













22–26 April, Hanoi, Vietnam





# New approaches of using technologies for smarter decision making in Serbia









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## **Republic Geodetic Authority**

"Geospatial Information for a Smarter Life and Environmental Resilience"



### Serbian Government

### **Ministries**

Special Governmental **Organizations** 

Ministry of Construction, Transport and Infrastructure

Republic Geodetic Authority

Republic level

6 Sectors

Municipal level

Real-estate Cadastre Offices - 170

By the official Law on state survey and cadaster RGA is national geospatial data provider responsible for:

- NSDI:
- Geodetic Reference Systems;
- State Survey:
- Real-estate cadastre:
- Utillity cadastre;
- Registry of administrative Units;
- Addresses Registry;
- Topography and Cartography;
- Real-estate Mass Valuation:
- Registry of Geographic Names;
- Professional supervision and licensing of geodetic organizations;
- Geomagnetism and aeronomy;



Geocoded Administrative Addressing Boundaries





















Place Names and Property

Imagery

Transport

Elevation

Land Cover



## 22–26 April, Hanoi, Vietnam Address register (2015)

"Geospatial Information for a Smarter Life and Environmental Resilience"

- **Population: 7,020,858**
- 2.676.898 citizens leave in street without name and house number
- 3.028.020 citizens leave in street without house number
- 6.500 streets are not registered estimation

















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### **Real Estate Cadastre**

"Geospatial Information for a Smarter Life and Environmental Resilience"





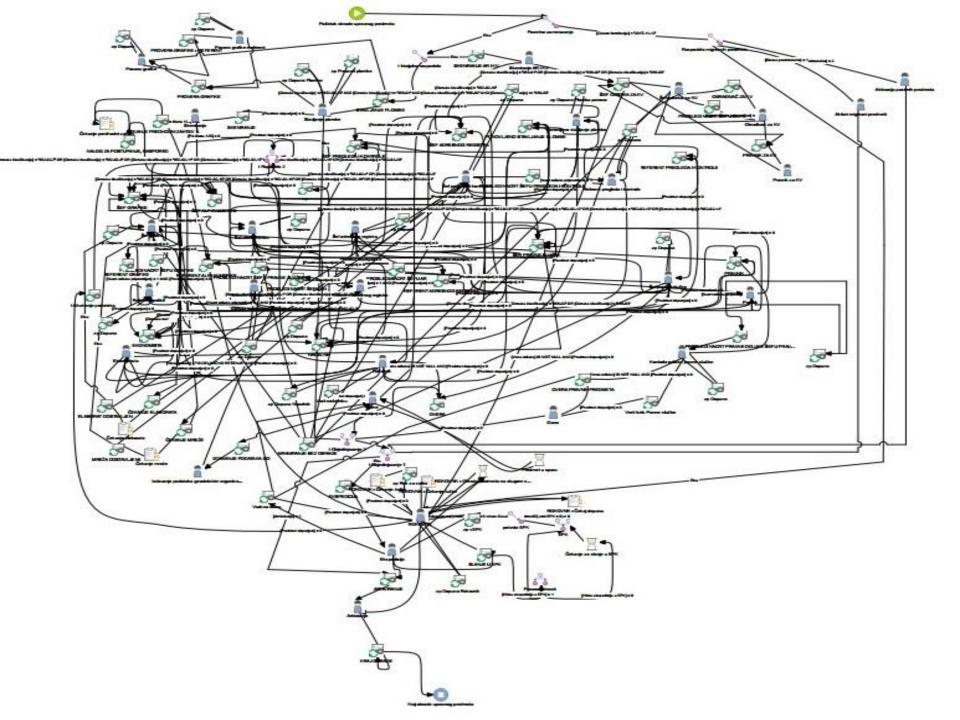


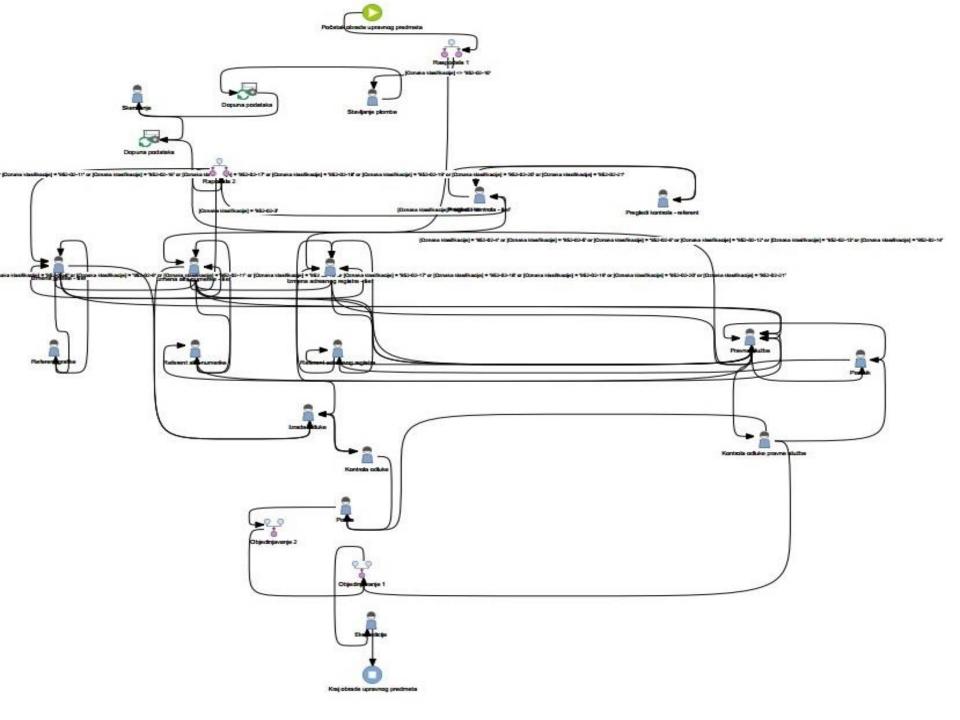














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### Legal framework

"Geospatial Information for a Smarter Life and Environmental Resilience"

- Law on National Spatial Data Infrustructure (2018)
- Law on Procedures for Real Estate and Utility Cadaster Registration (2018)
- Law on eGovernment (2018)
- Law on spatial planning (2018)
- Law on DRMR (2018)
- Law on Administrative fees (2017)



**Legal framework** 

- By-law on Address Register (2017)
- By-law on Internal organization and work places in RGA (2017)









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### **INOVATIONS**

"Geospatial Information for a Smarter Life and Environmental Resilience"

3D data - Basic Topographic Database in 3D

New IT system

New satellite images and processing methods

LIDAR from 2012, currently flood prope areas and archeology

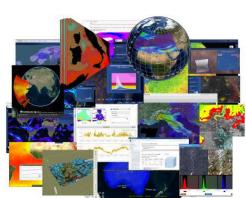
Blockchain technology - planned with UNDP

Big Data - Data Cube federation

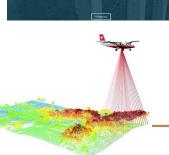
Crowdsourcing – Updating Address Register, Register of waste dump sites, Archeological sites

**Digital platform** – Geoserbia, further developments

























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## GEOSRBIJA - GEOSPATIAL PLATFORM "Geospatial Information for a Smarter Life and Environmental Resilience"

"a plug-and-play business model that allows multiple participants (producers and consumers) to connect to it, interact with each other and create and exchange value. Also collections of services used for hosting, processing and distributing geospatial data are called platforms."

### Key components of the platform:

- Data standardisation data schemas, quality rules, life-cycle rules, collection guidelines
- Data tools for the producers -data life-cycle management, error reporting, data updating tools
- Data portal finding, evaluating data situational picture, metadata search, quality dashboards
- Data distribution services, APIs, Analysis and processing services
- Support (community)
- Management of the ecosystem











## 22–26 April, Hanoi, Vietnam GEOSERBIA - GEOSPATIAL PLATFORM "Geospatial Information for a Smarter Life and Environmental Resilience"

### Services



### Metadata catalog

A national application enables searching, creating, maintaning and sharing metadata for spatial data sets, spatial data set series and spatial data services.



### Collaborative platform

National portal enables the cooperation between relevant national and regional communities, support, trainings and informing.



### Digital platform

The national web GIS application enables the display, search, analysis, transformation, creation, sharing and maintenance of geospatial data of Serbia.



Geosrbija mobi



Crowd SDI



**OGC** servises



Rest api



Stakeholdes



Training



Geoserbia mobi



Download

data sets for easier exchange.



Harmonization

together! Assistance in the



Open data

3D view. Web application based



crowdSDI

data collection.



**OGC Services** 

standard OGC data exchange services.



**REST API** 

An overview of the currently available standard REST services for networking registers.



Transformation

service and change of exchange



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### Geoserbia mobi

Android application that represents a fast link to the Digital Platform.



### Download

Service for downloading standard data sets for easier exchange.



### Harmonization

We create standard registers together! Assistance in the preparation of methodological guidelines for harmonization



### Open data

3D view. Web application based on the Cesium platform.



### crowdSDI

We create spatial registers together! Mobile application for data collection.



### **OGC Services**

Overview of currently available standard OGC data exchange services.



### **REST API**

An overview of the currently available standard REST services for networking registers.



### Transformation

Spatial data transformation service and change of exchange formats.

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## Collaborative platform



Колаборациона платформа - Алфа тестирање



























Тренинг за тренере



Моментари и повратне и...



Прекид рада



Општа дискусија



Примери добре праксе



International cooperation



Питања за одговорне субјекте НИГП-а



Лабораторија идеја



Пријави грешку



Политика садржаја / Content Policy









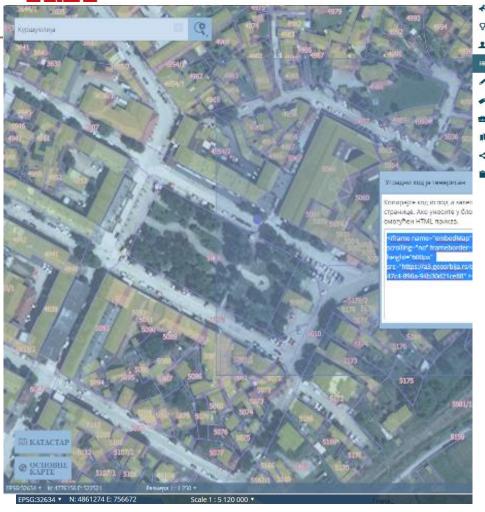




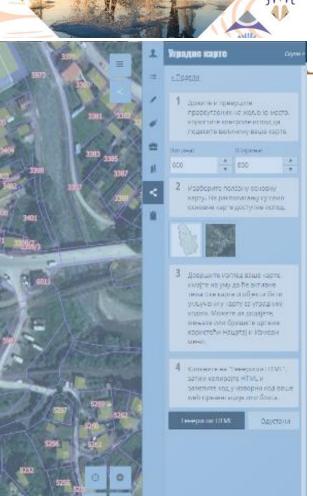




22-26 April, Hanoi, Vietnam NSDI DIGITAL PLATFORM



| Layer Manager Pro                      | Collapse : |
|--|------------|
| ▶ Tematic data                         | >          |
| Administrative Units                   | >          |
| ▶ Investment maps                      | >          |
| ▶ Addresses                            | >          |
| D Cadastral Parcels                    | >          |
| Geographical Names Register            | >          |
| Register of decision on demolition     | >          |
| Building register                      | >          |
| Condominium register                   | >          |
| Price Register                         | >          |
| Utility and governmental services      | >          |
| D Orthoimagery                         | >          |
| ▶ Agricultural                         | >          |
| Points of interest                     | >          |
| D Topographic maps                     | >          |
| ▶ Elevation                            | >          |
| Digitalisation                         | >          |
| ▶ Floods 2014                          | >          |
| Geomagnetism and aeronomy              | >          |
| De Coordinate reference systems        | >          |
| Geographical grid systems              | >          |
| D Spatial plans                        | >          |
| ▶ Transport                            | >          |
| ▶ Climatology                          | >          |
| ▶ Hydrography                          | >          |
| Statistical Units                      | >          |
| Statistical data profiles              | >          |
| Population distribution                | >          |
| ▶ Geology                              | >          |
| Natural risk zone                      | >          |
| Protection of cultural and natural ran | ities >    |
| ▶ Land Cover                           | -          |

















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### **NSDI DIGITAL PLATFORM**

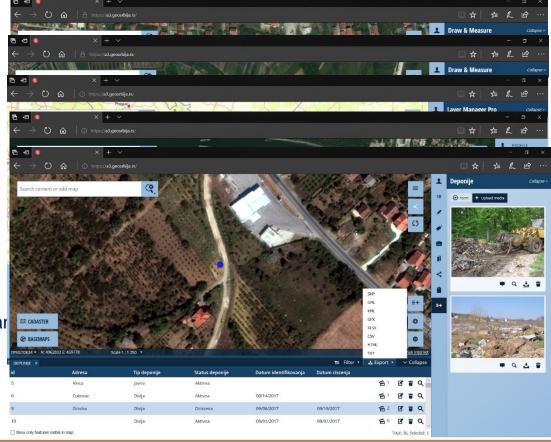
"Geospatial Information for a Smarter Life and Environmental Resilience"



### Colaborative work – crowdSDI desktop solution

http://a3.geosrbija.rs/

- Digitalization
- Simbology
- ✓ Media attachment (pictures, video, text files)
- Editing existing data
- ✓ Login/Authentification layer
- Colaborative work
- Crowd Sourcing functionality
- Collect and create new data sets
- Link with data owners
- Export Files
- Import external web services
- ✓ Import external data (link with Open Data portal)
- Users with dedicated permissions car easily set up new clients, defining their content, functionality, user interface etc.

















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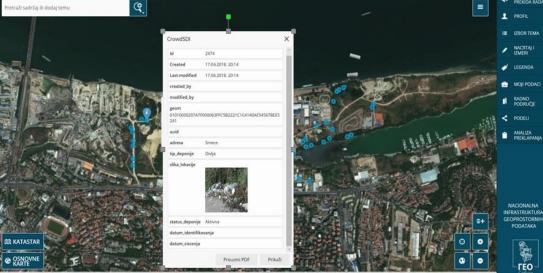
Crowdsourcing

"Geospatial Information for a Smarter Life and Environmental Resilience"

### Mobile App – crowdSDI

- ✓ Mobile app for crowdsoursing
- Android and iOS
- Geolocation and secure connection
- ✓ Verification of collected data
- Location, time, wheather conditions
- Offline mode
- Crowd Sourcing functionality
- Link with geoSrbija
- Link with data owners
- Users with dedicated permissions can easily set up new clients, defining their content, functionality, user interface etc.







**OBRIŠI** 





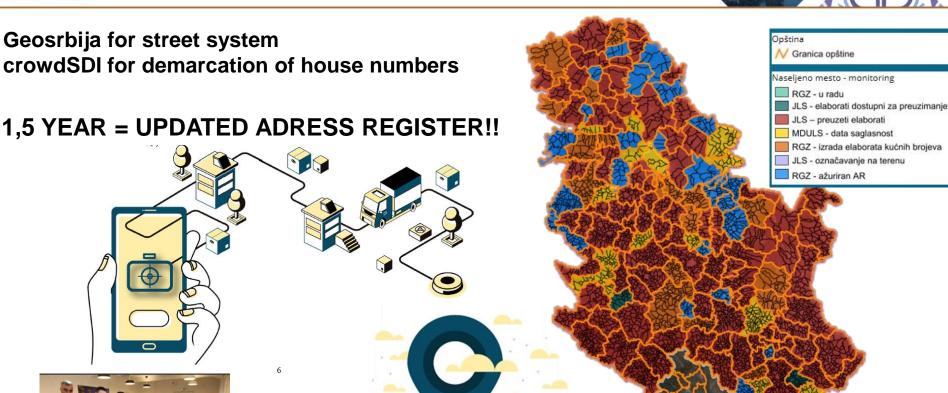








## 22–26 April, Hanoi, Vietnam Address Register "Geospatial Information for a Smarter Life and Environmental Resilience"



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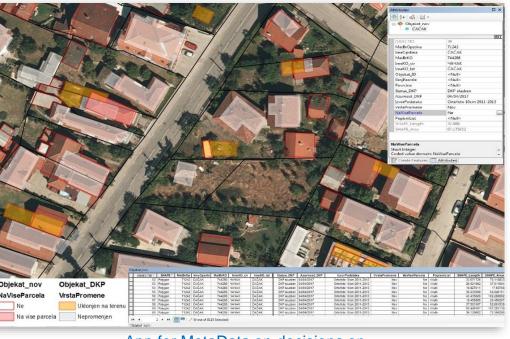






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## Building register "Geospatial Information for a Smarter Life and Environmental Resilience"



VHR WorldView GSD 30 and 40 cm

App for MetaData on decisions on **Building register** demolition of illegal buildings

- **Updated registers** (inventory of changes on buildings new, demolished, expanded; street names and house numbers definition for 4521 cadastral municipalities);
- Monitoring illegal construction and revision of spatial plans (over 4 mil of new illegal buildings identified – direct budget income from taxes over 500 mil euros);











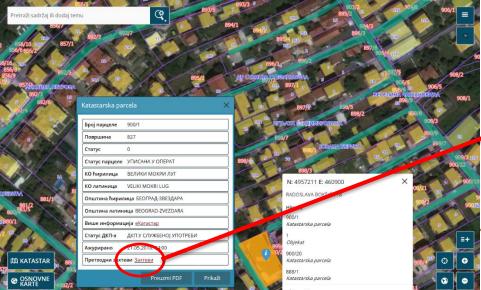


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FIELD WORK
"Geospatial Information for a Smarter Life and Environmental Resilience"







### Општи подаци

Општина: ЗВЕЗДАРА

ВЕЛИКИ МОКРИ ЛУГ Катастарска општина:

Датум ажурности: 16.10.2018

### Напомене

Парцела 900/1

Датум: 02.12.2011

952-02-19942/2011 Број предмета:

Опис: ПРОМЕНА НОСИОЦА ПРАВА НА

НЕПОКРЕТНОСТИМА-СТАН

БР.10,П=37,82М2,У УЛ.РАДОСЛАВА

БОКШИЋА 18

Парцела 900/1

Датум: 23.01.2018

Број предмета: 952-02-12-264/2018

Опис: ИЗМЕНА ХИПОТЕКАРНОГ ПОВЕРИОЦА СТАН

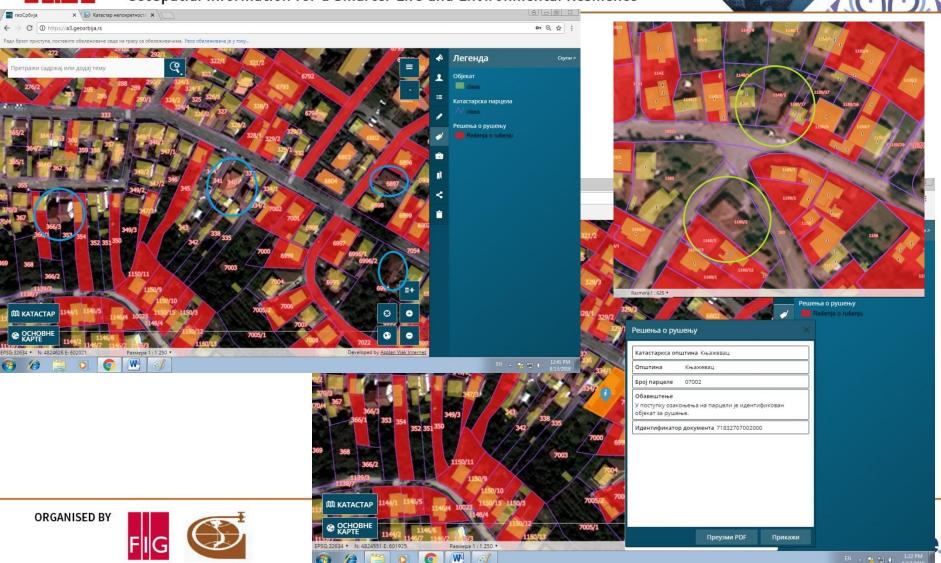
БР.13 У ИЗГРАДЊИ





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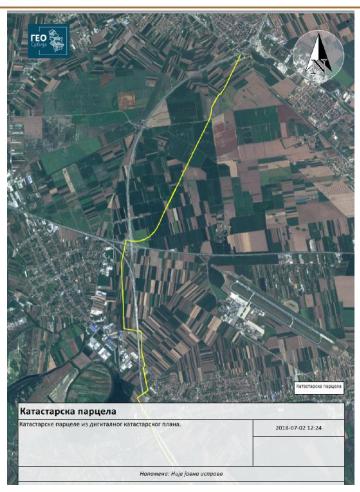
## CONTROL FROM THE OFFICE "Geospatial Information for a Smarter Life and Environmental Resilience"





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## Pipelines and railway analytics and planning "Geospatial Information for a Smarter Life and Environmental Resilience"





### Катастарска парцела

Табела испод приказује изабрана својства за објекте који су унутар ваших полигона или који пресецају ваше полигоне (имајте у виду да се могу налазити и ван граница карте). Укупна површина за ове објекте и површина објекта под полигоном су приказани са десне стране

| Назив   | Опис  | Површина<br>(km²) | Површина<br>под<br>полигоном<br>(m²) |
|---------|---|-------------------|--------------------------------------|
| 841/1   | SURČIN BEOGRAD-SURČIN СУРЧИН БЕОГРАД-<br>СУРЧИН | 0.00              | 34                                   |
| 3714/1  | SURČIN BEOGRAD-SURČIN СУРЧИН БЕОГРАД-<br>СУРЧИН | 0.00              | 11                                   |
| 4792/1  | SURČIN BEOGRAD-SURČIN СУРЧИН БЕОГРАД-<br>СУРЧИН | 0.02              | 223                                  |
| 4792/28 | SURČIN BEOGRAD-SURČIN СУРЧИН БЕОГРАД-<br>СУРЧИН | 0.01              | 139                                  |
| 4792/33 | SURČIN BEOGRAD-SURČIN СУРЧИН БЕОГРАД-<br>СУРЧИН | 0.03              | 467                                  |
| 4399/1  | SURČIN BEOGRAD-SURČIN СУРЧИН БЕОГРАД-<br>СУРЧИН | 0.01              | 77                                   |
| 4400/1  | SURČIN BEOGRAD-SURČIN СУРЧИН БЕОГРАД-<br>СУРЧИН | 0.01              | 85                                   |
| 4405/1  | SURČIN BEOGRAD-SURČIN СУРЧИН БЕОГРАД-<br>СУРЧИН | 0.01              | 71                                   |
| 4402    | SURČIN BEOGRAD-SURČIN СУРЧИН БЕОГРАД-<br>СУРЧИН | 0.01              | 66                                   |
| 4403    | SURČIN BEOGRAD-SURČIN СУРЧИН БЕОГРАД-<br>СУРЧИН | 0.00              | 40                                   |
| 4404    | SURČIN BEOGRAD-SURČIN СУРЧИН БЕОГРАД-<br>СУРЧИН | 0.00              | 12                                   |
| 3587/1  | SURČIN BEOGRAD-SURČIN СУРЧИН БЕОГРАД-<br>СУРЧИН | 0.01              | 188                                  |
| 3586/1  | SURČIN BEOGRAD-SURČIN СУРЧИН БЕОГРАД-<br>СУРЧИН | 0.02              | 169                                  |
| 3585/1  | SURČIN BEOGRAD-SURČIN СУРЧИН БЕОГРАД-<br>СУРЧИН | 0.01              | 51                                   |
| 3585/2  | SURČIN BEOGRAD-SURČIN СУРЧИН БЕОГРАД-<br>СУРЧИН | 0.01              | 67                                   |
| 3584/1  | SURČIN BEOGRAD-SURČIN СУРЧИН БЕОГРАД-<br>СУРЧИН | 0.04              | 226                                  |
| 4814/1  | SURČIN BEOGRAD-SURČIN СУРЧИН БЕОГРАД-<br>СУРЧИН | 0.01              | 182                                  |
| 4818/1  | SURČIN BEOGRAD-SURČIN СУРЧИН БЕОГРАД-<br>СУРЧИН | 0.00              | 8                                    |

Напомена: Није јавна исправа















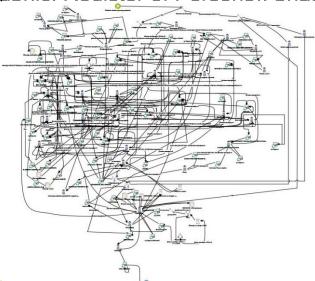
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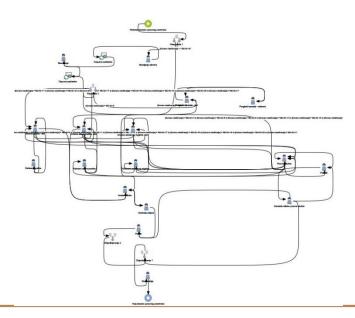
## Information System for Real Estate Cadaster "Geospatial Information for a Smarter Life and Environmental Resilience"

- Document Management System, ISREC, phase 1
- Data Quality Improvement,
- Development of Application modules for Address Register and Spatial Units phase 2

Development of Application modules for Real Estate Cadaster (Alphanumeric,

Graphic. Register of Persons). phase 3















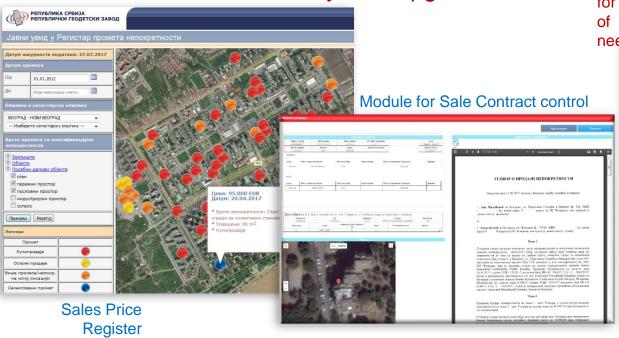




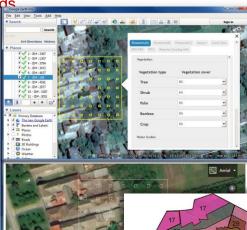
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## Price Register and Mass Valuation "Geospatial Information for a Smarter Life and Environmental Resilience"

### Real-estater Mass Valuation System upgrade



**UN FAO Supports Development of Module** for Sale Contract verification and collection of additional quality data designed for RGA





- Building Registry as add base linked to SPR- data for all objects: cadaster's and quality data
  - → reliable source for fair mass valuation system definition;
  - → changes in the taxation system generating additional and regular income;
- Module for data verification under development (national data sets, available external sources);
- Planned introduction of Register of real-estate offers (sale and lease).

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### **Public Sector Services**

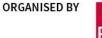
"Geospatial Information for a Smarter Life and Environmental Resilience"



- Data sharing Information system for Public Sector in Serbia
- Digitalization, efficiency, automatisation of business processes
- eGovernment
- More then 250 institutions
- Data sharing information system:
  - Geodetic companies
  - Advocates
  - **Notaries**
  - **Bailiffs**
  - Courts









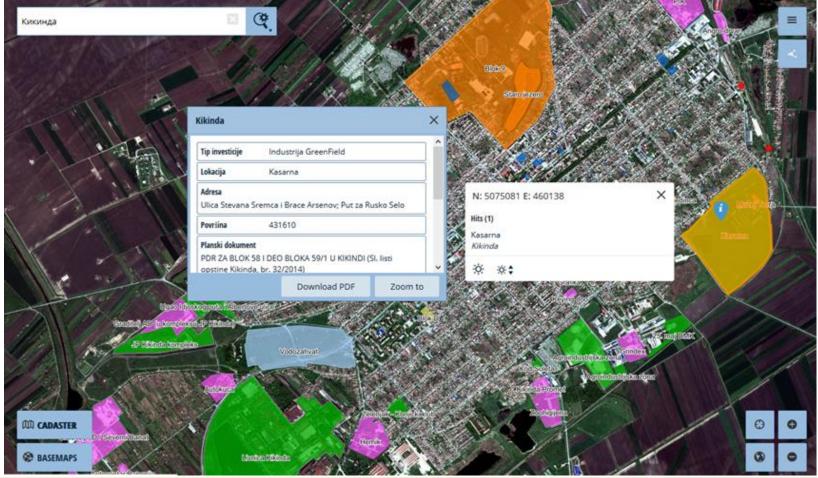




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## Register of Investment locations "Geospatial Information for a Smarter Life and Environmental Resilience"













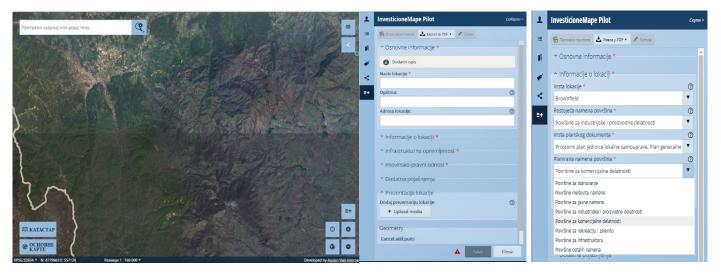






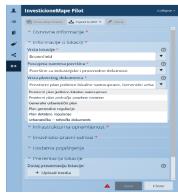
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## Register of Investment locations "Geospatial Information for a Smarter Life and Environmental Resilience"























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### **EXAMPLES:**

"Geospatial Information for a Smarter Life and Environmental Resilience"



- ✓ Updating Adress Register street system Government of Republic of Serbia
- ☑ Updating Waste Dump Sites Register Ministry of Environment
- ☑ Register of Archaeological sites Ministry of Culture
- ✓ Location for Greenfield, Brownfield and Grayfield investments Local municipalities and Ministry of Spatial planning
- ☑ Expropriation planning Local municipalities
- ☑ Risk Register Disaster risk management and reduction Sector for emergency situation
- ☑ Updating Building Register Republic geodetic authority
- ✓ Mobile operators / Internet providers
- ✓ Planning of geodetic field works Private geodetic companies
- ☑ Analize of the railway intersection JSC Serbian Railways
- ✓ Vacation planning Citizens
- ✓ ....





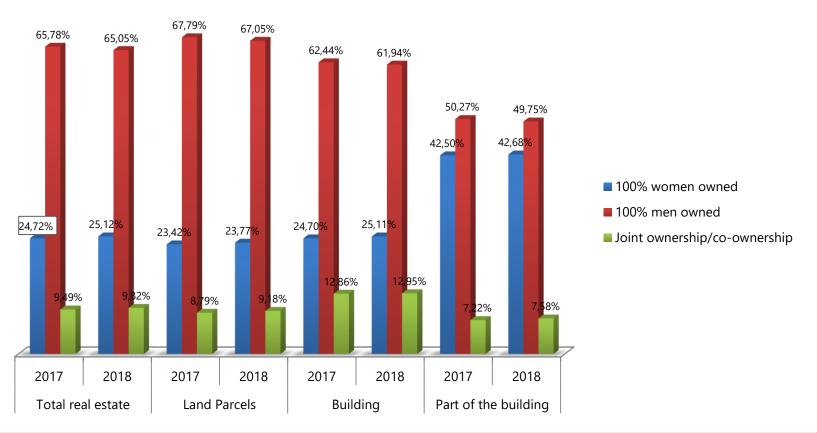




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## Gender Equality in Property Registration "Geospatial Information for a Smarter Life and Environmental Resilience"

### Types of real estate by the owners gender







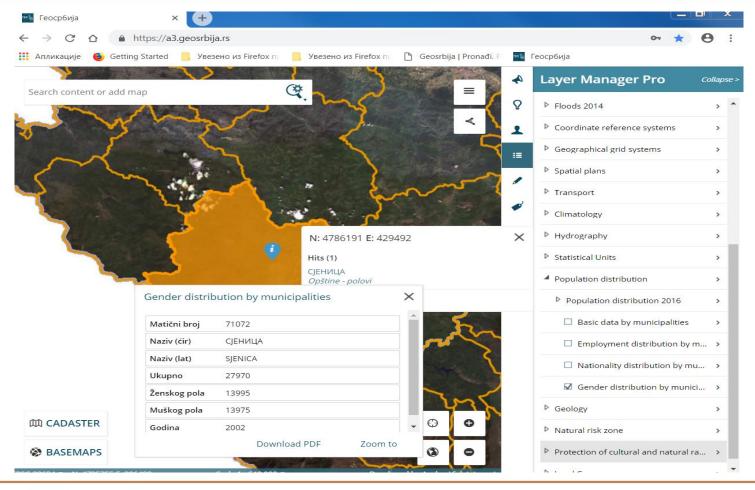




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### SPATIAL PRESENTATION OF GENDER DATA ON THE GEOPORTAL

"Geospatial Information for a Smarter Life and Environmental Resilience"











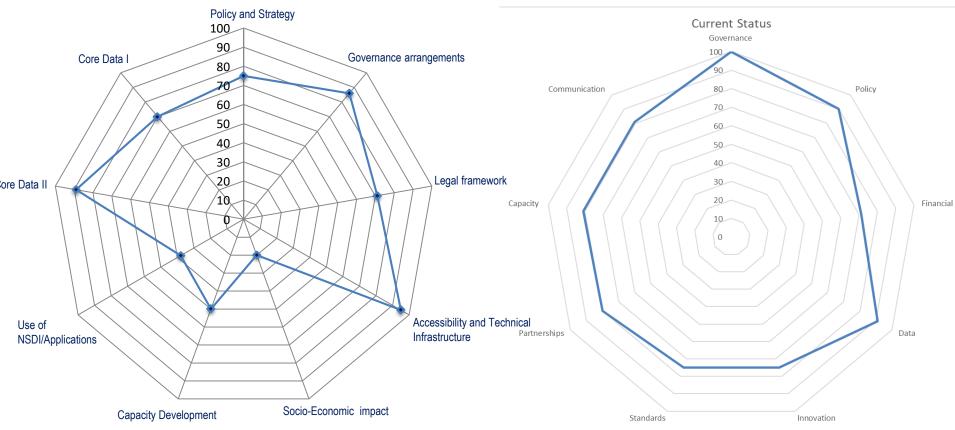




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## Status 2016 vs 2019 – Diagnostic Tool "Geospatial Information for a Smarter Life and Environmental Resilience"

















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"Geospatial Information for a Smarter Life and Environmental Resilience"



Macroeconomic data

**Gross Domestic Product was** 

RSD 3,270.8 billion

in 2017, while GDP growth rate was 1.9%

Projected GDP growth rate in the period up to 2020 is

3.3% per annum, on the basis of estimates of Economist Intelligence Unit

Inflation rate was

3.2% in 2017

For the period up to 2020, projected inflation rate is in the range from

2.2% - 2.8% according to estimates of Economist Intelligence Unit



Real Estate Market

Total number of real estate

transactions was 7,945 in 2017, while the compounded

13% in the period 2014-2017

The largest volume in real estate transactions was in Belgrade Region, with

3,872 transactions

in 2017, which represents

49% of total market

The largest growth rate in number of transactions was recorded in Belgrade Region at compounded growth rate of

15% per annum

in the period 2014 - 2017



Key Facts Monthly Trend of Hits

Total number of requests in RGA was

1.6 million in 2017, out of which the majority was recorded in Sumadija and Western Serbia Region in the amount of

432,600 requests in 2017

Total revenue from fees for services provided reached

RSD 3.74 billion

in 2017, out of which the majority was recorded in Vojvodina Region in the amount of

RSD 1.2 billion

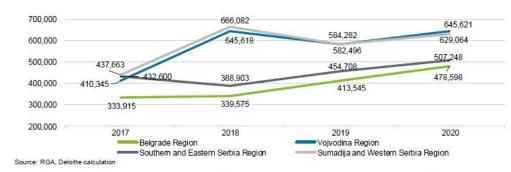
Jun 1, 2018-Mar 31, 2019



1.5M

Mar 01 Jun 01

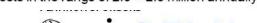
Figure 4 Dynamics of Number of Requests



Projections estimated total number of requests in the range of 2.0 – 2.3 million annually.



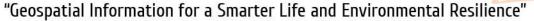








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## Director of RGA – Reformer of the year 2018 for digitalisation and economic development

















