

# Design of a multi-thematic small-scale community data panel

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## Abstract

The community data panel is a multi-thematic and multi-temporal database of socio-spatial and structural geo data. Various data sources are used to collect data with a high spatial resolution. All data is processed on raster level with use of European Commission's Data Specification on Geographical Grid Systems (INSPIRE). Besides the grid shape offers comparability between communities as well as within and is independently of political, administrative boundaries. The panel provides an opportunity of a socio-spatial monitoring approach for small and medium sized communities as well as for scientific long-term neighbourhood studies.

*Keywords:* urban monitoring, communal statistics, grid cells, socio-spatial development

## 1 Introduction

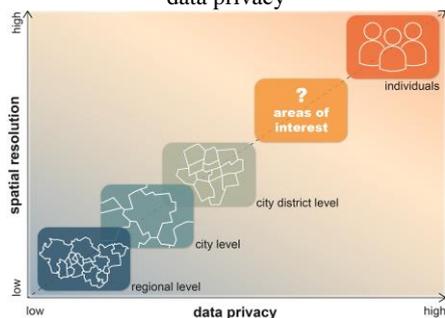
The technical requirements for the observation of urban development have increased in various professional contexts in the past few years. The enormous dynamics of spatial changes, the fragmentation and differentiation of socio-spatial patterns and an increasing degree of uncertainty about future trends led to a new increasing demand for valid and recent data on the small-scale level of urban and neighborhood development.

Larger cities such as Berlin and Hamburg have already been monitoring their urban and social spatial development for some time (HH BSW 2015, SSU Berlin 2015). However, this is hardly possible for small and medium-sized cities for reasons of expenditure.

## 2 Community data panel

The aim of the community data panel is to establish a small-scale, multi-thematic database for urban development purposes. This will comprise data of population and households, migration, companies and employees, social indicators, infrastructure, building structure and land use. Also there is a lack of spatial units representing a usable format to gather, analyse and display spatial urban phenomenon.

Figure 1: Urban monitoring in conflict between resolution and data privacy



Source: ILS

Spatial socio-demographic data gets into a conflict between the spatial resolution and the requirements of data privacy. Where there is low resolution, there is also low policy restriction but also low insight. High resolution would give better answers but is also highly restricted.

### 2.1 Spatial and temporal resolution

The intermittency of the data acquisition and thus, the temporal resolution, hardly depends on the efforts and the dynamics of the objects of observation. Especially basic information about inhabitants, households and social parameters will be updated annually, while accessibility of local suppliers and other indices need to be refreshed just every second or fifth year.

We propose to use the spatial system described in the European Commission's Data Specification on Geographical Grid Systems (INSPIRE 2014). The specification provides rectangular grids with edge lengths of  $10^x$  m where  $x$  in  $\{2;4\}$ . Data that are calculated on this base are likely out of privacy issues and can easily be aggregated to Grid cells of lower spatial resolution. In addition, data on conservative spatial units can still be easily calculated from these data (Kamingeri et al. 2010).

### 2.2 Workflow

After an initial test with two communities, the panel is about to be extended to provide long-term data of ten communities. Different data sources from communities, federal state, private sectors and own collections are used to set up the database for the panel. The spatial resolution differs from land cover polygons to individual data points due to a heterogeneous data source. All input data is transferred and if necessary aggregated or disaggregated to grid cells (Milego & Ramos 2011).

### 3 Community data panel – a cooperative idea

[tentwicklung/monitoring/download/2015/MonitoringSozialeStadtentwicklung2015.pdf](http://www.stadtentwicklung/monitoring/download/2015/MonitoringSozialeStadtentwicklung2015.pdf) [Accessed 06th February 2017].

The community data panel is a cooperative project between small and medium sized communities and the ILS. Small-scale anonymized data is provided by communities and processed and enriched by our institute. The collection of own e.g. structural data within communities as well as specific data from geo marketing sources (e.g. retail purchasing power, residential area indices and arrangements of income) are provided in collaboration with the local partners. As a case study for the community data panel the city of Herne (Ruhr Area) was selected. The ILS cooperated with the statistical and registry offices to produce register and mapping based GRID indicators. On top of these data, various additional sources were integrated including the federal state's open data initiative, contributed information from the OpenStreetMap community as well as geomarketing indicators regarding the social milieu and housing situation.

Finally, the panel data can be used by communities as a starting toolset for a small-scale social monitoring system. For research fellows it is a new resource for long-term neighbourhood studies.

### 4 Reference

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