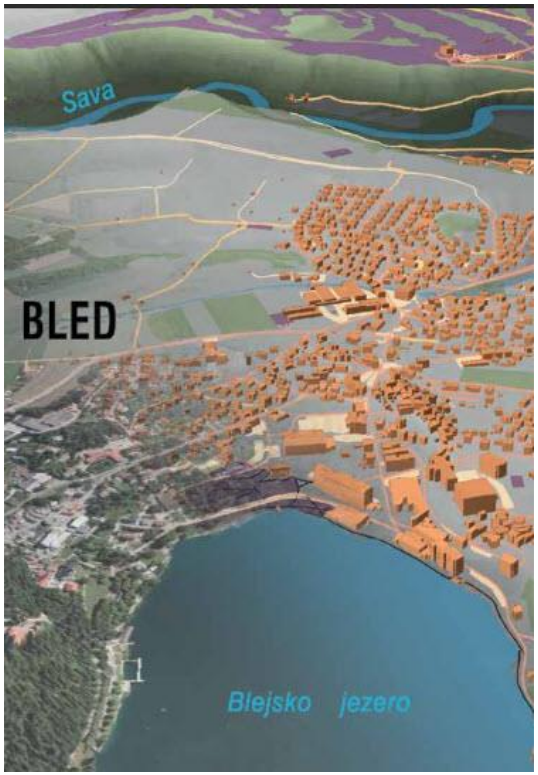
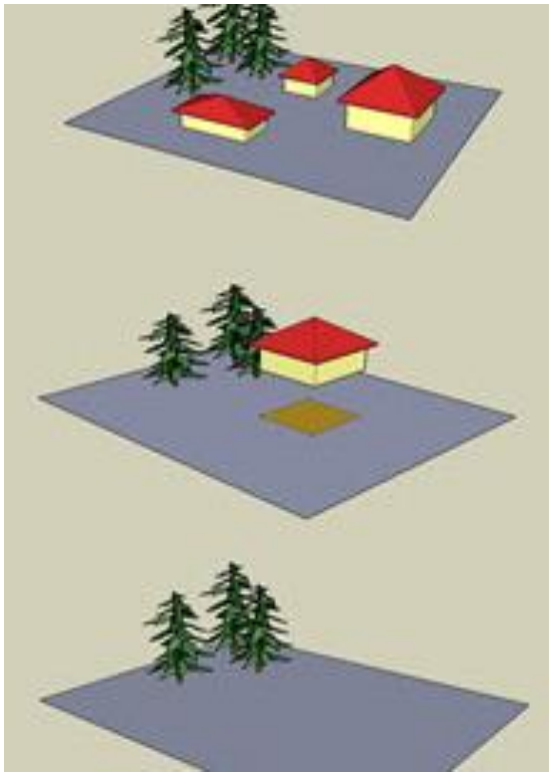
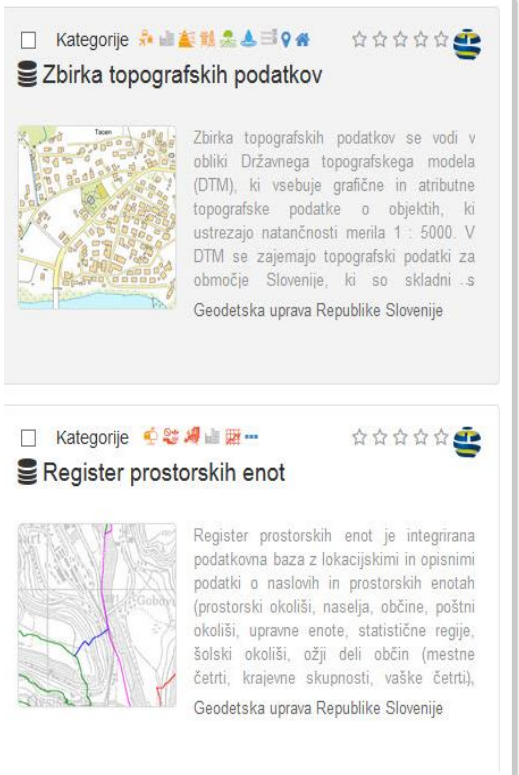
Quality issues & SMA

Geodetska uprava
Republike Slovenije







National geodetic reference system:

- National spatial coordinate system
- National topographic system

Real estate data:

- Cadastres (land, building, public infrastructure)
- Registers (real estate, spatial units)
- Mass evaluation data

Data Issuing and INSPIRE:

- Services
- Metadata
- Geoportal
- Open data
- Registry

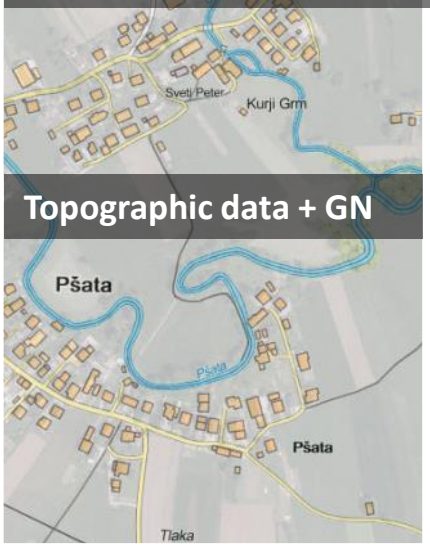
National spatial coordinate system

SIGNAL (hor. system)

Vertical system

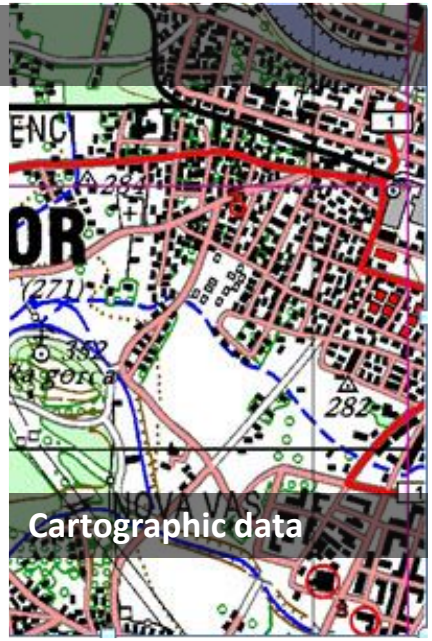
Gravimetric network

National topographic system



Topographic data + GN

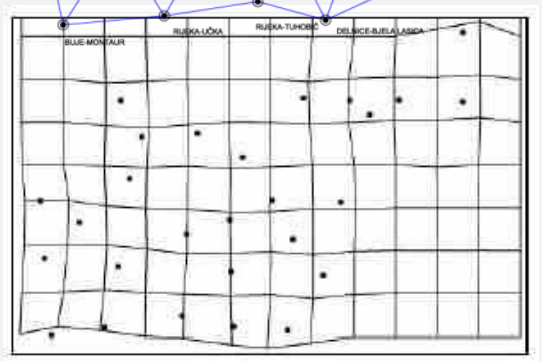
Remote sensing data



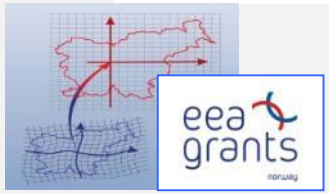
Cartographic data

National geodetic reference system

- Horizontal system (**D48/GK**):
- 29.000 basic, 225.000 measurement points, geodetic networks
- Leveling network: 11.000 points

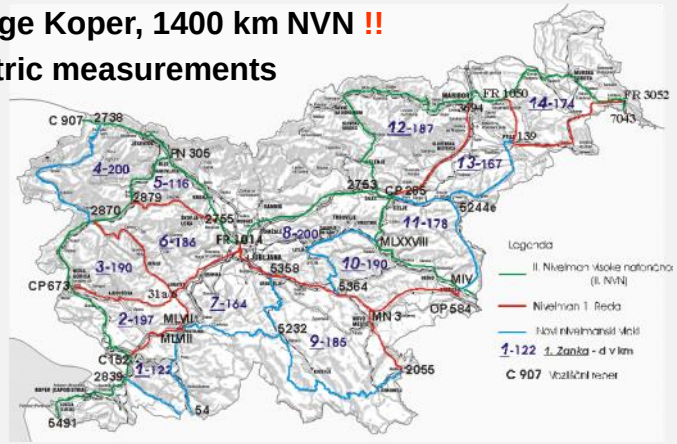


- Horizontal system **: ETRS89/TM (D96/TM)**
- **2000 ETRS-points and 16 GNSS stations (SIGNAL)**



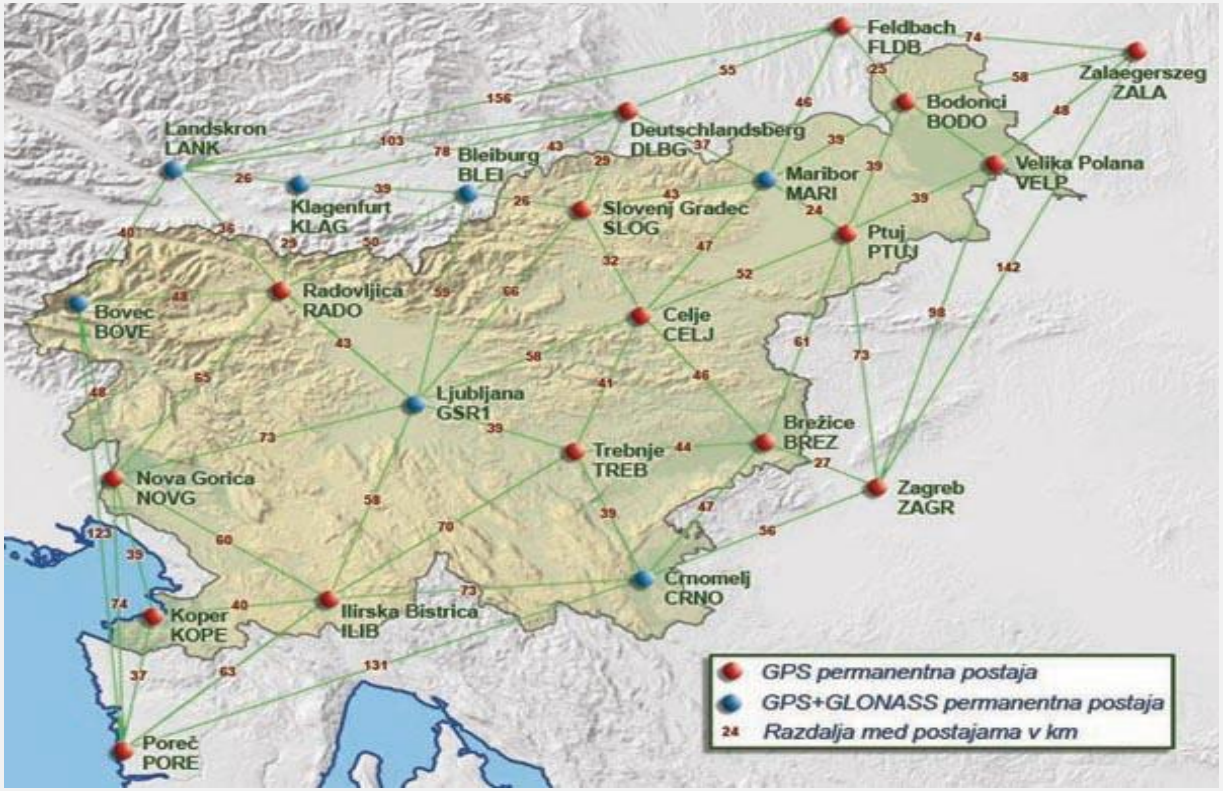
2004-2009
900.000 EVR
(400.000 NFM)

- **Height system: EVRS 2000**
- **tide gauge Koper, 1400 km NVN !!**
- **Gravimetric measurements**



New national CRS

STATE GNSS NETWORK - SIGNAL



SIGNAL =

Slovenia
Geodesy
Navigation
Location

Enables geodetic accuracy measurements countrywide

Homogene accuracy

Introduction of GNSS measurements in private (geodetic) sector

Installed 2000-2006
Operational 2006

- Old CRS – D48 (EPSG 3912)
- New CRS – D96 (EPSG 3794)

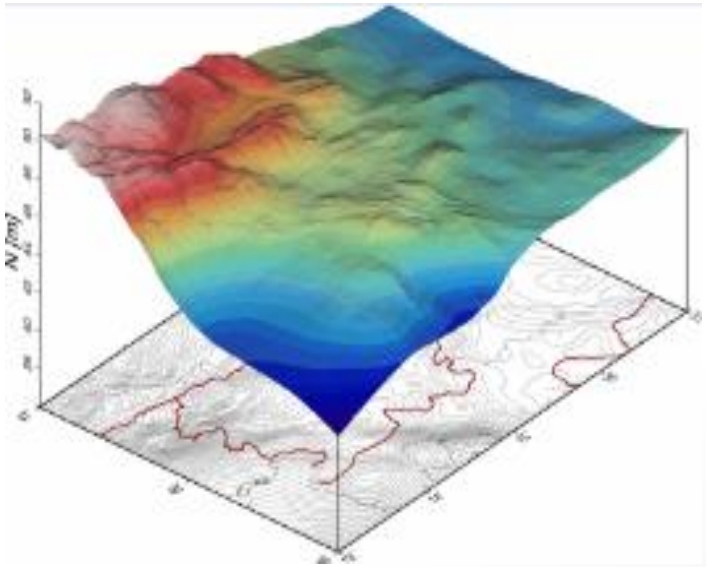
- **Activities:**
  - National geodetic CRS Act
  - Establishment of GNSS network called SIGNAL
  - List of tie points
  - Transformation parameters for transition
  - Software for performing transformation
  - Mostly data sets are transformed in new CRS
  - All field survey is done in new CRS
  - Different transformation models (depends on positional accuracy levels)

New national CRS

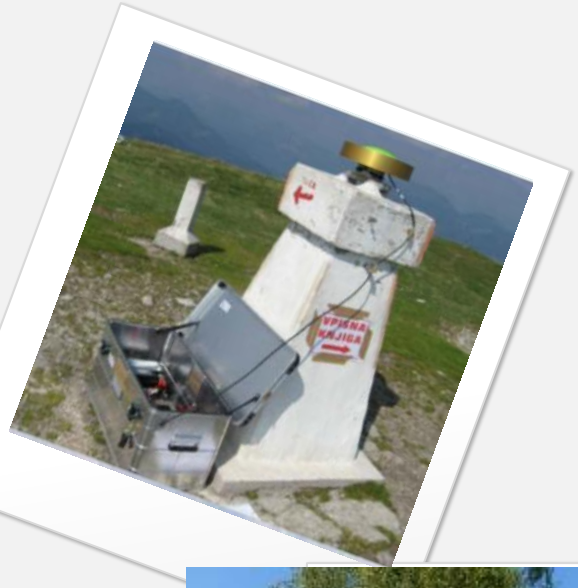
MODERNIZATION OF SPATIAL DATA INFRASTRUCTURE TO REDUCE RISKS AND IMPACTS OF FLOODS

- Establishment of the vertical component of the national coordinate system,
- Data layers of basic topographic and hydrographic data, compliant with the INSPIRE,
- Implementing INSPIRE requirements

EEA Grants - Subproject
GEODETIC REFERENCE SYSTEM



Quasigeoid model



national zero order geodetic network

- **ESTABLISHMENT OF A NATIONAL COMBINED GEODETIC NETWORK**
- **IMPLEMENTATION OF THE VERTICAL COMPONENT OF ESRS**
- **DEVELOPMENT OF THE GEOID MODEL FOR THE TERRITORY OF SLOVENIA**

Field survey – quality controls

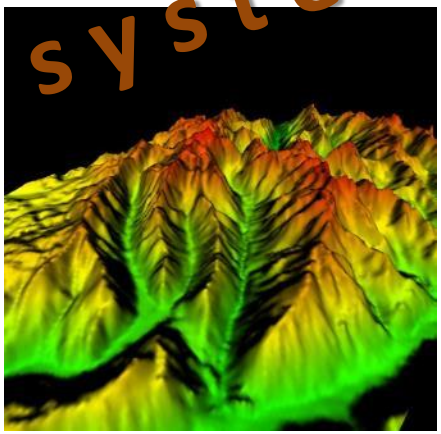
- Controls of ortophotos (ground control points)
- Controls of transformation model (CRS) for land cadastre
- Quality control of geoid model (1000 points)
- Controls of SIGNAL network (data flow, position of stations)
- EUREF campaign – checking the realisation of state CRS -
- Accuracy control of CPI
- Periodic checking of state border signs
- New measurement of border signs

Ortophoto

Topographic data

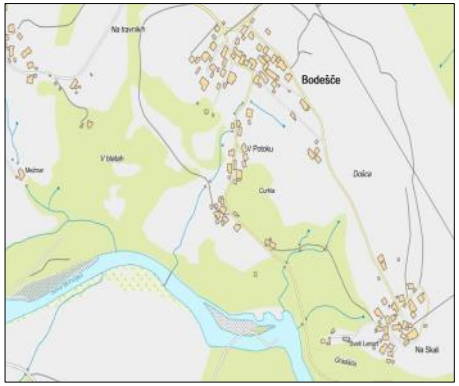
Topographic system

Preview maps



Terrain models

Geographical names



Topographic maps

Ortophoto

3 year cycle,
0.25 ; 0.5 and IR DOF,
Terrain model 5x5

- Control of specifications
- New standard for position accuracy (ASPRS standard)
- Controls partly outsourced (Geodetic Institute)
- Guidelines for Best Practice and Quality Checking of Ortho Imagery (JRC)
- Aerophotography, DMV & OF

2 ORTOFOTO

ID	Opis	Element	Podelement	Kontrolo izvaja
POP_1	Pregled elaborata ortofoto posnetkov	Popolnost	Zgrešenost in/ali izpustitev	GU
POP_2	Preverba prostorskega obsega, geolokacije in zapisov listov	Popolnost	Zgrešenost in/ali izpustitev	GU
PON_1	Kontrola stikov med ortofoti in prehodi med aeroposnetki v mozaiku	Položajna točnost	Relativna	GU
PON_2	Kontrola ortofotov na podlagi izmerjenih GNSS točk	Položajna točnost	Absolutna	
TEN_2	Vizualna ocena tonske uravnoteženosti ortofotov za celo OAF	Tematska točnost	Pravilnost nekvantitativnih atributov	GU

Ortophoto – quality report (completness)

2.2 Popolnost (POP_2)

ID	POP_2	
Opis	**Preverba prostorskega obsega, geolokacije in zapisov listov**	
Element	Popolnost	
Podelement	Zgrešenost in/ali izpustitev	
Mera vrednotenja	Število manjkajočih in napačnih (ki ne sodijo v OAF) ortofotov, pravilnost poimenovanja datotek, pravilnost zapisanega formata ter pravilnost georeferenciranja.	
Metoda vrednotenja	Pregled na oddanem disku zapisanih ortofotov, pregled datotek za vpis v bazo podatkov (TN-IFOPRO, ver. 5.0, dec 2014 - tehnično navodilo za izvajanje fotogrametričnih projektov). • Ali so izdelani vsi ortofoti znotraj OAF (po pogodbi); • Pravilnost formata zapisa vseh ortofotov (nekomprimiran TIFF); • Pravilnost geolokacije vseh ortofotov (TFW); • Pravilnost poimenovanja nomenklature DOF za TIF in TFW datoteko (SSSLLNN.*, pri čemer je SSS trigonometrična sekcija, LL zaporedna št. lista znotraj sekcije in NN nomenklatura glede na vrsto ortofota: 62=RGB50); • Pravilnost zapisa datotek za vpis v bazo podatkov.	
Rezultat kontrole	Manjkajoči listi DOF:	Ne
	Napačni listi DOF:	Ne
	Nepravilen format zapisa listov DOF:	Ne
	Nepravilno georeferencirani listi DOF:	Ne
	Napačna nomenklatura listov DOF:	Ne
	Pravilnost zapisa datotek za v bazo podatkov:	Da
Mnenje kontrolorja	**Ustreza**	
Meja ustreznosti	Nič (0) manjkajočih ali napačnih elementov, oziroma pozitivno mnenje kontrolorja.	
Sprejem/zavrnitev	**Sprejem**	

The project

»MODERNISATION OF SPATIAL DATA INFRASTRUCTURE TO REDUCE RISKS AND IMPACTS OF FLOODS«.

Subproject TOPO – Topographic database

- **GOALS:**

  - **Change of the existing topographic data model (inline with INSPIRE)**
  - **Creation of Data Quality model harmonised with INSPIRE**
  - **Establishment of a physical topographic database model and development of application for managing data**
  - **Transformation of existing topographic data into the new data model**
  - **Topographic data acquisition in accordance with new instructions**
  - **Development of new methods and processes for the maintenance of topographic data**
  - **Creation of a network service for viewing topographic data**

DATA SET	LAYER	INSPIRE THEME
DTK 5	Building	Buildings
DTK 5	High object	Buildings
ZK GJI	Powerline	Utility and governmental services
DTK 5	Road	Transport networks
DTK 5	Railway	Transport networks
DTK 5	Cableway	Transport networks
DTK 5	Vegetation	Land cover, Land use
DTK 5	Special use area	Land use, Land cover, Hydrography
DTK 5	Water area	Hydrography
DTK 5	Watercourse (line)	Hydrography
DTK 5	Water phenomenon	Hydrography
REZI	Geographical names	Geographical names
DMR	Digital elevation model	Elevation

INSPIRE themes

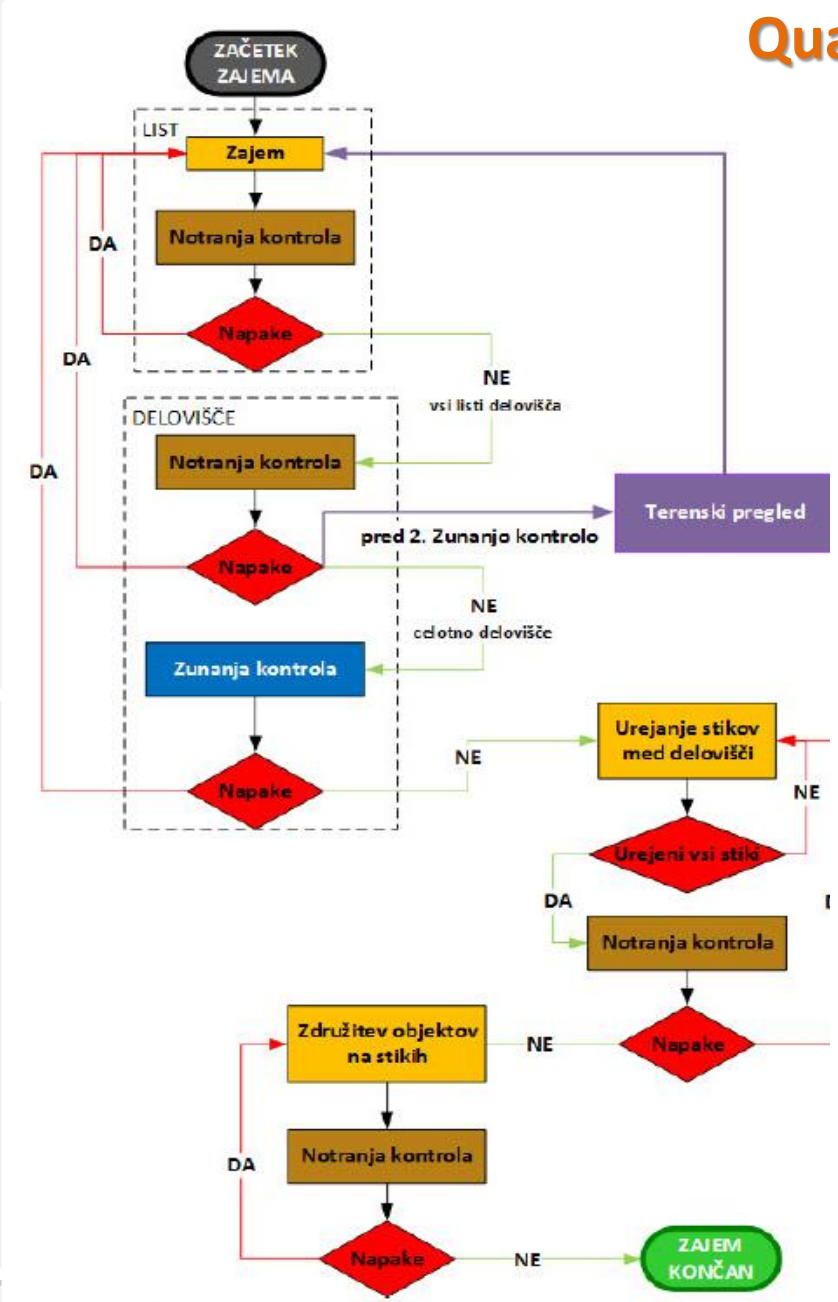
included in TOPO database

Topographic database

Quality issues:

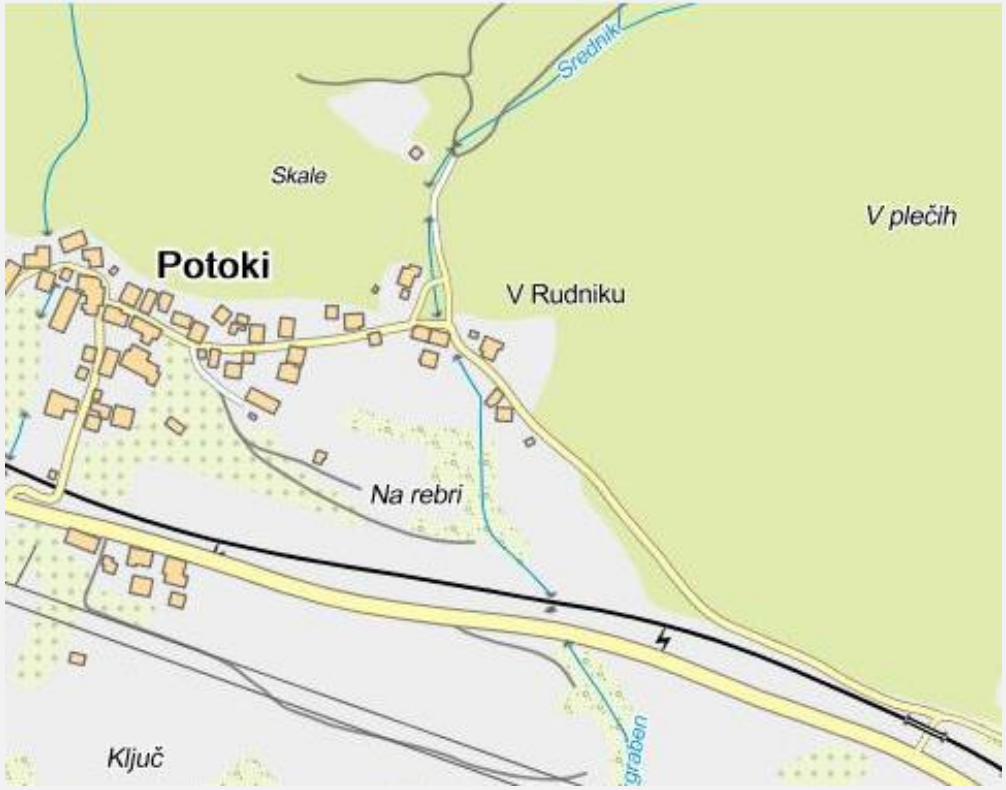
- **Creation of Data Quality model harmonised with INSPIRE**
- **New feature type catalogue**
- **Prepared rules for data capturing**
- **Topographic data acquisition in accordance with new instructions**
- **Quality control of captured data**
- **Development of new methods and processes for the maintenance of topographic data**
- **Creation of a network service for viewing topographic data**

Quality control of captured data

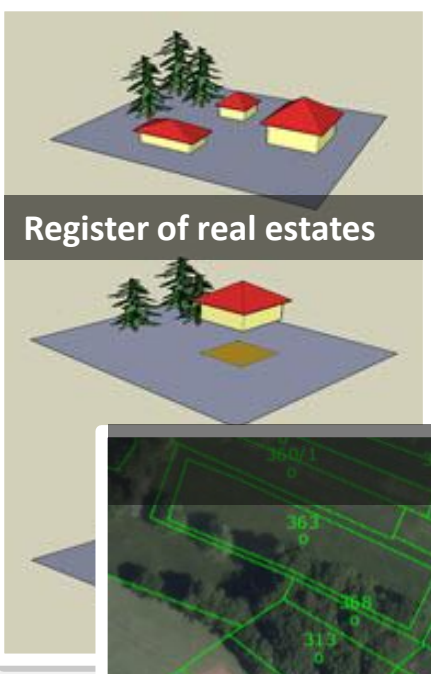


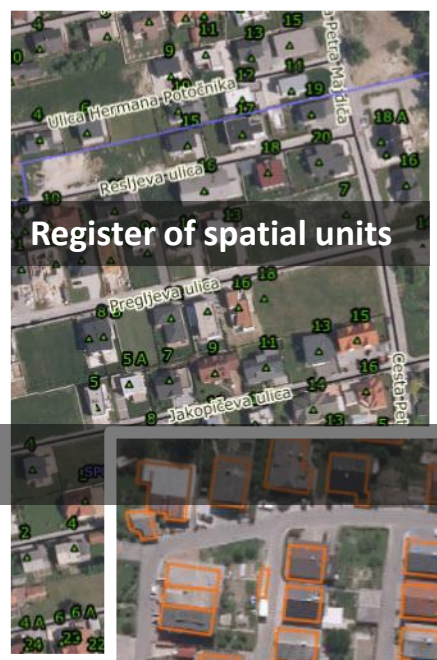
Slika 3: Diagram poteka dela pri zajemu topografskih podatkov.

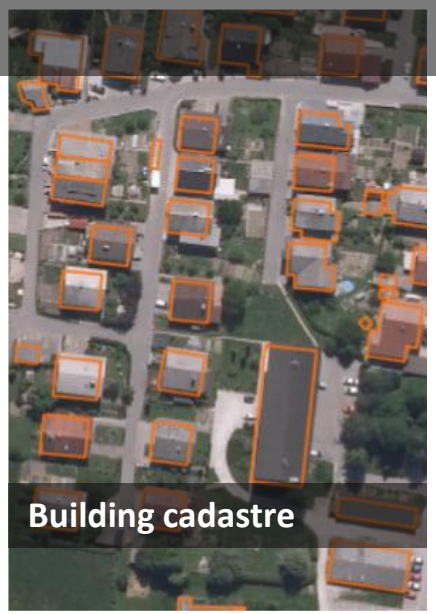
Register
Of
Geographical
Names

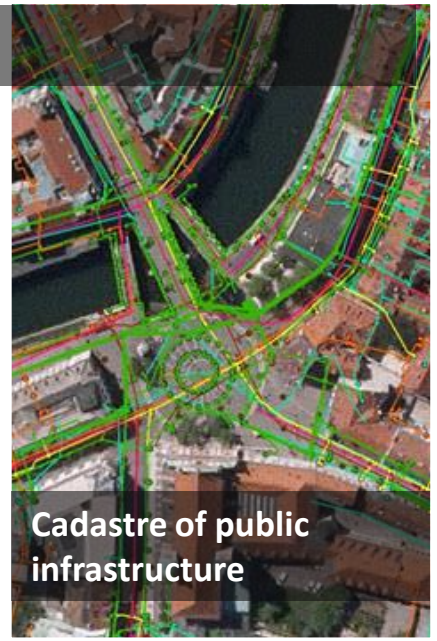


- **National commission for Standardisation of Geographical names**
- **Commission must issue an opinion for each change in RGN and names in other data sets (spatial units)**
- **Elimination of duplicated names**
- **Standardises names at scales 1:1mio, 1:250.00**
- **Toponomastic examination for GN at 1:50.000 level**





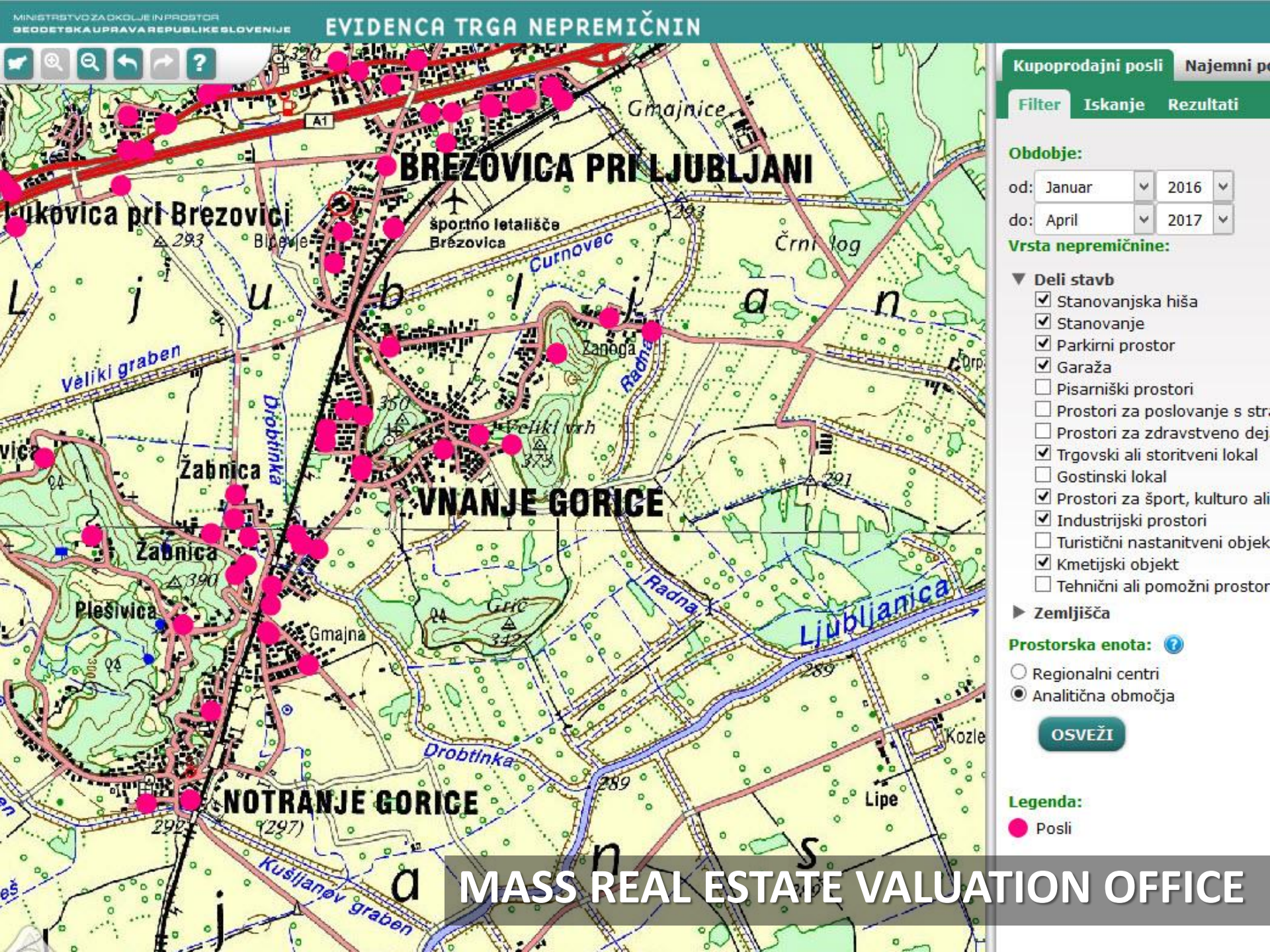




Real Estate Data Dets

VALUATION OFFICE IS RESPONSIBLE FOR:

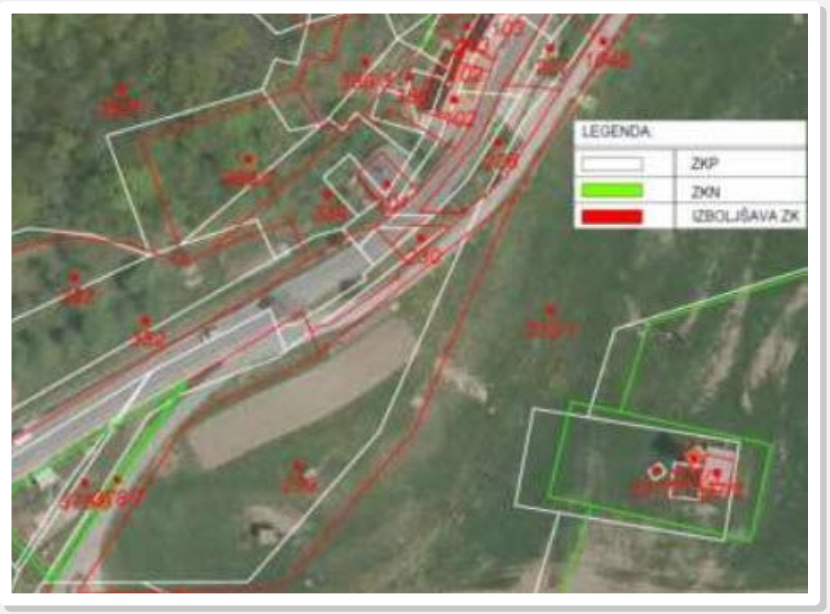
- Sales data registration, their improvement and quality
- Monitoring and reporting the Real Property Market
- General valuation every 4 years: model designing, model calibration, notification, appeal process, finally calculation of all property in Real Property data Register Consolidation of valuation models with all 211 municipalities
- Value Indexation every year


MINISTRSTVO ZA OKOLJE IN PROSTOR
GEODETSKA UPRAVA REPUBLIKE SLOVENIJE
EVIDENCA TRGA NEPREMIČNIN
Kupoprodajni posli
Najemni po
Filter
Iskanje
Rezultati
Obdobje:
od: Januar 2016
do: April 2017
Vrsta nepremičnine:
Deli stavb
Stanovanjska hiša
Stanovanje
Parkirni prostor
Garaža
Pisarniški prostori
Prostori za poslovanje s str
Prostori za zdravstveno dej
Trgovski ali storitveni lokal
Gostinski lokal
Prostori za šport, kulturo ali
Industrijski prostori
Turistični nastanitveni objek
Kmetijski objekt
Tehnični ali pomožni prostor
Zemljišča
Prostorska enota:
Regionalni centri
Analitična območja
OSVEŽI
Legenda:
Posli
BREZOVICA PRI LJUBLJANI
VNANJE GORICE
NOTRANJE GORICE
Gmajnice
športno letališče Brezovica
Črni log
Curnovec
Zanoga
Radna
Veliki graben
Drobtinka
Žabnica
Plešivica
Gmajna
Ljubljanica
Kozle
Lipe
Kušljanov graben
MASS REAL ESTATE VALUATION OFFICE

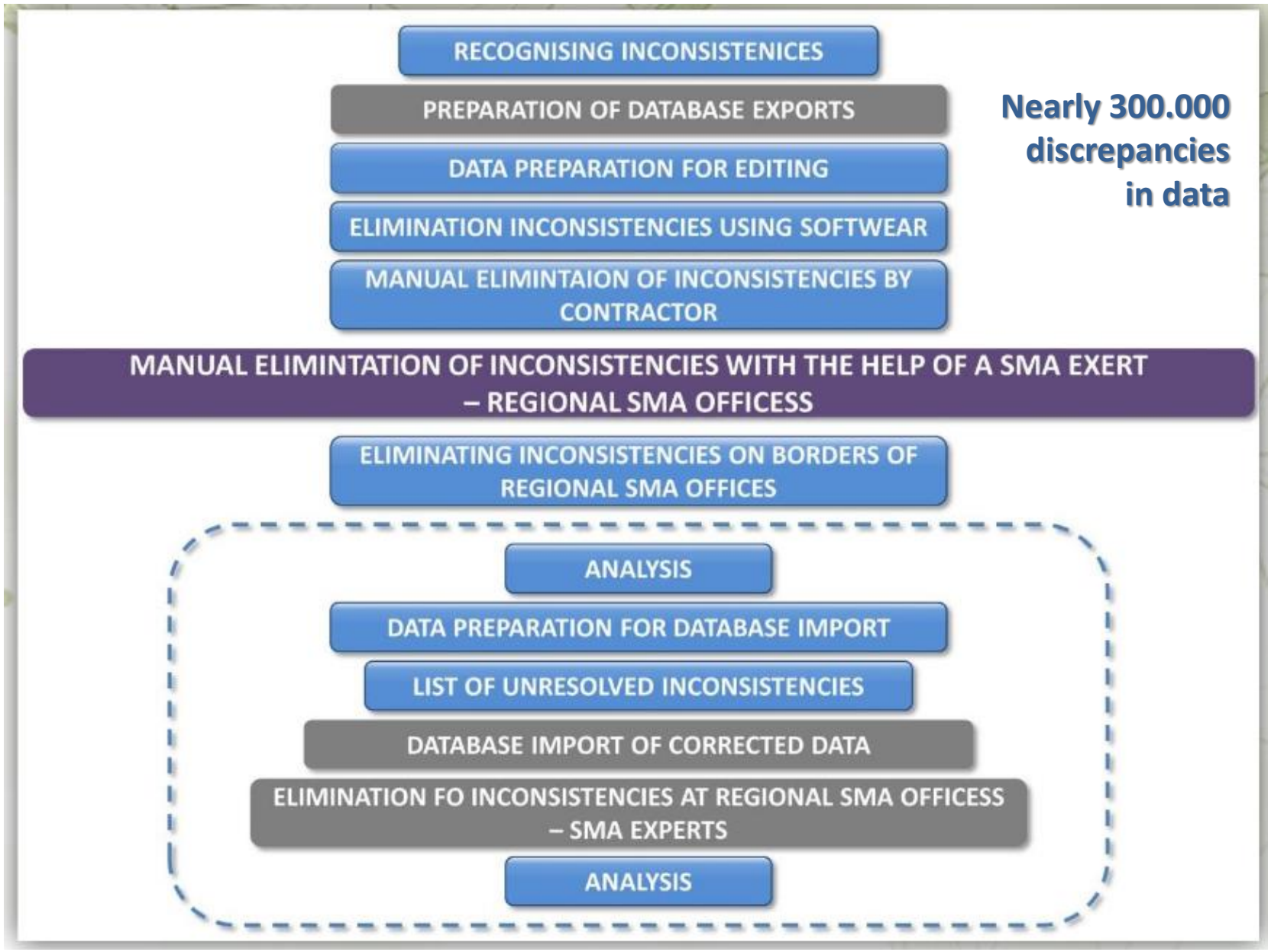
Land cadastre:

primary and the oldest data set

- Couple years ago we implemented a project for upgrading data in land cadastre.
- The analysis of the land cadastre data was carried out before the project start (9,5 mio of cadastre points; 5,5 mio land parcels)
- The need for Improvement of land cadastre point data (coord. in different CS), edit the topography of individual land parcels and the topology between different cadastral municipalities.

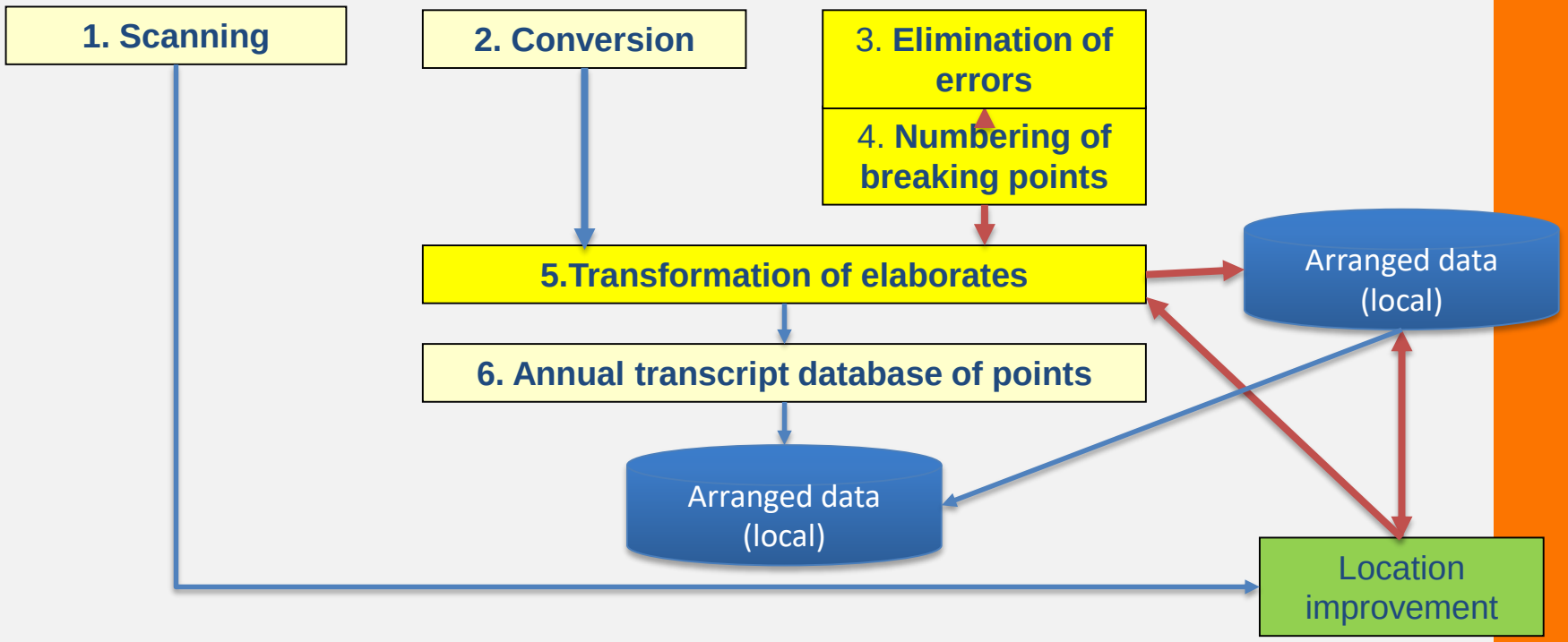


Statistics:
5 599 321 parcels /attribute database
5 597 760 parcels /graphic database
13 497 924 LC points
4 091 725 defined LC borders


RECOGNISING INCONSISTENICES
PREPARATION OF DATABASE EXPORTS
DATA PREPARATION FOR EDITING
ELIMINATION INCONSISTENCIES USING SOFTWEAR
MANUAL ELIMINTAION OF INCONSISTENCIES BY CONTRACTOR
Nearly 300.000 discrepancies in data
MANUAL ELIMINTATION OF INCONSISTENCIES WITH THE HELP OF A SMA EXERT – REGIONAL SMA OFFICESS
ELIMINATING INCONSISTENCIES ON BORDERS OF REGIONAL SMA OFFICES
ANALYSIS
DATA PREPARATION FOR DATABASE IMPORT
LIST OF UNRESOLVED INCONSISTENCIES
DATABASE IMPORT OF CORRECTED DATA
ELIMINATION FO INCONSISTENCIES AT REGIONAL SMA OFFICESS – SMA EXPERTS
ANALYSIS

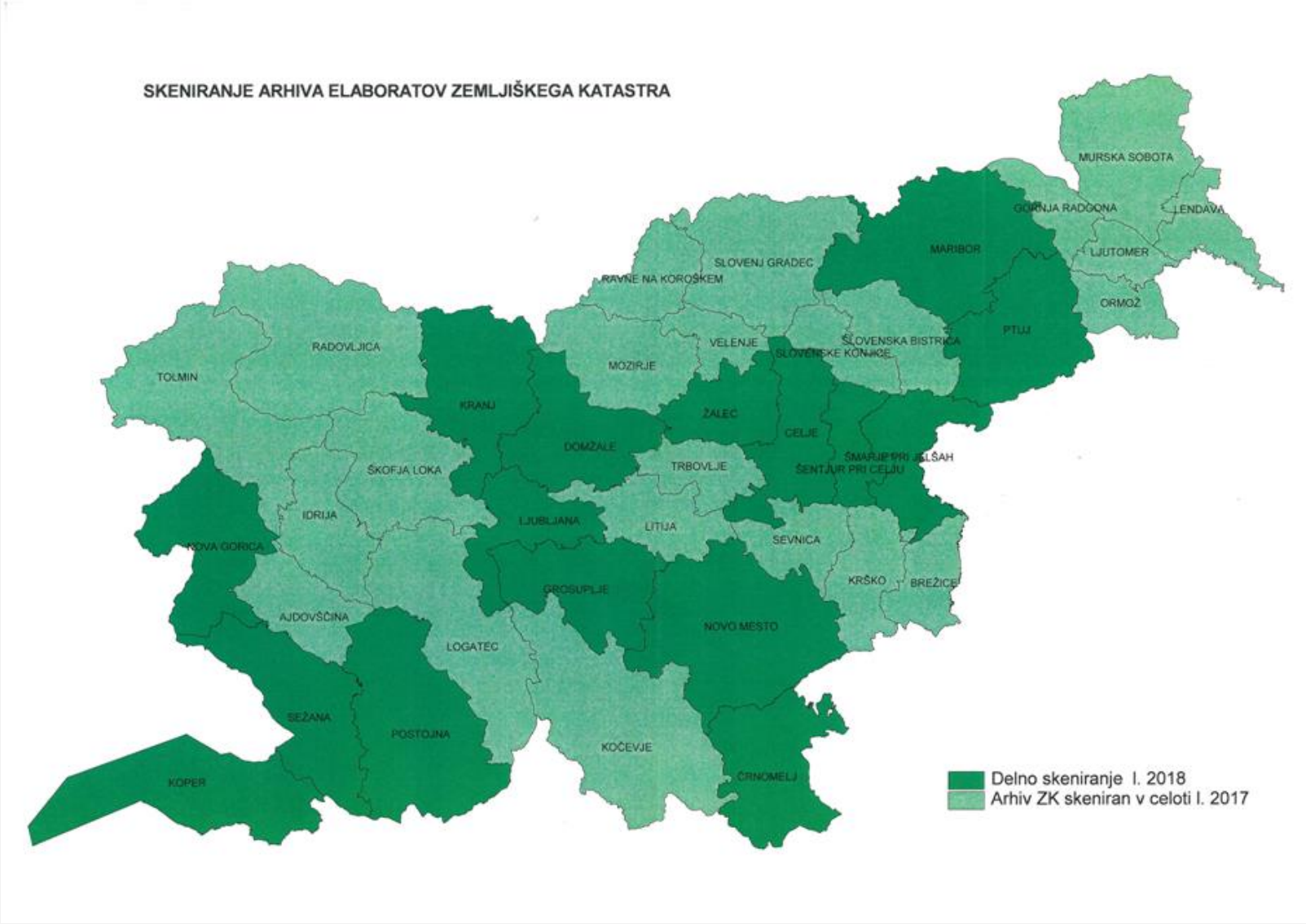
The arrangement (preparation) of data for location improvement land cadastre

1. Scanning of archieve data
2. Conversion of old codes for land use into LUB*
3. Elimination of errors in the data
4. Numbering of breaking point in graphic data
5. Transformation of elaborates (studies)
6. Annual transcript database of points and arranged borders



EVROPSKA UNIJA
EVROPSKI STRUKTURNI IN INVESTICIJSKI SKLADI
NALOŽBA V VAŠO PRIHODNOST

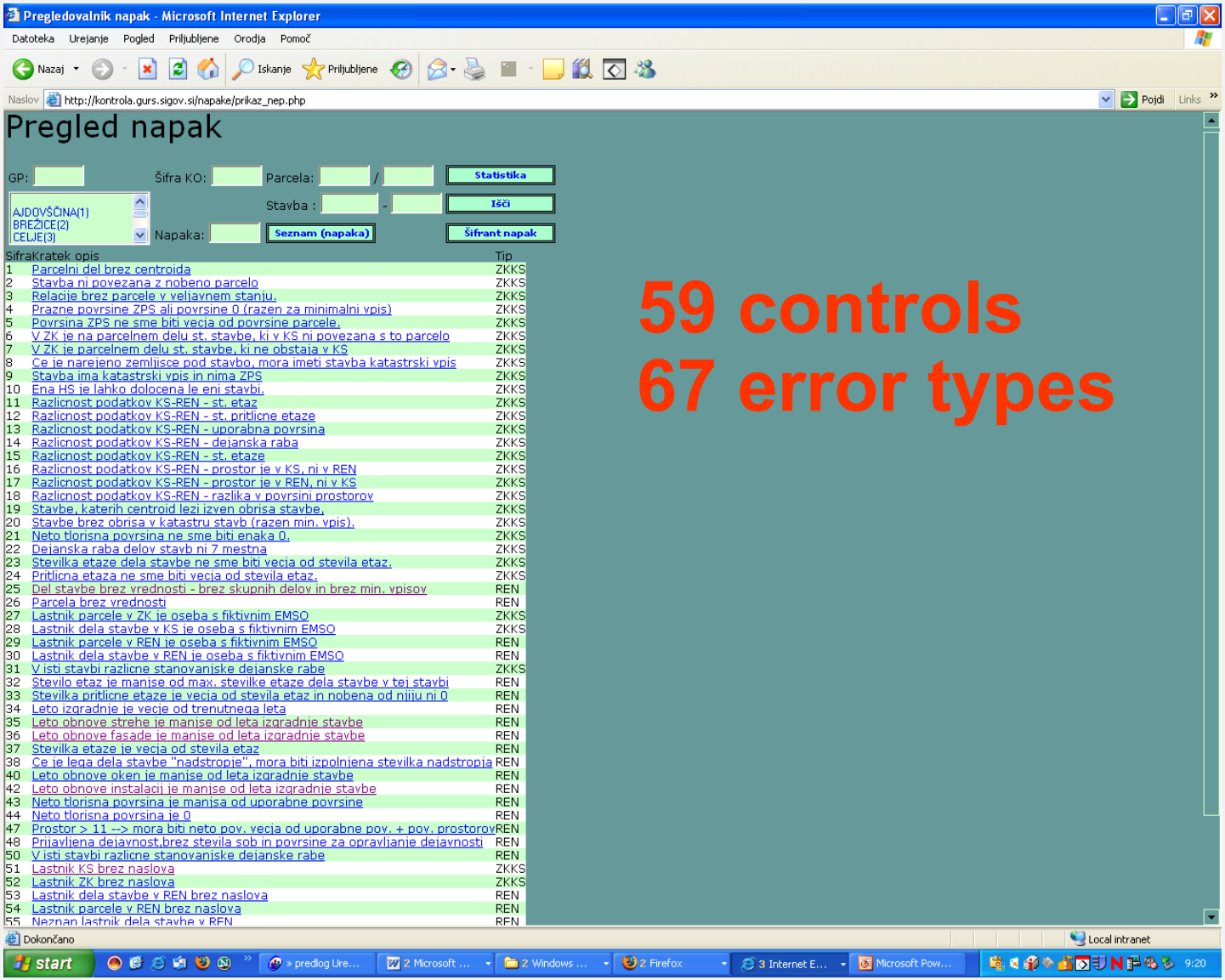
1. Scanning of archieve of LC:



Measures to improve DQ

- Assurance of quality data in the procedures of real estate recording
- Controls are set down for recording a new property and for updating existing property
- Internal intranet application for data quality testing with included 67 types of possible errors updated on daily basis
- Branch offices have to plan and report on troubleshooting every three month

Data quality control



59 controls
67 error types

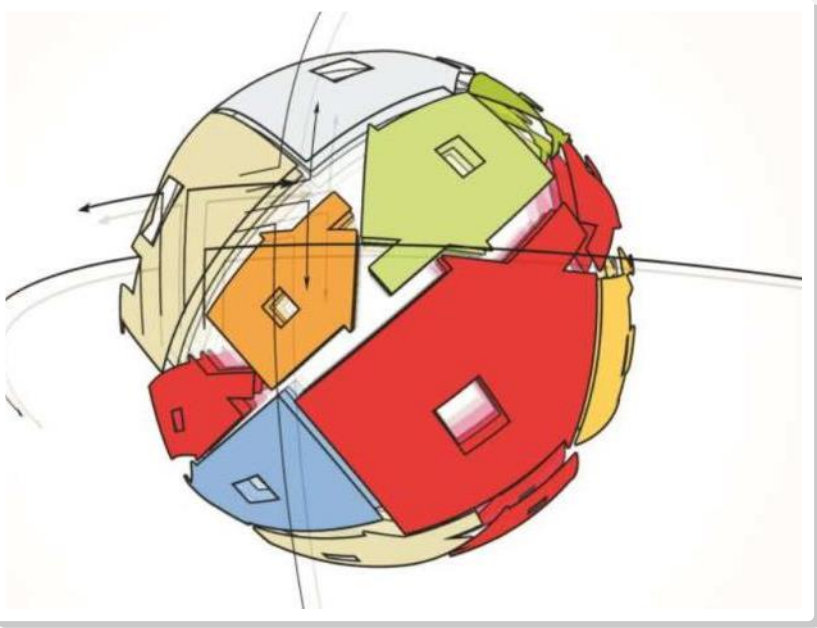
Buildnig cadastre + REN

1177926 buildings

1851154 building parts)

Building Cadaster is a basic data set on buildings and is linked to the land cadaster and land registry

Record in BC is the basis for land registration



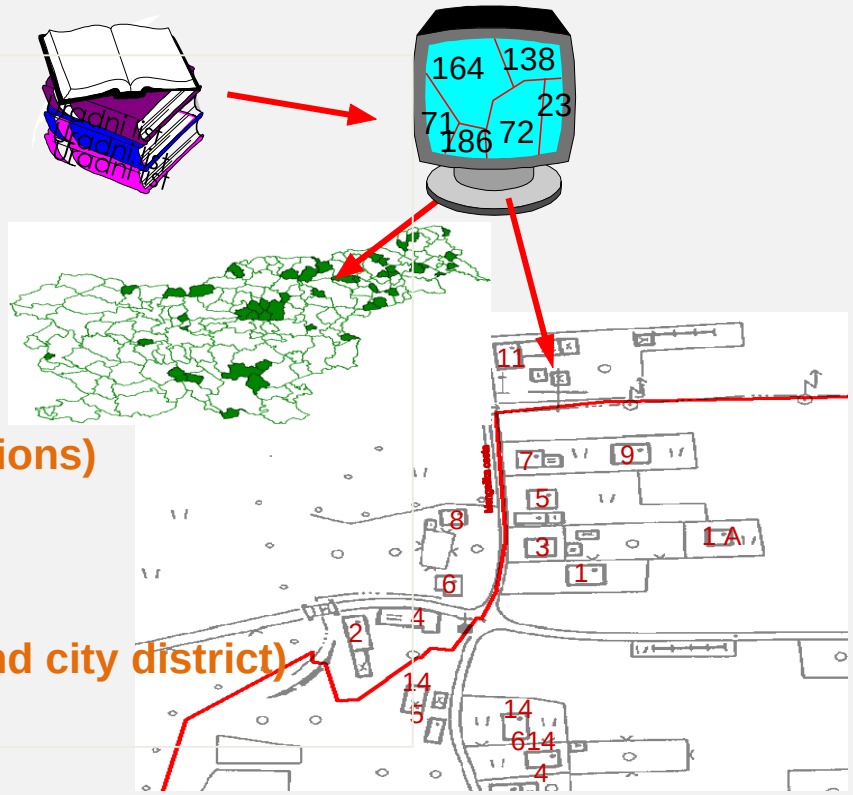
- Simplification of data management and quality upgrades of data (buildings and parts)
- Optical sensing of lidar recordings with an automated process of new or changed buildings .
- Reporting of the owners to geodetic Inspection

Register of Spatial Units

Provides data on addresses and other spatial definitions.

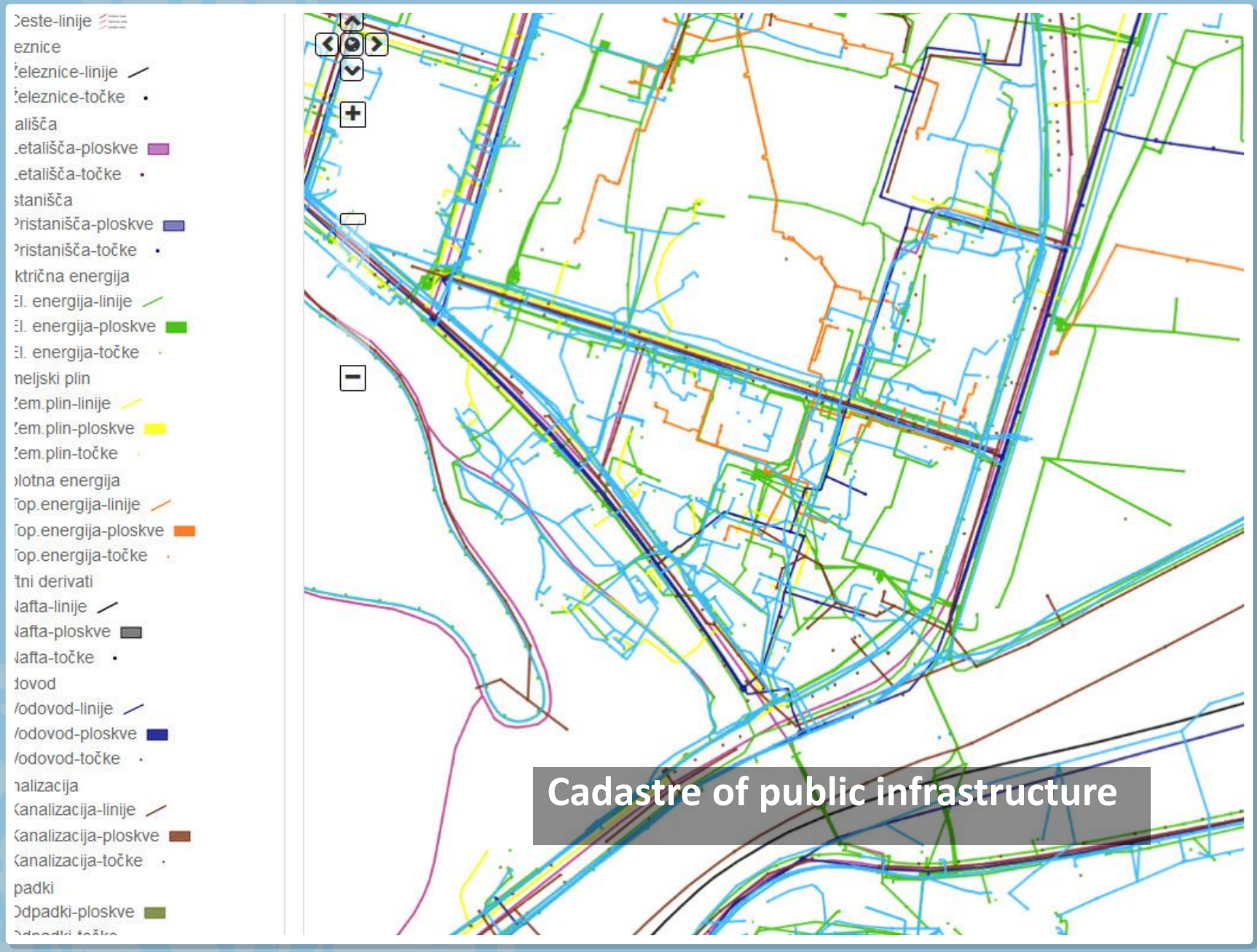
Provides data for the central national registers like the Central Population Register, the Slovene Business Register, the Register of Taxpayers and many other official data and data sets

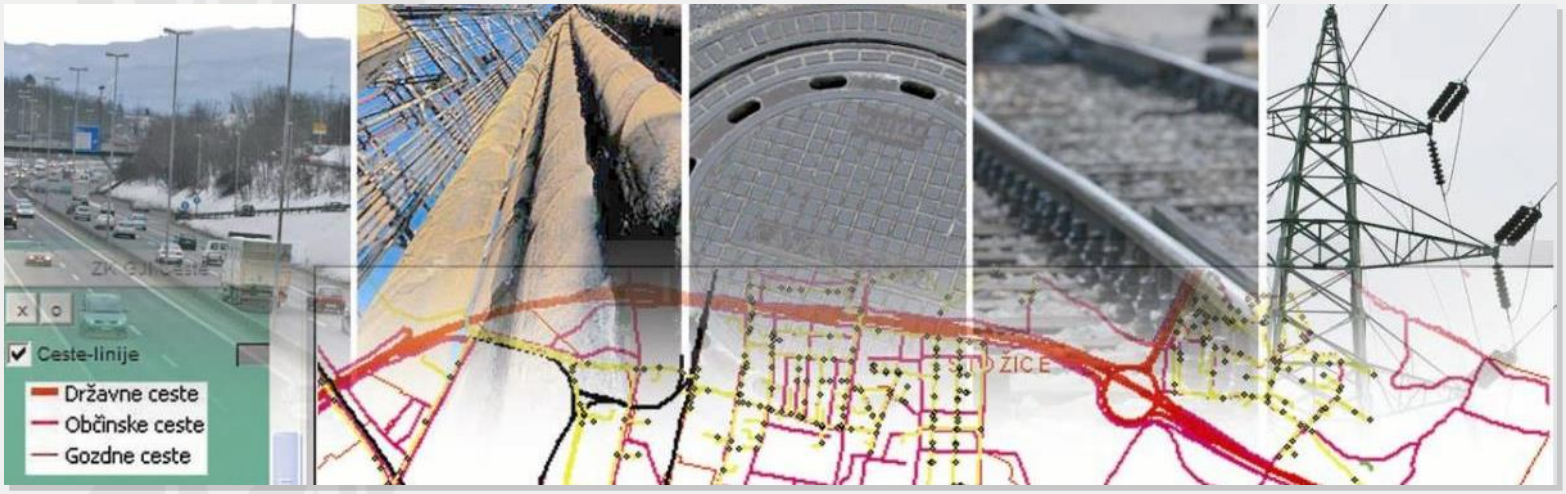
523 363 house numbers
10 060 streets
6029 settlements
210 municipalities
58 administrative units
2.695 cadastral communes
17.352 spatial areas
3.378 voting units (parliament elections)
3.461 voting units (local elections)
465 postal districts
808 school localities
1.270 communities (local, village and city district)
12 statistical regions



Administrative procedures for DQ assurance

- Simplifying procedures for recording real estate in cadastres
- Obligation of arranging real estate data in cadastres before getting the house number
- Procedures for registration of permanent residence and place of business
- Owners in real estate databases from CRP and CBR
- Connecting data from cadastres with data in Land registry


Ceste-linije
eznice
Železnice-linije
Železnice-točke
ališča
Letališča-ploskve
Letališča-točke
stanišča
Pristanišča-ploskve
Pristanišča-točke
ktrična energija
El. energija-linije
El. energija-ploskve
El. energija-točke
neljski plin
Zem.plin-linije
Zem.plin-ploskve
Zem.plin-točke
lotna energija
Top.energija-linije
Top.energija-ploskve
Top.energija-točke
tni derivati
lafta-linije
lafta-ploskve
lafta-točke
lovod
/odovod-linije
/odovod-ploskve
/odovod-točke
nalizacija
Kanalizacija-linije
Kanalizacija-ploskve
Kanalizacija-točke
padki
Odpadki-ploskve
Cadastre of public infrastructure



1. **TRAFIC INFRASTRUCTURE**
   (roads, railways, airports, harbours)
2. **ENERGY INFRASTRUCTURE**
   (power lines, gas supply, heat supply, pipelines)
3. **MUNICIPAL INFRASTRUCTURE**
   (water supply, sewage system)
4. **WATER INFRASTRUCTURE**
5. **TELECOMMUNICATION NETWORKS**

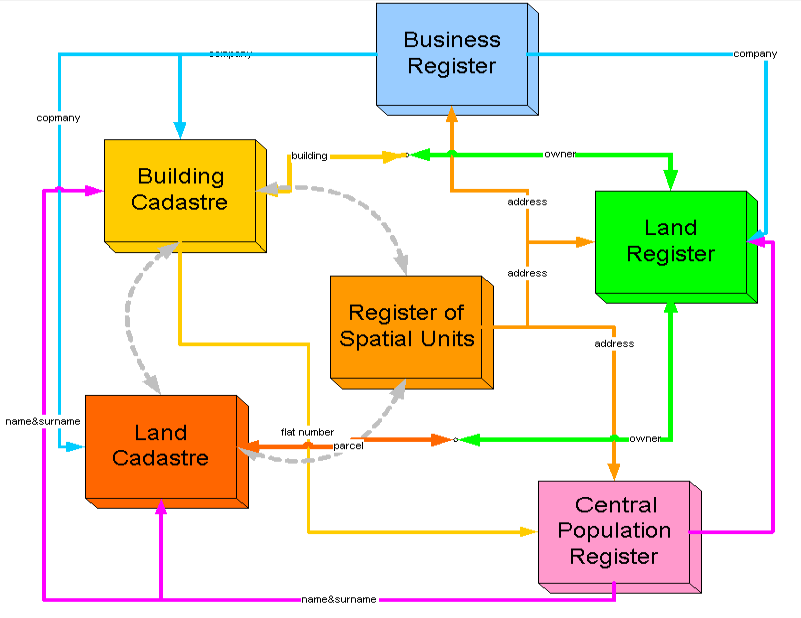
From the year 2006, systematic gathering od data (state, municiopalities,

Statstics - CPI

Type	Number of objects	Length [km]
Roads	138.122	50.660
Railways	7.545	2.495
Airports	130	-
Ports	1.095	-
cableways	323	21
Electricity	1.831.337	47.479
Natural gas	492.315	5.895
Thermal energy	74.140	1.061
Petroleum products	218	-
Water distribution system	1.120.664	26.818
Sewage system	872.610	10.633
Waste management	4.498	-
Water infrastructure	10.491	63
Electronic communications	2.886.282	66.837
TOGETHER	7.440.041	211.968

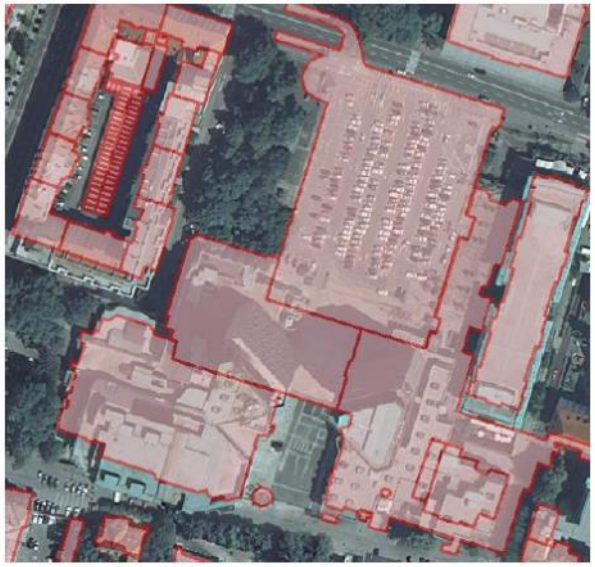
1. Permanent positional controls of data (field measurements)
2. Topological controls (consistency, distance between objects)
3. Software with formal, logical and other controls
4. Code lists harmonised with other data providers
5. Controls and links with other databases
6. Analyse of positional accuracy of objects in CPI (few municipalities, field measurements… → update of software, capturing rules, and classes of attributes)

Linking different data sets

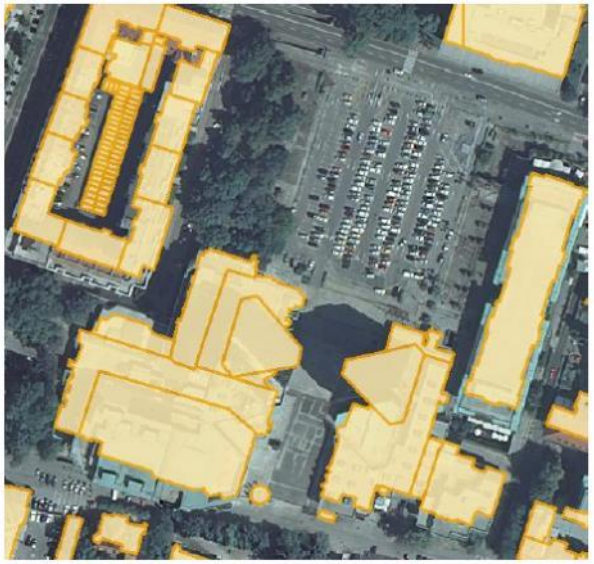


- Core data sets – links through web services established
- Importing data from different data sources
- Same object types in different data sets

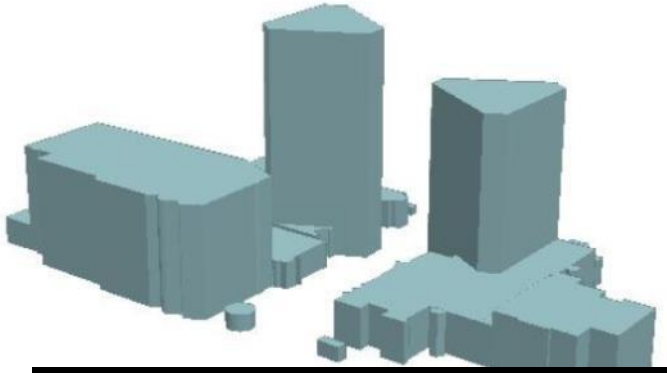
Harmonization of data in different datasets



Building cadastre



Topographic database



3D representation of the object

- Same objects in different data sets
- Capture rules
- Changes in feature catalogues
- New procedures for updating
- Capturing and storing only once

Services

National services

INSPIRE services

ELF services

Metadata

Extended INSPIRE profile (harvesting, national open data portal)

INSPIRE

SMA – national contact point

E-GEODETSKI PODATKI

1. Temeljni topografski načrt
2. Državni topografski model
3. Državna topografska karta
4. Državna pregledna karta

Open data

Free download of open data

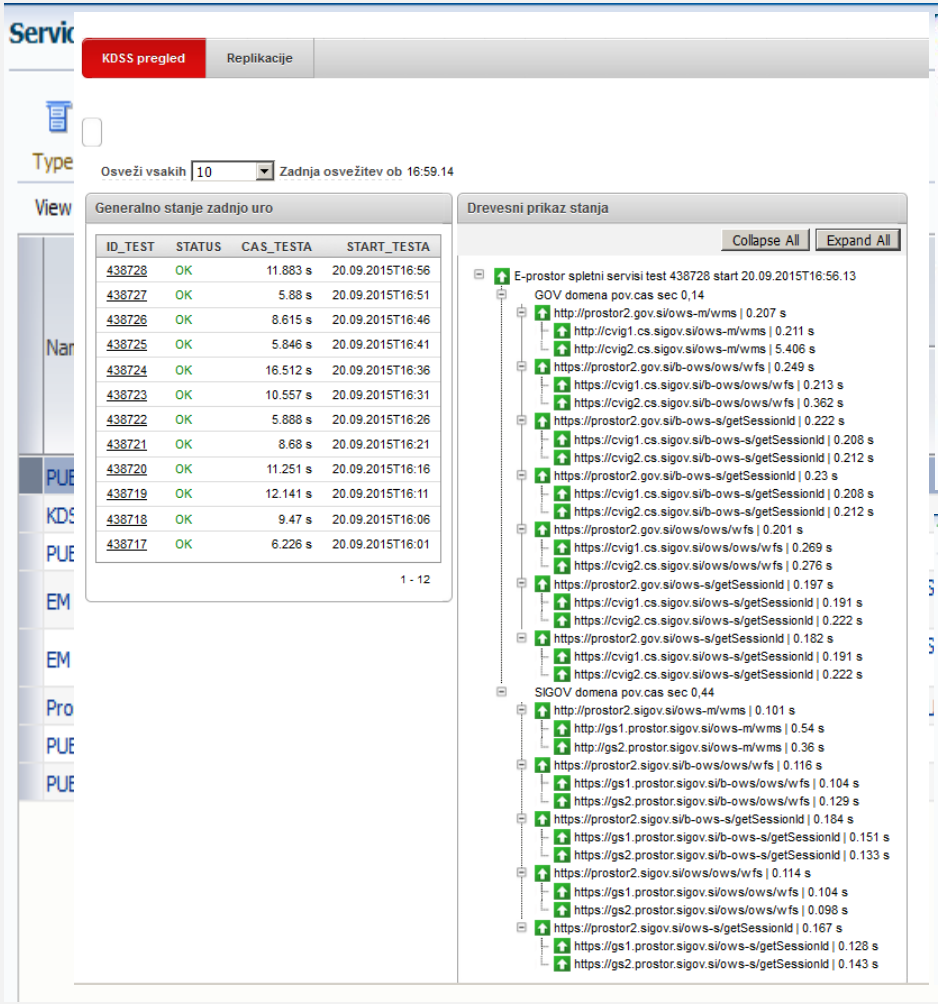
Applications

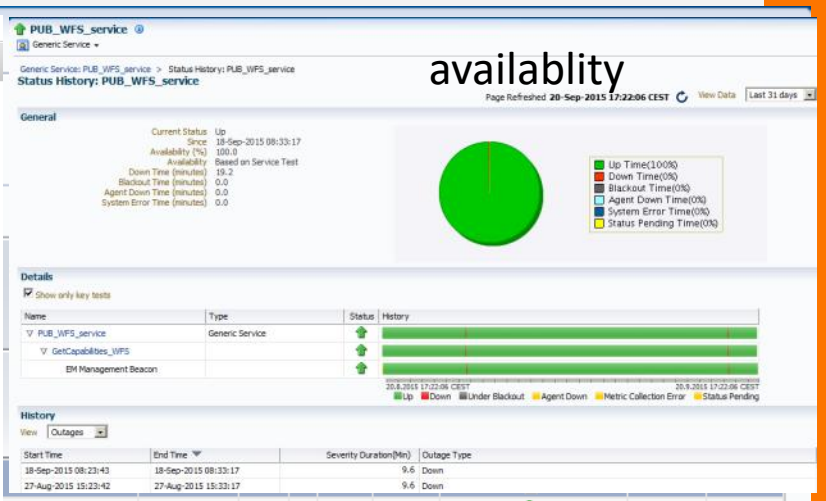
Viewers, data download, changing data, calculating…

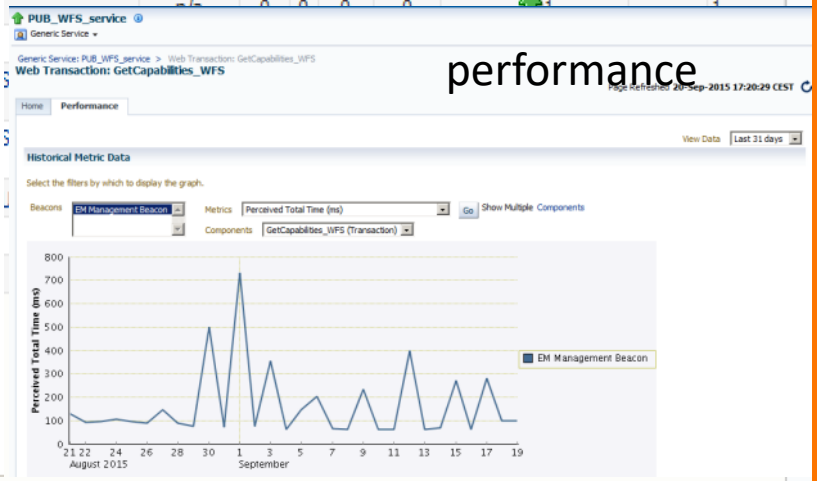
Geoportal

One entry point for spatial data, metadata, services, glossary

Monitoring


KDSS pregled
Replikacije
Osveži vsakih 10
Zadnja osvežitev ob 16:59.14
Generalno stanje zadnjo uro
ID_TEST STATUS CAS_TESTA START_TESTA
438728 OK 11.883 s 20.09.2015T16:56
438727 OK 5.88 s 20.09.2015T16:51
438726 OK 8.615 s 20.09.2015T16:46
438725 OK 5.846 s 20.09.2015T16:41
438724 OK 16.512 s 20.09.2015T16:36
438723 OK 10.557 s 20.09.2015T16:31
438722 OK 5.888 s 20.09.2015T16:26
438721 OK 8.68 s 20.09.2015T16:21
438720 OK 11.251 s 20.09.2015T16:16
438719 OK 12.141 s 20.09.2015T16:11
438718 OK 9.47 s 20.09.2015T16:06
438717 OK 6.226 s 20.09.2015T16:01
1 - 12
Drevesni prikaz stanja
Collapse All
Expand All
E-prostor spletni servisi test 438728 start 20.09.2015T16:56.13
GOV domena pov.cas sec 0,14
http://prostor2.gov.si/ows-m/wms | 0.207 s
http://cvig1.cs.sigov.si/ows-m/wms | 0.211 s
http://cvig2.cs.sigov.si/ows-m/wms | 5.406 s
https://prostor2.gov.si/b-ows/ows/wfs | 0.249 s
https://cvig1.cs.sigov.si/b-ows/ows/wfs | 0.213 s
https://cvig2.cs.sigov.si/b-ows/ows/wfs | 0.362 s
https://prostor2.gov.si/b-ows-s/getSessionId | 0.222 s
https://cvig1.cs.sigov.si/b-ows-s/getSessionId | 0.208 s
https://cvig2.cs.sigov.si/b-ows-s/getSessionId | 0.212 s
https://prostor2.gov.si/b-ows-s/getSessionId | 0.23 s
https://cvig1.cs.sigov.si/b-ows-s/getSessionId | 0.208 s
https://cvig2.cs.sigov.si/b-ows-s/getSessionId | 0.212 s
https://prostor2.gov.si/ows/ows/wfs | 0.201 s
https://cvig1.cs.sigov.si/ows/ows/wfs | 0.269 s
https://cvig2.cs.sigov.si/ows/ows/wfs | 0.276 s
https://prostor2.gov.si/ows-s/getSessionId | 0.197 s
https://cvig1.cs.sigov.si/ows-s/getSessionId | 0.191 s
https://cvig2.cs.sigov.si/ows-s/getSessionId | 0.222 s
https://prostor2.gov.si/ows-s/getSessionId | 0.182 s
https://cvig1.cs.sigov.si/ows-s/getSessionId | 0.191 s
https://cvig2.cs.sigov.si/ows-s/getSessionId | 0.222 s
SIGOV domena pov.cas sec 0,44
http://prostor2.sigov.si/ows-m/wms | 0.101 s
http://gs1.prostor.sigov.si/ows-m/wms | 0.54 s
http://gs2.prostor.sigov.si/ows-m/wms | 0.36 s
https://prostor2.sigov.si/b-ows/ows/wfs | 0.116 s
https://gs1.prostor.sigov.si/b-ows/ows/wfs | 0.104 s
https://gs2.prostor.sigov.si/b-ows/ows/wfs | 0.129 s
https://prostor2.sigov.si/b-ows-s/getSessionId | 0.184 s
https://gs1.prostor.sigov.si/b-ows-s/getSessionId | 0.151 s
https://gs2.prostor.sigov.si/b-ows-s/getSessionId | 0.133 s
https://prostor2.sigov.si/ows/ows/wfs | 0.114 s
https://gs1.prostor.sigov.si/ows/ows/wfs | 0.104 s
https://gs2.prostor.sigov.si/ows/ows/wfs | 0.098 s
https://prostor2.sigov.si/ows-s/getSessionId | 0.167 s
https://gs1.prostor.sigov.si/ows-s/getSessionId | 0.128 s
https://gs2.prostor.sigov.si/ows-s/getSessionId | 0.143 s


PUB_WFS_service
Status History: PUB_WFS_service
availablity
General
Details
History


PUB_WFS_service
Web Transaction: GetCapabilities_WFS
performance
Historical Metric Data
Perceived Total Time (ms)
EM Management Beacon
August 2015
September

The end

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