Consolidated Cadastre of Public Utility Infrastructure in Slovenia

Tomaž Petek

Zagreb, 26.11.2015
Home of 2,010,000 inhabitants
Area of 20,273 km²
GDP of 14,808 Euro
House numbers 520,628
Settlements 6,023
Cadastral communities 2,705
Land parcels 5,266,803
Land Owners 950,000 Buildings 1,2 mio
SURVEYING AND MAPPING AUTHORITY

Staff structure by their field of expertise in 2008

- Surveyors 287
- Agronomists 12
- IT specialists 17
- Lawyers, financial and administrative staff 218
- Total 482 staff
MAIN TASKS AND ACTIVITIES

• creation, administration and updating of real estate and topographic databases
• registration of changes in physical space and on real estate properties,
• role of a coordinator in the field of the real estate system and the spatial data infrastructure,
• mass real estate valuation,
• creating conditions for implementing land surveys
In Slovenia the cadastre of public infrastructure already exists. The law had established the cadastre already in 1968 and latter on in 1974, when a new law was passed. In cadastre data on public infrastructure networks and facilities were collected. Data on public infrastructure networks and facilities were managed for the territory of municipalities by a local surveying authority. Data in the cadastre were not properly maintained and they were incomplete. They have been mainly used for the needs of local communities.
HISTORY OF CPI ...

2003 - Spatial Planning Act

2004 - detailed instructions for the contents of the cadastre of public infrastructure (PI)

2005 – Establishment of system of Cadastre of Public Infrastructure

2006 – Informatization of system of Cadastre of Public Infrastructure

2013/14 – approximate 90% data complete

2013 - Telecommunication Act (Zekom-1)...

2015 ... – maintaining/preparing legislation
DEVELOPMENT IN TIMELINE

Concept of CPI, legislation

SW development

Data collecting, projects with PI owners

SW upgrading

Call before you dig

Mapping of network connection point

INSPIRE services

Data maintenance and improving of data

INFRASTRUCTURE NETWORKS AND FACILITIES

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

ANNEX I., INSPIRE

ANNEX III., INSPIRE
BASIC PURPOSE

• Distribution of basic data on infrastructure networks
• Protection of space where infrastructure lies
• Connection to more precise data on infrastructure networks (infrastructure owners data)
• Support for spatial planning
• Damage prevention

• Lack of information of existing PI
• Time-consuming procedures of obtaining PI data (many different owners)
• Use of non-up-to-date and non-standardized PI data in various applications and processes
COLLECTING AND MAINTAINING
DATA IN PI CADASTRE

95% popolnost podatkov
## DATA SUMMARY

**Number of objects in Cadastre > 7.000.000**

<table>
<thead>
<tr>
<th>Infrastructure</th>
<th>Lenght (km) 2010</th>
<th>Lenght (km) 2011</th>
<th>Lenght (km) 2012</th>
<th>Lenght (km) 2013</th>
<th>Lenght (km) 2014</th>
<th>Lenght (km) 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>roads</td>
<td>49.207</td>
<td>49.701</td>
<td>49.797</td>
<td>49.936</td>
<td>49.936</td>
<td>50.647</td>
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<tr>
<td>railways</td>
<td>2.495</td>
<td>2.495</td>
<td>2.495</td>
<td>2.495</td>
<td>2.495</td>
<td>2.495</td>
</tr>
<tr>
<td>electricity</td>
<td>25.701</td>
<td>35.749</td>
<td>39.081</td>
<td>39.696</td>
<td>40.246</td>
<td>47.173</td>
</tr>
<tr>
<td>gas</td>
<td>3.312</td>
<td>4.474</td>
<td>4.536</td>
<td>4.869</td>
<td>4.905</td>
<td>5.251</td>
</tr>
<tr>
<td>heating</td>
<td>532</td>
<td>914</td>
<td>969</td>
<td>977</td>
<td>979</td>
<td>1045</td>
</tr>
<tr>
<td>water</td>
<td>17.676</td>
<td>20.700</td>
<td>22.466</td>
<td>23.446</td>
<td>23.562</td>
<td>24.615</td>
</tr>
<tr>
<td>telekomuni.</td>
<td>37.041</td>
<td>57.250</td>
<td>59.518</td>
<td>60.373</td>
<td>60.689</td>
<td>64.681</td>
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<tr>
<td><strong>Σ=</strong></td>
<td><strong>142.059</strong></td>
<td><strong>179.538</strong></td>
<td><strong>187.831</strong></td>
<td><strong>190.826</strong></td>
<td><strong>191.737</strong></td>
<td><strong>205.870</strong></td>
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</tbody>
</table>
POWER LINES
TELECOMUNICATION NETWORK
WATER SUPPLY
DATA Exchange formats between owners and cadastre are:
- ESRI – SHP
- GML → KML (Google Earth)
- ASCII (each layer for points, lines, polygons)

Data are defined in document: CODE TABLE OF LAYERS AND DESCRIPTION OF FACILITY

<table>
<thead>
<tr>
<th>ATTRIBUTE VALUE: ATR1</th>
<th>MEANING</th>
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<tbody>
<tr>
<td>1</td>
<td>mixed line</td>
</tr>
<tr>
<td>2</td>
<td>faecal line</td>
</tr>
<tr>
<td>3</td>
<td>rainwater line</td>
</tr>
<tr>
<td>4</td>
<td>other line</td>
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<table>
<thead>
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<th>ATTRIBUTE VALUE: ATR2</th>
<th>MEANING</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>gravity</td>
</tr>
<tr>
<td>2</td>
<td>pressure</td>
</tr>
<tr>
<td>3</td>
<td>vacuum</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ATTRIBUTE VALUE: ATR3</th>
<th>ABBREVIATION</th>
<th>MEANING</th>
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<tbody>
<tr>
<td>1</td>
<td>AC</td>
<td>Asbest cement, fiber cement</td>
</tr>
<tr>
<td>2</td>
<td>BET</td>
<td>Concrete (all types, including centrifuged)</td>
</tr>
<tr>
<td>3</td>
<td>JE</td>
<td>Steel and stainless steel</td>
</tr>
<tr>
<td>4</td>
<td>KA</td>
<td>Stone</td>
</tr>
<tr>
<td>5</td>
<td>KER</td>
<td>Ceramics</td>
</tr>
<tr>
<td>6</td>
<td>LZ</td>
<td>Cast iron</td>
</tr>
<tr>
<td>7</td>
<td>NL</td>
<td>Spheroidal-graphite cast</td>
</tr>
<tr>
<td>8</td>
<td>OP</td>
<td>Brick (built canals)</td>
</tr>
<tr>
<td>9</td>
<td>PC</td>
<td>Zinc-coated iron</td>
</tr>
<tr>
<td>10</td>
<td>PE</td>
<td>Polyethylene</td>
</tr>
<tr>
<td>11</td>
<td>PVC</td>
<td>Polyvinyl chloride</td>
</tr>
<tr>
<td>12</td>
<td>RE</td>
<td>In situform canal lining</td>
</tr>
<tr>
<td>13</td>
<td>SV</td>
<td>Lead</td>
</tr>
<tr>
<td>14</td>
<td>TE (GRP)</td>
<td>Reinforced centrifuged polyester pipes</td>
</tr>
<tr>
<td>15</td>
<td>PP</td>
<td>Polypropylene</td>
</tr>
<tr>
<td>98</td>
<td>NEZ</td>
<td>Unknown</td>
</tr>
<tr>
<td>99</td>
<td>DRUG</td>
<td>Other</td>
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</table>

units, projects for implementation

<table>
<thead>
<tr>
<th>ID_EL</th>
<th>DAT_EL</th>
<th>DIM_YX</th>
<th>DIM_Z</th>
<th>OPU</th>
<th>ATR1-ATR5</th>
<th>OPIS</th>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5,000 or less
Picture 1: Polygon objects
Picture 2: Street light
REGISTRATION OF INFRASTRUCTURE

Picture 1: Transmission tower and wires
Picture 2: Asymmetrical power pol
Picture 3: Antenna tower and antennas
REGISTRATION OF INFRASTRUCTURE

Picture 1: Street light on the street lighting pole
Picture 2: Light on the power pole
Picture 3: Lamp suspended on wire
DATA IN PI CADASTRE

5.1. TRAFFIC INFRASTRUCTURE

5.1.1. Roads
5.1.2. Railways
5.1.3. Airports and harbors
5.1.4. Cableways
DATA IN PI CADASTRE

5.4. OTHER NETWORK IN PUBLIC USE
   5.4.1. Electronic communications
5.5. OTHER INFRASTRUCTURE
   5.5.1. Oil and gasoline infrastructure
   5.5.2. Water infrastructure
DATA IN PI CADAStRE

5.3. PUBLIC UTILITY INFRASTRUCTURE
  5.3.1. Water distribution system
  5.3.2. Sewer system
  5.3.3. Wast management infrastructure
PUBLIC ACCESS FOR VIEWING DATA

PROSTOR

Primeri iskanja

Primer iskanja
Primer 1: ISKANJE PODATKOV PREKO NASLOVA
V splošno iskanje vpišite kraj, ulico in hišno številko. Npr. Ljubljana Zemljiemerska 12
Primer 2: ISKANJE PODATKOV O PARCELI
V splošno iskanje vpišite šifro ali naziv katastarske občine in številko parcele. Npr. 1727 421
Primer 3: ISKANJE PODATKOV O STAVBI
V splošno iskanje vpišite šifro ali naziv katastarske občine in številko stavbe. Npr. 1727 808
Primer 4: ISKANJE PODATKOV PO NASLOVU IN ŠTEVILKI STANOVANJA ALI POSLOVNEGA PROSTORA
V splošno iskanje vpišite kraj, ulico, hišno številko in številko stanovanja ali poslovnega prostora. Npr. Ljubljana Zemljiemerska 12 2

http://prostor3.gov.si/
Izberite tematiko GJI za prikaz na izbranih parcelah oz. stavbah

Ime tematike GJI: Vodovod

<table>
<thead>
<tr>
<th>Identifikator GJI</th>
<th>Ime tematike GJI</th>
<th>Ime sloja iz ZK GJI</th>
<th>Šifra vrste GJI</th>
<th>Ime vrste GJI</th>
<th>Meja GJI na parceli</th>
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</thead>
<tbody>
<tr>
<td>7745318</td>
<td>Vodovod</td>
<td>Vodovod - linijski objekti</td>
<td>3101</td>
<td>Vodooskrbnica cev</td>
<td>11.16m</td>
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<td>7745317</td>
<td>Vodovod</td>
<td>Vodovod - linijski objekti</td>
<td>3101</td>
<td>Vodooskrbnica cev</td>
<td>11.19m</td>
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</tbody>
</table>
REGISTRATION DATA ACCESS

http://prostor.gov.si/
DOWNLOADING DATA

Gospodarska javna infrastruktura

Paketni prevzem
Datum veljavnosti podatkov: 02.04.2010
Format podatkov: GML SHP
Prevzem podatkov

Prevzem zadnjih veljavnih podatkov
Datum veljavnosti podatkov: 20.05.2010
Vrsta infrastrukture: 1100 - CESTE
Format podatkov: GML
Prevzem podatkov

Parcele

Stavbe

Naslovi in prostorske enote
(1) Funding for the construction of broadband networks or for the provision of a public communications service to provide broadband network connectivity may be obtained from public funds in accordance with the rules governing the monitoring of state aid.

(4) The party that has expressed a commercial interest in constructing the broadband network must construct such a network, in the areas and within the scope expressed, within three (3) years of notifying the ministry responsible for electronic communications (hereinafter: the Ministry) and the Agency of its interest. The Agency shall keep records of commercial interest expressed in construction of the broadband network.
In 2012 the Surveying and Mapping Authority in cooperation with the Directorate of the information society started with mapping of network connection points.

Mapping within Cadastre of public infrastructure.

Controlling the data, given by owners of the electronic communications network.

Connection to other databases of Surveying and Mapping Authority of the Republic of Slovenia (SMA)

(buildings, parts of buildings, house numbers).

Supplying the data in distribution database.
DATABASE CONCEPT

Production
SMA

Distribution
database

Spatial infrastructure

Public access

Web GIS

Distribution of data (WFS)
COAXIAL NCP
NCP WITH MORE THAN 100Mbps
Speed of broadband internet for each building
OVERVIEW
DATA QUALITY

Data completeness

<table>
<thead>
<tr>
<th>ATTRIBUTE VALUE: NAT_XY</th>
<th>MEANING</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.1m and less</td>
</tr>
<tr>
<td>2</td>
<td>from 0.1m to 1m</td>
</tr>
<tr>
<td>3</td>
<td>from 1m to 5m</td>
</tr>
<tr>
<td>4</td>
<td>from 5m to 10m</td>
</tr>
<tr>
<td>5</td>
<td>from 10m to 20m</td>
</tr>
<tr>
<td>6</td>
<td>more than 20m</td>
</tr>
</tbody>
</table>

Positioning accuracy:
Positioning accuracy

Sewage
- 2 (63%)
- 1 (13%)
- 0 (4%)

Water supply
- 6 (25%)
- 5 (19%)
- 4 (10%)
- 3 (6%)
- 2 (5%)
- 1 (4%)

Heating supply
- 6 (54%)
- 5 (22%)
- 4 (13%)
- 3 (3%)
- 1 (2%)

Telecommunication
- 3 (96%)
- 2 (13%)
- 1 (5%)

Gas supply
- 6 (86%)
- 4 (0%)
- 3 (3%)
- 2 (0%)
- 1 (11%)

Power lines
- 4 (25%)
- 3 (22%)
- 2 (14%)
- 1 (5%)
- 0 (0%)
THANK YOU!
HVALA!