



AKOS

Mapping project in AKOS

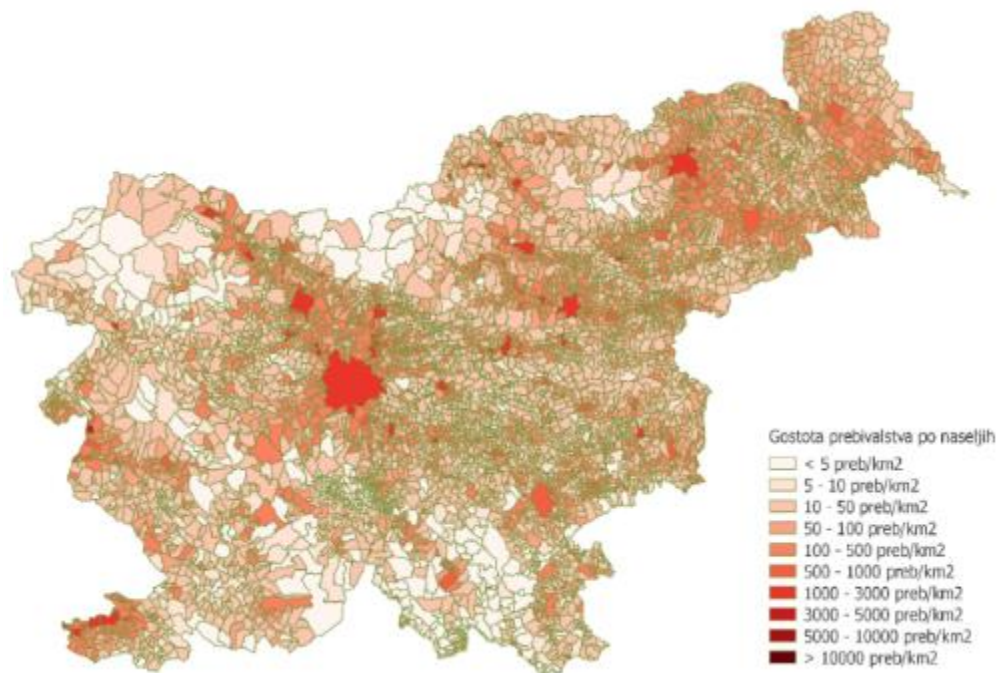
Mag. Tanja Muha

Marko Simončič

Budva, 27.9.2016

Basic statistics about Slovenia

Population	2.062.874
Area (in km ²)	20.274 km ²
Number of municipalities	212
Number of urban municipalities	11
Number of settlements	6036
The average population density	102 inh./km ²
Average altitude	556.8 m
Highest point	2.864 m
Number of households	851.289
Average household size	2.42



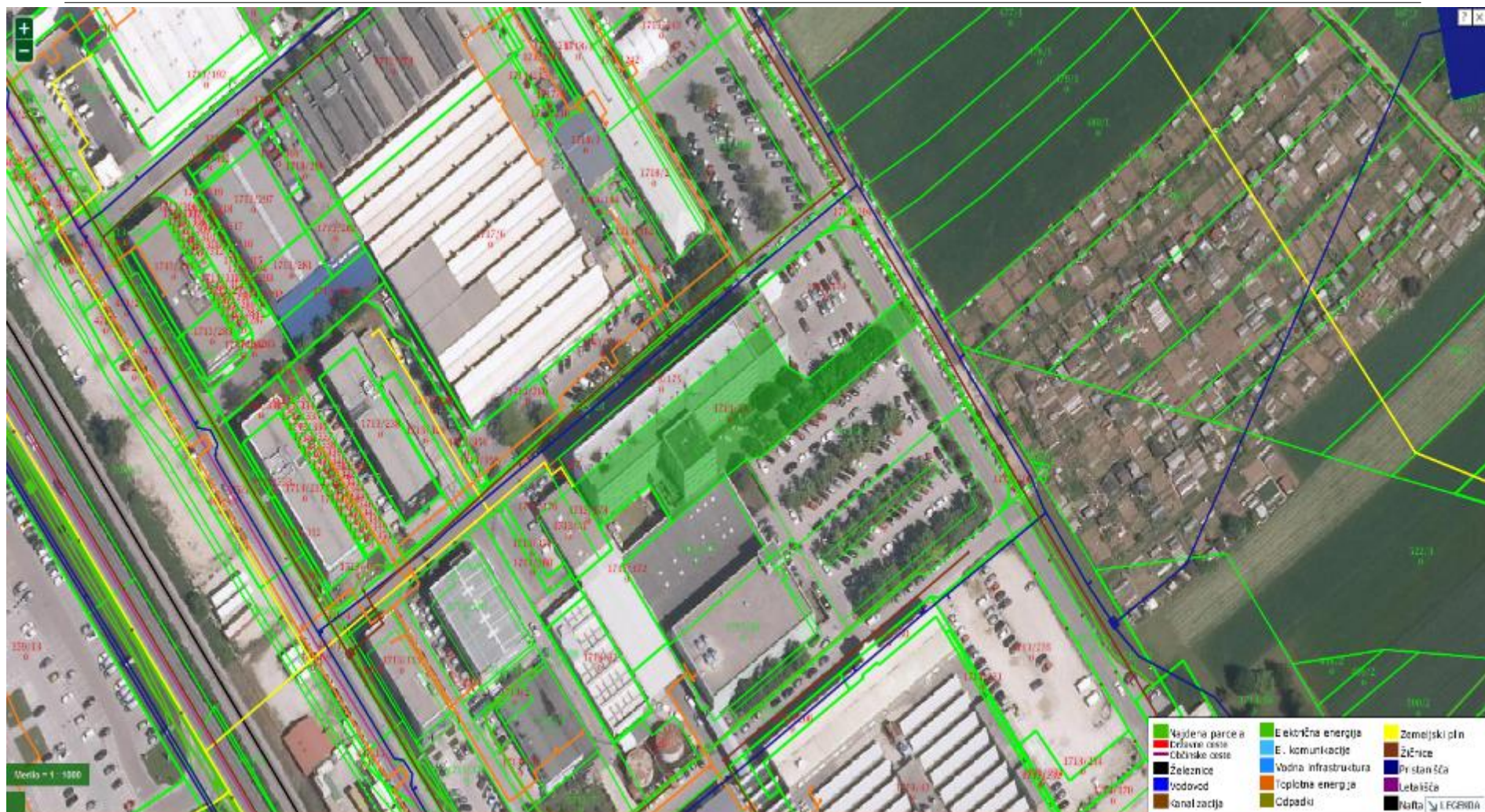
In 2004 Slovenian Surveying and Mapping Authority started with the development of the central database, called consolidated cadastre of public infrastructure.

Data included:

- Real estate and owners
- Public utility infrastructure, such as roads, railways, sewage, water, electricity, and other
- Electronic communications network connection points

CONSOLIDATED CADASTRE OF PUBLIC INFRASTRUCTURE - February 2013		
Roads	Object	139.543
Railways	Object	7.526
Airports	Object	89
Harbours	Object	1.096
Cable railways	Object	164
Electric energy	Object	1.391.296
Natural gas	Object	387.879
Heat energy	Object	67.738
Oil	Object	214
Water supply	Object	886.337
Sewer	Object	702.296
Waste	Object	3.758
Green surfaces	Object	0
Water infrastructure	Object	7.844
Natural resources	Object	0
Electronic communications	Object	2.427.668





**Article 14 of Electronic Communications Act (ZEKom-1)
(entry in the register)**

- (1) The **owner of a communications network and associated infrastructure** referred to in the second paragraph of Article 9 of this Act must supply information on the **types and location of the networks, and of the facilities** as far as they form part of the associated infrastructure, **directly to the body responsible for surveying and mapping**, for the purpose of in the register of infrastructural networks and facilities, in accordance with the regulation governing entry in this register. **Every amendment** to this information shall be reported to the competent body **within three months of its occurrence**.
- (2) The **owner of a public communications network and associated infrastructure must, in addition** to the information referred to in the preceding paragraph, **supply information on the existing state of affairs and the capacity of the network termination point directly to the body responsible for surveying and mapping**, for the purpose of entry in the register referred to in the preceding paragraph, in accordance with the regulation referred to in the preceding paragraph. **Every amendment** to this information shall be reported to the competent body **within three months of its occurrence**. The information contained in the record of the existing state of affairs and the capacity of the network termination point **shall not be public**. In addition to the body responsible for surveying and mapping, the **Agency shall have access to all the information** entered pursuant to this paragraph for requirements relating to implementation of this Act, as shall the bodies responsible for the implementation of Article 11 of this Act. The Agency shall, by means of a **general act**, prescribe in detail the information to be entered and the method of collection of the information, determine the categories of other users by method of access to this information in order to provide adequate protection of any business secrets of owners, and regulate other matters arising from implementation of this provision.
- (3) The Agency may, for requirements relating to implementation of this Act, require persons liable under the first paragraph of this Article to **supply information on the availability of the networks and facilities** referred to in the first paragraph of this Article, on which it shall keep its own records, and allow interested parties to inspect this information in relation to procedures it is conducting.

Article 15 of Electronic Communications Act (ZEKom-1) (supervision)

The Agency **shall oversee the implementation of the provisions** of this Chapter and of the regulations and acts issued pursuant thereto, and cooperate with the inspectorate responsible for construction in doing so.

The Agency has a possibility to act as a supervisor whether the input data is reported or not and if the data is correct. The fine for the medium or large firm (in case they don't report data) is **from 50.000 - 400.000 €**.

AKOS was included into the **mapping project in 2012**, together with the **Ministry of education, science and sport – Directorate for the Information Society and The Surveying and Mapping Authority of the Republic of Slovenia**

On the basis of the Electronic Communications Act, AKOS adopted secondary legislation in order to make sure that business secret of the owners of infrastructure will be protected.

General act on entry, collection and access to data in the register of infrastructural networks and facilities.

- Dealing with more detailed prescriptions of the legal
- Classification of the users of data
- Exchange Format

Public view

Users with lowest priority: each user of the register has the public view, which contains information if the building has the connection point or not

Owners of the infrastructure

Users with medium priority: owners of the infrastructure who report data can access their own data and public access

Overall access

users with top priority: mapping authority, relevant ministry and NRA; for the purpose of the mapping, analysis, geographic segmentation, designation of white areas; establishing the economic interest database.

Input attributes give the description of the termination point and they need to report: ID number, type of change, cadastral code, code of building inside the cadastral unit, ID of the building address, address connected to the ID, household, type of connection (fibre, coax, copper, wireless), maximum number of possible connections on the building, minimum capacity, active connection (yes/no), ID number of the owner of the broadband connection, coordinates from the state coordinate system



splošno iskanje

[>> Napredno iskanje](#)
[>> Pomoč](#)


Stavbe

Katastrska občina	Številka stavbe	Katastrski vpis	Število delov stavbe	Vrednost nepremičnine	Grafični prikaz
1738 DRAVLJE	1584	DA	76	na voljo samo za del stavbe	

Legenda: Podatki Registra nepremičnin Podatki Katastra stavb Podatki drugih upravljavcev

Katastrska občina 1738 številka stavbe 1584

Podrobni podatki o stavbi

NASLOV STAVBE	Ljubljana, Stegne 7
NETO TLOORISNA POVRŠINA STAVBE (M2)	6445,9
POVRŠINA ZEMLJIŠČA POD STAVBO (M2)	1431
DEJANSKA RABA STAVBE	nestanovanjska
ŠTEVILO ETAŽ	7
ŠTEVILKA PRITLIČNE ETAŽE	2
VIŠINA STAVBE (M)	25,4
LETO ZGRADITVE	1979
LETO OBNOVE STREHE	2008
LETO OBNOVE FASADE	-
MATERIAL NOSILNE KONSTRUKCIJE	2 - beton, železobeton
DVIGALO	Da
VRSTA OGREVANJA	1 - daljinsko ogrevanje
PRIKLJUČEK NA VODOVODNO OMREŽJE	Da
PRIKLJUČEK NA ELEKTRIČNO OMREŽJE	Da
PRIKLJUČEK NA KANALIZACIJSKO OMREŽJE	Da
PRIKLJUČEK NA OMREŽJE PLINOVODA	Ne
PRIKLJUČEK NA OMREŽJE ZA KABELSKO TV	Da
VRSTA (TIP) STAVBE	1 - samostoječa stavba
NAČIN TEMELJENJA	1 - pasovni, točkovni temelji
PRIKLJUČEK NA TEHNOLOŠKI PLIN	Ne
PRIKLJUČEK NA INDUSTRIJSKI TOK	Da
PRIKLJUČEK NA KOMPRIMIRAN ZRAK	Ne
ČISTILNA NAPRAVA	Ne

Podatki o širokopasovnem internetu

OMOGOČENA ZMOGLJIVOST	100 Mb/s
-----------------------	----------

Seznam delov stavbe



Guidance and content of cadastre of the communications networks and associated facilities

Type of data needed to be provided directly to the Surveying and Mapping Authority

The installations of communication networks and associated infrastructure which must be recorded in cadastre:

- The communication line of the same type and the same owner on the same route and the same position with type indication (**coax, copper, fibre**)
- Cable ducts
- Shaft
- Base stations
- Radio station
- Antenna tower,
- Telecommunications distribution cabinet
- The area of communications facilities

Later on, **AKOS establish its own database**, with all the inputs, which are already available and with the additional data collected from owners of electronic communications infrastructure, in order to get complete picture of the networks available in Slovenia.

Own database have a lot of advantages:

- reusing already collected data
- adding different information and various databases (FWBA, base stations, MDFs, etc.)
- responsive database
- flexible
- open source

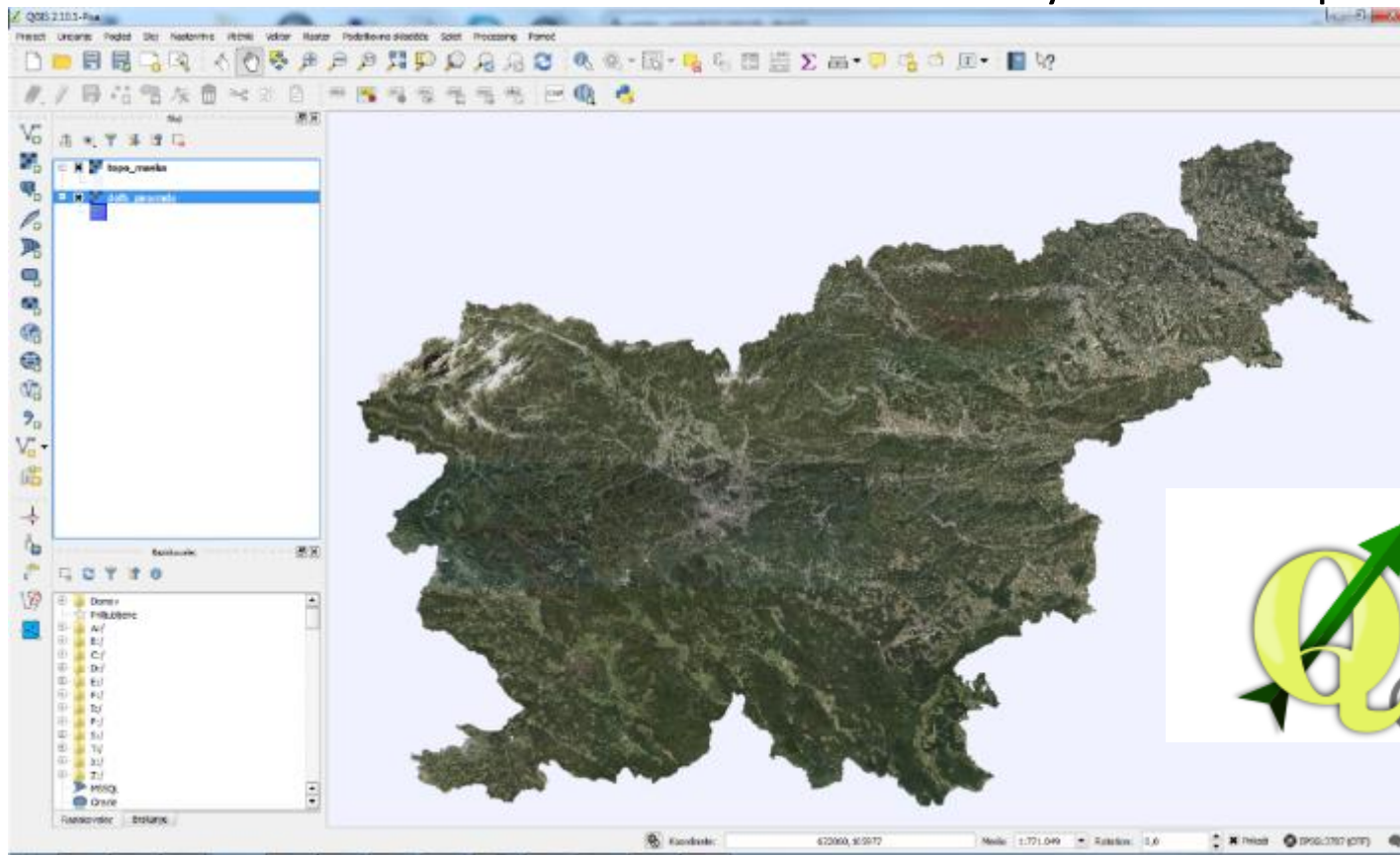


PostgreSQL is a powerful, open source object-relational database system. It has more than 15 years of active development and a proven architecture that has earned it a strong reputation for reliability, data integrity, and correctness.



PostGIS is a spatial database extender for [PostgreSQL](#) object-relational database. It adds support for geographic objects allowing location queries to be run in SQL.

- AKOS is using **free and open source** Geographic Information System – QGIS as a tool to show results of various analysis and complex research.



Pregledovalnik omrežnih priključnih točk

Analize

Vse

Po lastnikih

Po vrsti OPT

Po min. zmogljivosti

Po naseljih

Izbira vpogleda.

Občina

Naselje

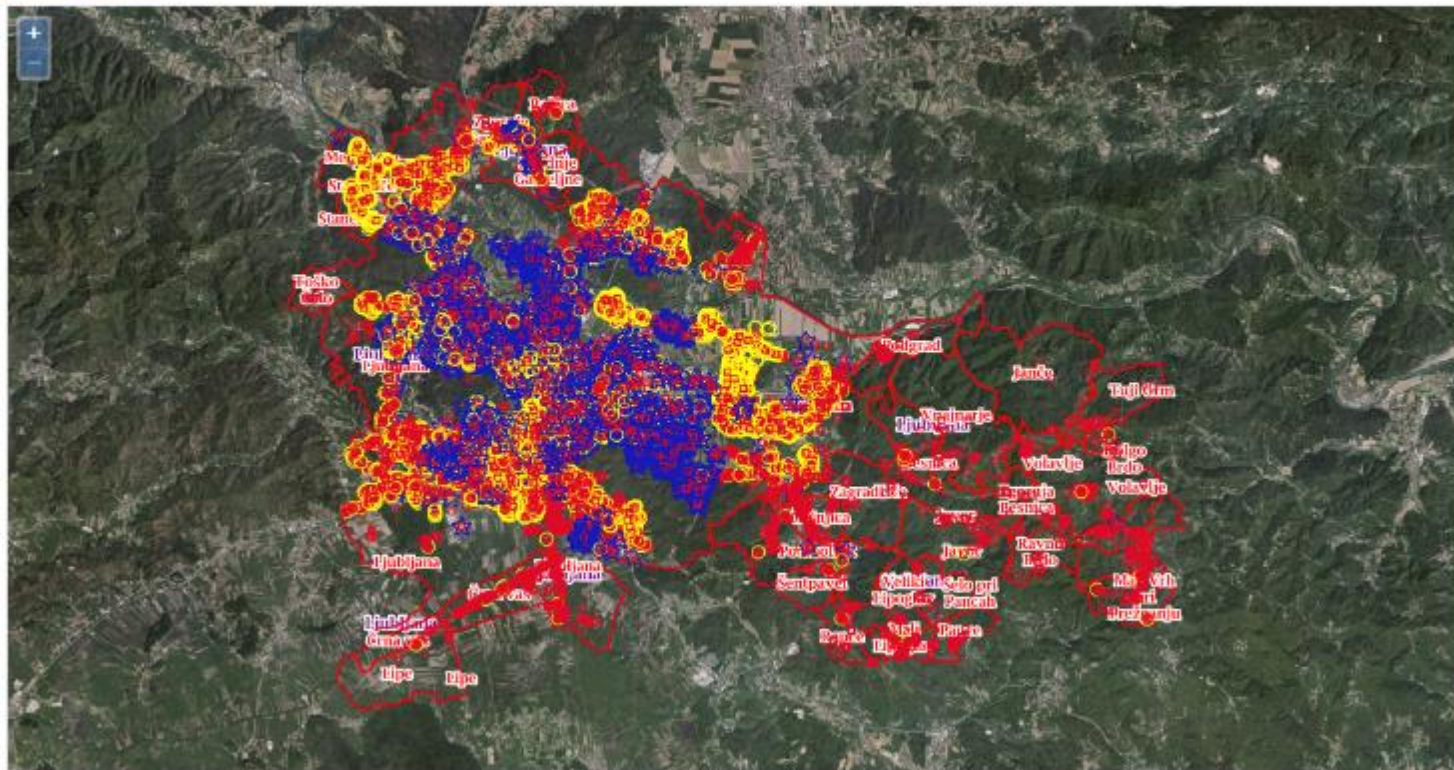
Ulica

Hišna številka

Počisti

Išči

Seznam naselij



Merilo = 1 : 136K

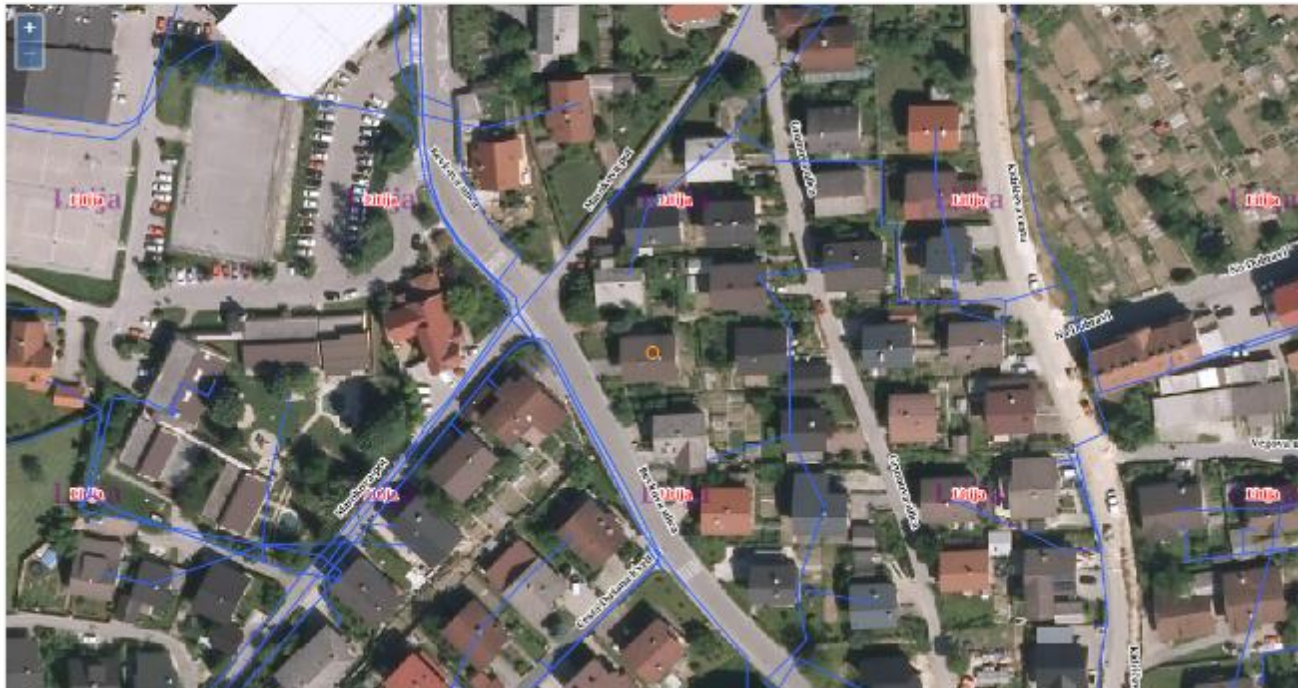
Legenda

Pregledovalnik omrežnih priključnih točk

Id	Tehnologija	Lastnik	Aktiven	Minimalna zmogljivost	
90335	kabelski priključek	EVJ ELEKTROPROM trgovina, proizvodnja, instalacije d.o.o.	Ne	3 Mbps	Podrobno
1976037	bakrena parica	TELEKOM SLOVENIJE, d.d.	Da	30 Mbps	Podrobno

Prikazano 1 do 2 od 2 zapisov

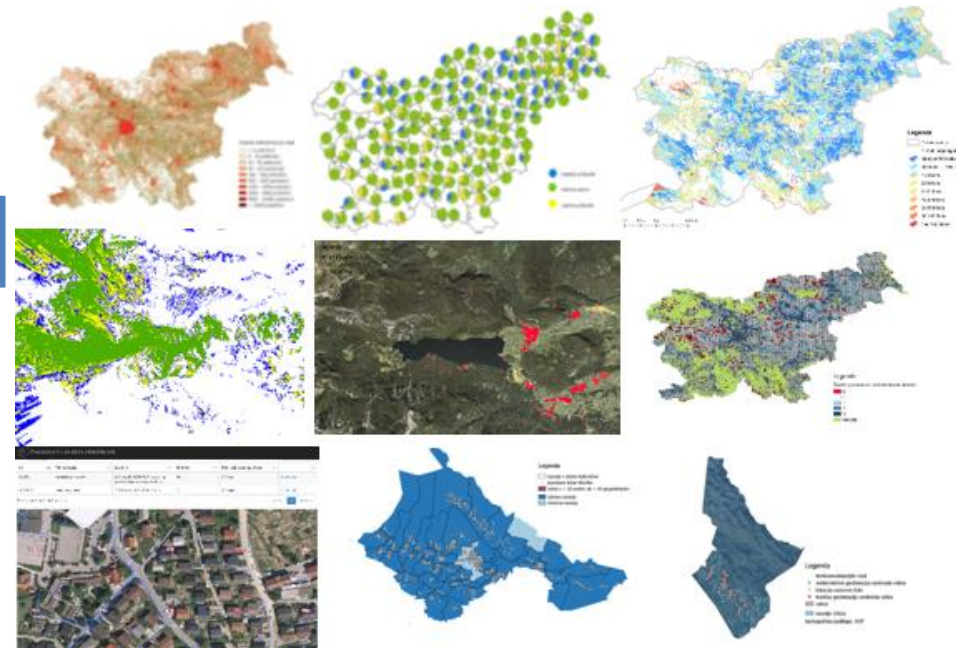
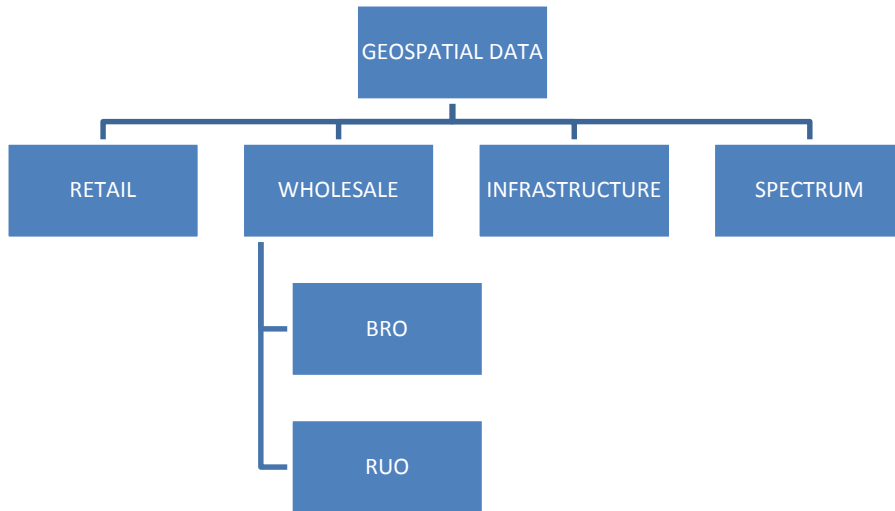
Prejšnji 1 Naslednji



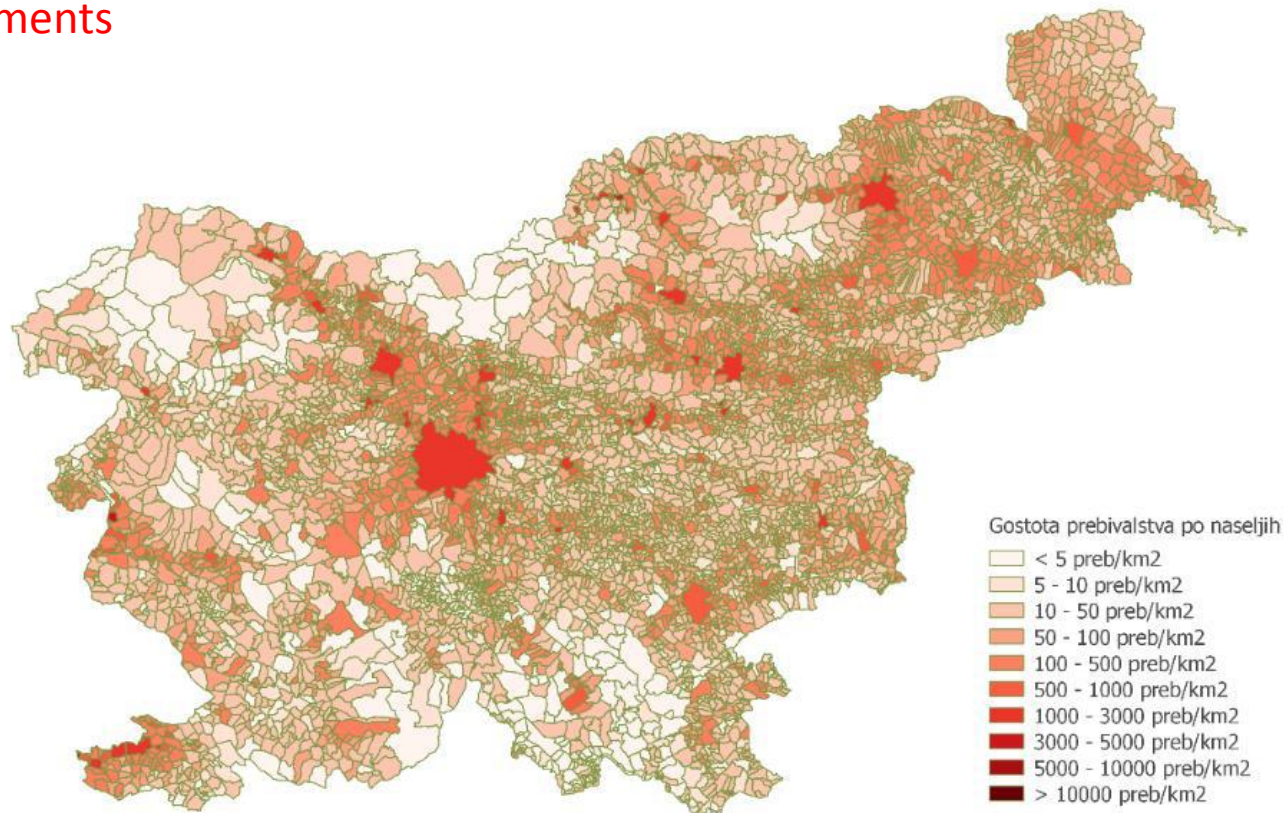
Merilo = 1 : 1065

Legenda

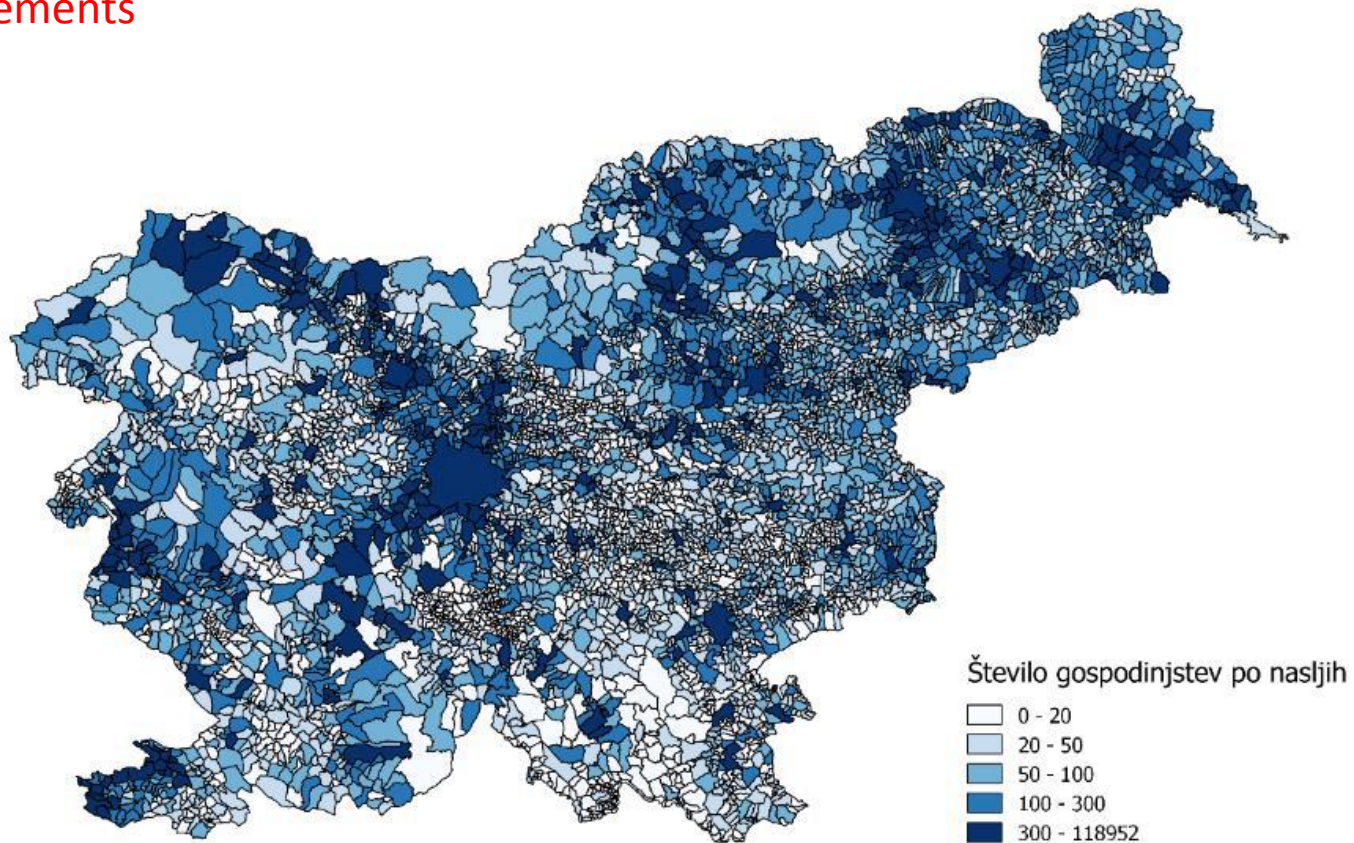
- AKOS establish its own database, with all the inputs, which are already available and with the additional data collected from owners of electronic communications infrastructure, in order to get **complete picture of the networks available in Slovenia. It is based on free and open source software (Quantum GIS, PostgreSQL, PostGIS).**
- Paradigm shift in collecting data in AKOS:**



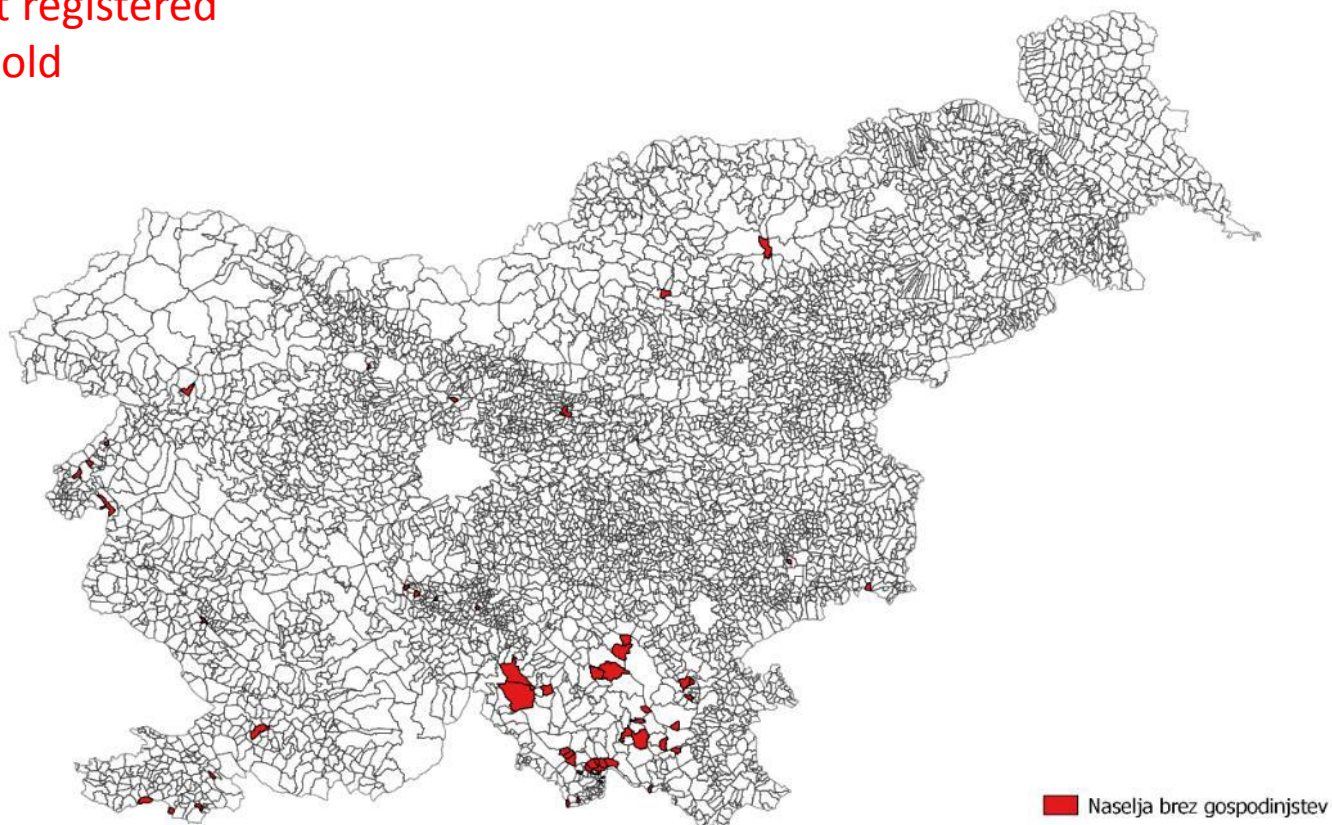
Density of population by settlements



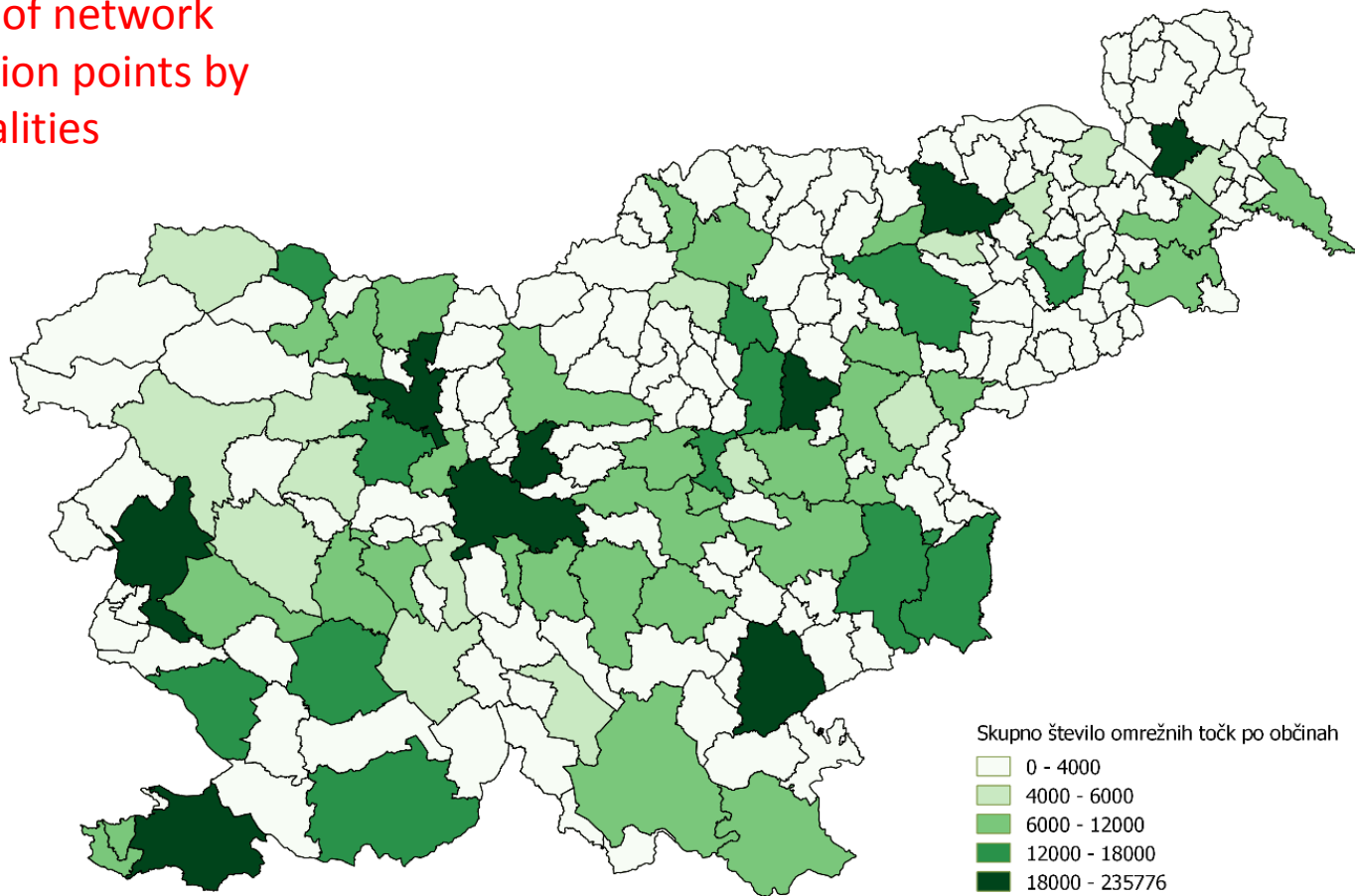
Number of households by settlements



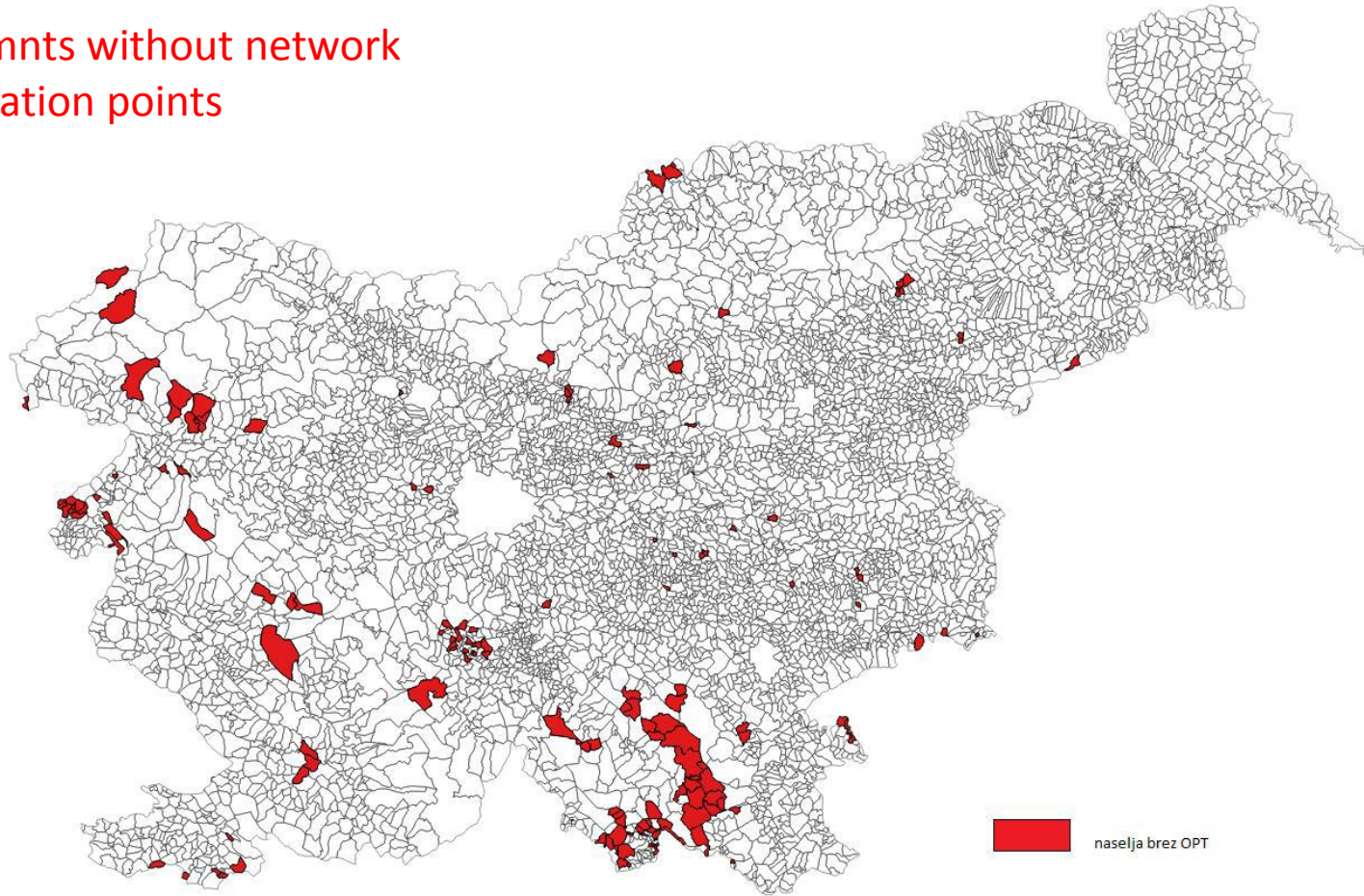
Number of settlements
without registered
household



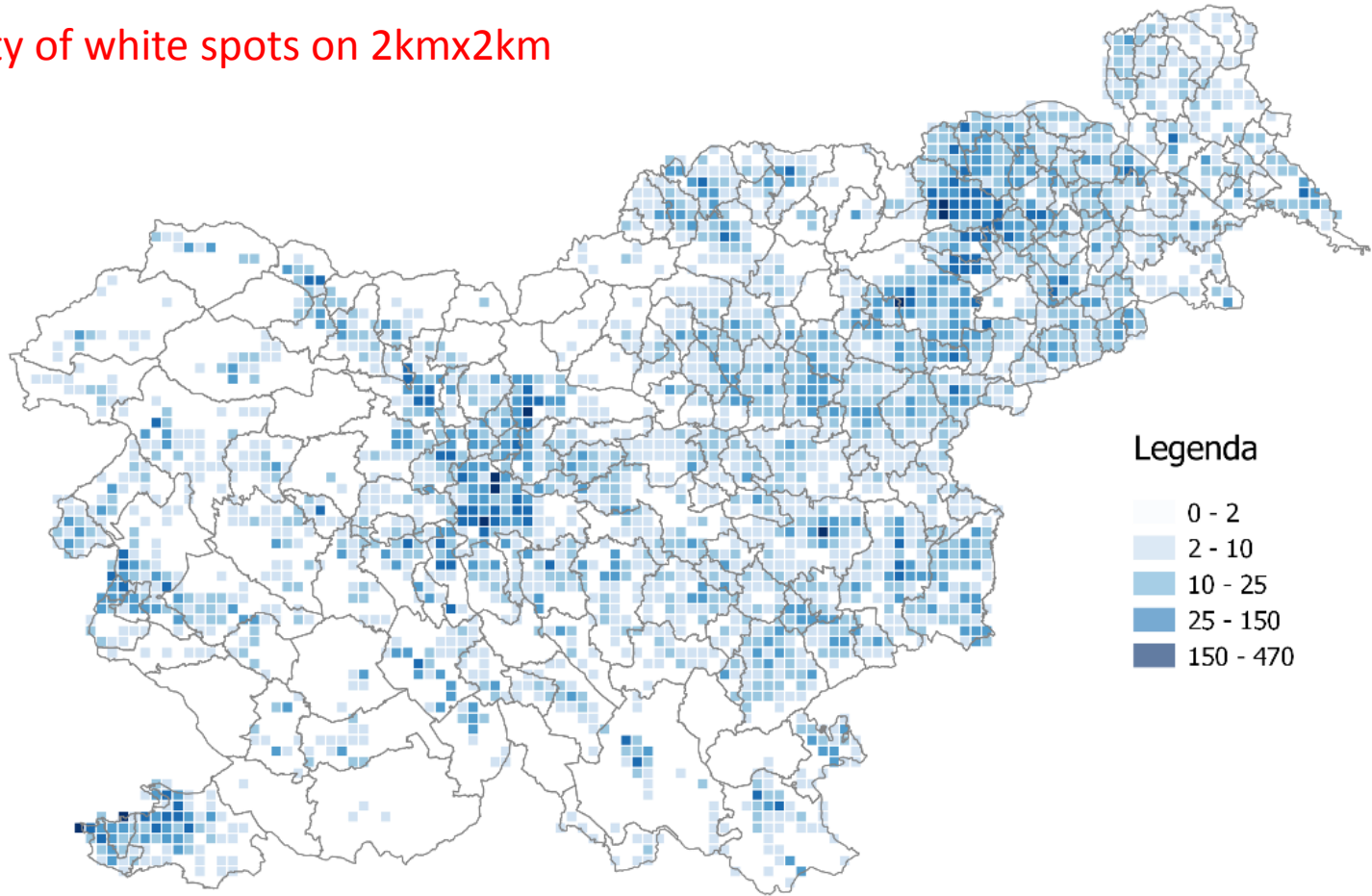
Number of network termination points by municipalities



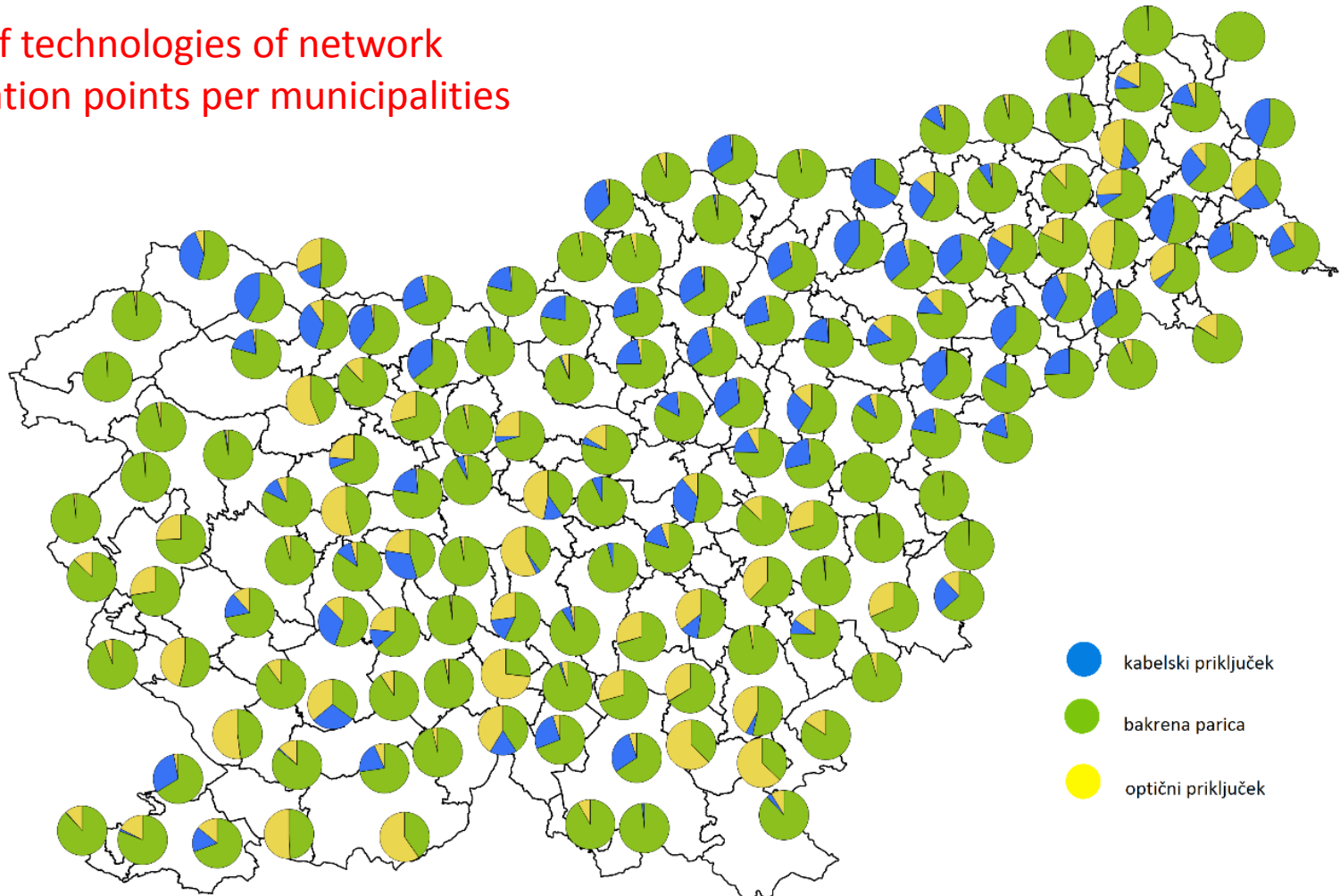
Settlements without network termination points



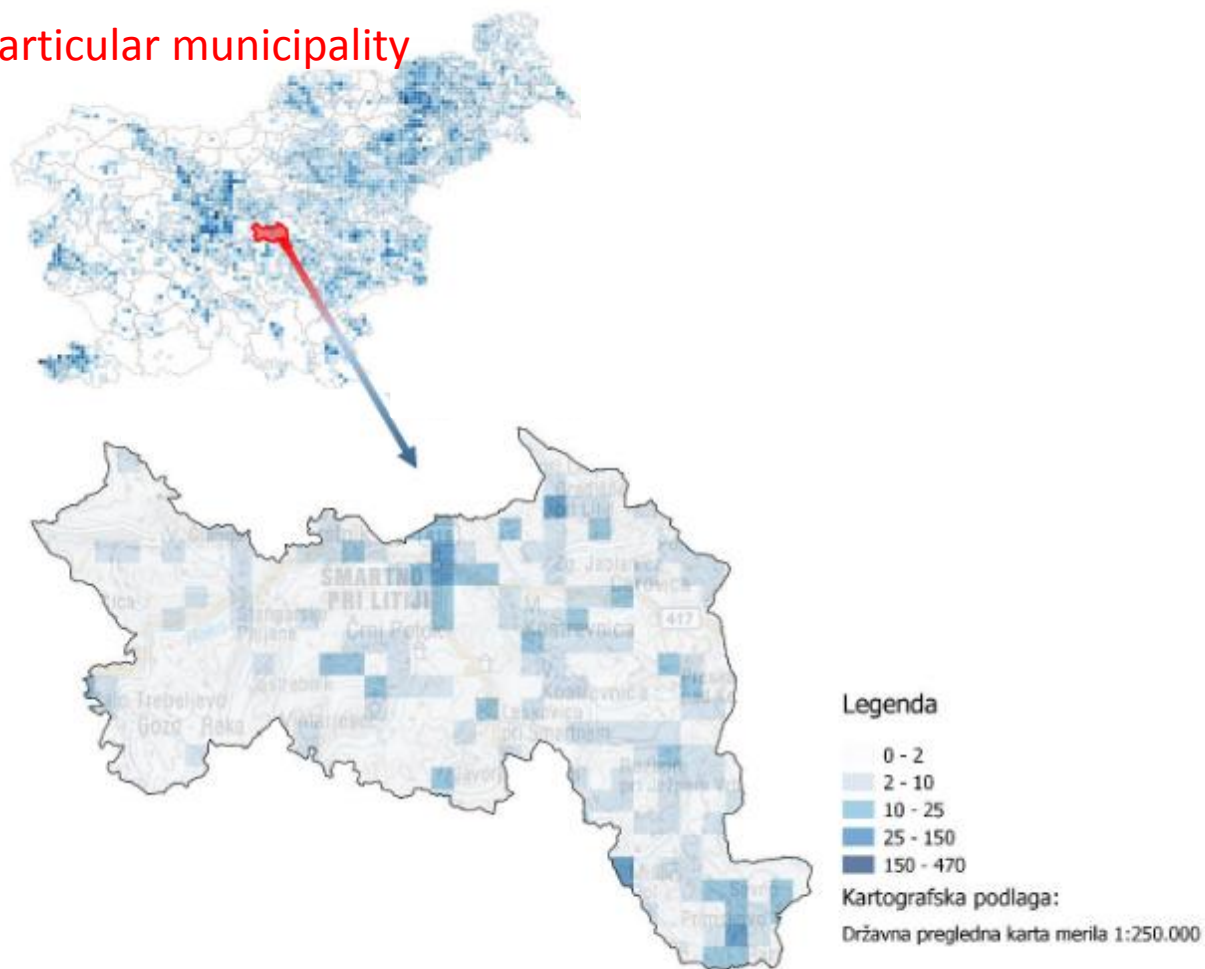
Density of white spots on 2kmx2km
grid



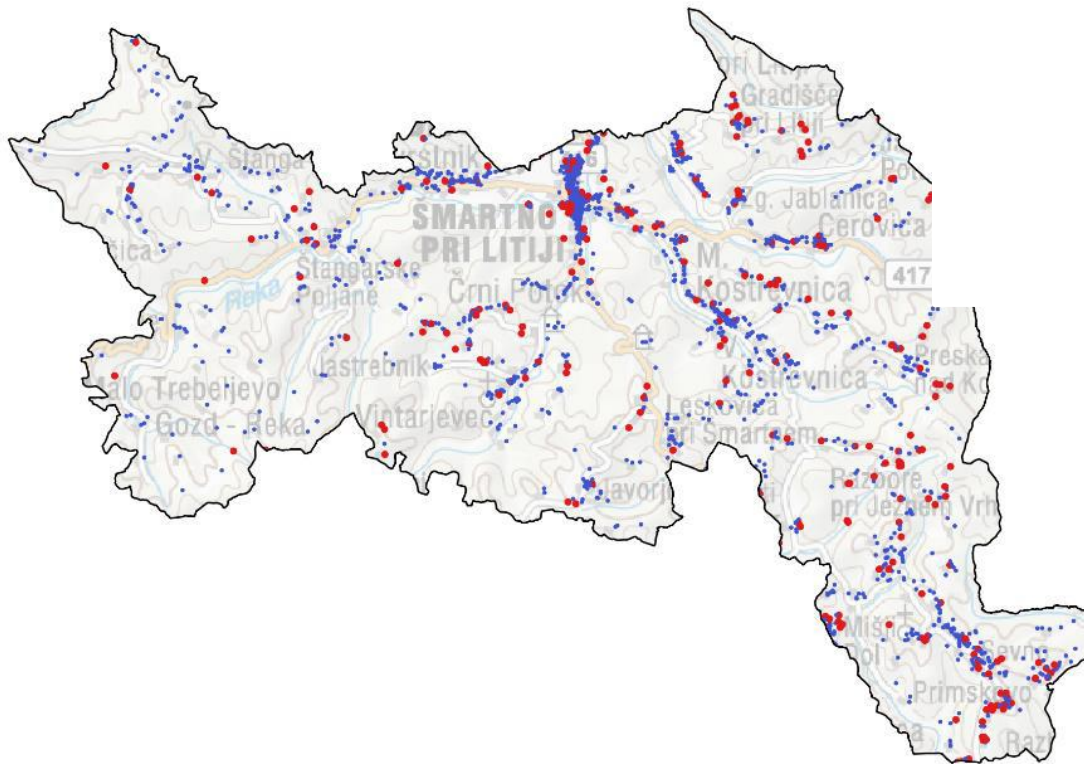
Types of technologies of network termination points per municipalities



White spots in particular municipality



Households in municipality with and without network termination point



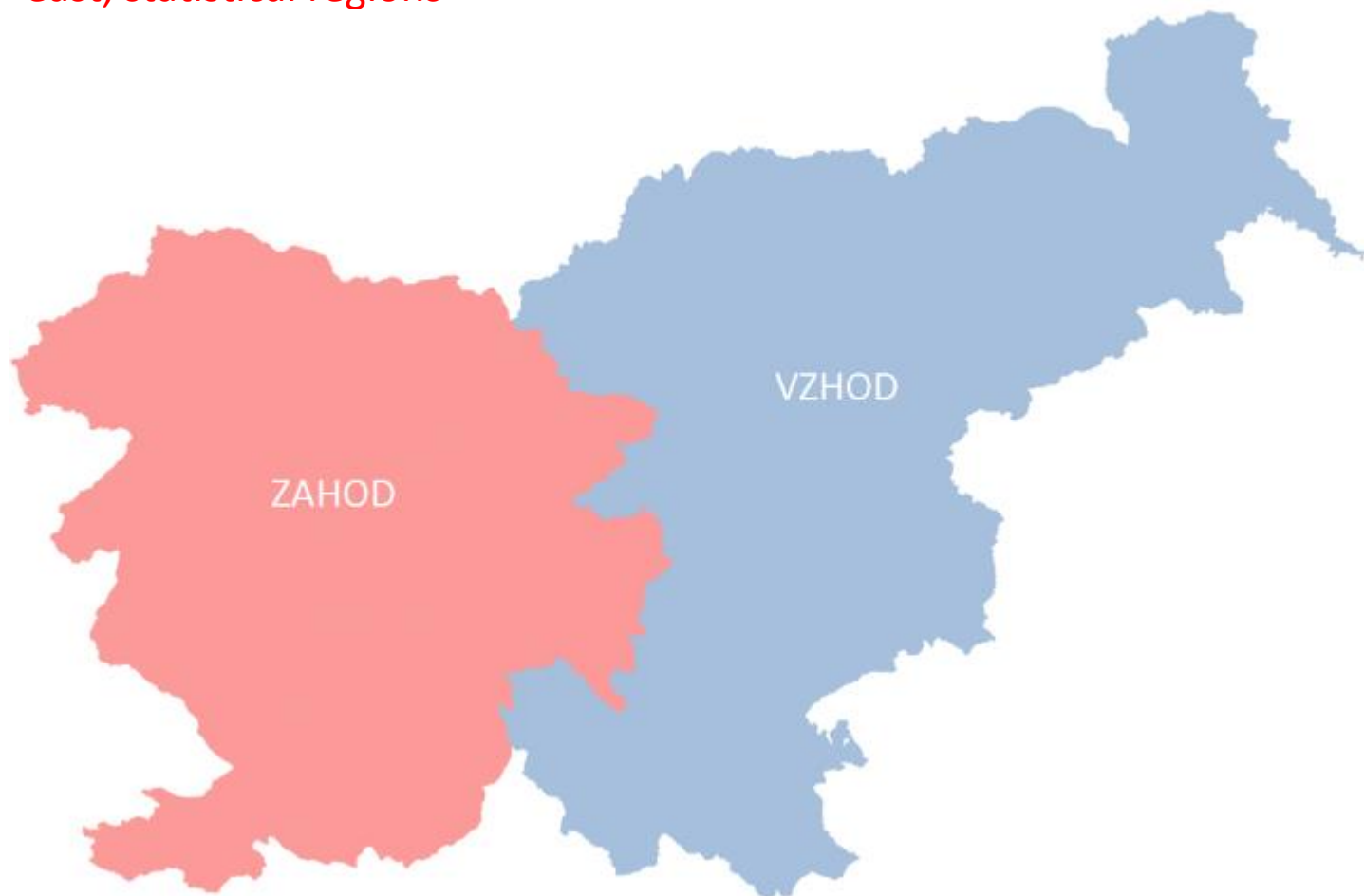
Legenda

- gospodinjstva z OPT
- gospodinjstva brez OPT

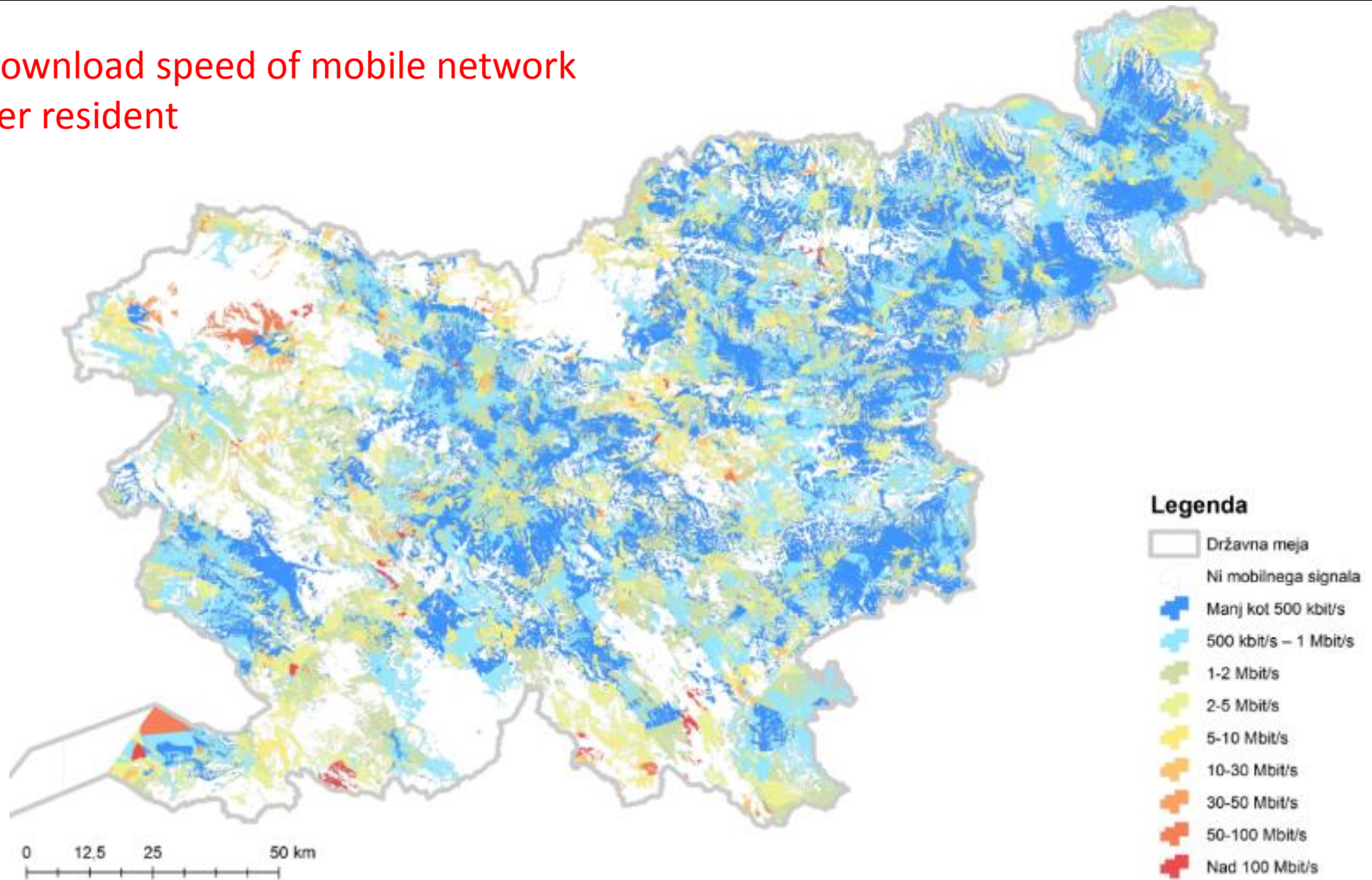
Kartografska podlaga

Državna pregledna karta merila 1:250.000

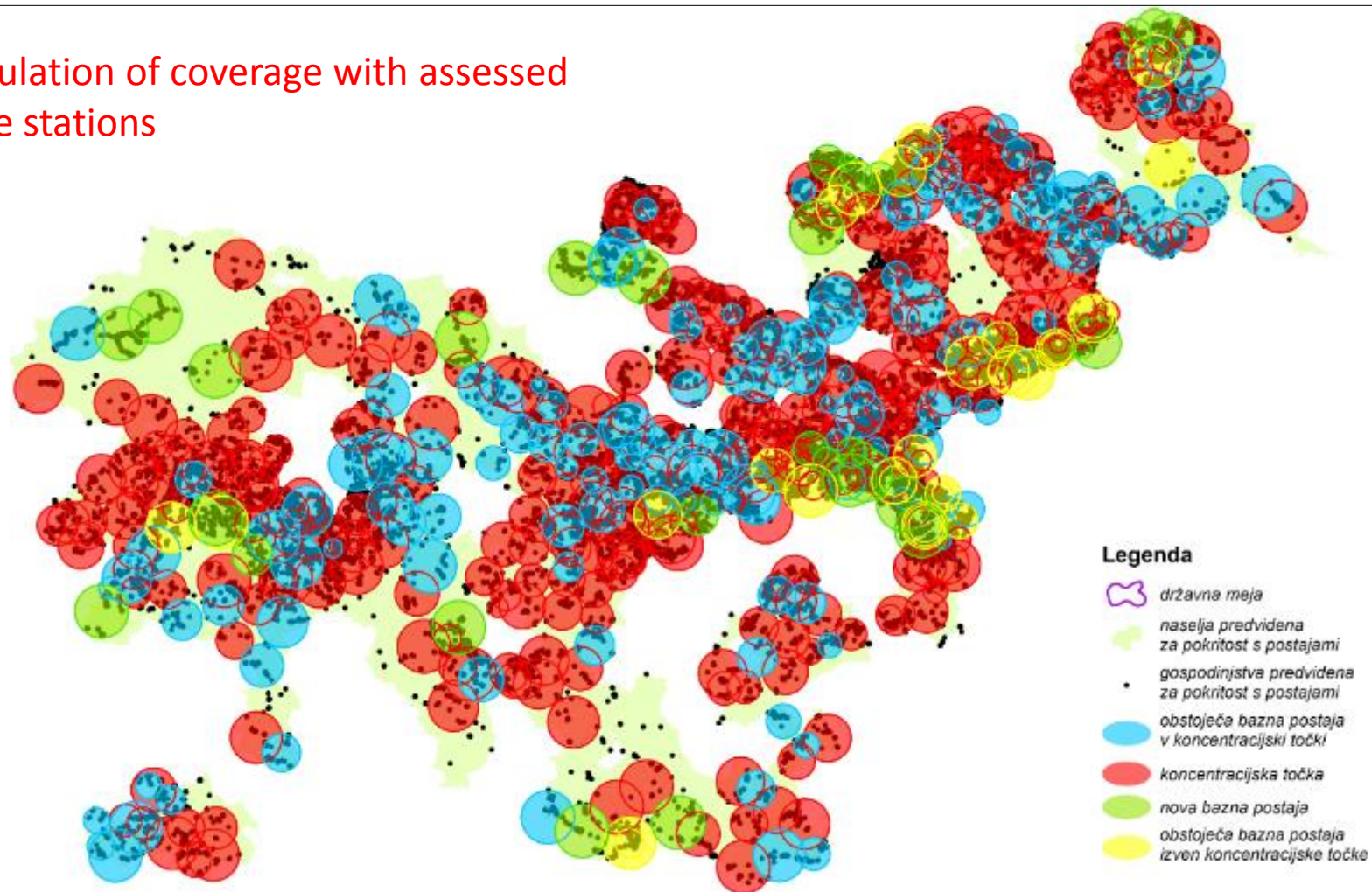
West – east, statistical regions



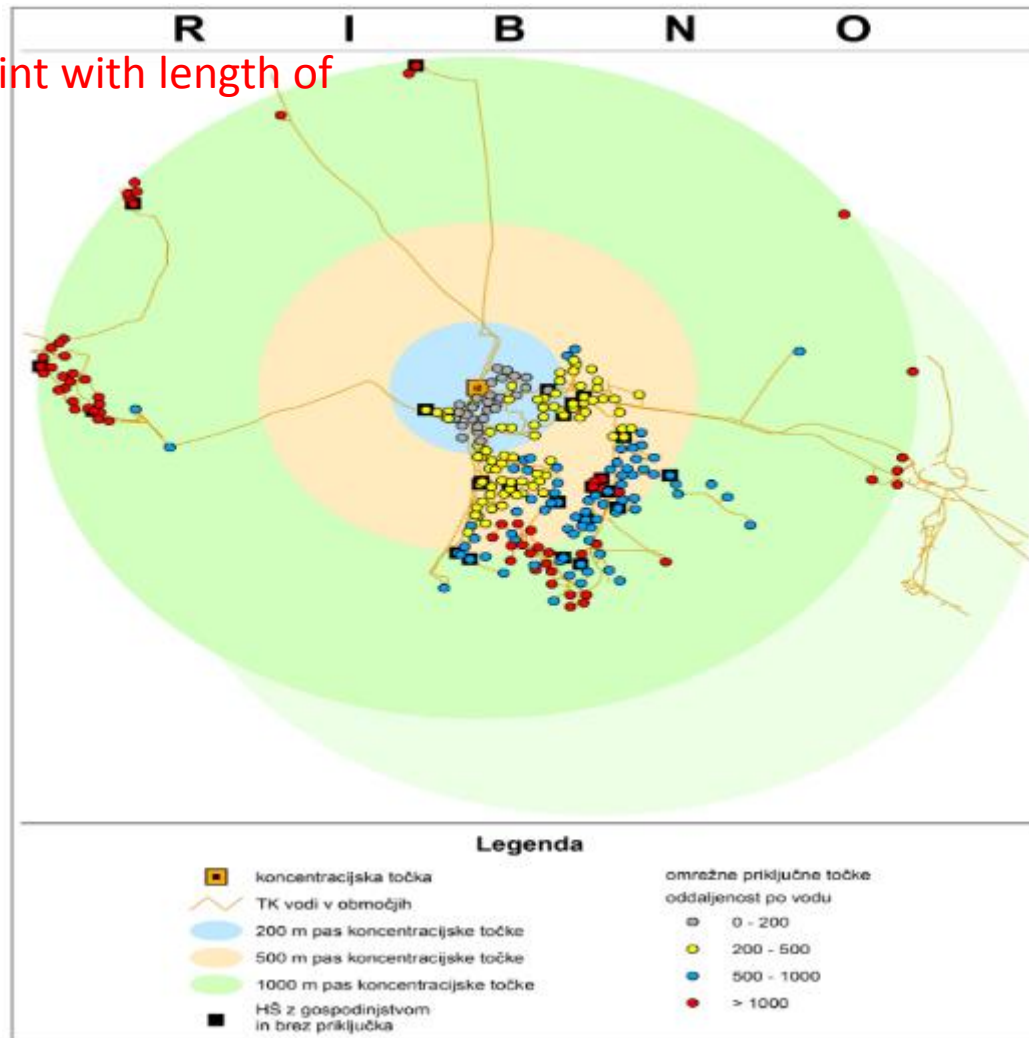
Download speed of mobile network per resident



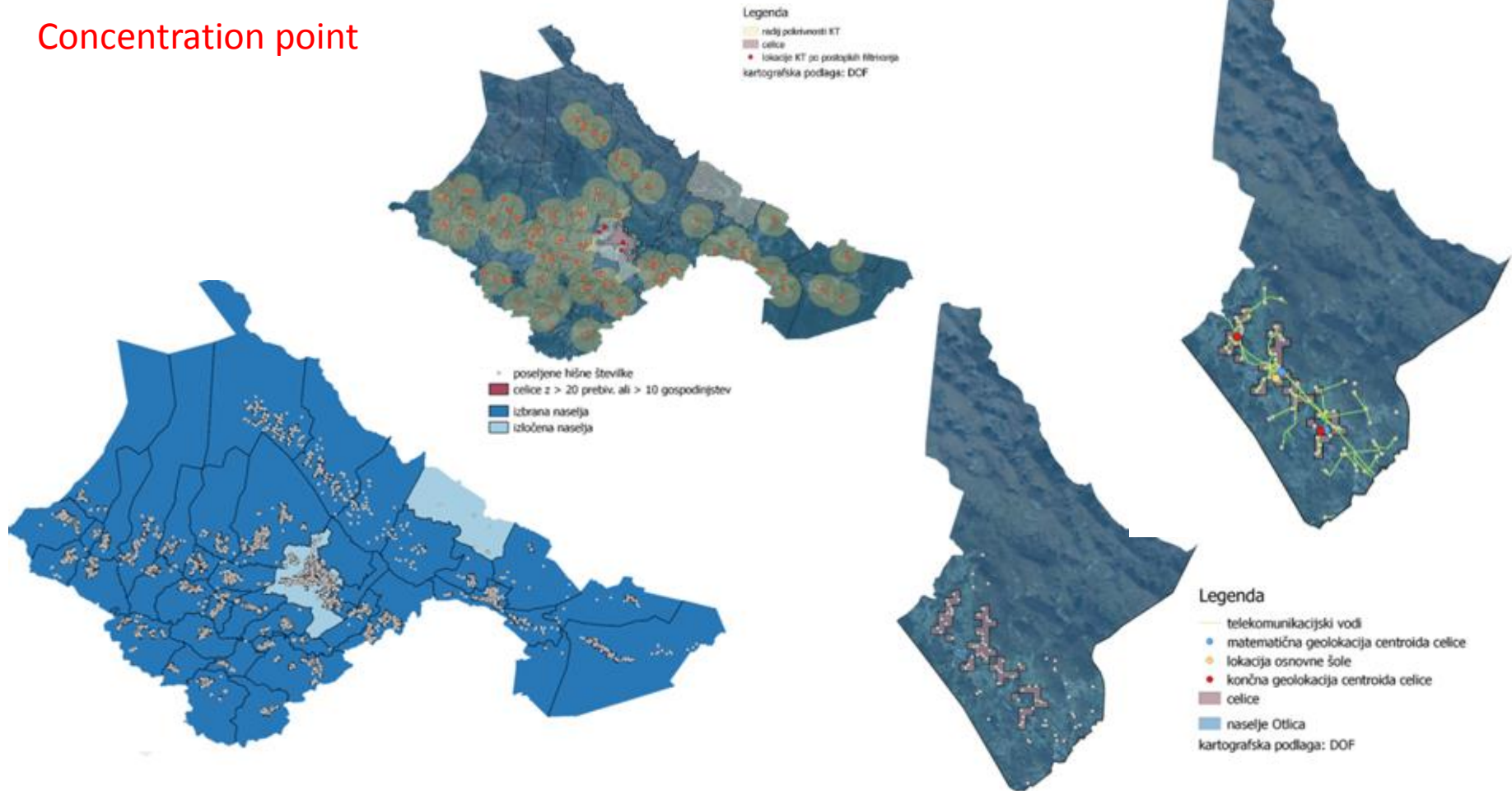
Simulation of coverage with assessed base stations



Concentration point with length of lines

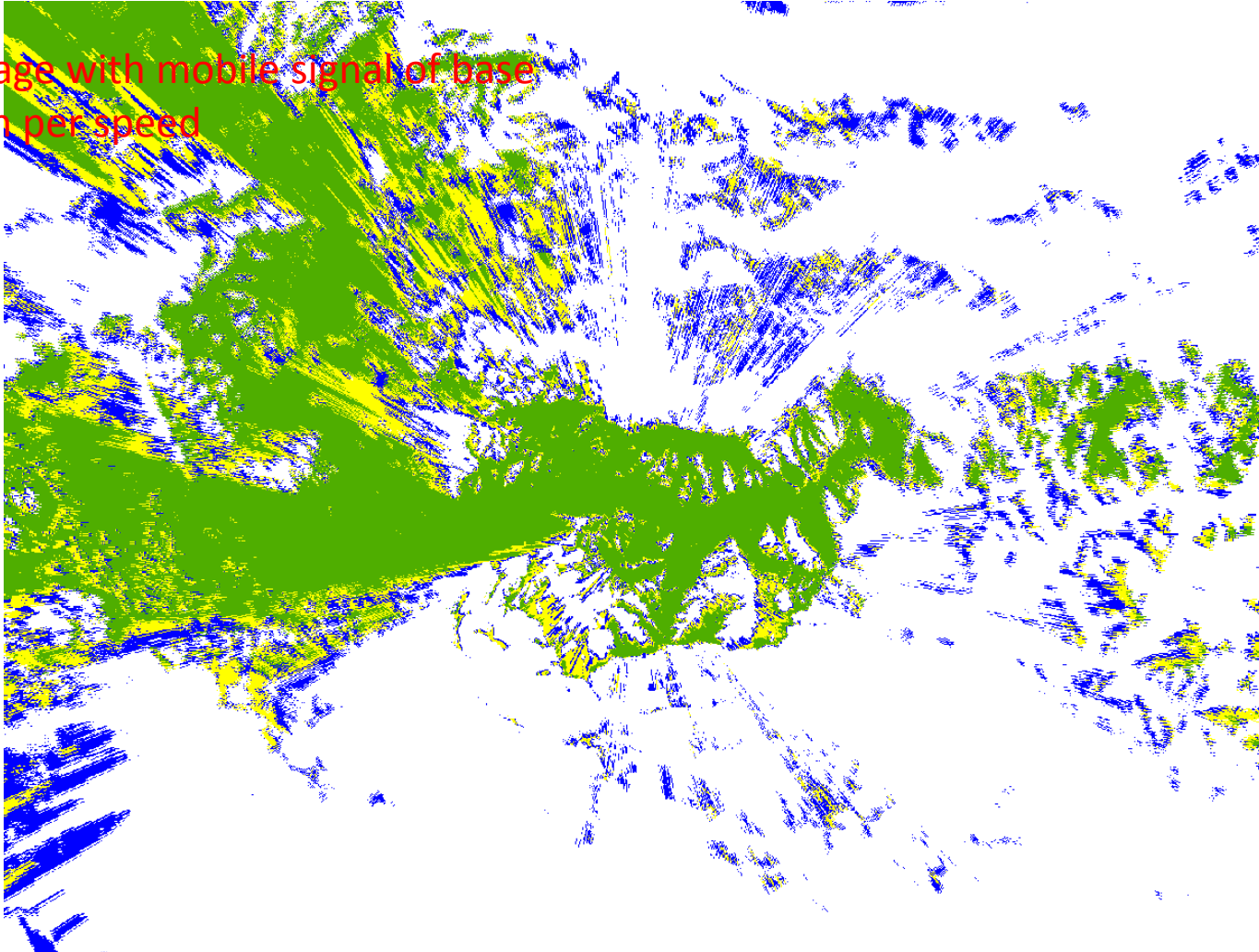


Concentration point

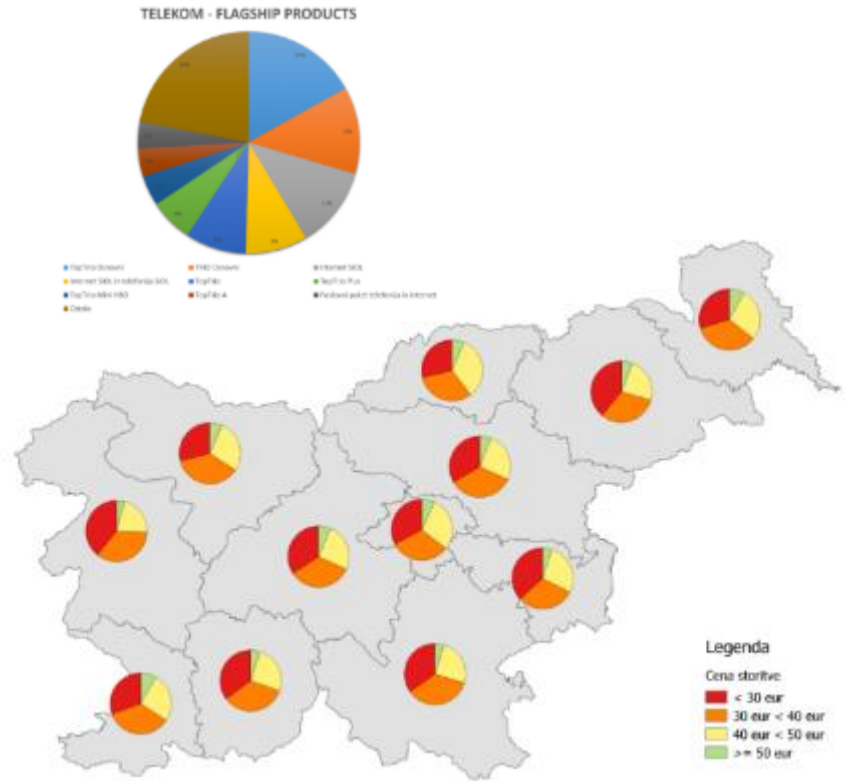
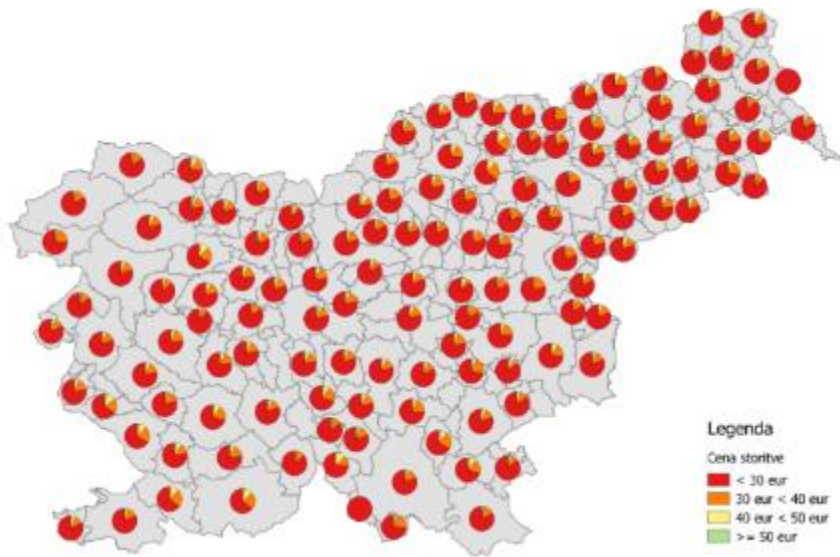




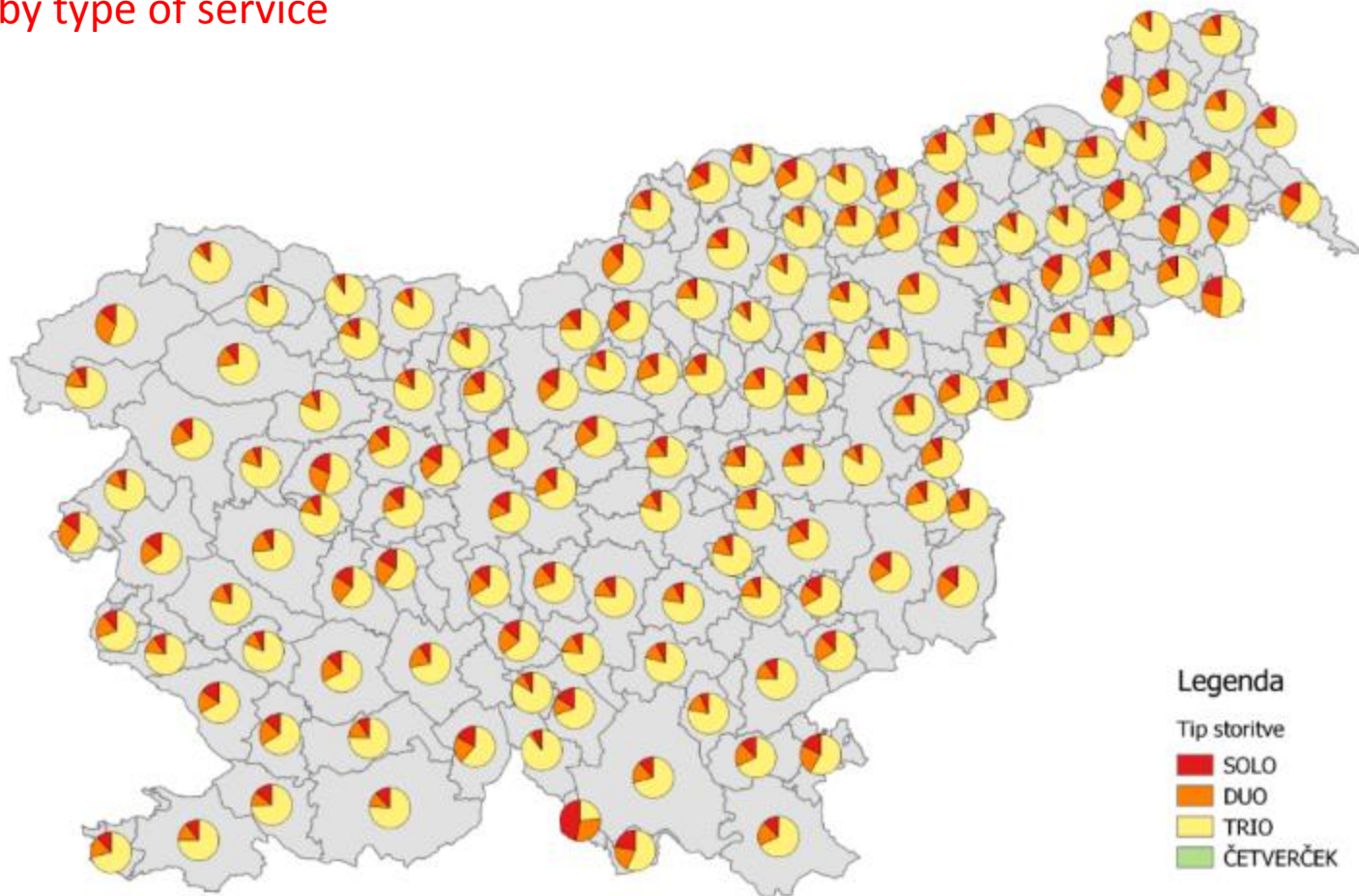
Coverage with mobile signal of base station per speed



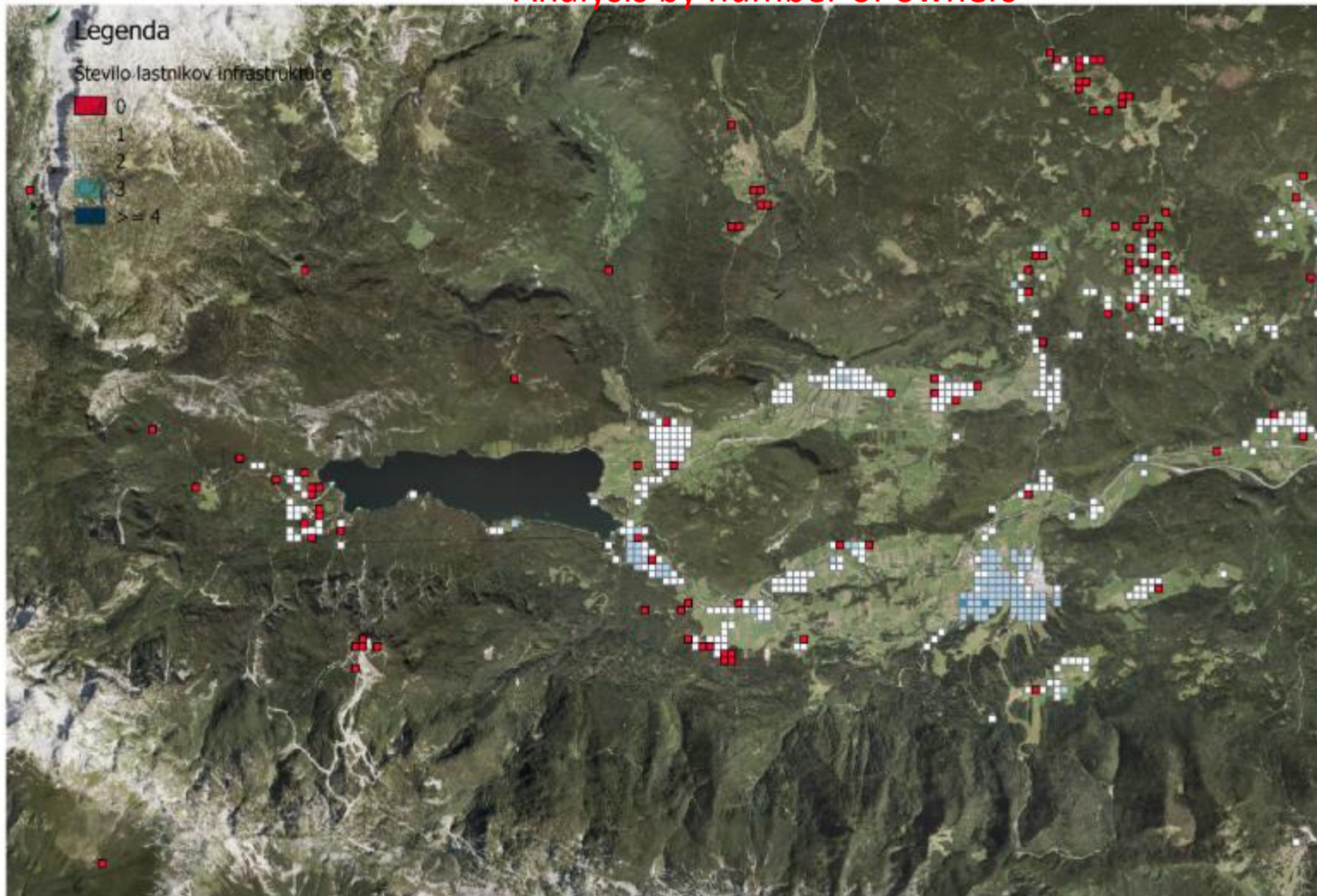
Retail prices analysis – flagship products



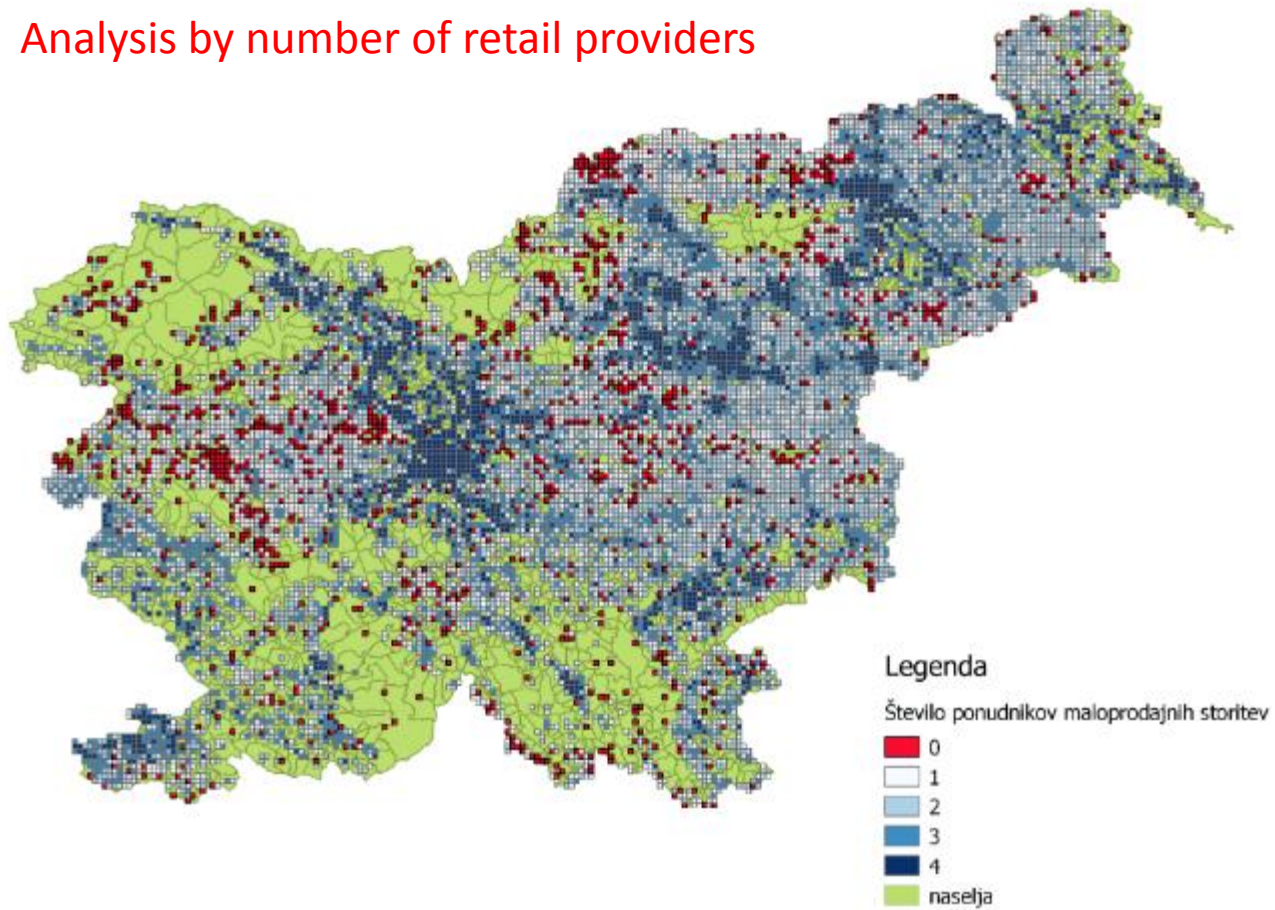
Analysis by type of service



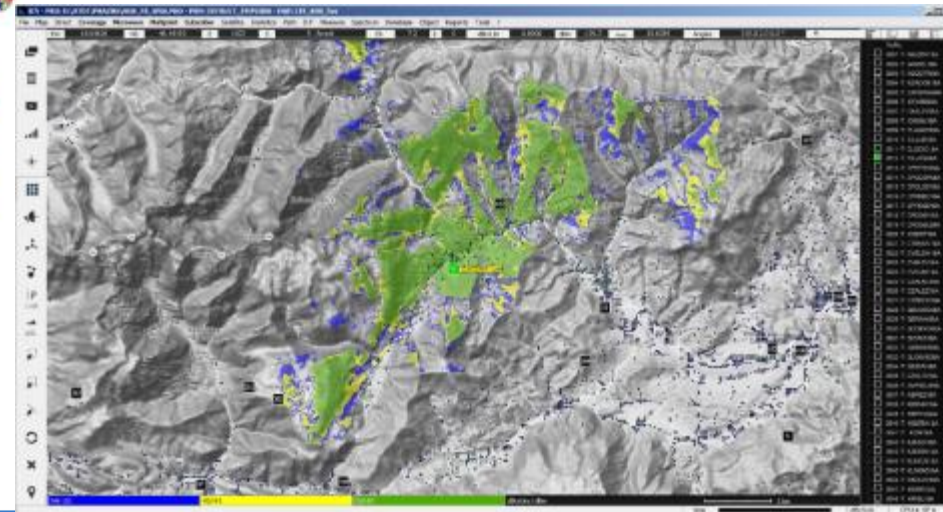
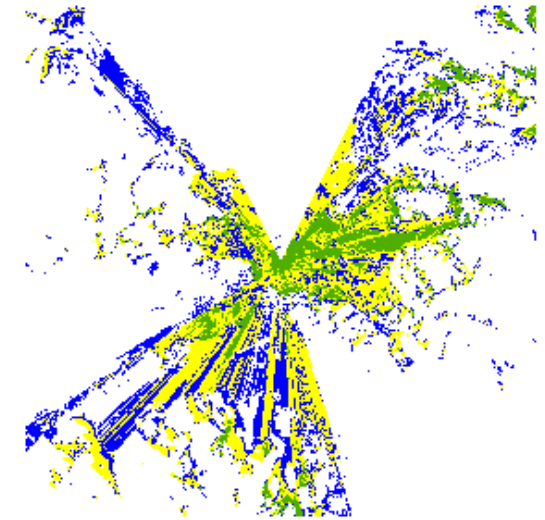
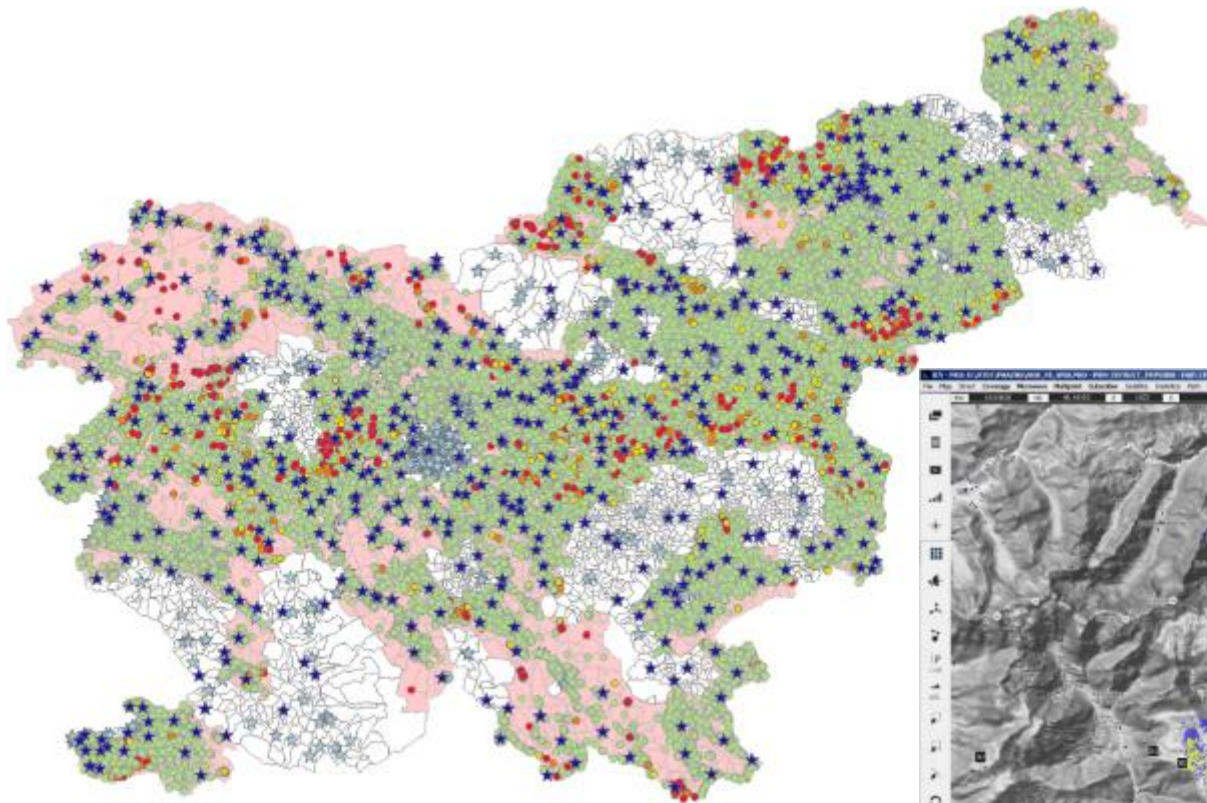
Analysis by number of owners



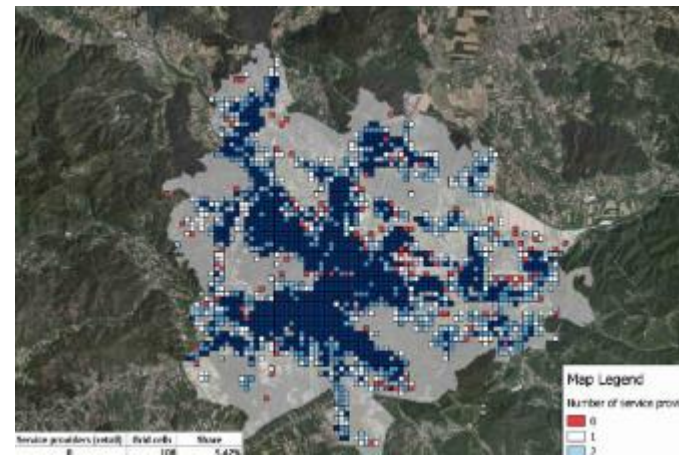
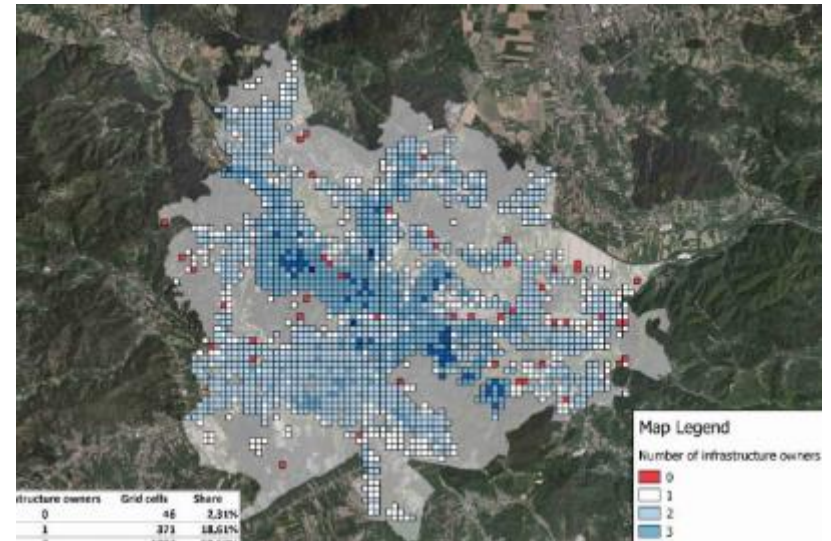
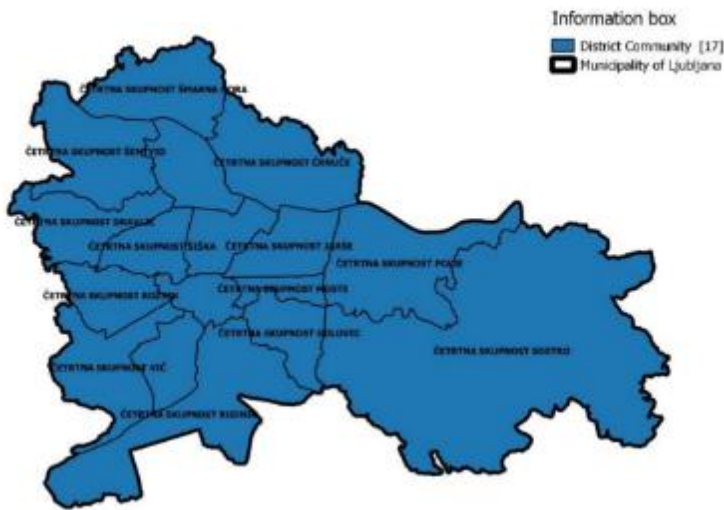
Analysis by number of retail providers



Simulation of optimal base station location



Study case - Ljubljana



Thank you.

tanja.muha@akos-rs.si

