5TH REGIONAL STUDY ON CADASTRE AND SPATIAL DATA INFRASTRUCTURE

Željko Bačić and Vesna Poslončec-Petrić

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5th REGIONAL STUDY ON CADASTRE AND SPATIAL DATA INFRASTRUCTURE

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1 EXECUTIVE SUMMARY

This is already the fifth time that the Study on Cadastre and Spatial Data Infrastructure in the region of Western Balkans has been conducted, showing the relevancy of regional cooperation and the value of exchanging the information about the Land Administration Systems and Spatial Data Infrastructures in the countries of the region, along with the knowledge accumulated by the national institutions in the region responsible for these fields. In the past, the regional Study on Cadastre and Spatial Data Information has been the platform for the Regional Conference on Cadastre and Spatial Data Infrastructure, as a source of valuable information and support in the decision-making process. This form of cooperation among the institutions started in Opatija, in 2008 and has been followed by Regional Conferences held in Ohrid, (2009), Bečići, (2010) and Bled, (2011). This, fifth Regional Conference is held in Banja Luka, Bosnia and Herzegovina.

The persons responsible for compiling the Study - for which this Final Report is hereby submitted – are Prof. Željko Bačić, Ph.D., and Mrs. Vesna Poslončec-Petrić, Ph.D., supported by the IPA 2010 INSPIRATION – Spatial Data Infrastructure for the Western Balkans Project consortium. However, the key role and effort has been delivered by the participating institutions and their representatives in the Permanent Technical Committee of the Regional Conference on Cadastre and Spatial Data Infrastructure. They have done a great job in processing the questionnaires, and communicating and discussing their content with the study team.

As for the first three regional studies which were, beside the Regional Conference hosting institution, financially supported by the Kingdom of Norway through the support of Mr. Helge Onsrud, Director of the Centre for Property and Development under Statens kartverk in Norway, the work on this year Study was enabled with the financial support of the European Commission through the above-mentioned IPA 2010 INSPIRATION Project Consortium led by GFA Consulting Group.

As it was precisely expressed already in the 1st Regional Study, “the term Land Administration System (LAS) has often been given a broader meaning than what has been applied in this Study. In the Questionnaire and the Study Report, LAS is defined as the system for cadastral map and related data and registration of real property rights” (Roić et al., 2008).

The activities of the regional institutions in the past 12 months are showing some clear trends and focus on certain topics. Due to the global economic crisis and general trends in governing the states and running the public administration, there is a clear trend in adopting the new or improving the existing legislations, in line with the requirements of the government and the society. It is to expect that the present cycle of legislation improvements will be closed at the end of this year, whereas the new one has been initiated with the adoption of the NSDI law in Slovenia. The global economic crisis reflects also the change in institutional financing since the trend has changed towards the self-financing from the state revenues. The percentages of self-financing achieved in Banja Luka and Belgrade, as well as in Tirana and Skopje, are in fact, even at the global level, impressive. It is unclear yet whether this trend will expand to the institutions presently fully financed from the state budget.
The development of IC technologies, maturity of e-Government concepts and expansion of usage of GI systems and geospatial information reflects the need for the delivery of products, data and information collected, systemized, kept and maintained by institutions. Due to the given short deadlines and the lack of money, it is clearly focused on the certain products (digital orthophoto). At the same time, a lot of effort is invested in establishing the tools for mass data viewing and dissemination (browsers and geoportals).

Probably the most visible result of these efforts is the establishment of permanent GNSS networks. Taking into account the two GNSS networks under construction (ALBPOS and KOSPOS) which should become also operational this year, the region will be fully covered by a dense network of permanent GNSS stations. Anticipating the imminent establishment of Galileo and Kompass GNSS systems, the question arises as to the further development of these GNSS networks.

Most newly adopted legislations have covered the issue of the NSDI and promoted the responsibility of the regional land administration institutions for this activity. This can be understood as a success of institutions since in the rest of Europe the situation is not identical and a number of NMCA’s have a modest role in the establishment of SDI’s in their countries. This positive momentum can and should be used for further development of SDI’s in the countries of the region, for the establishment of the necessary services and for implementing the Inspire Directive rules, or transposing the whole directive into the national legislation. It is clear that there is still a lot to be done and the input which should come from the INSPIRATION project should be used to the utmost.

The above-mentioned positive momentum should also be used to support the development of the e-Government concept with regards to the key registers. It can be envisaged that the Key register concept will become a topic of great interest for the governments and especially governmental bodies or institutions responsible directly for the implementation of e-Government since the reorganization of key registers is a logical next step in increasing the efficiency of public administration and public registers and also for savings in public administration. The only question is where and how will the land administration institutions in the region position themselves in regard to this for future important activities.

From the responses in the questionnaire, it can be judged that the development of national SDI’s is progressing well, as can be seen from the answers in the reports from this and previous regional conferences. It is also clear that in principle the NSDI structures are established or this will happen very soon, and that there are geoportals developed together with the basic services. But looking deeper, the institutions should be aware that there is still a long and hard way towards the full establishment of NSDI’s that are fully compatible with the Inspire. However, this is also a difficult issue for a number of European Union countries, so the challenges should not discourage institutions but rather keep them realistic and pragmatic in their efforts.

Since this is the fifth study on Regional Conference on Cadastre and Spatial Data Infrastructure in the Western Balkans it can be stated, without any hesitation, that great progress has been achieved in the region understanding that great effort, human, organizational and financial, has been invested in the reforms and modernization as well as introduction of new activities. Events of the past years testify that this has also reflected on the position of the profession in own counties, recognized as a modern profession which is using the most advanced technologies for the collection, systematization, organization, maintenance and distribution of spatial information and registry data to all kinds of users. The institutions can be proud on their achievements,
but they should be aware that the expectation of users is always growing faster than the possibility of institutions to provide new services and information.

For the first time the annual study contains the descriptions of project that are the most important for the institutions as well as the institutional activities supporting capital projects for the economical development and growth of the countries in the region. The reason for this step is understandable and logical. Due to the economic crisis, the governments are mobilizing all capacities to foster sustainable economic growth of their countries. This also includes land administration institutions, especially because of the fact that most of the capital projects are related to land, infrastructure, ownership issues, etc. Since one of the purposes of the Regional Conference on Cadastre and Spatial Data Infrastructure is to promote institutions and profession and their contribution to the overall well being of the society in the eyes of our governments, business sector and citizens, the 5th chapter contributes to a better understanding of our activities for society and awareness of the contribution made.

Finally, similarities in legislations, models, solutions and practices between the institutions show us that institutional bilateral and multilateral cooperation in the past years, like this regional gathering, has clearly contributed to the overall development of the land administration in the region, supporting economic growth of the countries.
2 ABBREVIATIONS AND DEFINITIONS

2.1 Abbreviations

BG – Belgrade - Serbia
BL – Banja Luka - Bosnia and Herzegovina (RS)
LJ – Ljubljana – Slovenia
PO – Podgorica - Montenegro
PR – Pristina – Kosovo*3
TI – Tirana - Albania
SA – Sarajevo – Bosnia and Herzegovina (FBiH)
SK – Skopje - Macedonia
ZG – Zagreb – Croatia
EG – EuroGeographics
EU – European Union
FIG – The International Federation of Surveyors
INSPIRATION – INSPIRATION Spatial Data Infrastructure in the Western Balkans (EU IPA2010 Multicountry Project)
INSPIRE – Infrastructure for Spatial Information in Europe (EU Directive)
IPC – INSPIRATION Project Consortium
LAS – Land Administration System
NSDI – National Spatial Data Infrastructure
SDI – Spatial Data Infrastructure
WB – World Bank

3 Whenever Kosovo* is mentioned in this report, this designation is without prejudice to positions on status, and is in line with UNSCR 1244 and the ICJ Advisory Opinion on the Kosovo Declaration of Independence. Therefore Kosovo in this report is always marked with an asterisk (*) meant at making reference to the above statement.
2.2 Definitions

*Land Administration System:* the system for cadastral map and related data and registration of real property rights

*Institution (Participating):* Public body responsible for cadastral map and/or land book

*Cadastre:* The FIG defines the cadastre as follows: “A cadastre is normally a parcel based and up-to-date land information system containing a record of interests in land (i.e. rights, restrictions and responsibilities). It usually includes a geometric description of land parcels linked to other records describing the nature of the interest and ownership or control of those interests, and often the value of the parcel and its improvements. It may be established for fiscal purposes (e.g. valuation and equitable taxation), legal purposes (conveyance), to assist in the management of land and land use (e.g. for planning and other administrative purposes), and enables sustainable development and environment protection” (FIG, 1995).

The UNECE’s Land Administration Guidelines point out that different countries use the term cadastre differently, which is often a cause of confusion (UNECE, 1996).

*Cadastral map:* Analogue or digital document containing spatial and non spatial attributes of properties (parcels)

*Cadastral system:* The system which includes the cadastre, title registry and the associated processes of land transfer, subdivision and adjudication often termed land administration.

*Land Cadastre:* Register established for primary purpose of land taxation.

*Land Book:* Register of real property rights based on the cadastral map identification.

*Census Cadastre:* Register of parcels established without (precise) cadastral surveying, also called evidentiary cadastre.

*Region:* Spatial area under responsibility of participating organizations in this study.

*Single/dual organizations:* indicating whether the system for cadastral map and related data and registration of real property rights is run by one or two organizations.
3 INTRODUCTION AND BACKGROUND

3.1 The Region

The region of the Western Balkans is inhabited by some 28 million people and covers an area of 295,000 km² split in 62,671,006 parcels (Petek, 2011). Nine institutions in the region are responsible for registering the parcels (see Figure 1), having some 7,500 employees, supported by 1,989 private surveying companies and 3,521 charted surveyors (Petek, 2011).

![Figure 1: Western Balkans Region – areas of institutional responsibility](image)

3.2 The Study

The goal of the Study is to provide an overview of the Land Administration System and Spatial Data Infrastructure in the countries of the region with the emphasis on several topics which are defined each year with regard to their relevancy and interest of participating institutions.

The tasks of the consultants were to analyse the similarities and differences, advantages and disadvantages, and deliver an overview of the LAS in the region.

In cooperation with the organizers of the Conference and IPC, a questionnaire was developed and distributed in English language to the following nine cadastral and registration organizations⁴:

⁴ In bracket is added a two letter abbreviation of the cities in which the institution’s headquarter is located. Please refer to overview map overleaf.
Agency for Immovable Property Registration of the Republic of Albania (TI)
Agency for the Real-estate Cadastre of the FYR of Macedonia (SK)
Bureau for Geodetic and Property Relations of Republic Srpska (BL)
Federal Geodetic Administration of the Federation of Bosnia and Herzegovina (SA)
Kosovo Cadastral Agency, Kosovo* (PR)
Real Property Directorate of the Republic of Montenegro (PO)
Republic Geodetic Authority of the Republic of Serbia (BG)
State Geodetic Administration of the Republic of Croatia (ZG)
Surveying and Mapping Authority of the Republic of Slovenia (LJ)

Each of the institutions was represented by a member of the Permanent Technical Committee of the Regional Conference on Cadastre and Spatial Data Infrastructure, as follows:
- Xhevair Llakay (TI)
- Lidija Krstevska (SK)
- Dragan Macanović (BL)
- Antonija Sikimić (SA)
- Muzaffer Qaka (PR)
- Mirjana Ljumović (PO)
- Saša Đurović (BG)
- Dejan Blažeka (ZG)
- Tomaž Petek (LJ)

Beside the work on the questionnaire, the listed institutional representatives served as the main contact persons between the institutions and the consultants preparing the Study. The IPC was represented by Mr. Ivica Skender who contributed to the preparation of the questionnaire and worked on the study.

The Questionnaire contains 4 main chapters divided into 43 questions:
1. Progress on the establishment of up-to-date cadastre - update of the 2011 report and status of the development and implementation of electronic information services to the public, of the implementation of Global Satellite Navigation Services (GNSS) and of preparation of basic line maps/topographic maps and orthophoto data
2. Legal framework of the national mapping and cadastre organizations (NMCO)
3. Status of key registers

The work was done by means of electronic (internet) and oral (two meetings of Permanent Technical Committee in Sarajevo on March 27th and Banja Luka on May 18th) communication. Due to the fact that institutional representatives are familiar with the regional study questionnaire and related routines, all nine institutions had submitted their answers in time to prepare this Report. The answers are included as appendices in electronic form on the CD attached.

We use this opportunity to express our sincere gratitude to the persons with whom we have worked on this study and wish to thank everybody for their involvement and contribution. This applies foremost to all the colleagues from the Permanent Technical
Committee, but also to the directors of the involved institutions for their support and release of capacities to work on the questionnaire as well to other known and unknown colleagues who have participated in this work.

3.3 The Conference in Banja Luka

The 5th Regional Conference on Cadastre and Spatial Data Infrastructure in Banja Luka was organized by the Bureau for Geodetic and Property Relations of Republic Srpska (BL), Federal Geodetic Administration of the Federation Bosnia and Herzegovina (SA) with the support from the Inspire Project Consortium (IPC).

The Conference was opened on June 7th in premises of the Government of the Republic Srpska in Banja Luka in presence of the representatives of the government of Bosnia and Herzegovina:

- Slavko Marin, Counselor of the Chairperson of the Council of ministers of BiH
- Hanka Mušinbegović, Assistant minister for physical planning of Federation of BiH
- Dragan Jevtić, Assistant minister for spatial planning, construction and ecology of Republic Srpska

Representatives of science:
- prof. Milenko Stanković, PhD., Dean of Faculty of Architecture, Construction and Geodesy in Banja Luka and
- prof. emeritus Vladimir Lukić, PhD

as well as representatives of business, media and Conference participants.

In the introductory session the role of land administration in sustainable development and building modern society has been presented. The Conference continued in San Hotel in Laktaši on June 7 and 8 when this study was presented and the presentations were given from member institutions about the Conference topics. Executed Conference agenda was as follows:

**June 7, Banja Luka, Government of Republic Srpska premises**

**Conference opening and introductory session on role of geodetic profession and service in economic development of countries in region**

The organizers and participants have been addressed by:

- member of Eurographics Management Board, Lidija Krstevska
- director of EFT mine and powerplant Stanari, Ivica Jakovljević
- counselor of chairmen of Council of ministers BiH, Slavko Marin

Letters of greetings to organizers and participants of the 5th regional conference have been sent by:

- President of Republic Srpska, Milorad Dodik
- President of Federation of Bosnia and Herzegovina, Živko Budimir
- direktor of State border police of Bosnia and Herzegovina, Vinko Dumančić
- dean of Faculty of Geodesy in Zagreb, prof. Miodrag Roić, PhD

After the Conference opening, following presentations have been given:
THE ROLE OF LAND ADMINISTRATION (SURVEYING AUTHORITIES) IN CAPITAL PROJECTS RELEVANT FOR THE REGION
prof. Željko Bačić, PhD

PRESENT ACTIVITIES IN REPUBLIC SRPSKA
prof. Tihomir Gligorić, PhD

PRESENT ACTIVITIES IN FEDERATION OF BOSNIA AND HERCEGOVINA
Željko Obradović

June 7, Laktaši, Hotel San
Session I: SDI as a challenge for all agencies in the region
SDI AS A CHALLENGE FOR SURVEYING AND MAPPING AUTHORITY OF THE REPUBLIC OF SLOVENIA
Tomaž Petek

AREC CADASTRE SYSTEM AND DISTRIBUTION SERVICES
Goce Gruevski

SDI AS A CHALLENGE FOR ALL AGENCIES IN THE REGION
Besnik Como

INSPIRE IMPLEMENTATION IN SERBIA
Saša Đurović

SPATIAL DATA INFRASTRUCTURE (SDIA) IN FEDERATION BIH
Nedžad Pašalić

NSDI IN CROATIA
mr. sc. Tomislav Ciceli

IMPLEMENTATION OF SPATIAL DATA INFRASTRUCTURE OF THE REPUBLIC OF SRPSKA
Dušan Jovanović i Velibor Vitor

ACTIVITIES OF REAL PROPERTY DIRECTORATE IN ENSURING NSDI DATA
Mirjana Ljumović

June 8, Hotel San, Laktaši

Session II: Presentation of 5th regional study on cadastre and spatial data infrastructure and World Bank analysis
REGIONAL STUDY ON CADASTRE AND SPATIAL DATA INFRASTRUCTURE
prof. Željko Bačić, PhD and Vesna Poslončec-Petrić, PhD

ICT AND SDI IN SUPPORT OF GOOD GOVERNANCE OF TENURE OF LAND
LESSONS LEARNED AND GOOD PRACTICES FROM ECA
Rumyana Tonchovska and Gavin Adlington

Session III: Legislative framework of geodetic sector
LEGAL FRAME OF CADASTRAL SYSTEM IN REPUBLIC SERBIA
Msc. Kosta Mirković

GEODETIC SECTOR LEGAL FRAMEWORK ALBANIA
Besnik Čomo
THE ROLE OF GEODESY AND GEOINFORMATICS IN CAPITAL PROJECTS OF ROC „OBSTACLE OR NECESSITY?”
PhD. Danko Marković

GEOETIC SECTOR LEGAL FRAMEWORKS IN SLOVENIA
Tomaž Petek

REAL ESTATE DIRECTORATE OF MONTENEGRO
Mladen Ilić

STRATEGIC FRAMEWORK FOR THE MACEDONIAN NSDI
Sonja Dimova

LEGAL FRAMEWORK OF GEOETIC SECTOR IN FEDERATION OF BOSNIA AND HERCEGOVINA
Msc. Antonija Sikimić

REAL ESTATE CADASTRE AS UNIFIED REGISTER OF REAL ESTATES AND RIGHTS ON THEM IN REPUBLIC SRPSKA
Aleksandar Deurić

All together 21 contributions were presented are they are given in Appendix 2, on the Conference CD.

The Conference finished with the adoption of the following conclusions discussed and adopted by the Steering Committee of the Regional Cooperation on Cadastre and Spatial Data Infrastructure. The conclusions are:

5th REGIONAL CONFERENCE
ON CADASTRE AND SPATIAL DATA INFRASTRUCTURE
6-8 June 2012, Banja Luka – Laktaši, BH

The Fifth Regional Conference on Cadastre and Spatial Data Infrastructure was held 6-8 June 2012 in Banja Luka and Laktaši, Republika Srpska, Bosnia and Herzegovina, with the participation of the delegations of the following national cadastral regional institutions:

- Republic Geodetic Institute of the Republic of Serbia
- Federal Bureau for Geodetic and Property Relations of the Federation Bosnia and Herzegovina, Bosnia and Herzegovina
- Republic Administration for Geodetic and Real Property Affairs of Republika Srpska, Bosnia and Herzegovina
- State Geodetic Administration of the Republic of Croatia
- Geodetic Administration of the Republic of Slovenia
- Agency for Real Estate Cadastre of the Republic of Macedonia
- Albanian Agency for Real Estate Registration
- Real Estate Administration of Montenegro

and the representatives of the Joint Research Centre of the European Commission, World Bank, Lantmateriet from Sweden, Eurogeographics and INSPIRATION Project Joint Venture.
The event attracted over hundred participants who, at the end of this extremely successful conference, adopted the following

CONFERENCE CONCLUSIONS

1) The cadastral regional institutions gathered at the Fifth Regional Conference on Cadastre and Spatial Data Infrastructure, considering what has been done in the past five years, underline great progress in implementing the reforms and modernising the geodetic and cadastral systems in the region, demonstrated by numerical indicators stated in this year's Study, as well as by the overview of capital projects carried out by the land administration institutions either aimed at developing their systems or at supporting the capital projects of their governments.

2) The real property cadastre has become reality in the region and has been or is being intensely established in all countries. The efforts, aimed at increasing its updatedness, accuracy, availability and efficiency of implementing changes, are the new focus of all land administration institutions.

3) Extraordinary results have been achieved in establishing electronic IT services as can be unambiguously demonstrated by indicators showing the use of these services, as well as launched web browsers and geoportals that have become the main communications tool for the citizens and the transparency of the registers kept by the institutions. The next development stage of these services is the development of the application for the automated data distribution through services and the development of national geo-portals.

4) By launching the SRPOS and FBiHPOS permanent GNSS networks in late 2011 and planned launching of ALBPOS and KOSPOS network this year, these systems will cover the entire region. An example of the successful regional cooperation is the data exchange between 50 GNSS stations between the institutions which has significantly raised the quality and reliability of individual permanent GNSS networks. The conference participants welcome the announcement of the upcoming signing of the Agreement on the SRPOS and FBiHPOS network data exchange with the neighbouring networks which will strengthen the connections between permanent GNSS networks.

5) Cadastral regional institutions continued to carry out the activities related to the adoption of the new legislation last year, which has modernized the legislative scope of their work and strengthened it with new jurisdictions and tasks. In this context, cadastral regional institutions have, following the joint vision of the significance and role of the spatial data infrastructure, instigated the legal definition of the spatial data infrastructure in their respective states and taken over the role of the establishment leader. Visible steps have been made in establishing the national infrastructures by adopting the implementation rules, establishing services and initiating working groups. This momentum should instigate the continuation of efforts in building the infrastructure and making the stakes of other SDI stakeholders more concrete.

6) Serving the SDI and the e-Government concepts' development, the conference participants recognize the concept of key registers as the next step in increasing the efficiency of establishing and using the basic State registers as the basis for establishing a modern State administration that will efficiently satisfy the needs of other State bodies, economy and citizens and underline the need of its implementation in the regional countries.
7) The Regional Conference on Cadastre and Spatial Data Infrastructure expresses great satisfaction due to the launch of the INSPIRATION – Spatial Data Infrastructure for the Western Balkans Project and stimulates the INSPIRATION Project joint venture to invest utmost efforts in its realisation that will be accompanied with full support of cadastral institutions.

8) The Regional Conference on Cadastre and Spatial Data Infrastructure states the need to continue the form of the regional cooperation initiated by the INSPIRATION Project and imposes on cadastral regional institutions to launch the activities to prepare the new, follow-up project.

9) The overview of capital projects, implemented by cadastral regional institutions in order to develop or carry out capital projects of their governments, has shown a full scope of actions and ability of the institutions to successfully complete the set tasks. The experiences show that the timely participation of institution in capital projects of the governments and implementation of the necessary geodetic and technical as well as legal and property operations are crucial factors in successfully completing the capital projects serving the economic development of countries.

10) Cadastral regional institutions welcome the wish expressed by the Bulgarian Cadastre Agency and its interest to participate in the Regional Conference on Cadastre. They invite it to apply for membership and participate at the Sixth Regional Conference in 2013.

11) Cadastral regional institutions express great satisfaction with the work of the Permanent Technical Commission of the Regional Conference on Cadastre and Spatial Data Infrastructure in the past year and the Fifth Regional Study on Cadastre and Spatial Data Infrastructure developed in cooperation with Prof. Željko Bačić and Vesna Poslončec-Petić, Ph.D. The Conference inspires the Commission to continued dedication in realizing the vision of regional cooperation between national mapping and cadastral institutions and joint projects.

12) The Conference participants accept with pleasure the proposal of the Regional Cooperation Executive Board to hold the next 6th Regional Conference on Cadastre and Spatial Data Infrastructure in 2013 in Serbia, organised by the Geodetic Institute of the Republic of Serbia.

The Conference participants especially thank the Conference organisers, the Republic Administration for Geodetic and Property-Rights Operations of the Republika Srpska and the Federal Bureau for Geodetic and Property Relations of the Federation Bosnia and Herzegovina for outstanding conference organisation and hospitality as well as contribution to the regional cooperation.

Besides the member institutions, the Conference was attended also by the representatives of the following international organisations, institutions, agencies and companies:

- The World Bank and FAO, Rumjana Tonchovska and Božena Lipej
- Joint Research Center EC, Katalin Toth
- EuroGeographics, Lidija Krstevska
- Lantmäteriet, Kingdom of Sweden, Anda Zimič
- INSPIRATION project – GFA, Conrad Graf Hoyos, Fritz Krois, Bernd Wild and Mariza Dujmović
- INSPIRATION project – GDi GISDATA, Ivica Skender
- INSPIRATION project – benefactor institutions coordinator, Sanja Zekušić
Participants of the 5th regional conference on cadastre and spatial data infrastructure

Prior to Conference, on June 5 and 6 in Laktaši, IPC representatives held first INSPIRE training in frame of INSPIRATION project execution.

Participants of the first INSPIRE training in frame of INSPIRATION project execution

The participants list of the 5th Regional Conference as well as the official photos is given in Appendix 3 on the Conference CD.
4 Study Results

4.1 Report 2011 update

4.1.1 Progress on the establishment of up-to-date cadastre

With the exception of LJ which harmonized its cadastre and land registry data and relied on sporadic changes initiated by owners, regional institutions are conducting various activities of systematic establishment or improvement of up-to-date cadastre in the region. These activities include initial surveying of a certain area, resurveying of areas with poor records, harmonization of the activities between the cadastre and land registry, or homogenization processes aimed at improving the quality of the existing textual and graphical records. In the past 12 months, the following improvements have been reported, see Figure 2.

Note for Figure 2: LJ and ZG have full coverage of the real estate cadastre. Since LJ improves its data quality through sporadic changes the value in Figure 2 is set at 0). ZG implements both approaches, sporadic and systematic so for ZG, only the amount of systematic changes is presented in Figure 2.

Also, huge effort has been invested in the digitalization of the existing paper cadastral maps and creation of digital cadastre maps, see Figure 3.
Budget allocation is still the most important source of funding of the participating institutions (Figure 4). Today over 50% of the finances of BG, BL, SK and TI depend on the revenues (up to 83% BL and 79% BG). Beside the listed institutions, LJ also has its own revenues (5%), whereas PG, PR, SA and ZG do not generate own revenues. Loans and technical aid are still a relevant part of the institutional annual budgets (BL, PG, PR, SA, SK, and ZG) but not as before.

When it comes to using the loans for land administration reforms in the region, the World Bank is still very involved. Presently BL, PG, PR, SA, SK, TI and ZG are using WB loans and only 4 institutions are using EU funds for their projects (BL, PR, SA and ZG).

Beside the World Bank, the donor countries such as Norway, Sweden, Germany, Japan and The Netherlands are present in the area and regional institutions have reported that further six projects applied for funding or preparing the applications (BL, TI, PR and SA). Unlike them, LJ prepared a project proposal for the European Economic Area (EEA) Financial Mechanism 2009-2014 with the following title “Modernization of Spatial Data Infrastructure to Reduce Risks and Impacts of Floods”.

### 4.1.2 Status of providing the electronic information services to the public

The development and implementation of electronic information services to the public reflect the level of development of each institution. Namely, in order to release one efficient electronic information service, the providing institution has to create a unique, complete and fully specified database, develop a user friendly, fast and robust information service and establish such an organizational structure which will be able to regularly update the database, maintain the information service and provide support to users. Therefore, it is no surprise to see the results of this part of the annual
questionnaire since it is visible from other answers, like on questions 1.1.4 and 1.1.5, that many of the foreign funding projects are devoted to developing the electronic information services. This is especially valid for the development of geoportals (Figure 5).

Level of completeness of the coverage provided by electronic information services is given in Figure 6a and in relation to figures given in year 2009 (Steiwer et al., 2009) progress is visible (Figure 6b).

Speaking about electronic information services and especially about geoportals, the pricing policy is of special interest. In accordance with the initiatives coming primarily
from the private sector (geo-companies) and supported also by a number of international organizations and institutions like UN or EU bodies, there is a constant pressure for releasing all publicly collected spatial information for free (except personal data). Recognizing the simplicity and transparency of this model, its drawback is that usually the financial model for the maintenance of the public data sets is not developed or is insufficient, as stated many times by EuroGeographics (EG), or noted by LJ in their answer to question 1.1.3. Models implemented in the region are listed in Figure 7.

Restrictions on the access to data available by electronic information services are another important issue which each provider of the public data has to define. An overview of how this has been done by the institutions in the region is given in Figure 8.

Finally, the responsible public institutions disseminating their spatial information via electronic information services have to make a decision about the role of the private sector providers in IT system operations and data dissemination. Only four answers were received to this question (BL, LJ, PG and ZG), and all of them defined the role of the private sector as application development, maintenance and technical assistance, and added value products reseller.
4.1.3 Status of GNSS implementation

At the beginning of this year, two permanent GNSS networks in Bosnia and Herzegovina, namely SRPOS and BiHPOS, become operational, increasing the number of permanent GNSS stations to 34 (each network 17). A full coverage of the region with GNSS permanent networks will be, according the announcements, achieved in June/July of this year with the release of ALBPOS and KOSPOS (Figure 9). So today we have 7 operational GNSS permanent networks in the region with 158 permanent stations. The data from 50 permanent stations is exchanged between institutions (8 cross-border exchanges established, further 5 are in preparation) and this is visibly strengthening institutional networks.

All operational GNSS permanent networks are providing three services (differential, real time precise and geodetic post processing service). The same has also been foreseen for two (PR, TI) GNSS permanent networks under construction. All systems are maintained by the institution itself that is also distributing the data with the exception of LJ, where distribution is performed by a telecom operator.
Regarding the fees for using the GNSS permanent networks, there was no major changes except for SIGNAL network for which telecom operator introduced additional monthly fee resulting in higher costs. Two new GNSS permanent networks, SRPOS and BIHPOS, are free of any charges for the first year of the networks operation. A detailed analysis of the GNSS networks and pricing models is given in the 2010 annual study (Roić, 2010). Worth presenting are the current figures on using the GNSS permanent networks in the region (Figure 10 and 11) and the comparison between the numbers collected in 2010 and 2012 (Figure 12), showing a clear raise in the number of users and usage of the systems.
4.1.4 Status of Maps

The production of cadastre and topographic maps is the responsibility of all involved regional institutions, whereas BG and TI are not responsible for the production of small scale topographical maps in their countries. In accordance with the answers to question 1.4.1 and having in mind answers to questions 1.1.2 and 1.2.2, the coverage of cadastre and topographical maps is continuously improving. This is especially visible in the increased percentage of vectorized maps and especially in the production of digital orthophoto maps. Still, regional institutions have a small number of vector databases, Figure 13. Since technical characteristics of these databases are unknown, no deeper evaluation is possible.

Figure 13: Existing maps and their databases

The situation with mapping is also characterized by the presence of on-going programs of producing new maps, see Figure 14. In accordance with the listed map scales in question 1.4.1, some 4 – 10 programs should exist per institution. The answers given to question 1.4.2 are showing that these figures are clearly smaller.

Figure 14: Planned or ongoing mapping projects

The situation with the digital orthophoto maps production is much better. Due to the fact that this production lasts much less than the production of classical maps and that the costs are far lower, the institutions have focused themselves, in accordance with the needs of the society and especially other governmental institution, on the production of orthophoto maps. Presently all institutions have produced at least one full coverage digital orthophoto (BL and SA just finishing it), see Figure 15.

With regards to the production of digital orthophoto maps, a positive fact is that 7 out of 9 institutions have either ongoing projects producing new series of orthophoto maps or have such projects in pipeline for the forthcoming period, Figure 16.
4.2 Land Administration Systems Legal Framework

The adoption of the new basic legislation which regulates the land administration and the responsibilities and work of land administration institutions in the region started in 2006 (LJ) and have continued intensively during the past period, whereas we can say that the last twelve months, since the last Regional Conference, have been the most intensive legislative period. Since the last Regional Conference, the following laws have been adopted or amended:

- whole set of new laws regulating the land administration system and work of the Kosovo* Cadastre Agency, i.e. Law on Cadastre, Law on Immovable Property Rights and Law on Address System (all in 2011),
- Law on Registration of the Immovable Properties in Albania (2012), and
- Law on State Survey and Real-estate Cadastre in Montenegro (2012),

while three laws have faced further amendments (SK, PG and ZG). Based on this development, we can say that today the whole region, with the exception of SA, has a new basic legislation on land administration and, especially, the cadastre. The timeline of the main legislation adoption for respective countries and institutions is presented in Figure 17. The start of the timeline represents the adoption of the (first) law and the end of the timeline shows the last change of the law(s).

![Figure 17: Adoption period of valid main legislation](image-url)
finally on the level of the adoption of the European Union Aquis Communautaire which changes to a certain degree the traditional legislative framework in the countries in the region (LJ). In the questionnaires, the institution representatives listed differently the secondary legislations but it is very clear that there is a high number of laws which are relevant for the land administration system and functioning of the national institutions, as listed in LJ questionnaire.

The main legislation is usually enforced with the adoption of bylaws or administrative instructions enabling its implementation. Practices differ for each institution but numbers in Figure 18 clearly indicate that the institutions have made great effort to provide bylaws, directives and instructions enabling the implementation of laws.

![Figure 18: Foreseen and adopted bylaws of main legislation](image)

Beside the existence of the legislation, it is also important today to make respective legislations visible and available to the public, regardless whether it is professional or general. In accordance with the replies to question 2.4, we can be satisfied with the basic visibility since all institutions made their respective legislation available in paper and electronic format. Still, half of them are available only in their mother tongue, see Figure 19.

![Figure 19: Lingual availability of main legislation](image)

Various areas are covered by the main legislation of the regional institutions. This is also completely logical and expected but there is a common set of areas covered by all laws: state survey, official mapping, cadastre and execution of the state survey and real estate cadastre works, see Figure 20. The remaining areas depend on the legislative setup and responsibilities given to the institutions in their respective countries. It should also be underlined that only LJ has incorporated in its legislation the real estate valuation as its task, whereas BG, PG and SA have classical cadastre taxation regulation. Observing the global trends and discussions at the political level in the countries in the region, it is to be assumed that in the next period this area will be of great interest. Having a taxation function greatly impacts on the land administration
Institutions in terms of their activities and position in the governmental administration and society so the institutions should pay attention to it.

In addition to the main legislation and in line with the key political decisions of the governments in the region, the legalization of informal buildings and settlements has in recent years assumed great importance in the region. This is visible from the fact that in 2011 Macedonia and Croatia adopted new special legislations about legalization and Serbia made amendments to its existing legislation. Furthermore, Montenegro and Kosovo are preparing new legislation about this issue. An overview about legislation dealing with informal buildings and settlements is given in Figure 21.

Regardless to the legal framework, for institutions and profession the role in legalization process is much more relevant. The relevancy of cadastre and surveyors (and/or land registry) in the legalization procedure can be illustrated by the example of BL, presenting a classical role of cadastre and surveyors in this process:
Role of cadastre - providing data from the cadastral records necessary for the performance of field geodetic-technical works (copies of cadastral maps, information on real estate from the cadastral registry, etc), and after obtaining the necessary documentation (building and use permits for illegally constructed buildings) implementation of changes on the cadastral maps and cadastral register.

Role of surveyors - (private surveyors or RSGA) - field geodetic-technical works - surveying of illegally constructed buildings and processing of field data.

The extended role of cadastre and surveyors is visible in the explanation given in the answer to question 2.7 by SK:

AREC’s competences are, if the illegally built object has been built on land with unregistered right, the competent body shall send an ex officio request to the Agency for Real Estate Cadastre for conducting the adequate rights registration procedure for the land in question, in accordance with the Law on Real Estate Cadastre, and the Agency for Real Estate Cadastre shall conduct this procedure ex officio.

If the application for determining the legal status of an illegally built object does not include some of the listed pieces of evidence or if the land on which the illegally built object is built is without registered rights, the competent body shall, within ten days after receiving the application, make a decision to stop the procedure and submit a notification to the applicant for supplementing the application, i.e. shall submit an application to the Agency for Real Estate Cadastre to conduct an adequate procedure for registering the rights of the land in question in accordance with the Law on Real Estate Cadastre, and the Agency for Real Estate Cadastre shall perform this procedure ex officio.

Currently, AREC has processed a total of 18000 applications for registering objects for which decisions have been delivered for their legalization from the competent authorities – the local self-government. The applications for legalization were to be submitted latest by September 1st, 2011, and the legalization procedure itself is ongoing in accordance with the law and it will continue for the next 6 years.

4.3 Status of Key Registers

In the past decade, the developed countries have paid significant attention to increasing the efficiency of its civil services. Significant attention was paid also to the issue of the key registers efficient functioning because the analyses have shown that the multiplied collection of information contained in the key registers, non-existence of standardized methodologies for collecting and modeling such information and the absence of the services to exchange the information directly affects the efficiency of the State and local administration and economy to the detriment of all citizens. In the region, we are witnessing the problem of key registers functioning which leads us to the need to seriously address this issue because the modern society is based on the efficient use of spatial data collected primarily through official State registers and databases. Since the functioning of the State and local administration is today one of the key issues in Europe, it becomes clear that the parts of the administration to
function efficiently and satisfy the needs of the State and society will advance in the system and acquire an important role and influence i.e. that the purpose and goal of the parts of the administration that will not be able to satisfy these needs will be questioned and reorganized and even rescinded in their present form.

There are several definitions of the registers/databases containing the basic information and considered as obligatory information sources for all other official registers and databases in a country that clearly define who, when and how collects this data i.e. how the data is stored and distributed. One of the countries that have invested considerable efforts in the past in developing the key registers concept is the Netherlands and the following is its definition of key registers:

**Key registers are databases that hold information for which they are the only valid and approved source for government use; such information is called authentic information. The data in such a key register is the only source for that data that governments in the Netherlands are permitted to use. They will no longer be allowed to collect any data that already exists in a key register.** (Goorman, 2010)

Key registers in the strictest sense involve the data on physical persons and legal entities and the real properties and related objects.

The answers to the questions in the questionnaire clearly show that key registers have been established in all countries of the region. However, the institutions defined by law that are in charge of the key registers differ both in the number and description of their tasks. The scale of the number of institutions responsible for key registers is shown in Figure 22 and varies between two and five. Given the number of stakeholders to implement the key registers concept, the influence of the number of institutions involved is clear with regards to the complexity of endeavors.

The following aspect of the key registers concept implementation is the number of registers under the authority of the LAS regional institutions. This number varies between 1 and 3, see Figure 23, which speaks about the importance of these institutions among the future stakeholders building the key registers concept. One has to bear in mind that the LAS institutions have to base their role, apart from the fact that they are in charge of the key registers, also on the fact that they are in charge of official
cadastral, topographic and orthophoto maps of their countries that are key for implementing the concept.

In line with the current trends, all regional countries have adopted the strategies to develop the e-Government. It is interesting that the valid strategic e-Government documents were adopted in 2009 (for BG, BL, PG, PR, SA and TI) respectively 2010 (for SK) and that, given frequent changes and the developments in the ICT as well as the needs of the society to develop the e-Government, the cycle of such strategic document is relatively short so some of the countries have already adopted new strategies (PO and LJ). However, when it comes to the strategic document related to the key registers, only LJ, through the implementation of the directives about connections key registers and exchange data between registers, 89/666/EGS, 2005/56/ES in 2009/101/ES, has adopted such a document.

When considering the key registers concept implementation, the current practice of collecting the basic data contained in the key registers of the regional countries is of importance because it contributes to the image of the existing situation and provides indications that can be used in implementing the concept. Figure 24 provides answers to the question: “How are basic key registers (listed in question 3.1) data collected and used in your country?“.

![Figure 24: Data collection modality for key registers](image)

The following two questions, seemingly identical, describe how the information contained in the key registers detected in question 3.1 is available to users (Figure 25), or rather how it is available to other key registers (Figure 26). It is indicative to see that the mechanisms of accessing the data are almost identical for general users and other institutions in charge of the key registers. SK and LJ have introduced the model of issuing/exchanging the data by concluding agreements between the stakeholders, which are practical steps in implementing the concept.

![Figure 23: Accessibility of key registers data to users](image)

![Figure 23: Exchange of key registers data (among stakeholders)](image)
In this context, the answers to the question: “Existence of key registers project(s)?” indicates that currently these projects are not in the focus of the institutions or of the regional governments. Apart from ZG that has just completed the initial project to develop the key registers concept with the financial and expert assistance from the Kingdom of Netherlands and the Dutch Kadaster, there are no new active projects explicitly dealing with this issue. The ZG experience in implementing the project that has just been completed, and similar experiences in similar fields certainly exist in each institution. They speak about the challenge of carrying out such projects because a number of institutions that are the key register stakeholders must be gathered, made aware and willing to mutually cooperate (in the case of ZG, this involved 6 institutions). On the other hand, the answers clearly show (e.g. PO, PR) that a number of projects are being carried out or prepared, aiming at improving the registers that we have detected as key, which definitely contributes to and prepares for the concept implementation.

4.4 NSDI establishment status and INSPIRE directive adaptation

In line with the new legislation, today the majority of institutions has integrated into their legislation the chapters on the NSDI establishment, see Figure 27. The exception is, on one hand, SA and PR, that are to establish the NSDI legislative framework, while, on the other hand, LJ has completed the basic process and adopted the Infrastructure for Spatial Information Act (Official Gazette of RS, No. 8/2010), thus fully transposing the INSPIRE directive, as was its obligation as an EU member State. Apart from the fact that the majority of countries have very quickly adopted legislation establishing the NSDI, it is worth mentioning that six institutions have drafted and passed, either independently or as official documents of their governments, the NSDI strategies (BG, BL, LJ, SK, TI and ZG). These documents are available to the public on the web sites of the afore-mentioned institutions.

![Figure 27: Adoption of legal definition and NSDI strategy](image)

Strategic issues listed in answers to question 4.2 are showing that institutions are familiar with the issues relevant to the NSDI establishment, with the emphasis on activities which are oriented to stakeholders and general users (metadata and geoportal services) as well as the establishment of an NSDI structure and the development of the NSDI community. Standardization and financing are also listed as strategic issues (BG, SK), as is the development of other services (discovery) (ZG).

Special emphasis should be put on the fact that the NSDI establishment is stipulated by the regulations under the jurisdiction of the land administration institutions (or their respective ministries) and that they have a significant and most frequently dual role in the NSDI establishment. They participate in the national NSDI bodies that pass or propose to the governments political and strategic decisions and documents while, at the same time, they play the role of providing technical and organisational support to both the bodies themselves and all the NSDI subjects in their countries, which we
deem as a very beneficial position as well as responsibility that they must justify. The foregoing is important because there are a number of countries in Europe, having a different approach to the NSDI establishment, where the land administration institutions, especially national cadastral and geodetic institutions, do not have as much influence on the NSDI establishment, as is the case in the region.

Figure 28: NSDI organizational structure

The implemented organisational structure differs from one country to another. Out of the seven institutions having the NSDI legislation, four (BG, BL, LJ and ZG) have established the NSDI bodies while three are in the process of its establishment. Namely, PG has just recently adopted the NSDI regulation, SK is in the process of adopting the NSDI strategy by the government that will appoint the bodies, and TI has sent the regulation into the parliamentary procedure and will establish the bodies after its adoption. In principle, apart from the authority of the governments that adopt the key documents, the NSDI Council (Coordination Group in Slovenia) represents the political and strategic body. Most often, the NSDI Board appointed by the Council (TI, SK, and ZG) or the institution itself (BG and BL) is the operational and implementation body. It should be mentioned that, in case of PR, the Government appointed the Land Administration and NSDI Council pursuant to a decree on the NSDI jurisdiction, Article 23 of the new Law on Cadastre, without the explicit legislative framework for the NSDI establishment. The number of levels of the NSDI structure for respective countries is given in Figure 28.

Figure 29: Status of the NSDI services establishment

The picture is clearly different when it comes to implementing the operational web services which give access to geographic information, including the status of provision
of the basic digital linemaps/topographical data. Looking objectively, this is no big surprise, since many EU states are still working on the establishment of operational SDI web-services. Figure 29 presents the status of establishment of the operational web services.

All of the above mentioned also affects the status of implementation of the Inspire Directive. Despite the fact that this directive is presently mandatory only for LJ and will be mandatory for ZG after 1 July 2013, Figure 30 clearly shows that the regional institutions are recognizing its relevancy, taking it very seriously and preparing themselves for its implementation (transposition).

![Figure 30: Level of Inspire Directive relevancy](image)

The table also shows how far the institutions and countries have come in transposing the Inspire Directive, see Figure 31.

![Figure 31: Status of Inspire Directive transposition](image)

To fulfill their role in the NSDI implementation and the INSPIRE Directive transposition, in the forthcoming period the regional institutions should also become involved in the INSPIRE bodies. Responses to question 4.8 show that, except for LJ being a member of EU, this involvement is rather limited, see Figure 32. Only ZG, BG, SK and TI are involved at various levels and even not all institutions are participating at INSPIRE conferences.

![Figure 32: Status of inclusion in the Inspire directive institutions/bodies](image)
5 LAND ADMINISTRATION INSTITUTIONS CONTRIBUTION TO THE SUSTAINABLE DEVELOPMENT

5.1 Beograd

REAL-ESTATE CADASTRE IN REPUBLIC OF SERBIA

The Republic of Serbia spreads over 8.8 million ha. The territorial organisation consists of 150 municipalities with local governments, 23 towns and, as a separate territorial unit, the City of Belgrade. According to the first results of the 2011 population census, the Republic of Serbia has 7,120,666 inhabitants. The State as well as natural persons and legal entities use 18,388,267 cadastral parcels in total, registered in 4,214,904 real property sheets.

Thanks to the timely planning and adoption of mid-term work programs of the Republic Geodetic Authority for the period of 5 years, annual work plans of the republic Geodetic Authority and realisation of specific projects such as the „Real Property Cadastre and Registration of Rights in Serbia“, as well as several donor projects, the Republic Geodetic Authority, according to the cadastre and land registry data, successfully completed the real property cadastre establishment and property records for 99.4% of the territory.

The „Real Property Cadastre and Registration of Rights in Serbia“ was developed in early 2004 and was evaluated and approved by the International Development Agency-World Bank in late May 2004 at the session of the World Bank Board directors. Thus, the Republic of Serbia-Republic Geodetic Authority (RGA) has received an IDA-World Bank loan. The project was implemented between October 2004 and October 2010, and extended until May 2012. The project is worth USD 30,000,000 WB and USD 9,514,000 RS budget.

Reasons for the real property cadastre establishment

The main reason for a fundamental change of the real property records and formation of the real property cadastre as a unique database of real properties, related rights and encumbrances as well as restrictions in Serbia, was the situation of the existing real property records i.e. the absence of the property records for over 2/3 cadastral municipalities. Besides, other reasons for having Serbia establish the real property cadastre as a single system are:

- Inability to register rights over real properties
- Inability to record a large number of flats and business premises due to the limitations for recording buildings
- Inability to register mortgages and other encumbrances
- Registration of the same real property data with two state bodies and at two different places
- Doubled costs for registering real property
- Doubled time required to register one real property at two different places
- Problems with mismatching data in the current records
- Incompleteness and lack of updated data on real properties recorded in the land registers
- Incompleteness of the real property data registered in the land cadastre
- Inability to efficiently distribute the real property data to the end users.

The legal framework for setting up unique records on real property and related rights for the Republic of Serbia by merging and upgrading the existing data of the land cadastre and land registers, was formed in 1988 with the adoption of the first Law on Survey and Cadastre and Real Property Rights Registration (Official Gazette of FRS, nos. 17/88, 13/90 and 28/90).

The Law on State Survey and Cadastre and Real Property Rights Registration (Official Gazette of RS, no. 83/92) described this subject even in more detail and in time, based on the experiences gathered when working on the real property cadastre establishment, the afore-mentioned Law was amended (Official Gazette of RS, nos. 83/92, 53/93, 67/93, 48/94, 12/96, 15/96, 34/2001 and 25/2002) until the Law on State Survey and Cadastre (Official Gazette of RS, nos. 72/09 and 18/10) completely supported the real property cadastre establishment.

The real property cadastre had been built at an unsatisfactory pace until 2000. The reasons lay primarily in the lack of experience and of bylaws that would stipulate the work procedures and manner in more detail as well as the issues related to the land registers' take-over. More significant results in the real property cadastre establishment were reached in 2000 and improved significantly after the Law on State Survey and Cadastre and Real Property Rights Registration was amended in May 2002. In the 2008-2011 period, the real property cadastre was mainly established for urban cadastral municipalities.

The Republic Geodetic Authority, services in charge of the real property cadastre carried out the real property establishment for the area of the City of Belgrade and 21 towns as follows: Sombor, Kragujevac, Kruševac, Jagodina, Cačak, Loznica, Novi Sad, Kraljevo, Leskovac, Niš, Novi Pazar, Užice, Šabac, Zrenjanin, Pančevo, Sremska Mitrovica, Bor, Vranje, Zaječar, Subotica and Valjevo.

The real property cadastre was established for the urban area of the town of Smederevo while the real property cadastre establishment is near completion for the rural cadastral municipality. The real property cadastre establishment is in the final stage for the town of Požarevac.

**Works related to the digital cadastral map production**

In the process of establishing the real property cadastre as well as thereafter, the Republic Geodetic Authority performed transformations of analog cadastral maps into digital form. Until now, digital cadastral maps are being officially used in 33.6% of the total number of cadastral municipalities while for 2.84% cadastral municipalities, the DCM databases are being reviewed and put in official use. For 17.89% cadastral municipalities, digital cadastral maps are being produced and the remaining number of cadastral plans will be digitized, as planned, in 2012 and 2013 whereby the complete graphical and numerical real property cadastre data will be digitized.

Based on the experiences acquired in the past twenty years in establishing and maintaining the real property cadastre, advantages can be defined for the real property cadastre as a single and not dual system of land cadastre and land registers. The advantages are significant for the Institute as well in terms of improving the data quality and business operations for the Institute, for the users of the data and services of the Institute and for the entire State.
It is important to underline that the real property cadastre operations have been successfully implemented because of the commitment of the civil servants and additionally hired experts from the geodetic and legal professions. The Republic of Serbia has thus, for the first time in its history, regulated in a unique way the important register of the real property and real property rights.

Positive practical experiences in maintaining the real property cadastre and issuing the data on the real property and related rights testify to the fact that the users of data and services of the RGI can perform their real property affairs in an efficient and faster way because all the data on the real property and related rights can be found at one place, in one State organ which enables to register all real properties without restrictions, with the status resulting from the documentation available (e.g. illegal objects), reduction of costs and red tape because the registration is made at one place, increased efficiency and effectiveness of procedures, complete protection of the real property title holders, efficient distribution of data to interested users, contribution for the real property market development, positive practical experiences in cooperating with the citizens, State organs and local governments, enterprises and other organisations and agencies.

The real property cadastre, as a modern and completely reliable register on the real property and real property rights for boosting the investment, developing the real property market and assisting the Republic of Serbia in its accession to the European Union.

5.2 Banja Luka

CAPITAL PROJECTS AND ACTIVITIES OF RGURS IN FUNCTION OF EXECUTION OF GEODETI-C-TECHNICAL WORKS AND SOLVING PROPERTY-LEGAL RELATIONS FOR CAPITAL PROJECTS OF REPUBLIC SRPSKA

Bureau for Geodetic and Property Relations of Republic Srpska (RGURS) has in frame of its responsibilities launched several key projects to be able successfully to participate in realization of capital infrastructural and economical projects. Especially for emphasizing are:

- Spatial Data Infrastructure of Republic of Srpska – IGPRS and
- RGURS Geoportal

As a responsible institution for production, maintenance, exchange and distribution of biggest part of spatial data for territory of Republic Srpska, among which cadastral data are definitely most important, RGURS has, in accordance to given legal authority and respective position in this field, taken role of key player and integrator in the area of establishment of Spatial Data Infrastructure of Republic Srpska (IGPRS).

Modernization of geospatial data management

Recognizing importance of geospatial data (at most cadastral), the Government of Republic Srpska has ordered RGURS in year 2008 to start with establishment of RGURS Geoinformation System (GIS RGURS), with goal of:

- ensuring of more efficient work of RGURS,
- establishment of real-estate cadastre database for the area of Republic Srpska,
- establishment of IGPRS
- ensuring quality improved cadastre evidence about real-estates,
- adaptation in to the European Union standards (INSPIRE directive),
- ensuring important improvements of organizational, ownership and other relations in sphere of spatial planning.

GIS RGURS implementation

GIS RGURS implementation started in year 2008 when the Strategic study about development of GIS RGURS has been developed and adopted by the Government of Republic Srpska. This was followed by production of secondary projects defined by mentioned document and their implementation. Complete study and project documentation has been produced with full respect of INSPIRE directive as well as other standards defining area of spatial information like:

- ISO TC 211 (Technical Committee ISO/TC 211, Geographic information/Geomatics,
- OpenGIS consortium (OGC).

Produced project documentation has, beside the segment of cadastral evidence in Republic Srpska, included all other segments of geospatial data under responsibility of RGURS (state survey, cartography, spatial units, etc.), in fact complete spatial data infrastructure in Republic Srpska including all business processes in RGURS having goal to establish electronic administration – e-Administration.

Presently, implementation of 2nd phase of GIS RGURS is ongoing, which should be implemented till the end of year 2012 and includes:

- implementation of new integrated application solution for cadastre registers in all territorial units of RGURS,
- central server in the RGURS Headquarters in Banja Luka implementation which will keep copies of all cadastral data in Republic Srpska,
- initial RGURS Geoportal implementation (initial segment of IGPRS) for distribution of spatial data under responsibility of RGURS.

By implementation of GIS RGURS, this authority will completely fulfil European standards defined in INSPIRE directive.

Law on survey and cadastre of Republic Srpska

Implementation of European and global standards is itself impossible if it is not properly supported by adequate legal documents. Recognizing necessity to regulate implementation of European standards in the area of geospatial data (INSPIRE directive), RGRUS has fully accepted this fact during preparation of new Law on survey and cadastre of Republic Srpska, as done by surrounding countries and from European Union. Doing so through this law IGPRS area has bee formally defined. Through the Law on survey and cadastre of Republic Srpska basic segments of IGPRS have been defined like:

- IGPRS stakeholders (public administration institutions, public enterprises, legal persons),
- IGPRS establishment, maintenance and usage,
- IGPRS platform standards (INSPIRE and other standards),
- IGPRS content (metadata, services, sets of geodata),
- the role of RGURS in IGPRS – RGURS establishes, maintain and manage IGPRS Geoportal,
- IGPRS bodies –IGPRS Council and IGPRS working groups.
The Government of Republic Srpska appointed the IGPRS Council in April 2012 defining the Council president (RGURS director) and nine members from responsible ministries. IGPRS Council:

- proposes of Government subjects, criteria and norms for establishment and maintenance of IGPRS, midterm work plans, sources and financing ways for IGPRS,
- defines responsible subjects for certain IGPRS topic,
- harmonizes activities of IGPRS subjects,
- execute control of establishment and functioning of IGPRS,
- adopts documents regulating its work,
- establishes IGPRS working groups for execution of specific professional jobs and
- informs Government, IGPRS stakeholders and public about activities related to establishment and functioning of IGPRS.

**Geoportal RGURS**

Presently, the final phase of Geoportal application implementation is under execution including:

1. database structure has been created,
2. data for IGP have been collected,
3. to enable collection and update of GIS data via internet till end of year 2012,
4. final stage of Geoportala establishment, till end of year 2012,
5. enable data delivery via internet till end of year 2012,
6. discovery, catalogization, description and distribution of objects, maps and images has been enabled,
7. establishment of metadata catalogue has been enabled.

Clear development goal for RGURS is to develop software support for establishment of geospatial data infrastructure in RGURS and establishment of distribution, exchange and Geoportal development over such infrastructure. Through the establishment of Geoportal of geospatial data in RGURS connection and exchange of spatial data from various sources is enabled and makes those data easy accessible for users via internet or intranet.

By the activities executed till now 2 phase of Geoportal establishment has been successfully implemented, respectively initial RGURS Geoportal has been implemented understanding following:

- appropriate hardware and communication infrastructure has been secured,
- initial application support for Geoportal – Erdas Apollo has been secured,
- initial amount of geospatial data has been prepared for presentation,
- initial services for data viewing on Geoportal have been implemented.

Transfer to next phase of Geoportal implementation will require important activities, meaning:

- implementation of remaining data discovery, invoke, exchange, download and e-commerce Geoportal services,
- preparation of all geospatial data for their presentation on Geoportal,
- detailed rules and roles for stakeholders and users of IGPRS definition.

RGURS Geoportal is defined in manner to satisfy all standards and user demands, especially regarding basic functionalities of Geoportal:
- data representation,
- object distribution (WFS/WFS-T),
- maps (WMS),
- images (WCS),
- user data maintenance activities and
- user groups privilege distribution.

The look of Geoportal for data access and IGPRS is given below. One of the functionalities, related to presentation of data via web-service (WFS or WMS) is given on Figure 33.

On Figure 33 spatial unit data viewing via WFS has been presented. Data presented are loaded in Oracle 11g database, in which the database structure has been created in accordance to INSPIRE directive. On Figure 34 full view of spatial units has been shown, where each layer has been presented in different styles which can be modified in accordance to request of user. Using proper scale enables also presentation of municipality names.

**Metadata catalogue**

Metadata catalogue are agents for service representing key component in service oriented architecture managing common sources and simplifies source discovery inside of open distributed system. Metadata catalogue establishment should rely on respective adopted standards in this area, first of all OGC standards and INSPIRE recommendation Figure 35 is showing INSPIRE Metadata editor.
Metadata catalogue enables preparation, loading, maintenance and validation of metadata. Example how metadata catalogue should look like is given on Figures 36 and 37.

One of basic metadata catalogue functionalities included also possibility of selling products via metadata catalogue. On Figure 37 example of selection of appropriate product and request preparation for its buying or ordering is shown.

**Executing of geodetic-technical works and solving property-legal relations for capital projects of Republic Srpska**

RGURS participated in scope of its responsibilities in realisation of number of capital projects among which we extract:

- Solving property-legal relations and supervision over execution of geodetic-technical works on capital project of construction of **Banja Luka – Gradiška highway**.
- Solving property-legal relations and supervision over execution of geodetic-technical works on capital project of construction of **Mahovljani node which connects Banja Luka – Gradiška and Banja Luka – Doboj highways**, see Figure 38.
- Execution of geodetic-technical works and solving property-legal relations on capital project of construction of **Banja Luka – Doboj highway**.
• Solving property-legal relations and supervision over execution of geodetic-
technical works on capital project of construction of **Banja Luka – Klašnice motorway**.

• Solving property-legal relations and supervision over execution of geodetic-
technical works on capital project of construction of **pipe hydro power plants on the river Bosna in municipalities Doboj and Modriča**.

![Figure 38: Section of new highway Banja Luka - Gradiška](image)

- Execution of geodetic-technical works in preparatory phase for solving property-
legal relations on capital project of construction of **tourist complex Jahorina in municipality of Pale**.

- Execution of geodetic-technical works in preparatory phase for solving property-
legal relations on capital project of construction of **thermal power plant Stanari in municipality of Doboj**.

- Execution of geodetic-technical works and solving property-legal relations on capital project of construction of **road Eastern Sarajevo – Tvrdimići - Jahorina, over mountain Trebević**.

- Execution of geodetic-technical works and solving property-legal relations on capital project of construction of **road Gacko – Foća (in the area of fault Čemerno)**.

Executing those activities RGURS has shown being capable to execute any task which Government of Republic Srpska gives to it contributing so to economic development of Republic of Srpska.

### 5.3 Ljubljana

**CAPITAL PROJECTS FOR REAL ESTATE REGISTRATION AT SMA**

There have been many of capital projects gained by Surveying and Mapping Authority of the Republic of Slovenia in the last few years. We could mention some of them for example:

- Transition to the new coordinate system
- Establishing the national network of permanent GNSS stations - SIGNAL
- Electronic access to geodetic data
• Real Property Census
• Real Estate Register establishment
• Informing owners on the trial real estate value calculation
• Establishing a cumulative cadastre of public (utility) infrastructure,
• Implementation of INSPIRE directive
• Etc.

In this document, we will describe only some of these capital projects that have had a significant impact on the wider society and economical development of Slovenia.

The Surveying and Mapping Authority of the Republic of Slovenia has been striving for some time to establish a quality record of the building and parts of buildings data (apartments, business premises, etc.). Using the aerial survey data, the **2000-2002 real estate registration modernization projects** produced digital data of the outlines and positions of all the buildings in the country. All the buildings were designated with identification numbers; the buildings were linked to parcels and house numbers, if the latter were designated. In this manner one of the prerequisites for the linking of land and building (parts of buildings) data into a real property, as stipulated by the Law of Property Code, was fulfilled. In the continuation of the same project thus acquired buildings were amended with the attribute data on the buildings and parts of buildings using existing records. The data used were obtained from the Land Cadastre, the Register of Spatial Units, and the data for determining the ground rent, the Central Population Register, the Business Register, the infrastructural cadastres and the data from the major property administrators. The quality of the thus acquired data depends on the sources used in the establishment of the record, which resulted in varied data qualities.

The Property Data Collection Project started in 2007 and it was named the **Real Property Census**. Its start could not be earlier because the Real Property Registration Act was as the project legal basis was passed in the Parliament in May 2006. The main objective of the project was to revise and collect needed data about buildings and parts of buildings characteristics. On the basis of all identified buildings (aerial inventory), data from land cadastre and building cadastre and other public registers, documents and questionnaires were prepared for the field inspection of each building (and all of its parts) in Slovenia. It took one year of the field work to collect the data. It took another year to process collected data in order to establish Real Property Register. The project costs were approximately 11 million EUR provided by the state budget. The Real Property Register (RPR) was established in 2008 based on land cadastre data, building cadastre data, land register data and collected data on the field. Since then all property data in the Real Property Register have been managed in a digital form according to the prescribed procedures. There are approximately 6.5 million properties registered at the moment. The property type structure is: 540,000 houses, 330,000 apartments, 130,000 garages, 30,000 industrial properties, 40,000 business premises, 40,000 offices, 3,000,000 agriculture land, 450,000 agriculture objects, 1,500,000 forest land and approximately 440,000 other types of properties.

The Real property census project was one of the biggest projects that the Surveying and Mapping Authority of the Republic of Slovenia has ever conducted. It was a project that directed the operations of our regional offices away from regular everyday activities, placed the management of the Surveying and Mapping Authority of the Republic of Slovenia in the public and media spotlight, Figure 39, and too many people, for the first time, communicated what we do and what our competences are. There were a lot of difficult moments and challenges but today, with all of it behind us, we could say that this “mega” project was a successful one.
All data collected during Real property census project was established in new record of real estate – the **Real Estate Register**. A new record of the Real Estate register was established at Jun 2008.

The system valuates market values for all registered real estates, including all types of land. Assessed market values will be stored in the Real estate register and publicly accessed without restrictions. The main purpose for developing the system was the idea to tax the possession of real estate on a base of their market value. In a present system possession of real estate is taxed by two different taxes; tax on (real) property and charge of the use of building ground. In a future we would like to substitute both taxes with unified property tax on real estate and connect the taxation system on data on real estate in real estate register.

In the area of real estate valuation we established a **service for mass valuation**. On the basis of the acquired Real property census data, it will be able to carry out an assessment of the real estate value for the whole area of the country. The real estate transactions were processed for the purpose of making a model of the Slovene real estate market and determining a valuation model of individual types of real estate.

The legal basis for the, mass real estate valuation is in the Mass real Estate Valuation Act, which was adopted in Slovenia in May 2006. This is a new system field pertaining to real estate, real estate prices, values, and real estate market and consequently affects the operation and decision making in all the state agencies, municipalities, real estate owners and other citizens.

In 2010, the Surveying and Mapping Authority of the Republic of Slovenia started with the project **Informing owners on the trial real estate value calculation**. For the first time in Slovenia, the collected data on real estate and the mass real estate valuation system enabled the calculation of a trial value for each individual section of real estate stating the probable value that such a section of real estate would gain in the market. The basic purpose of the project was to inform the owners of real estate of the calculated value of real estate and to collect proposals to such value. The value of real estate is also influenced by real estate data collected in the Real Estate Register.

The notification was aimed at notifying owners of data collected in the Real Estate Register and enabling them to use various ways (by post, through web application or by visiting the land survey office) to adjust real estate data with the actual situation and thus provide for the correct real estate value calculation. For the purposes of this
project, the hardware for administering and maintaining the land register was properly upgraded and improved.

Figure 40: Informing owners on the trial real estate value brochure

The project „Informing owners on the trial real estate value calculation“ In the first half of 2010, the Surveying and Mapping Authority of the Republic of Slovenia prepared a methodological-technological basis for informing real estate owners of the trial real estate value calculation. Software for data entry, as well as an online application for informing of eventual changes by owners, was designed for the staff of the Surveying and Mapping Authority of the Republic of Slovenia. During the period 29 September until 4 October 2010, real estate owners received 1,098,349 notifications of the trial real estate value calculation. A brochure was delivered to Slovenian households on how owners can change and supplement data or submit suggestions to the valuation models, Figure 40. Real estate owners were informed of 84,000,000 real estate data. From 4 October 2010 until 25 January 2011, real estate owners made changes or suggestions for 1,443,263 data on real estate, which represents 1.71% of all data submitted by the Surveying and Mapping Authority of the Republic of Slovenia by means of notifications. These changes refer to 545,079 real estate plots, representing 9% of all real estate in Slovenia. During the project, 194,881 real estate owners visited land survey offices in order to arrange data, while 64,252 owners submitted data through the online application. On 31 December 2011, 5,405,799 plots and 1,161,407 buildings and 1,807,258 parts of buildings were registered in real estate database in Slovenia.

5.4 Podgorica

ACTIVITIES OF REAL ESTATE ADMINISTRATION REGARDING REAL ESTATE CADASTRE DESIGNING IN ORDER TO CONSTRUCT HIGHWAY BAR-BOLJARI AND ADRIATIC IONIAN HIGHWAY

According to the mid-term plan of works on state survey and design of the real estate cadastre for 2008 - 2013 adopted by the Government of Montenegro, in order to construct Bar - Boljari highway and Adriatic Ionian highway, the Real Estate Administration is realizing projects designing the real estate cadastre in an unsurveyed part of the Montenegrin territory, covered by the census cadastre which is not reliable evidence on property and owners. Therefore, as the final result, we are achieving
consolidated public evidence where property, rights to the property and obligatory rights are registered in compliance with law.

Projects encompass a few phases: the first step is a media campaign, with the aim of informing the citizens about their obligation to mark their property. The real estate administration contacts every media, electronic and printed, as well as maintains direct contacts with citizens by employees, in order to explain the process of marking and to deliver them evidence from census cadastre.

The second phase is aerophotogrammetric scanning and processing of films made, and the creation of cadastral maps in digital form. Creation of cadastral maps consists of numerating cadastral parcels, objects within parcels and defining the area of parcels and objects. All this leads to the creation of elaborates or public display of data which consists of: survey elaborate, cadastral plans, title of deeds with temporary written data and documentations about properties.

The next phase is public display of data process, where elaborate is available for preview to the citizens-owners and interested parties on the territory of cadastral municipality for which public display of data is in process and where is needed to define property rights. Public display of data is implementing commission for public display appointed by administration organ.

The administration defines the time and date of public display of data, by publishing announcement in, at least, one daily newspaper available on the entire territory of Montenegro. That announcement contains all necessary data and to all entities registered in temporary deeds as owners, co owners or common ownership, is sent the call for the hearing with the time and date.

Public display of data process id terminated when the commission for public display of data delivers temporary title of deeds to the administration organ.

Final phase is confirming database, when administration organ determines that real estate cadastre is designed in accordance to the law by decision and by determining the start of implementation, published in Official Gazette of Montenegro.

In the period of adopting the mid-term program, the Real Estate Administration in cooperation with private sector has started implementation of many projects designing real estate cadastre.

The State budget of Montenegro funds the following projects:

- Production of the real property cadastre in the municipalities of Podgorica (14 cadastral municipalities spreading over 20,372ha), Bijelo Polje (17 cadastral municipalities spreading over 26,397ha), Andrijevica (3 cadastral municipalities spreading over 2,195ha) and Berane (3 cadastral municipalities spreading over 3,177ha), or rather totalling 52,141ha.
- Production of the real property cadastre in the municipalities of Cetinje (15 cadastral municipalities spreading over 54,670ha), Nikšić (11 cadastral municipalities spreading over 31,626ha) and 1 cadastral municipality of the Podgorica Municipality spreading over 1,911 ha, or rather totalling 88,207 ha.
- Production of the real property cadastre in the municipalities of Podgorica (23 cadastral municipalities spreading over 60,502 ha).
- Production of the real property cadastre in the municipality of Berane (2 cadastral municipalities spreading over 4,693 ha).
• Production of the real property cadastre in the municipalities of Berane and Rožaje spreading over 66,730 ha.

This totals 272,273 ha, or rather 41.55% of the unsurveyed territory of Montenegro.

A World Bank loan funds the following projects:

• Production of the real property cadastre in the municipalities of Andrijevica (15 municipalities spreading over 25,865 hectares), Berane (17 cadastral municipalities spreading over 28,456 ha) and Mojkovac (7 cadastral municipalities spreading over 25,096 ha), or totalling 79,417 ha.

• Production of the real property cadastre for 10 cadastral municipalities of the Žabljak Municipality totalling 36,649 ha.

• Production of the real property cadastre 18 cadastral municipalities of the Plav Municipality totalling 45,106 ha.

• Production of the real property cadastre for 24 cadastral municipalities of the Pljevlja Municipality totalling 78,605 ha.

This totals 239,777 ha, or rather 36.6% of the unsurveyed territory of Montenegro.

As can be concluded, on 1 May 2012 the real property cadastre projects are being carried out over 512,050 ha, or rather 78.15% of the unsurveyed territory of Montenegro.

During the real estate cadastre creation, data provided will serve as the basis for realizing expropriation for the construction of a highway and digital cadastral plans will be designed with leveling terrain description as the basis for the geometric base for the creation of the technical documentation for the highway construction (Project idea and Main project).

5.5 Priština

BUSINES ENVIRONMENTAL TECHNICAL ASSISTANCE (BETA) PROJECT

Short description of projects until 2005

Since its establishment, the Kosovo* Cadastral Agency (KCA) has initiated a number of projects intended to establish a cadastral system, but also to organize other activities in order to produce spatial information. In the period from 2000 to 2003, the development of the KCA was supported by the governments of Sweden, Norway and Switzerland within the Support for Reactivation of Cadastre in Kosovo* programme. The purpose of this programme was development and reactivation of cadastre and establishment of the immovable property rights.

Regarding registers projects can be divided into basic and cadastral projects. So far, there have been no projects to update cartographic products. Some of the projects have been carried out and completed. In this programme is established reference network KOSVAREF01 connected to the ETRS89 system. The first-order network consists of 32 points and 397 points of 2nd order referent network. The aerial surveying and orthophoto and digital elevation model creation projects were carried out in three rounds. The first systematic aerial surveying of the territory of Kosovo* was performed in 2001 with continuation in 2004 and 2009.
All available cadastral map sheets have been scanned and vectorised. In order to achieve optimal results, the Vectorisation Quality Control project was carried out. The geometric position of sheets was in the old datum, so the Cadastral Information Transformation project transformed the sheets into the new datum (KOSOVAREF01). The descriptive cadastral information on parcels, cultures and holders were found stored on tape. The Consolidation of the Textual Cadastral Information Database (KCID) project transferred this information into a modern, unified database accessible from every municipal cadastral office. The Kosovo* Cadastral Interim Database supports the establishment of the Immovable Property Rights Register. The legal requirement of establishing an Immovable Property Rights Register was met through the Implementation of the Immovable Property Rights Register project (desktop system). A database and entry user interfaces were created, and in 2005 data entry was initiated. The WebGIS was realized within one component of the second stage of the Kosovo* Cadastral Support Programme (KCSP II). The application is based on Geomedia WebMap. It is installed on the KCA intranet.

**Business Environmental technical assistance (BETA) project**

Besides the projects described above, there have been several other projects being carried out in Kosovo* with the support of various donors. From 2006 World Bank has started a project for Cadastre development under BETA project (Business Environmental technical assistance). In the project was only one component for Cadastre and the project aim was to secure immovable property rights as a contribution to land market development and facilitating new business start-ups in terms of improving access to capital, improving use of property rights as collateral through mortgages, and reducing transaction times. This project has been completed in the end of 2011.

Subcomponents of the Cadastre component:

1. **Associated Registration improvement, Land Policy and Legal Framework**
   Subcomponent has supported further development of the land policy framework, legal framework development especially the Law for Immovable Property Rights Registration, the cadastre law and the mortgage law. Trainings (Project management, ECDL etc.); Project coordination office professional staff; Drafting and publication of Operational manuals for Cadastre reconstruction, Building cadastre construction, Procedures for registration etc, Figure 41.

   ![Figure 41: Project poster](image-url)
2. Support for registration of property rights

The subcomponent has supported Re-engineering of Municipal Cadastral Office’s: Prishtina, Prizren and Ferizaj according to the front/back office model, where except physical renovation of existing MCO offices also they are supplied with IT equipments and furniture and trainings about the procedures and workflows. This is an example to serve as a demonstration office for the other MCOs in the territory of Republic of Kosovo*. There are included also study tours to other countries in the region with well-developed customer service functions.

Additionally subcomponent has supported capacity building of MCO’s for efficient services to all citizens. KCA is supported IT Server equipment for security and Immovable Property Right Register server and KCA IT for training center.

3. Cadastre Reconstruction

Subcomponent has supported reconstruction of cadastral information in 26 Cadastral Zones located in 17 Municipalities, where are collected the data in the field and after public display process are registered in IPRR (Figure 42, 43).

![Figure 42: Situation before reconstruction](image1)
![Figure 43: Situation after reconstruction](image2)

4. Building Cadastre

Sub component has supported the collection of the data from the field and registration of buildings, apartments and business premises in IPRR for cities Prishtina, Peja, Prizren and Gjilan. The project has been completed successfully and has created the basics for the continuation with new World Bank project “Registration of real estate in Cadastre” - RECAP with same objectives. Project has just started and will be finalized in 2015.

5.6 Sarajevo

PROJECTS OF THE FEDERAL GEODEΤIC ADMINISTRATION SERVING THE CAPITAL PROJECTS OF THE BIH FEDERATION

The BiH Federation Government has initiated a number of capital projects aimed at creating preconditions for the economic growth of the BiH Federation. In some of these projects, significant tasks have been given to the Federal and cantonal geodetic administrations in order to create the necessary preconditions to carry out the capital
projects. Two current projects should be underlined: Expropriation Project for the Vc Corridor Highway (for the BiH Federation area) and BiH Population Census Project.

In order to implement the: Expropriation Project for the Vc Corridor Highway, the Federal Geodetic Administration (hereinafter: FGA) prepares and develops the legislation to regulate in the BiH Federation the area of expropriation. The valid Expropriation Act was passed in 2007 and has been enforced ever since. In accordance with the current needs and according to the conclusion of the BiH Federation Government, the FGA has prepared two novelties of the former Expropriation Act – Law on Modifying and Amending the Expropriation Act (BiH Federation Official Gazette, no. 36/10) and Law on Amending the Expropriation Act (BiH Federation Official Gazette, no. 25/12). The main goal is to amend the original text of the Law in order to accelerate the expropriation procedures conducted in order to build the key transportation infrastructure, especially the Vc Corridor Highway.

In order to implement these novelties, the FGA offers opinions regarding the interpretation and enforcement of the provisions of the valid Expropriation Act in concrete situations and expropriation processes, as well as expropriation in general (annually, approx. 30 requests or queries). Furthermore, as the federal organ in charge, the FGA passes second-instance administrative decisions about the expropriation and annually process approx. 120 cases in this area. Apart from this and due to the need to accelerate the construction of the Vc Corridor Highway, the FGA prepares and drafts decisions whereby the BiH Federal Government, pursuant to its authority stated in Art. 31, para. 2 of the Expropriation Act (most frequently it involves the JP Autoceste Federacije BiH d.o.o. Mostar company), allows the acquisition of expropriated real properties before the expropriation decision enters into force and before the compensation for the real properties expropriated has been paid (annually, approx. 400 such decisions are forwarded, in order to be adopted, to the BiH Federal Government). Thereby, the geodetic report on the expropriation is compiled by the municipal administrative body in charge of geodetic works while the expert assistance related to preparing the geodetic report for expropriation and the inspection of geodetic works in the expropriation procedures and enforcement of the decision on expropriation in the cadastral municipal documentation, is provided and implemented by the FGA.

BiH Population Census Project is carried out by the Federal Bureau of Statistics (hereinafter: FBS) while FGA offers support in its preparation. The final goal of the FGA activities is to provide the drawings of statistical and census circles with all characteristics in order to establish the updated spatial units register for the population census, other statistical research and users.

The geodetic report of this Project encompasses:

- Vectorization of the borders of spatial units, statistical and census circles, borders of settlements, cadastral municipalities, cantons and entities;
- Updating of borders of spatial units, updating of statistical and census circles with the production of drawings and descriptions of the afore-mentioned borders, entering the descriptions into the SUR database, production of overview maps for statistical circles for municipalities and populated places;
- Forming and updating the records of streets and house numbers;
- Development of SUR DB (Spatial Units Register Database);
- Production, print preparation and printing of drawings of statistical and census circles;
- Development, print preparation and printing of overview maps.
The data of the Real Property Cadastre is digitized in accordance with the Rules and Regulations on the Real Property Cadastre Database (Official Gazette of the BiH Federation, nos. 21/08 and 14/09) (hereinafter: Rules and Regulations) as well as other regulations from the field of survey and real property cadastre, while the Spatial Units Register data is digitized in accordance with the criteria stipulated by the Project assignment.

The entire procedure of performing the afore-mentioned tasks encompasses the involvement of the service providers receiving the materials from the FBS (scanned and geo-referenced cadastral maps of the BiH Federation and other necessary data owned by the FGA, digital orthophotos of the BiH Federation and other necessary data owned by the Federal Ministry for Physical Planning, and drawings (in analogue and raster format) of the statistical and census circles, and other materials owned by FBS. The service provider performs the vectorisation of the spatial units borders, updates the borders of spatial units (of statistical and census circles), produces the descriptions of statistical and census circles and sets up and updates the records of houses and house numbers. It, furthermore, produces the SUR DB, prepares for printing and prints the drawings of statistical and census circles and overview maps. The service provider controls and verifies the operations and delivers the data to FBS and FGAU.

The service provider should assess the quality of the existing materials and possibly give adequate comments. It should all be clearly documented in the technical report to be produced for each municipality.

In order to prepare and implement the afore-mentioned capital projects of the BiH Federation, FGA has carried out several projects in order to prepare the system for the realisation of the set tasks. This involves:

**Permanent GNSS Stations Establishment Project – BiHPOS**

This project has been carried out as a unique project comprising networks of two entities: BiHPOS network of the BiH Federation and SRPOS network of Republic of Srpska. The project was funded by the European Commission from the IPA Grant 2007 and the Ministry of Civil Affairs of Bosnia and Herzegovina.

The main purpose of this project is to ensure the national service based on GNSS surveys for positioning in the entire territory of Bosnia and Herzegovina. The system enables the real time positioning and offers three services of various characteristics and corrections. It involves the DSP (DGNSS) differential service of real time positioning (corrections of 1-3 meters), VPSP (PDGNSS) or highly precise service of the real time positioning (correction of 1-2 centimetres) and GPSP or geodetically precise service of the near real-time positioning and post-processing (corrections of 1 centimeter).

The project was carried out in 2011 and has become operational in early 2012. The network consists of 34 permanent stations (17 in each entity). The establishment of the permanent stations network has created the basis for integrating the network of Bosnia and Herzegovina with the networks of neighbouring countries and the European permanent stations network (EUREF permanent network). Apart from the geodetic profession, the permanent stations network is of great importance also for physical planning and regulating the land, agriculture, forestry, transport and communication, environmental protection, mine clearing and various GIS and other users.
Digital Orthophoto Map Production Project

The project is funded by IPA 2008 Grant of the European Commission and is carried out in cooperation with the Ministry for Civil Affairs of Bosnia and Herzegovina, Brčko District, Republic Geodetic Administration of Republic of Srpska and FGA. The basic task of this project is the production of digital orthophoto maps (hereinafter: DOP) on the basis of aerial photogrammetry and digital terrain model for the entire territory of Bosnia and Herzegovina.

The project involves the digital aerial photogrammetry, stipulated pixel samples expressed as Ground Sample Distance in line with the geographical conditions and flight altitudes and spatial resolution DOP production (PR, GSD) for:

<table>
<thead>
<tr>
<th>Type</th>
<th>Area</th>
<th>GSD less than</th>
<th>Scales of index map*</th>
<th>DOP resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>A – urban areas</td>
<td>11000 km²</td>
<td>20 cm</td>
<td>1:2500</td>
<td>25 cm</td>
</tr>
<tr>
<td>B – State areas</td>
<td>51129 km²</td>
<td>40 cm</td>
<td>1:5000</td>
<td>50 cm</td>
</tr>
</tbody>
</table>

The product identification will run along the border of the map sheets of relevant scale and rules for naming and dividing into the detailed sheets.

This DOP is part of a geographic IT system and serves as the basis for various types of planning, designing, geodetic and cadastral operations and controls the general cartography, cadastral surveys, urbanism, transport planning, monitoring – illegal construction in urban areas, forests, agriculture, environmental protection etc.

Project of Producing the Digital Topographic Map in the Scale of 1:25,000

In October 2002, the agreement to launch the project was signed in Sarajevo between the Ministry for Civil Affairs and Communications of Bosnia and Herzegovina and the Japan International Cooperation Agency, in the presence of the representatives of the Ministry of Foreign Affairs of Bosnia and Herzegovina, FGA and Republic Geodetic Administration of Republic of Srpska. The aim of the Project was to produce 47 sheets of the digital topographic map of cities and more significant settlements, based on the new aerial photogrammetry, install the HW and SW equipment for the project realisation in Sarajevo and Banja Luka, train the personnel in Bosnia and Herzegovina in order to produce the remaining part of topographic maps, and create the conditions for their periodic harmonisation with the situation in the field, and to enable the distribution of topographic map in analogue and digital format, in line with the user requirements.

Between 3 July and 9 September 2003, the entire territory of Bosnia and Herzegovina was surveyed in the scale of 1:40,000, (2702 photographs in total). By using the adequate SW packages and created codes specified by the data model, all the planned map sheets were produced. Apart from the foregoing, all 426 sheets of the existing topographic map in the scale of 1:25,000 in analogue format was scanned (400 dpi) and transformed into the coordinate map system in raster and vector formats.

In September 2005, at the Grand Hotel in Sarajevo, the project closing ceremony was held. In the follow-up project of the digital topographic map in the scale of 1:25,000 nine more sheets were funded from the BiH Federation State budget and produced.
The project to systematically update the cadastre in BiH Federation

The final goal of this project is to harmonize the situation in land registers and cadastre with the situation in the field. As part of the „Land Registration Project“ – Component B – Cadastre, the cadastre was systematically updated in the cadastral municipalities of Čapljina-grad, Gradačac-grad, Ljubuški-grad and Travnik-grad, and the situation in the cadastre was harmonized with the situation in the field. The Project encompasses the following procedures:

1. Taking over the data required for the Project realiseation,
2. Developing the reports on renewing the network of permanent geodetic points in a certain area
3. Renewal of the permanent geodetic point network (preceded by a public notification on performing this task)
4. Production of the surveying plan
5. Production of the action plan to improve the situation
6. Marking the boundary points
7. Cadastral survey (using RPCDB – real property cadastre database and DOP – digital orthophoto)
8. Analysis of the obtained results
9. Preparation and collection of data on condominium units to register in the cadastre and land registers
10. Implementing changes in the cadastre (RPCDB)
11. Harmonizing the real property data in the cadastre and land registers (submission of application report to the Land Registry Office-LRO).

The systematic updates resolve the issue of the past lack of updated data in the cadastre. If the municipal courts, in charge of keeping the land registers, will not follow the work of the cadastre, the systematic updating of the cadastre will be of no avail and will result in not completely solving the problem of the people using the cadastre and land registry data.

5.7 Skopje

“Development of a Basic State Map for GIS in RM” Project

In the period 2004-2006 the Government of Japan, through the Japanese International Cooperation Agency, funded the project titled Preparation of a Basic State Map for GIS in RM. Essentially, it is about the development of a digital topographic map in a scale of 1:25 000, which is the first time such a map is made in Macedonia after the state declared its independence. The basic objectives achieved through the project were the development of a DCM for a certain part of the territory of state (55% of the territory of FYRM), transfer of technology and knowledge for the development of digital topographic maps (donating equipment and software and training for handling the equipment and software) and establishment of an efficient mapping data distribution system. As part of the project and based on the new aerial photogrammetric imaging, 105 sheets of DCM have been made (out of 205 in total) in vector, raster and hard copy format, as well as ortophoto maps and a digital elevation terrain model for the entire territory of FYRM.

The success of the Project is also confirmed by the fact that even after the completion of the project, AREC continued to develop the remaining 100 sheets of DCM independently, and finished them by 2011.
‘Real Estate Cadastre and Registration’ Project

The Project supported the establishment of the Real Estate Cadastre on the whole territory of state, and by the end of December 2010 when the Project was finalized the coverage was 99.50%. The Project also supported the Institutional Development of the Agency for Real Estate Cadastre. Namely, during 2008, the new Law on Real Estate Cadastre was enacted, and the State Authority for Geodetic Works had transformed into the Agency for Real Estate Cadastre as its legal successor.

Some key legal amendments were made, and they were the following

- The procedures for establishing and maintaining the REC were shortened;
- Short deadlines for registering and maintaining the cadastre were introduced (15 days for the first registration of the ownership right and 1-3 days for registering changes of the right)
- Short deadlines for issuing data from the GCIS were introduced;
- Preliminary registration was introduced as well as issuance of a preliminary certificate for a building that is in the stage of construction.

The office space of all REC departments was improved, with the purpose of getting better conditions for the employees, front desk work was regulated, so that the service become better for the users. A Call Center was introduced and set up, and later on Info Lines were introduced for the citizens and larger business companies, and the aim was to introduce mechanisms for the improvement of the services and the work performance. The project also supported a massive campaign for informing the public which provided education / information for the citizens regarding the ongoing reforms in AREC and the ways in which the people can fulfill their right and register their real estate.

As a result of the outputs from the implemented reforms in AREC, at the end of March 2010, the Management of the World Bank announced the winner of the third annual competition ‘Improving the Lives of People in Europe and Central Asia Region’ 2010. Project ‘Real Estate Cadastre and Registration’ implemented in the Agency for Real Estate Cadastre was chosen as one of the 12 rewarded projects for 2010. In a competition of 282 projects and a shortlist of 47 better designed and supported nominations that cover a wide range of areas / activities and countries, the Project ‘Real Estate Cadastre and Registration’, in accordance with the assessment of the World Bank is one of 12 projects that have shown innovativeness and specific results in the improvement of the property registration system in Macedonia and have had an impact on the lives of the people in F.Y.Republic Macedonia.

Figure 44: Tempo of establishment of the real estate cadastre in F.YR. Macedonia
The reforms have also contributed for an increased number of newly submitted applications - transactions, at the same time with the establishment of the real estate cadastre, as well as for an increase of the number of registered mortgages and the value of mortgages.

During the process of establishment of the real estate cadastre, the private geodetic practice has contributed significantly.

Figure 45: Number of new received cases/applications vs. unsolved cases/applications

Figure 46: Number of registered mortgages vs. number of deleted mortgages

Figure 47: Value of mortgages and loans expressed in thousands Euros
We would like to emphasize that the private geodetic practice, in compliance with the Law on legalization of illegally built constructions/objects (Official Gazette of RM # 23/11), is actively involved also in the procedure for legalization of the illegally built contractions/objects by producing geodetic reports on the basis of which the local self-government units enact decisions for legalization of the illegally built contraction/object, which represents a basis for registration of the property rights in the public book as well as for incorporation of the same in the urban-planning documentation.

Until now, the Agency for REC has processed 18.000 applications for registration of constructions/objects legalized under procedure carried out under the local self-government.


‘Capacity Building of AREC for the Implementation of AREC’s Strategic Plan for the period 2009 – 2013’ Stage II

The Project provided support for the institution in the development of the Strategic Business Plan of AREC for the period 2009 – 2013; the development of the Law on Real Estate Cadastre; support in providing local and international training for AREC’s staff in order to implement the strategic priorities of the institution.

The project supported the establishment of an active GNSS network on the entire territory of the F.Y.Republic of Macedonia – MAKPOS; it assisted the improvement of the transparency in AREC’s work, through the establishment of web services, more specifically the introduction of online access to the cadastral parcel data through the website for the municipalities in which real estate cadastre has been established, on the territory of the F.Y.Republic of Macedonia.

A web service was also introduced for cadastral service users to enter the database, including mortgage, encumbrances and restraints information. The existing web application was supplemented with a graphical component, and there is a web presentation of the data where real estate cadastre has been established. In the period 2009-2012 the project provided support in the implementation of an e-cadastre on the entire territory of RM, and in parallel with this, new e-services were developed, and this enabled:

- Issuing property certificates for any city in which the e-cadastre is implemented, regardless of where you submit the application
- Viewing the status of applications (solved / unsolved)
- An AREC GIS portal with 2D and 3D web service (a web service for viewing the cadastral maps with a display of the aerial photos and a web service for viewing topographic maps of RM)
- Establishment of an electronic front desk for professional users (E-FrontDesk for the notaries and other professional users of cadastral services).

The Project also funded the development of the Spatial Units Registry. The Project funded and completed the precise satellite positioning and navigation system MAKPOS and achieved uniformity of the entire equipment. AREC introduced electronic payment through setting up POS terminals, thus enabling the users to pay for cadastral services without using cash. The project supported the management and the staff of the institution in performing the staff training program as well as the preparations, production, promotion and dissemination of informative brochures for cadastral services, procedures and prices.
Short-term G2G projects funded by the Kingdom of the Netherlands

The Government of the Kingdom of the Netherlands has provided its support in the form of short-term G2G project, by supporting AREC in the development of a Study of Digitization of Cadastral Maps as well as a Strategy for the National Spatial Data Infrastructure.

5.8 Tirana

LAND ADMINISTRATION PROJECTS IN ALBANIA

A. First project on the Land Administration was in 1994. The main objective was the unification of Cadastre Office and Hypothec Office (Legal Register or the register of deeds) in only one administrative unit: Immovable Registration System (IPRO).

B. Register of property title is based on the parcel, considering it as one of the modern system that operates on the main EU Countries.

C. Legal bases for establishment of Immovable Property Registration System (IPRS) are in the Law Nr. 7843 date 13.07.1994. The IPRO is acting today based on the new Law Nr.33, date 21.03.2012, “For registration of Immovable Properties”.

D. Scope of the work of IPRO is the property title registration, and, as it is mentioned above, the title registration is based on the parcel. In the registration system are included properties of public and private sector.

E. Why this kind of Registration System? This is because it protects the property rights of the owners, defined in the property certificate and the other documents. This system is simple and with low cost in administration. It is easier to supply to clients the information for each property, as it is needed for purchase, buying, mortgage, lease, etc. System permits the setting up of GIS (Geographic Information System).

F. The main principals of our System are:
   - Mirror Principle
   - Curtain Principle
   - Guaranty Principle
   - Open Principle

According to the definitions, the Mirror Principle means that the information on immovable properties should reflect the existing reality. The Curtain Principle means that cartels and index maps should have thorough information about ownership and other property rights, requiring no further verification. The Guaranty Principal means that the state gives guarantee that any information in the cartels is correct and for any damage that can be caused to someone, due to incorrect information issued form IPRS, the property owner shall be compensated. The Open Principle means that everyone can get information on any kind of property that it is interested.

G. Albanian Registration System is a centralized one. The Central Office of IPRS is on the top. The Central Office is responsible for all the activities of the district Offices, on the legal, technical and financial issues.

H. The administrative territory of Albania is composed by 36 Districts. In each district it is in function one Registration Office, which means that in all territory there are 36 Registration local Offices.
I. Albanian territory is divided in 3057 Cadastral Zones. In general, one Cadastral Zone is a country in rural area, and a part of the city in urban area.

J. It is going on the process of property first registration, which means that the property (identified by the unique ID property number) information are reflected to cartel and index map in a digital form, according to articles of Registration Law.

K. Legacy documents, submitted for property registration, should be in compliance with the Registration Law requirements. Provisory map should be attached to the documents. Changes on property, when the property is in a cadastral zone where the first registration is in the process, can be carried out up to 30 days, prior to public display deadline. Registration office doesn’t guarantee the property certificate, prior completion of first registration.

L. Till now, the first registration process is done in 2510 Cadastral Zones, which means on 86 % of total cadastral zones. In areas when the first registration is not ended yet, the registration offices are acting with registers of deeds and registers of titles. The first registration process is done in two ways: systematic and sporadic registration.

M. Priority zones, for the first registration process, are those in city areas (foreseen to finish next year), and the touristic areas.

N. There are three main projects, running on, in Albania:

1. Land Administration and Management Project, financed by the World Bank, with a cost of about 20.4 mil US$. Part of this project is the property first registration. Another component of this project is the modernization and computerization of the main processes in the registration offices. The ICT department is working on in these issues.

2. The One Stop Shop project (joint project with Ministry of Justice), to be financed by Austrian loan, with an approximately cost of 0.4 Million Euro. It is in the process preparation biding documents.

3. Twining project between IPRO and Landmateriet (Sweden), with a value of about 0.8 Million Euro, will support the IPRO to run on the GNNS, to train GIS experts, and in self-financed management issues.

5.9 Zagreb

BUILDING CADASTRE

The Law on State Survey and Real Property Cadastre (OG 16/2007, 124/2010) regulates *inter alia* the land cadastre or rather the real property cadastre. State Survey and the Real Property Cadastre activities are of interest for the Republic of Croatia. The State Survey and Real Property Cadastre data is public data. The Real Property Cadastre data is the basis of the Land Registers kept by land registration courts. The basic spatial unit of the Real Property Cadastre is a cadastral parcel. Cadastral municipal documentation (operaft) is kept for the area of one cadastral municipality. Cadastral municipal documentation for a cadastral parcel keeps the data on boundaries and other borders, on the cadastral parcel address, manner of using the cadastral parcel and its parts, the cadastral parcel area and areas of parts of the cadastral parcel used in various ways, and the special legal regimes established on a cadastral parcel.
The cadastral municipal documentation for buildings and other structures keeps the
data about their position and shape, their house numbers and their usage, as well as
the data whether a building or other structure can be used in accordance with
construction regulations.

The cadastral documentation does not contain the data on the height of a building,
number of floors, number of special real property parts, list and description of flats,
business premises and the entire area of the building as well as other attributes such
as the year when an object was constructed, that might assist the valuation of a real
property.

In line with the Land Registration Act, a certain number of flats, business premises and
other special parts of the real property are recorded in the land registers (separate
register under the jurisdiction of the Ministry of Justice registering the real and other
property rights) for the purpose of recording ownership over separate real property
parts but without the positional and altitudinal illustration and other attributes of
buildings.

The cadastral documentation is documenting the actual situation in the field.
Throughout the history, it has been the basis for taxation in the Republic of Croatia.
The current manner of recording the objects is not a good basis for the global valuation
of the real property in the RoC and needs to be improved.

In most EU countries, the building cadastral records have existed for many years.
Recently, many voices have been heard in the Republic of Croatia about the need of
establishing a building registers i.e. the building cadastre.

After the last population census was published in 2011 – for whose production the
State Geodetic Administration had produced the technical documentation (datasets
consisting of the data of the spatial units register under the SGA jurisdiction spatially
laid over the data of the digital orthophoto map and the data obtained from the SGA
topographic databases), the Central Bureau for Statistics has clearly underlined that
the population census would be more successful if the State Geodetic Administration
had been able to provide also the data on the special parts of the real properties (list of
flats, business premises).

The Ministry of Finance clearly underlines that the strategic goal of the Republic of
Croatia is the introduction of the real property tax to replace the existing system of
utility services fees.

The introduction of the complete database of both the land and the building would
create the preconditions to perform valuation of such real properties that would serve
as the basis for the introduction of the real property tax. The data from the building
cadastre and the land cadastre would enable the local government units to record utility
services costs in a better way. Apart from the taxation purposes, the records on the
building cadastre established in such a way would serve as an even better basis for the
physical planning county offices to produce detailed physical planning analyses for
further development and expansion. Even after establishing the missing records
(records on buildings), the legal transactions with the separate real property parts
(buildings and land as a whole) would be performed on the basis of the land registry
data and would be recorded in the land registers but the establishment of such records
would create preconditions to strengthening the real property transactions (knowledge
of the estimated value for investments and real property transactions).

The State Geodetic Administration is ready and prepared to produce the initial list of
buildings (residential and business) on the basis of the data under its jurisdiction
(cadastre, Spatial Units Registers) and the data from the DOP (cartographic and topographic databases). Afterwards, it should be organized in financial, resource and technical way to perform field visits whose purpose would be to update the initially compiled list of buildings. Based on such activities, it is possible to produce the register of all buildings in the Republic of Croatia to represent the basis for the building cadastre establishment and development. Apart from the data on the buildings and separate parts of the buildings, the data on the real property title holders (and their Personal Identification Numbers) and the data on their separate parts would be collected and subsequently updated in the land cadastre (or the merged land and building cadastre).

Until now, the topic has been raised several times in the Republic of Croatia related to the need of developing the building register but the importance of introducing the building cadastre at the national level has not been recognized so far.

It is important to stress that the existence of the legislative framework is a precondition for the establishment of a new registers (or for upgrading the existing land registers, which is a better variant). It is necessary to add the provisions stipulating the obligation of introducing such a register to the Law on State Survey and Real Property Cadastre. The provisions about the obligation to record the legal real property status in the land registers would still remain in the Land Registration Act. Such a division of responsibilities, whereby the cadastre would collect the data on the real properties (the land and everything connected to it) and the land registers would record the legal status of the real properties, would allow the institutions to simply continue performing the operations under its jurisdiction but with an increased scope, for the benefit of the citizens and institutions requiring high-quality, reliable, complete and updated data on the real property.
6 LITERATURE


Petek, Tomaž: Regional Cadastral and NSDI Study 2011 (Draft), 4th Regional Conference on Cadastre and NSDI, Bled, Slovenia 2011. Publisher Surveying and Mapping Authority of Republic of Slovenia, 31 pages.


7 APPENDICES

Refer to CD:

Appendix 1: Questionnaires
Appendix 2: Conference presentations
Appendix 3: List of Conference participants
Appendix 4: Official Conference photos