

Mapping urban open space and the compact city – research methodology

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1 ABSTRACT

European Policies on contemporary cities favour the compact city (European Union Expert Group on the Urban Environment, 2004), a theory or idea which has not been clearly defined. Compactness of cities often refers to urban sustainability achieved by dense, mixed neighbourhoods, (Jenks, Burton, Williams, 1996) which make cities more livable. High densities do not match the idea of providing urban open space (squares, parks, boulevards etc.). Urban open spaces may be a source of benefits for cities, which may be revealed in housing real estate market (Luttik 2000, CABE, 2002). In this paper a research methodology is being introduced: how to describe cities' compactness by a set of different indicators with special attention to urban open space and housing density. Distinction of open (public, semi-public) space and enclosed (gated: semi private, private) space seems to play crucial role in cities sustainability. A research on two cities located in Poland (Gliwice and Tychy) has been conducted. The results show which policies might be applied for better, high quality urban open spaces and higher densities. Applied methodology helps to understand what makes cities sustainable and livable.

2 URBAN OPEN SPACE AND THE COMPACT CITY

2.1 Compact city

Compact City Strategy recommended by the European Commission in its 1991 Green Paper on the Urban Environment as a basic model for sustainable urban design, is still essentially valid (Green Paper, 2004). The Compact City strategy focuses on the form of the city and the efficiency of the distribution of human activities within it, through compact, mixed-use and dense settlement structures enabling effective use of public transport and non car-based movement systems and minimising vehicular movements. The Compact City approach remains a key element of urban design for sustainability but that urban design and landscape design must be closely linked (Green Paper, 2004).

Policies that favour the compact city have been applied in Amsterdam, Hamburg, Copenhagen (Scheurer, 2007). New policies on housing have been applied f.e. Planning Policy Guidance 3 in United Kingdom suggests the minimum densities. Density measurement itself causes problems since there is no professional agreement how to measure density (Jenks, Burton, Williams, 1996). The most popular measure is amount of units per hectare or gross density ratio, however it doesn't reflect the amount of people who live there. Density ratios vary on location, local technical requirements, local climate etc. so there is no uniform rule for what is the appropriate density requirement for every single place. The latest literature shows interest in high density developments (Mozas, Javier, 2006) and projects (Fernandez, Javier 2007). Some research methodologies such as Space Syntax (developed by Space Syntax Laboratory at University College London) deal with public open space and the way they work, others such as Spacemate (Meta, per Haut, 2004), or Function Mixer (MVRDV) focus on the problem of density.

New urbanists theories, for example 'Sustainable urbanism' (Farr, 2007) respect economic aspects, which means that real estate values also should be considered. According to Kauko's (2002) research on real estate values in Helsinki and Amsterdam – housing density has a significant impact on real estate values. High densities in the centres and low densities in well connected areas feature high property values. Further research in that field on different densities and different scales of cities would be helpful in deciding how compactness reflects on the market.

Protagonists of the compact city argue that it is 'the only way forward', while compromisers argue that such policy doesn't guarantee sufficient quality of life. Contemporary challenge for more sustainable and livable cities is as following: How to make cities more compact within existing urban brownfield? How to provide both high density urban fabric and high quality of urban life?

2.2 Urban open space

Open space provide high quality of life and may be a source of environmental, economic, and spatial benefits (CABE, 2005). Although environmental and spatial benefits seem to be obvious, the economic dimension of urban open spaces is still not wide known. Higher real estate values caused by evidence of open space amenities such as trees, water, parks (Luttik, 2000, CABE, 2002) etc. may be a source of benefits by property taxation. High quality streets and paths may result in increasing walking or higher commercial property values (Buchanan P., 2005, Buchanan C., 2007). Most of the available research shows interest in urban green spaces preservation and renewal, but the evidence of new green public spaces development is little.

The contemporary European city should be compact and green at the same time (Green Paper, 2004), but real estate market clearly shows that it is easier to built rather a compact, dense block than a park. Although benefits and costs of urban open space are still a subject of research, there is enough data to state, that there is demand for green space (Bell et al., 2006, Roundewal et al., 2008).

New urbanists advocate clear distinction of private and public space, but there is no uniform proportion between both. There is no uniform agreement how much green space should be available for each dwelling and what structure (dispersed or cumulated) of open space is more feasible in a compact city. Planning new developments allow for control of private/public distinction, but there is still concern about the existing urban fabric and its linkage with new one. One of the answers is finding a balance between open and gated (enclosed) urban open space.

3 RESEARCH METHODOLOGY

A research methodology has been developed in order to describe cities' compactness and urban open space. The main theme was an attempt to find a methodology, which would combine both matters with relatively simple indicators allowing for comparison between the entire city structure and its singular unit (urban block). The research has been conducted as following:

- Part A – city scale: spatial structure of the city: research on urban open space and housing areas
- Part B.1 - district scale: areas which perform as neighborhood units has been chosen
- Part B.2 - urban block scale: representative type of urban block with typical housing has been chosen

The goals of the research methodology were:

- to indicate urban open spaces and urban gated (enclosed) spaces
- to measure density
- to measure real estate values

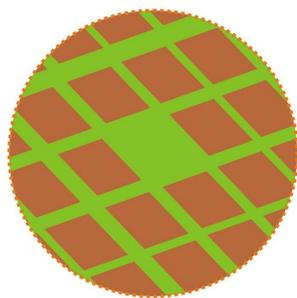
Comparison of mentioned indicators in both scales/parts (B.1 and B.2 – see Fig.1) allows for better understanding how does an urban block (simple building or a buildings complex) affects on entire neighbourhood.

A research on two middle sized (ca. 190.000 inhabitants) cities has been conducted: the city of Gliwice with over 800 years of history, with traditional urban open spaces (market, parks, old town, main shopping street etc.) and the city of Tychy, which has been mostly designed and developed in 50-ties and no traditional public places exist (in fact there is no city centre hub). Both cities belong to Silesian Metropolitan Region.

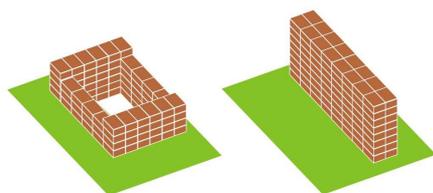
The research methodology is an a part of PhD thesis in the field of urban planning. Real estate valuation may be considered as experimental since it, has been conducted using comparative analysis method with data only for similar (multi-family) housing types within the same areas. The research showed that there was no significant correlation between real estate values and housing density. This may be true since demand on housing in both cities is high and most of new developments are located in the suburbs. Real estate prices varied mainly on quality of public realm, evidence of greenery (parks), and evidence on spatial distinction of space: the more gated and private space was provided, the higher prices were reached. Methodology has not been tested on single family housing typologies yet. The research showed that high rise (9-11 floors) doesn't provide significant higher densities, comparing to traditional perimeter housing block types (4-5 floors). The research showed positive correlation between mix of use and real estate values. Comparison of results in both cities showed that evidence of traditional urban open spaces and clear distinction of public/private space

effects on real estate values and on urban open space quality. The results from part B compared with data from part A gives a clear view what are opportunities for future development.

DIAGRAM



B.1 NEIGHBORHOOD UNIT



B.2 URBAN BLOCK



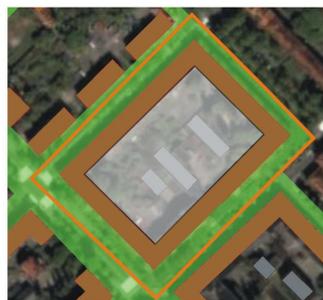
INDICATORS

- GROSS DENSITY B.2
- GROSS DENSITY B.1
- REAL ESTATE VALUE B.2
- REAL ESTATE VALUE B.1
- OPEN / GATED (ENCLOSED) SPACE B.2
- LAND USE B.2
- OPEN / GATED (ENCLOSED) SPACE B.1
- LAND USE B.1

CASE STUDIES



Distinction of urban open spaces (green) and gated (enclosed) spaces (white) - neighborhood scale
Gliwice- City centre Gliwice- outside city centre



Distinction of urban open spaces (green) and gated (enclosed) spaces (white) - urban block scale

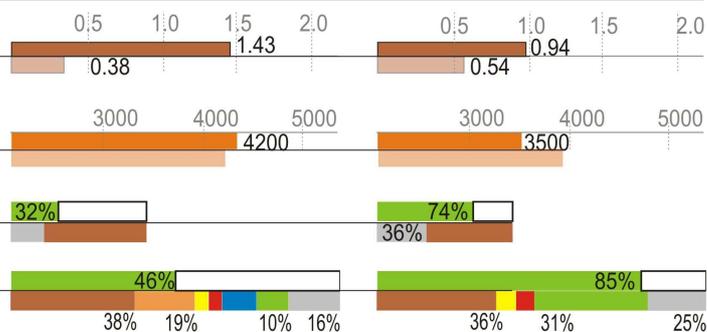


Fig. 1: Mapping urban open space and housing density: Research methodology diagram and implementation in case study

4 CONCLUSION

Presented results may be useful in urban research and urban planning. Although some of the results may seem to be obvious, it turned out that the final effect - if tested on the entire city - would give new image of the city: densities map (for different uses), real estate values map, urban open space map with its quality indicators. All research and analysis are easy-to-conduct with a GIS-based system. The most promising part would be its economic-spatial dimension.

As a result several policies might be proposed: optimized (increased) minimum and maximum densities ratio (for all uses), optimized minimum and maximum urban open space ratios for new developments, policies which promote provision of urban open space for example allowance for higher densities, if part of new development addresses the public realm might be given, public-private partnerships for better maintenance of green may be established.

In conclusion: mapping urban open space, density and real estate values seems to a useful tool in urban planning.

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