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1. Introduction

The Estonian Land Board (ELB) is responsible for the maintenance of the Land Cadastre, co-ordination of land reform, supervision, organisation and co-ordination of the activities in the fields of land consolidation, land assessment, geodesy, cartography and geoinformatics according to valid legal acts in Estonia. ELB is a government agency under the jurisdiction of the Ministry of the Environment and the costs in connection with the Board's activities are financed from state budget. ELB employs today 230 people and the total budget for 2001 is equivalent to 5.2 million Euros.

The present report is concentrating on the Land Board's activities in the fields of geodesy, cartography and geoinformatics as well as on other aforementioned activities which handle spatial data. The following ELB’s departments and bureaus under these are directly involved in managing spatial data:

- Department of Geodesy and Geoinformatics, Bureaus of Geodesy, Cartography, Geoinformatics, Technical Supervision and Archives of Geodedical and Cartographical data;
- Department of Land Cadastre, Bureaus of Central Land Cadastre, Cadastral Map, Real Estate Valuation, Central Land Cadastre Archive and Local Cadastral Offices in all counties (in total 15 counties).

The main tasks of these departments are to supervise, organise and co-ordinate the activities with the aim of providing the society with high-quality services in the related fields. The Department of Geodesy and Geoinformatics maintains several spatial databases (geodetic network, topographic maps, special maps) but it has very little production capabilities and majority of the works (building and measuring of geodetic networks, cartographic production, software development) are outsourced. The Department of Land Cadastre registers land and maintains Land Cadastre, all actual land surveying works are carried out by private surveyors or companies at landowners own expense.

For providing these services ELB uses modern technology. ELB owns a set of high-precision GPS instruments (Ashtec) and analytic (Leica) as well as soft photogrammetric (LH Socet Set, with aerophotoscanner) stations, which are given to subcontractors for performing works ordered from them. ELB’s main building and local offices are connected via Virtual Private Network (VPN), which is built on governmental Wide Area Network (WAN). The main database platform is from Oracle with Spatial Option and GIS software from Intergraph (GeoMedia, GeoMedia Pro and GeoMedia Web Map Enterprise). The central office as well as all local cadastral offices are equipped with A1/A0 inkjet plotters to produce cadastral maps on demand. ELB also owns wide photoplotter (Scantext Largo) for making different photographic products (orthophotos, printing originals).
Cadastral Information System (CIS) now manages in an integrated way both textual and map data. Since the end of the year 2000, free public access to the textual part of the cadastral database covering the whole country has been provided via ELB’s home pages (http://www.maaamet.ee, the interface is only in the Estonian language at the moment). Since July 2001, access to the cadastral maps for 9 counties has been added to the service with plans to have full coverage (15 counties) by the end of the year. This public service includes almost all large scale digital spatial data available from ELB as backdrop maps (raster and vector maps, orthophotos), so everybody can use these pages also just as an Estonian web atlas. The service has experienced an average load of 30 thousand hits per day during the two months it has been active. Besides the public service described targeted service for registered surveyors has been set up. Surveyors have access to the geodetic network data, they can register their planned works and they can see other surveyors’ registered works via web. Some other services are under development and testing right now, including Web Map Service and spatial data interchange using XML/GML standards.

ELB cooperates with many national and international institutions and organisations within the scope of the related fields. National bodies include the Ministry of Justice (real-time link between the Land Cadastre and the Title Book), the Ministry of Agriculture, the Army Headquarters, and the Border Guard. Real-time link with the Buildings Register is at the testing phase at the moment. Cooperation, started in 2001 with nationwide utilities companies like the Estonian Energy and the Estonian Telephone, is beneficial for both parties. Utility companies get up-to-date map and property boundaries information and ELB gets information about utilities’ networks as restrictions to cadastre as well as for map data production.

ELB’s international cooperation include bilateral, regional as well all pan-European contacts:

- Bilateral with the National Land Survey of Finland, the Finnish Geodetic Institute, the National Survey and Cadastre of Denmark;
- Regional: within the framework of the Baltic Council of Ministers, MapBSR (Digital Map of the Baltic Sea Region) Project;
- Pan-European: ELB has been a partner in several EU PHARE projects, the aims of which have been accelerating the land reform and setting up cadastral and land information systems. ELB was an active member of CERCO. ELB has been granted a role of the Baltic Sub-regional Coordinator in EuroGeographic’s EuroGlobalMap Project. As a governmental body, ELB had to wait for the approval from the Estonian Government to join EuroGeographics as an active member, which now has been granted.

2. Cartography

Cartography has been one of the main activities of the Land Board since the establishment of the agency. In the field of cartography ELB is responsible for the organisation of national topographic databases and maps. Also the production of national thematic maps falls within the cognisance of ELB.

In the field of cartography the Land Board has the following tasks:
• Strategic planning of map production;
• Development of guidelines and specifications;
• Outsourcing of mapping works, i.e. organisation of public procurement;
• Contract management;
• Quality control of cartographic works and produced spatial data;
• Dissemination of spatial data.

The copyright and ownership of data and publications produced by order of the agency belong to the Estonian Land Board.

2.1 General Overview of Mapping Projects

The Land Board is engaged in the following mapping projects:
• Estonian Basic Map – topographic digital database 1:10 000;
• Estonian Base Map – GI digital database 1:50 000;
• Estonian Soil Map – GI digital database 1:10 000;
• Maps of urban areas – topographic digital databases 1:2000;
• Thematic maps – different thematic maps both as digital databases and paper maps;
• MapBSR - digital database 1:1000 000 produced in international co-operation between the states inside Baltic Sea catchment area;
• EuroGlobalMap – digital database 1:1000 000 for the whole Europe produced under EuroGeographics conforming to GlobalMap specifications.

In addition to organising the production of maps, ELB is participating in the development of GI standards for Estonian society.

2.2 Estonian Basic Map 1:10 000

The Estonian Basic Map is a seamless digital topographic database covering the whole territory of Estonia, which contains information on utilities (roads, electric power lines, etc.), settlement, hydrography, relief, place names and land use. The accuracy and content corresponds to the mapping scale of 1:10 000. The used projection is LAMBERT-EST. Digital data are in MicroStation DGN format.

The fundamentals of the Estonian Basic Map Project were developed and approved in 1991. As source materials are used aerial photographs, fieldwork materials, existing cartographic and statistic data. Contractors are chosen through public tendering procedure.

The project provides users with the products described as follows.
• Digital orthophotos 1:10 000.

The majority of orthophotos have been produced on the basis of aerial photography made within the Basic Map Project in the years 1991-2000. Digital orthophotos have been made by two methods:
- Up to 1996 by scanning analog orthophotos;
- Since 1996 directly in digital form.

Estonia is covered by 2050 tiles of 5 by 5 km. By the end of 2001 the whole territory of Estonia will be covered by new orthophotos (Figure 2.1). For 2002 it is planned, in co-operation with the Estonian Agricultural Registers and Information Board and with funding provided by EU PHARE program, to perform new aerial photography and to produce new orthophotos for areas where these were originally made using analog methods (23,000 km²).

- Digital vector and raster map 1:10 000.

The vector map will be completed as a result of stereomapping and digital processing of already available information, or of information that is collected during fieldwork. The digital vector map consists of aforementioned tiles, which include 3-4 files each with different information in DGN format. All already completed vector maps contain a file with topographic information (points, lines, texts) and a map frame file (frames, coordinate grids, frame texts). Since 1999 a file with closed areas has been included too.

Mainly considering the needs of the land cadastre, ELB has produced from the vector map also a raster map (black-and-white, TIFF or CIT format).

By the end of 2001, 67% of the territory to be digitally mapped in the framework of the Basic Map Project will be completed (Figures 2.2 and 2.3). The digital map covering the whole Estonia is expected to be ready by the end of 2002.
• Printed paper map 1:20 000.

The first Basic Map sheets that were produced by manual technology were printed in 1994. The production has been fully digital since 1996. As the works above, ELB procures via public tendering also compilation and publishing of printed maps from mapping companies. The publisher is responsible for the following works:

- Generalisation of data from the scale 1:10 000 to 1:20 000;
- Adding of height contour lines;
- Editing of geographic names;
- Editing map layout to make the information on map correct and readable;
- Preparations for printing and organisation of printing.

Figure 2.2. Digital Basic Map Coverage

In 1997 a strategic decision was made on concentrating resources to complete orthophoto
and vector database coverage and to produce printed maps only over areas where there is the highest demand. By the end of 2001 altogether 80 sheets of the Estonian Basic Map will have been printed (Figure 2.4). Plotter maps are available from the digital data where it is completed.

![Figure 2.3. Basic Map Production Capacity](image1)

![Figure 2.4. Printed Basic Map Coverage](image2)

### 2.3 Estonian Base Map 1:50 000

The aim of the Base Map Project was to produce in short time a digital map containing the main spatial data of Estonia using SPOT satellite data as a source. The accuracy and content corresponds to the scale 1:50 000. The Base Map contains so called “base
information” about the Estonian territory, which can be used for creation of geographic information systems and production of thematic maps. The Base Map is in TM-BALT1 projection (Transverse Mercator Baltic, common TM projection for the Baltic countries). Digital maps of similar aim, content and design are produced also in Latvia and Lithuania.

The international project started in 1993 and the digital database was completed in 1996, the last sheets of paper map were printed in 1998. SPOT images (orthorectified panchromatic and multispectral data as well as plots on film and paper) and some equipment for all Baltic States were provided by Sweden as technical aid.

In the production of the Base Map ArcInfo GIS software was used. After completion the map has been converted also to MicroStation and MapInfo formats.

The Base Map database is distributed first of all to state agencies, local governments and research establishments for whom it is free of charge. It is planned to extend the database to make it correspond to the content of a topographic map. The Base Map has already been used in the Estonian Defence Mapping Project at the scale 1:50 000 corresponding to NATO standards, in CORINE Land Cover Project, in the digital textbook “Estonian Geography for Schools” developed by the Institute of Geography of Tartu University.

2.4 Estonian Soil Map 1:10 000 and Maps of Land Value Zones

The digital map was produced at the scale 1:10 000 in the coordinate system of L-EST, as backdrops were used the sheets of cadastral map in raster form (50x50 cm). The map was compiled on the basis of soil maps of former collective and state farms and forest districts. The available maps at the scale 1:5000 were reduced and generalised to correspond the scale 1:10 000.

Graphic data, i.e. the digital soil map, is in DGN format and the soil database in MS Access. The designed GIS-interface allows different queries, calculations of soil areas according to soil properties, making of soil explications, etc. ELB mostly needs the Estonian Soil Map for land valuation purposes. The project was initiated in 1997 and the works were outsourced through public tendering. To date maps and data cover the whole Estonia except the land of towns and settlements, the total covered area is 43300 km².

Maps of value zones are compiled for rural municipalities, towns and settlements. In rural areas the maps include soil quality zones, which are mainly formed on the basis of Soil Map of soils of the same fertility. The indicator of fertility in zone is the productivity (value) of arable land expressed in grades. In addition, the maps include value zones of yard land, in which the value level is expressed by the value of unimproved residential land in kr/m². In urban areas (towns and settlements) only value zones are depicted on the map. Maps of value zones serve as basis for land assessment. For the first time maps of value zones were manually compiled for the land assessment of 1996. For the ongoing round of assessment (2001) the maps of value zones are created digitally (DGN format). The database containing data of value and soil quality zones was created as a part of the Transactions and Valuation Register already in 1999.
2.5 Maps of Urban Areas 1:2000

The Land Board has produced topographic digital city maps at the scale of 1:2000 mainly for the needs of the land cadastre.

These maps are in the same co-ordinate system as the Basic Map (Lambert-EST). The following products are made:
- Digital orthophotos 1:2000;
- Vector maps digitised by analytic photogrammetric method.

In 2001 the Land Board organised the production of orthophotos for 30 urban areas, totally 200 km².

2.6 Models of Spatial Data

The aim of the project is to create preconditions for maintaining spatial data of different Estonian state registers and databases in the same system and allowing cross-reference between them.

For Estonian spatial data three models will be created: reality-, data- and presentation models that must set uniform requirements both for producers and consumers.

The models will be developed in co-operation with the Institute of Geography of Tartu University. In 1999, in the first stage of the project, a detailed analysis of current situation and a preliminary list of features were compiled. In 2000, i.e. in the second stage, the principles for creation of models were defined.

In 2001, in the third stage, the reality model for the Estonian National Topographic Database (ENTD) will be created.

ENTD is the Land Board’s GIS-database that contains topographic data collected during basic mapping. Furthermore, GIS-database will contain features causing restrictions to cadastral units and the extent of restrictions (restriction zones).

Thus, the reality model of ENTD contains features that can be distinguished on the Basic Map, or features causing restrictions according to legislative acts. At the same time the present catalogue does not for the time being treat the areas with valid restrictions (e.g. restriction and protection zones) as separate features.

The reality model of ENTD complies with ISO 15046/10 standard and contains the following information:
- Name of feature in Estonian and its English equivalent;
- Shortened name of feature;
- Is it a feature causing restrictions?
- Code of feature;
- Basic Map code of feature;
- Definition of feature;
3. Geodesy

In the field of geodesy the Land Board is responsible for the planning and co-ordination of works necessary for the development of national and local networks as well as for the creation of geodetic database.

In the possession of ELB there are a great number of data, the majority of them being reports of geodetic works maintained as hard copies (catalogues of coordinates and heights, schemes of traverse and levelling lines, technical reports). Computerised information dates back to the beginning of 1990ies, when the establishment of national geodetic network was started. This information includes mainly measurement results; in the last couple of years also sketches and general schemes of networks have been digitally stored.

In the field of geodesy there is close co-operation with the Finnish Geodetic Institute, the National Survey and Cadastre of Denmark and the Committee of Senior Officials on Geodesy, Cartography and Land Reform of the Baltic Council of Ministers. Estonia has also participated in the measuring campaigns organised by EUREF as well as in annual symposiums. Reports on gravimetry have been presented at several conferences.

Future priorities in the field of geodesy are connected with the maintenance of geodetic database and design of permanent GPS network.

Overview of geodetic works:

Currently the following projects are ongoing:
- Establishment of third order horizontal network (densification network) on the islands of West-Estonia;
- Improvement of local networks;
- Improvement of vertical network;
- Densification of gravimetric network;
- Completing the geodetic database.

In addition, two projects have been completed:
- Reconnaissance and coordination of the Struve Geodetic Arc;
- Re-measuring of calibration baseline in Vääna test field.

3.1 Third Order Horizontal Network (Densification Network)

So far densification networks have been established on 41 260 km² of Estonia’s mainland the total number of points being 4341. The establishment and re-adjustment of
densification networks on the mainland of Estonia has been completed. For the readjustment it was necessary to measure additionally vectors at the borders of different objects. As the result of the final adjustment the points of densification network were provided with coordinates in L-EST coordinate system. As densification networks have been established at different times, the quality control of the third order horizontal network was performed. To check the network and determine its real accuracy, distances between points in pair were measured with electro-optical distance meters (approximately 100 points in pair). The RMS is ± 1…3 cm and the relative error for point pairs is 1:250 000 and between points in pair 1:50 000.

Currently the establishment of densification network is continued on the islands of West-Estonia, where 4250 km² are under construction. The establishment of densification networks in Estonia should be completed by the end of 2001. After the completion the total number of points included in the densification network will be about 4900.

![Figure 3.1. First, Second and Third Order Horizontal Network (by the end of 2001)](image)

### 3.2 Local Geodetic Network

For the time being local geodetic networks have been established in 8 towns and settlements. In connection with transferring to the uniform cadastral information system, it is necessary to transform the existing local networks to the national coordinate system. This work was started in 2000, when transformation parameters were determined and coordinates recalculated for local networks in 41 towns and settlements.
In 2001 these works have been continuing and the local geodetic networks of another 46 settlements are being transformed into L-EST coordinate system. A more profound establishment and improvement of local networks will be started in 2002.

3.3 Vertical Network

This year the inspection of first order height network was started and the reconstruction of 68.1 km of levelling lines was carried out. Connection of points of first and second order horizontal network to the national vertical network will also be started.

3.4 Gravimetric Network

The main activities in 2000-2001 included checking, correcting and digitising of gravimetric data measured in Estonia in the years 1949-1998. In 2000 new values were calculated for the points of first, second and third order gravimetric network. In 2001 densification of the gravimetric network was started with LaCoste&Romberg gravity meters. The project will continue also in 2002. Re-measurements will be made on the points of first and second order gravimetric network. Future plans include the determination of gravity on the points of first and second order national geodetic network and vertical network.

3.5 Geodetic Database

In 2000 the design and installation of Internet interface for the geodetic database (Volts) was completed in the framework of cooperation between ELB and the National Survey and Cadastre of Denmark (KMS). Volts is a WEB-based program for the establishment of public access to data via Internet, and it is based on the Informix database. Both Volts and the Informix database are the results of the long-term cooperation between ELB and KMS. The adjustment of Volts (from Valdemar, similar program developed in KMS) into Estonian conditions was started in the autumn of 1999; it was followed by a visit of the Land Board’s and Estonian Map Centre Ltd. (subcontractor) specialists to Denmark in the spring of 2000 with the aim of studying the final version. In December 2000, the final version of Volts was installed in Estonia by Danish specialists.

In December 2000 ELB, Estonian Map Centre and KMS conducted a study course on EstGeo Database, which treated the design and functionality of the database as well as the data processing software. In April 2001 the course was followed up by training in Denmark, which concentrated on the theoretical principles of databases.

Further work related to databases includes the analysis of the structure and functionality of the existing databases, checking of the existing data, formatting of data for input, analysis and digitising of point sketches.

3.6 Reconnaissance and Coordination of the Struve Geodetic Arc

International Institution for the History of Surveying & Measurement under FIG has initiated a campaign to include the preserved points of the Struve Meridian Arc in the UNESCO World Heritage List.
The intention was to include in the List 2-3 points from every country the Struve Arc was passing through. In Estonia there are 22 points of which we recommended to include in the List the Tartu Observatory and the end stations of base line situated in Simuna, Lääne-Viru county.

The initial point in the Tartu Observatory was situated at the centre of the observatory's cupola. The NW end station of Simuna (Katko) - Võivere base line is monumented with a 1.15-m high granite obelisk under which the marker is situated. Up to now it was thought that the marker of SO end station in Võivere had been destroyed, but it was found with the help of instrument measurements. The marker is a big granite stone with a bored hole at the centre.

The coordinates of all three points were determined by GPS and terrestrial measurements and forwarded to the representatives of FIG.

### 3.7 Re-measuring of Calibration Baseline in Vääna Test Field

In October 2000 the calibration baseline in Vääna test field was re-measured in cooperation with the Finnish Geodetic Institute. The length of baseline is 1680 m and it has 7 stable observation pillars, which divide the baseline into sections of different length (24 m, 96 m, 192 m and 384 m). The baseline was measured in all combinations, which resulted in the total length of baseline and distances between pillars and ground benchmarks. All measurement and calibration data were forwarded to the Land Board, and the Finnish Geodetic Institute issued a Certificate of Calibration of the Vääna baseline.

### 3.8 International Cooperation

#### Within the Baltic Council of Ministers
- Further development of the permanent GPS network. (Preparation of the project of the permanent GPS network in the Baltic countries).
- Connection of national levelling networks. (Completion of the project and development of basic requirements for the high precision levelling network of the Baltic countries).
- Improvement of gravimetric networks and geoid. (Connection of gravimetric networks, creation of databases including a uniform format for data exchange, improvement of local and joint geoid of the Baltic area).

#### With the Finnish Geodetic Institute
- Scientific cooperation (development of measuring and analysis methods for gravimetric measurements in Estonia, compilation of Finnish-Estonian gravimetric map, Calculation of Finnish-Estonian gravimetric geoid, research of the land uplift in Southern Finland and Northern Estonia and compilation of Finnish-Estonian land uplift map).
- Consultations (Estonian geodetic networks (horizontal, vertical, gravimetric), Estonian permanent GPS network, development of the Estonian tide gauge network and on analysis of observation data, digital photogrammetry, geodetic and cartographic databases).
Training of staff (supervision of Estonian postgraduate students, training of Estonian specialists in the field of geodesy, photogrammetry and cartography).

Technical assistance (gravimetric absolute measurements, connection of Finnish and Estonian gravimetric networks, calibration of levelling rods, re-measuring of calibration baseline in Vääna test field).

With the National Survey and Cadastre of Denmark


4. Geoinformatics

The year 2001 may be regarded as a major milestone in the development process of (geo)information systems at the Estonian Land Board. The Cadastral Information System (CIS) Project is at its final stage and new development projects have been initiated. Main goals are to develop different public services by creating links between different databases and registers. One of the priorities is also the creation of the Estonian National Topographic Database (ENTD) that together with CIS forms a basis for the National Land Information System.

4.1 Cadastral Information System.

The new Cadastral Information System was completed in the spring of 2001 and will be implemented to the county cadastral offices during this year. New Intergraph Geomedia 4 product family software was acquired. CIS constitutes one part of the Estonian National Land Information System (NLIS) and consists of Land Register (i.e. the Estonian name for cadastral register), cadastral maps and archive. CIS can be divided into two parts based on its technological architecture:

1. Data Registration Application - tool for data registration (LAN-WAN application)
   - Alphanumerical data registration
   - Spatial data registration
   - Management Information (LAN-WAN-Intranet)
   - Summaries and views of alphanumerical data
   - Maps (Thematic maps)

2. Public Services System (WEB application)
   - Output task for land surveyor
   - Land information system for public user
   - Cadastral unit (CU) data for public user.

4.2 Data Registration Application

The main feature of the new CIS is integrated alphanumerical and GIS data and functionality (Figure 4.1). Integration of different data and development of registration
tools for different types of data was one of the major tasks in 2001 in the fields of cadastrre, IT and GIS. Graphical data of cadastral and administrative boundaries were reviewed and transferred into a central database covering the whole Estonia. As a result a dataset was formed that would serve as basis for the cadastral index map in the Public Service System and for the development of the map of administrative boundaries. Both alphanumerical and spatial data are stored in Oracle Database (spatial data in Oracle Spatial Cartridge) and data have been consolidated into a central register. Thanks to the central database, data quality checks and procedures are now more efficient and easier to conduct. Special tools were developed for quality checks and spatial analysis. In addition to that, a central management of classifiers is now possible. The main advantage of one central database is the possibility to query both spatial and alphanumerical data using SQL, which provided us with the basis for developing different public services. To avoid possible network problems, local offices work with local copies of the central database with replication time (time when changes are transferred into the central database and vice versa) set to two hours. The system is set up in such a way that it does not depend on administrative division, i.e. one county cadastral office is able to serve some other region when needed.

![Cadastral Data Registration System – GIS Tools](image)

**4.3 Public Services System**

The Public Service System is a tool for achieving one of ELB’s main objectives, i.e. to provide the society with land related information. It also enables public access to spatial data maintained by ELB. The Public Service System is a group of services based on the Land Board's datasets and map server and offered via Internet. Internet map server is based on Intergraph Geomedia Web Enterprise 4 technology.
Besides the services already implemented several new services are under development and testing:

- Universal Presentation Service (UPS) will enable users to integrate LIS data into their own applications using OpenGIS WMS (Web Map Service) protocol.
- Universal Registration Service (URS) will enable users to store their own data into LIS.
- Universal Information Service (UIS) will serve spatial data using standard XML-GML format;
- Universal Extraction or Printing Service (UES/UPS) gives possibility to get formatted data with defined layers, symbols, output format (DGN, MIF/MID, ESRI shape), etc. over defined area.
- Universal Catalog Service (UCS).

![Figure 4.2. Surveying Extract – Vicinity Map of the Planned Surveying Works](image)

**4.3.1 Output Task for Land Surveyor**

Before land surveying the surveyor can look at the maps, geodetic information and cadastral data of the area he is interested in via Internet and he can print out a surveying extract (Figure 4.2). The land surveyor can view the surveyed boundaries of cadastral
units, administrative boundaries and use orthophotos and the Basic Map in raster format or other topographic maps as backdrops. The data of geodetic points make a special layer on the map. Furthermore, it is possible to make queries by the designation numbers of cadastral units or geodetic point numbers. This service is designed for a certain group of users like land surveyors, local municipality officials, etc. and therefore is not available for the public.

**Figure 4.3. Land Information Service and CU Data Service Web pages**

### 4.3.2 Land Information Service for Public User

The Land Information Service is available for everyone and designed especially for the public. Everyone can use this service free of charge. For users the service is a web map application (Figure 4.3). Using navigation tools it is possible to see administrative boundaries and the Estonian Base Map at the scale 1:50 000 as a topographic background map. Zooming further the user can choose for displaying either the Estonian Basic Map or digital orthophotos, both at the scale 1: 10 000. Also the cadastral and geodetic information is available. It is possible to display on the screen geodetic points and the parcel boundary layer, and by clicking in the point or parcel the alphanumerical information is displayed in a pop-up window or as a tool tip. The service is accessible through the Land Board’s home page [http://www.maaamet.ee/teenus/maainfo.php](http://www.maaamet.ee/teenus/maainfo.php)

### 4.3.3 Cadastral Unit (CU) Data for Public User

CU Data Service is also designed for public usage and is free of charge. Using different queries it is possible to get alphanumeric data from the cadastre. The service is suitable in cases when graphical cadastral data are of no interest. The service is accessible through the Land Board’s home page [http://www.maaamet.ee/teenus/kiirp2ring.php](http://www.maaamet.ee/teenus/kiirp2ring.php) It is also possible to query information by mobile phone using WAP protocol, the address is wap.maaamet.ee/ky.