

# **Second NSDI National Workshop - Serbia**

INSPIRATION

Spatial Data Infrastructure in the Western Balkans

## **SERBIAN NATIONAL STUDY**

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6<sup>th</sup>– 7<sup>th</sup> June 2013, Belgrade

# INTRODUCTION

The study entitled INSPIRATION Country Report – SERBIA done within the framework of the project INSPIRATION – Spatial Data Infrastructure in the Western Balkans.

Research and collection of materials were carried out in the period 2012-2013.

The first version of the document was created on 15 May 2013.



The European Union's IPA Programme

**INSPIRATION –  
Spatial Data Infrastructure in the  
Western Balkans**

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**INSPIRATION: National report  
Serbia**

**DRAFT VERSION OF 15.05. 2013.**

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# **1. ABSTRACT**

The study shows the establishment of the National Spatial Data Infrastructure (NSDI) in Republic of Serbia, which is based on INSPIRE principles.

The objective of INSPIRE directive is to create framework that facilitates easier access to and use of geo-information, through development of the system to support geo-data harmonization and interoperability using standards.

# 1. ABSTRACT

The study presents a detailed analysis of individual segments required for the implementation and development of the NSDI in Republic of Serbia:

- detail the implementation of the NSDI,
- the technical implementation of the NSDI and
- recommendations for further development of the NSDI.

# 1. ABSTRACT

Recommendations for further development of the NSDI in Republic of Serbia are presented in the following areas:

- legislation,
- coordination,
- organization and technical implementation.

## **2. PROJECT SCOPE AND INTRODUCTION**

### **Terms of reference – TOR**

Terms of reference – TOR INSPIRATION – The Spatial Data Infrastructure Solution for Western Balkans (EC 2011) promotes:

- spatial data infrastructure (SDI),
- coordinate their construction in Southeastern Europe,
- with the idea of preparing users to comply NSDI with the objectives of the INSPIRE Directive.



## **2. PROJECT SCOPE AND INTRODUCTION**

### **Terms of reference – TOR**

To achieve the above objectives defined by the following project activities:

- analysis of the political, institutional and legal framework,
- capacity building and knowledge transfer,
- awareness raising and communication.

## **2. PROJECT SCOPE AND INTRODUCTION**

### **The aim of the project**

In accordance with the TOR for INSPIRATION project (EC 2011, p.16) objectives of this report are:

- create recommendations for the improvement of the legislative framework,
- draft regulations for the NSDI users,
- future harmonization with the INSPIRE Directive.

## **2. PROJECT SCOPE AND INTRODUCTION**

### **The aim of the project**

Looking at the set goal and the overall context in which the report is made, National Report on the NSDI includes the following two main components:

- Details of the implementation of the NSDI in Republic of Serbia,
- Recommendations for further development of the NSDI in Republic of Serbia.

# 3. METHODOLOGY OF THE STUDY

Methodology of the Study is based on the research methods, data analysis, communication, discussion and analysis of realized questionnaire.

The research and analysis of data used:

- official documents of the Government of the Republic of Serbia,
- official documents of the Republic Geodetic Authority (RGA),
- Studies, reports, articles and presentations made by RGA,
- Studies and reports which have been made for the EU.

# **3. METHODOLOGY OF THE STUDY**

Interviews were conducted with representatives and persons responsible for NSDI development in the following institutions:

- Ministry of the Republic of Serbia;
- Republic Geodetic Authority;
- Faculties and Universities;
- Research institutes;
- Local governments.

### **3. METHODOLOGY OF THE STUDY**

Republic Geodetic Authority - Department of Informatics and Communication, Department of NSDI – has made questionnaire in 2012. There were a total of 78 institutions.

The results of the survey are presented in the document entitled "Details of the results of the questionnaire on the state of geo-sector" (2013).

# 3. METHODOLOGY OF THE STUDY

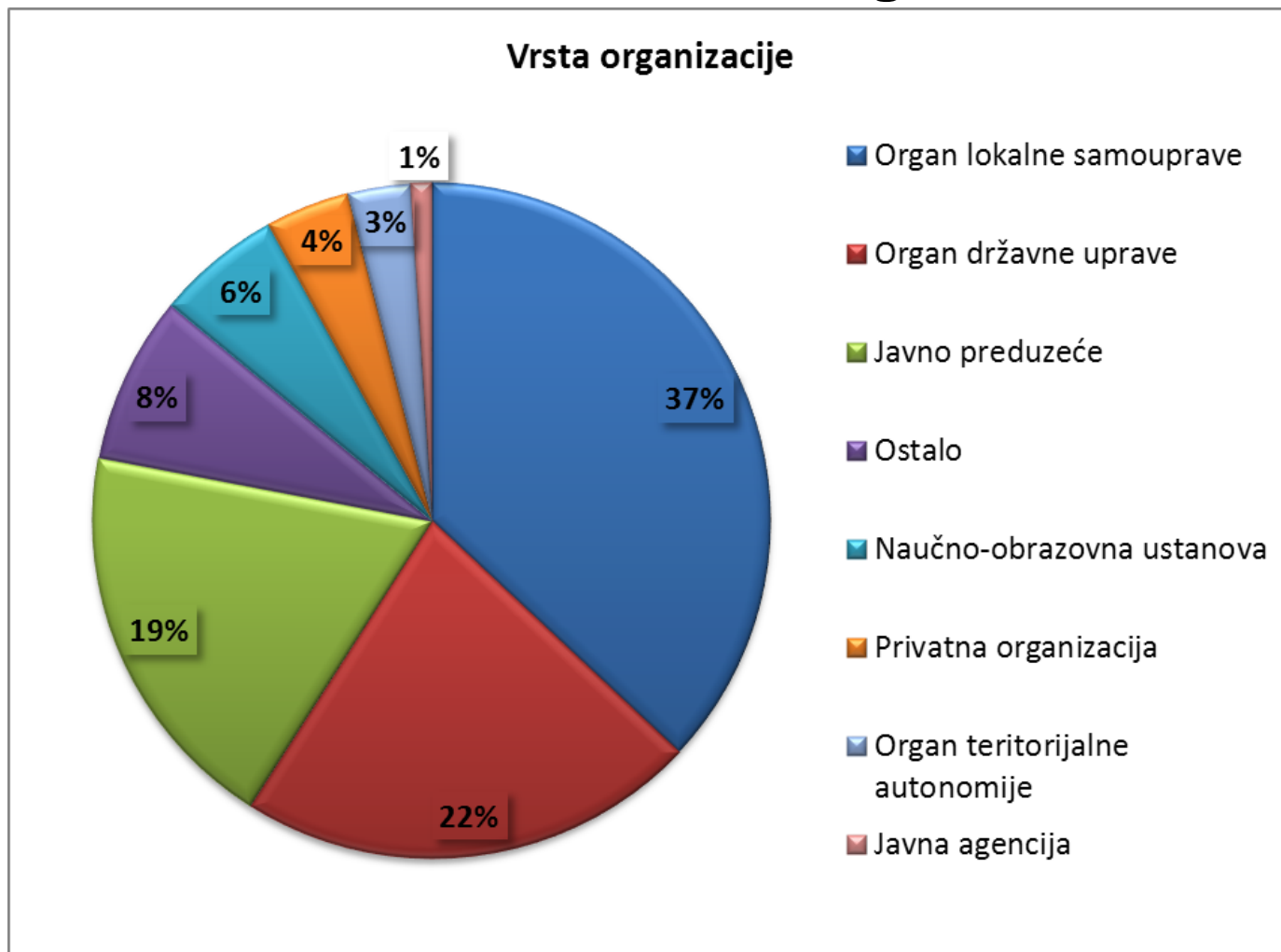
## Basic information on the questionnaire

The questionnaire contains 33 questions grouped into 5 themes:

1. Information about the organization;
2. Spatial data;
3. Cooperation between subjects NSDI;
4. Standardization;
5. Other.

# 3. METHODOLOGY OF THE STUDY

## Information about the organization



The local government

The state administration

Public enterprise

Other

Scientific and educational institution

Private organizations

Territorial autonomy

Public agency

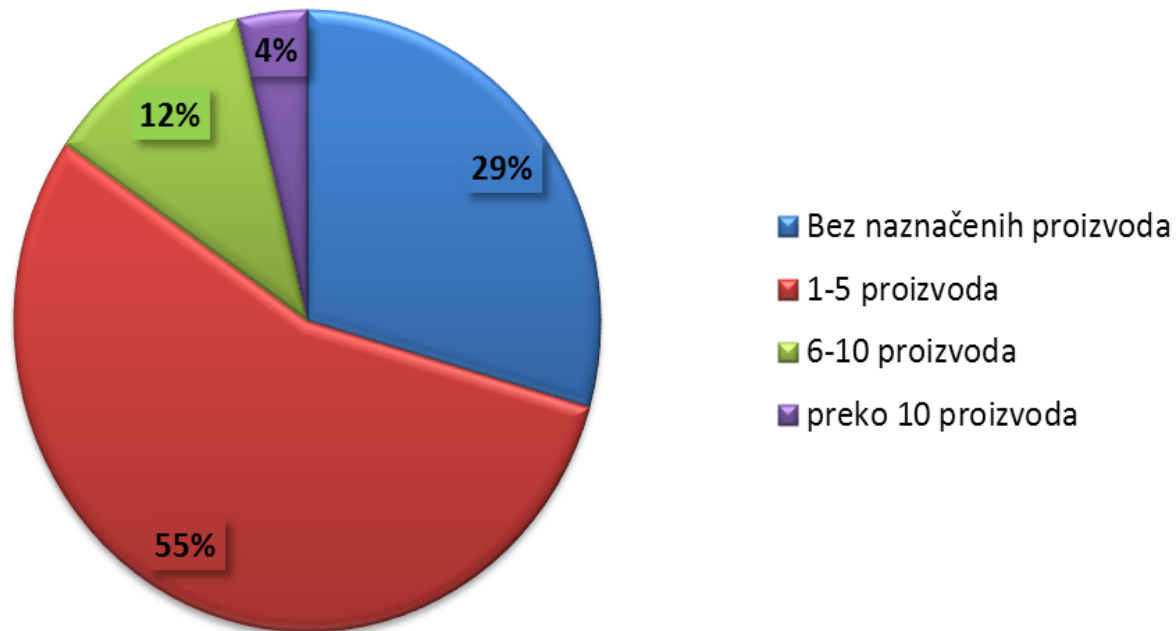
Representation of organizations in the survey by type.



# 3. METHODOLOGY OF THE STUDY

## Spatial data

Broj organizacija prema broju skupova prostornih podataka

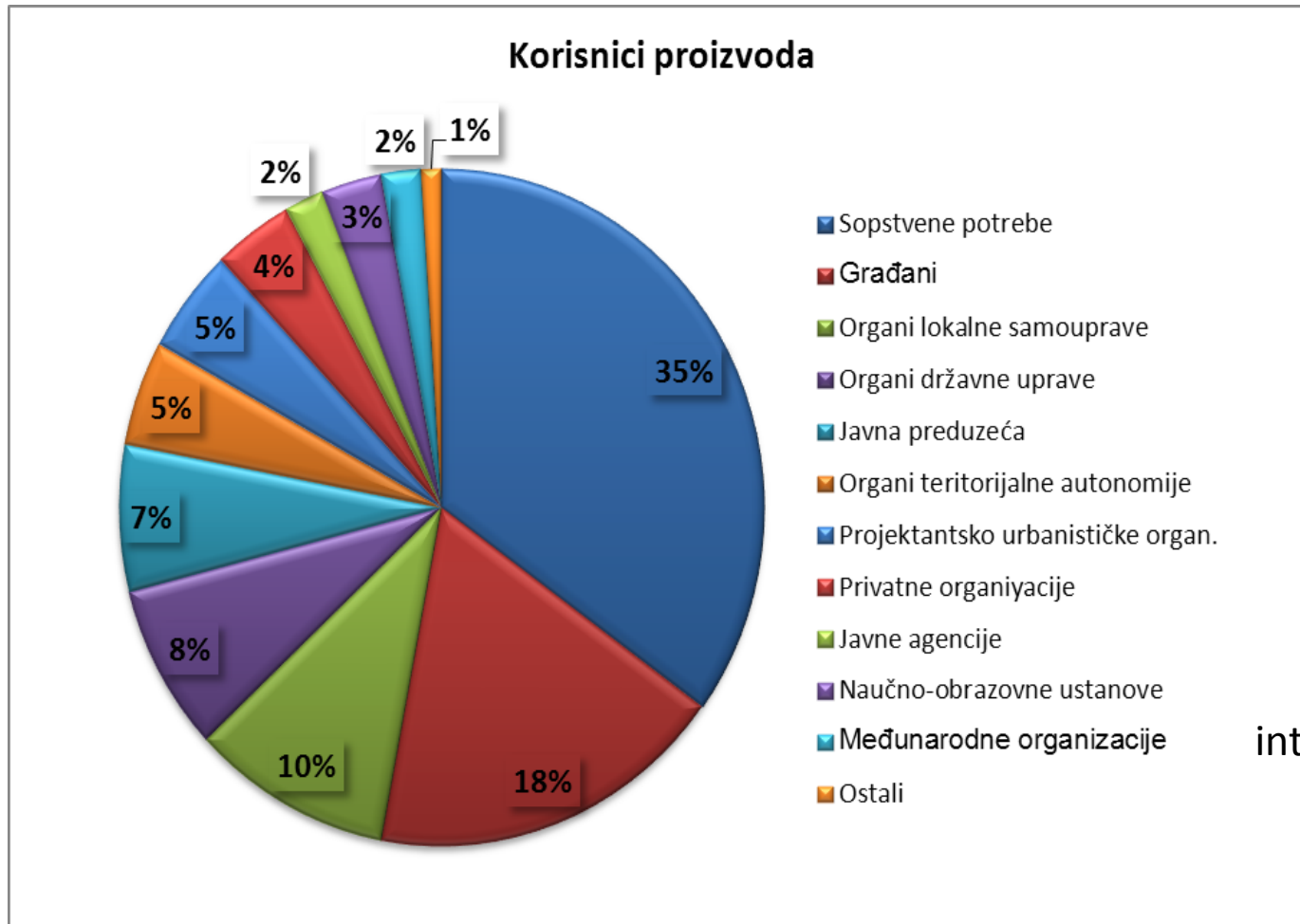


no product data  
1-5 product data  
6-10 product data  
over 10 product data

Number of organizations by number of spatial data sets

# 3. METHODOLOGY OF THE STUDY

## Cooperation between subjects NSDI



own needs  
citizens  
local authorities  
state administration  
public enterprises  
...  
international organizations  
other

The users of the product

# 3. METHODOLOGY OF THE STUDY

## Standardization

Offered the following standards: INSPIRE, ISO, CEN, OGC, W3C, GIS software, National standards of Serbia.

Status of implementation of the INSPIRE standards

Status INSPIRE standards	representation	percentage
1. No answer	37	47%
2. In use	6	8%
3. Partially	5	6%
4. Required	13	17%
5. Not used	8	10%
6. We are not aware	9	12%

## 4. STUDY RESULTS

The results of studies relating to:

- Details of the implementation of the NSDI;
- Technical implementation of the NSDI;
- Recommendations for further development of the NSDI.

# 5. DETAILED REVIEW OF THE IMPLEMENTATION OF NSDI

## 5.1 Legislation

The legislative framework for the implementation of the NSDI in Serbia consists of the following documents:

- Laws;
- Regulations;
- Strategies.



# **5. DETAILED REVIEW OF THE IMPLEMENTATION OF NSDI**

## **5.1.1 Description of the legislative framework**

Description of the legal framework in Serbia is discussed in detail in the document National Spatial Data Infrastructure - Overview of legislation in the field of geo-data (2012).

This document is made in Republic Geodetic Authority, as basis for discussion and further updating, by the working groups and the NSDI Council in 2012.

# **5. DETAILED REVIEW OF THE IMPLEMENTATION OF NSDI**

## **5.1.1.1 Current regulations governing the NSDI**

### **A. Legislation which regulating geo-data**

The most important legislation in Europe and the Republic of Serbia are:

- INSPIRE Directive - EU;
- Law on State Survey and Cadastre - Serbia.

# **5. DETAILED REVIEW OF THE IMPLEMENTATION OF NSDI**

## **5.1.1.1 Current regulations governing the NSDI**

### **INSPIRE direktiva**

INSPIRE Directive adopted by the European Parliament and of the Council of the European Union 14 March, 2007.

Directive provides a framework for creating infrastructure harmonized spatial information within and between Member States.

At the same time, the directive defines a common approach to issues of access to and exchange of digital geographic data and thus provides geo-information available at national and European level.



# **5. DETAILED REVIEW OF THE IMPLEMENTATION OF NSDI**

## **5.1.1.1 Current regulations governing the NSDI**

### **Law on State Survey and Cadastre**

Law on State Survey and Cadastre ("Official Gazette of RS", no. 72/2009 and 18/2010) regulates the professional affairs and public administration related to the geodetic and cadastral affairs.

With this Law, created the basis for the establishment of the NSDI through provisions that define (Articles 159 - 167):

# 5. DETAILED REVIEW OF THE IMPLEMENTATION OF NSDI

## 5.1.1.1 Current regulations governing the NSDI

### B. Legislation which regulating work government and other agencies

	Legislation which regulating work government and other agencies
1	Law on ministries
2	Law on competences of the Autonomous Province of Vojvodina
3	Law on local self-government
4	Law on the capital city

# 5. DETAILED REVIEW OF THE IMPLEMENTATION OF NSDI

## 5.1.1.1 Current regulations governing the NSDI

### B. Legislation which regulating areas of profession

	Legislation which regulating areas of profession
1	Law on public roads
2	Law on railways
3	Law on water
...	
16	Law on the register of spatial units
17	Law on the state seismological bureau

# **5. DETAILED REVIEW OF THE IMPLEMENTATION OF NSDI**

## **5.1.1.2 Regulations in preparation for the NSDI**

### **The drafting of a new law on the NSDI**

Working group on the legal framework has decided to adopt a new law for complete transposition of the INSPIRE Directive in serbian legislation.

Will be adopted and by-laws, with the planned timetable for adoption.

### **NSDI Strategy for the period 2013-2015**

In order to further develop the National Spatial Data Infrastructure, Republic Geodetic Authority began in 2013 drafting of a new NSDI strategy for the period 2013-2015.

# 5. DETAILED REVIEW OF THE IMPLEMENTATION OF NSDI

## 5.1.1.3 Regulations on access to public sector information

Availability of data held by the government and other bodies is defined by a series of acts.

	Availability of data constitution and laws
1	Constitution of the Republic of Serbia
2	Law on free access to information of public importance
3	Law on Ratification of the Convention on access to information, public participation in decision-making and access to justice in environmental protection
4	Law on environmental protection

# 5. DETAILED REVIEW OF THE IMPLEMENTATION OF NSDI

## 5.1.1.4 Regulations on the protection of intellectual property rights spatial information

In Serbia there are many laws which governing the legal protection of intellectual property.

	Laws which governing the legal protection of intellectual property
1	Law on Copyright and related rights
2	Law on patent
3	Law on trademark
4	Law on the legal protection of industrial designs
5	Law on protection of topographies of integrated circuits

# 5. DETAILED REVIEW OF THE IMPLEMENTATION OF NSDI

## 5.1.1.5 Legislation to restrict the right of access to spatial information

	Laws about limited rights
1	Law on State Survey and Cadastre (Article 165)
2	Law on confidentiality data
3	Law on the protection of personal data
4	Law on free access to information of public importance
5	Low on the issuance of publications

# **5. DETAILED REVIEW OF THE IMPLEMENTATION OF NSDI**

## **5.1.2 Exchange geo data**

Constitution, laws and other general acts regulated the relations of government and other agencies.

Geo-exchange is realized on the basis of agreements and regulations. The study shows:

- General obligation to cooperate;
- Way exchange of geo data;
- Other requirements relevant;
- Cooperation between subjects NSDI;
- Rules of the exchange and use of the product;
- Products and services within the NSDI;
- Using geo data;
- Situation in practice.



# **5. DETAILED REVIEW OF THE IMPLEMENTATION OF NSDI**

## **5.1.3.1 Financial model NSDI**

In the Study is discussed the financing model NSDI:

- Services based on geo information;
- The practice of other countries in relation to the use of spatial data;
- INSPIRE requirements for securing the conditions for the exchange of geo data and services;
- Current policy RGA.

# **5. DETAILED REVIEW OF THE IMPLEMENTATION OF NSDI**

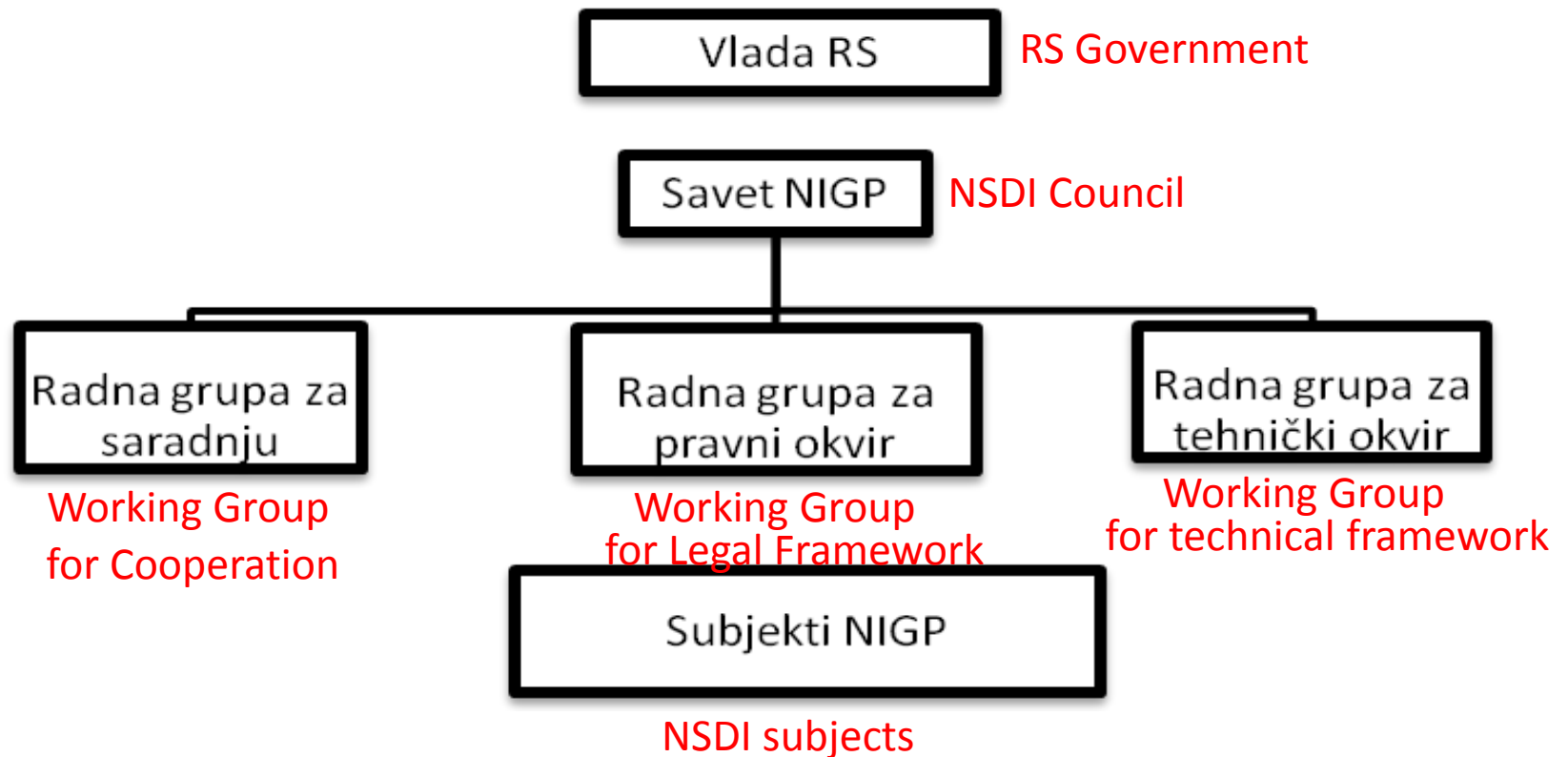
## **5.1.3.2 Pricing policy for spatial data**

The study shows:

- Market;
- Data Quality;
- Distribution system;
- Methods of payment.

# 5. DETAILED REVIEW OF THE IMPLEMENTATION OF NSDI

## 5.2.1 The current institutional framework and body NSDI

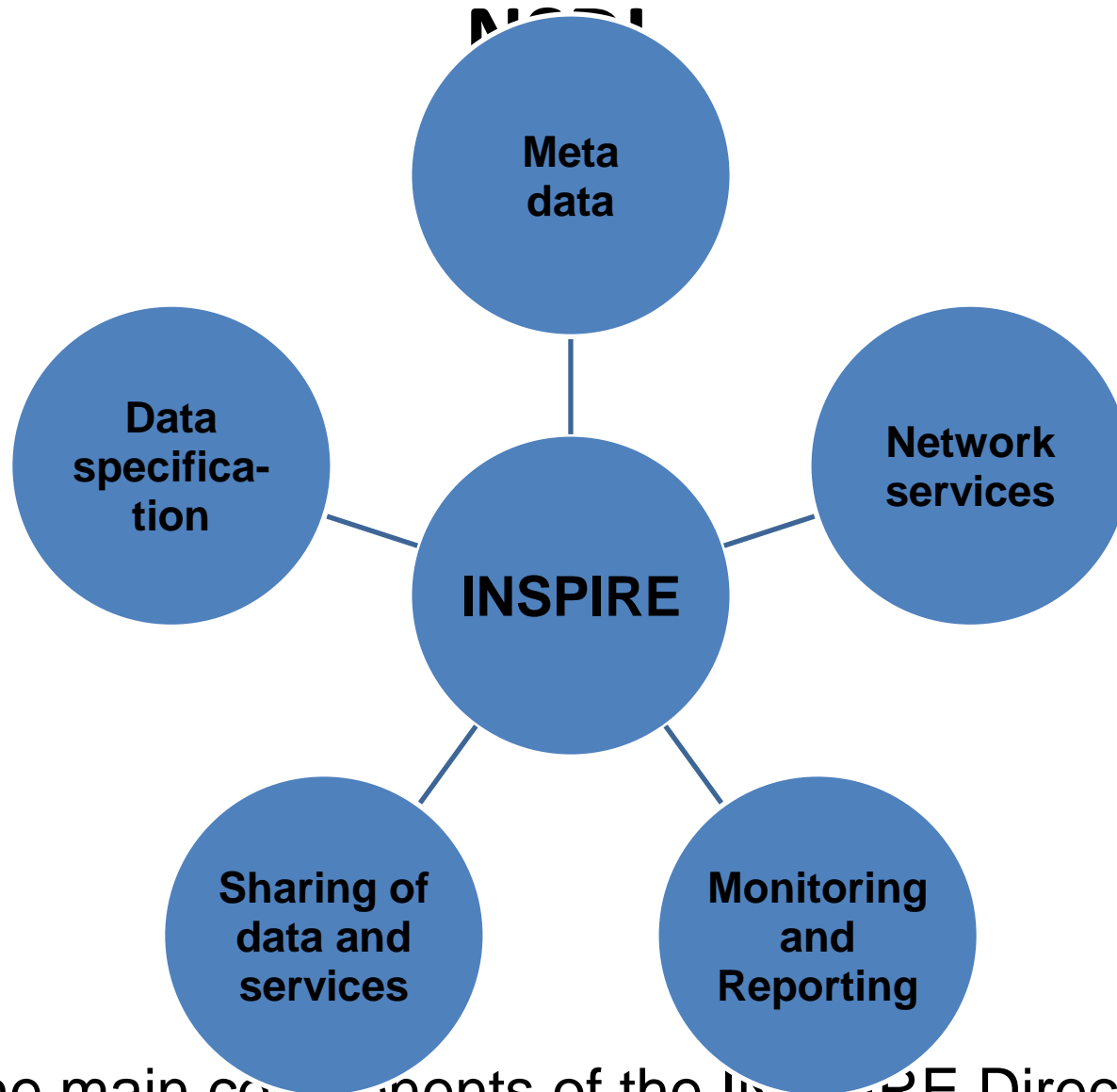


# 5. DETAILED REVIEW OF THE IMPLEMENTATION OF NSDI

## 5.2.2 National Strategy Implementation NSDI

	National strategy and implementation NSDI
1	Strategy for Information Society Development in the Republic of Serbia to the 2020
2	Strategy for e-Government Development in the Republic of Serbia for the period since 2009 to 2013
3	The strategy of establishing an infrastructure for spatial information in the Republic of Serbia for the period 2010-2012
4	Regulation on the medium-term program of work on the establishment and maintenance of the NSDI for the period 2011-2015

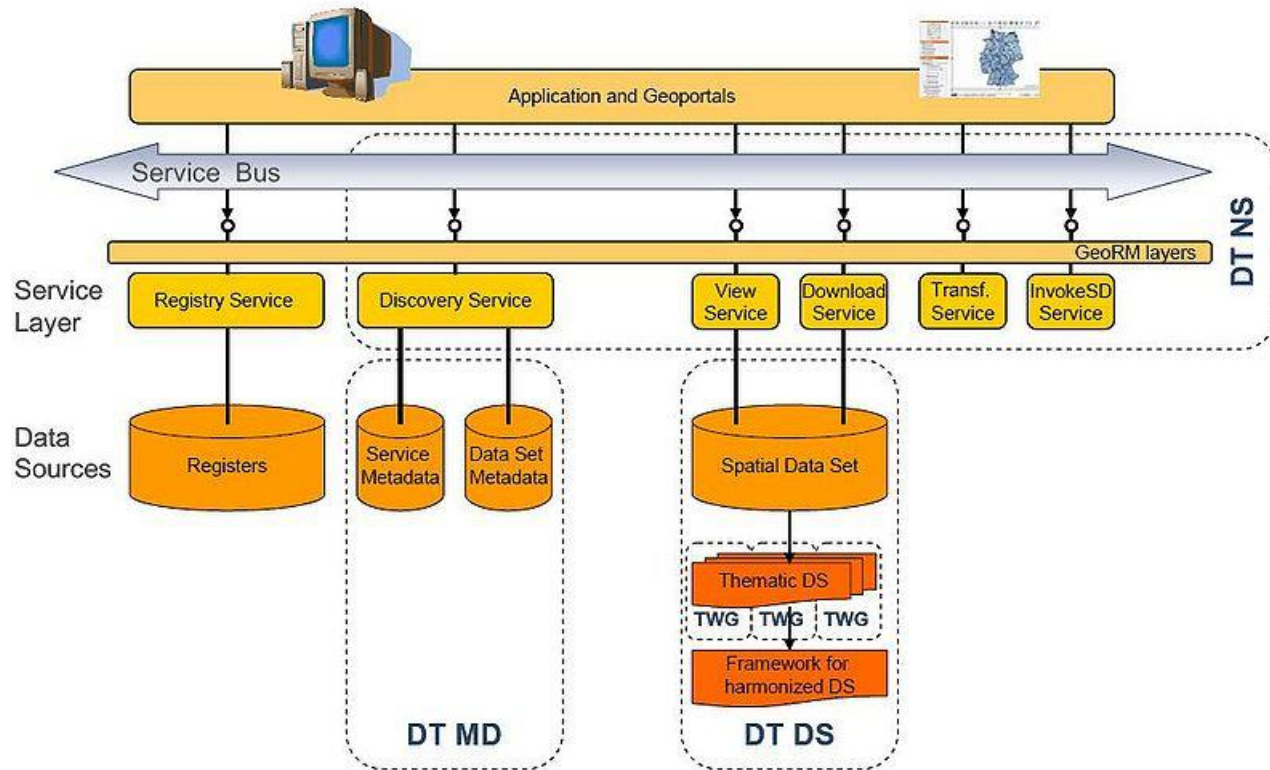
# 6. TECHNICAL IMPLEMENTATION OF THE



The main components of the INSPIRE Directive

# 6. TECHNICAL IMPLEMENTATION OF THE NSDI

Service-oriented architecture (SOA) has been adopted as the technical implementation of the NSDI concept in Serbia.



Service Oriented Architecture (SOA)

# 6. TECHNICAL IMPLEMENTATION OF THE NSDI

## 6.1 Data

Data were analyzed from the aspects of:

- Data specification;
- Model transformation and formats for data exchange;
- Data formats for NSDI;
- Overview of projects that provide geo-information.

# 6. TECHNICAL IMPLEMENTATION OF THE NSDI

## Overview of projects

**Project 1:** The CARDS program of the European Union (2005-2010), the "Digital orthophoto production in Serbia".



DOF resolution of 10 cm (Belgrade, Republic Square)



# 6. TECHNICAL IMPLEMENTATION OF THE NSDI

## Overview of projects

**Project 2:** JICA project (2009-2011), Japan donor project "Capacity building for the development of digital basic state map in Serbia".

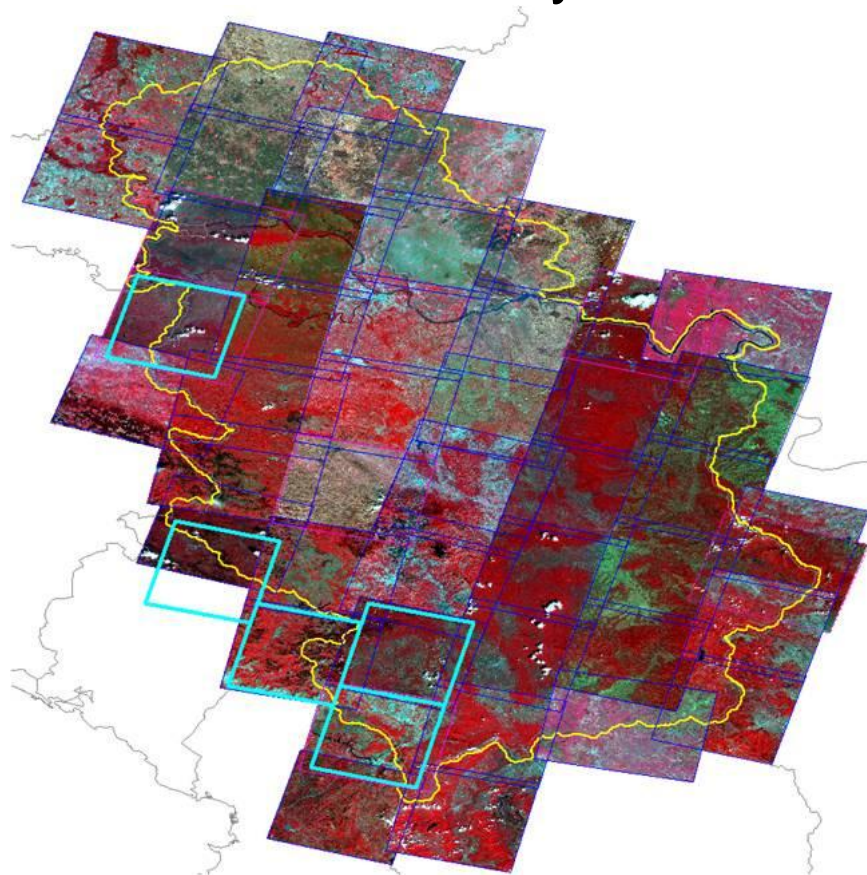


Parts of the main state map - Palic R = 1:5000

# 6. TECHNICAL IMPLEMENTATION OF THE NSDI

## Overview of projects

**Project 3:** IGIS project (2010-2013): National Spatial Data Infrastructure and the Center for Remote Sensing of the Republic of Serbia based on System IGIS (with IGN and EADS ).



Mosaic of satellite images

# 6. TECHNICAL IMPLEMENTATION OF THE NSDI

## Overview of projects

**Project 4:** Geoinformation for development and European Integration (2005-2011), Norwegian donation to support the establishment of NSDI.



Opening ceremony geo-portal (Republic Geodetic Authority)

# 6. TECHNICAL IMPLEMENTATION OF THE NSDI

## Overview of projects

### Project 5: EuroGeographics projects



EuroBoundaryMap (EBM) – scale 1:100 000

# 6. TECHNICAL IMPLEMENTATION OF THE NSDI

## 6.2 Metadata

The proposed metadata standard NSDI is based on standards:

- INSPIRE implementing rules for metadata;
- ISO 19115 - Geographic information - Metadata;
- ISO 19139 - Geographic information - Metadata - XML schema.



# **6. TECHNICAL IMPLEMENTATION OF THE NSDI**

## **6.3 Network services**

At the national level, there is a network of services for the spatial data sets and services for which metadata have been established in accordance with the INSPIRE Directive (Directive 2007/2/EC).

It is essential that all state agencies have the technical possibility to link their spatial data sets and services on the network service.

## **6. TECHNICAL IMPLEMENTATION OF THE NSDI**

### **6.3.1 Geoportal**

Geoportal is a type of Web portal and used to locate and access geospatial data and related services (display, edit, analyze, etc.) via the Internet.

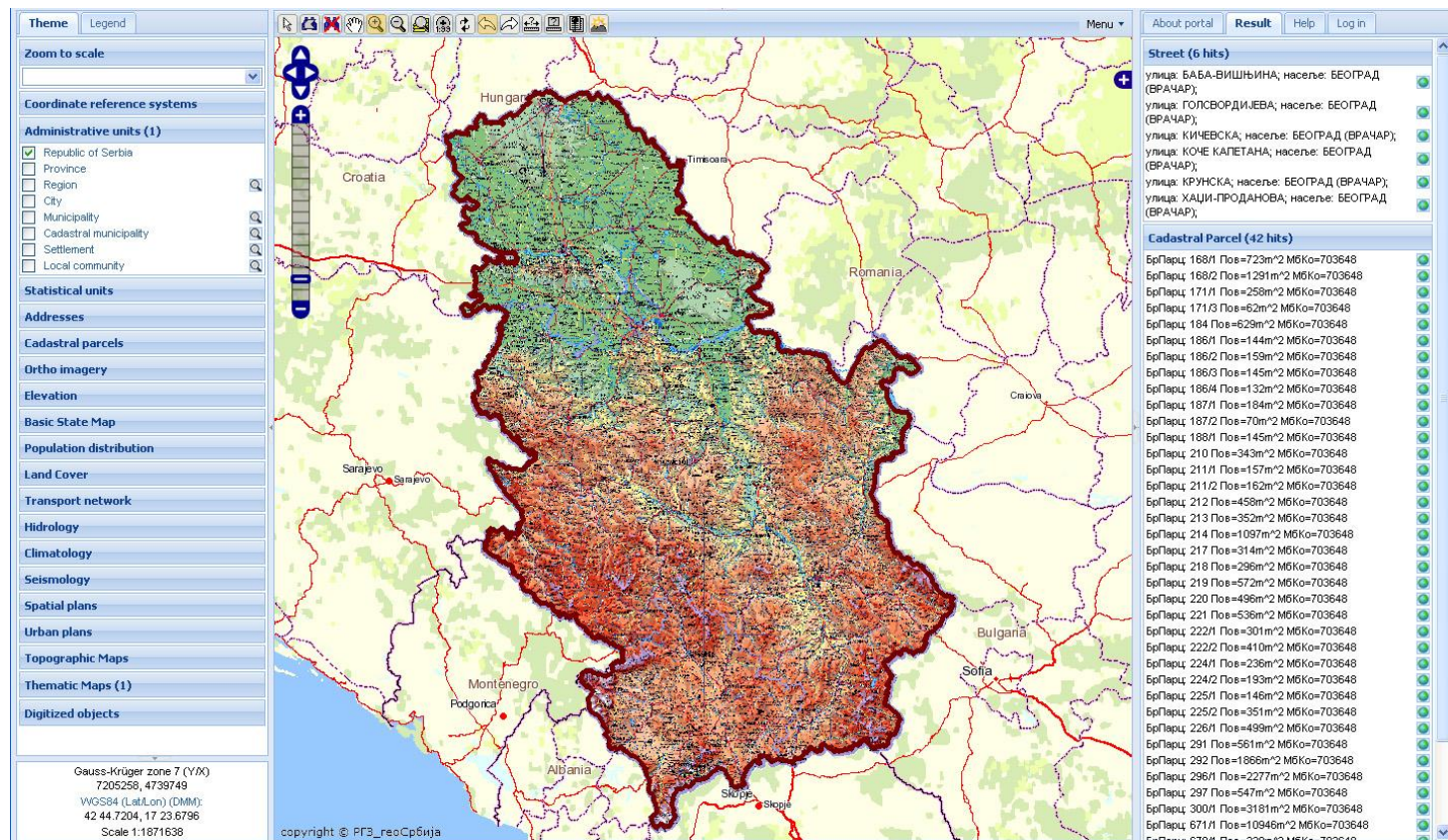
Geoportal in practical use, which contribute to the development of the NSDI in the Republic of Serbia, there are at levels:

- national,
- regional,
- local.

# 6. TECHNICAL IMPLEMENTATION OF THE NSDI

## 6.3.2.1 Geoportal GeoSrbija - national level

Initial geoportal Geosrbija, was put into operation on 27 November 2009. The jurisdiction of the Republic Geodetic Authority and other institutions.



Geoportal GeoSrbija

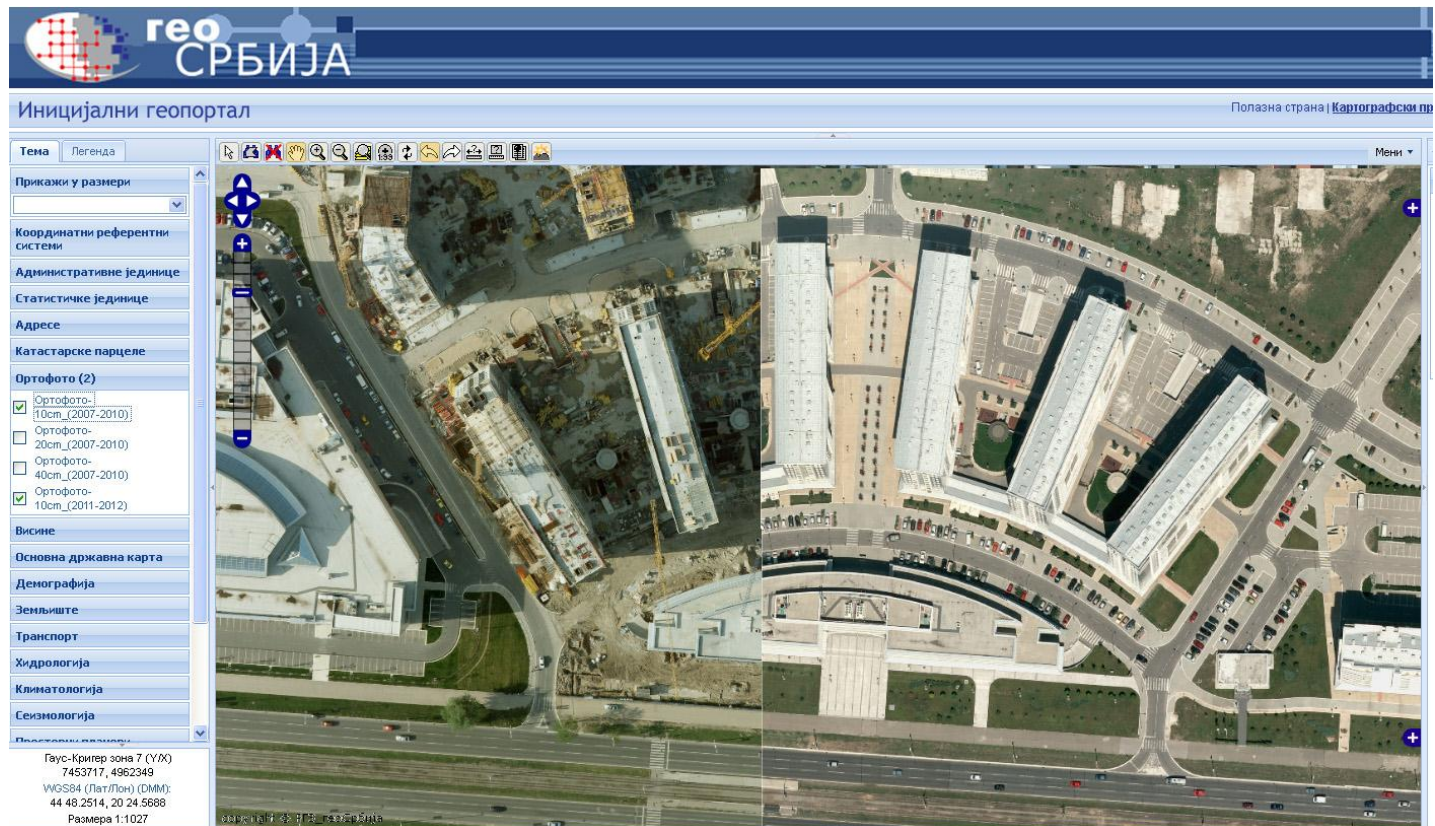


# 6. TECHNICAL IMPLEMENTATION OF THE NSDI

## 6.3.2.1 Geoportal GeoSrbija - national level

Geoportal is available on [www.geosrbija.rs](http://www.geosrbija.rs) and consists of three pages:

- The home page,
- Viewing metadata,
- Viewing of geodata and services.

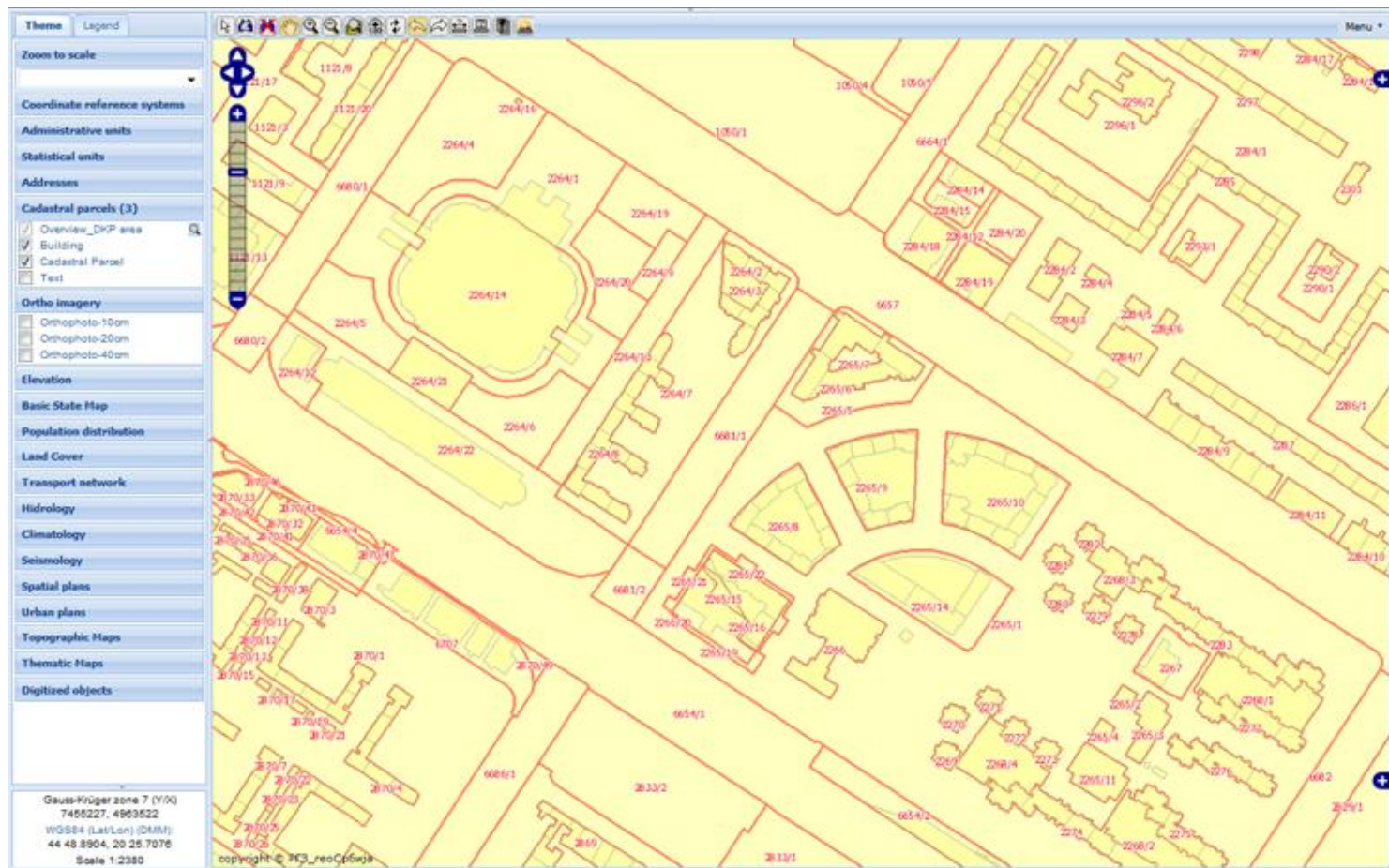


Viewing of maps on Geoportal Geosrbija (orthophoto)

# 6. TECHNICAL IMPLEMENTATION OF THE NSDI

## 6.3.2.1 Geoportal GeoSrbija - national level

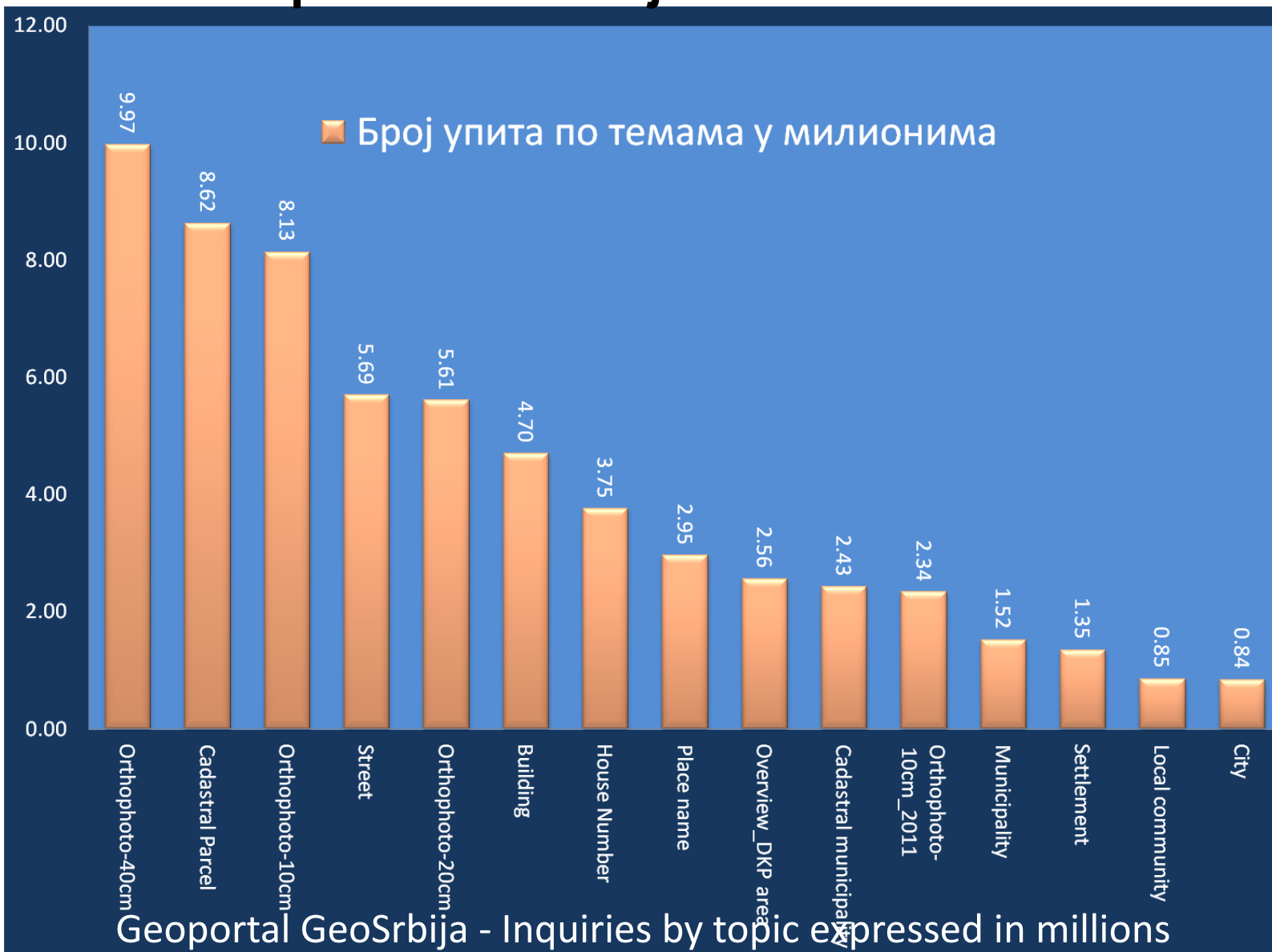
Insight into geodata and services available through the mapping of geo-data and services available through the basic functions.



Viewing of maps on Geoportal Geosrbija (cadastral plan)

# 6. TECHNICAL IMPLEMENTATION OF THE NSDI

## 6.3.2.1 Geoportal GeoSrbija - national level

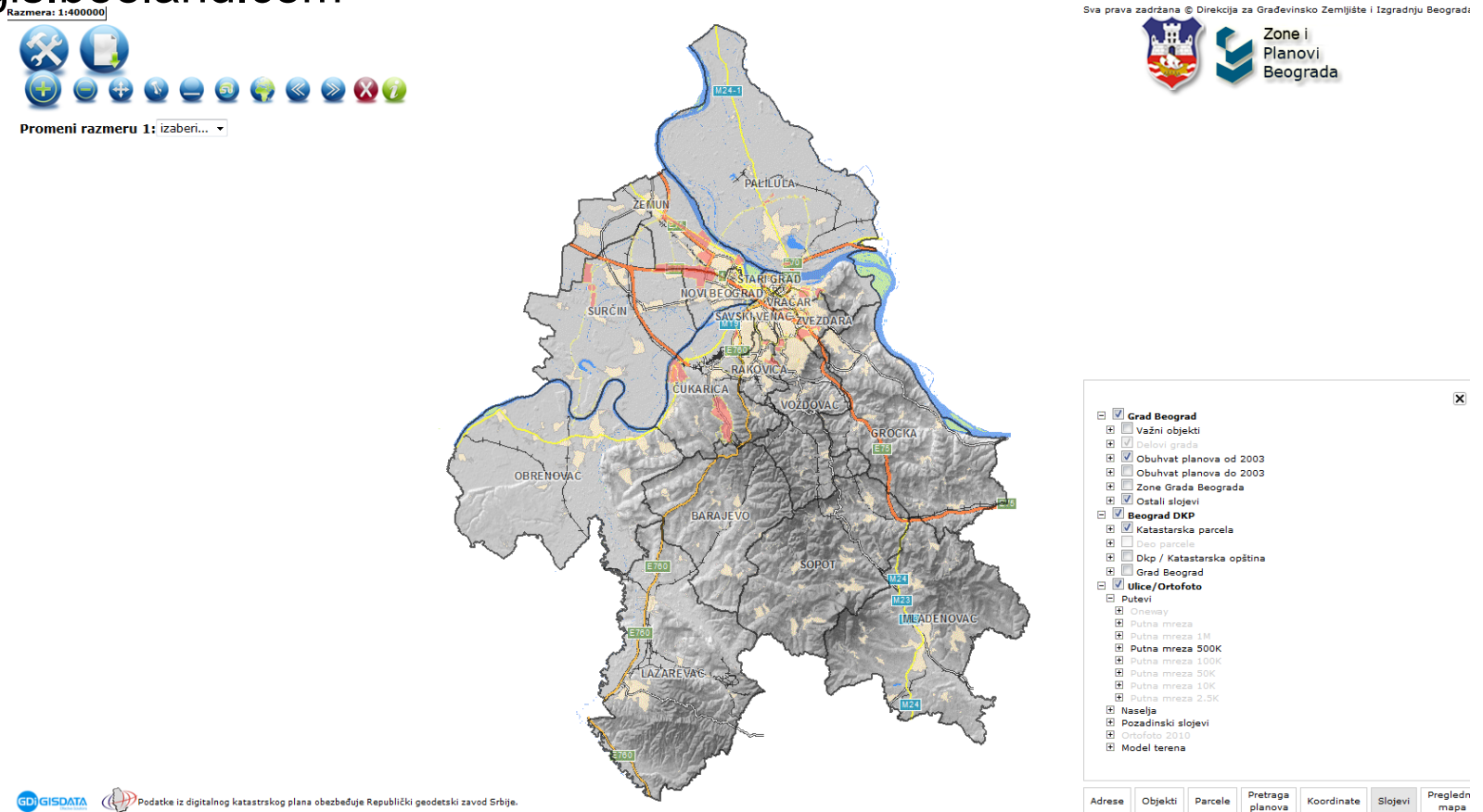




# 6. TECHNICAL IMPLEMENTATION OF THE NSDI

## 6.3.3.1 GIS service-Zone and plans Belgrade-regional level

Belgrade City Hall is the founder of "The Directorate of Land and Construction of Belgrade". The portal is at address <http://gis.beoland.com>



Portal Zone and plans Belgrade

# 6. TECHNICAL IMPLEMENTATION OF THE NSDI

## 6.3.3.1 GIS service-Zone and plans Belgrade-regional level

Spatial data available on the portal are:

Digital cadastral map of the territory of Belgrade;

The digital terrain model;

Orthophoto;

Display settlements;

The road network;

Zone of Belgrade;

Spatial plans;

Parts of town;

Important objects;

Railways;

Islands;

Lakes;

Rivers.

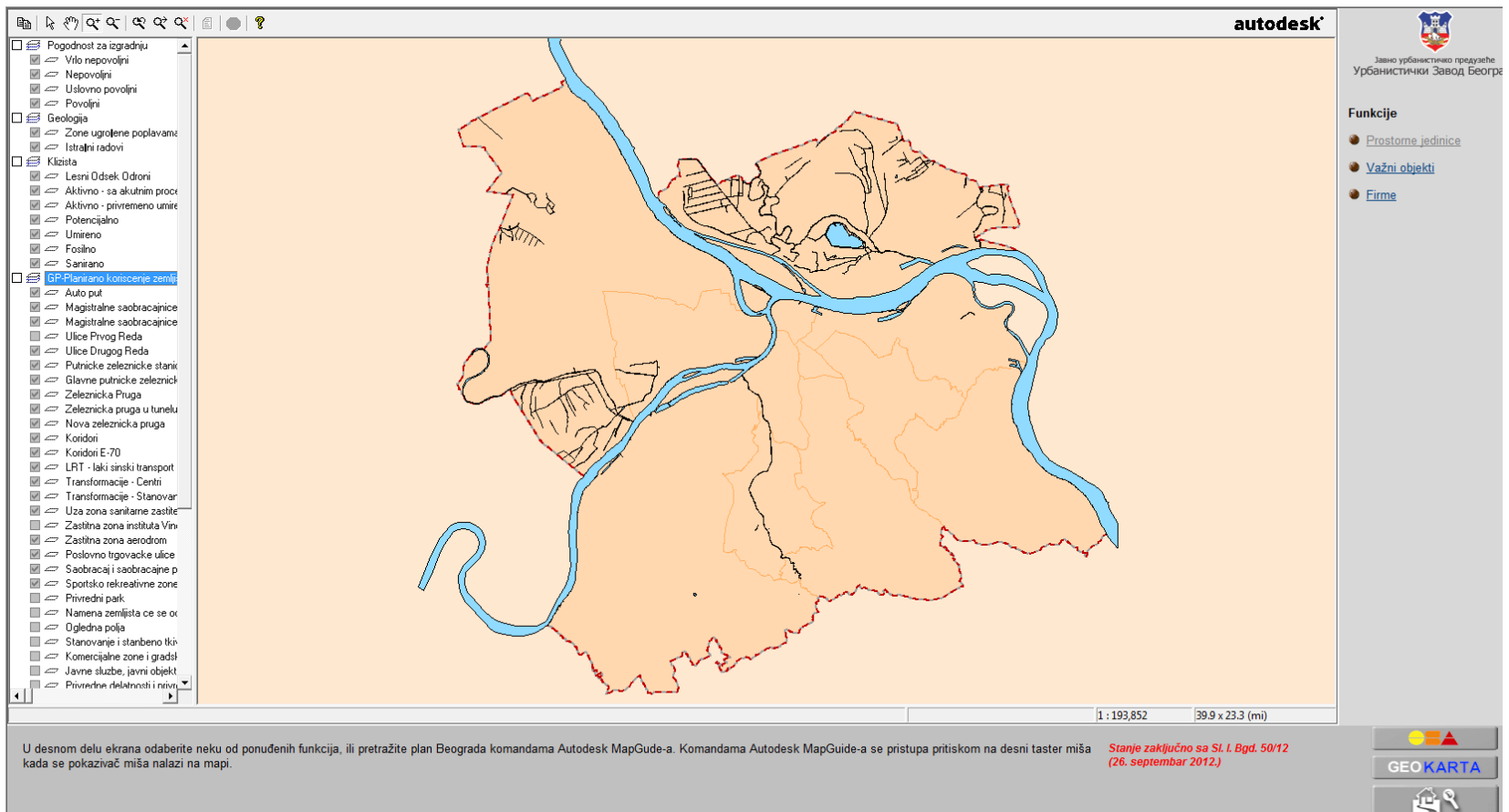


Overlapping layers of different types

# 6. TECHNICAL IMPLEMENTATION OF THE NSDI

## 6.3.4.1 Beoinfo GIS - City of Belgrade - local government

Planning Institute of Belgrade has developed GIS application BEOINFO which is located at the URL <http://mapa.urbel.com/beoinfo>



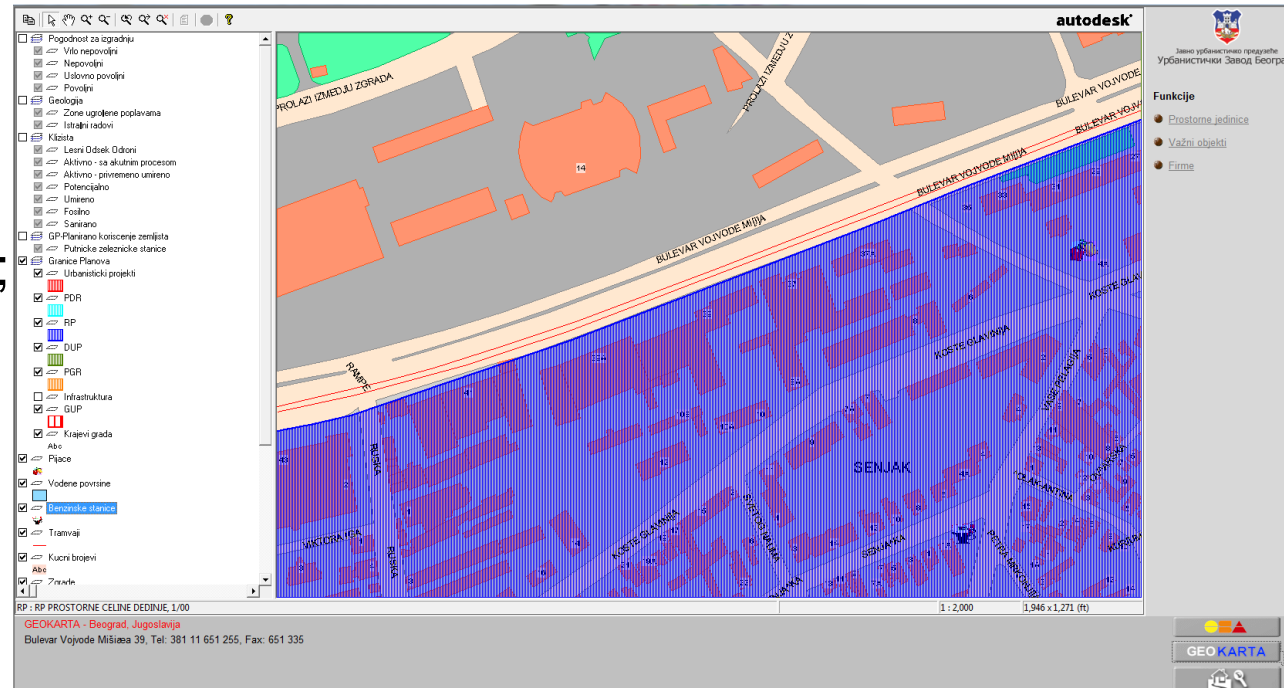
## Geoportal BeoInfo

# 6. TECHNICAL IMPLEMENTATION OF THE NSDI

## 6.3.4.1 Beoinfo GIS - City of Belgrade - local government

The data set BEOINFO:

- General Plan of Belgrade
- The planned land use;
- Easy to build;
- Geology;
- Water surfaces;
- Gas stations;
- The main courses;
- Landslides;
- Municipalities.



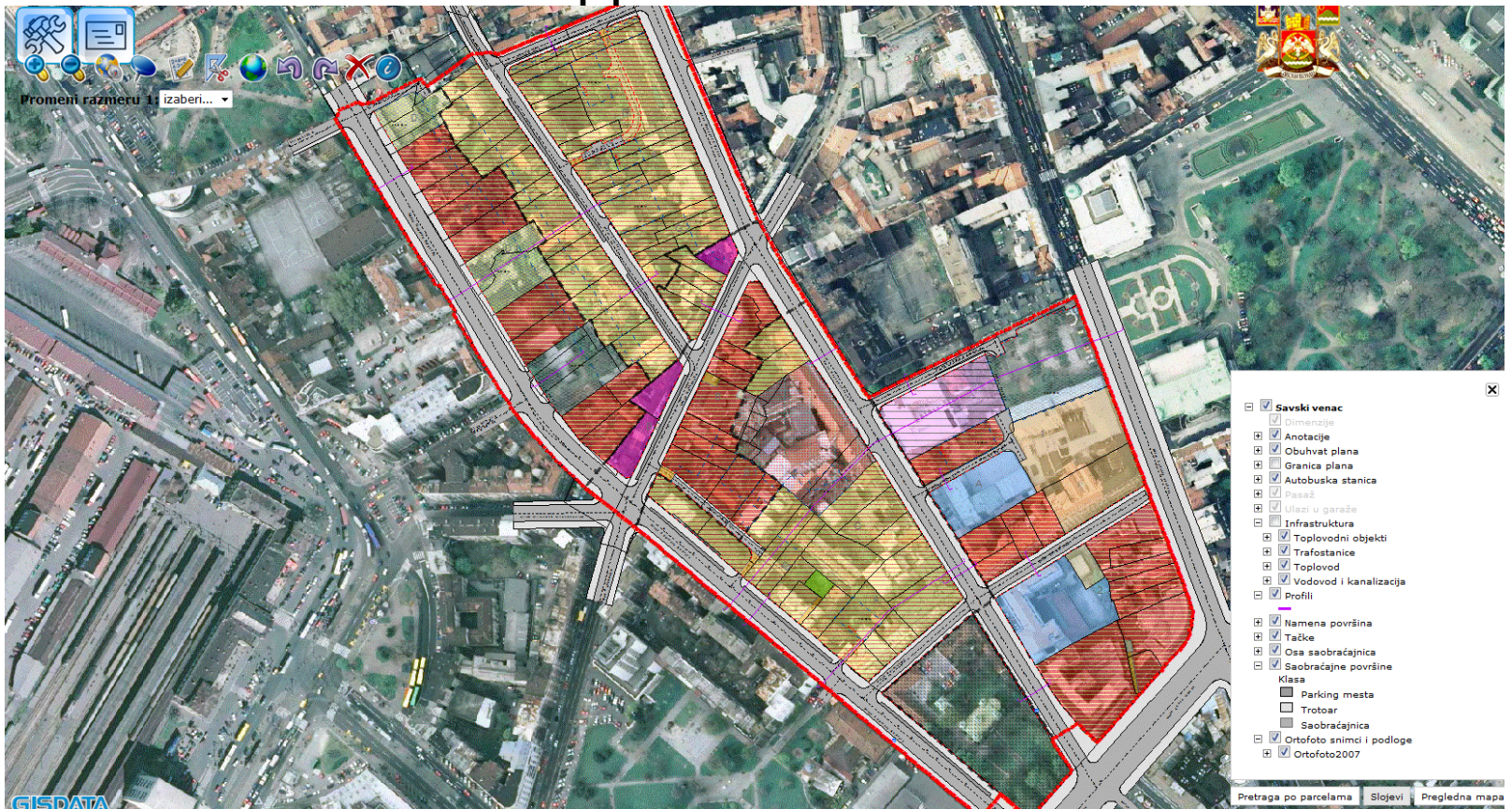
Overlapping layers of different types



# 6. TECHNICAL IMPLEMENTATION OF THE NSDI

## 6.3.4.1 Beoinfo GIS - City of Belgrade - local government

In the municipality Savski venac (City of Belgrade) is made of several GIS applications.

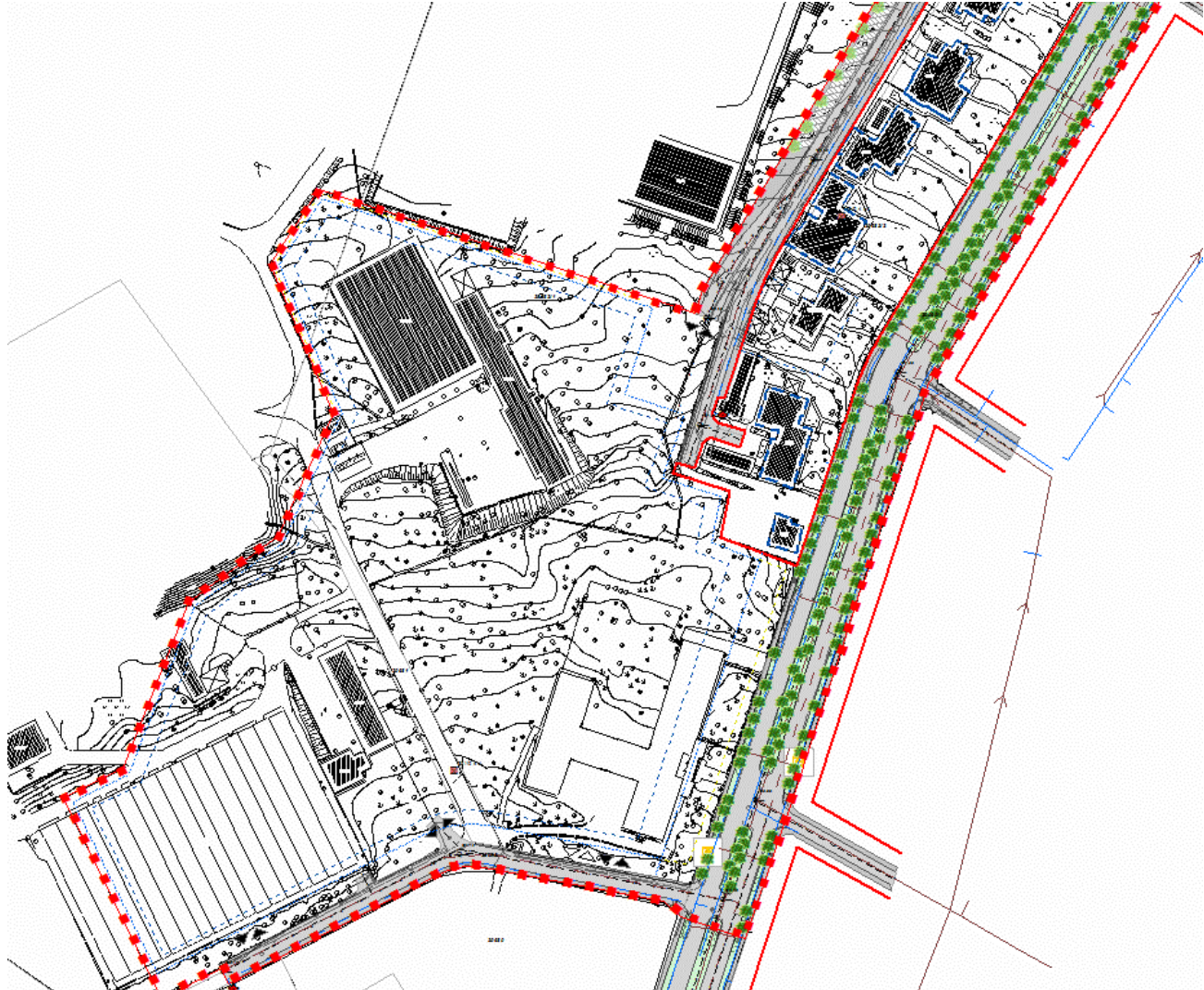


GIS applications of Savski venac



## 6. TECHNICAL IMPLEMENTATION OF THE NSDI

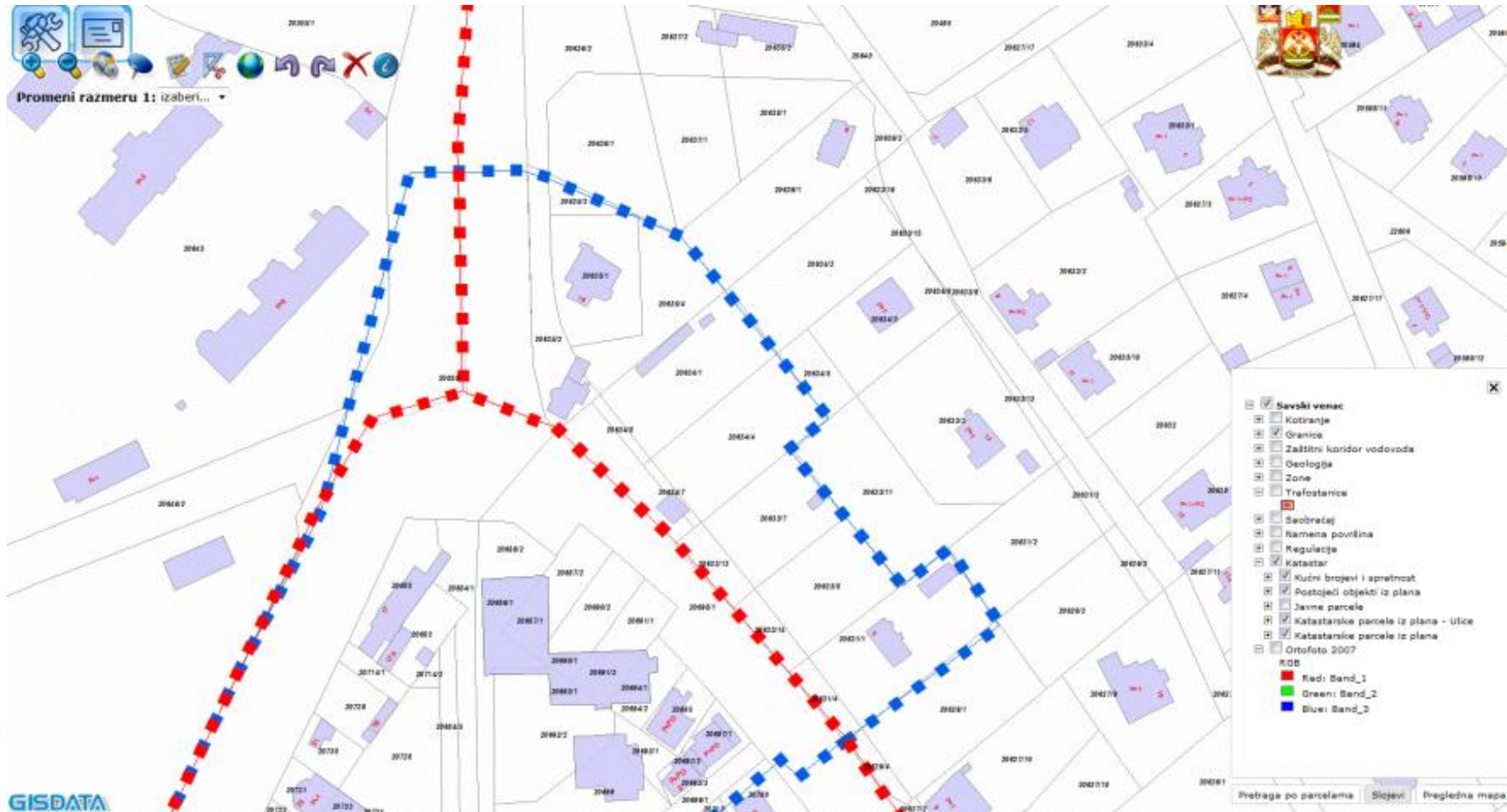
### 6.3.4.1 Beoinfo GIS - City of Belgrade - local government



Spatial data of Savski venac

# 6. TECHNICAL IMPLEMENTATION OF THE NSDI

## 6.3.4.1 Beoinfo GIS - City of Belgrade - local government



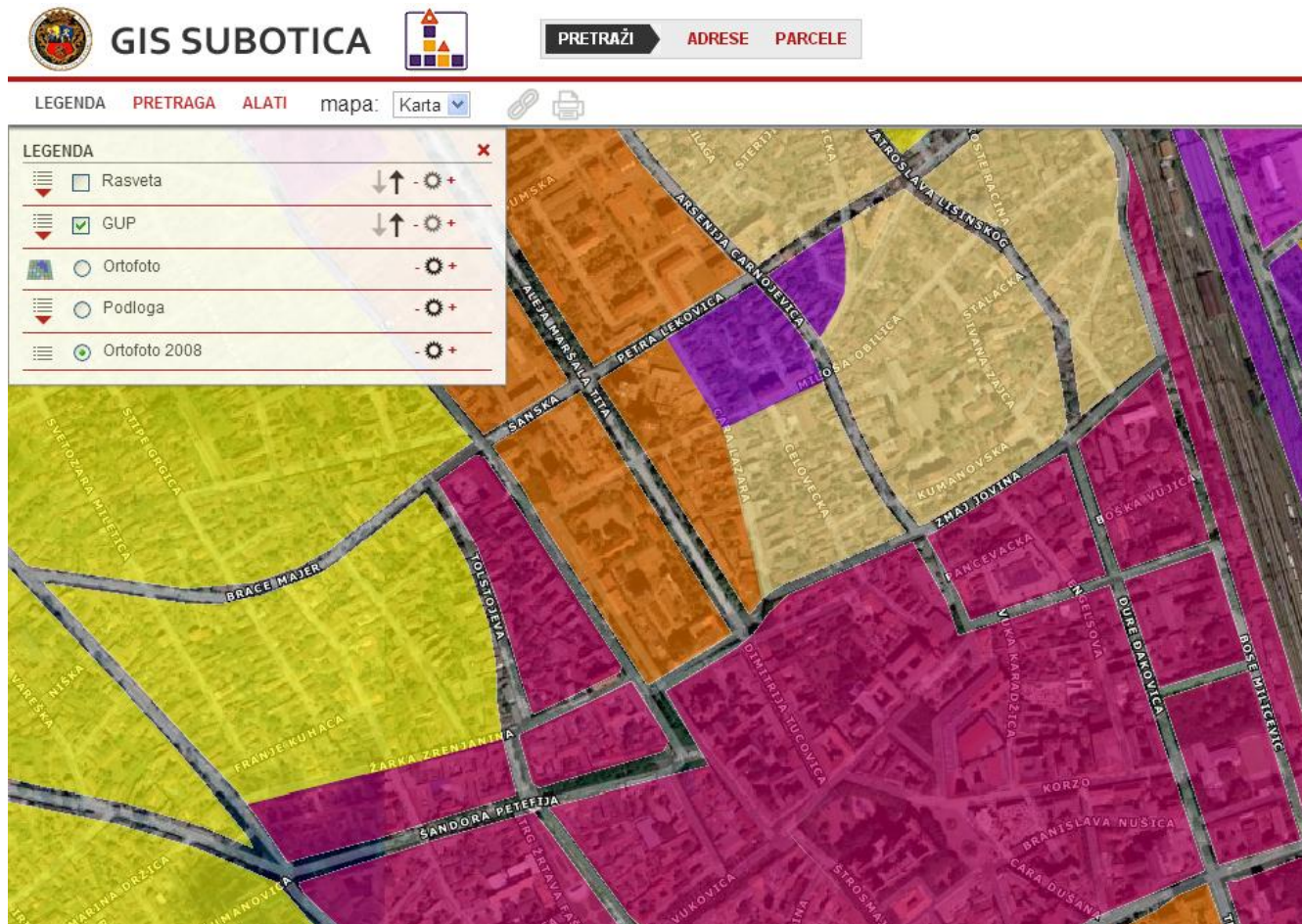
Spatial data of Savski venac



# 6. TECHNICAL IMPLEMENTATION OF THE NSDI

## 6.3.4.10 GIS Municipality of Subotica

The Subotica municipality introduced geographic information system for the whole city and including 25 organizations.



Geoportal of Subotica <http://www.subotica.rs/>

# 6. TECHNICAL IMPLEMENTATION OF THE NSDI

## 6.4 Conclusion

After considering the technical implementation of the NSDI in Serbia, it is observed that the main components of the INSPIRE Directive contained in:

- Data;
- Metadata;
- Network services.

# **7. RECOMMENDATIONS FOR FURTHER DEVELOPMENT OF THE NSDI**

INSPIRE Directive 2007/2/EC of the establishment of the infrastructure for geospatial information within the European Community was partially transposed in Serbia.

In order to further develop the NSDI in Serbia, recommendations are given in three fields:

- Legal;
- Institutional;
- Technical.

## **7. RECOMMENDATIONS FOR FURTHER DEVELOPMENT OF THE NSDI**

In order to further develop the NSDI, recommendations are given in three categories:

- Implementation of the recommendations that should be immediately or as soon as realized;
- Implementing the recommendations would be desirable to implement;
- Recommendations that would be well taken into account in future considerations for the establishment of the NSDI.

# 7. RECOMMENDATIONS FOR FURTHER DEVELOPMENT OF THE NSDI

## 7.1 Legislation

		Implementation of the recommendations that should be immediately or as soon as realized
1	1.1	Making draft of the new law on the NSDI in Republic of Serbia.
	1.2	Adoption of the NSDI strategy for the period 2013 – 2015.

		Implementing the recommendations would be desirable to implement
2	2.1	Creating contract on the rights and obligations of subjects NSDI.
	2.2	Monitoring the establishment of a legal framework.

		Recommendations that would be well taken into account in future considerations for the establishment of the NSDI
3	3.1	Use the application examples of good practice in the EU.
	3.2	Increasing awareness of the importance of the NSDI.

# 7. RECOMMENDATIONS FOR FURTHER DEVELOPMENT OF THE NSDI

## 7.2 Coordination and organization

		Implementation of the recommendations that should be immediately or as soon as realized
1	1.1	NSDI Council should launch initiatives to create new documents in order to establish the NSDI in line with strategic objectives.
	1.2	NSDI Council need to co-ordinate and organize the working group for: cooperation, legislation and technical framework.

		Implementing the recommendations would be desirable to implement
2	2.1	Monitoring coordination and organization NSDI.
	2.2	Capacity development in area of NSDI.

		Recommendations that would be well taken into account in future considerations for the establishment of the NSDI
3	3.1	Use the application examples of good practice in the EU.
	3.2	Lifelong learning teams responsible for the organization.



# 7. RECOMMENDATIONS FOR FURTHER DEVELOPMENT OF THE NSDI

## 7.3 Technical implementation

		Implementation of the recommendations that should be immediately or as soon as realized
1	1.1	Implementation of standards in the framework of the NSDI.
	1.2	Implementation and further development of the National Geoportal with network services NSDI.
		Implementing the recommendations would be desirable to implement
2	2.1	Monitoring the establishment of the technical implementation of the NSDI.
	2.2	Comparison of the data model RGA, and data sets of stakeholders, with the INSPIRE data specifications for selected topics.
		Recommendations that would be well taken into account in future considerations for the establishment of the NSDI
3	3.1	Use the application examples of good practice in the EU.
	3.2	Lifelong education in the technical implementation.

# Acknowledgements

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