Monitoring System for Changes in Urban Structure

Abstract

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The urban structure – or spatial structure - consists of the physical and functional system of housing, working, services and green areas; generally speaking the living environment of our daily life. It also includes the connections between the above mentioned functions.

The urban structure influences our life daily. Fragmented urban structure means longer commuting distances, longer trips to services and wasting of time and money. It causes higher building and maintaining costs. The fragmented community also wastes natural resources and energy. All these things influence to the climate change. On the other hand, an integrated urban structure gives a possibility to arrange functional public transport. People must have choices instead of using only a car. A functional urban structure makes possible good accessibility to services and saves natural areas, natural resources and energy. So, there're good reasons to try to reduce the fragmentation of urban structure. Our society needs information about the state and direction of development of urban structure in a wide scale: we have needs like legislative, development of guidance, research, planning and operational decisions needs, to mention some.

The realization of monitoring the spatial structure was principally developed to serve the ministry of the environment, but by the years the range of use has expanded a lot. The main feature of the Monitoring System for Spatial Structure, YKR, is the temporal and spatial comparability. The information reflecting the urban structure has a solid linkage to location. Describing the change is difficult because the observed area and the phenomenon both change in the same time. The solution is to compare the cross-sections. The area is modeled by geographic information system tools. The modeling produces area classes like densely built-up areas, different types of villages, other rural areas etc. The method is independent from any administrative borders or units. The same modeling is done for all periods of time. This is done by using the high quality, comparable grid data from the same periods of time. The most important data sources are national basic registers, other national registers, GI data and also own data production. At the moment YKR consist of grid data sets from years 1980-2005, area classes for years 1980-2005, a set of tools like information systems and longer term reporting and development activities. The most of the grid data is refined and produced by Statistics Finland. It included a wide scale of variables for population, buildings, labour force, jobs, household, work trips, car ownership, land use etc.

The most powerful feature of YKR – flexibility – causes the most difficult problems. There're so many possibilities to combine data from different eras to areas from different eras. To overcome this problem a new information system was developed. YKR is now a part of Environmental Information System HERTTA. It makes possible to get spatial and statistical information within a GIS knowledge through Internet. The information system also gives the user shortcuts to the most important and useful analyses. Nowadays the users of YKR are the environmental administration (circa 3000 person), all (19) regional councils and cities of Helsinki and Espoo use YKR. Besides that, YKR in a heavy use in a great number of research projects. The goal is to expand the possibility to use the system for all who need it. There's always room for developing better ways to understand and plan our world. The only way to get results with modest resources is the co-operation between data producers, data refiners and users.