Examples of the application of regional reference systems in the Czech Republic
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Abstract

The presentation will describe regional reference system in the Czech Statistical Office (CZSO) where the Register of Enumeration Districts and Buildings is maintained by the Czech Statistical Office. CZSO records information on Enumeration Districts, territorial identification elements and buildings situated in the Czech Republic. The Register of Enumeration Districts and Buildings is a hierarchical system of registered objects which tracks their interrelations and changes in contents, time and space. The Register of Enumeration Districts and Buildings records a system of territorial elements and territorial registration units which tracks territorial, administrative, settlement and statistical structures, buildings or parts thereof (entrances) with assigned land-registry numbers or street numbers. A part of the Register is spatial data on direct location of registered phenomena which are defined in accordance with relevant topographic bases.

We provide information from the Register of Enumeration Districts and Buildings (according to our Statistical Act.), the most often request is a list of buildings in some area etc. But we can provide also very detailed data for municipalities or institutions:

1) There are some EU projects for cities which can obtain money for improving "problematic areas" - they asked us to prepare some data on age structure, education etc. to support their requests for EU money. Problem was in defining such areas - they had list of streets and wanted us to provide data - but their list was very different from our regional system - so we came through their list and tried to link their requests and our possibilities as much as possible. Finally we were quite successful (on level of enumeration areas) and gave them data requested.

2) Second similar case was connected with Ruzyne airport expansion - new runway is planed and for some administrative decision it was asked to provide data of number of people affected with noise. Prague Airport gave us "maps" of different level of noise around new runway and we counted number of people affected in each zone - we used data from Census and connected building X and Y coordinates with "noise maps". On that base we were able to calculate number of people potentially affected by noise.

Key words: region, spatial, register
Register of Enumeration Districts and Buildings

Register of Enumeration Districts and Buildings is maintained by the Czech Statistical Office. CZSO records information on Enumeration Districts, territorial identification elements and buildings situated in the Czech Republic. The Register of Enumeration Districts and Buildings is a hierarchical system of registered objects which tracks their interrelations and changes in contents, time and space. The Register of Enumeration Districts and Buildings records a system of territorial elements and territorial registration units which tracks territorial, administrative, settlement and statistical structures, buildings or parts thereof (entrances) with assigned land-registry numbers or street numbers.

A part of the Register is spatial data on direct location of registered phenomena which are defined in accordance with relevant topographic bases.

CZSO maintain Register according to Act No. 89/1995 Coll., on The State Statistical Service, (Article § 20a):

(1) The Register of Enumeration Districts and Buildings maintained by the Czech Statistical Office records information on Enumeration Districts, territorial identification elements and buildings situated in the Czech Republic based on data acquired under special legal regulations or under this Act.

(2) The Register of Enumeration Districts and Buildings is a hierarchical system of registered objects which tracks their interrelations and changes in contents, time and space.

(3) A part of the Register is spatial data on direct location of registered phenomena which are defined in accordance with relevant topographic bases.

The main principles:

- Hierarchy (top-down, down-top)
- Time (historical linkage)
- Space (geographic delimitation or location);

Logical segmentation:

- Description part (attribute data, full history, normalized relational data model)
- Geographic part (spatial data, only in versions);

Territorial units:

- NUTS
- Districts
- Municipalities
- Municipality Parts
- Cadastral Units
- Basic Settlement Units
- Census Districts
- Streets
“Large” Territorial Units (NUTS 0-4)

Medium Territorial Units

Small Small Territorial Units (Census Districts with buildings)

Buildings and Streets

Target Area on Orthophoto – COSMC
Current numbers:
- 8 areas (NUTS2), 14 regions (NUTS3), 91 districts (NUTS4)
- 6,250 municipalities
- 141 town parts
- 15,092 municipality parts
- 13,027 cadastral areas
- 22,639 basic settlement units
- 53,010 census districts
- 73,971 streets, 8,729 postal codes
- 2,543,952 buildings
- 2,477,048 addresses with coordinates
- 4,479,806 flats

Main characteristics of geographic data:
- Represent each of registered objects (except for flats);
- Cover all of the Czech Republic territory;
- High spatial accuracy (cadastral maps 1:1000/2880, topographic maps in scale 1:10,000);
- Maintained by GIS tools;
- Topological checked;
- Spatial reference system: S-JTSK (national grid);
- Data stored in Central Geodatabase (RDBMS);

List of geographical products:
- Territorial structure layers (boundaries of census districts, basic settlement units, cadastral units, municipalities and NUTS);
- Address structure layers (definition points of buildings, definition points of address places, annotation of streets);
- Special layers (map layouts, election districts, etc.);

Updating flows:
- Administrative sources
  - Cadastral Database (Mapping Agency) – new buildings, boundaries of cadastral units, basis maps (cadastral, topographic);
  - Ministry of Interior – changes of addresses;
- Statistical sources
  - STAV: Building Office (new and canceled buildings and flats, technical attributes);
  - Census (technical attributes etc.);
  - LOK: Mapping Agency (spatial location of the buildings – coordinates, situation plans);

Support of statistical surveys:
- Labour Force Surveys;
- Energo 2004, Microcensus 2002;
- EU – SILC, etc.;

Selected register tools:
- Random sampling of the surveyed units (buildings, flats, statistical zones, etc.);
- Lists of the selected units with the possibility of a map as a navigation aid for questioners;
- Territorial presentation of results (also in a map form);

Support of other statistical tasks
- Elections
- Statistical Publications
- Regional Statistics, Public Databases
Support of information services provided by the CZSO:

We provide information from the Register of Enumeration Districts and Buildings (according to our Statistical Act.), The most often request is a list of buildings in some area etc. But we can provide also very detailed data for municipalities or institutions:

1) “62 cities” project
There are some EU projects for cities which can obtain money for improving “problematic areas” – they have to prepare “Integrated programs for city development”. There was close cooperation with Ministry for Regional Development and municipalities.

Several phases:
- selection of indicators – age structure, education etc.
- definition of “problematic areas” (list of streets and houses) and their matching with statistical areas and units – the most difficult activity
- calculation of data from Census database and Regional databases, experts estimations
- basic condition for provision of EU money was that situation in the area has to be "worse" than in the whole city (Example for city Kladno)
### Kladno

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<th>Enumer</th>
<th>Population</th>
<th>Economically active</th>
<th>Share of ec. active pop.</th>
<th>Population 15+</th>
<th>Economic activity ratio</th>
<th>No education</th>
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<th>Total</th>
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| City   | 71132 | 38098 | 53.6 | 60054 | 63.4 | 283 | 14041 | 14324 | 23.9 |

• Such tables were sent by municipalities to Ministry of regional development as annexes of applications for EU grants

2) “Noise maps”

Second similar case was connected with municipalities close to Ruzyné airport. Local units Hostivice, Jeneč, Horoměřice, Na Dědině, Na Padesátíniku, Nebušice, Přední Kopanina, Tuchoměřice, Suchdol wanted to know how many inhabitants is influenced by noise from the airport and roads to it.

We obtained “isophones” of the area:
Selected polygon of noise level

Isophones were matched with information from Register of Enumeration Districts and Buildings (buildings with house ID):

Data from Census were matched to house ID

Client obtained simple table with results.