

Jan Bareš , Jiří Ěšek
Institute of Municipal Informatics of capital Prague
Praha 2, Vyšehradská57, 128 00
JanB@imip.mepnet.cz, JiriC@imip.mepnet.cz

Spatial information management in the Czech Republic

The Czech Government accepted the decision no. 525 of May 1999, the Action Plan for State Information Policy Realization, and also the decision of October 1999 – the concepts for building the State Information System for the public administration. These documents have relation to the act No. 272/1996 – Information Systems for Public Administration. On the top level, the Office for the State Information System was grounded, and the Government Councilor for the State Information Policy.

The action plan will finish in August 2000. The goal is to coordinate the State Information Policy together with the corresponding program of the European Union. The important base for this coordination is the standardization, therefore the Office for the State Information System was created. It publishes the standards of the State Information System of Czech Republic since the year 1995.

One of the most important issues is the standard for spatial identification. The purpose of this issue is to unify the interchange format for data transfer between digital cadastral map and the digital technical map of the cities.

The Enhanced Information System of the Cadastre of Real Estates of the Czech Republic (Enhanced Cadastre) is nowadays the key development project of the Czech Office for Surveying, Mapping and Cadastre (COSMC). The most important tasks of the branch of the COSMC are associated with the state administration of the Cadastre of the Real Estates of the Czech Republic (CRE). The CRE is probably almost unique in the Europe for the fact that it comprises both cadastre (a technical mean) and land registry (a legal part) according a new cadastral legislation since 1.1.1993. Entry into CRE is based on the decision of Cadastre Office and new factual rights come into full force only after the entry into CRE is made. There is another type of registration into the CRE - record - when ownership and other factual rights are changed by the decision of court or other state administration bodies (heritage cases, restitution cases, results of land consolidation projects, etc.). Cadastral Offices in cases of records just check the technical correctness of documents. The long-term strategy of re-establishment of the Czech Cadastre was prepared in 1993. The Government of the Czech Republic (Decision 312, 16th June 1993) supports the conception of CRE. It involves the establishment of procedural regulations and infrastructure, and the establishment of the cadastre based on the two components of the Descriptive Information Files (legal and administrative part) and the Survey Information Files (map based description and cadastral map data).

The aims of the program may be briefly summarized as follows:

- Establishment of the necessary legal and regulatory framework.
- Procurement of the basic IT equipment for Cadastral Offices as a pre-requisite for the other tasks (1992-1994).
- Completion (data conversion) of the Descriptive Information Files at all cadastral offices. (1994-1998)
- Project of the Enhanced Information System of the CRE (1997-2000).
- Program of control densification to allow new surveys to be tied to the national geodetic framework (1994-2000).
- Project of data conversion of the Survey Information Files (SIF) into the Digital Cadastral Maps at all Cadastral Offices (1994-2006)
- Program to support interaction with administrators of other components of the State Information System. (from 1998)
- Resumption of the new cadastral mapping project (after 2000)

The completion of the databases of Descriptive Information Files (DIF) was the most important and demanded by the whole society, as the DIF play the crucial role for the security

of titles, for taxation system, for land market etc. This project had progressed quite well and was accomplished successfully by the end of 1998.

Central Data Base of CRE	Number of records in millions by 31.12.						
	1992	1993	1994	1995	1996	1997	1998
Total number of records	29,1	32,1	38,1	45,9	53,5	64,8	78,4
from it about parcels	12,7	14,0	15,5	17,3	18,9	20,4	21,0
Owners	15,1	15,4	16,0	16,5	16,9	17,6	18,0
legal relations	1,3	2,7	6,6	12,1	17,7	23,9	27,9

State budget and Phare ensured the purchase and installation of Local Area Networks (LAN) and network management software within the district cadastral offices. These systems are able to manage the basic land ownership information and support the data conversion into the Descriptive Information File component of the Cadastre of Real Estates. There is also the Central Database of DIF, located in Land Survey Office, the historically the first one (origins in 1976), from which the systems of local databases had to be derived.

The architecture and design of Enhanced Cadastre has been determined after the thorough assessment of several possible solutions. Not only cadastral bodies, but also relevant ministries were addressed during these stages and possible solutions were discussed with them.

The reasons for the optimal solution in Czech conditions, can be summarized as follows:

- the most of demands at the local level can be satisfied from the local databases – minimizing of the traffic on the Net,
- the pure central or distributed solutions are very vulnerable and increase the demands on the traffic on the Net,
- the central data base will be updated in the real time and will serve as the only point of connection with remote users – security reasons,
- as the graphical data (of Digital Cadastral Maps) will be stored also in the relational data base form, this solution enables to store all graphical data at central level, too – affordable demands on the traffic on the Net for updating of graphical data,
- The central database will serve as the means of data exchange with the other state administration bodies (register of inhabitants, companies, etc.),
- The central database will serve as back up for local databases and vice versa.

The basic, most important features of the Enhanced Cadastre are as follows:

- a sufficient capacity for the increase of volume of cadastral data, ensuing mainly from ongoing digitizing of cadastral maps,
- a full integration of Descriptive Information Format (DIF), Survey Information Files (SIF) and other parts of cadastral documentation; even graphical data will be stored in database environment,
- a full compliance of data structure of Enhanced Cadastre with National Standards of State Information System,
- a smooth mutual data exchange with other relevant registers of the State Information System,
- the central data base will be the only point of connection for remote clients and via the central data base country wide search and provision of cadastral information from the whole territory of the Czech Republic will be possible;
- The environment for remote access of clients to cadastral data is Internet.

The Enhanced Cadastre is based, with the only exception of different hardware for the central system and local workplaces, on the unified technology tools for both levels:

- Oracle Enterprise Edition with Oracle Spatial Data Cartridge as a database engine,

- Oracle Application Server for the presentation on the Web,
- Bentley MicroStation SE, GeoOutlook and PowerScope as tools for different level of work with graphical data,
- Wintel platform (Intel based application and database servers and workstations with Windows NT operating system) for the local level of cadastral offices.

The project of Enhanced Cadastre started in July 1997. Nowadays, the application software of Enhanced Cadastre has been tested intensively at 13 pilot and test workplaces. As the technology infrastructure of the Enhanced Cadastre is concerned, all parts were contracted and installed, at least partially (at some cadastral workplaces). All remaining parts will be installed by the end of June 2000 at latest.

According to the current time schedule of the Enhanced Cadastre project – the realistic one – the commencement of the rollout is planned in the beginning of June 2000. There will be three more versions of the application software of the Enhanced Cadastre before the rollout. The rollout will take place in nine waves of 10 – 15 workplaces till the end of October 2000. The trial partial run of the remote access services will start in August 2000.

Adjacent activities:

As the result of PHARE conclusion, cooperation of experts from Netherlands cadastre and specialist from the branch of Czech Office of Surveying, Mapping and Cadastre, as well as from the ministries, universities and professional groups, the NEMOFORUM group was found in October 1999. The main role of this NEMOFORUM is the cooperation of the members to support the coordination of solution related to the parcels and buildings in the continuity to the needs of the administration and development of the area, together with the information services. At present, the members of the NEMOFORUM prepare in four commissions the recommendations for the optimization of the content and services of the Enhanced Cadastre Information System.

In June 1997, CAGI – The Czech Association for Geo Information was established. The main sense of this association is:

- Creation of the conditions for further development of spatial oriented information systems and wide use of geoinformation
- The exchange of information and skills between the members of the association
- Formulation of common interests and standpoints
- Elaboration of the projects, suggestions and studies for development support of spatial oriented systems
- Czech geoinformation community representation faced to the state administration bodies
- Consultation and expert activities for the State Information System
- Ensuring of the international contacts in the relation to the European and World organizations, mainly to the European Umbrella Organization for geographical Information – EUROGI

Practical connection of the CRE and the Urban Information System of the Capital City of Prague (ISHMP) has been realized since 1991. ISHMP is being developed by the Institute of Municipal Informatics of Capital Prague (IMIP). This is possible on the bases of the cooperation contract between the City of Prague and the Czech Office for Surveying, Mapping and Cadastre. IMIP as an administrator of the ISHMP is responsible for the production of the collection of digital large scale maps of Prague (SDMP), their updating and supply for users. SDMP consist of:

- The Unified Digital Map of Prague (UDMP) is formed as an unified coordination base of ISHMP UDMP (1:500) provides compulsory compatibility between Digital Cadastral Map, Technical map of Prague and mapping documentation of utilities administrators. UDMP contents the horizontal and vertical control points, planimetry, altimetry and description 87% of the Prague territory is covered by UDMP till this year.

- **The Digital Reference Maps (DRM):**

- 1) DRM of Administration Borders (1:1000). Content: the Prague's territory border, the Municipal sector borders, the Administration districts borders and the Cadastral areas borders,
- 2) Cadastral DRM (1:1000). Content: the Prague's territory border, the Cadastral areas borders, the points of geodetic network, the plot borders, the definition points of plots, the map symbols,
- 3) DRM of street sectors and addresses points (1:1000). Content: the network of nodal connecting lines in the axes of street sectors, the name of streets, the address points with address data,
- 4) Block DRM (1:1000). Content: the blocs of: agricultural land, forest, green land, water communications, railways, ports, airports, the built - up blocks, the blocks for sport and recreation.
- 5) Generalized block map 1:20 000

The whole town territory is covered by DRM.

- **The Digital Thematic map (DTM)** 1:5000. Content: reduced content of UDMP or Cadastral DRM, the street names, the cadastral unit names.
- **The Digital Orthophotomaps (DORT):** black and white (1:1000), color (1:2000) and spectrozonal (1:2000), the **Digital Terrain Model (DTM)** with 1 meter contour intervals.

Similar production of the digital maps follows in about 40 towns in the Czech Republic.