing and registration of real property data, covering all legally defined data on real property, ownership or ownership rights thereto, restrictions and encumbrances on these rights, as well as graphical data collected in the process of surveying of real property boundaries or contours.

Lithuanian real property cadastre system methodically describes real property objects (or immovable things) – land parcels, structures, premises and engineering structures, by indentifying where an immovable thing is located, and what its quantitative attributes are.

Lithuanian real property register system ensures legal status of immovable things and rights thereto, and provides data on who possesses these objects and how they are owned.

Lithuanian real property valuation system must ensure collection of qualitative and value data of immovable things, and explain why such qualitative attributes of immovable thing have been established, and what their value is.

Graphical information is a must for effective real property administration, since the majority of real property units are associated with geographical location of the object – real property location, configuration, and area. Graphical information enables to establish the location of property units, their size, layout and area, use, productivity and value, contributes towards creation of a mechanism reflecting the real property content (size) and ownership.

The following immovable things are considered as objects of the Lithuanian Real Property Cadastre:

1. Land parcel;
2. Structure (including non-completed structure), except for temporary structure and simple structure that does not need any construction permit;
3. Premises formed as separate immovable thing.

Land parcel is legally defined as a part of area having the established boundaries, cadastral data, and registered with the Real Property Register (Law on the Amendment of the Law on Land of the Republic of Lithuania, Official Gazette, 2004, No 28-868).

Structure is legally defined as everything that results from construction operations using construction products and is steadily fixed to the ground. Such shall include buildings (dwelling, industrial, commercial, office, health care, educational, recreational, agricultural buildings and others) and engineering works or mixed-type structures (buildings attached to engineering works), annexes, superstructures and their parts, constructions of equipment, technological engineering systems and engineering systems of a structure (Law on Construction of the Republic of Lithuania, Official Gazette, 1996, No I-1240, as last amended on 3 May 2007, No X-1111).

Premises are legally defined as a part of the building with clearly defined function (flats, offices, etc.) walled off from premises of common use, other flats or non-residential premises (Law on Real Property Cadastre of the Republic of Lithuania, Official Gazette, 2000, No 58-1704; 2001, No 16-497).

Real Property Cadastre contains records on immovable things. Each record includes:

1. Textual cadastral data on immovable thing;
2. Graphical cadastral data on immovable thing reflecting position of such thing within the national coordinate system – a real property cadastre map.

The purpose of the Real Property Cadastre is to collect cadastral data on immovable things and provide the official information regarding data compiled in the Cadastre. Data recorded into the Real Property Cadastre are collected and stored in the central databank of the Real Property Register.

Recording of cadastral data on immovable thing into the Real Property Cadastre is considered as registration of immovable thing with the Real Property Register. Data recorded into the Real Property Cadastre are considered true and complete until they are not changed or disputed following the procedure prescribed for by legal acts.

The following immovable things, which are formed as separate real property objects according to the procedure established by the Law on Real Property Cadastre, are registered with the Real Property Register:

1. Land parcels;
2. Structures;

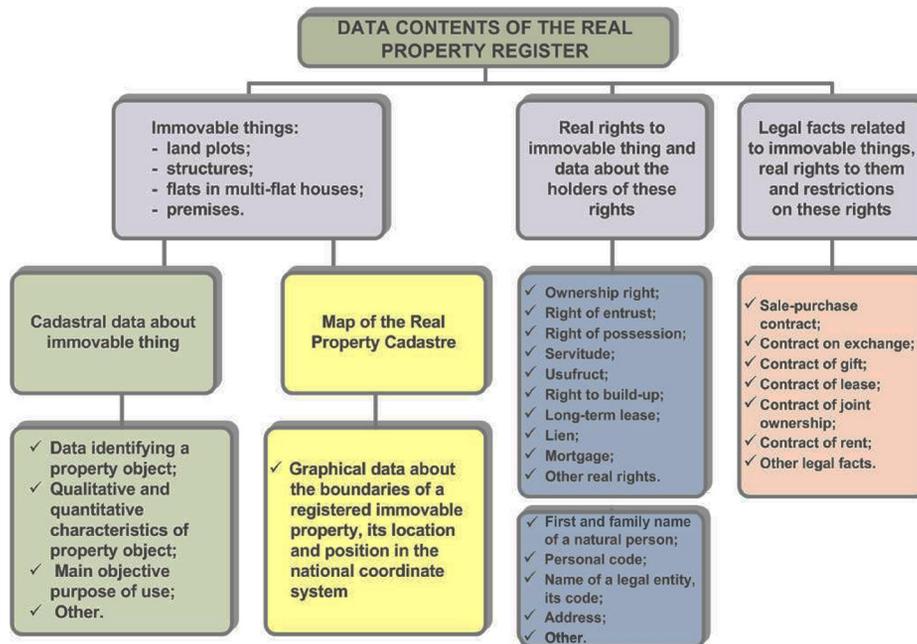
3. Flats in multi-flat houses;
4. Premises.

Real Property Register data contain the following elements:

1. Cadastral data on immovable thing;
2. Graphical data on the location of the registered immovable thing and its position within the national geodetic coordinate system – Real Property Cadastre map;
3. Data on real rights to immovable thing and owners of these data;
4. Notes and other additional data.

Data structure of the Real Property Register is presented in Figure 6.

**Figure 6. Data contents of the Real Property Register**



Original versions of data of the Real Property Register and Cadastre are compiled and stored in the central databank of the Real Property Register.

Excerpts from the central databank of the Real Property Register or other documents prepared on the basis of data from this databank are considered the only official information proving registration of immovable thing, real rights thereto, encumbrances on these rights, and legal facts. All data contained in the Real Property Register databank are recognized as true and complete from the moment of their recording, unless they are disputed following the procedure established by legal acts.

## **2.1 Cadastral maps**

Real Property Cadastre map is prepared and specified using geo-referential databases, orthophoto map, Real Property Register data, documents prepared in the process of formation of immovable thing, which are submitted for the purposes of recording cadastral data of immovable thing.

Cadastral maps are prepared at scales 1:10000, 1:5000, 1:2000, 1:1000, and 1:500.

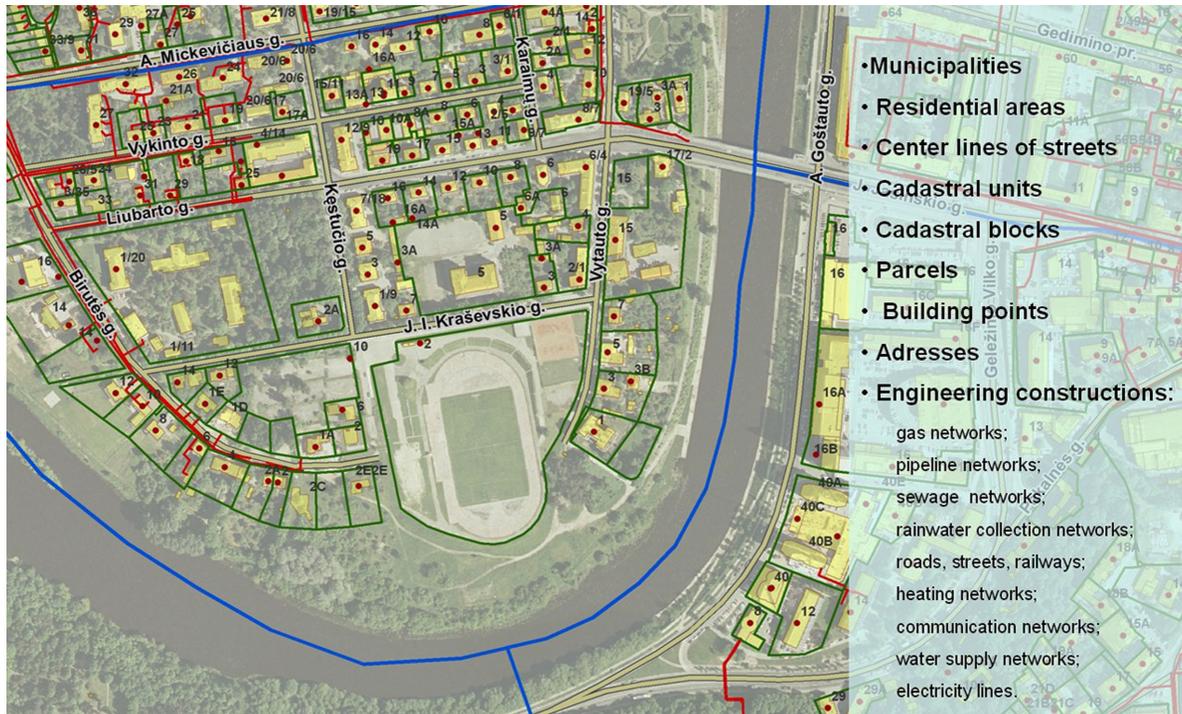
Cadastral map covers the entire territory of the Republic of Lithuania (GIS database, which is being currently developed, contains graphical cadastral data on 1.9 million land parcels and 40,000 engineering structures).

Cadastral map contains the following main graphical layers:

1. Geo-referential data: vector and raster mapping material; coordinates of national geodetic background points and local geodetic background points linked to the national coordinate system, and other attributive information describing these points;
2. Boundaries, names and codes of administrative units;
3. Boundaries, names and codes of residential areas;
4. Boundaries, names and codes of cadastral areas;
5. Boundaries, names and codes of cadastral blocks;
6. Boundaries of land parcels, coordinates of vertexes of these boundaries within the national coordinate system, and their unique and cadastral numbers;
7. Coordinates of contours of buildings or coordinates of central points within the national coordinate system, and their unique numbers;
8. Contour or axial lines of engineering structures (linear objects), coordinates of points of their beginning, end and vertexes within the national coordinate system, and unique numbers;
9. Zones of real property market value established by mass valuation method, names and codes of immovable thing.

Example of Real Property Cadastre map is provided in Figure 7.

**Figure 7. Real property cadastre map**



Real Property Cadastre map is used for the purposes of territorial planning, activities relating to preparation of land management plans, other cadastres and registers, determination of real property taxation, and for other purposes.

Extracts of cadastral maps are provided in analogue and digital forms as well as through the Internet for the wide range of users: surveyors, developers, municipalities, land management divisions, administrators of other registers and cadastres, banks, insurance companies, notaries, real estate agencies, private persons and other institutions.

Specialists of the Centre of Registers use freely chosen symbols on the Internet map and when printing cadastral maps to the clients. The clients are provided with legend explaining the symbols used on the Internet map.

## 2.2 Textual cadastral information

The following cadastral data on land parcels are recorded and stored in the Real Property Cadastre:

1. Name and code of cadastre area, code of cadastre block, block number of land parcel (cadastral number of land parcel), which is assigned by the Cadastre Administrator pursuant to the procedure established by the Regulations on Real Property Cadastre;
2. Unique number of land parcel, which is assigned by the Cadastre Administrator pursuant to the procedure established by the Regulations on Real Property Cadastre, and which remains stable throughout the life cycle of a land parcel;
3. Principal specific purpose of land use;
4. Type and nature of land parcel use;
5. Land parcel area;
6. Content of land parcel area by the types of farming lands: agricultural farming lands, which include arable land, gardens, meadows and natural pastures; forest land; roads; built-up territory; land occupied by water areas; other land covered by trees and green plantation, swamps, injured land and other not utilised land;
7. Land area with irrigation equipment: drained land; irrigated land;
8. Assessment of the quality of agricultural farming lands expressed in productivity grade;
9. Special conditions on land use and regulations on preservation of the protected areas;
10. Data on protected area, which includes cultural monuments and properties;
11. Land parcel values established pursuant to the procedure defined by the Government; dates of establishment of values;
12. Price and date of procurement;
13. Coordinates of vertexes of land parcel boundaries within the national coordinate system;
14. Date of establishment of cadastral data on land parcel;
15. Other data established under legal acts.

The following cadastral data on structures are recorded and stored in the Real Property Cadastre:

1. Object: building, premises; engineering structure;
2. Unique number of a structure (including incomplete structure), which is assigned by the Cadastre Administrator pursuant to the procedure established by the Regulations on Real Property Cadastre and remains stable throughout the life cycle of a structure;
3. Unique number of premises formed as separate real property object, which is assigned by the Cadastre Administrator pursuant to the procedure established by the Regulations on Real Property Cadastre and remains stable throughout the life cycle of an immovable thing;
4. Principal specific purpose of the structure's use and name of this structure;

5. Parameters of the structure: area; volume; length, width, diameter, cross-section, height, depth, perimeter or other geometric parameters of structures;
6. Construction material of a structure;
7. Characteristics of the structure's in-house facilities and installations;
8. Structure's values established pursuant to the procedure defined by the Government; dates of establishment of values;
9. Percentage of depreciation and completeness of a structure;
10. Price and date of procurement;
11. Year when the construction works (reconstruction) of the structure started and were completed;
12. Data on status of construction works of the structure;
13. Location of the structure within a land parcel (unique number of a land parcel whereat the structure is located);
14. Location of premises, formed as separate immovable thing, within the building (unique number of a structure wherein premises are located);
15. Number of storeys of a structure;
16. Number of premises formed as separate immovable things;
17. Number of residential premises formed as separate immovable things;
18. Number of rooms in residential premises formed as separate immovable things;
19. Storey whereat the premises, formed as separate immovable thing, are located;
20. Data on cultural monuments and properties;
21. Digital graphical information on contours of the structure and digital graphical data on the in-house layout of the structure;
22. Date of establishment of cadastral data on this structure;
23. Other data established under legal acts.

### **2.3 Plans of the urban units (flats, houses, apartments)**

Layout plans of structures are drawn at a scale 1:500 – 1:2000, taking into account size, particularity and complexity of the object. Sketches and other available auxiliary cartographical material are used to draw layout plans of structures. The plan is set out in the middle of the sheet and oriented to the direction of North.

For the layout plan of structures, all buildings are marked as symbols: the first symbol (number) specifies the number of building within the parcel, the second symbol (capital letter) describes the purpose of the building, the numerator of fraction (number) specifies the number of storeys of the building, the denominator thereof (small letter) – the building material of walls.

Engineering structures are drawn pursuant to the regulation of technical requirements "Legend of Topographical Plans at Scales 1:500, 1:1000, 1:2000 and 1:5000" under the field survey or making copies from the cartographical material.

On the right bottom corner of the layout plan of structures the contact details of the contractor are referred.

Plans of storeys are prepared for the main buildings only. The plans of storeys of auxiliary buildings are prepared if the client requests so. In case plans of storeys of auxiliary buildings are being prepared, all the cadastral data on this building are collected and described in the same manner as for the main building.

During the field works for the preparation of plans of storeys of buildings, all the component parts of the building are measured and described. Plans of storeys of buildings are drawn according to the sketch at a scale 1:100 – 1:200, taking into account size, particularity and complexity of the object and using signs and symbols of the legend.

Plans of storeys of buildings are drawn in the following manner:

1. External contours of building;
2. Interior retaining walls;
3. Walls of extensions to buildings;
4. Partition walls, heaters, interior and exterior doors and windows;
5. Other elements of building.

### **3 INFORMATION SYSTEM OF REAL PROPERTY ADMINISTRATION**

The State Enterprise Centre of Registers has been delegated with the functions related to creation and management of information system of real property administration. The enterprise implements the delegated functions by using its own technical and human resources. However, the scope of activities urges the involvement of external capacities. The use of external technical and workforce resources is justified when addressing various issues, such as technical information updating, licensing and maintenance of the standard software, and, in separate cases, system development issues.

The principal providers of external services supply the basic software and are mainly represented by the world-wide companies in this field – Oracle Inc., ESRI Inc. Software products of such companies constitute a basis of real property administration system. The main application fields of these products are as follows:

1. Database of the Real Property Register;
2. Cadastre database supported by the Geoinformation system (GIS);
3. Information analytic system of the real property market data.

The real property database model is being created on the basis of the Oracle Database management system (DBMS), which allows working with large databases. Oracle DBMS provides the structural basis for the system management, even though the separate parts of the system are configured with respect to the specific requirements of the database.

Aiming at tailoring solutions of the databases to its own needs, the Centre of Registers has established its own division with large technology capacities – the Information Technology Centre. Thereby, the enterprise resolved two major issues: raised the efficiency of its operations and reduced operation costs. The Centre of Registers designs data management systems and has a valuable experience in performing similar operations.

Separate software application field of the Centre of Registers includes geoinformation systems (GIS), on the basis of which real property cadastral data are managed. For the purpose of GIS design, the Centre of Registers applies multi-purpose technological solutions of the US company ESRI Inc. On the background of basic geoinformation systems, specialists of the Centre of Registers program separate system parts and applications.

Information system of real property administration is being developed in line with the following principles:

1. Central database model is used;
2. The main applications are created using J2EE (Java 2 Enterprise Edition) technology; the Internet browser without any additional plug-ins is sufficient for working with these applications;
3. Paper documents are scanned and stored in the electronic archive;
4. The IS technology cycle includes creation, testing and production environments.

Information system of the Real Property Register is closely linked with the Register of Legal Entities and the Address Register. For example, after changing a company's name in the Register of Legal Entities, this name is also changed in the Real Property Register. Information system is linked as well to the Population Register, Mortgage Register and Register of Property Seizure Acts.

Interactive means or web services are used for supplying data to users. When using web services, data are transferred from one information system to another in XML format.

Usage of application servers for the central administration of database enables to strengthen information system security, to speed up and render more reliable data updating process, and to provide real property information to the user in a prompt manner. At the same time, the system operation costs become lower, since the above-mentioned procedures do not require special software. When applying this technology, fewer resources of data transmitting networks are required.

Currently, the above-mentioned technology is used by the following information system components:

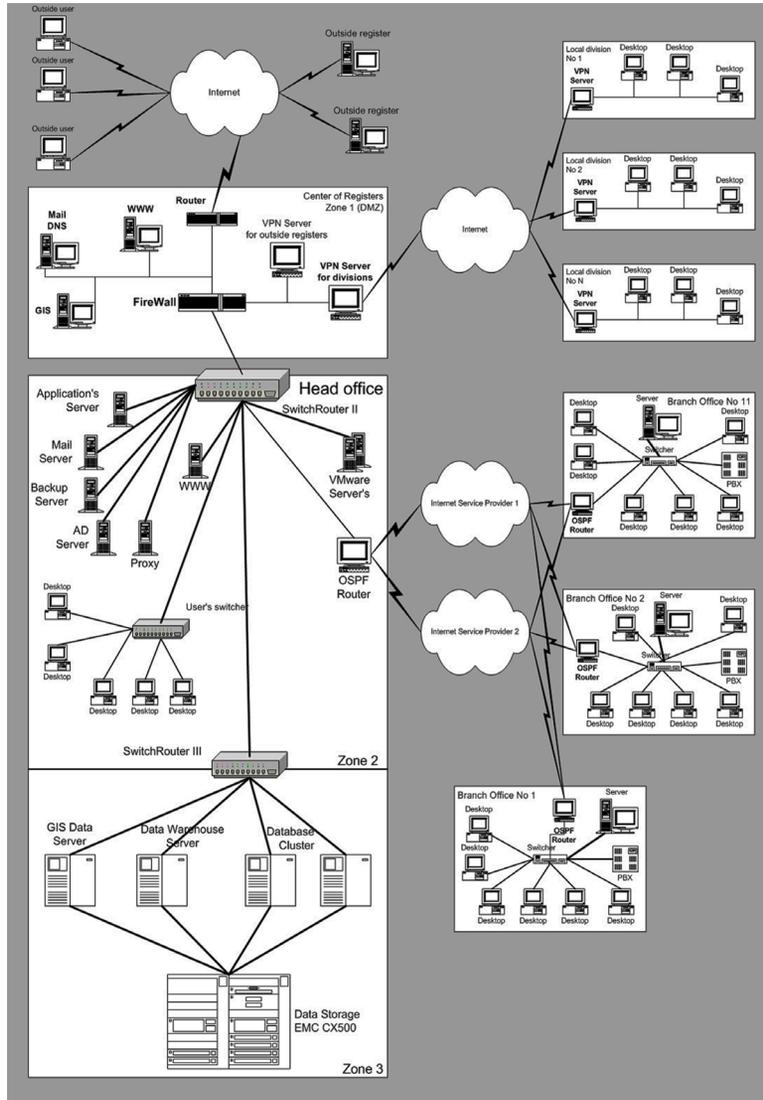
1. Application for real property data management;
2. Application for control over the orders and flow of archival files;
3. Application for accounting and control of the provided services;
4. Application for management of real property seizures;
5. Application for registration and audit of data users;
6. Application for search in the Real Property Register;
7. Application for the notary and register employee for ordering and preparing certificate of the Real Property Register for transaction.

The IT infrastructure scheme of the Centre of Registers is illustrated in Figure 8.

Each structural subdivision of the enterprise has its own local area network (LAN). Commutators are used to connect computers together. In larger subdivisions, LAN is divided into virtual area networks (VLAN). Connection speed of workplaces reaches 100 Mbps, and of servers – 1 Gbps. All the Branch Offices and Branch Office Divisions of the enterprise are inter-connected through the wide area network (WAN), which has been implemented with the help of three different technologies: smaller branch offices (or their divisions) are inter-connected over DSL by using their own virtual private network (VPN) connection; medium-size subdivisions (smaller branch offices and larger branch office divisions) are inter-connected through two Internet service providers (IPS) with MPLS technology; larger branch offices are inter-connected by the optical ring of a speed 100 Mbps.

In the Central Unit, LAN consists of three security levels: Data management zone (DMZ); applications and users; databases.

**Figure 8. IT infrastructure scheme of the Centre of Registers.**



### **3.1 IS hardware and software**

Hewlett-Packard Integrity rx4640 server with 4 Itanium II processors and external data storage is used for the central database. EMC CLARiiON CX500 with raw capacity 8 TB is used as data storage. Red Hat Enterprise Linux ES 4 operating system and database management system Oracle 10gR2 Enterprise Edition Release are used in this server.

A computer cluster is used to strengthen reliability and manage server load in the database server. At present, the cluster links three computers.

Linux operating system with JBoss Java Application Server and Apache Web server software is commonly used in the application servers. To reduce administrative and energy-consuming costs, virtualization technology is applied to application servers, when many virtual computers are created in one computer. For this purpose, VMware ESX 3.5 software is used.

A special microclimate is maintained in the premises where information system service stations operate; electric energy is supplied from two independent subsidiary stations; diesel electric stations and fire prevention systems are installed in these premises. System for control of access to the premises, system for identification of internal and external users, and system for copying and restoring of data are all in place. Data copies are stored in the archive where special equipment is installed. Firewall prevents from unauthorised access to the data.

SAPERION document management system is used for accumulation of computer-based archive of documents. The following documents are now being compiled in the electronic archive: documents scanned from the register files (sale-purchase contracts, court decisions, etc), plans of buildings (premises) and photographs of structures. The system, which is currently being developed, enables users to receive these documents at their workplace.

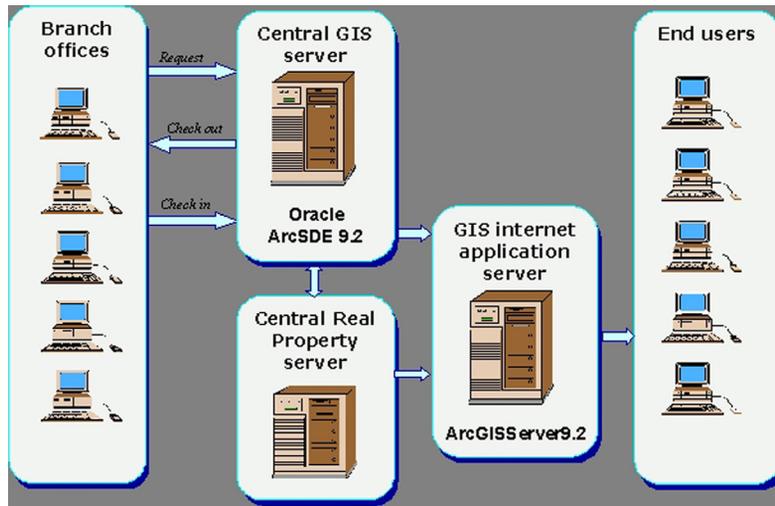
### **3.2 KADAGIS application**

Prior to the registration in the Real Property Cadastre and Register, land parcels are entered on the cadastral map where the area and geographical location among other parcels are checked. A powerful application KADAGIS has been created for updating of cadastral maps using ArcEditor 9.2, ArcObjects and .NET.

Branch offices using application KADAGIS work at remote locations and edit ArcSDE 9.2 DEFAULT versions using disconnected editing. Every user in Branch Offices creates approximately 10-20 check-outs during a day, and all users create more than 700 check-outs during a day. KADAGIS

extension for ArcEditor 9.2 was created in order to meet the specific needs of the Centre of Registers for updating of cadastral map. The application KADAGIS has more than 50 functions for updating of cadastral maps. Scheme of database updating is illustrated in Figure 9.

**Figure 9. Database updating scheme**



Parcel boundaries are entered into cadastral map from coordinates or by vectorising scanned and georeferenced parcel maps.

Some controls have been created that speed up and make more user-friendly such operations as data entering, editing, quality control and updating of central ArcSDE database. Disconnected editing facility is used to decrease network traffic.

Advanced software and computer technologies are being developed, which allow prompt updating and administering of geoinformation system of the Real Property Cadastre, by using the following software: ARCINFO, ARCSDE, ARCGISSERVER, AUTOCAD, ORACLE.

Use of ArcGISServer capacities allows creating Internet (program) applications that could serve as a tool for entering, editing and revising of geodata by using the Internet, without installing any additional GIS programs in the user's computer.

## **4 UPDATING PROCEDURES**

Determination of changes of cadastral data on immovable thing is considered as actions whereby changes of cadastral data on immovable thing recorded into the Real Property Cadastre are being determined, and cadastral data file on immovable thing is being updated.

When determining changes of cadastral data on a land parcel, the following actions are undertaken:

1. Farming lands, which are required for establishment of land cadastral data, are being mapped, and other changes are determined;
2. Land parcel plan is being prepared;
3. Total area of a land parcel is calculated; explication on farming lands is being prepared;
4. Land parcel values are estimated:
  - 4.1. Land parcel value by land valuation method;
  - 4.2. Average market value by land value maps prepared in line with the Rules on Preparation of Land Value Maps, approved by the Order No 515 of the Minister of Agriculture as of 23 December 2002 (Official Gazette, 2003, No 5-221);
5. Form of cadastral data on a land parcel is being prepared;
6. Cadastral data file on immovable thing is being updated.

Changed situation of farming lands is edited by using orthophoto maps and by performing mapping activities on site.

When determining changes of cadastral data on structures, the following actions are undertaken:

1. Buildings, separate storeys are being inspected on site, and then checked against the existing plans. Control surveys are performed. In the absence of photographs of facades of the main buildings, or if these facades have changed, the facades of the main buildings are being photographed;
2. Changed data, established during inspection and surveying, are recorded in the outline;
3. If during revision of cadastral data it is determined that the purpose of use of premises in use within the building has been changed, data of these premises are determined according to the actual purpose of use;
4. Cadastral data of newly built extensions and superstructures are compiled and processed following the main requirements on cadastral surveying of buildings;
5. Changes of building are marked on the plans following the main principles on compiling and documenting of cadastral data, and the legend;
6. After the changes of cadastral data have been determined, all new construction elements, plumbing installations and other elements are marked on the plans of building storeys, in

- the same manner as when determining the main cadastral data;
7. New plans of storeys of buildings are drawn. Areas are calculated according to the newly determined measurements, regardless of how much the area of premises has been changed;
  8. Cadastral data form is being prepared;
  9. Cadastral data file on immovable thing is being updated.

An immovable thing is registered according to the location of this thing. When registering an immovable thing in the Register, the register entry of immovable thing is made. Such entry is being formed by assigning the entry number to the immovable thing, which is considered as a number of register entry of immovable thing.

Real rights to immovable things are registered by entering data in the register entry of a given immovable thing. One register entry of immovable thing may contain data on several immovable things owned by the same owner, if they are located within the same land parcel.

When making a decision regarding registration or removal from the Register of immovable things and real rights thereto, the data must be recorded into the central databank of the Register, after such a decision is documented.

Real right is registered by entering in the register entry of immovable thing the name of real right, real right holder and the name, date and number of the document certifying real rights under registration. In the process of registration of real right, notes on encumbrances to real right must be made, if such encumbrances are established in the same document, which serves as a basis for registration of real right.

Real rights are removed from the Register, when the real right holder loses his real right or transfers it, and other real right holder has been registered, or that immovable thing perishes (or disappears).

Immovable things are removed from the Register upon submission of a document established by legal acts and certifying the fact that the immovable thing perished.

Register entries on immovable things are marked in the Register database as archival and are stored in the central databank for indefinite period.

When making a decision regarding registration of immovable thing or real right, a person who submitted an application is provided with the excerpt from the central databank of the Register

certifying registration of real right – certificate on registration in the Register of immovable thing and real rights thereto.

When making a decision regarding removal from the Register of immovable thing or real right, a document certifying removal from the Register of immovable thing or real right is being issued to a person who submitted an application. Having adopted the decision to remove from the Register an immovable thing or real right thereto, the real right holder and other interested persons are notified accordingly in writing within 3 days.

A moment of registration or removal from the Register of immovable thing, real rights thereto, is considered as automatic confirmation of the central databank to the territorial registrar that data of the central databank of the Register have been updated.

NOTE: A process of automated updating of the cadastre map is described in point 3.2 hereof.

## **5 PROVIDED SERVICES**

The State Enterprise Centre of Registers, as Administrator of the Real Property Cadastre and Register, provides the following services:

- Registers real property of natural persons and legal entities, ownership and other real rights to immovable things, restrictions on these rights, as well as legal facts established by laws;
- Provides Real Property Cadastre geographical data;
- Prepares and publishes Real Property Cadastre map;
- Provides the users with the archival data excerpts from the Real Property Register and document copies, is responsible for the accuracy of the provided data.

### **5.1 E-services**

At present, the following Real Property Cadastre and Register services may be ordered through the Internet:

- Excerpt from the Real Property Register by the indicated property address;
- Excerpt from the Real Property Register by the owner;
- Excerpt from the Real Property Register on real property registered n years ago;
- Duplicate of cadastral data file;
- Certificate on the agricultural land parcel possessed by the right of ownership;
- Certificate on the owners of the adjacent land parcels;
- Printing of the extract of cadastral map;

- Preparation of the cadastral data file on immovable thing;
- Cadastral surveys of immovable things – establishment/adjustment of cadastral data on land parcels, structures, premises and engineering structures.

Internet users may use the following services of information system:

- Public search on property by address;
- Property search by identifiers for the registered users;
- Property search by address for the registered users;
- Property search by the owner (natural person) for the registered users;
- Property search by the owner (legal entity) for the registered users;
- Cadastre map for the registered users;
- Downloading of extract of cadastral map in PDF format;
- Downloading of vector boundaries of land parcels in DXF and SHP format;
- Search on the average market value of land and structures by the unique number;
- Search on taxable (basic) value of structure by the unique number;
- Search on value zones by municipalities.

Both public sector (state authorities, law enforcement institutions, counties and municipalities) and private sector (notaries, banks, leasing companies, real property agencies, property valuers, insurance companies, lawyers, bailiffs etc.) are users of services (data on land, buildings, premises, flats, GIS information, data on owners, registrations, obligations, mortgages, rights, addresses, market value, cadastral information, legal entities etc.) provided through the central databank (e-supermarket) of the Centre of Registers.

The State Enterprise Centre of Registers provides electronic services not only to the domestic, but also to international customers. The enterprise participates in the European Land Information Service (EULIS). EULIS is an electronic service offering access to real property registers in European countries. Users can see directly online and download register information from: Netherlands, Lithuania, England and Wales, Sweden, Ireland and coming soon – Austria.

Professional users (customer segments include professional users such as: banks, lenders, credit agencies, solicitors, legal professionals, estate agents, government departments and enforcement agencies) in the countries mentioned above can also access the information in the central databank of the Real Property Register, which is administered by the State Enterprise Centre of Registers. To get Lithuanian Real Property Register and Cadastre information, users from the mentioned countries should apply to the respective agency, authority and organisation in their country.

Through EULIS portal a user will also have access to all necessary reference information on the land and property registration services provided and the associated legal environment in the country. This helps with understanding of terminology and meaning. More information about EULIS is available at: <http://www.eulis.eu/>

On-line demo of Lithuanian application is available at: [http://www.registrucentras.lt/presentations/eulis\\_demo.html](http://www.registrucentras.lt/presentations/eulis_demo.html)

## **5.2 Latest developments**

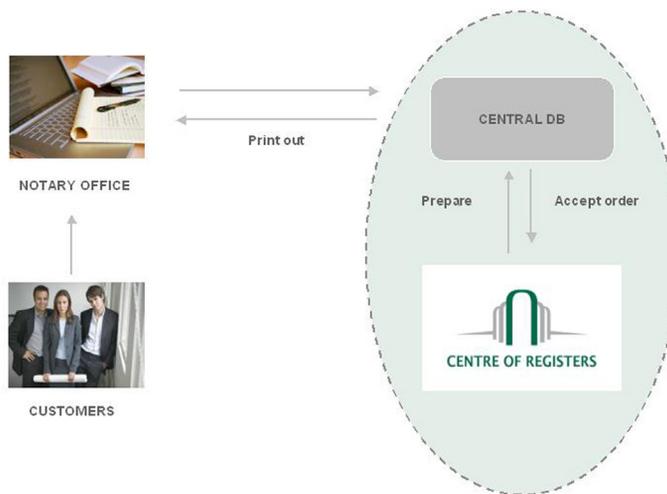
One of the most important recent activities of the Centre of Registers is the development of a public electronic service for real property transactions (NETSVEP).

The aim of NETSVEP is to implement one-stop-shop principle on real property transactions, to offer better electronic services for the society-at-large, to provide official direct information on the Real Property Register and Cadastre for notaries and parties to a transaction by electronic means, to install automated preparation of transaction data and documents, registration of rights and legal facts in the Real Property Register and store these electronic documents.

NETSVEP offers a possibility for the real property transaction parties to conclude a transaction within a shorter time period by performing all actions related to acquisition of real property and registration of rights thereto at the notary bureau without direct applying to the Centre of Registers. The notary who is going to verify the transaction in person receives electronic certificates and data on whether property subject to transaction was not sold to other person, was not mortgaged, seized or has no restrictions on the rights to dispose of the property, which are needed to conclude a transaction. Upon request of the person who acquired the property, a notary verifying the transaction may register the rights of ownership to real property in the Real Property Register electronically.

With the launch of this new e-conveyance service in 2009, real property transactions become simpler, since it is possible to conclude transaction at one place – notary bureau. Property transactions are prepared using modern electronic means and working directly with the central databank of the Real Property Register. Such a novelty promotes better quality services for the population and ensures more secure real property transactions. An electronic system precludes from any illegal manipulations with real property and fraud of documents. Notaries verify real property transactions as well as property registration operations by using a qualified electronic signature. The NETSVEP procedure for registration of real property and rights thereto is illustrated in Figure 10.

**Figure 10. Procedure for registration of real property and rights thereto (NETSVEP)**



The NETSVEP service also aims at contributing to the Programme of the Government of the Republic of Lithuania and public electronic services of the European Union, to the implementation of the e-government, e-business, e-society and other areas of information society development, and encouraging wider use of modern electronic means and Internet possibilities. Thus, the new public electronic service may be also used for the development of other public electronic services and provision of better access to the official information.

The major economic benefit to the Lithuanian citizens is a simplified procedure for concluding real property transactions. NETSVEP service is designed for all Lithuanian citizens and legal entities willing to acquire real property and rights thereto in the whole territory of Lithuania, irrespective of social status, gender, and residence place of citizens, or real property location.

Another latest development – digital certificates – allows implementing the following operations: (1) provision of information on real property without contracts; (2) signing of contracts on sale of information on-line; (3) service for the preparation of authorisations for the third parties to represent legal entity; (4) authentication in NETSVEP and other information systems of the Centre of Registers; (5) verification of real property transaction contracts with qualified e-signature of a notary.

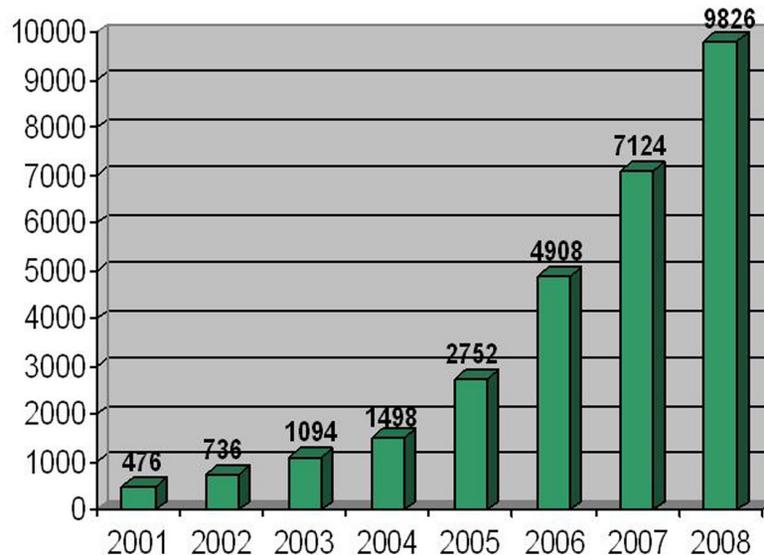
Electronic client self-service system is in operation that enables to get all types of excerpts from the Real Property Register and Register of Legal Entities as well as information of any amendments made on data of the owner's property. A new service was launched in July 2009 that offers possibility for legal entities and natural persons to get information of who have requested access to their property data in the recent 6 months.

### 5.3 Provision of information

For several years, the Centre of Registers has been providing a public service of search on information about the real property objects in the central databank of the Real Property Register for public and registered users.

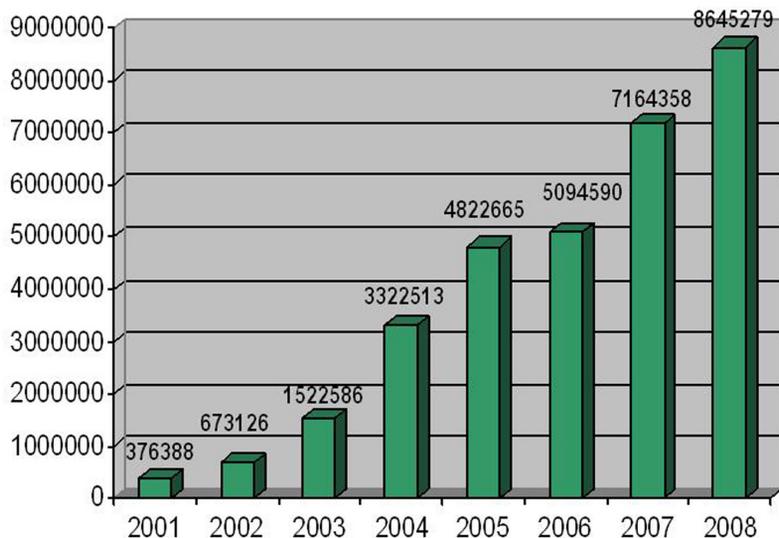
Growth in the number of professional users to the central databank of the State Enterprise Centre of Registers is shown in Figure 11.

**Figure 11. Growth in the number of professional users to the central databank (e-supermarket).**



Dynamics of searches in the central databank is presented in Figure 12.

**Figure 12. Dynamics of searches in the central databank.**



Dynamics of searches indicates that the need for such information services is constantly growing.

Law enforcement institutions were among the first who started using services of search on electronic information about real property. At present, state institutions, business subjects and ordinary citizens use this service more frequently than before. Such a trend is expected to remain in the next year.

Active participation of population and business subjects could be related to the development of real property market, better Internet access and ability to use information technologies.

Small and medium-size businesses are actively using these services. Such a trend could be related to the growing competition as well as necessity to use real property information for provision of better and more efficient customer services.

From 2003, the State Enterprise Centre of Registers supplies the Bank of Lithuania with information on changes in housing prices, which, in its turn, delivers such information to the European Central Bank. From November 2006, the Centre of Registers started to publish this information on its web site: [http://www.registrucentras.lt/ntr/stat/busto\\_kainos.php](http://www.registrucentras.lt/ntr/stat/busto_kainos.php) (in Lithuanian).

Information is provided in tables and graphics. Such information is useful and interesting to the housing market stakeholders, valuers and consultants as well as to the bank sector.

Transaction prices, which are officially declared in the purchase-sale, purchase on instalments and financial leasing contracts concluded by natural persons and legal entities and, which are recorded in the transaction database handled by the Centre of Registers, are used for calculation of housing price changes.

Changes in the sales prices of new and older construction apartments and individual residential houses are calculated from 1999, in comparison to IV quarter of 1998 and previous quarter, by applying common calculation methods and transaction selection criteria.

Housing transactions in case of new construction are taken by housing construction year – of the same year and one previous year, including also incomplete construction housing transactions.

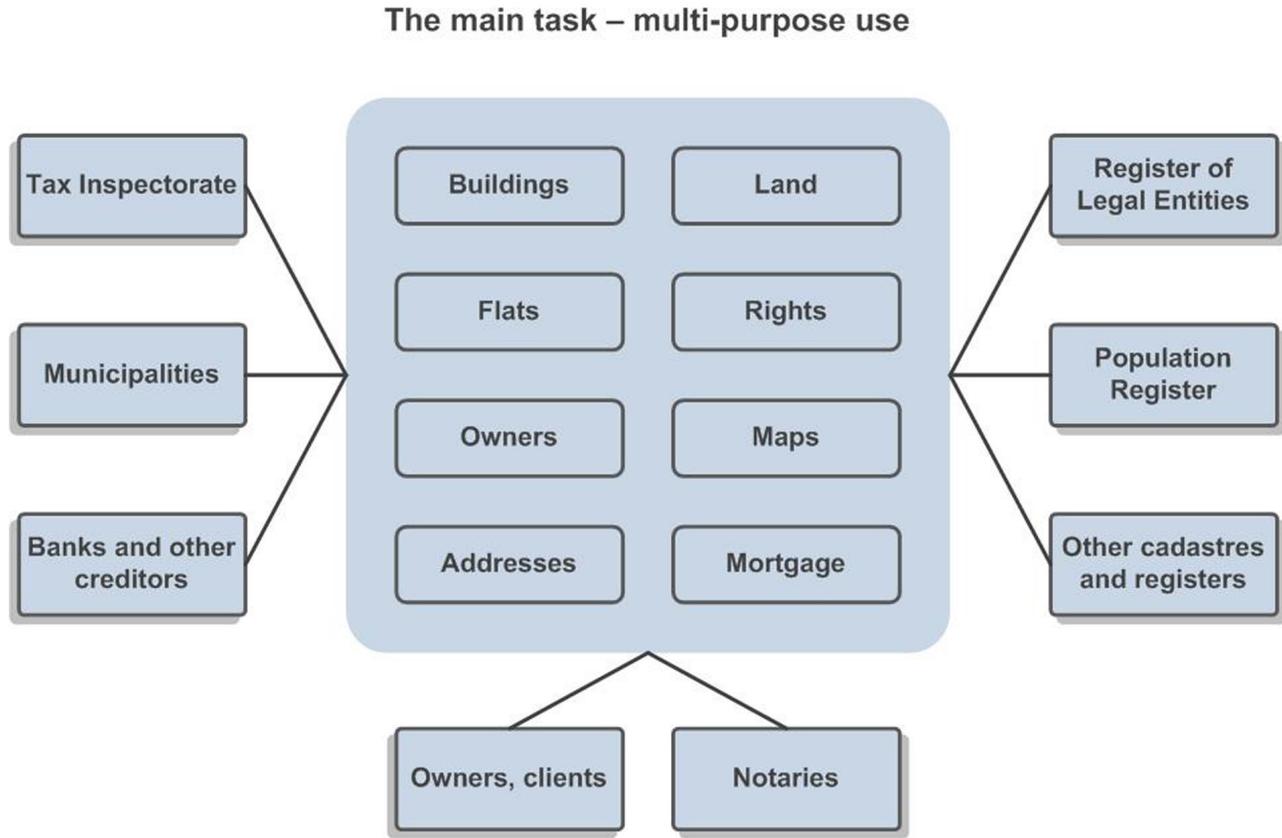
Information on the number of real property market transactions is also provided. Intervals of providing such information: previously – every quarter; at present – every month. These data are used by the Bank of Lithuania for the preparation of Financial Stability Reports, other macro-economic analyses and forecasting.

## **6 LINKS BETWEEN CADASTRE AND REGISTER**

Over more than a decade ago Lithuania developed an integrated multi-purpose real property cadastre and register system, wherein cadastral and register data are stored in one central database. The system has been created following the recommendations on real property administration of the Economic Commission for Europe, with respect to the advice of foreign experts, experience of Western countries, taking into account particularities of the Lithuanian economy and traditions.

The feature of all modern real property administration systems is a multi-purpose use of the system data. In this connection, Lithuanian real property administration system has been always assigned with the following task (see Figure 13):

**Figure 13. Multi-purpose use of the system data.**



The Lithuanian integrated real property administration system consists of the following elements:

1. Descriptive data, i.e. description of property, its location, main quantitative and qualitative attributes, type of use, value and price;
2. Legal data, i.e. information on the property owner, holder or possessor, nature of property ownership (title, rent, trust or other rights), encumbrances on the ownership right and other relevant data;
3. Legal facts;
4. Geographical data, i. e. cadastre map.

In the beginning of 2009, ca 1.9 million land parcels and ca 4 million buildings, flats, structures, engineering structures and rights thereto have been registered with the Real Property Register.

Archives constitute an important part of real property cadastre and register system. They store documents on real property registration, Real Property Cadastre, real property valuation and market analysis, cadastral maps, organisational, administrative and information documents. Each year, the archive increases by 7%. Considering their content and importance, a new system of electronic archive of documents is being created.

To summarise, the main features of the Lithuanian real property cadastre and register system are as follows:

1. Unified: property objects and rights in single organisation and single system; land and structures (houses, apartments, premises, utilities, roads, railways, etc.) in a single system; value information is in the same single system; State and private properties are treated equally.
2. Centralized: the central data bank covers the whole country; only data in the central data bank have legal status.
3. Digital: cadastre and legal data (graphical and descriptive) cover whole country, only digital data (extracts of databases) have legal force; data services available on-line (e-services), e-conveyance in process.
4. Multi-purpose: property guaranty, taxation, valuation, and market service.
5. Self-financed: full cost recovery from fees of the clients.

## **7 REAL PROPERTY TAXATION AND VALUATION**

### **7.1 Real property taxes**

Historically, land and buildings were treated as separate entities. This is also reflected in the property taxation system, where these two elements are used as distinct tax bases. Currently, the real property taxation system in Lithuania includes 2 taxes – land tax and tax on real property (buildings). There is also the third charge included to the property tax system – land lease tax and it concerns state-owned land units used by private persons and legal entities using land on rental basis. The land rent is paid instead of land tax. Other taxes on real property include inheritance tax, as well as registration and transfer fees payable when registering or transferring the property. All the above-mentioned taxes, except for land tax, are determined according to the procedure established by legal acts and are based upon average market values estimated by mass valuation method.

The main characteristics of the tax on real property (buildings) are as follows:

1. Legal basis for taxation – Law on Real Property Tax adopted in 2005 (came into force from 1 January 2006), replacing the Law on Taxation of Real Property Belonging to Enterprises and Organizations.
2. The tax object is real property (private buildings, premises, engineering structures) located in Lithuania belonging by the right of ownership to natural and legal persons and used in their commercial and economic activity.
3. The tax base is the average market value of real property determined using the real property mass valuation, and in some cases - value determined by using the replacement value (cost) approach.
4. The taxpayers are Lithuanian and foreign natural and legal persons – owners or users of taxable real property (or its parts).
5. Tax rate may vary between 0.3-1% in accordance with the decision of the municipal council. Legal persons have to pay advance instalments, amounting to  $\frac{1}{4}$  of the tax, on a quarterly basis. Both individuals and legal persons have to file annual real property tax return (declaration) to the State Tax Inspectorate and to pay tax (if instalments had been paid, the difference between the tax and instalments paid) not later than on 1 February of the next year. Municipalities receive real property tax revenues. They are entitled to reduce the tax at the expense of their budget or completely exempt from the payment thereof.
6. Main exemptions (reliefs):
  - State-owned or municipal real property and real property of state or municipal enterprises and real property of budgetary institutions;
  - Real property of embassies, international governments' organizations;
  - Real property of churches, charitable organizations;
  - Real property used for education, science, cultural activities, social, environmental purposes;
  - Real property owned by companies registered in free economics zones, agricultural and insolvent companies;
  - The structures, which have not been recognised as fit for use (unfinished buildings), where they are not actually used.

The main characteristics of the land tax are as follows:

1. Legal basis for taxation - Law on Land Tax adopted in 1992.
2. The tax object is private land, owned by legal entities and individuals.
3. The tax base is a normative value of land, which is calculated according to the methodology approved by the Government of the Republic of Lithuania.
4. The taxpayers are the owners (legal and natural persons) of land.

5. The annual rate of land tax is at the level of 1.5 % of the normative value of land (the value multiplier 0.5 is used for agricultural land, 0.35 – for gardeners' associations, household land).
6. Municipalities receive land tax revenues. Municipalities are entitled to reduce the tax or to grant exemptions.
7. Exemptions (non-taxable):
  - Land used for public roads;
  - Land of historical, cultural, nature monuments;
  - Land of embassies;
  - Forest land;
  - Municipalities set size of parcel of land owned by physical persons aged over 65 years (for pensioners).

The main characteristics of the land lease tax are as follows:

1. Legal basis – Civil Code of the Republic of Lithuania and resolutions of the Government of the Republic of Lithuania concerning land lease tax on state-owned parcels of land.
2. The tax object is leased state-owned land parcels, tax base is the average market value of the land, determined using mass valuation.
3. Taxpayers are individuals and legal persons leasing land from the state.
4. The annual rate of land lease tax varies from 0.1 to 4 % of the taxable value of land.
5. The particular annual rate of this tax and the terms of its payment are being established by the councils of respective municipalities within the territory whereof the land parcel is located.
6. A municipal council of the territory, where state-owned land parcels are located, receives tax revenues; the municipal council of the territory, where state-owned land parcels are located, may reduce the tax or provide relief from tax payment.

## **7.2 Tax and valuation administration**

The State Tax Inspectorate is responsible for administration of the tax on real property (buildings) and the land tax, whereas local municipalities are responsible for administration of the land lease tax. The State Tax Inspectorate administers assessment and payment of taxes, collects and maintains data on taxpayers in the computerised databases, receives data on tax objects from the Centre of Registers twice a year, assesses land tax and sends the notices to taxpayers.

Administrative responsibility for property valuation for taxation purposes is assigned to the State Enterprise Centre of Registers having Valuation for State Needs Divisions in the Central Unit and in 11 Branch Offices. The State Enterprise Centre of Registers has been collecting sales information along with a physical inventory of real property since 1998. When new real

property object is created or built, an inventory of it is completed and included in the Real Property Cadastre, and ownership rights and other related information is recorded with the Real Property Register. When a property transaction occurs, data in the cadastre record do not change, but data in the Real Property Register do. The real property database at the Centre of Registers also includes property attributes, including the address of property, type of property, and its use; transaction date and price; year constructed; construction material; number of floors; and utility information such as heating, sewage, and gas. If it is a building, the database will contain information on the number of flats or apartments; type of foundation, roof, and construction materials; water supply; total area, living area, and supplemental area; and value in reconstruction. Property values are registered in the databank of the Real Property Register (rights) and Cadastre (property description) alongside with other cadastral parameters (e.g., property classification by its purpose of use). Analysis of the real property market data for mass valuation and other needs is conducted by using the data from the real property market database, which is formed as a supplement to the real property database.

The State Enterprise Centre of Registers submits the data of the Real Property Register and the Real Property Cadastre, which is necessary for tax calculation, to the local tax administrator. At the request of a taxpayer, the State Enterprise Centre of Registers prepares an extract from the Real Property Register specifying the taxable value of real property. These extracts are prepared and delivered or sent to natural persons free of charge. The taxable value of mass valuated real property can be found on the website of the State Enterprise Centre of Registers at [www.registrucentras.lt](http://www.registrucentras.lt) by entering a unique number of real property object.

Taxpayers may appeal against the taxable value to the Centre of Registers and further to the second level Administrative Court.

Until 2006, neither land nor real property was taxed at market value, despite the presence of the infrastructure necessary to perform computer-assisted mass appraisal. Mass valuation of land based on market principles began in 2002, however, taxable values for both land and real property (buildings) were determined by applying adjustment coefficients to base value. Base value for land depended on its productivity, and this was adjusted for location (how near it was to settlements and urban areas), availability of infrastructure, environmental conditions, and other factors. Base value for real property was based on replacement cost adjusted by a location coefficient. In January 2006, Law on Real Property Tax introduced ad valorem property tax in Lithuania and thereby, has changed the way property is valued. Taxable value (assessed value) for buildings is now the average market value arrived at using the comparable sales approach and the income approach. Computer-assisted mass valuation is used for valuation, and the

taxable value is determined for a five-year period. Other properties, such as manufacturing facilities and utilities, are assessed using the reproduction cost method adjusted by location coefficients.

### **7.3 Real property mass valuation system**

Lithuania is one among the first countries of Eastern and Central Europe where computer-assisted mass valuation has been introduced, and land information systems as well as other advanced technologies are widely applied.

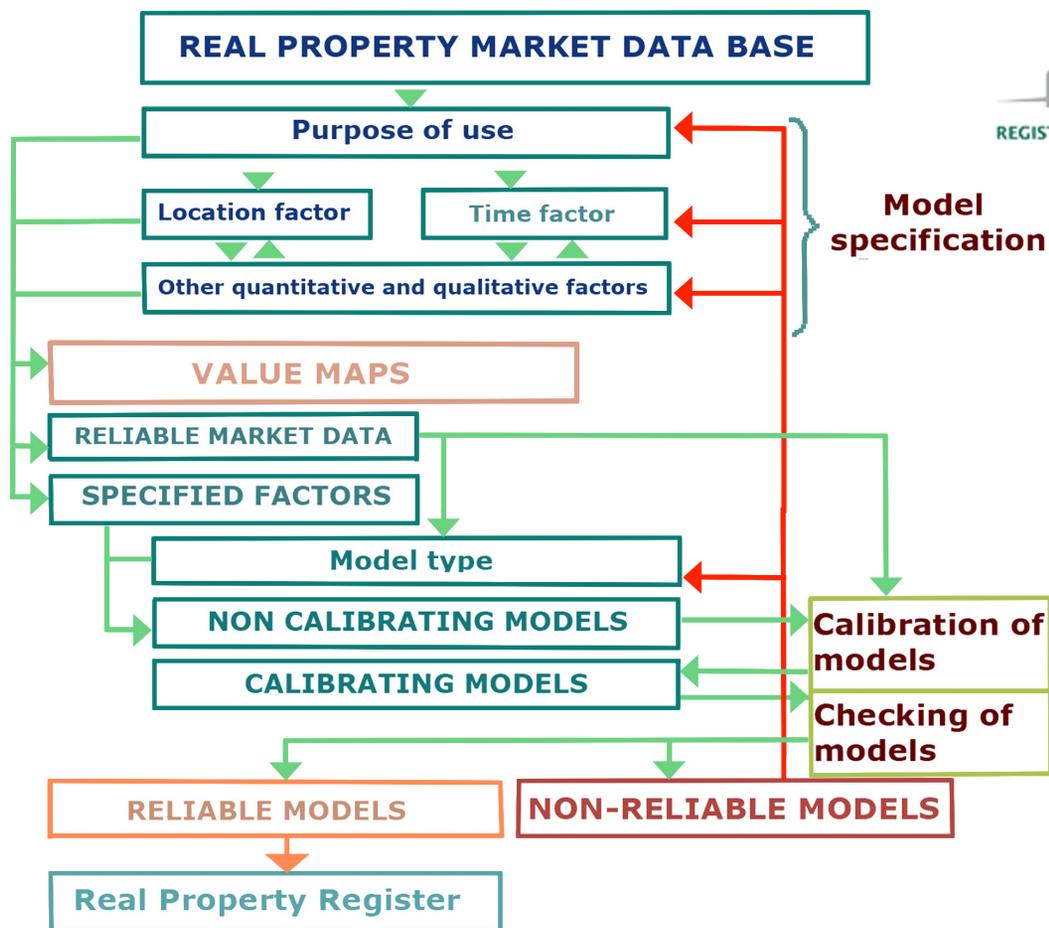
The main aspects of the mass valuation system in Lithuania are as follows:

1. Almost all information necessary for mass valuation is collected at one enterprise – the State Enterprise Centre of Registers: it enables to perform mass land valuation work with the minimum additional technical, human, and financial resources, as well as in the shortest time, to ensure the quality of valuation results; poses minimum of interagency problems with solving mass valuation issues;
2. Information all over the country is collected according to the same standard;
3. All information is electronic and supported with software. A computerised mass valuation provides a possibility to evaluate real property in the entire territory of the country based on uniform principles, within the defined time, and using updated market data. It also allows periodical revaluation of property, taking into account market developments;
4. The results were integrated with GIS and therefore provide a possibility for public access to the value maps and receiving the mass appraisal results through the Internet. The automated databases at the Centre of Registers facilitate providing valuation results to the clients in digital form and link data with property owners;
5. Valuation activities and valuation results are public and available through the Internet;
6. The entire mass valuation system is based on economic approach.

The State Enterprise Centre of Registers has the best technical and organizational possibilities in Lithuania to perform mass valuation. The central database and its sub-component – real property market database – are computerised and continuously updated.

Collection of data in a uniform digital format is a basic factor for success in developing an automated mass valuation model based on statistical methods. A scheme on creation of mass valuation model is provided in Figure 14.

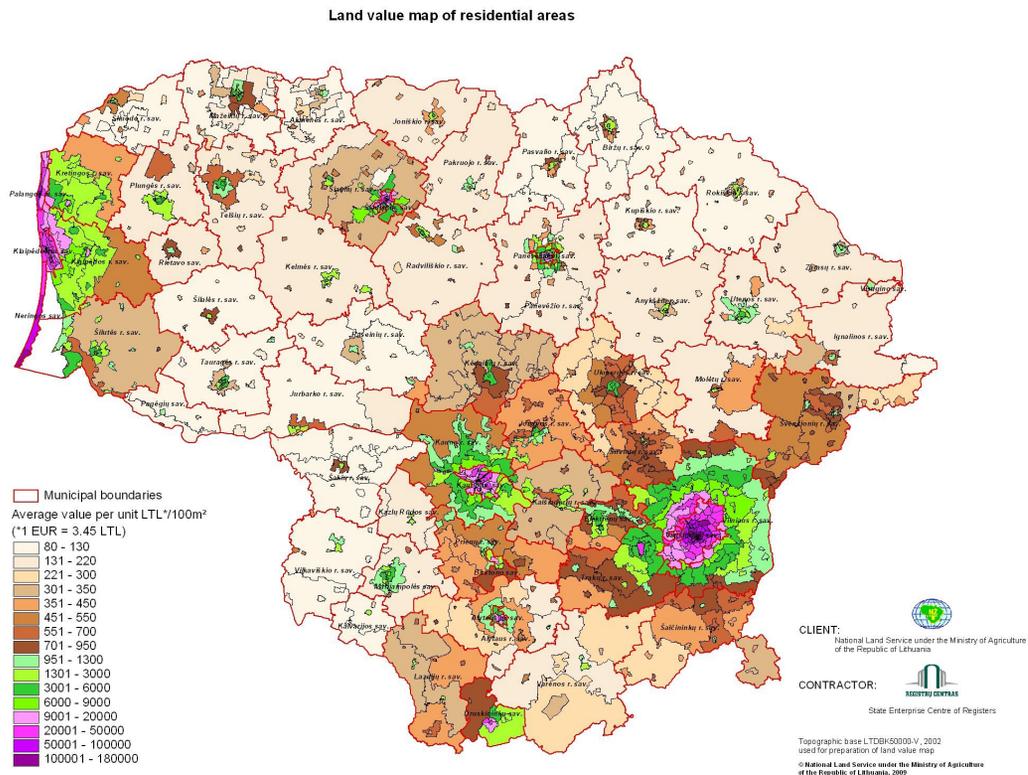
Figure 14. Creation of mass valuation model.



Using the available data, the Centre of Registers performed the first mass valuation of land parcels in 2002-2003, and in 2005 – the first mass valuation of all real property (land parcels and structures) in the country. Results from the latter valuation were used for calculation of taxes on real property for commerce.

Mass valuation performed by the Centre of Registers enables to valuate large number of properties at minimum time and financial costs, by using single methodology (e. g., in 2008, 38 specialists of the Centre of Registers analysed over 300,000 real property transactions, updated value maps of land and structures in the municipal areas, formed 1135 value zones, made calculations and prepared 969 valuation models (formulas) that permitted automatic calculation of the average market value of ca. 2 million land parcels and over ca. 3 million structures, prepared 122 reports on mass valuation). An example of mass valuation product – land value map – is provided in Figure 15.

**Figure 15. Land value map of residential areas.**



By applying real property mass valuation, determination of value of one real property object costs 1 Litas (ca. 0.3 EUR), which is hundreds times cheaper than by applying individual valuation. At the same time, accuracy of valuation is only ca. 10 % lower than with individual valuation.

The Ministry of Finance reviews and confirms buildings' mass valuation documents, the National Land Service at the Ministry of Agriculture provides methodical support for cadastral surveying and mass valuation issues, reviews and confirms land mass appraisal documents, solves land mass valuation disputes.

Mass valuation is a tool for calculation of real property taxable value, serving for the following purposes:

- Sale of state-owned agricultural land not by auction;
- Sale of state-owned agricultural land or its lease by auction;
- Sale or lease of state-owned land use for other purposes;
- Calculation of a fee for the registration of immovable thing and rights thereto;
- Providing social assistance to low-income families (for persons who live alone);
- Calculation of taxable value of the inherited property;
- Providing State guaranteed legal aid;
- Calculation of notary fees;
- Calculation of rent for all state-owned land (as of 2009).

On the basis of analysis of real property market and average market values, statistics is prepared for state and local government institutions. These data are used within the system of management and administration of land and other real property, serve as a basis for decisions adopted by the state institutions, promote social and economic development, ensure appropriate functioning of the public sector, and allow making economic and financial forecasts.

Mass valuation results and spreadsheets prepared on the basis of these results are widely used by the Bank of Lithuania, commercial banks, real property development and construction sector. At the same time, mass valuation system contributes towards stability in banking sector and crediting system.

A fully computerised mass valuation system meets the standards of European Union and other Western countries, is of high quality and internationally recognised (in 2003, the Centre of Registers received an award of the International Association of Assessing Officers for the best performed land valuation, and in 2007, the Institute of Revenue Rating and Valuation presented the Centre of Registers with an award for Excellence in Valuation for the created mass valuation system).

Database of the Real Property Register and its subsystem – database of market transactions – serve as a tool for the analysis of real property market and its dynamics by various aspects. In 2008, customers were offered a new service – the Internet access to the database of market transactions. Over 80 customers – legal entities – have concluded agreements on such service. In 2008, market players were also offered a service providing a spreadsheet of real property market value with time adjustment coefficient. Such services become especially important under the current conditions of real property market and national economy recession.

A wider range of customers become interested in the property market research, statistical data and data analysis services presenting an objective and up-to-date picture of national or local property market or market of a selected real property group.

## **8 FUTURE PLANS**

In the nearest future, the State Enterprise Centre of Registers will continue developing real property administration system, designing and using information systems of the Real Property Register, Cadastre and other registers, initiating and providing public administration services related to the state registers and based on the one-stop-shop principle. Another target is to make fees for the provided services customer-oriented, paying a lot of attention to the activity costs, introducing new electronic services for private persons, contributing towards harmonisation of the real property valuation and taxation system with the requirements of the European Union.

To implement the major objective – effective real property administration, the State Enterprise Centre of Registers will further promote publicity and transparency of its activities, private-public partnership, standardisation and concentration of operations, better availability of textual and graphical data on the Internet, data interoperability, data sharing, better institutional co-ordination and e-services (see Figure 16).

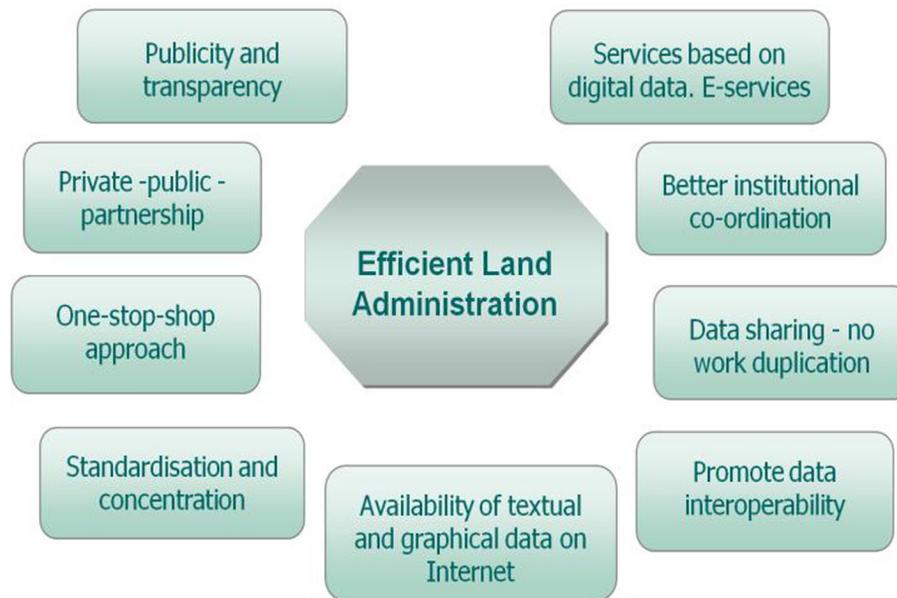
The priority will be also given to the development of the Address Register, transfer of procedures for registration of legal entities into the electronic environment, implementation of procedures for winding-up of non-operating legal entities, and modernisation of electronic archive of the registers administered by the State Enterprise Centre of Registers.

E-conveyance process, which is currently going live, as well as certification services will be further developed, thus promoting use of electronic documents and better security of real rights.

Provision of e-services based on one-stop-shop principle is expected to bring the following benefits: simplification of administrative procedures and bureaucracy; more efficient implementation of

legal acts; closer co-operation between public institutions, agencies and authorities; lower labour costs; transparency of public services; better accessibility of services for the citizens; quicker communication with businesses, which in turn accelerates business processes and efficiency.

**Figure 16. The main trends in Lithuanian real property administration development.**



# THE CADASTRAL SYSTEM IN LUXEMBOURG



LE GOUVERNEMENT  
DU GRAND-DUCHÉ DE LUXEMBOURG  
*Administration du cadastre  
et de la topographie*

<http://www.act.etat.lu>

September 2009

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# 1. INTRODUCTION

## 1.1 History and purposes of the Cadastre

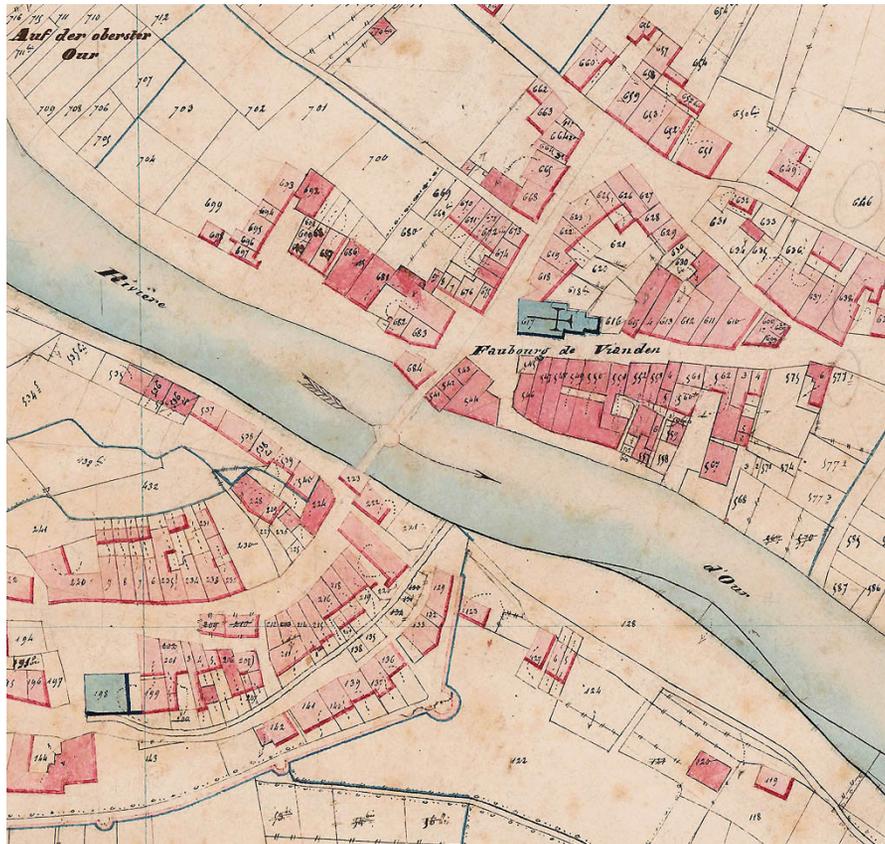
The territory which forms the actual Grand-Duchy of Luxembourg, was under foreign dominion for more than 350 years. In 1766 the Austrian Empress Maria-Theresia ordered a census of all real estates in the ancient Duchy of Luxembourg. The purpose was to evaluate the yield of the real estates in order to levy taxes. But data collected was based only on the indications declared by the owners themselves, and not on a technical survey. Napoleon's troops occupied the territory in 1795. Luxembourg became a French department and French laws came into force. In 1801 the Prefect ordered a general land surveying realised by 61 geodetic surveyors. Again, these works had a fiscal background. Works were interrupted when Napoleon was defeated in 1814. Since 1815 Luxembourg is an independent country, and raised to the status of a Grand-Duchy. The Congress of Vienna decided to appoint the Dutch king as Grand-duke of Luxembourg. Surveying restarted in 1816 and in 1824 most of the work was completed.

The results of these surveyings were:

- the introduction of the metric system;
- the evaluation of the yield of real estates;
- the boundary determinations of the municipalities and their subdivision in sections;
- expertises about the economic situation of the municipalities;
- cadastral maps, mostly drawn in the scale 1/2500 or 1/1250 (in vineyard regions), 1/500 or 1/1000 (in urban regions), and 1/5000 (in forest regions);
- a register of real estates per section indicating the cadastral number, the owner, the field name, the surface area;
- a specification indicating the clear profits of the real estate.

This data from 1824 is called "Urkadaster" in Luxembourgish, which means the cadastral origin. The surveying of the last municipalities was finished in 1831, but the Belgian revolution stopped further works. In 1839 Belgium became an independent state. By the treaty of 1839, Luxembourg did not fully join Belgium, and remained under the leadership of the Dutch king until different inheritance laws caused it to separate as an independent Grand-Duchy.

**Figure 1. Original historic cadastral map from 1824**



## **1.2 Development of the institutional and organisational structure**

As purpose was to raise taxes, the surveying operations were placed under the control of the tax office. When the german army invaded Luxembourg in 1940, and the occupant installed a different rule system, a certain (more technical) independence was granted to the Land Register service, and called "the Cadastre". After World War II, a new administration, called "Administration du Cadastre" ("Administration du Cadastre et de la Topographie" -ACT- since 1964), was instituted by grand-ducal decree from the 26th of September 1945. To maintain the

fiscal link the administration operates under the Ministry of Finance (or the Ministry of Budget and Treasury).

Since 1830 the cadastral service respectively the ACT has accomplished several important evolutions:

- 1842 review of the basic data collected before 1832  
register showing the properties per owner ("matrices") and per municipality
- 1846 detailed alphanumerical and graphical documentation proving owner changes and boundary changes ("feuilles de mutation" and "case-croquis")
- 1850 register of sale deeds
- 1926 national basic triangulation
- 1938 law regulating the activities of notaries obliging sellers to contact a notary in order to draw a sale deed, which also had to be transmitted to the Property Registry Administration and to the Mortgage Office
- 1942 national basic levelling
- 1948 register of sale deeds replaced by "Extrait de l'acte de mutation" (extract of the sale deeds)
- 1952 first national topographic maps
- 1972 changeover from handwritten registers to digital data (program "CAMUT")
- 1988 law concerning registering of co-ownership in buildings
- 1994 creation of the National Topographic Data Base;  
setup of a GPS network
- 1995 digitised cadastral maps
- 2000 new program (called "Publicité foncière", PF) to manage the updatings of property changes in the cadastral registers
- 2001 digital orthophoto
- 2002 creation of the service called "service for Positioning by satellite" (SPSlux);  
legal mission for updating the national register of localities and streets;  
new law regulating the access to the profession of Licensed Surveyor ("géomètre officiel")
- 2004 creation of the National Cartographic Data Base
- 2009 2008 introduction of the GEOPORTAL

### **1.3 Financial and organisational issues**

Luxembourg's Administration du Cadastre et de la Topographie is a government level public service. It directly depends on the Ministry of Finances, together with the tax administration and the registration administration. Its activities are completely financed via a yearly allocated budget.

ACT is one of the very few state services that have the right to have a cash office and to sell products. The money encashed through these sales are collected and transferred to the State finance office. The amounts encashed have no impact on ACT's activities and cash flow, as these funds cannot be used by ACT.

## **1.4 Decentralisation, involvement of the private sector**

### **1.4.1 Structure of the ACT**

The ACT is sectioned in three departments regulated by the law from 25th of July 2002:

1. the Department of Cadastre with:
  - the Division of Conservation of data including the service for integrated land tenure system
  - the department responsible for registering the co-ownerships in buildings
  - the department responsible for the national register of localities and streets
  - the Division of regional offices for surveying and of great projects
  - the Division for land consolidation
2. the Department of Topography with
  - the department responsible for Land information system and the topographic service
  - the department responsible for geodetic networks and for national borders
3. the Central Department with
  - the personnel office
  - the administrative management
  - the accountancy
  - the information desks
  - the archives
  - the department responsible for maintaining of vehicles and technical equipment
  - the control department
  - the IT department
  - the department for special missions
  - the reproduction department
  - the geoportal and NSDI department

The ACT is the only administration in Luxembourg responsible for collecting, archiving and delivering surveying data, as well as informations about land property. The administration is a government department offering services in the area of land registration, cartography, and geodesy. The ACT undertakes all the work associated with land registration, cadastral surveys, geodesy, topography and the implementation of a national GIS. At present, ACT assumes a new

task byhosting the geoportal at the national level, and by directing the inter-ministerial committee of the luxembourgish Spatial Data Infrastructure. ACT is member of EUROGEOGRAPHICS and of EUROGI.

Geodetic surveying within the national boundaries of Luxembourg is done by the ACT, by private licensed surveyors, by the surveying departments of the two biggest municipalities (Luxembourg and Esch-sur-Alzette), by the National Railway Company (CFL) and by the Office for Land Consolidation. Two further cities located in the mining region of the country stopped their surveying departments because of the mining decline. Two private companies, the ARBED (now ARCELOR-MITTAL) and the CEGEDEL (company for providing transportation and distribution of electric power to the Grand-Duchy of Luxembourg) employed their own surveyors. But when the surveyors retired, their respective departments were closed.

Today ACT runs five regional surveying offices. Their respective regional competence matches the political division of the country. Luxembourg is divided into cantons. The regional offices are competent for the following cantons:

- the eastern office located in Grevenmacher is responsible for the cantons of Grevenmacher, Echternach and Remich
- the northern office located in Diekirch is responsible for the cantons of Diekirch, Wiltz, Clervaux and Vianden
- the western office located in Mersch is responsible for the cantons of Mersch, Rédange and Capellen
- the southern office located in Esch-sur-Alzette is responsible for the canton of Esch-sur-Alzette
- the central office located in Luxembourg-City is responsible for the canton of Luxembourg.

There exist some minor exceptions to this principle of division for practical reasons.

#### **1.4.2 Involvement of the private sector**

The law from 25th of July 2002 regulated the private surveying sector in Luxembourg. Prior to this law, each Luxembourger already had the possibility to become a private licensed surveyor : based on his university diploma, he could attend a state examination after a 2-year practical training period at ACT. But no one opted for this possibility, because there were always fewer candidates than vacancies at the ACT or the 2 municipalities which also employ surveyors. Some non-licensed surveyors existed but acting under the control of the ACT when boundaries were defined.

The actual law allows EU-citizens to act as licensed surveyor ("géomètre-officiel") in Luxembourg. A surveyor can have obtain a license in two ways. In the first case, the EU-citizen has no license. But if his University diploma is recognized as compliant to the requirements of the law, the aspirant attends a state examination organised by the ACT. In the second case, the interested person is a licensed surveyor in another EU member state. Then the candidate attends a test controlling his knowledge of luxembourgish legislation and his know-how in cadastral instructions. Since 2002 seven "géomètres officiels" have obtained their licenses, and are nowadays working in the private sector among them a Belgian, a French and a German surveyor. All geodetic surveyors working for the ACT, the municipalities and the National Railway Company are "géomètres officiels" and their cadastral working is under the control of the ACT. Measure data and graphical documents are collected and archived by the ACT.

## **2 CONTENT OF THE CADASTRE**

### **2.1 Legal definition of the property**

In Luxembourg the real property is defined by law. The "Code Civil", introduced during the French occupation at the beginning of the 19th century, regulates properties, the encumbrance of ownership, the mortgage and real servitudes. So the "Code Civil" states for instance about the ownership of a wall, a hedge or a ditch. This law also stipulates the methods of acquiring real property, such as the purchase, the prescription, the heirship, the marriage and the right to acquire land property by avulsion. Buildings are part of the parcel, but emphyteutic lease and heritable building right clarify the destiny of the buildings.

When a licensed surveyor is chartered to define a boundary, he starts to collect documents delivered by the ACT and verifies the existing boundaries before beginning a new parcelling of the real estate. If cadastral documents are insufficient to define a boundary (because surveyor maps do not exist before 1945), the geodetic surveyor first applies the Code Civil or tries to arrange a compromise. If no arrangement is possible, the owners have to submit the definition of the boundary to the court.

The most important laws, decrees and regulations dealing with ACT or the liberal profession of geodetic surveyors are as follow (for details contact: [www.legilux.lu](http://www.legilux.lu)):

- Loi du 3 frimaire an VII (23 novembre 1798) relative à la répartition, à l'assiette et au recouvrement de la contribution foncière (law from the 23rd November 1798 regulating the charge of land tax)

- Loi du 18 juin 1898 concernant la révision du classement et des évaluations cadastrales des propriétés non-bâties (law from the 18th June 1898 concerning the revision of cadastral evaluations of the not build-up properties)
- Arrêté grand-ducal du 26 septembre 1945 portant réorganisation de l'Administration du Cadastre (decree from the 26th September 1945 concerning the reorganisation of the ACT)
- Loi du 17 avril 1964 portant réorganisation de l'Administration du Cadastre (law from the 17th April 1964 concerning the reorganisation of the ACT)
- Loi du 25 mai 1964 concernant le Remembrement des Biens Ruraux (law from the 25th May concerning Land Consolidation)
- Loi du 21 juin 1973 portant organisation de l'Administration du Cadastre et de la Topographie (law from the 21st June 1973 concerning the organisation of the ACT)
- Loi du 6 février 1980 portant modification de la loi du 21 juin 1973 portant organisation de l'Administration du Cadastre et de la Topographie (law from the 6th of February 1980 concerning the modification of the law from the 21st of June 1973 concerning the organisation of the ACT)
- Règlement grand-ducal du 31 octobre 1980 portant désignation des sièges, de l'étendue et des attributions des bureaux régionaux de l'Administration du Cadastre et de la Topographie (grand-ducal regulation from 31st Octobre 1980 concerning the locations, the ambits and the field of functions of the regional offices)
- Règlement grand-ducal du 21 novembre 1980 autorisant la création et l'exploitation d'une banque de données nominatives pour le compte de l'Administration du Cadastre et de la Topographie (grand-ducal regulation from 21st Novembre authorising the creation and the running of a database by ACT)
- Loi du 19 mars 1988 concernant la publicité en matière de copropriété (law from the 19th March 1988 concerning cadastral informations about co-ownership in buildings)
- Règlement grand-ducal du 22 juin 1988 concernant la publicité en matière de copropriété (grand-ducal regulation from the 22nd June 1988 concerning cadastral informations about co-ownership in buildings)

- Règlement grand-ducal du 14 avril 1990 concernant l'exploitation de la banque de données des propriétaires d'immeubles inscrits au Cadastre (grand-ducal regulation from 14th April 1990 concerning the running of a cadastral database listing real estate owners)
- Règlement grand-ducal du 17 août 1998 portant fixation des modalités de concession de droits d'utilisation des fichiers numériques issus de la base de données topo-cartographique (BD-L-TC) du territoire national, gérée par l'Administration du Cadastre et de la Topographie (grand-ducal regulation from the 17th August 1998 fixing the modalities for using digital data stored in the topographic database managed by the ACT)
- Règlement grand-ducal du 14 septembre 2000 portant fixation des modalités de mise à disposition des données numériques issues du plan cadastral numérisé – PCN (grand-ducal regulation from the 14th September 2000 fixing the modalities to use digital data based on PCN)
- Loi du 25 juillet 2002 portant réorganisation de l'administration du cadastre et de la topographie (law from the 25th July 2002 concerning the reorganisation of the ACT)
- Loi du 25 juillet 2002 portant création et réglementation des professions de géomètre et de géomètre officiel (law from the 25th July concerning the creation and the reglementation of the profession of the surveyor and the of the licensed surveyor)

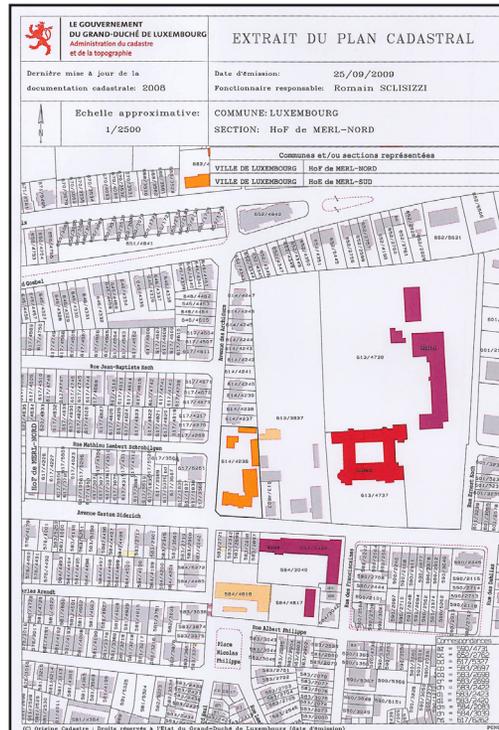
## 2.2 Cadastral maps

Until 1995 cadastral maps existed in hard paper form ("Grand Aigle" format) and were based on the original surveying realised in 1824. Updatings due to boundary changes were originally effectuated on the map itself by scratching out old lines and redrawing new boundary lines. This system was used until 1975. Periodically the old maps were redrawn between 1840 and 1975. Copies for customers were realised by drawing extracts by hand. In 1975 all maps were copied on photographic film and scratching was fulfilled on the films. From then on, copies were released by photocopy. Until 1832 nearly 1700 "island maps" had been drawn showing 620000 parcels. Normally used scales were 1/2500, but also 1/1250 (in vineyards regions), 1/500 and 1/1000 (urban regions), or 1/5000 (in forest regions). Today the country counts about 680000 parcels.

In 1997, after a trial period in 1995, ACT started to digitise the cadastral maps developed by means of vectorisation. Works were finished in 2002. The new product was called PCN ("plan cadastral numérisé", i.e. digitized cadastral map). Meanwhile the new program for integrated land tenure (called "Publicité foncière", PF) started in 2000 so that it was possible to link both

products. Since 2002 each parcel of the alpha-numeric register has a digital link to the PCN and vice-versa. By this way ACT avoids to have an antagonism between alpha-numerical and graphical data.

**Figure 2. Official cadastral map extract**



The main difference concerning the practical daily use between the PCN and the older cadastral maps is that PCN data are structured in 10 layers, whereof the principal layers are:

- PARCELLE: including data about parcels
- BATIMENT: including data about buildings
- PARCNUM: parcel-number (parcel identification)
- TOPONYME: including field-name and name of the street
- LIMADMIN: including the boundaries of the municipalities and those of the cadastral sections

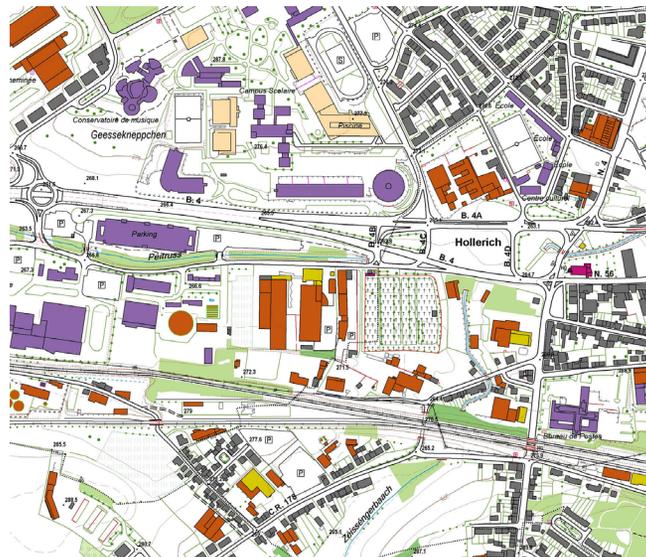
The PCN is georeferenced. As it is based on the "1824" cadastral maps, there is no difference concerning the contents of the maps. Elements represented on the PCN are therefore those enumerated above. Note that streets have no parcel-number because they are public and are not subjected to land tax.

The ACT clearly specifies that the cadastral maps in digital form have been scanned and digitised from the original cadastre maps. Thus the accuracy of all cadastre products is limited to the accuracy of the original information.

The ACT produces also topographic datasets and maps. The cartographic department within the ACT provides the topographic maps at the scale 1/5000 and 1/20 000. These maps are created based on aerial photos, and updates are made about every ten years. The 1/20 000 maps are then used to derive different maps at the following scales: 1/50 000, 1/100 000 and 1/250 000.

The BD-L-TC is a vector database created at the scale 1:5 000 and derived from a photogrammetric survey. The database covers the complete extent of the country. The data is grouped in 10 themes, where each theme has multiple object classes: points, lines, areas. These objects are described by attributes.

**Figure 3. Topographic 1/5000 database printout**



The 10 themes are:

- Roads
- Railways and energy lines
- Hydrography
- Buildings and infrastructure
- Vegetation
- Orography
- Altimetry
- Administrative boundaries
- Geodetic infrastructure
- Toponyme (region names)

### **2.3 Cadastral register**

The following attributes of a parcel are registered in the Publicité-Foncière-Database:

- The municipality
- the cadastral section
- the parcel number
- the field name
- the address (if known)
- the owner(s) with his/their national identification number(s)
- the form of land use
- the form of ownership
- the surface area
- the reference to the last measuring
- the date of the creation of the parcel
- the yield (has only a historical value, but is still used to calculate registry costs)
- the name of the building (in case of co-ownership)
- the segmentation (flats, garages, cellars, attics etc) inside an apartment house

**Figure 4. Cadastral extract : parcel list**

LE GOUVERNEMENT DU GRAND-DUCHÉ DE LUXEMBOURG Administration du cadastre et de la topographie		EXTRAIT CADASTRAL RELEVÉ PARCELLAIRE par personne				
		Date d'émission : 25 septembre 2009				
		Responsable : Roman SCLISZZI				
No parcelle	Numéro(s) Mesurage(s)	Lieu dit nature	Occupation(s)	RNB RNBST	RBT RBTST	CT CTP
© Origine Cadastre: Droits réservés à l'Etat du Grand-Duché de Luxembourg (2009)						
Provenance		Quote part		Lieu dit/lot		
Domaine de l'Etat						
Commune : LUXEMBOURG				Section : Hof de MERL-NORD		Mise à jour : 2009
4	897	-	AUF DER GINZ terre labourable	-	19.88	- 24a82ca
7	1492	-	AUF DER GINZ terre labourable	-	95.92	- 69a90ca
8	970	-	AUF DER GINZ terre labourable	-	53.76	- 67a28ca
9	802	-	AUF DER GINZ terre labourable	-	35.76	- 44a70ca
10	1307	-	AUF DER GINZ terre labourable	-	38.88	- 48a60ca
12	1308	-	AUF DER GINZ terre labourable	-	92.43	- 48a98ca
			terre labourable	-	19.95	- 24a82ca
			terre labourable	-	12.87	- 24a82ca
13	1188	-	AUF DER GINZ terre labourable	-	92.80	- 51a79ca
			terre labourable	-	20.88	- 25a85ca
			terre labourable	-	12.82	- 25a85ca
14	6492	8851	AUF DER GINZ place voie	-	-	- 49ca
16	6491	5851	AUF DER GINZ place voie	-	-	- 11ca
18	6487	8851	AUF DER GINZ chemin d'exploitation	-	-	- 1a78ca
18	6489	8851	AUF DER GINZ place voie	-	-	- 8ca
18	6507	5851	Rue Alexandre Fleming place (occupée)	services de santé au sociétar	-	- 1ha9a31ca
61	6487	5851	Rue Alexandre Fleming place	-	-	- 24ca
61	6499	5851	Rue Alexandre Fleming chemin d'exploitation	-	-	- 2a90ca
61	6501	5851	Rue Alexandre Fleming place voie	-	-	- 3ca
348	3771	3839	AUF DER BARTHINGERGAECHT place	-	1.86	- 1a77ca
511	3773	2674 4296	Route de Longuey place	-	0.69	- 66ca
512	3777	3505 4296	Route de Longuey place	-	1.05	- 1a00ca
660	5439	2266	Avenue du Dix Septembre place (occupée)	-	11.68 4000	- 1a93ca
614	4236	618	Avenue Gaston Diderich place (occupée)	bâtiment à habitation	-	- 32a3ca
650	6194 8289 9317 9393		Route d'Arion bâtiment non défini	-	-	- 1a18ca

It is possible to edit the history (the provenance) of each parcel known since 1824! Between 1824 and 1850 all changes of ownership are documented without precise date. Since 1850 all changes are documented by the register of sale deeds, and since 1972 changes are digitally noted by the respective informatic applications (CAMUT or PF). At the beginning of the 21st century the program PF allowed to complete history data collected since 1972 with data going back until the origin of the Cadastre (if required). There is also the possibility to chart graphic data about boundaries. Indeed since 1846 all changes of boundaries are documented and since the introduction of the PF-program it is possible to show changes on screen. Note that ACT is scanning all the historic registers in order to simplify research.

Place names are available from different sources:

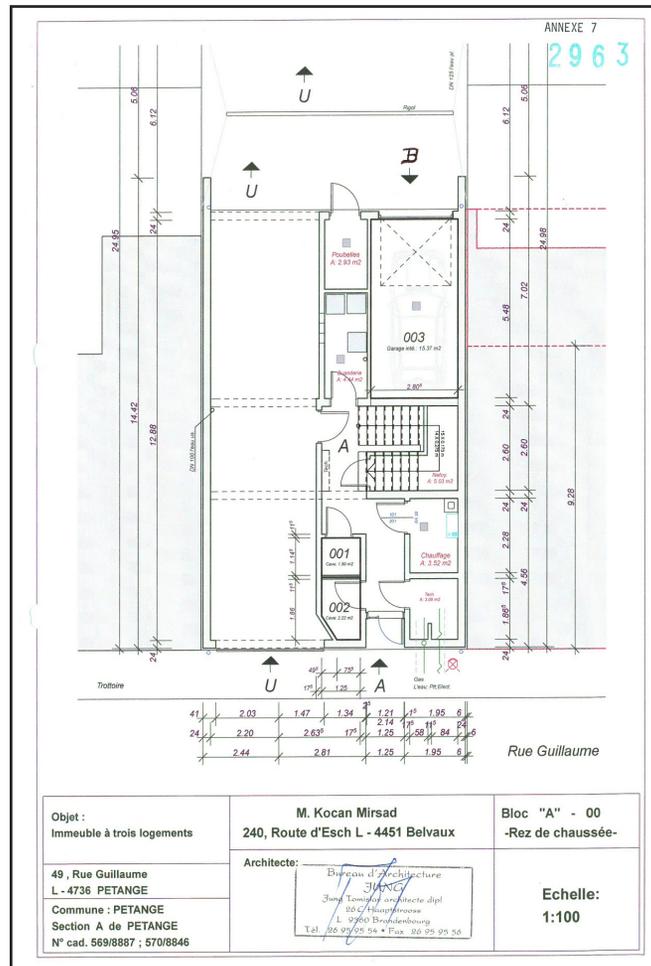
- The Luxembourg gazetteer of villages and towns. This is not coordinated by ACT. The names are given in French, German, Luxembourgish. The database is managed by the Institut Grand-Ducal, Section de Linguistique, d'Ethnologie et d'Onomastique;
- Place names are also one of the themes in the BD-L-TC and are managed by the ACT.



To establish a dossier for this so-called "cadastre vertical", ACT asks for the following documents:

- a listing of all the lots
- a plan (scale 1 to 250 or 1 to 500) showing the location of the building on a parcel
- vertical section and cross section plans (scale 1 to 100) of the building
- the municipality's authorisation for the project or the segmentation

**Figure 6. Cross section plan**



Each building with co-ownership built before 1st of April 1989 must be adapted to the new system until 2014. Actually the plans are scanned to be usable in a digital workflow. In the meanwhile, ACT is working on a project to digitise the units' data.

### **3 TECHNOLOGICAL INFRASTRUCTURE**

#### **3.1 General infrastructure**

The National Cadastre and Topography Administration (ACT) consists of

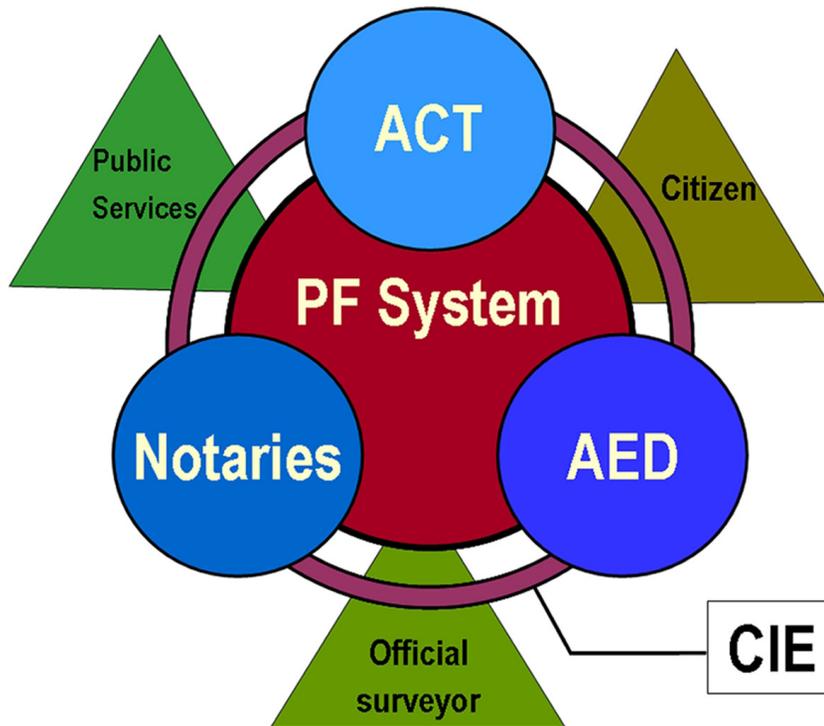
- a main building containing the direction, the central services, the IT department, the geoportal service, archives, the public information desks, as well as the topography and cartography department,
- 5 regional surveying offices,
- 1 building with the updating office and the vertical cadastre office.

ACT uses an own dedicated network, which is part of the public state network and which allows to use distributed IT services. Each regional office is equipped with an own central server providing licenses and local graphical and alphanumerical data from surveying and postprocessing, as well as a connection to the central IT department. Closed surveying dossiers and plotfiles are transferred via network to the central IT department for archiving, control, printing and plotting. Regularly scheduled backup procedures act from the central building and make sure that in case of IT problems, data loss can be reduced to a minimum.

An important point is the splitting of the location of the different data types concerning the cadastral data : while any graphical information (surveying drawings are made with Carto WinStar software) are entirely kept at ACT's central IT storage system, the corresponding alphanumerical data of the Publicité Foncière (property rights, cadastral areas, personal data of the owners etc) are hosted on a mainframe based database at the CTIE (Centre des Technologies de l'Information de l'Etat, Luxembourg's State IT Administration). Any information system using both the graphical and the alphanumerical parts of the cadastral information have to access both databases. The link between these databases is done via the unique parcel identifier.

In the so-called "Publicité Foncière" system the key actors in the process of the creation and updating of the cadastral data are connected via an integrated network-based system: ACT, AED (Registration administration) and the notaries. Other public actors like the municipalities can obtain a securized access to these databases, and participate in the exchange of highly actual data.

**Figure 7. Collaboration schema of the PF key actors**



### **3.2 Grid Network**

To draw the original cadastre maps (1824) a local grid network was established on each municipality's territory. But the surveying data was not kept. When a national basic triangulation was introduced in 1926, Luxembourg created its own national grid network based on Gaussian coordinates - the so-called Gauss Luxembourg coordinates. The projection system used throughout all mapping at all scales in Luxembourg is Cylindrical Transversal. To avoid negative values the origin (0;0) of the network was located outside of the Grand-Duchy. Stone markers and steeples were included in this network. Before 1945 a first and a second order were realised. This system was called ATL system, ("ancienne triangulation du Luxembourg", i.e. old triangulation of Luxembourg). After 1945 this network was completed by a third and a fourth order (called NTL, "nouvelle triangulation du Luxembourg", i.e. new triangulation of Luxembourg). But only

major projects were connected to the national coordinate system. In 1994 a new network, still compliant to the Gaussian coordinate system, was built which was based on GPS measurement data and on WGS84. Information about the so-called LUREF (Luxembourg Reference Frame) and parameters for the transformation from the national system to WGS84 and EUREF 89 are available at <http://www.etat.lu/ACT/datum.html>. Since then, most of the surveyings are realised having as a result LUREF-coordinates measured directly in this system or local coordinates being transformed into LUREF-coordinates.

### **3.3 The Geoportal**

Taking into account the Government of Luxembourg's policy to reform the civil services and to promote an easier access of State's Services especially through the internet, ACT contributes to the national eLuxembourg program by offering a new internet service to the public services as well as to the citizen in general – the geoportal.

With the National Geoportal of Luxembourg ([www.geoportail.lu](http://www.geoportail.lu) or [www.geoportal.lu](http://www.geoportal.lu)), which is taking an increasingly important part in the technical infrastructure of ACT, ACT has created a powerful tool to communicate with the users of cadastral information and geodata in general. It is designed to provide the cadastral and topographic information and data which are under the responsibility of ACT, as well as geodata from other providers cooperating with the system.

With the geoportal, ACT has different goals:

- Easier access to the data of ACT and the other connected providers;
- Faster delivery of ordered products and data;
- Reduce the staff workload by eliminating tasks which can be done automatically;
- More transparent interaction between Civil Service and customer;
- Create a central geodata exchange platform for Luxembourg;
- Provide a key element of the future national geodata infrastructure of Luxembourg;
- Contribute to satisfy the national and international needs for geodata and metadata.

The geoportal's mapper offers geodata like the digitized cadastral map, the topographic maps, the topographic databases, orthoimagery, geological maps, and geodata provided by other administrations and municipalities. The aim is to grant the general public as well as the professional user a possibility to view the whole range of interesting geodata created and maintained by the public sector.

The geoportal's catalog contains ISO 19115 compliant metadata sets about the geoproducts, the geodata webservice and the geodata layers offered in the geoportal. In the geoportal's

webshop, registered users can file orders or estimate requests of the geoproducts offered in the catalogue.

OGC compliant webservices provide a modern way of interaction: the WMS, WFS, and CS-W services are more and more in demand. For this reason a whole range of dedicated servers have been installed and webservices have been made available for different user categories.

### **3.4 Spatial Data infrastructures in Luxembourg**

Already in 1992, the need for coordination, sharing and re-use of spatial data has been recognized in Luxembourg's administrations, and has resulted in the creation of the Interministerial working group on GIS (GTIM-SIG). This working group is not active anymore, as its tasks were either considered as resolved or integrated in the activities' plan of the newly created coordination board of the national spatial data infrastructure CC-ILDG (Comité de coordination de l'infrastructure luxembourgeoise de données géographiques). An achievement of the GTIM-SIG was the the creation of the basic topographic database (BD-L-TC) as it is by now held, managed, updated, and delivered by ACT in its 3rd version. Other projects concerned f.e. a metadata catalog, but these projects were abandoned when ACT's geoportal project was being realised, as the latter included a centralized ISO19115 compliant metadata catalog.

By operating the above mentioned geoportal, ACT provides a central and national platform to deliver metadata, geodata, webservices, general information as well as data ordering services. The importance of the current activities in this field has led to the creation of a new department for the geoportal and the ILDG at ACT.

The general aim of the ILDG is the creation of a national SDI by consolidating the public sector's activities in the GIS domain, providing rules and specifications to harmonize geodata and technical backbones as well as general political strategies to create, update, deliver, exchange, transform and sell public sector geodata. An essential step has been made in July 2008, when Luxembourg Government officially decided to mandate ACT to organise and direct these activities. With the geoportal running, the technical fundation already exists. A second important achievement is the organisation of the CC-ILDG, formed by representatives of the main public sector instances coping with geodata. Different working groups are actually in place, and deal with different topics:

- transposition of the INSPIRE directive, creation of a law text;
- inventory of the INSPIRE annex themes, and identification of the concerned public sector actors;
- technical issues, functionalities, IT;

- a new GIS system for the water management administration (Administration de la Gestion de l'Eau);
- online functionalities for farmers with the help of online mapping, to declare modifications in their agricultural parcels.

The working groups report to the plenary meetings.

Currently, the range of geodata and metadata being made available via ACT's geoportal is almost limited to its own topographic and cadastral data products. But geology data, Natura2000 as well as the first datasets provided by several municipalities are visible in the mapper. Several non public data exist, but are only displayed to their respective user groups. As ILDG is a very recent project, the implementation of datasets has only begun.

Consultation and use of the geoportal's functions are free for the general public as well as for the professional users.

## **4. UPDATING PROCEDURES**

The cadastral data is updated nearly instantaneously when modifications happen.

### **4.1 How does the procedure function to transfer property? Organisations and persons involved**

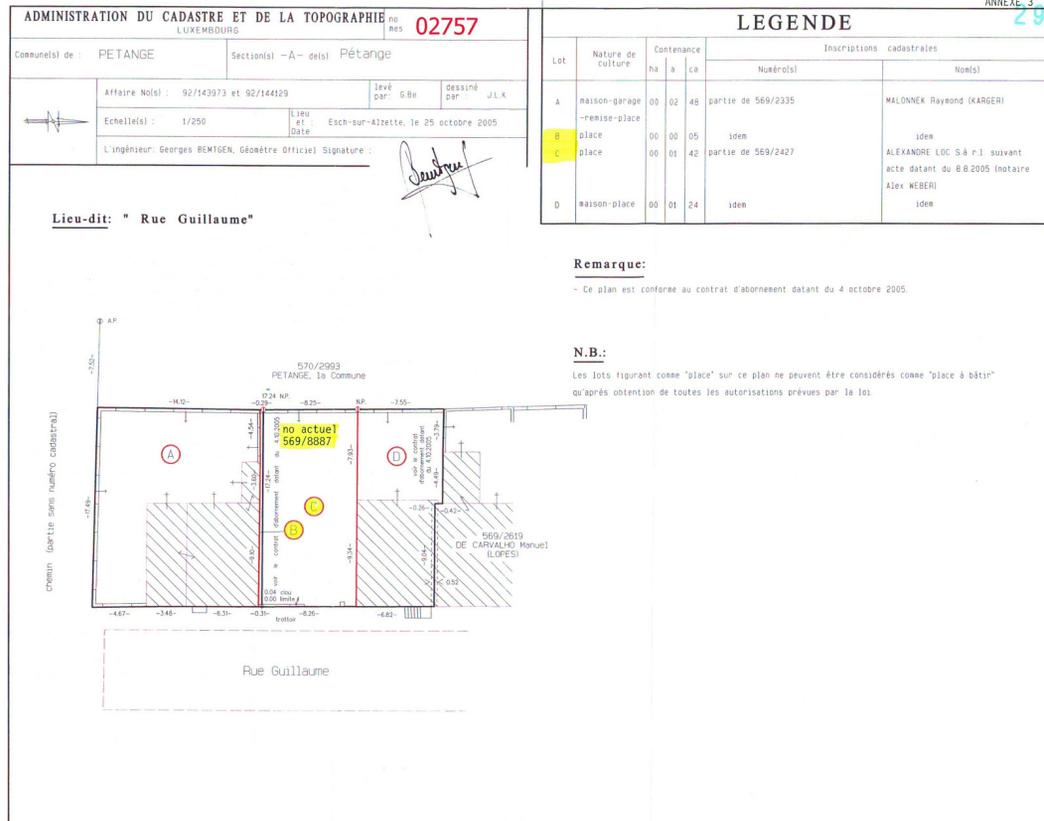
Parties visit mostly a notary to draft and authenticate the sale agreement (so-called "compromis de vente"), though they could do so without notary. After signing such a 'compromis de vente' agreement, a notary is involved again, to create and authenticate the notarial deed. The sale is complete between the parties, and ownership is acquired as of right by the buyer with respect to the seller, as soon as the object and the price have been agreed upon, although the object has not yet been delivered nor the price been paid. As a sale of real estate must be registered (which triggers the payment of registration taxes) and recorded in the mortgage registry in order to be enforceable in regard of third parties, and as only duly certified deeds may be entered in the register, the sale must be recorded in a notarial sale deed ("acte de vente"). The notary is deemed a public official with powers delegated by the state to authenticate the deeds he drafts, and to provide complete security to the contracts he supervises. The authenticity of the deeds grants the parties an undisputable date and content in court. The law imposes a personal liability on the notary for his professional acts which is more extensive than that of other branches of the legal profession.

There are 36 notaries in total in the Grand-Duchy of Luxembourg, 13 of whose are established in the canton of the capital Luxembourg. The sale parties have a free choice of the notary they want to refer to for their sale. The notary has to investigate (recherche par case hypothécaire) at the property registry (Bureau des Hypothèques). For this investigation, he requests either a "relevé des inscriptions hypothécaires" (containing a list of mortgages), or a "recherche par case hypothécaire" (containing a list of all land transactions effected by the landowner together with that of every mortgage or charge burdening the property). The notary also has to investigate the cadastral data, and has to notify the tax administration of the transfer to and obtain a tax clearance certificate, proving that all property taxes are settled. This means in practice, that the notary visits the tax administration office to notify that the property is being sold. Upon this declaration, the tax administration office confirms that the property has no claims or unpaid taxes on it. If there are outstanding claims or taxes, the tax administration may register a judicial mortgage on the property. The buyer will pay the taxes, fees and funds for the property to the notary, in addition to notarial fees. The buyer must also send anti-moneylaundering documentation to the notary at this time, regarding the origin of the funds he is using. The sale parties return to the notary to sign the transfer deed original. Then the notary registers the transfer deed at the AED (registration administration), and has to pay a transfer tax. Through the official recording of the transfer deed by AED, the transaction becomes opposable to third parties. AED also provides an extract of the deed to ACT, to be able to update the owner information in the cadastral database. This updating of the cadastral information takes about two weeks. In the same period, ACT sends a copy of the registered deed, with the official stamp of ACT and a reference number, back to the notary. In practice, this particular document is used to clear the payment of a bank credit.

So all the documents necessary for updating the cadastral information transmitted between the notaries, AED and ACT.

If parcels are not sold entirely, and thus only one part of a parcel is sold, the parties first have to rely on the ACT or a private licensed surveyor to draw a precise and officially acknowledged surveying plan of the part of the parcel being sold. This plan has to indicate all the relevant measures and the surface area. ACT also determines a new cadastral number of the part to be sold and of the rest of the parcel. The surveying plan is delivered to the notary and annexed to the deed.

**Figure 9. Surveying plan**



In general it can be said that from the signing of a deed an average of 2 weeks is needed for the updating of the owner in the cadastral registers to be effective.

#### 4.2 How are cadastral data updated?

The updating program is called "Publicité Foncière" (PF). It has been realised from 2000 in a inter-ministerial project to develop an integrated management system for the real estate databases.

The project's objectives are:

- (a) to create a network between the three principal players: ACT, AED and the Notaries;
- (b) to follow the existing computing architecture;
- (c) to provide for continuous data sharing and data integration as well as to establish data flows that are automatic and computerized.

The real estate information management system was completed in 2006 and yielded considerable improvements in the ACT services' speed and quality. Among the improvements are:

- the possibility to use the national identity number to search and identify persons, when connecting to the system;
- the distinctions between property held in common (e.g. within marriage) and property individually owned;
- new software tools to increase productivity, eliminate redundant work as well as some work currently done manually;
- the gradual elimination of the delays in updating the cadastre (alphanumeric and graphical);
- centralized delivery of cadastral data to all interested parties.

## **5. PROVIDED SERVICES**

In principle there is no different service for citizens, public administrators and professionals. Each cadastral product is available for all these users with one exception: copies of the cross section plans of buildings with co-ownership. Copies of these maps are available only for notaries and for the owners listed for these buildings.

### **5.1 How are services provided?**

- On paper (mostly requested for cadastral maps, measuring and extracts of cadastral register).
- Digital data available for measuring and maps (star, dwg, dxf, shapefile). Normally professionals ask for digital data concerning measuring. All the map data are available on CD.

There are two different on-line services:

- the geoportal (see special chapter) and
- the online-service dealing with the PF-program. PF is only provided in an internal network

Concerning the PF-program, users are split into two groups. AED and notaries are the first group. They contribute to the program providing PF-data with their products (deeds and registration activities). The second group is composed in a first step by other state authorities or municipalities. The access to this program provides only consultation functions and no data can be uploaded.

Concerning payments: for the moment all services are paid by cash or by postal money order. Notaries receive a bill for their orders and they pay by money transfer. Well known customers pay also by money transfer. Online-payment is in preparation.

## **5.2 Use of the different types of services**

The use is documented by sales data from 2008 (extracts of the cadastral register, copies of measuring maps, copies of cross section maps of buildings with co-ownership)

- 1.901.270, 23 € for private users
- 2.339.515,30 € for governmental and communal users

including more than 31900 topographical maps and orthophotos sold (491.982,13 €)

## **6. LINKS BETWEEN CADASTRE AND LAND REGISTRY**

In chapter 4.2 the procedure to transmit property is largely described. To resume:

- The deed set up by the notary is first transmitted to the registry service of AED and then to the mortgage service. The notary is only responsible for the data published in the deed, but not for the exactitude of the data. A buyer buys what he "sees". The notary is also responsible for certifying the presence of the persons signing the deed;
- The registry office gives a certitude of date to the deeds binding the signing parties. So the date indicated in the deed is not an officially recognised date;
- Inscription in the mortgage registers fulfills the transcription. Now the deed is also binding third parties;
- ACT collects the data written in the deeds, notes registry dates and proceeds to the updating of the cadastral information.

What distinguishes the three actors concerning the consultation of the documents?

- At the notary office the user can find the original deeds. But each notary has only a collection of his own deeds and of those written by his predecessors, the former holder of the chancellery. If a user wants to know the name of a notary having set up a deed he contacts ACT;

- There are 11 registry offices in the country. Each office has a list of deeds registered at this office set up for parcels situated within the ambit of the registry office or set up by a notary whose chancellery is located within the same ambit;
- At the mortgage office the user finds copies of the deeds, but until 2002 there was no link between the parcel numbers written in the deed and the parcel number listed in the cadastral registers, this number changing sometimes for several reasons (assembling two parcels e.g.);
- ACT is responsible for collecting data and producing a register of properties with all the attributes listed in the deeds. Complete history of a parcel can only be found at ACT.

## **7. LINKS BETWEEN CADASTRE AND REAL ESTATE EVALUATION**

### **7.1 Taxes on land property**

Notary costs:

- sale agreement 4.00 € stamp per page of the deed
- search at property registry 2.48 € for full search
- notary fees generally range between 0.5% to 1% of property value.

Registration tax:

- Registration tax (to pay by the buyer) is at 6%, with an additional 1% transcript tax. If a resale clause is added to the deed, registration tax will go up to 7.2%, however, up to 5% can be recovered if resale is registered within four years. An additional 3% surtax is paid for Luxembourg City. No registration tax is due in case of the first house bought by the buyer, but he must use this house for his own living.

Extracts from cadastre:

- extracts in format DIN A4 or DIN A3 3.00 €
- extracts in format DIN A2 or DIN A1 or DIN A0 9.00 €
- search in register to establish history for a parcel 40.00 € per hour
- delivery of digital data for an area 0.35 € per parcel

A discount of 80% is granted in case of a new request for digital data for the same region, if this request is done within a period of five years following the first request. For municipalities a discount of 20% is granted.

- access to the Publicité foncière data: for municipalities 75 € per year
- for private surveyors, notaries and bailiffs 750 € per year

## 7.2 Other cadastral products

- topographic map 1/5000	6.25 €
- topographic map 1/20.000 Série R	6.50 €
- topographic map 1/50.000 Série L	6.50 €
- topographic map 1/100.000	6.50 €
- topographic map 1/100.000 mini	6.50 €
- topographic map 1/100.000 plastified	25.00 €
- topographic map 1/250.000	1.00 €
- aerial photo 24x24 cm (~ 1:20.000)	25.00 €
- aerial photo 50x50 cm (~ 1:10.000)	37.00 €
- aerial photo 96x96 cm (~ 1:5.000)	50.00 €
- orthophoto	20.00 € per km <sup>2</sup>
- 1/5000 digital	6.25 €
- 1/20000 digital	25.00 €
- 1/50000 digital	190.00 €
- 1/100000 digital	180.00 €
- 1/20000 on CD-Rom	12.00 €
- DVD Luxembourg 3D	40.00 €

## 7.3 Ground Taxes

### Municipal Ground Tax

A property in Luxembourg is subject to municipal ground tax which is levied annually at 0.7% to 1% of its assessed unit value (usually lower than its actual market value). The tax amount based from the preceding computation is further multiplied by a municipal coefficient that is between 180% and 800% depending on the municipality. The property's unit value, basic tax rate and the municipal coefficients depend on the property's classification such as size, age, site, and economic use. The maximum rate is set at 7.5%.

### Rental Income (valeur de location)

Taxable rental income realised from leasing properties may be computed in either of the two ways (the occupancy of a house or an apartment by his owner is also considered as leasing!):

- Itemised deduction All expenses related to property such as management agent's commission, maintenance and repair costs, insurance, mortgage and interest payments, property tax, and insurance premiums are deducted from the gross rent. Straight-line depreciation is also deductible, though land is not depreciable. Rates of depreciation are between 2% to 6%.

- Standard deduction A standard deduction of 35% of the gross annual rental income with a maximum of €2,700 is available instead. This deduction includes maintenance and repair costs, insurance premiums, and depreciation (not including debt interest on loans used to finance the property).

Since 1945 the cadastre is not used any more for direct evaluation and taxation. This is actually done by the tax office (valeur de location) and by the municipalities (ground tax).

Values of the properties are transmitted by the mean of the "extrait de mutation de l'acte", but values are not stored. As the "extraits" are not destroyed after updating, it is always possible to consult them going back until 1948. The consulting of the "extraits" for users outside the ACT is only allowed on request and has to be authorised by the director of the ACT. Authorisations are accorded to forensic experts having the mission to fix a price in case of a dispute and to members of the Council for land acquirement by the State in order to determine an average price for buying a private property in the name of State.

# THE CADASTRAL SYSTEM IN DENMARK

.....  
DANISH MINISTRY  
OF THE ENVIRONMENT

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National Survey  
and Cadastre

<http://www.kms.dk/English>

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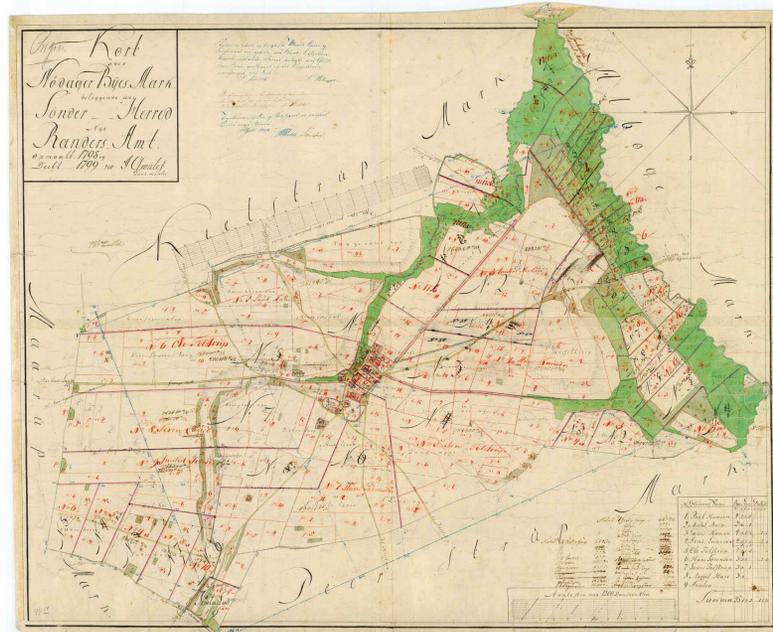
# 1 INTRODUCTION

## 1.1 History and purposes of the cadastre

The first cadastre was implemented along with the absolute monarchy in 1660. Before that time the nobility administered individual books of the land taxes paid by the farmers to the lord of the manor. The newly formed government established a nationwide cadastre in 1664, the so called Matrikul of 1664. This cadastre was used as a source for the tax collection until 1688, where a new cadastre was taken into use. In the new cadastre land parcels were measured, so taxation could be based on area sizes as well as soil conditions.

However, the cadastre of today is younger. It derives from the results of the enclosure movement in the end of the 17th century, and was established in the year 1844. From the very start, this cadastre consisted of two parts: The cadastral register and the cadastral maps. Both of these components have been updated continually ever since.

**Figure 1. Cadastral map from 1799 (Nødager By, Nødager 1:4000)**



As a result of the enclosure movement, the former feudalistic society was changed into a society based on private ownership of land. Even if the primary purpose of the cadastre was to levy land taxes, the cadastral identification is today also used to support the land ownership and land transfer system.

Over time the Danish cadastre has thus changed from being primarily a basis for land valuation to a legal cadastre supporting an efficient land market.

## **1.2 Development of the institutional and organisational structure**

The National Survey and Cadastre in the Ministry of Environment holds the cadastral register and map, which identifies real properties by cadastral number(s) and area and shows all land parcels graphically. The National Survey and Cadastre is a rather new organisation, since it only origin back to 1989, where the Geodetical Institute, The Nautical mapping Archive, and the Cadastral Directorate was merged into one organisation. The National Survey and Cadastre is the cadastral authority for all of Denmark excluding the Municipalities of Copenhagen and Frederiksberg. The Municipality of Copenhagen has had a municipal cadastral service since 1690 and the Municipality of Frederiksberg since 1925.

The cadastre is separated from the land registry, which exists under the Ministry of Justice. Land and property taxation is the responsibility of the Ministry of Taxation.

## **1.3 Financial and organisational issues**

The Cadastral and Legal Authority is a part of the National Survey and Cadastre. Budgets and accounts are managed as a whole for the National Survey and Cadastre.

In 2008 the total budget was 250 mill. DKK (30 mill. EURO).

Of the expenditure a little more than half was salaries.

Of the income nearly half was directly financing from the State Budget. Registration of changes to the cadastre are financed by customer fees. In 2008 the total amount of customer fees for registration of cadastral changes totalled 52 mill. DKK (7 mill. EURO) This was due to an unusual high cadastral activity during the years 2006-2008.

The National Survey and Cadastre incomes are to a large extend derived from distribution of data, where customers pay for rights to use the data and for the distribution itself. Agreements

have been made for distribution of data to State and Local Authorities whereby authorities contribute to the cost of distribution via the State Budget and the rights of use to the data is free of charges.

The applicant pays the costs of the licensed land surveyor as well as a fee for registration with the National Survey and Cadastre. The following amounts are applied for 2009:

Subdivision	DKK 2040 (EURO 270)
Transfer of part of property	DKK 1530 (EURO 205)
Amalgamation	DKK 1020 (EURO 135)
Change of internal boundary	DKK 510 (EURO 70)

A fee (tax payable to the Ministry of Finance) is payable for subdivision of a new property of DKK 5000 (EURO 670) for each new property.

However, this does not apply if the subdivided property is less than 100m<sup>2</sup>, a road area, an area for common use regulated by a local plan, or if it was established through expropriation.

#### **1.4 Decentralisation, involvement of the private sector**

In Denmark, activities regarding property formation, also known as cadastral activities, are divided between private licensed land surveyors and the cadastral authority of the National Survey and Cadastre located in Copenhagen. For more than 200 years, these activities have been carried out in a "Public-Private Collaboration Model". Outside the municipalities of Copenhagen and Frederiksberg, private surveyors perform cadastral work, which involves demarcation and survey of the plot as well as preparation of the documents necessary to register the changes in the Cadastre. The cadastral authority ensures compliance with the provisions of the Subdivision Act and other legislation before the changes are registered in the Cadastre. In the municipalities of Copenhagen and Frederiksberg, the cadastral service is municipal and "Stadskonduktøren" and "Stadslandinspektøren", respectively are responsible for the authority tasks in the cadastral work.

Licenses for land surveyors are granted by the Minister of the Environment after the surveyors have completed a five year University degree, M.Sc. in Surveying, Planning and Land Management at Aalborg University, and after having carried out cadastral work at a private surveying firm for three years. However, the Minister for the Environment may allow that employment at other places can be included in the three-years' employment. The requirement for a Danish land surveyor exam lapses if there is authorisation in international agreements.

In 2009 there are 80 firms of licensed land surveyors in Denmark with about 150 branches. There are about 200 owners and about 150 assistant land surveyors with or without authorisation. The licensed land surveyor sector employs a total of about 350 licensed land surveyors with 200 employees with technical or administrative qualifications. The number of surveying firms is decreasing and the structure of the private surveying branch is changing over time. The trend is towards bigger firms and company co-operations.

Over the past 80 years, practicing licensed land surveyors have taken over duties from the authorities and the courts. These include the following duties: In 1927, in accordance with the Land Registry Act, practicing licensed land surveyors became responsible for preparing declarations of easements as the basis for allocation by the Land Registry of registered easements in connection with subdivision etc.

Rules were also introduced on a change in the procedure for issuing certificates of innocuousness which will afford even more responsibility to the licensed land inspectors. With the new Land Registry Act the cadastral authority should assess whether an intended cadastral change can be made without any risk to mortgage security and with only insignificant reduction in the value of the property. In order to make such an assessment there must be a declaration from a practicing licensed land surveyor.

Practicing licensed land surveyors also carry out technical measurements in connection with construction and many other tasks. These other tasks make up more than one-half of the work of a traditional firm of licensed land surveyors.

By far the majority of practicing licensed land surveyors are members of the Danish Chartered Surveyors Association, and the constitution of the Association requires that practicing licensed land surveyors take out indemnity insurance. Since 1 April 2006 this duty to take out insurance has been written into statute.

## **2 Content of the Cadastre**

Real estates are based on the concept of a cadastral property as defined in the Subdivision Act. The cadastral register shows whether a cadastral entity is a cadastral property in itself, or whether it is part of a cadastral property containing several cadastral numbers (and which numbers). Cadastral numbers under the same cadastral property can be spread over the cadastral district, and possibly in different cadastral districts and in different municipalities.

The Cadastre has a full topological two-dimensional coverage of Denmark. Each cadastral parcel has a unique identifier, which consists of a cadastral parcel number and a cadastral district number or name. For each parcel is registered which administrative areas the parcel is placed in, eg. local authority, church district, etc. The parcel size is registered. Public restrictions such as protected forest, obligation to use for agricultural purposes, etc. are furthermore registered in the Cadastre.

As a part of the cadastre is recorded the source for all changes, ie. the ID of the application for the cadastral change, which was submitted by the land surveyor, and identification of the employee who accepted the change and the date at which the change took effect by registration at the Cadastre.

The Danish cadastre has since 2008 consisted of one spatial database including both register and map data. However, in the following the cadastral register and cadastral map are described individually.

## **2.1 Cadastral maps**

The cadastral map is a key component of the Danish national cadastre. It illustrates all property boundary data from across Denmark, with the exception of the local authorities of Copenhagen and Frederiksberg (which maintain their own cadastres). It also provides information about protected forests, polluted areas, coastal erosion areas and cliff protection. The map does not contain topological features such as elevation or buildings.

The cadastral map is a digital legal document. It is intended to present the cadastral register in visual form, such that individual parcels can be identified along with their attribute data (cadastral number, road access, etc.).

The cadastral map is updated daily, as new property registrations, boundary changes and field surveys are submitted to the National Survey and Cadastre for approval. This excludes the environmental data found in the maps (protected forests, polluted areas, etc.), which are generated and updated by the responsible public agencies.

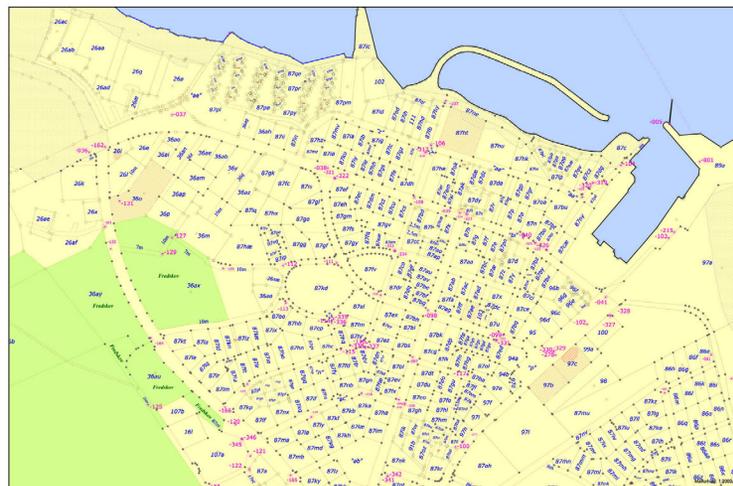
Today's cadastral map is based on historical, hand-drawn property maps that through the years 1991-1997 were digitised (vectors) and georeferenced in a national grid. In 2008 all data were transformed to UTM Zone 32, EUREF89. In-field surveys and measurements are increasingly improving the precision of the digital cadastral map. However, since the existing map is based on analogue maps, the accuracy of the cadastral map varies from a few centimetres in some urban

areas to several metres in some rural areas. Therefore, the digital cadastral may not totally compare to a digital topographic map.

It must also be noted that the digital cadastral map is a graphic map, not a numeric map. This means, that the co-ordinates for the boundary points only represent the boundary in the graphic map. The final determination of boundaries must be done according to the cadastral regulations. The parcel co-ordinates in the cadastral database therefore may not be used for exact calculation of parcel areas and dimensions.

The procedures for updating the digital cadastral map will be just opposite to the procedure for updating the analogue map. In the analogue map new boundaries were adjusted graphically to the position of existing mapped boundaries. In the digital cadastral map any new cadastral measurement will be used for adjusting the position of the existing boundaries. This establish a process of continual improvement of the accuracy of the cadastral map, - a dynamic element. It is however recognised that some problems may arise in practice when a decision has to be made on the area to be included in the adjustment. Furthermore, adjustment of existing boundaries in the cadastral map may cause problems in those cases where other administrative boundaries or features were based on cadastral boundaries in a Geographical Information System. These problems of upgrading the cadastral map will continue to be investigated so that sustainable solutions can be developed to suit all users.

**Figure 2. The Danish cadastral map**



A general understanding of these problems related to the process of establishing and maintaining the digital cadastral map are essential for all users. In other words, the success of the digital cadastral map will depend on the degree of educated use of the map.

## **2.2 Cadastral register**

The cadastral register encompasses property information for all of Denmark except the local authorities of Copenhagen and Frederiksberg. The register includes cadastral identification numbers, property size, roads and rivers, administrative areas (such as municipal borders) in addition to case references for all past updates to individual properties. Furthermore the register contains a number of legal registrations, see below.

- Cadastral number
- Name of cadastral district
- Code of cadastral district
- Main notification
- Other cadastral parcel under the main notification
- Road identification
- Municipality number
- Municipality name
- Area
- Status of use
- Hereof road
- Hereof water
- Hereof protected forest
- Hereof area of dune protection
- Interest of land
- Forest identification
- Dune protection
- Polluted area
- Legal determination of boundary
- Common plot
- Owners of common plot
- Case type
- Map number
- Additional measurements
- Measurement sheet
- Remarks

The register was computerised during the period 1984-86. Today the register includes 2.5 mill parcels representing about 1.5 mill properties. The cadastral identification is a combination of numbers and text based on the historic village areas which still constitute the framework for the register and the cadastral maps – e.g. Cadastral number 17a, Troense By, Bregninge: 043-02-55.

The register contains all cadastral areas which have existed since 1st of January 1844. The cadastral register is updated daily, based on applications for new property registrations and boundary changes submitted to the National Survey and Cadastre.

### **2.3 Cadastral archives**

Historical information about Denmark's cadastre, including early property maps, cadastral protocols and field survey measurements, can be found in the cadastral archives. Some of the older case files are kept at the National Archives.

Housed at the National Survey and Cadastre's headquarters in Copenhagen, the cadastral archives include the documents that have defined property ownership throughout Denmark. These date back to before the official introduction of the national cadastre in 1844, and include some of the first property maps drawn in 1806.

Historical cadastral information for Copenhagen and Frederiksberg local authorities can be found at the offices of the respective independent cadastral authorities. A number of documents related to cadastral developments in southern Jutland can be found at the National Archive for Southern Jutland in Aabenraa, Denmark.

Large contents of the archives have been digitized. Today it is possible to access all the historic cadastral maps from 1860-1998. More than 40.000 historical maps are accesible thourgh the internet. It is also possible for professional users to acess the field survey measurements though the internet. These can be consulted for more precise field measuments undertaken by chartered surveyors.

According to the Subdivision Act, the Danish Cadastre consists of the Cadastral Register, the Cadastral Map and the Cadastral Measurement Sheets. Measurement sheets are kept with the case files. Private land surveyors request copies of these when carrying our cadastral work. All measurement sheets have been stored digitally since 2005 and steps are taken to scan measurement sheets back to 1986 within the next few years. Digital measurement sheets are accesible through the internet via an application that allows seaching for specific sheets.

### **3 TECHNOLOGICAL INFRASTRUCTURE**

The licensed land surveyors use an it system to prepare the applications for cadastral changes in a way that the data can be used directly for updating the cadastral databases at the Cadastral Authority at the National Survey and Cadastre. This it system is developed by a software firm to specifications made by the Cadastral Authority and the licensed land surveyors' organisation. The system is called MIA.

Data are transferred directly in a standardised format (XML) from the MIA system to the cadastral data handling system at the National Survey and Cadastre. This system is called miniMAKS and is developed by a software firm to specifications made by the Cadastral Authority. MiniMAKS presents the data prepared by the licensed land surveyors and enables the employees of the National Survey and Cadastre to verify that the relevant approvals are obtained before accepting the proposed changes to the cadastre. All changes in the database are registered by date and applicationID (caseID), thus enabling historical searches for changes to the cadastral data. All documents, which are a part of an application, are kept in the digital archives and the digital measurement sheets are stored in a system, which provides access to measurement sheets to licensed land surveyors via the internet.

The miniMAKS system is based on service oriented architecture. Integrations to external systems, such as general document handling systems, bookkeeping system, etc., are implemented as web services. Also internally the system is based on services with a process server as the hub. Cadastral data are distributed via the National Survey and Cadastre distribution system (the Map Supply), more about this in chapter 5.

### **4 UPDATING PROCEDURES**

#### **4.1 Existing types**

##### **4.1.1 Property formation**

A new cadastral property can be formed by subdivision, entry in the Cadastre or amalgamation.

###### **4.1.1.1 Subdivision**

Subdivision means that a new, independent cadastral property is formed and the boundary of the remaining property is changed. Usually, the separated property will be given a new cadastral number, while the remaining property will retain its cadastral number.

In subdivision, the subdivided property is relaxed (released from liability to mortgages) after the subdivision has taken place and before the final title deed to the property is registered in the Land Registry.

A new property can also be formed by subdivision of areas from several properties, so that the individual areas together form a new independent property with a new cadastral number. The remaining properties each retain their cadastral number, even though the boundaries to the properties have changed. However, in this type of subdivision, from two or more properties, the areas to be separated have to be released from liability to mortgages before the subdivision can be registered in the Cadastre.

#### **4.1.1.2 Entry in the Cadastre**

A new property can also be formed when a previously unregistered area is registered in the Cadastre. Properties which are not registered in the Cadastre are not usually registered in the Land Registry. If part of a registered public road area is to be sold or mortgaged independently, a new property is established by registering the area in the Cadastre. If an island is formed as part of land reclamation, it must be registered in the Cadastre. If an island is formed naturally and is to be registered, this will also be through entry in the Cadastre.

#### **4.1.1.3 Amalgamation**

When several properties are owned together and are jointly liable to mortgages or if they are not mortgaged, the properties can be amalgamated into one property. However, other legislation, for example the Agricultural Act, stipulates requirements related to the location of the land and the maximum size of an amalgamated property.

### **4.1.2 Transfer of part of property between existing properties**

#### **4.1.2.1 Transfer of part of property**

Transfer of a piece of land from one property to another property may be through transfer of part of property. Before transfer of part of property can be registered in the Cadastre, a certificate from the Land Registry must document that registered mortgages and easements have been observed.

**Figure 3. The Cadastral Map identifies the properties in the Land Registry**



If the two properties affected by the transfer of part of property have different owners, a transfer document (title deed) must be drawn up and there must be documentation that the deed has been registered in the Land Registry as an encumbrance on both the property transferring the part and the recipient property. The deed must be enclosed with the cadastral case when it is submitted to the National Survey and Cadastre. When the case is submitted, the deed must be a final title deed, furnished with authority for the cadastral authority to forward it, on behalf of the applicant, for final registration in the Land Registry for the acquirer, once the transfer of part of property has been registered in the Cadastre.

If there is a transfer of part of property and the value of the part transferred does not exceed DKK 40,000 (EURO 5330), the title deed can be replaced by a declaration of title from the owners of the property.

The part of the property which is to be transferred must be relaxed (released from liability to mortgages). Alternatively, if the value of the land is below 4% of the total of the mortgaged property, the land surveyor can state this in an innocuousness certificate submitted with the case (at value between 2 and 4% the mortgagees must be heard), and the cadastral authority can register the transfer without relaxation of mortgage.

For transfers of part of property to or from public roads or railways, there must be a declaration from the owner of the property affected and the road board or the owner of the railway area, which may be the Danish state railway or a private railway owner.

#### **4.1.2.2 Rectification of boundaries**

When a property boundary is changed by prescription, the area taken over may be transferred to the neighbouring property by rectification of boundaries. However, this requires that the owners of both properties declare that the change in the boundary is due to prescriptive rights, i.e. the situation had remained unchanged for at least 20 years. The boundary resulting from prescription may also be proposed through legal determination of boundary.

When the boundary to a property is changed through natural coastal withdrawal or growth, the registered boundary may be changed through rectification of boundaries, if there is a declaration from the owner of the property affected that the change is due to natural coastal withdrawal or growth.

### **4.2 Organisations and persons involved (also involvement of the private sector)**

The Subdivision Act regulates property formation and change of boundaries between properties (cadastral changes). New property can be established by subdivision or entry in the Cadastre, and the boundaries of a property can be changed through subdivision, entry in the Cadastre, transfer of part of property, amalgamation, or rectification of boundaries.

Outside the Municipalities of Copenhagen and Frederiksberg, cadastral changes requires the assistance of a licensed land surveyor in private practice and the cadastral authority.

The provisions of the Subdivision Act apply for all of Denmark, except for the provisions on legal determination of boundary which do not apply for the Municipalities of Copenhagen and Frederiksberg. In the municipalities, boundary disputes are determined by the courts.

#### **4.2.1 The licensed land surveyor**

Outside the Municipalities of Copenhagen and Frederiksberg, licensed land surveyors in private practice have exclusive right to carry out cadastral work which includes marking boundaries and preparation of the documents necessary for registration in the Cadastre, including procurement of the necessary authorisations pursuant to other legislation.

The licensed land surveyor carries out cadastral work in accordance with the regulations in the Statutory Order on cadastral work and the associated guidelines. The licensed land surveyor marks and measures new boundaries, and existing boundaries, when required, and involves the owner and neighbours where necessary. After this the licensed land surveyor prepares a measurement sheet and other measurement documents, a changes map which shows the changes in the cadastral map, and a schematic report on the desired cadastral changes. The licensed land surveyor must also acquire the necessary judge's certificate as evidence that the provisions on title, mortgage and easement have been observed.

**Figure 4. The licensed land surveyor carries out cadastral work in Denmark (Photo by Asger Sonne Kristensen)**



Before commencing field work, the licensed land surveyor will have considered and possibly carried out preliminary hearings with the relevant authorities if there is doubt as to whether the desired changes can be carried out according to the relevant existing legislation.

Pursuant to the Statutory Order on control of subdivision and the associated guidelines, the licensed land surveyor must submit all matters regarding subdivision, entry in the Cadastre, transfers of part of property, amalgamation and changes in the registration of private roads on the cadastral map to the municipal authority and ensure the accept of the proposed changes by the municipal authority. The licensed land surveyor must also issue a statement on whether the application to implement cadastral changes or changes in land use is in conflict with the provisions of the Agricultural Act, Nature Protection Act, Museums Act, or Forests Act, and if so enclose authorisations from the relevant authorities.

After this, the licensed land surveyor sends the case to the National Survey and Cadastre so that the desired cadastral changes can be registered in the Cadastre. When the licensed land surveyor receives notification of registration in the Cadastre, the licensed land surveyor sends a copy of the notification and an invoice to the applicant. For subdivision, the licensed land surveyor prepares a subdivision map, which is a copy of the current cadastral map with the new cadastral number, and sends this to the applicant as well. For subdivision or transfers of part of property, the licensed land surveyor prepares a certificate of easement which lists the registered easements that will apply in the individual areas after the registration. Changes to the Land Registry Act in 2009 (in relation to establishment of a digital land registration system) requires land surveyors to indicate the geographic location of the easements. The certificate of easement is sent to the Land Registry which transfers the relevant easements to the individual plots.

In the event of boundary disputes or in other contexts, any person wishing to confirm a property boundary can request a licensed land surveyor to hold a legal determination of boundary. According to the Subdivision Act, legal proceedings cannot be brought regarding the location of a boundary before legal determination of boundary has been held. At legal determination of boundary the licensed land surveyor decides on the location of the boundary, including whether the location has been changed through prescription. The decision of the licensed land surveyor is binding on the owners of the property in question unless one of them instigates legal proceedings on the location of the boundary within eight weeks of the date they received notification of the decision of the licensed land surveyor.

If a property is divided into condominiums, no later than registration of the first title deed in a condominium, the licensed land surveyor must submit a notification of division to the land registry of the entire property into condominiums. This material, including the lists of the

individual condominiums, maps etc. which are to accompany the notification, must be certified by a practicing licensed land surveyor with special authorisation. These regulations apply correspondingly for changes in condominiums. Furthermore there must be a declaration from the licensed land surveyor that subdivision is not possible.

Complaints regarding practicing licensed land surveyors are dealt with by the Board of Licensed Land Surveyors (Landinspektørnævn), which has three members appointed by the Minister for the Environment. The chairman must be a judge and the two other members must be licensed land surveyors; one employed by the National Survey and Cadastre, and the other a practicing licensed land surveyor. The Board of Licensed Land Surveyors hears about ten cases each year. Complaints regarding practicing licensed land surveyors can also be brought before a committee preparing legal opinions (Responsumudvalg) under the Danish Chartered Surveyors Association. Three members are licensed land surveyors, one is employed at the University of Aalborg, and one at the National Survey and Cadastre. The Committee also makes statements to be used in legal proceedings. The Committee hears about 5-10 cases each year.

#### **4.2.1.1 Land owners**

Usually, the land owner will request subdivision and other cadastral changes. Land owners must approve the marking of the new boundary and the existing boundary by the licensed land surveyor in cases of rectification of boundaries as a result of prescription or through natural coastal withdrawal or growth. Land owners must also approve registration and changes to private roads on the cadastral map as well as rights of way, and they must sign conveyance documents relating to transfers of part of property.

#### **4.2.1.2 The municipal council**

The municipality is usually involved at an early stage in a cadastral change because the licensed land surveyor at the municipality has to obtain information about affected properties, including the names and addresses of owners as well as planning and environmental conditions. Later in the process, all matters regarding subdivision, entry in the cadastre, transfer of part of property, amalgamation and registration of private roads are presented to the municipal council in order to ensure that cadastral changes are not registered in the Cadastre contrary to section 20 of the Subdivision Act or other legislation. The municipality ensures compliance with planning provisions, distance to the boundary from buildings and other installations, as well as certain environmental aspects. Furthermore, the municipality approves access from the area to public roads and installations or registration of private roads, in which case the municipality is the road board. According to the Statutory Order on control of subdivision, the municipal council must

verify the compliance in a specified formula which is returned to the land surveyor. When the municipality receives notification from the National Survey and Cadastre on registration in the Cadastre, the municipality will update the common Municipal Property Data System. The system is also updated daily by data transfer of changes. The municipality will furthermore update the Building and Dwelling Register with new parcel numbers etc, see chapter 7.3.

#### **4.2.1.3 Other authorities**

If the case relates to areas adjoining or requiring access to a main road, for which the Land Registry may include provisions on limits on access and building lines, the road authority must approve the case. Cases relating to agricultural property require authorisation from the relevant agricultural commission, unless the licensed land surveyor can declare that the cadastral change can be made without authorisation. If the case leads to intervention in or establishment of areas with protected forests, protected habitat types or other nature interests, the local state forest district, the municipality or the Forest and Nature Agency must be heard. If the case relates to a change in parish and/or municipal boundary, the Ministry of Ecclesiastical Affairs or the Ministry of the Interior and Health, respectively, must be heard. The Coast Directorate must notify authorisation if the matter involves intervention or land reclamation along the coast.

For reallocation of land, the reallocation plan is usually prepared by the licensed land surveyor, while the Directorate for Food, Fisheries and Agri Business takes care of the secretariat function for the agricultural commissions. When an order is to be issued, the reallocation commission is expanded with a judge as chairman and a credit expert member. Cadastral rectification is carried out by the licensed land surveyor.

#### **4.2.1.4 The cadastral authorities**

The National Survey and Cadastre Act requires the National Survey and Cadastre to take charge of the cadastral and licensed land surveyor service in accordance with the relevant legislation. The acts mentioned are under the auspices of the Minister for the Environment. The cadastral service is regulated by subdivision legislation.

Separate areas which arise from subdivision, transfer of part of property etc. must always have access to a public road. The cadastral authority makes entries in the Cadastre and ensures that the cadastral change or the intended land use as informed will not lead to conflicts with the provisions of the Subdivision Act or other legislation. New cadastral parcels are given a unique parcel identification.

The cadastral authority must notify the Land Registry and the municipal council of cadastral changes in order to update the Land Registry and the common municipal property data system.

The National Survey and Cadastre receives about 10,000 cadastral cases a year as well as 2000 cases on registration of restrictions (protected forests, soil contamination etc.). In recent years more than 12,000 new properties have been subdivided each year. From 2010 the amount is expected to be approx. 8000 new properties each year as was the case before 2005.

If there are errors or omissions in cases, the National Survey and Cadastre sends the cases back to the licensed land surveyor for correction. About 10-20 per cent of cases are returned to licensed land surveyors because of errors or omissions. In other circumstances the licensed land surveyor is requested by telephone or email to submit the outstanding information. When the case is as it should be, the National Survey and Cadastre makes the necessary registration in the Cadastre and notifies the licensed land surveyor and other authorities of the registration. The notification of registration is now sent by email and published on the National Survey and Cadastre website. Notification to the new Land Registry system is sent system-to-system.

Decisions by the cadastral authorities under the Subdivision Act cannot be appealed to another administrative authority. Decisions by the cadastral authorities may be brought before the courts or the Ombudsman of the Danish Parliament.

#### **4.2.1.5 The Land Registry**

The Land Registry or the information in the Land Registry, is part of the process of property formation at several stages. Early on, the licensed land surveyor examines whether the intended cadastral change conflicts with registered easements.

When the cadastral case is to have a declaration from land owners on private rights of way, rectification of boundaries, or transfer of part of property, a certificate of title must be prepared, which is either issued by the Land Registry or is a transcript from the electronic Land Registry signed by the licensed land surveyor.

For transfer of part of property and amalgamations, there must be documentation from the Land Registry that the provisions of the Land Registry Act on title, mortgage rights, and easements have been observed.

For transfer of part of property in which the value of the area transferred is greater than DKK 40.000 (EURO 5330), there must also be documentation that the transfer document has been

registered in the Land Registry on the property, the area from which the transfer was made, and the area to which the transfer was made. For transfer of part of property in which the value of the transferred property does not exceed DKK 40.000 (EURO 5330), this documentation can be replaced with a declaration from the parties.

For transfer of part of property to or from a public road or railway, a certificate from a licensed land surveyor can replace the Registry's certificate if the licensed land surveyor certifies that the value of the area transferred does not exceed DKK 8.000 (EURO 1070) and that the transfer of part of property is not deemed to have any effect on the value of the area from which the transfer was made.

The Land Registry must be notified of registration in the Cadastre and after this updates the Land Registry. For transfer of part of property with title deed, the cadastral authority also sends notification to the Registry which then registers the title deed in the Land Registry and informs the notifier.

Finally, in subdivision and in transfer of part of property, the judge allocates the registered easements. The licensed land surveyor will have prepared a declaration on easements as a basis for this allocation.

New real properties can also be in the form of condominiums. Division of a property into condominiums requires the involvement of a practicing licensed land surveyor, and of the cadastral authority for condominiums in the Municipalities of Copenhagen and Frederiksberg. Finally the Land Registry is also required to register the division of the property in the Land Registry. Condominiums are not registered in the cadastre.

New real properties can also arise when new buildings are established on rented land. There are no special rules for identification or other documentation for registering rights in the Land Registry to such real property. Existing buildings which have been erected by or belong to the owner of the land cannot be separated from the land and are treated as an independent real property.

### **4.3 Processes' automation**

In the last years the updating systems in the National Survey and Cadastre have undergone big changes. The current cadastral registration and case processing system was hence first put in use more than 15 years ago, and the digital cadastral map system was made nationwide almost 10 years ago. While both systems have been regularly adapted in line with developments,

they were in need of technological renewal. The National Survey and Cadastre has therefore worked intensively with IBM to develop a new up-to-date cadastral updating and quality system (miniMAKS), which was implemented in 2008.

The goal is to ensure increased efficiency and improved standardised digital exchange of data, partly through use of MIA data, and partly by developing a general method to register and maintain items (statutory notes) in the Cadastre. The new system has the cadastral register and cadastral map in a common database so that the register and the map are updated simultaneously. Electronic filing of the digital cadastral cases has been introduced in the new system as well as requirements on digital signatures for licensed land surveyors.

## 5 PROVIDED SERVICES

Cadastral data are distributed by the National Survey and Cadastre Map Supply. The Map Supply provides a range of information services based on WMS and WFS. There continues to be a growing demand on the Digital Map Supply, coming partly from a large number of requests from the Danish Nature and Environment Portal, where the Digital Map Supply supplies the maps of environmental data for public administration and the public in general. Different other professional users also prescribe to the Map Supply. Most users include the provided web map services in their own systems. A special user group consists of 'partners' that develop applications, for specific use based on the web map services provides by the Map Supply combined with other data. Access to the Map Supply is limited by username and password. The cost is derived based on actual use of the services.

**Figure 5. Customer service is a big priority in the Danish National Survey and Cadastre**



Since January 2009 a special agreement has been in effect for all state departments, which gives access to all data at the Map Supply. Rather than paying traditional usage fees, each ministry will pay a fixed annual contribution based on its use and needs. The yearly contribution is paid via the State financial Budget and based on stipulated user profile (type and amount of data requirements). A similar agreement has been reached with the Local Authorities in Denmark with effect from April 2010. The agreement underlines the National Survey and Cadastre's role as the central government's infrastructure organisation for maps and geodata.

The National Survey and Cadastre maintains an application on the internet which provides access to cadastral data, the webCadastre. Users prescribe for a small fee to this application with access limited by usernames and passwords. All relevant cadastral information is available at this application.

**Figure 6. The WebCadastre application provides access to cadastral data through the internet**



The National Survey and Cadastre does also provide access to cadastral data via a simple application on the home page of the institution. This application is free of charge to the general public. Print facilities are however not good.

Copies of the cadastral map can be purchased via the private land surveyors. Measurement sheets can be purchased at the National Survey and Cadastre at the cost of used time to retrieve and copy the information.

Cadastral changes are on a daily basis replicated by data transfer to the Municipal Property Register and to the Public Information Server. The Public Information Server (OIS), administered by the Danish Enterprise and Construction Authority (EBST), maintains a vast amount of information on properties in Denmark. Using OIS, property owners have free online access to their own data, and businesses gain access to digital property data.

## **6 LINKS BETWEEN CADASTRE AND LAND REGISTRY**

The current Cadastre was established in 1844 as the basis for collecting land taxes. Today the Cadastre is a property cadastre containing fundamental information about cadastral numbers which in themselves comprise a real property or a group of cadastral numbers which together comprise a real property. Registration of individual properties in the Cadastre is vital for the Land Registry as well as public administration. Buildings and other fixed objects on the land belong to a real property, unless the building was erected by someone other than the owner of the land. Registered public roads are included in the Cadastre without a cadastral number, instead they are allocated a litra.

Information on who owns the real property as well as the mortgages and easements registered on the property can be found in the Land Registry (tingbogen). The Land Registry is based on information on the individual property in the Cadastre.

Only one year after the new Cadastre took effect, in 1845 it was decided that properties in the Land Registry (previously referred to as the registry of deeds and mortgages) - Skøde- og Panteprotokollerne - should be described: "as has been done in the new Cadastre". In 1927 the link between the Cadastre and the Land Registry was further coordinated with regard to the requirement that the cadastral reference should be correctly stated on all Land Registry documents, that the cadastral authorities should notify the Land Registry about all cadastral changes, and that in subdivision and registration of the first title deeds, the registered easements should be allocated, so that all easements are not just transferred from one parent property

to the new property. At the same time, the state accepted responsibility for the accuracy of information in the Land Registry.

Today, the cadastral information in the Land Registry is still kept as a copy of the information in the Cadastre. The Land Registry is regularly notified about registration of cadastral changes so that the Land Registry can be kept up to date. Corresponding reports are sent to the municipal council in order to update the common municipal property data system (Det Fælleskommunale Ejendomsdatasystem (the ESR)), which is also based on data from the Cadastre.

The Land Registry is administered by the Ministry of Justice. Before 2009, 82 local courts carried out the registration in the Land Registry. In 2009 the Land registry System was centralized and the processes of the registry are today fully digitized.

## **7 LINKS BETWEEN CADASTRE AND REAL ESTATE EVALUATION SYSTEM / REAL ESTATE TAXES**

In Denmark the personal income tax is by far the most important tax covering 53 % of all taxes and duties. In general the income tax accounts for about half of the gross personal income. Also the "value added tax" (VAT) or general sales tax and the taxes on specific goods (such as spirits, cars, fuel, etc) are important and accounts for 31 % of the total tax and duty revenue. The VAT, being 25 %, covers almost all transactions of goods and services including construction of buildings. The profit from sales of immovable property is not subject to VAT. However, immovable property is subject to a number of other taxes as listed below.

### **7.1 Recurrent property taxes**

Denmark has three types of recurrent property taxes, a land tax on all types of land, a service tax on the value of buildings used for business or administration, and a property value tax on the owner-occupiers of dwellings and summer houses. All three taxes are local taxes levied by the two levels of local government (municipalities and counties).

#### **7.1.1 Land taxes**

Land tax is levied by the county and municipal authorities based on the assessed market value of the land for all kind of private properties. The tax to be paid to the county councils is fixed by law to be 1 % of the assessed market value of the land. The tax to be paid to the municipal councils is fixed as a part of the yearly total budgeting for each municipality.

The combined tax rate must be fixed within a range of 1,6 - 3,4% of the land value. The average rate to municipalities in 2001 was 1,5 %. The determination of the municipal land tax rate within the prescribed limits is considered an important factor for the local political and fiscal discretion.

Public properties and other properties such as preserved properties and embassies are not subject to land tax. Publicly owned properties are, however, subject to a service tax meant to cover the costs of public facilities such as roads, parking, fire brigades etc. For state owned properties the tax is equivalent to the land tax. For other publicly owned properties the service tax is normally fixed as half of the land tax. A service tax may also be levied on certain business properties.

### **7.1.2 Service Tax**

For buildings for private businesses there is no service tax to counties. The service tax to municipalities cannot be more than 1 % of the value of the building. 29 % of the municipalities (mostly urban areas) have decided to levy this tax. Some are using the maximum rate and on average the rate is 0.7 % for those municipalities that levy this service tax.

For buildings owned by the central government the service tax to the counties is 0.375 % of the value of the building. There is no county service tax for municipal buildings.

For buildings owned by the central government or by the counties there might be a service tax to the municipalities at a maximum rate of 0.5 % of the value of the building. 74 % of the municipalities levy this tax, almost all of them at the maximum rate.

### **7.1.3 Property value tax**

Persons who own their home must pay tax of the value of the home, known as property value tax. The tax is determined and levied by the state government and is included in the total tax payable during the year. The revenue of the property values tax is, however, transferred to county councils (one third) and municipal councils (two thirds).

## **7.2 Single taxes**

### **7.2.1 Property transfer tax**

A conveyance tax must be paid to the Land Registry whenever a property is sold or transferred to another owner. The tax is fixed by law as 1.400 DKK (EURO 185) plus 0,6 % of the sales price (at

least 0,6 % of the public valuation for the total property value). The tax is due before entering the deed into the Land Registry.

Mortgage document are also taxed when entered into the Land Registry. The tax is fixed by law as 1.400 DKK (EURO 185) plus 1,5 % of the mortgage amount. Document of concerning easements etc are subject only to the land registry duty of 1.400 DKK (EURO 185).

### **7.2.2 Development gain tax/betterment tax**

This tax is imposed on land being transferred from rural to urban zoning. The change of zoning is the result of an adopted detailed spatial (local) plan transferring a rural zone area into an urban development zone. As a result of the new development possibilities the land value will increase, and a part of this increased value is subject to taxation. The tax is based on the difference between the land value for agricultural use and urban development use. The tax to be paid is 40 % of a difference lower than 200,000 DKK (EURO 26665) plus 60 % of amounts beyond this.

### **7.2.3 Capital gain tax**

This tax relates to the profit calculated as the difference between the prices of buying and selling. The profit is included in the basis for income tax. The tax, however, does not relate to properties such as dwellings, summerhouses and freehold flats being used as the home base of the owners. Capital gain tax, this way, only relates to business properties.

## **7.3 Bodies related to real estate taxation - Distribution of Administrative Responsibilities**

The chapter summarises the most important actors and databases, which keep information on real estate and real estate prices.

The municipalities carry out collection of land tax and service tax. They collect both the municipal taxes and the county taxes.

Central government collects the new property value tax. It is withheld together with the individual income tax. The collection is thus carried out in the same way as for the income tax of imputed rent.

The central government has the responsibility for valuation of immovable property. Originally the Central government appointed 224 Valuation Committees, each had 3 members. Each

Valuation Committee was given secretarial assistance by the municipality. In 2002 were the function of Valuation Committees assumed by 15 Property Valuation Boards of appeal, which are nominated by the Ministry of Taxation, among persons proposed by the municipal boards. The Central Customs and Tax Administration, which is a part of the Ministry of Taxation, carries out the valuation.

Till 2002, each municipality has a Property Tax Office, which carries out the collection and the secretarial assistance to the Local Valuation Boards. After 2002, the valuation task is performed by government officials.

The basic information needed for valuation and collection is all stored in computerised registers. The Central Customs and Tax Administration maintain a Sales Information Register. The municipalities maintain a Municipal Property Data System (before Valuation and Collection Register). This register includes description of the land parcels, which come from the National Survey and Cadastre. The municipalities maintain a Building and Dwelling Register containing the description of the buildings and dwelling units.

The Ministry of the Interior legislates about the land tax and the service tax while the Ministry of Taxation is responsible for legislation about the property value tax and the legislation about valuation.

## **7.4 Integrated land administration in Denmark**

The background to the automated valuation system is the structure of the concept for integrated land management. The concept is organized as a network of interactive subsystems containing the information that are very often used. The automatic linkage between the subsystems is achieved by establishing the "Cross Reference Register" which contains all the key identifications within each subsystem (e.g. the cadastral parcel number, the building number, the postal address) and the cross reference between these identifications. This means that it is possible to obtain all available information on a specific property or building by knowing only one of the keys. Furthermore, the identification-keys can be linked into the relevant physical element represented in the maps, e.g. the building, the parcel or the property. As a basic principle, the subsystems are maintained and updated by the local authorities (custodians) who need the data and therefore care for the updating procedures and the applications as a part of their daily administrative routines.

**Figure 7. While the Danish cadastral system is split up in several organizations, the technological links provide a seamless administration**



There are unique links between the Cadastre (Parcel Register, and Digital Cadastral Map), the Land Registry, and the Building and Dwelling Register caused by the cadastral parcel number. Furthermore there are links between the Building and Dwelling Register and the Central Population Register due the unique postal addresses of the buildings. By linking a set of X,Y co-ordinates and thereby establishing a list of geo-coded addresses, it is possible to link any address related information to a map database. This creates a multipurpose information tool for analytical and administration purposes, including valuation and taxation purposes.

## Litteratur

- Wolters J. and Enemark S. 2002: The Danish way 8 - The property valuation and taxation in Denmark.
- Enemark S. 2002: The Danish way 1 - Land Administration in Denmark
- Clausen C. 2006: Ejendomsregistrering i de nordiske lande, Kapitel 1. Kort & Matrikelstyrelsen, København
- Kristiansen B. 2006 Dannelse og Transaktioner vedrørende fast ejendom i de nordiske lande, Kapitel 1. Kort & Matrikelstyrelsen, København
- Daugbjerg P. and Hansen K. 2000: Ejendomsdata. Kort & Matrikelstyrelsen, København
- The Danish Cadastre 2009, <http://www.kms.dk/English/Danish+Cadastre/>
- Gall, J.(2007) Description of the Danish property valuation and tax system <[http://people.plan.aau.dk/%7Eest/Valuation/Danish%20valuation%20and%20tax%20system\\_Feb17.doc](http://people.plan.aau.dk/%7Eest/Valuation/Danish%20valuation%20and%20tax%20system_Feb17.doc)>. 17 p. Prepared during a study visit at Aalborg University 2007.

# THE CADASTRAL SYSTEM IN ROMANIA



<http://www.ancpi.ro>

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## **1. INTRODUCTION**

### **1.1 History and purposes of the cadastre in Romania**

Romania's cadastral activity covered the following stages:

#### **1.1.1 Early Stage of the Cadastre**

In the Romanian provinces, cadastral and land registration activity began differentially, depending on historical circumstances, as of the 19th century:

- In Transylvania, Banat and part of Bucovina, specific works began after the Austro-Hungarian regime, as of 1794, and went on after 1850 as „Concrete Cadastre” (consists of delimitation, description and representation of localities' borders, plot limits, rivers and roads);
- In Walachia and Moldavia, as of 1831 and 1832 respectively, the first attempts for cadastre introduction were made by the first border-settling engineers prepared in Iasi by Gheorghe Asachi (since 1813) and in Bucharest by Gheorghe Lazar (since 1818);
- In the rest of the country, the cadastre would be established after the First World War, at the same time with land reform.

#### **1.1.2 Organization Stage of the Cadastre in Romania (1919-1933)**

In 1919, “Directorate for Cadastre and Technical Works” was set up, which limited its activity, especially to measurement of domains and their parceling for the land assigned after the First World War. Surveys were carried out according to local reference systems, with differences in accuracy and content, as there was no homogeneous geodetic triangulation network. For cadastre execution, technical data was prepared in the Topography School (1919) within the Directorate for Cadastre.

A big step was made in 1930 when the stereographic projection system was adopted, as a result of cooperation between the Directorate for Cadastre and the Geographic Institute of the Army.

#### **1.1.3 Start-up Stage of Modern Cadastre and Unification of Land Books (1933-1955)**

The reference point for this field of activity was Law no. 23/1933 on organization of cadastre and land books, which for the first time regulates how to organize and prepare the land cadastre, starting from unitary geodetic networks and preparing cadastral plans and registers as per the first technical and economic normative instruments.

In the beginning, cadastral works were planned to be executed in Walachia and Dobrogea, then in Moldavia and Oltenia, while updating those existing in Transylvania, Banat and Bucovina.

In terms of land registration, this was systematically organized by Law no.115/1938 regarding unification of provisions on land books. The works started in the former Ilfov county and the communes ancillary to Bucharest, which were to be used as model for the rest of the country, could not be completed because of the war and were suspended in 1941, when only 54 communes (65% of total amount) had benefited from those works. The experience of technicians from the other provinces was put to use, new instructions included in the "Technical Norms" (1943) were developed and engineers were prepared within the cadastral section of the Polytechnic School of Bucharest as of 1940.

After the Second World War, surveys and parceling works were carried out for temporary assignment of land to peasants, the cadastre institution being no longer funded by the communist power.

In 1949, agricultural collectivization was decided and cadastral law and surveys became obsolete for the totalitarian system.

#### **1.1.4 Stage of Land records and Land cadastre Systems (1955-1990)**

For registration and follow-up of the dynamics of agricultural lands belonging to public units, in 1955, organization and execution of the "land record" were enacted, a system which was used for merging agricultural areas during agricultural collectivization and which contributed to limiting the property rights.

Between 1955 and 1968, topographic maps on a 1:10000 scale for 13 millions hectares and land registers were carried out by the Superior Council of Agriculture.

In 1968, Law no. 32 regarding defense, preservation and use of agricultural lands provides for, among others, introduction of the land cadastre throughout the country. The totalitarian political administration kept on using the old records and misinformation regarding agricultural areas against the deliberate ignorance of the idea of cadastre.

The land inventory started in 1968 also went on after 1974 by Law no. 59, being drafted annual balances of the land property, but being limited legal movement of lands only to their legal inheritance.

The whole range of terrestrial surveys was subject to regulations by the Decree no. 305/1972 regarding the geodetic, topo-photogrammetric and cartographic activity, as well as the use of data and documents resulted from this activity.

Among cartographic documentations drafted as of 1965, it must be mentioned the basic topographic plan on a 1:5000 and 1:2000 scales, which, unfortunately, could not be updated at appropriate times, although they cover approximately 90% of the country's territory.

This demonstrated its value for the economic sectors with large areas of land (agriculture, forestry, transport, localities' planning), but also for the provision of graphic support for cadastral works by derivation of its contents.

### **1.1.5 Stage of Property Law Application (1991 - currently)**

The recent changes are first connected to the general legal framework regarding the legal system of land property, public and private property, acquisition of the property right and legal movement of lands.

General regulations in the field of property appear in the Constitution of Romania promulgated in 1991, in the Law no. 69/1991 on local public administration, abrogated by Law no. 215/2001, as amended and supplemented, in the Romanian Civil Code and Civil Procedure Code, as amended and supplemented.

In the last decade, normative instruments which are the basis of the property right institution have been promulgated: Law no.18/1991 on land property, as amended and republished by Law no. 169/1997, which includes legal norms regarding public and private ownership over lands, legal system thereof, protection and improvement of lands, Government Decision no. 834/1991 regarding establishment and evaluation of lands owned by public companies, Law no. 54/1998 on legal movement of lands, Law no. 1/2000 on the reestablishment of the right of ownership over agricultural and forest lands, as subsequently amended and supplemented.

For the cadastre institution in Romania, the most important legislative instrument is the Cadastre and Land Registration Law no. 7/1996, which provides the legal framework necessary to develop a modern cadastre and open the gates of an institution de jure with European roots, based on historical traditions. By this Law, in terms of organization, at central level, the public institution of the National Office of Cadastre, Geodesy and Cartography (currently NACLR) was created as specialized body subordinated to the Ministry of Public Administration and, at county level, OCGC (currently OCLR) were organized. The activity of these institutions is concerned with the

organization, management, guidance and control of work execution in the field, preparation of technical norms and specialized methodologies, organization of the national geodesy and graphics fund, data bank of the unitary cadastre system and, last but not least, monitoring of natural and legal persons who may develop and check specialized works.

As it became a liberal profession, the cadastre expert's activity is slowly given the place it deserves, as things return to normality, in a society based on democratic values. The private sector will increase in importance, the public actor will guarantee the security of the land registration system, the cadastre will benefit from the developments in the IT field and advanced cadastral data collection, processing and storage techniques will contribute to property reinforcement, the management of the real estate properties and the management of a modern tax system.

## **1.2 Definition, Features, Role**

The general cadastre is the unitary and compulsory system for keeping technical, economic and legal records of all real estates throughout the country's territory (according to the Cadastre and Land Registration Law no. 7/1996, as republished).

The general cadastre is of:

- Objective nature: expresses an objective reality, beyond human control, regardless of his/her social or technical function;
- Unitary nature: is executed according to unique norms and instructions;
- Historical nature: reflects the society laws (types of property specific to a system);
- Dynamic nature: expresses the natural ever-changing reality (imposes the need for continuous maintenance);
- General nature: meets the requirements for different economic sectors;
- Compulsory nature: is executed throughout the country's territory for all owners of real estate, either natural or legal persons.

The cadastre role is to supply real data regarding:

- determination of the expanse, configuration and position of property units, their destination and use;
- identification of owners and real estate holders and their registration in cadastral and land registration records.

The main purpose of the general cadastre is to supply, at any time, real data to legal and tax authorities, regarding the quantitative part of the property right, and economic data showing the

qualitative part of real estates respectively, within an administrative territory (commune, town, and municipality).

Apart from the respective main purpose, the general cadastre which presents itself both as a set of technical and organizational activities and as an institution, fulfills the following purposes:

- Supplies summary data to statistics and public administration bodies regarding the stage and progress of land property by counties and by country;
- Takes part in the preparation of studies and research works regarding territorial planning, environmental protection and other activities carried out on large areas of the country's territory;
- Takes part in the identification of land resources;
- Supplies updated data for updating different thematic maps, etc.

The wide experience of Transylvania, Banat and Bucovina showed that when the general cadastre operates with the land books, these activities support and supplement each other. These two components are meant to serve the owner in its essential matters of property rights, as well as local and central public administrative institutions in functioning as arbitrators and guarantors for ensuring this right, as well as for equitably setting tax liabilities.

### **1.3 Importance of the General Cadastre**

The cadastre proved in time to be a set of technical and organizational activities meant to serve administration, real estate owners in matters of property rights, and from another point of view, the cadastre constituted an advanced institution which helped to prove and guarantee the property.

Cadastre works are important for making information systems in the territory capable to supply fast real data to local and central public administrations, as well as other sectors concerned.

### **1.4 Development of the institutional and organizational structure**

Between 1947 and 1990, the land was removed from the civil circuit and cadastral and land systems adapted to this situation, being however carried out cadastral plans and maps, as well as land evaluations, especially for centralized economic planning, considering the real estate owners of that time (public and cooperative sector). According to some normative instruments, which formed the basis of land records (Decree no. 281/1955 and Decision of Ministers' Council no.1240/1955), cadastre suffered mutations, i.e. it served at agricultural land merging within a real estate record of public and cooperative socialist property.

After 1990, at the same time with the enactment of the Land Property Law no. 18/1991, real estates were returned to their rightful owners, which led to a significant increase of the society's interest in property.

- 1990-1996 – Office for Cadastre and Agricultural Territory Organization (OCATO), subordinated to the Ministry of Agriculture, participated in the application of property laws and in writing of property deeds.
- 1996 – According to the provisions of the Cadastre and Land Registration Law no. 7/1996, the National Office of Cadastre, Geodesy and Cartography, a public institution subordinated to the Romanian Government, under the direct coordination of the Prime Minister was established, which guided, controlled and carried out the activity of geodesy, photogrammetry, remote sensing, cartography and cadastre throughout the country. The Institute of Geodesy, Photogrammetry, Cartography and Cadastre, as well as 42 county Offices of Cadastre, Geodesy and Cartography and the one of Bucharest Municipality were subordinated to the National Office of Cadastre, Geodesy and Cartography.

The Government Emergency Ordinance no. 70/17.05.2001, with effect as of 1 July 2001, changed the existing institutional and organizational structure, that is:

- The National Office of Cadastre, Geodesy and Cartography took over the responsibility for the agricultural cadastre from the Ministry of Agriculture, Food and Forests by taking over OCATO;
- At county and Bucharest level, offices of cadastre, geodesy and cartography were created, as a public decentralized service, subordinated to NOCGC; the former offices of cadastre and agricultural territory organization and the former offices of cadastre subordinated to NOCGC were dissolved;
- The two institutes, the Institute of Geodesy, Photogrammetry, Cartography and Cadastre and the Institute of Cadastre and Agricultural Territory Organization respectively merged into one institute, the Institute of Cadastre, Geodesy, Photogrammetry and Cartography, subordinated to NOCGC;
- Due to these changes, the two great structures – general cadastre and agricultural cadastre – were transferred into the responsibility of the same body and thus cadastral databases, specific technique and human power compressed, which created the prerequisites for a coherent activity and rational use of resources;
- 2002 – NOCGC was transferred into the Ministry of Administration and Interior's responsibility;
- 2004 – The National Agency for Cadastre and Land Registration (NACLAR) was established, by reorganizing NOCGC and taking over the activity of land registration from the Ministry of Justice.

Unification of cadastre and land registration under a single authority creates the prerequisites for an accurate and transparent record of all real estates at national level. On short and medium-term, NACLRL's priorities are focused on developing and improving an efficient property registration system throughout the country, according to European standards in the field of cadastre and land registration.

On long-term NACLRL plans to develop a fully computerized, unitary in terms of cadastral and land registration information, accessible and easy to maintain database.

NACLRL's purpose is to be able to efficiently and transparently supply quality information to all citizens and provide a real basis for the development of the real estate market, governmental and international programs in the field of cadastre and land registration. The data produced and supplied by NACLRL are extremely important due to their implications at the level of local and central public administration structures, in the field of real estate market and, last but not least, in the national and international business environment.

At the same time, NACLRL pays a special attention to the regulations in the specific field, so that specialized firms, self-employed persons, institutions in the field could be able to develop their activity within an appropriate legal framework ever-adapting to the trends at European and international level.

## **1.5 Financial and organisational issues**

NACLRL's main tasks are coordination and control of cadastre, cartography, topography, geodesy, photogrammetry and remote sensing works, as well as registration of immovables in the land book throughout the country. It also develops norms, promotes techniques, standards, procedures and methodologies, authorizes natural and legal persons that can execute specialized technical works and ensures standardization of procedures according to European and international standards. NACLRL is a public institution subordinated to the Ministry of Administration and Interior. Recurrent and capital expenditures are fully funded from own sources.

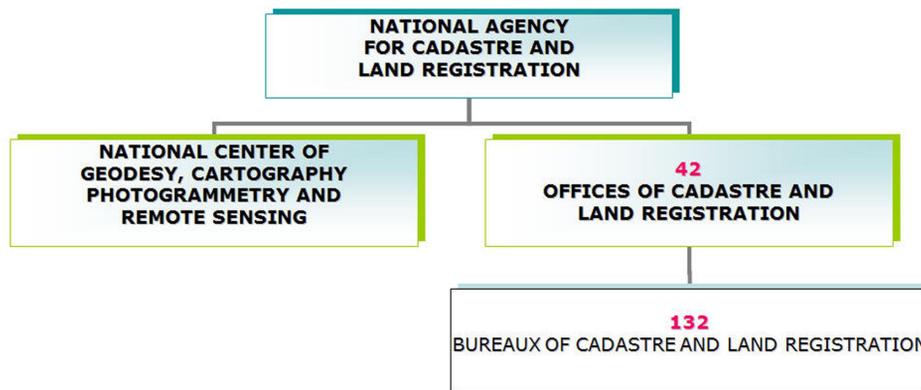
42 county offices of cadastre and land registration (OCLR), 132 bureaux of cadastre and land registration (BCLR) and one National Center of Geodesy, Cartography, Photogrammetry and Remote Sensing (NCGCPRS) are subordinated to the NACLRL.

The main tasks of OCLRs are to register real estates into the cadastral and land registration records, register all real rights, either constituted or modified, approve the specialty documentation, provide services and information to natural and legal persons, as well as public authorities. One or more bureaux of cadastre and land registration, which have the power to carry out cadastral

and land registration operations with real estates located in the administrative territorial units to which they belong, are subordinated to the offices of cadastre and land registration.

NCGCPRS develops and maintains the official maps of Romania and the administrative limits of the country, processes aerial photos and remote sensing records and manages the national cartographic database.

**Figure 1. Organisational structure**



## 1.6 Involvement of the private sector

Natural/legal persons may execute works in the fields of cadastre, geodesy and cartography on Romania's territory, based on an authorization certificate issued by NACLRL. This is issued based on an examination organized by NACLRL according to the Regulation approved by the Order no. 538/2001 of the Minister of Public Administration. The main conditions that applicants have to comply with are specialized studies and experience in execution of specific-field works. The authorization is issued by NACLRL.

In order to complete the works, authorized legal/natural persons are contacted and paid by owners, based on free negotiation of their fees or they are appointed as winners of the tenders organized according to law. In case of registration in the land book of legal acts and facts, authorized persons draft cadastral documentations that are approved by the territorial offices subordinated to NACLRL. More precisely, these carry out the surveys and technical works necessary to inscribe: the property right over a real estate which is not registered in the land

book, the detachment of a real estate, the accession of two or more properties having common boundaries, the change of property limit, the change of real estate area.

The works executed by authorized natural/legal persons are subject to NACLRL's approval and acceptance via OCLR, according to the Regulation for approving, verifying and accepting specialized works in the fields of cadastre, geodesy, topography and cartography.

In order to manage the information regarding the authorized natural and legal persons, NACLRL developed a database accessible on the Agency's website: [www.ancpi.ro](http://www.ancpi.ro). At the same time, OCLR and NACLRL monitor the activity carried out by the authorized natural/legal persons and, if necessary, apply sanctions for the deviations they found.

## **2. CONTENT OF THE CADASTRE**

The general cadastre is the unitary and compulsory system for keeping technical, economic and legal records of all real estates throughout the country's territory. The purpose of the cadastral system is the registration in the land registry.

The basic entities of this system are the parcel, the building and the owner. Immovable means one or more adjacent parcels, with or without buildings, belonging to the same owner. Parcel means the land area having the same land use.

Cadastre and Land Registration Law no. 7/1996 laid the legal foundations of a unique system of land registration for the entire country, which was to replace the existing land registration systems: the one of the registers of transcriptions and inscriptions, regulated by Civil Code and Civil Procedure Code, the one of the former land books respectively, regulated by Decree no. 115/1938 regarding unification of provisions on land books. As its name suggests, the new law regulates two different institutions in the same normative instrument: the technical institution of the cadastre and the legal institution of new land books.

The cadastral and land registration entry system keeps records of: immovables, property rights, inscriptions on divisions of property rights and charges. Buildings represent a special case of registration if their owner is different from the one of the land, as well as apartments for the blocks of flats. The buildings on the parcel are registered together with this if the owner is the same.

In the areas where the system of transcriptions and inscriptions was used, immovables estates were progressively registered in the land book, as they entered the civil circuit, based

on cadastral documentations drafted by authorized natural/legal persons, upon beneficiaries' request, in compliance with NACLR regulations. The documentations allow for identification, survey and description of immovables and registration of all legal acts and facts related to them. These cadastral documentations are accepted by territorial OCLRs/BCLRs and information is entered into cadastral and land registration records and become thus binding on third parties. More precisely, these documentations include, among others, the site plan of the real estate on a 1:200 – 1:5000 scale, apartment sketch on a 1:50 – 1: 500 scale, if the case, calculation of areas, coordinates inventory. Thus, the data registered on immovables refers to the real estate boundaries, buildings boundaries which are stored in the cadastral map (together with the boundaries of the intravilan, UAT, county, country), and a series of cadastral attributes, such as cadastral number and real estate address, areas of the constituent parcels with the land use and taxable value.

**Figure 2. Cadastral Map**



The cadastral and land book records are kept and maintained by the bureau of cadastre and land registration in whose jurisdiction the immovable is located and bears the generic name of cadastral land registry. It includes:

- a) land books;
- b) cadastral plan;
- c) general entry register;
- d) immovables cadastral register (shows the cadastral number of immovable and the number of the land book in which this is registered);
- e) alphabetical index of owners;
- f) a file in which the inscribing applications are kept, together with a copy of documents ascertaining the juridical acts or deeds submitted to inscription;
- g) other registers (such as: register of blocks of flats or condominiums).

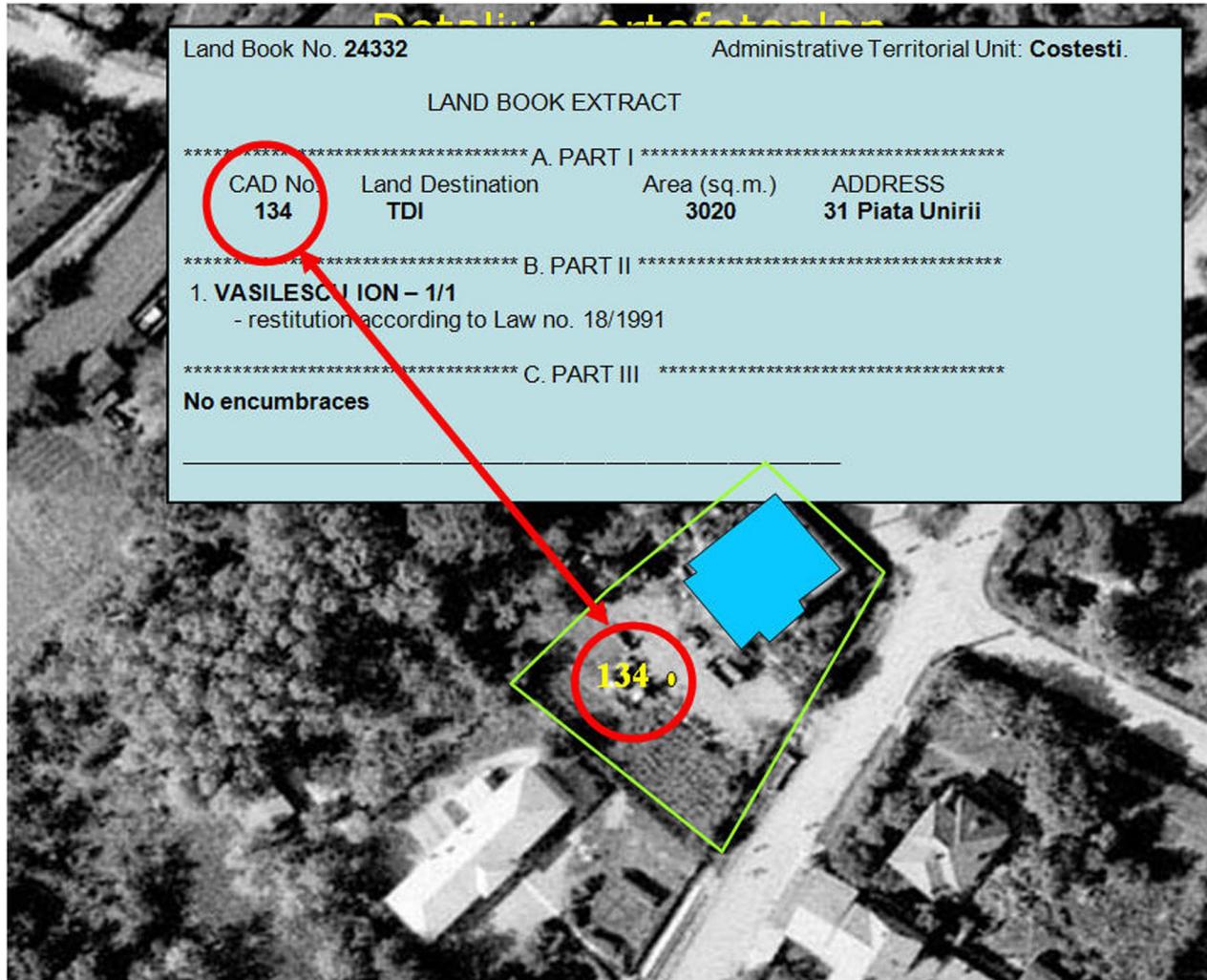
For every real estate, a different land book is drawn up, in which juridical acts and deeds regarding that immovable are registered based on the application submitted by applicants. The land book represents the basic unit of the legal records.

The land book consists of title (which includes the land book number and the administrative territorial unit where the real estate is located) and three parts:

- part A (or part I) referring to the description of immovable (cadastral number, address, destination, land use, area and, if the case, buildings);  
Part A is accompanied by an annex, the real estate plan respectively, which depicts geometry, vicinities, real estate description, and location coordinates inventory;
- part B (or part II) includes information on the owner (surname and forename/name, identity number) and the property right (such as: number and date of the document based on which the property right was founded);
- part C (or part III) includes records regarding property right divisions (trust, use, usufruct, habitation right, servitudes to the charge of the subdued fund), charges (mortgage, real estate privileges) or other inscriptions (tenancy, distraint).

The process of real estate registration has been automatized. Thus, information is registered in a digital database which contains both graphical (real estate boundaries, buildings boundaries) and textual data (cadastral number, area, owner's name, real estate and owner's address, supporting deeds of the property right over the real estate). NACLAR also owns the digital orthophotomaps, on a 1:5000 scale, for the whole country, used both for cadastral documentations acceptance and for preparation of projects by the persons/institutions concerned.

**Figure 3. Integrated spatial and legal information**



In order to develop and maintain an integrated and complete structure of graphical and textual data (specific for land book), a cadastre and land registration IT system, called e-Terra, was

developed, which will be implemented throughout the county by the end of this year. The real estate cadastral number is the unique identifier that connects graphical and textual databases in the integrated cadastre and land registration computer system. e-Terra system creates a unique technical and legal electronic archive for data coming from both current operations and conversion of paper data, stored in the old archives. e-Terra applications allow data synchronization and in the database information is stored for one time in one place.

## **2.1 Cadastral Numbering**

Cadastral numbering is performed for every administrative territorial unit, which is identified in the SIRSUP taken from the "Permanent Register of Administrative Territorial Units", as published by the National Commission for Statistics.

One or more adjacent parcels situated on the territory of one administrative territorial unit, regardless the land use and belonging to the same owner, define an immovable which is identified by a cadastral number and registered in one land book. Immovables are numbered within an administrative territorial units following the order of applications for inscribing, with numbers from 1 to  $n$ , using Arabic numerals. Where the immovable was not registered in the land book before, this is assigned a whole cadastral number, after the last number assigned for that administrative territorial unit.

If the immovables which are subject to a new documentation, were registered in the land book with whole, fractional, multiple fractional or atypical cadastral numbers (topographic numbers from the land book, from merger of whole numbers etc.) these are numbered with new cadastral numbers, after the last whole cadastral number assigned for that administrative territory.

Constituent parcels of immovables having different land uses are determined by expeditive methods (ensuring that the sum of their areas is not exceeding the immovable area) and are represented on the site plan by dashed lines and codes; within real estates, only the parcels with land uses exceeding 50 sq.m in intravilan and 300 sq.m in extravilan area will be represented.

Within every real estate, constructions are identified by a code attached to the cadastral number, made up of letter "C" followed by a number from 1 to  $n$  (e.g. C1, C2, C3, ...). Type and composition of the construction, by destinations and sections, are emphasized in the site plan. For constructions-condominium, individual properties are numbered as follows: the immovable (land) cadastral number and the construction code are accompanied by the individual property code (e.g. 178-C1-U25 for the immovable made up of land with cadastral number 178, construction C1 and individual unit 25). The types of individual units are depicted in the collective land book.

## **2.2 General Cadastre**

Besides the registration on demand ("sporadic"), NACLRL coordinates and performs the reception of works for introduction of general cadastre at the level of administrative territorial units, financed from the state budget, local budgets, or from its own budget. After the introduction of the general cadastre, a complete spatial and textual database shall be obtained at administrative territorial unit level, which shall be permanently updated, according to the technical and legal changes the real estates are subject to.

## **2.3 Property Titles**

As ancillary activity, because of taking over the attributions of former OCAOTA, until the enforcement of property laws is finalized, territorial offices also ensure the writing of the property titles issued according to the land restitution laws, thus enforcing the resolutions of County Committees for the establishment of the property right over the land. NACLRL has created at national level the scanned and indexed database of all property titles issued according to Law no. 18/1991, the land fund law, which was made available to all offices and free of charge to town halls. The inscription of the property right concerning the agricultural land situated in the extravilan based on the property title issued according to the property laws is performed free of charge.

## **3. TECHNOLOGICAL INFRASTRUCTURE**

The integrated cadastre and land registration IT system (eTerra) is NACLRL's main operational computer system that ensures the management of the electronic cadastre and land registration records.

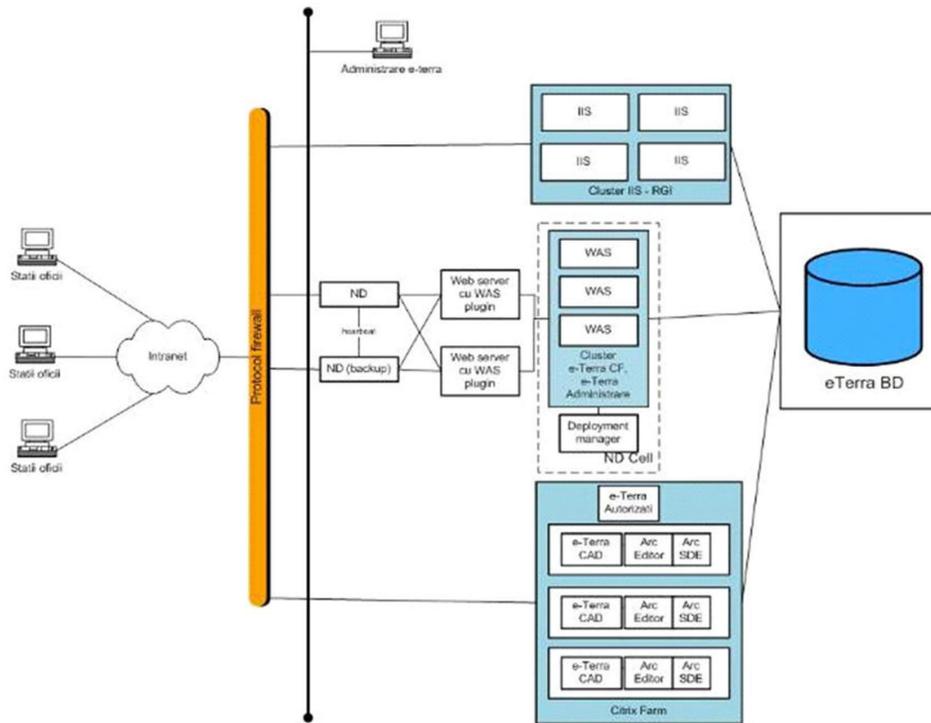
The purpose of this computer system is to unify, standardize and automate the processes of updating and inquiring the cadastral and juridical records administered by NACLRL, having as final target the increase of quality of services delivered to the citizens and the institutions of this country.

The system manages a unique database containing the graphical and textual data related to cadastral and legal record, having as primary element of information organization and presentation, the administrative territorial unit represented by the commune, town or municipality.

The Information managed is grouped into the cadastral land registry, which, together with the real estate cadastral register, the owners alphabetical index, the owners cadastral register, the

cadastral plan and the annexes to part I of the land book form the organizational structures of the cadastral and legal records.

**Figure 4. eTerra System Architecture**



### 3.1 Technologies used in eTerra system (main components)

eTerra Cadastre module: 3-tier architecture:

- presentation & application layer : VB .Net - ArcGIS Engine Runtime 9.2 (ArcEditor)
- deployment local : Citrix Presentation Server Farm
- database layer : Geodatabase (GIS data access server (ArcSDE 9.2) - Oracle 10g RAC)

ETerra Land book module: 3-tier architecture:

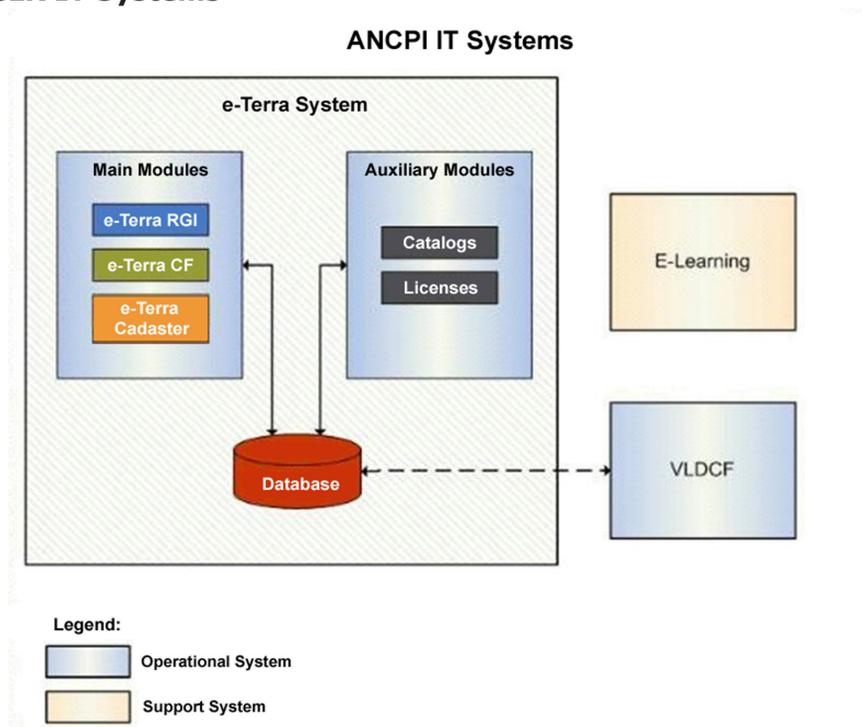
- presentation layer: client desktop (SWT);
- application layer: Websphere Application Server (WAS);
- database layer: Oracle 10g RAC.

ETerra RGI module: 3-tier architecture:

- presentation layer: browser web;
- application layer: IIS;
- database layer: Oracle 10g RAC.

ETerra system functional components (also called modules or applications) are divided into main components and auxiliary components depending on their contribution to the achievement of the general purpose of the system: cadastral and legal records management.

**Figure 5. NACLR IT Systems**



The main modules are:

- eTerra General Entry Register (RGI);
- eTerra Cadastre (CAD);
- eTerra Land book (LB).

The auxiliary (support) modules are:

- eTerra Catalog Management;
- eTerra Authorized Persons.

Each module offers functionalities for the settlement of specific problems related to the cadastral and legal records management activity described hereinafter.

### **3.1.1 eTerra General Entry Register**

eTerra General Entry Register (eTerra RGI) Module ensures the input of applications into the system and the flagging of communications between employees and clients during their processing. Currently, the module is exclusively used by NACLRL employees, as the representatives of professional groups NACLRL cooperates with in the carrying out of its activity (ex. notaries, licensed persons) do not have the possibility to input these applications.

Presently, the management of fee collection in relation to the services requested by means of the applications is performed outside eTerra system, before their registration into eTerra RGI module, in local computer systems or in a paper base record.

Current functionalities offered:

- application registration;
- application modification;
- application assignment (appointment of the responsible);
- application re-assignment;
- total, individual (per employee) time limit calculation;
- event marking within the work flow;
- supplementation report communication;
- supplementation report answer receipt;
- applicant notification in relation to document delivery;
- acknowledgement receipt of successful delivery of the documents issued;
- admission / rejection / supplementation report (for the OCLR/BCLR where eTerra Cadastre and eTerra Land book were not yet implemented);
- management of employees unavailability periods of time (leaves, delegation);

- claim registration;
- emergency tax registration subsequent to application registration;
- “General Entry Register” daily report issuing;
- application registration note issuing.

### **3.1.2 eTerra Cadastre**

eTerra Cadastre (eTerra CAD) ensures the functionalities that perform information update, scanning and extraction from the technical (cadastral) records.

Textual and graphical technical record update is performed following the approval of the cadastral documentation, drafted in compliance with the regulations in force, on paper and electronically.

The electronic version is the eTerra system proprietary XML format, known under the name of pu (property unit) file, that contains the cadastral documentation (graphical and textual) data forming the object of the inscription with the technical and legal record of NACL. pu file is generated by the persons licensed to perform works in the field of cadastre by means of an application distributed free of charge by NACL, called eTerra .pu. generation.

Functionalities offered by eTerra Cadastre module:

- approval of the following types of cadastral documentations:
  - first registration of the real estate / UI,
  - splitting of the real estate / UI,
  - amalgamation of the real estate / UI,
  - update of real estate data / UI,
  - technical data update (text modification only),
  - boundary rectification,
  - apartment subdivision of the building,
  - new apartment subdivision of the building,
  - graphic database exploitation,
  - cadastral data extraction,
  - support layers (parcel division plans, cadastral plans, orthophoto map) management.

### **3.1.3 eTerra Land Book**

eTerra Land Book (eTerra LB) module ensures legal records update.

Functionalities offered by eTerra Land Book module:

- land book conversion;

- site plan conversion;
- land books conversion rectification;
- inscription of the following types of cadastral documentations:
  - first registration of the real estate / UI,
  - splitting of the real estate / UI,
  - amalgamation of the real estate / UI,
  - apartment subdivision of the building,
  - new apartment subdivision of the building,
  - update of real estate data / UI,
  - technical data update (text modification only),
  - boundary rectification,
- land book operation;
- land book (material error adjustment) rectification;
- land book unblocking
- land book suspension;
- issuance of land book extract for information;
- issuance of land book extract for authentication.

### **3.1.4 eTerra Catalog Management**

eTerra Catalog Management Module ensures the management of eTerra system configuration data, called catalogs. Data regarding the users and the access rights to system functionalities are also temporarily included herein, until the specific dedicated system for their management is implemented.

Catalog management ensures the following operations:

- query;
- display;
- new elements input;
- existing elements modification, their inactivation inclusively.

### **3.1.5 eTerra Licensed Persons**

This module ensures the storage, update and extraction of reports regarding the information on natural and legal persons licensed by the Local Offices of Cadastre and Land Registration, as well as by the National Agency of Cadastre and Land Registration, to carry out activities in the field of cadastre.

Functionalities offered by this module:

- Input and update of the data regarding the authorized natural and legal persons.
- Issuing and monitoring of licenses.
- Issuing and monitoring of sanctions applied to authorized natural and legal persons.
- Storage and display of the data regarding the natural and legal persons licensing exams.
- Supply of reports regarding the authorized persons.

### **3.2 Land Books Validation Module (LBVLD)**

Land books validation application (LBVLD) is a tool for the verification and rectification of the data supplied by the land books archives conversion services and has the following final objectives:

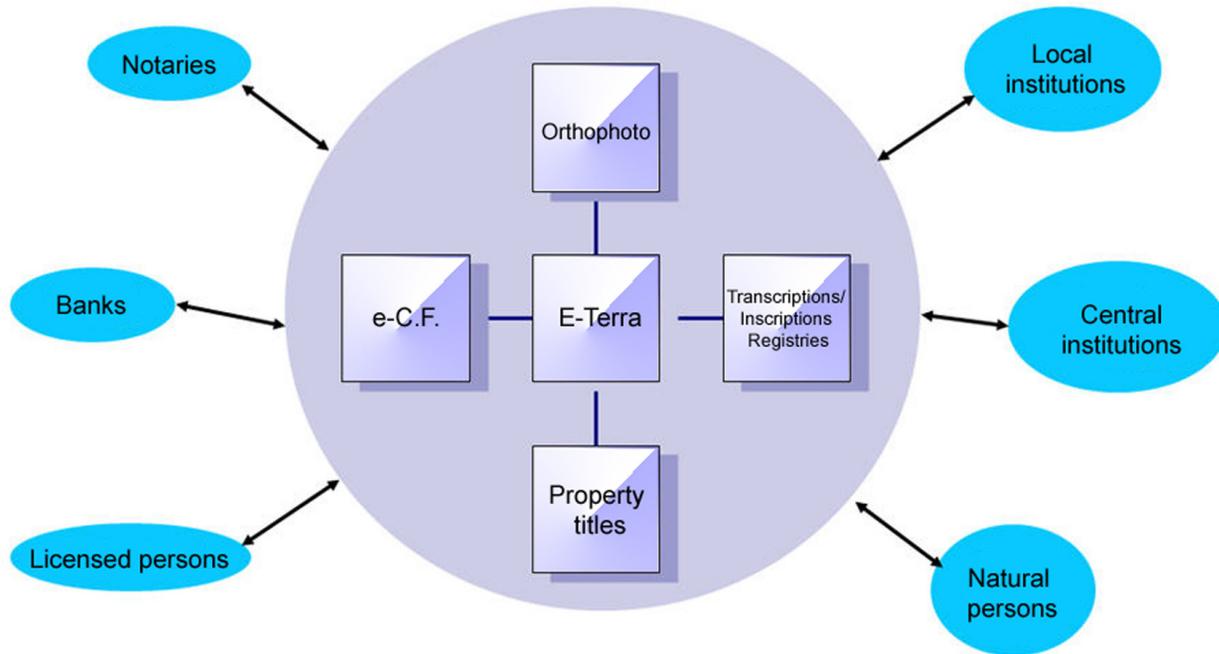
- land books electronic archive (performed by scanning) management
- validated data transmission to eTerra application.

Functionalities offered by this application:

- a. editing the text data (metadata) related to scanned land books:
  - addition, modification, deletion of data related to active\* positions within a certain land book (regardless of what land book part they belong to);
  - creation, deletion of relations between active positions in IInd Part and active positions in IIIrd Part;
  - creation of new land books by including a data subset belonging to a scanned land book.
- b. positions selection and grouping into a land book and its transactional export into eTerra system.
- c. own catalogs management and the use of the catalogs made available by eTerra system.
- d. writing of the following predefined reports:
  - status report regarding land books validation at national level,
  - report regarding land books validation at national level,
  - report regarding the activity performed by the operators responsible for land books validation at national level,
  - report regarding the modifications performed on a scanned land book,
  - report regarding the volume of performed modifications,
  - report regarding the number of minimally / entirely indexed land books.

### 3.3 Other Production Computer Systems

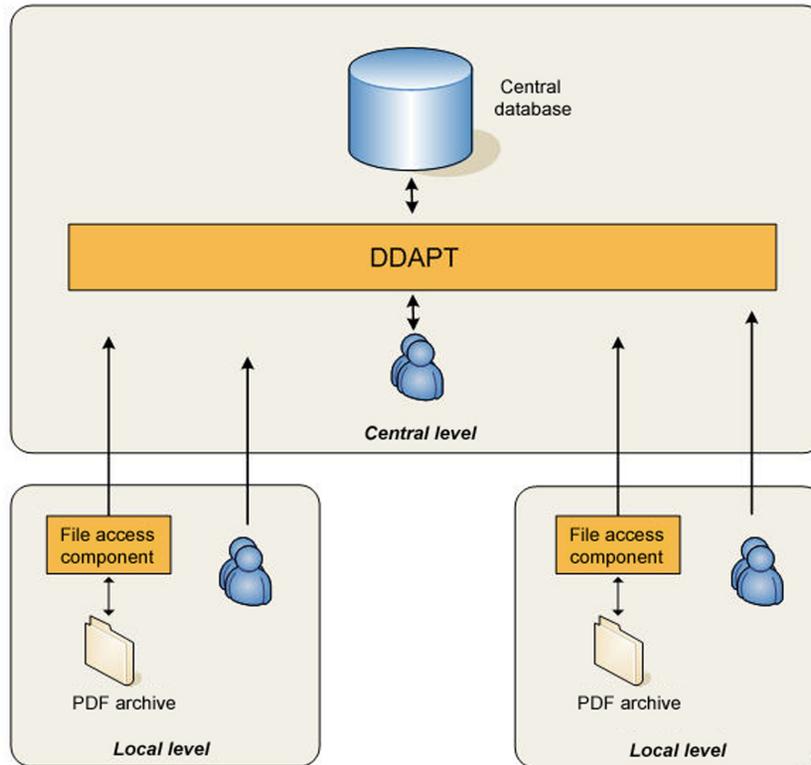
Figure 6. Production IT Systems



### 3.4 Digital Database Archive for Property Titles (DDAPT)

DDAPT (Digital Database Archive for Property Titles) System ensures property titles management at national level by means of a Web application. The functionalities offered by the system are: user authentication based on digital certificate, property title creation and addition into the system, new property titles printing in predefined format, property titles search in the central archive, predefined reports writing, new reports creation using a reporting component.

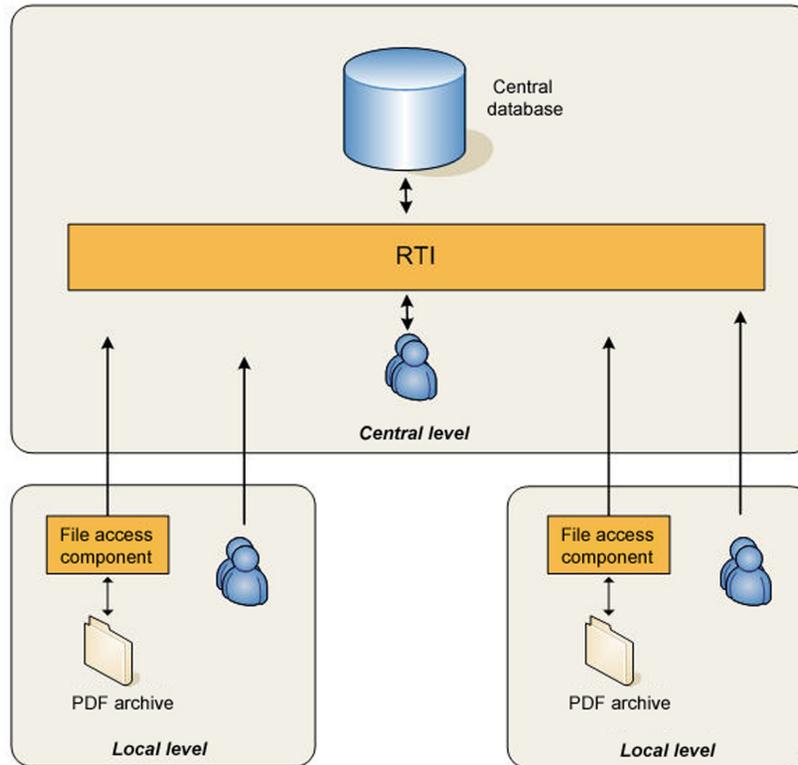
**Figure 7. DDAPT System Architecture:**



### **3.5 Registers of Transcriptions and Inscriptions (RTI)**

RTI (Registers of Transcriptions and Incriptions) system ensures the management at national level of transcriptions-inscriptions registers' records. The functionalities offered by the system are: user authentication based on digital certificate, new records creation and addition into the system, material rectification of existing records, existing records correction, issuance of preliminary decisions for each registration inscription, issuance of certificates of encumbrances, solving of the applications filed in electronically by means of eLandBook system, records query and grouping using search filters.

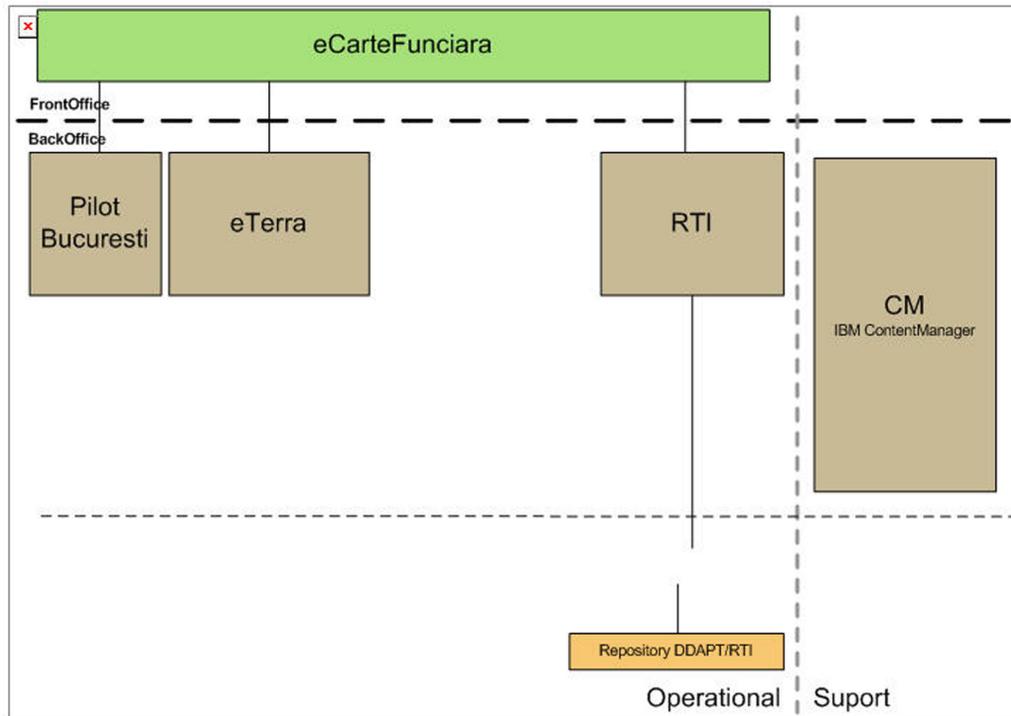
**Figure 8. RTI System Architecture:**



### **3.6 eCarteFunciara**

eCarteFunciara system ensures the electronic filing in and solving of the applications made for land book and cadastre services provision by professional groups (notaries, banks, real estate agencies, licensed persons, etc.). The functionalities offered by the system are: solving of applications for information extract, authentication extract, inscription in the land book of the applications for the inscription in the registers of transcriptions and inscriptions, user authentication based on digital certificate, signature of documents and applications enclosed by professional groups having qualified digital certificate, remittance slip for notaries, payment modalities (advance payment, electronic payment, regular payment).

**Figure 9. eCarteFunciara System Architecture:**



## 4. UPDATING PROCEDURES

### 4.1 Existing types

Graphical information update is necessary in the following cases: parcel boundary modification, new buildings, land use modification, street name modification, zip code modification, general cadastre introduction.

New cadastral documentations are necessary in many of these cases. Natural and legal persons are authorized to perform the surveys for drafting the site plan and OCLR/BCLR verifies and

approves the works before performing updates of database. In case of building erecting, authorizations and other documents are necessary for their inscription in the cadastre and land registration system before performing the respective modifications.

Legal information update – land book is permanently updated based on the documents filed in by the clients or other stakeholders. Ownership transfer and owner modification are mandatory for the registration by OCLR/BCLR. The law specifies the content and format of the documents. The most frequent update cases are: owner modification, mortgage registration.

## **4.2 Organisations and persons involved**

OCLRs/BCLRs are responsible for the technical and legal records update. The private sector is involved in documentations preparation for the update. In virtue of the law, licensed natural and legal persons perform only the surveys and draft the site plans. Public notaries involvement in legal documents preparation for the registration of changes in relation to the ownership is mandatory according to the law.

### **4.2.1 General work flow**

The real estate inscription in the cadastral and legal records, existing data update or inquiry are performed based on an application and payment of a fixed or variable fee (except for the cases when the applicant is completely exempted from payment), application which is registered in the General Entry Register established in the BCLR responsible for the administrative territorial unit in which the real estate is located, under a unique number assigned at each year's level. The fee varies depending on the nature of the operation requested (service requested), the number of units forming the object of the application and the capacity of the applicant.

Record update is performed based on the documents imposed by the regulations in force related to the service required, which shall be enclosed to the application put forward to BCLR. The services requested determine the update or inquiry type (ex. technical record only, legal record only, technical and legal record – based on which the application is assigned "in circle" for solving to BCLR and/or OCLR employees), the total time limit for the delivery of the documents related to the application type and the solving time limit per each employee involved.

Technical records update is performed by the cadastre inspectors based on the documentation (cadastral file) on paper and in electronic format enclosed to the application. They verify the accuracy and integrity of the file, the geographical location of the real estate graphic representation in the existing cadastral plan and its compliance with other existing graphical layers (parcel

division plan, orthophoto map, etc). In case all graphical and textual validations were successfully made, the inspector approves the modifications brought to the real estate technical records by means of the presented documentation. In the case of the first registration, the real estate is assigned a unique identifier at the level of the administrative territorial unit to which it belongs, under the form of a natural ascending number, called cadastral number. Modifications made to the technical record are considered proposals until they are approved by the land book registrar.

Legal record update is performed by assistant registrar based on a report approved by the registrar, drafted following the analysis of the application and related documents. This involves land books opening, addition or modification of inscriptions in the newly opened land books and in the existing ones in order to reflect the legal condition presented by means of the related documents. Land book opening requires the assignment of a unique ascending natural number at the level of the administrative territorial unit where the real estate forming the object of the inscription in the land book is located in. Modifications made to this record are considered proposals until they are approved by the land book registrar.

In case additional information or the rectification of the information existing in the documents on paper or in electronic format is necessary, the inspector and the registrar assistant may require this information by means of a supplementation report.

The final inscription of the proposals regarding technical and legal records update is decided by the registrar, who is entitled to reject the work based on the legal deeds and on the modifications proposed by the inspector and the assistant. The modifications shall be provisionally performed in the system.

The decisions of the registrar in relation to the technical and legal records update may be contested by filing in a claim or contestation at the law court having jurisdiction over the locality the real estate is located in. Depending on the court decision passed, the modifications made to the record remain valid or are annulled.

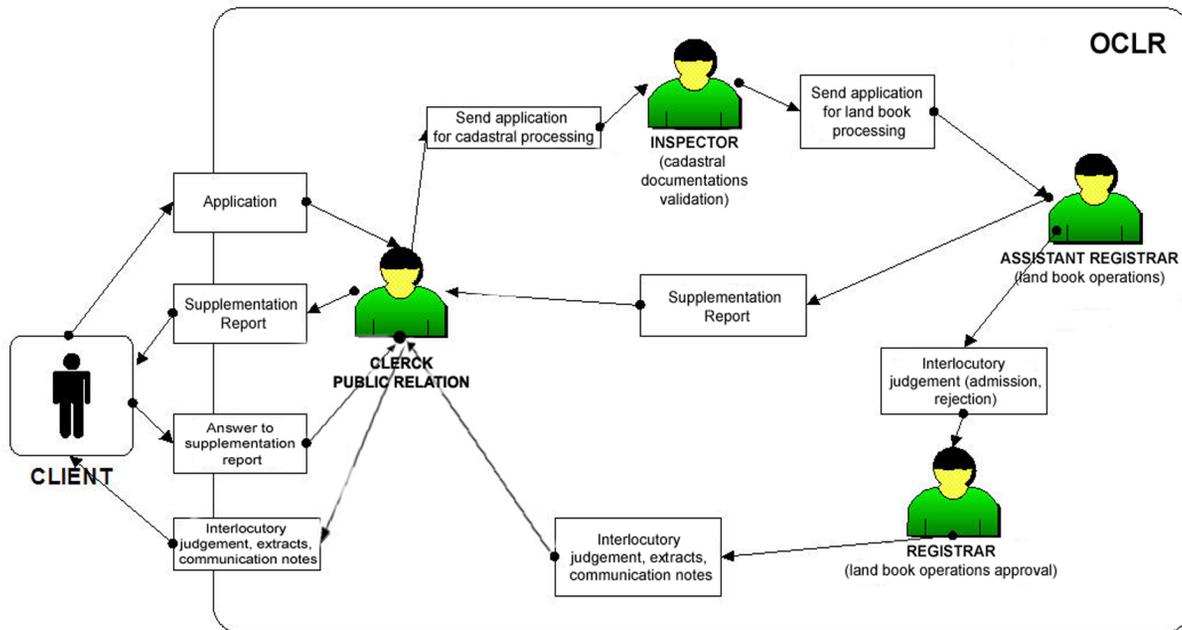
Record inquiry is performed by registrar assistants and by other employees of the archive and IT departments operating within OCLR and BCLR.

Any record update is exclusively performed based on application filing in. The application may be filed in by the authorized proxies (empowered by law) of the person interested in record update (applicant), such as the persons authorized to perform works in the cadastral field, notaries, law courts, etc.

### 4.3 Processes automation

The use of e-Terra integrated cadastre and land registration computer system has started as of June 2008. Currently, the system operates in 35 of the 42 counties, and by the end of the year it shall be entirely implemented. The new system has as main objectives: standardization of processes related to document verification, reception and inscription in the land book, computerization of main NACLR/OCLR workflows, automation of certain processes and achieving of operations efficiency.

**Figure 10. Workflow standardization and automation**



Advantages offered by the new system:

- reduction of clients applications solving time periods,
- possibility of a very quick access to historical data from the archive (real estates, land books),
- redundant activities avoidance,

- tracking down in due time the fraud attempts made by the clients,
- limitation of the possibility of human errors occurrence,
- reduction of the volume of transferred and archived physical documents (on paper support),
- ensuring a balanced work volume for the territorial offices employees.

## **5. PROVIDED SERVICES**

NACLRL provides, against payment in general, cadastre and land book information, data and other services to external users and citizens. The products are available in analog and digital format. There are cases when service/information provision is performed free of charge for public authorities, government institutions, law courts, as they are regulated by means of legislative acts.

NACLRL provides services and data to major external users - CFR, PETROM, Compania Națională de Autostrăzi și Drumuri Naționale, etc. based on agreed protocols.

The basic cadastre and land registration services provided by NACLRL are in relation to the registration of real estates, juridical acts and deeds in relation thereto, of changes occurred in time as well as to the supply of information on real estates. e-Terra integrated computer system, by means of the network put in place and applications implemented, ensures the supply of (graphical and legal) information for internal use. It is estimated that in relatively short time, the data shall be made available on-line to the public. Currently, only the service by means of which a person can monitor the status of its application is available online.

An image server is available to public, which offers the possibility to view online the orthophoto (mosaic) images at county level. The purpose of the application serving the image server was to enable the online order of products obtained from the aerial photography works, respectively the aerial ortho-rectified images. Data sources are the orthophoto map mosaics performed by means of ErMapper software specialized modules. Wavelet type compression enables the obtainment of a product without information loss, the original orthophoto maps resolution being kept in the final product (mosaic). Information is organized on counties. Images displayed in the central application window are represented in Stereo 70 coordinates. Currently, images from the flights performed in 2003, 2004 and 2005 are uploaded, on 1:5000 scale, for 98% of the Romanian territory surface, the remaining 2% being satellite images, which are not marketed. The user friendly interface makes possible the selection of the interest area, specified by county level, and within the county, by ATU level. Panning tools make possible image extension, restriction or movement in the desired location, the location coordinates displayed in the central window

being permanently updated and displayed in the lower left corner. The on-line order facility is not currently active, because of the difference existing between the modality of service charging - on surface area, and the modality the data extraction application was designed in - for a resolution selected by the client. There is also the financial problem; the online payment for the services provided by NACLRL is not implemented. The population with other data is possible, being conditioned by the storage space on the storage server. Presently, the application may be used for aerial image view, the online order option being inhibited, the client receiving an invitation message to consult the section site plans and maps, where information on the modality of acquiring the mapping and geodesic products as well as the graphic presentations regarding the various product categories are stored. Besides the orthophoto maps, the national geodesic fund makes available to its clients, against payment, other products in analogical or digital format, such as: cadastral plans and maps, digital terrain model, thematic maps of Romania, topographical plans.

TransDatRO - a software for the transformation of coordinates from the national reference system into the European reference system and vice versa is available free of charge to external users on NACLRL web site. A very important feature of the program is the fact that it offers unique transformation solutions, for the persons that perform the geodesic works, as well as for the persons that verify and perform the reception of these works, which makes possible coordinates transformation standardization in our country.

The interested persons may also access online, on NACLRL web site, the list of the natural and legal persons licensed to perform technical specialized works.

Romanian Position Determination System - ROMPOS ensures the exact positioning in the ETRS89 European coordinates and reference system based on the National Permanent GNSS Stations Network. ROMPOS is based on Global Navigation Satellite Systems (GNSS - Global Navigation Satellite Systems) including GPS, GLONASS and GALILEO (in the future) supplying complementary data necessary for position determination accuracy improvement to millimeters.

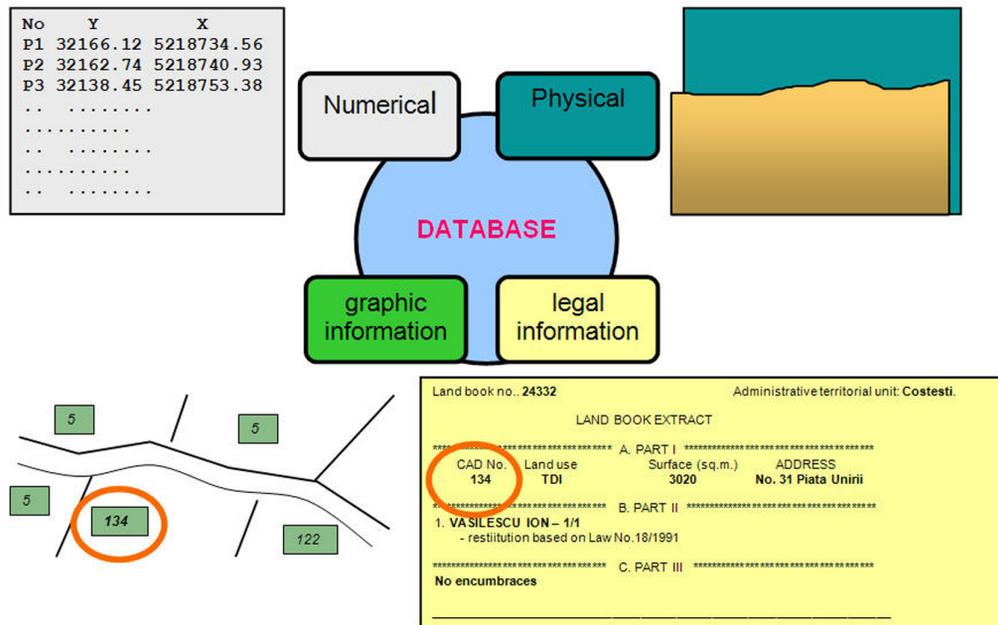
ROMPOS covers the entire Romanian territory and is available any time for any location in Romania. Using ROMPOS, modern GNSS receivers work more efficiently, increasing labor productivity, and reducing costs. With only one GNSS receiver and wireless Internet access by GSM/GPRS connections, the user may benefit from ROMPOS services. Currently ROMPOS services are directly offered to a wide range of users by NACLRL, and should be mentioned that there are no other providers offering these services. A significant number of companies carrying out their activities in the field of geodesy and cadastre, natural persons authorized in the field of geodesy and equipment manufacturers have verified the horizons opened by real time ROMPOS

services (DGNSS/RTK), as they were granted free access to these services during December 2007 – April 2008. Presently, the services are provided as follows: ROMPOS DGPS and RTK (for real time positioning) are provided free of charge and ROMPOS GEO (for post-processing) is provided against payment.

## 6. LINKS BETWEEN CADASTRE AND LAND REGISTRY

A unified cadastre and land registration system developed at national level was implemented in Romania and is administered, in compliance with the European and international standards in the field of cadastre and land registration. The system performs the efficient and secure registration of real estates, ensuring a much improved coordination between the technical and legal components.

**Figure 11. Cadastre and land registry unified database**



Some of the principles the system is based on are:

- inscribing a single real estate in a land book,
- a single entry register (for the cadastre and the land book, called "General Entry Register"),
- new cadastral numbering,
- introduction of an integrated work flow – that ensures the solving of an application requiring cadastre as well as land registration services by means of a single decision, after the successive processing performed by the cadastre and the land book clercks.

## **7. LINKS BETWEEN THE CADASTRE AND REAL ESTATE EVALUATION SYSTEM / REAL ESTATE TAXES**

Considering the provisions of article 9 paragraph (2) of Law no. 7/1996, the cadastre and land registration law, republished, as subsequently amended and supplemented, „the technical elements necessary for the real estates taxation value establishment are pointed out within the economic function of the general cadastre”, the National Agency of Cadastre and Land Registration has the obligation to supply “the data necessary to tax system for the accurate establishment of the taxpayers’ liabilities”.

In the same time, the Government Program for 2009-2012 pays a special attention to the enforcement of the measures necessary for real estates taxation at their market value, taking into consideration natural and legal persons’ ability to pay.

In Romania, after 1989, when the real estates were recovered by the entitled owners, there were no sufficient funds for the execution of cadastre works on the entire territory of the country, and real estate registration was made sporadically, upon request. Therefore, NACLRL can supply the data necessary to the tax system only for the real estates existing in its records.

Moreover, NACLRL has paid special attention to the identification of the factors that may influence the legal, economic and organizational frame of the real estates evaluation activity for the purpose of their taxation “at the market value”, in compliance with the provisions of international evaluation standards.

Taking into consideration the aforementioned specific conditions, NACLRL has participated in the carrying out of two internationally financed projects: the Project “Implementation of the Cadastre and Real Estate Property Rights Registration System in Romania”, with a component focused on real estate evaluation problems, and the project “Support for Romanian Real Estate Market Monitoring”. The purpose of the second project was real estate monitoring in a pilot area. Therefore, credible data on the immovable properties was collected, such as: the characteristics

of the sold real estates, their size, the types and the transaction prices. After the statistic processing of information, predictions regarding the sale prices of several types of constructions (apartments, houses, lands, etc), located in a certain area, have been possible. These can be used in the taxation value calculation.

# THE CADASTRAL SYSTEM IN PORTUGAL



<http://www.igeo.pt>

September 2009

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# **1 INTRODUCTION**

## **1.1 History and purposes of the cadastre**

In 1801, it was first publicized the willing of executing cadastre in Portugal by a royal charter. It should cover rural and urban areas with an obligation of registry of the titular of the right of the parcel.

In 1848, without any development of the Portuguese cadastre, the Counsellor António José D'Ávila made a visit to Italy to acknowledge the cadastral works. In his conclusions it was clear that cadastre should not only be the base of property taxation, but also the map of the country, the description of the real property, the inventory of its products value and the owner's cartulary. Despite his remarks, the country decided to post-pone the beginning of the cadastre.

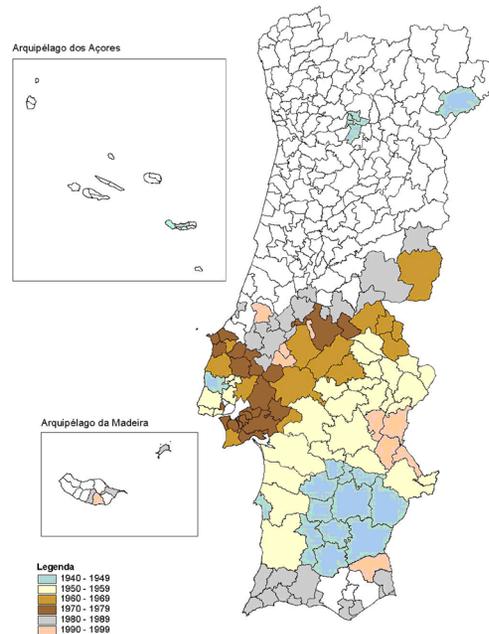
In 1921, the Rural Geometric Cadastre Services were created, inside the Finances Directorate. Along, it was decided that cadastre should be fiscal oriented, the core of property taxation and to restrict the survey to the rural parcels due to its importance at that time – rural property cadastre. It was published the Decree-Law 12451/26, from October 27, that defined the rules for the cadastre project. The government lack of interest and the low incomes from the Public Treasury maintained the hold on the project until 1942, when the cadastre works begun in 5 municipalities. Two years later, the first municipality cadastre was concluded and its success allowed the government to increase the investment on cadastre. In fifty years, the data acquisition for rural property cadastre was concluded in 121 municipalities corresponding to roughly 50% of Portugal's mainland area. As the data acquisition process went North, the workflow become slower and obviously more expensive due to the orography and the bigger parcel fragmentation.

In 1995, the Decree-Law 172/95, from July 18, made a paradigm shift on cadastre. Due to multiple factors, such as the increase importance of urban areas, environment, city planning and the lack of connection with the real property registry the cadastre became homogeneous with no distinction between parcel in rural and urban areas, multifunctional and additional legal value – real property cadastre.

The data acquisition process was opened to the private sector and cadastre was made in 5 municipalities. Despite the willing of putting this cadastre in-force, legal, organizational and technological problems did not allow this cadastre information to become public and updated. In 2005, after a deep reflection of the problems experienced, through the Council of Ministers Resolution 45/2006, from May 4, a project designated by SiNERGIC was created in order to establish a common platform regarding cadastral information. The main aim was to give the

country a proper cadastral base, in order to grant the knowledge of parcel boundaries and the property's titular, that allows the creation of the parcel unified identification for all public administration. With a one-to-one link with the real property registry, giving additional legal and factual value to cadastre, SiNERGIC is based in a spatial data infrastructure (SDI) philosophy, integrating in a single infrastructure the cadastral, land registry and fiscal information systems, putting them to work together.

**Figure 1. Rural property cadastre data acquisition in Portugal**



## 1.2 Development of the institutional and organisational structure

The first organisational structure related with cadastre was created in 1921, within the responsibility of the Ministry of Finances. Geometric Cadastre Services inside the Finances Directorate had as main aim the creation of cadastre for tax purposes.

In 1926, this Service was transferred for the General Administration of Geodetic, Topography and Cadastre Services, in order to organize the nationwide cadastre. As a result, and in the same

year, it was created the Geographical and Cadastral Institute. As the rural property cadastre developed during five decades inside the Ministry Finances umbrella, there were some changes in the Geographical and Cadastral Institute structure, namely the finance autonomy in 1977 and the creation of Regional Offices in 1980.

Although the cadastre remained focus on tax purposes, in 1987 the Geographical and Cadastral Institute was transferred to the Ministry of Planning and Territory Administration. In 1995, with the paradigm shift of cadastre for a multipurpose cadastre (real property cadastre), it was created the Cartography and Cadastre Portuguese Institute due to a significant reform of the Geographical and Cadastral Institute.

With an administrative modernization reform undergoing and public finance consolidation, the Portuguese Geographic Institute (IGP) was created in 2002, due to the fusion of Cartography and Cadastre Portuguese Institute with the National Center of Geographical Information. IGP is included under the Ministry of Environment, Spatial Planning and Regional Development supervision and became the national authority for geodesy, cartography and cadastre and responsible for the national geographical base information policy execution.

Its mission is to regulate the exercise of activities in geodesy, cartography and cadastre, products homologation, development and coordination of the National Spatial Data Infrastructure (NSDI), named SNIG, and also to promote geographic information technology and science research.

### **1.3 Financial and organisational issues**

IGP is a central service of direct administration of the State, with administrative autonomy, integrated in the Ministry of Environment, Spatial Planning and Regional Development. It has a General Director and two Deputy Director-General. It has also a Research Council and a Supervision Unit of Scientific Research. Its internal organisation is developed under the hierarchical structure model with five nuclear units, designated as Services Directorate, which include Cadastre Services Directorate. Its budget is made mainly from the state budget, but also with a percentage of its customer fees services and products, namely rural property cadastre up-date services and cartography products.

### **1.4 Decentralisation, involvement of the private sector**

Besides the Central Office, there are 5 branches at regional level, distributed along the country, mainly in rural property cadastre areas in order to update it. Presently, the update of rural property cadastre is made only by professionals of the IGP, although it can be opened in the

future to licensed surveyors.

Since 1995, the real property cadastre data acquisition process is made by private sector companies, through international tenders managed by IGP. The update process of this cadastre will be also regulated in order to permit the private sector to be involved.

## **2 CONTENT OF THE CADASTRE**

Portugal still has two cadastral systems running, with different data models. We will focus on the real property Cadastre

Rural Property Cadastre:

The rural property cadastre has more entities, due to the fact that is tax driven and has additional elements regarding the rural property evaluation, such as land use. Its main elements are: Parcels, Sub-Parcels, Rural Constructions, Property Marks, Administrative Boundaries and Marks.

Real Property Cadastre:

Legal Parcel definition: Parcel, designated as "prédio", is a juridically autonomous limited part of land, which includes water, plantations, buildings and constructions of any nature incorporated in it.

Although a parcel boundary can be defined by a building, cadastre model doesn't include them. The basic spatial elements of the cadastre: parcel, its boundaries and the corresponding defining property marks.

There is also a special element, designated as no-parcel areas, which represents the areas not defined as parcels, which include public areas, unknown owner areas and litigation areas.

The cadastre registers the parcel identification number – NIP, the corresponding identification codes from the land registry and real estate tax, the declared owner and corresponding personal data.

### **2.1 Cadastral maps**

Rural Property Cadastre:

- Scales: 1:500 (Madeira islands), 1:2000, 1:2500 and 1:5000;
- Number of maps: 23,798;
- Format: raster (tiff and ecw format) and vector (dgn, shp and geodatabase format).

Real Property Cadastre:

This data is on acquisition process. There is a cadastre data model, without no distinction between map elements or register (<http://www.igeo.pt/sinergic/portugues/SiNErGIC.html>).

## 2.2 Cadastral register

Rural Property Cadastre:

Content of the cadastral register:

- Administrative area (municipality and parish);
- Map identification;
- Parcel – number, designation or address and area;
- Tax payer - name, tax id and home address;
- Land use sub-parcels – id, area and evaluation quality;
- Land cover – evaluation quality and quantity;
- Construction – area;
- History – former parcel and tax payers.

The access to the cadastral register is only available to the tax payer of the parcel, its owner and to the Finance Directorate

Real Property Cadastre:

Parcel Identification Number - NIP:

- 15 digits, distributed by 4 groups;
- 1st group: one digit to locate the parcel inland or in Azores Islands or Madeira Islands;
- 2nd group: six digits that identify the square section prior define where the parcel is located;
- 3rd group: six digits that identify the number of the parcel inside the square section;
- 4th group: two control digits.

The data acquisition process will collect information regarding the person who declares to be the owner of the parcel and also the land registry and tax identifiers. Nevertheless, this information is only available to the person who declares the parcel, the Land Registry, the Finance Directorate and other Public Administration Organisations that are permitted access to this data. When this cadastre is official, this data is saved as historical information and, through the use of the NIP and SiNErGIC web-based platform, users will be able to access different types of information, from different organizations – cadastre, land registry and real estate tax.

All personal data has restricted access.

### 2.3 Plans of the urban units (flats, houses, appartements) – if available

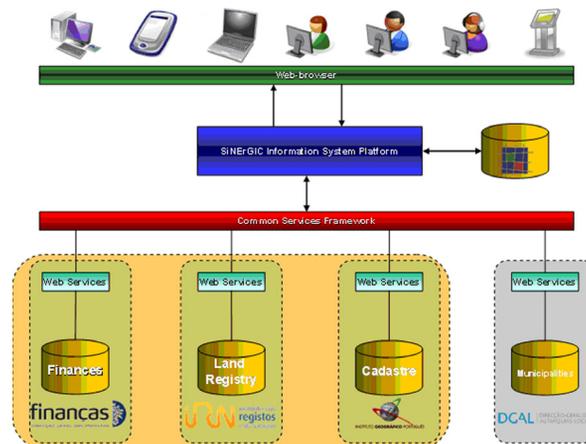
These plans, managed by municipalities, are not currently connected with cadastre, although the SiNErGIC spatial data infrastructure philosophy will permit the entities responsible for these plans to connect with cadastral information layer.

## 3 TECHNOLOGICAL INFRASTRUCTURE

The technological infrastructure is being build and will manage the two types of cadastral systems. The rural property cadastre will rely on a strong interoperability between cadastre and finances due to its fiscal purposes. The real property cadastre has a broader vision and pretends to assure the interoperability between organizations directly related with the real estate market to assure a unique and complete identification and characterization of all parcels with legal value.

It is a distributed system that stores, manages and makes available geo-spatial information regarding parcels. The information results as an outcome of direct cross information gathered in different systems of the main public stakeholders of the real estate market. In a single interface user can access parcel geometry and its physical, legal, economic and fiscal features. Each public stakeholder maintains its system, data and information according to its legal responsibilities. Each user, according to its privileges, is given access to data from the land registry, tax system and cadastre.

**Figure 2. SiNErGIC Technological Infrastructure**



The technological infrastructure is based on SOA, according to the Open Standards used by similar international projects, where functionalities are implemented as distributed services. This approach allows a resource optimization, by the reuse of services, systems and databases of the main public stakeholders, guaranteeing that already existing functionalities are available as web-services and giving the chance to integrate new functionalities and requirements. Clients and services communicate and understand each other, based on shared language with common syntax, semantic and design, through a canonical data model and the use of xml schemas on process and services definition.

The system relies on the follow presupposes: interoperability, availability, security, reliability, scalability and flexibility.

## **4 UPDATING PROCEDURES**

### **4.1 Existing types**

Rural Property Cadastre:

In 1995, it was established by Decree-Law nº 172/95 that this cadastre should be official until there's a real property cadastre acquisition project on the same area. The processes that implicate a change on rural parcels should be sent by the Finance Directorate to IGP which will wait until the real property cadastre acquisition project starts. The only exceptions are the processes considered urgent by the owners, which will be solved immediately, once the owner pays the costs associated with it. Thus, the rural property cadastre is only updated when the owners is willing to do so.

The constant changes that occur in rural parcels due to union or division of parcels, total or partial, sub-parcel land use change, new constructions or enlargement of the existing ones (located in rural parcels) make this cadastral data outdated, as it is only randomly updated. This cadastre is updated by what is designated as Administrative Resolution Process – PRA. It consists on a number of procedures that permit the individual update of a rural parcel.

This process has 6 stages:

- Instruction
- Reception and pre-analysis
- Resolution
- Process Information
- Office analysis
- Conclusion

#### Instruction:

A PRA is established by someone legally directly related with the parcel and is issued to the Municipal Finances Office. In this request form the person explains what are his pretensions, which have to be sustained by a legal document such as deeds, land registry certificate, judiciary verdict, will or others. The law also permits IGP to establish a PRA on behalf of the owner, whenever there is a parcel change found and not made in cadastre.

#### Reception and Pre-analysis:

PRAs are sent to IGP by the Regional Finances Offices, who sequential register the PRA per municipality and per year. Then, the PRA is register at IGP Information System.

Afterward, an IGP technician makes a pre-analysis in order to assure that the process has the necessary conditions to be accepted, namely the legitimacy of the interested parties. If there is any anomaly the process is sent back to the Regional Finances Offices. Otherwise, the process is accepted and remains in IGP until the interested parties request IGP to update the cadastre information.

#### Resolution:

PRA resolution is requested by the interested to IGP, through the internet or physically in any Regional Office. At this time, the pre-analysis report is checked, and the interested is informed of the costs estimated and the necessity of the parcel to be correctively marked. After the PRA is paid, the pre-survey procedures begin. Most of this PRA oblige a topographic work and a redistribution of the sub-parcels, which means the necessity of a field team with survey and land evaluation capabilities.

The field team identifies the parcel in the Cadastre Information System and downloads the necessary information such as parcel geometry, orthophotos and descriptive data. Usually these teams have planned more than a field job per day, which means they have to plan an itinerary. At the field, the team meets with the interested parties. Usually, the first step is to analyse the sub-parcels land use and reclassify them. The second step is to spatial update the parcel, giving priority to the use of GPS-RTK procedures, wherever possible. If there's any problem detected at this time, the process is suspended until the interested parties solve it. The suspension, depending on the problem type, can go until 3 months, with the exception of judiciary verdict. The field team uploads all the work data into the Cadastre Information System, and gives the go-ahead to the next stage.

#### Process Information:

At this stage the responsible for the field team makes a final report where it has to be clear the acceptance of the update and the identification of the legal background that supports the decision,

depending on the update – parcel division, parcel division for urban purposes, area rectification, boundaries rectification, parcel elimination, parcel union, sub-parcel land use change, parcel designation change, parcel charge elimination.

Most of the processes are accepted. The main reasons for the rejection are:

- lack of marks that identify the parcel boundaries;
- Difference between legal and physical parcel area;
- Interested parties litigation;
- Land-use changes;
- Doubts on the interested parties legitimacy to request the update;
- Parcel division request based on public road;
- Parcel update request on a parcel that isn't on rural property cadastre.

Office analysis:

The first step in this stage consists on the quality control of the field work, where all the prior steps are verified. Then the data is finally accepted as official and cadastre register is updated.

Conclusion:

The PRA is sent back to the Regional Finances Directorate, the interested parties are informed and the update data is made available for all.

Real Property Cadastre

The updating procedures in SiNERGIC were designed in order that any real property owner that pretends to spatially update it can make it by web or at a one-stop physical place. Public Administration is responsible for the interoperability between all the institutions with responsibilities on the update.

It's mandatory the use of the Parcel Identification Number (NIP) in all updating procedures, which means that the parcel must be on cadastre in order to be eligible for transactions or spatial changes.

SiNERGIC platform and the update workflows allow, both the owner and the Public Administration, to understand the status of all update procedures undergoing.

Main benefits:

- Owner avoids unnecessary displacements to several Public Institutions in order to update cadastral information, allowing him to start the procedure at home;

- Unchain automatic messages to different Public Institutions originated by a update procedure request;
- The intervention of a licensed cadastral surveyor whenever there's a spatial update request will reduce evaluation terms of municipalities or land registry;
- Increase transparency in real estate market by allowing everyone who's interested to know the parcels situation on-the-fly;
- Allowing the owner to know on-the-fly the status of his update request.

Main simplifications of the update procedures:

- The owner only needs to fill a single digital form, with all the data necessary for the different authorities allowances;
- The owner doesn't need to deliver to the Public Administration documents that already exist in, at least, on of the authorities;
- There's no transmission of physical documents between Public Administration Institutions, due to the use of a interoperable platform which manages the update, notifying each organisation at the appropriate time.

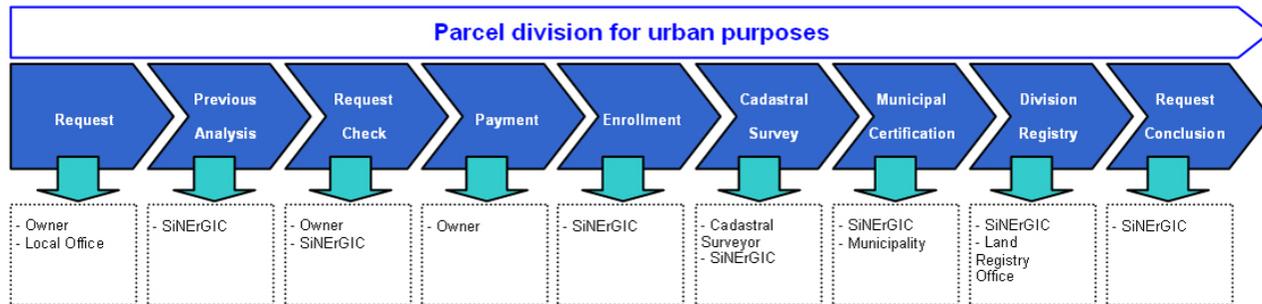
## 4.2 Organisations and persons involved (also involvement of the private sector)

Rural Property Cadastre:

The update procedures involve, for the moment, only public authorities as explained above.

Real Property Cadastre:

Example: parcel division for urban purposes



Organization/Person	Organisation/Person role
Owners	<ul style="list-style-type: none"> <li>• Requests the parcel division for urban purposes, identifies the parcel spatically or by the NIP;</li> <li>• Checks the request update;</li> <li>• Selects the licensed cadastral surveyor;</li> <li>• Fills SiNERGIC form and makes the payment;</li> <li>• Can cancel the update procedure at anytime.</li> </ul>
Local Office	<ul style="list-style-type: none"> <li>• Fills SiNERGIC form, at the owner request, with all necessary data to start the update procedure;</li> <li>• Checks the owner or his legal delegate identification and property right;</li> <li>• Delivers confirmation of all operations made to the owner.</li> </ul>
SiNERGIC platform	<ul style="list-style-type: none"> <li>• Makes cadastral information available for all;</li> <li>• Collects all data given by the owners and gives all necessary information regarding the update procedure;</li> <li>• Automatic Temporary Parcel Identification Number (NIPP) attribution that allows a unique parcel identification during the update request to all organizations;</li> <li>• Assures secure and reliable messages between all directed involved organisations.</li> </ul>
Cadastral Surveyor (private or public)	<ul style="list-style-type: none"> <li>• Working for the owner, a cadastral surveyor analyses on the field the request viability and makes a cadastral field survey;</li> <li>• Uploads cadastral data to SiNERGIC platform allowing other organizations to analyse the update request.</li> </ul>
Municipality	<ul style="list-style-type: none"> <li>• Certifies that the parcel division for urban purposes update fulfills all the legal requires and its jurisdiction.</li> </ul>
Land Registry Office	<ul style="list-style-type: none"> <li>• At any time, can inform SiNERGIC platform that there's a registration made capable of nullify the update request;</li> <li>• Proceeds with the cadastral update request registration adding this information in its system.</li> </ul>

### 4.3 Processes' automation

#### Rural Property Cadastre:

The procedures related with this cadastre are going through a reformulation process in order to be automated. The relation between IGP and Finance Directorate and its Regional and Municipal Offices is going to be web based, without the change of paper documents.

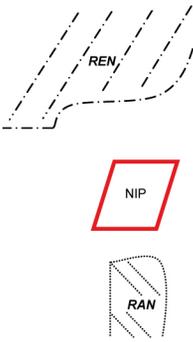
These automations will reduce the duplicate information, allowing cadastre to only manage the parcel and sub-parcel geometry and identification and Finances Directorate to manage the information related with the owner, tax payer and parcel evaluation.

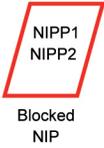
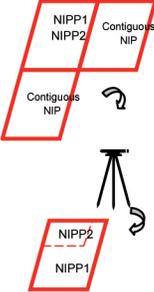
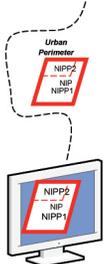
#### Real Property Cadastre:

The use of SiNERGIC platform will be compulsory for whoever needs to search or update cadastre information. The software under these web-based services is being chosen, but the users will not

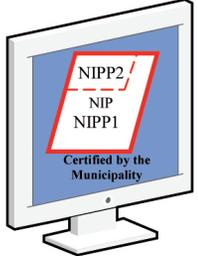
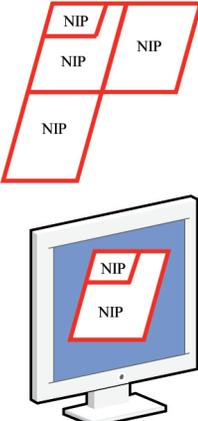
need to have specific software to use this information. The costs of using this platform are being analysed, depending on the business model to be established.

Example: parcel division for urban purposes process

Process step	Description	Example
Request	<ul style="list-style-type: none"> <li>At home, a place with internet access or in a Local Office at least one owner requests a parcel division for urban purposes;</li> <li>Owner logs-in and selects the update procedure, identifying the parcel with the Parcel Identification Number (NIP) or by location;</li> <li>If the access is made by a Local Office, a certified person will help the owner interact with SiNERGIC platform.</li> </ul>	
Previous Analysis	<ul style="list-style-type: none"> <li>SiNERGIC connects on-the-fly with the Land Registry System checking if there wasn't a similar division on the specific parcel in the last 10 years, and spatially intersects the parcel with land-use restrictions layers, such as Agricultural Protected Zones (RAN) or Environment Protected Zones (REN) – pre-conditions for allowing this update request.</li> <li>If it's possible to continue, SiNERGIC makes available to the owner all the information related with request workflow: permissions that are being given by the owner, costs (except the cadastral survey), terms and a list of licensed cadastral surveyors;</li> <li>If there's a restriction to the update request, the owner is informed and the request cancelled.</li> </ul>	
Request Check	<ul style="list-style-type: none"> <li>One owner at least fill the digital form with all the requested data;</li> <li>SiNERGIC checks and stores the data, confirming to reception to the owner;</li> <li>SiNERGIC waits for the permission of all the owner is order to proceed;</li> <li>Owner decides which licensed cadastral surveyor to contract;</li> <li>SiNERGIC informs the owner of the exact request costs (except the cost related with the cadastral survey) and payment form and terms.</li> </ul>	
Payment	<ul style="list-style-type: none"> <li>Owner chooses the payment form;</li> <li>If the payment is not made within the defined term, the request is cancelled.</li> </ul>	

Process step	Description	Example
Enrollment	<ul style="list-style-type: none"> <li>SiNERGIC automatically creates Temporary NIP (NIPP) that will be used during the update process to identify the areas corresponding to the future parcels;</li> <li>SiNERGIC blocks NIP of the original parcel, denying any other attempts of update requests until this one ends;</li> <li>Land Registry can, from this point on, inform SiNERGIC of any registry impediment to the division request;</li> <li>SiNERGIC informs the owners that the NIPP have been created.</li> </ul>	 <p style="text-align: center;">Blocked NIP</p>
Cadastral Survey	<ul style="list-style-type: none"> <li>Licensed Cadastral Surveyor connects with the SiNERGIC platform and identifies the parcel by the NIPP given to the owner;</li> <li>SiNERGIC makes available to the Cadastral Surveyor all the data related to the parcel and its contiguous parcels;</li> <li>Cadastral Surveyor analyses the request and verifies if the division has conditions to be made;</li> <li>If possible, the parcel survey is made and the data is uploaded (GML format) to SiNERGIC platform for validation;</li> <li>SiNERGIC validates and stores the survey data, confirming the reception to the cadastral surveyor and owner;</li> <li>If impracticable, cadastral surveyor informs the owners the reasons and waits for its resolution.</li> </ul>	
Municipal Certification	<ul style="list-style-type: none"> <li>SiNERGIC platform sends an electronic alert to the Municipality in order for them to certify the division request;</li> <li>Municipality analyses the request (example: if the parcel is inside the urban perimeter);</li> <li>If the request is legally accepted, the Municipality certifies the division request through SiNERGIC platform;</li> <li>SiNERGIC platform stores the municipal data and confirms its reception;</li> <li>If the request is rejected, the Municipality informs the owners and the request is finished.</li> </ul>	

## 5 PROVIDED SERVICES

Process step	Description	Example
Division Registry	<ul style="list-style-type: none"> <li>• SiNERGIC platform sends the division registry request to the Land Registration;</li> <li>• Land Registration analyses the request;</li> <li>• If accepted, the Land Registration records the new parcels; with the NIPP as NIP;</li> <li>• SiNERGIC platform stores the data sent by the Land Registraton and confirms its reception;</li> <li>• From this moment, Land Registration may use the former NIPP1 and NIPP2 as the new NIP for each parcel.</li> <li>• If rejected, Land Registration informs the owner its reasons and the request is cancelled.</li> </ul>	
Request Conclusion	<ul style="list-style-type: none"> <li>• If the request is not accepted by any organisation with legal power to do so, SiNERGIC stores in the original parcel the reasons, and informs the owner that the request has been cancelled and the NIPP are eliminated;</li> <li>• If the owner are entitled to a monetary devolution, SiNERGIC platform informs them.</li> <li>• If the request is accepted and finished, SiNERGIC platform makes the NIPP the new parcel NIP, storing the former NIP and the parcels history;</li> <li>• SiNERGIC blocks the permission for another parcel division for urban purposes in the former original parcel for 10 years – only changeable by the Municipality;</li> <li>• SiNERGIC platform informs Finance Directorate that there's been a change in that specific parcel for tax purposes;</li> <li>• SiNERGIC makes available online for all the new parcel structure.</li> </ul>	

### Rural Property Cadastre:

All personal data has restricted access. Besides the update procedure – PRA, rural property cadastre has the following services available.

### Parcel Coordinates:

This service is open to citizens, public administration and professionals and gives exact coordinates of property marks and parcel boundary points. This service can be provided on paper or on html format, and the payment has to be done in IGP Offices or through banking transfer.

Cadastral Elements Certification:

IGP certifies spatial and descriptive data associated with a parcel.

Other Services:

IGP and Municipalities are undergoing a network project in order to make the rural property available for its use by these local services.

IGP also makes available all cadastral maps in paper, raster or vector format.

Costs and payments methods are available at <http://www.igeo.pt/e-IGEO/precario/precario.htm>.

Real Property Cadastre:

The services are under development.

## **6 LINKS BETWEEN CADASTRE AND LAND REGISTRY**

Land registry gives publicity to the parcels legal situation, in order to have a secure juridical real estate market. In other words, through the information given by the registry, with special regard to the buyers, anyone can know the parcel constitution, who owns it and what type of charges fall upon it.

Based on a register of deeds, since the beginning of 2009 the deeds are not mandatory and can be substituted, in specific conditions, by what is legal designated as authenticated particular document.

Cadastre and land registry are in different organizations that are working very closely in order to implement the real property cadastre. As previous described the information will be in distinct databases that interoperate by SiNErGIC platform.

One of the first decisions to contribute to facilitate real property cadastre, taken in the fall of 2008, was to make the land registry mandatory for all parcels.

IGP and Notary and Registry Institute are working in order to have a one to one relation between parcel and a land registration, with a unique parcel identification number. The main aim is that every spatial change in a parcel must start on SiNErGIC and must always be confirmed by the Land Registry.

## **7 LINKS BETWEEN CADASTRE AND REAL ESTATE EVALUATION**

System / real estate taxes:

The rural property cadastre exists mainly for real estate evaluation and there's a direct connection with the Finance Directorate for this purpose.

Tax types on land property:

- Municipal Tax on Real Estates – managed and collected by Finance Directorate that distributes it by the municipalities.
- Real Estate Transaction Tax – managed and collected by Finance Directorate, partially distributed with the municipalities.
- Stamp Tax – managed and collected by Finance Directorate associated with the real estate transaction.
- Succession or donation Tax – managed and collected by Finance Directorate associated with real estate owners change.
- Special Real Estate Taxes - managed and collected by Finance Directorate, it occurs on specific real estate locations, namely on municipalities that directly benefit from large public investments.
- Registration Tax – managed and collected by the land registry when there's a registration request.
- Real Estate Construction or Plan Tax – managed and collected by the municipalities when someone requests a permit to construct buildings or an urban development plan.

The main land property tax is the Municipal Tax on Real Estates. It's a tax that falls upon the tributary patrimonial value of the parcel (urban, rural or both) located in Portugal. This value is obtained by evaluation of the parcel depending on its type.

If rural, this value is determined based on cadastral information where it exists and it corresponds to the product of its agrarian income by a factor of 20. This income corresponds to the balance of a culture annual account where the credit is represented by the total income and the debt by the exploration cost defined by law.

If urban, the value is obtained by an evaluation formula that corresponds to the product of the following items: base value for parcels that correspond to buildings, construction and implementation area, affecting coefficient, localization coefficient, quality and comfort coefficient and age coefficient.

The rural property cadastre is used by the Finance Directorate on direct evaluation of this type parcels. Wherever there's no cadastral data, specifically on urban areas, the Finance Directorate make valuations based on zoning areas associated with census areas.

The value of the property is not stored in the cadastre, but the information is available with strong restrictions by the Finance Directorate.