

## ARCHITECTURAL AND URBAN ASPECTS OF THE QUALITY OF LIFE IN TWO LARGE HOUSING ESTATES FROM THE COMMUNIST PERIOD: GRÜNAU IN LEIPZIG AND MILLENNIUM IN KATOWICE

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### Abstract

Large housing estates, built in the socialist countries in the years 1960-1990 were the result of huge demand for housing and the implementation of one of the government policy priorities. Desirable in the 70s, stigmatized in the 90s, are now being rediscovered as settlements of well-planned urban development, with full service infrastructure, socially sustainable. Residential buildings are the subject of a number of works to adjust them to modern standards, however, the political and economic changes, but also changes in the ownership structure of settlements generate a lot of problems with their management and maintenance. Within the frameworks of the Polish-German interdisciplinary research project large housing estates: one in Leipzig-Grünau and three in Katowice were chosen for analysis. The comparative study was made, using research tools: expert analysis, survey and in-depth interviews with residents, meetings with settlements' planners and designers, with representatives of the authorities and local actors that influence the investment processes.

### Streszczenie

Wielkie osiedla mieszkaniowe, budowane w krajach socjalistycznych w latach 1960-1990 były efektem ogromnego zapotrzebowania na mieszkania oraz realizacją jednego z priorytetowych celów polityki ówczesnych władz. Pożądane w latach 70., stygmatyzowane w latach 90., teraz zostają na nowo odkrywane, jako osiedla dobrze zaplanowane urbanistycznie, wyposażone w infrastrukturę usługową, zrównoważone społecznie. Budynki mieszkalne są przedmiotem działań dostosowujących je do aktualnych standardów, jednak okres przemian politycznych, ekonomicznych oraz zmiany w strukturze własnościowej osiedli generują wiele problemów z ich zarządzaniem i utrzymaniem. W ramach polsko-niemieckiego, interdyscyplinarnego projektu badawczego wykonane zostały analizy i badania wielkich osiedli mieszkaniowych: jednego w Lipsku-Grünau oraz trzech w Katowicach. Zbadano wady, zalety i możliwości rozwojowe osiedli przy wykorzystaniu narzędzi badawczych: analizy eksperckie, ankiety i wywiady pogłębione z mieszkańcami, spotkania z projektantami osiedli, przedstawicielami administracji oraz aktorami lokalnymi mającymi wpływ na procesy inwestycyjne.

Keywords: Large housing estates; Post-socialist housing.

## 1. INTRODUCTION

The second half of the 20<sup>th</sup> century was the time of accelerated industrialization and the ensuing influx of labor from rural areas to towns and cities. It was a real challenge to provide, in a relatively short time, a big quantity of flats, which, in Poland, was mostly the state's responsibility. Subsidies allotted to the housing industry, apart from political reasons, were also necessary in the absence of private financial resources,

weakened by the effects of the Second World War and low level of incomes [1,2]. The dynamic growth of towns and cities and necessity of immediate construction of compact housing settlements contributed to a search for new building technologies, especially housing manufacturing techniques and new planning solutions, creating opportunities for rapid growth of the urban tissue [3,4]. Traditional technologies used in multi-family housing gradually became replaced con-



Figure 1.  
Housing estates: Millennium in Katowice and Grünau in Leipzig

crete panel buildings and multi-block estates, where the exterior walls, interior walls, load-bearing walls, floors, roofs and stairs were made of pre-cast concrete elements of big dimensions produced at the construction site or at manufacturing lines (in the so called factories of houses) [5].

In the middle 1950s multi-dimensional slab concrete prefabricated elements were used in the construction of multi-family housing blocks in Nowa Huta. In 1957 the first slab tower block was erected in Warsaw, and, in the late 1960s, prefabricated large panel systems became commonly applied in multi-family housing estates in big agglomerations. In total, in the period of 1966 – 1998 over two million flats were built in Polish cities with the use of concrete panel technology [6].

The search for new construction technologies contributed to organizing in 1967 the contest for designs of open concrete panel housing technology, in the course of which two systems were selected to constitute the bases for the manufacture of pre-fabricated elements: Szczecin system and W-70 [1]. The W70 system, being more open and, in consequence, more prospective, was widely implemented in Poland.

A similar system – WBS 70/80 – was adopted in the German Democratic Republic, where the development of mass multi-family housing, just like in Poland, was one of the most important assumptions of the Communist political system. German cities have undergone a strong process of industrialization and strong growth in the second half of the 19<sup>th</sup> and in the early 20<sup>th</sup> century. At this time, also in Upper Silesia, nearby the industrial plants residential buildings of different standards for workers and clerks were created (the so-called patronage settlements). Intensive construction processes took place to fill downtown with residential-service houses. These buildings, however, mostly met 19<sup>th</sup> century poor standards when it comes to the structure of the premises and their technical equipment. After World War II, the construction of large housing estates was driven by the need to supply new housing for the residents of the surrounding settlements and villages occupied by the developing industry and for the inhabitants of the old, neglected residential buildings situated within the city. New housing estates provided new technical and functional quality, while meeting the vision of unified, egalitarian “socialist city” [7] – the structure of multi-family housing that ensured decent habitation for the basic social unit as the family was seen, with additional features such as shops, schools, clubs, residential areas, facilitating daily life.

It was the continuation of the idea of the so-called “neighborhood unit” – thesis formulated in 1923 by Clarence Arthur Perry.

Similar assumptions, concerning the size of the architectural and urban solutions, construction technologies and social and political circumstances of the emergence of large housing estates in Poland and the GDR, provide grounds for mutual comparative analyses and determination of development forecasts of such estates.

## 2. RESEARCH PROJECT LHE (LARGE HOUSING ESTATES)

In 2011, within the framework of a grant allotted by the Polish German Foundation for Science, joint Polish-German research into the quality of living in large housing estates was undertaken for the following settlements erected in the second half of the 20<sup>th</sup> century: “Millennium”, “Paderewskiego” and “Zgrzebniocka” in Katowice, and “Grünau” in Leipzig (Fig. 1). The project is run at The Faculty of Architecture, Silesian University of Technology by the team (Bartoszek A., Komar B., Kucharczyk-Brus B., Niezabitowski M., 2011 – 2012) supervised by Professor Elżbieta Niezabitowska in collaboration with the German team (Haase A., Grossman K., 2011 – 2012) from The Helmholtz Centre for Environmental Research – UFZ in Leipzig headed by Professor Sigrun Kabisch. The scope of the project is to conduct interdisciplinary analyses of the selected housing estates and their social structure involving the technical, urban- architectural and social capital issues.

Selected for the survey large housing estates, in which the flats were haunted in the 70s, stigmatized and rejected in the public consciousness in the 90s, are now being rediscovered. The research team raises the question – why such a change in the value of these estates, in terms of technical, market and symbolic issues? What are the objective advantages and disadvantages of these settlements, what management problems such large housing generate and what may their future look like?

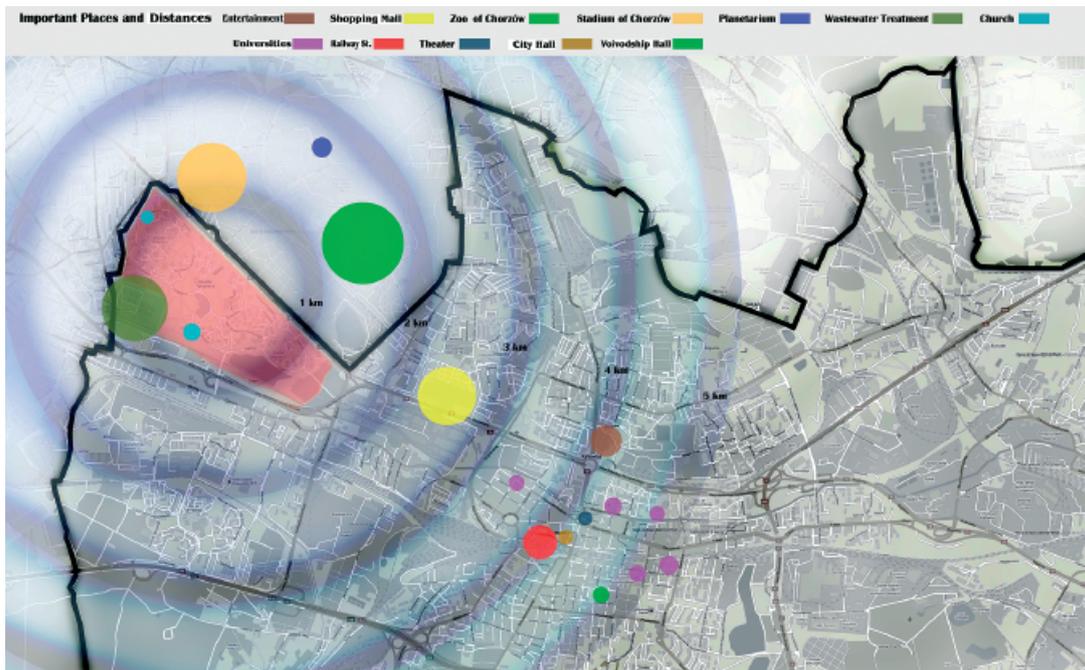


Figure 2. Millennium estate in Katowice – important places and distances, wayfinding

The model of the experts assessment devised for the project included:

- Assessments of urban solutions – spatial distances and transport links with the city centre, layout of the housing estate, legibility and quality of the access roads system and pedestrian ways, gradation of the privacy level of generally accessible space, technical infrastructure, services and accessory functions, quality of public transport, distance to services and recreation areas, condition and quantity of green areas (trees, lawns, tec.), accessibility of space to the disabled, etc.
- Assessments of architectural solutions – construction technology conditions, evaluation of the structure of buildings and possibilities of implementing changes in the functional systems, quality and size of flats and particular rooms, installations, acoustic and thermal insulation of horizontal and vertical partitions, architectural barriers, functional quality of the entrance zone of the buildings, assessment of the internal and external aesthetics of the buildings – quality and type of finishing materials, state of maintenance, artistic solutions, etc.

The experts criteria, including the issues of general quality of civilization, in consideration of the needs of the disabled and seniors, were elaborated on the bases of the Building Law provisions binding in Saxony (SächsBauordnung [8], for the studied German estate) and supplemented by the requirements of Design out Crime [9] and Universal Design [10], Built for All [11], Housing Enabler [12] requirements of ergonomics [13] and ADAAG. In addition, the requirements of the EU Standard were also taken into account in the assessment of the spatial parameters of flats.

The input materials for the experts' analyses are spatial development plans of the estates and documentation concerning the buildings, weighted against the inventory and in-situ observations of the design solutions and later modernization measures. The assessment involves the comparison of the derived information on the existing solutions with the requirements set for the present quality of the built environment, and their compliance with currently binding legal provisions concerning ergonomics and accessibility for the disabled.

Apart from the experts assessment, the discussed Project also includes other comparative analyses of social, economic, administrative and political nature, based on surveys, focus interviews with representatives of the cooperatives, developers and designers of

the examined estates (for more information see: <http://lhc-katowice-leipzig.polsl.pl> [14]). This paper is focused on selected issues of the experts assessments, such as: the comparison of the urban concept of the housing estates and their condition after 1990, as well as on the approach to the design of the flats structure.

### 3. COMPARATIVE STUDY

#### Urban quality – experts assessment

Millennium housing estate in Katowice is situated at the north-western boundary of the city, about 3 km from the Katowice market square (Fig. 2). It occupies the area of 188 hectares and is inhabited by 23 500 people. Located at one side of Chorzowska Street it is opposite the Culture and Leisure Park and has very convenient access to the city transport system – tramway lines along Chorzowska Street, numerous bus connections, including those also inside the estate and links with DTS (Diameter Main Road) running behind the southern boundary of the estate, as well as with A4 highway which goes parallel to DTS, a little further to the south.

Just as Leipzig-Grünau, the Millennium estate in Katowice was designed to provide a large number of modern standard apartments for the former inhabitants of old, technically worn-out, 19<sup>th</sup> century buildings, as well as for the multitude of newcomer workers of mines and other industrial plants. However, the authors do not mention the estate was about the vision of socialism, which was a key assumption of Nowa Huta in Krakow. Primarily they focused on the search for new technologies that could be adapted to difficult geological conditions and the implementation of the new functional concept of healthy buildings, derived from le Corbusier's concept of "open urban systems". Similar settlements were created in the world at that time, as an alternative to dark, overcrowded housing for workers [15].

The first buildings designed by the team of architects and engineers supervised by Arch. Henryk Buszko and Arch. Aleksander Franta were erected in 1964. At that time the urban design entailed the construction of the lower part of the estate, today called: "the lower estate" – "(...) 20 thousand inhabitants in reference to the postulated land capacity and 15 years of further building perspective. As the works were started in 1960 they were planned to be completed in 1975..." (A. Franta, focus meeting, May 2011). However, the design works were continued because of the necessity

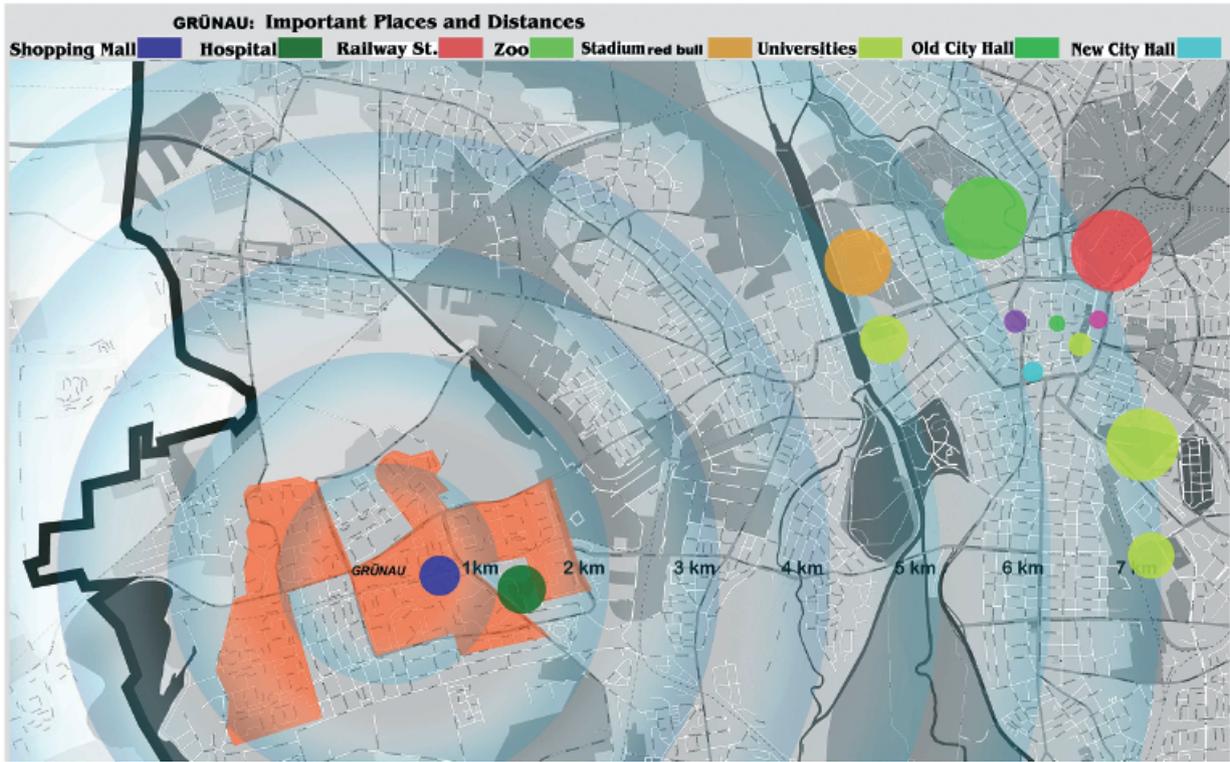


Figure 3. Grünau estate in Leipzig – important places and distances, growth periods

of managing the adjacent site which, in the course of the construction works was used for storage, and, first and foremost, due to the increasing demand for flats in Katowice and the need for more “compact” settlements in the developed territory (detached “Finnish” style houses) and convenient location. The last of the buildings designed by the authors of the entire complex – 19-storey “corn-cob blocks” – were constructed at the turn of the 1990s / early 2000s.

Nowadays, as the location of the estate is considered as attractive on the Katowice flat market, despite protests advanced by the inhabitants, several new houses have been crammed into the estate. Four new buildings are planned along Chorzowska Street, founded on elongated one storey section containing the commercial and services passage. New investments are made, including: playgrounds, recreation areas, other elements of small architecture, new pavements for pedestrians and car traffic and new parking places, which are currently urgently in great demand for the inhabitants.

Grünau housing estate is located on the outskirts of Leipzig (Fig. 3), 6 km from the city centre, and because of such distance it is perceived as isolated, independent urban space. There are green areas around it, partly occupied by detached houses, and partly by recreation and agricultural lands. One of the attractions of its neighborhood is Kulkwitzersee natural lake (about 2 km from the centre of the estate). It is very large, its surface of 870 hectares with about 46 thousand inhabitants is divided into several housing complexes (WK – Wohnkompleks), each with a slightly different layout and separate spatial character. The central axis of the estate is the suburban train line (currently not in operation) and the main north-south axis of WK4 and WK5 complexes, connecting two communal streets – the road along the southern boundary of the estate and the road in the middle of it. The tramway lines running along the two roads provide the main means of public transport connection with the centre of Leipzig. There are also four bus lines, of which one is privately owned. The line was created in response to the inhabitants’ initiative and it serves only the area inside this vast housing estate.

With the development of industry, the city of Leipzig has developed rapidly at the turn of the 19<sup>th</sup> and 20<sup>th</sup> century, reaching its peak population in 1933. Since then, the population underwent reduction, for various reasons, also because of the declining birth rate.

In the late 1960s, to meet the growing demand for modern flats, the authorities of the city of Leipzig

undertook the decision to build a large housing settlement in Grünau. The cornerstone was founded in 1976 and, up to 1989, more and more buildings were hastily erected to come up to the expectations of the Communist system propaganda, but also to provide housing for residents of the old buildings being demolished in the city center. The first housing complexes: WK1, WK2, WK3 were constructed on the bases of urban development plans and designs prepared by architects and urban planners; however, because of the pressure put by the authorities to build more and faster, the subsequent complexes were not so elaborately designed, and the urban and functional layout of the buildings was enforced by the concrete panels technology and pre-fabricated multi-family blocks manufactured at a local factory (B. Puckelwaldt, focus meeting, June 2011). As “(...) it was impossible to create small-scale urban structures with modern, industrial building techniques, open structures became the dominating form of building with the building crane as its main architect (...)” [7]. In 1989 Grünau estate reached its demographic peak, with 85 thousand inhabitants. Unfortunately, this year marked a breaking point, also in political terms, and slow but consistent outflow of the inhabitants [16, 17]. Newly erected blocks of houses were gradually abandoned. A bad image of the slab technology settlements created and strengthened by media and preserved in the public consciousness as a bad legacy of the previous political system also contributed to housing emptying. Other causes of vacancies at the estate were: shrinking population of the city of Leipzig and the related general oversupply of housing, population outflow to western part of the country in search for jobs, and Grünau residents moving into the newly renovated houses located closer to the city center.

In the 1990s, to enhance the image of the estate and attract new inhabitants, several investments were made including: a swimming pool and big shopping mall at the intersection of its central north-south and east-west axes. Yet, more and more inhabitants were moving out. In consequence, the authorities were obliged to devise the demolition plan for deserted buildings. The plan was implemented in the year 2000. Currently, there are no investments made at the estate and empty sites created after the removal of the buildings have not been systematically managed; instead they provide space for spontaneously created garden allotments, or remain undeveloped, and create the optic impression of even bigger distance between particular parts of the estate.

The infrastructure of the two estates: Millennium in Katowice and Grünau in Leipzig and availability of services at the time of their construction was subject of legal regulations – stipulating the number of schools, nurseries, shops, medical care units, playgrounds and recreation sites available for the planned number of inhabitants had to be provided. As far as these requirements are concerned, up till now both estates provide appropriate quality of accessory functions supporting housing. The problem that the inhabitants of Grünau have to face is the withdrawal of some institutions subsidized by the local community authorities: libraries, activity clubs, post office outlets, etc. from the parts of the estate located at big distance from its core, as they are regarded as loss-making and peripheral. Accordingly, the quality of services is decreasing, which, in turn, draws people out of the estate.

The city of Leipzig is nowadays more focused on investments within its most compacted urban district renovation of tenement houses and early 20th century urban complexes, replacement of some parts of the urban tissue, introduction of new energy-efficiency technologies, etc. Obligatory reductions of the quantity of uninhabited flats have, first and foremost, affected peripheral districts and buildings of lowest historical importance, such as Grünau. The condition of Millennium multi-family housing estate is entirely different – continuous demand for flats and convenient location of this settlement make it a place attractive to investors, providing housing and its accessory functions: services, commerce, medical care etc.

#### Ownership structure

Large housing estates in Poland and Germany were financed by local authorities and housing cooperatives and mostly supported by state subsidies and government programs that facilitated the acquisition of bank loans and grants. After the political and economic transformations and the ensuing development of the free market, it became more and more difficult to finance the loans drawn out for their construction. The solution was to privatize flats [18, 19, 20] – inhabitants were encouraged to purchase their flats and offered some allowances (in Poland regulated by the following legal acts: “Housing Cooperative Law” dated September 16<sup>th</sup> 1982, Journal of the Laws of the Polish Republic No: 54/1995, et seq.; “Real Estate Law” dated August 21<sup>st</sup> 1997, Journal of the Laws of the Polish Republic No: 115, Entry 741; “Flat Ownership Law” dated July 24<sup>th</sup> 1994, Journal of the

Laws of the Polish Republic No: 85, Entry 338). Unlike in Poland, buying out flats in Grünau housing estate was not popular. Some buildings were sold as a whole to private investors, others remained in the ownership of the local government or several housing cooperatives. Nowadays there are eight cooperatives functioning at Grünau estate, seven private companies and LVB communal institution that manages the local housing resources. There is no separate ownership of single flats – the flats are subject of hire, and the rent depends on the location of the flat on a given floor, its technical condition, size and furnishings of the building.

The ownership structure of Millennium estate, due to the political and economic transformations, has been broken up and several forms of ownership may be distinguished in accordance with the Polish law:

- Ownership right to a flat or utility premises – in buildings that were previously part of the local government resources, the flats and facilities were bought out and owners’ associations established pursuant to the relevant legal provisions to manage a given building or real property; this group also includes flats and facilities located in developers’ buildings, where owners’ associations are also founded;
- Tenant cooperative ownership right to a flat or utility premises – in cooperative-owned buildings particular flats were bought out pursuant to the relevant legal provisions and are owned by private persons but entire buildings are managed by the cooperative administration;
- Cooperative ownership right to a flat – based on the principles of hire, where the tenants are members of the cooperative and take advantage of subsidies and allowances, there are only few flats with this status in the whole flat resources of the estate, because most of the tenants took the opportunity of buying out their flats;
- Other forms – parts of the buildings are owned by the local community authorities (not many, as predominately the flats were sold out) and parts owned by PIAST housing cooperative – such buildings are managed either by the cooperative or by owners’ association board (buildings previously owned by the local government authorities).

A distinguishing feature of the Polish political and economic transformations is the scattering of ownership, which does not always facilitate administrative measures and proper management of repair works, evokes problems in obtaining financial outlays for investments, hinders decision-making and debt collection from particular co-owners. The number of communal or cooperative flats for rent is very small, due to big demand for housing in this area. Flats offered for hire are privately owned and the rents are individually established and are not subject of any legal provisions. Unlike Grünau, at the Millennium estate it is a big problem to replace one's apartment for the other, more adapted to the needs of users. The replacement involves high costs and the need to carry out a time-consuming transaction of sale and buy.

#### Architectural quality – experts assessment

Millennium estate and Grünau estate were constructed in different building technologies:

- Millennium buildings were designed to resist mining damage: basement cells, ferroconcrete frame constructed as climbing formwork, ferroconcrete stiffening walls made in multi-spatial formworks, prefabricated stairways, floors and balcony plates;
- Grünau buildings were constructed completely in concrete plate technology and slab blocks technology: the exterior walls, interior walls, floors, stairways, balcony plates, balcony casings, bathrooms, elevator shafts, etc. delivered to the construction site as ready-made elements, with finishing and ready for assembly.

As far as the technical quality of the studied buildings both in Katowice and in Leipzig is concerned, even upon commissioning, there were many defects; therefore, repair works to remove the technical faults were commenced early and included: cracks in the partition walls in Millennium buildings and insufficient tightness joints between façade plates in Grünau. Both in Poland and in Germany building works are carried out to reduce the energy-intensity of houses to comply with the newly introduced regulations. The facades are thermally insulated and enriched with new aesthetics. Lifts, lighting systems of commonly shared space, self-closing entrance doors, etc. are replaced with modern, energy-efficient equipment and furnishings. Windows are replaced in flats and in staircases – here the German example is especially worth emphasizing – the window replacement plan covers the whole building. The new windows have the

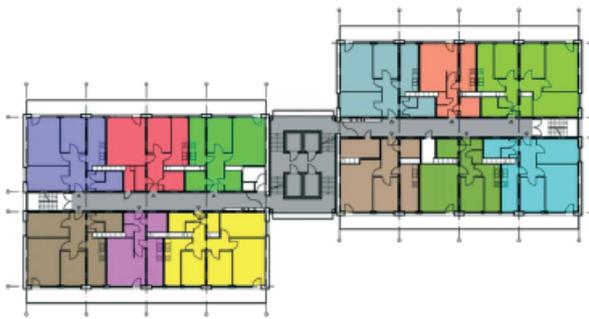
same colour, identical partitions and are supplied by one manufacturer, positively contributing to the whole image of the building, which cannot be claimed about Polish multi-family houses. In some Grünau buildings new energy-efficiency technologies are implemented: solar panels to provide warm water. Building works and installation of amenities for the disabled and seniors are undertaken both in Grünau and Millennium buildings.

The analyses of the internal structure of buildings and flats were conducted in view of the spatial requirements and possibilities of moving around by persons in wheelchairs or other movement-supporting equipment, as this group of users has very specific needs. The flats in the examined German and Polish buildings are not adjusted for the disabled. This regards poor access to bathrooms, kitchens, and the entrance zone to the flats, as well as insufficient width of the doors frames. The buildings were designed in the 1960s and 1970s in compliance with the regulations in force at that time, as in those years pro-integration requirements were not frequently taken into account. Basic problems occur even in the accessibility of the ground floor, even in buildings equipped with elevators (a positive exception are the “corn-cob blocks” at Millennium estate, where the entrance zones and the first stops of the elevator are placed at the level of the ground) – behind or before the entrance doors to the buildings there are several steps making it impossible for people in wheelchairs to reach the elevator. In Germany, as well as in Poland, flats situated below the fifth floor did not have to be equipped with elevators. Currently, in Germany, to improve the comfort of use, external elevators are assembled at the vertical penetration zones, but this measure does not completely solve the problem of accessibility to the flats, as, due to the structure and functional layout of the buildings, the elevator stops can be arranged only at half-floors.

In comparison with Millennium buildings, the flats in Grünau estate have narrower door frames (even only 65 cm), which is an outcome of specific legal regulations.

KATOWICE - TYSIĄCLECIE

UŁAŃSKA

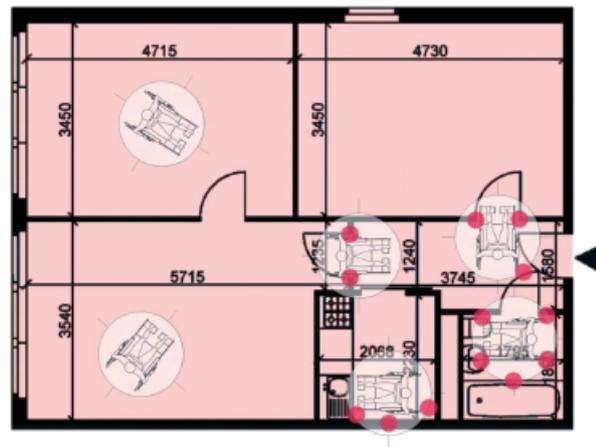
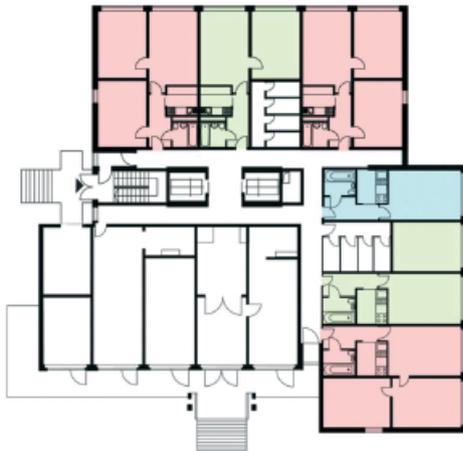


BUILDING

FLAT

LEIPZIG - GRUENAU

STUTTGARTER ALLEE 4



BUILDING

FLAT

Figure 4. Millennium, Katowice and Grünau, Leipzig – flat floor plan comparative analyses

**Table 1.**  
Comparative analyses of flats [21] (Fig. 4)

No	Criteria	Millennium estate	Grünau estate
1.	Entrance zone	The entrance doors are 80 cm wide, at the entrance there is no place available for putting aside the shopping, trolleys, wheel-chairs, etc.; entrances to some flats are situated too close to vertical penetrations	The entrance doors are 80 cm wide, they have high doorsills, there is no additional space at the entrance- tightness of space
2.	Hall and corridors	Width in compliance with the regulations	Width of the hall in accordance with the standards, side corridors not wide enough (80 cm)
3.	Living room	Size of the living room in compliance with the current European standards	Size of the living room in compliance with the current European standards; inadequate proportions of the living room (3.5 x 6.0 or 3.5 x 9.0)
4.	Bedroom	Too small in relation to current requirements	Size consistent with currently binding standards (many flats at Grünau are single room studies, with no separate bedroom)
5.	Kitchen	Kitchens with inadequate shape- narrow and long; yet their size is correct	Blind kitchens (without windows) or kitchenettes in living rooms
6.	Bathroom	Separate WC, which results in the tightness of all other sanitary rooms in the flats; no access for the disabled	Tight bathrooms, no access for the disabled, bathroom floor level is 5 cm higher than the other parts of the flats
7.	Balcony	Narrow balcony and high doorstep onto the balcony	High doorstep onto the balcony
8.	Accessory rooms	In some buildings (corn-cob blocks) there are accessory rooms on particular floors located at the elevator shaft and the staircase	In all buildings accessory rooms are available on every floor

#### 4. CONCLUSIONS

There are similar social and political circumstances of the historical development of the two discussed estates erected in the times of Communism:

- Provision, in relatively short time, a big quantity of flats in response to the deficiency and poor technical condition of the old urban tissue and migrations of people in search for jobs (strongly developed industry in Katowice and Leipzig),
- Rapid growth of multi-family housing was one of the most important assumptions of the Communist state – supply of a big number of flats, scrupulously and widely disseminated by the media, was an excellent tool of success propaganda and pro-social image of the authorities,
- Similar approach to the design of the structure of buildings and flats – Corbussier’s concept of an unhindered urban plan and housing development treated as a “machine for habitation” in combination with new technologies facilitating fast construction of tower blocks resulted in the emergence of easily legible systems of multi-family settlements, alike in form and functional quality- with comparable arrangement and size of flats, technical furnishings, and similarly planned accessory functions; differences in construction technologies or utensils stem from geological conditions – the design of the estate in Katowice considered the land surface formation (geological faults enforced the urban layout of the estate ) and mining damage.

The differences of the two compared estates, observed during the study, are the following:

1. A significant difference in the size of the fore-designs of the two estates emerged from planning assumptions. In Katowice the primary objective of the design architects was to manage wastelands and degraded areas situated almost in the centre of the agglomeration, instead of looking for investment sites outside green areas, in compliance with the requirements of the general plan. Design engineers deliberately pushed forward their agglomeration concepts to upgrade the urban tissue quality in that part of Katowice. Because of this and also due to the in-situ geological and urban circumstances (restrictions imposed by the existing and planned roads system and the neighboring settlements), the size of the estate, in spite of being large in relation to other construction projects undertaken in those times, remained limited. Conversely, Grünau was a project promoting moving city inhabitants to green and recreation areas, far away from urban noise and pollution. The lands for housing development were rural, posing opportunities of suburbanization and construction of the estate with the size even bigger than a small town – a planned size of nearly 100 thousands of inhabitants.
2. After 1990, the main differences in the development of the two estate were caused by the following factors:
  - different demographical conditions of the two cities after the political and economic transformations – upon the unification of East and West Germany migrations of people to the western areas led to a decrease in the number of Leipzig inhabitants and, in consequence, growing number of empty flats, which was further enhanced by negative population growth and suburbanization – inhabitants moving to areas on the city outskirts and detached houses. A similar phenomenon may also be observed in Katowice, where the number of the inhabitants is getting smaller year by year. However, this does not contribute to the increasing number of flat vacancies as the demand for housing in the city is still very big
  - disruption of the balance between supply and demand for flats in Leipzig caused by the above-mentioned demographical phenomena and the availability of new, high technical and functional quality of flats in Leipzig after the political and economic transformations, access to finance for investments, modern construction technologies and finishing materials, modernization and adjustment of technically worn tenement houses and post-industrial site, emergence of flats in the vicinity of the city centre offering new quality and aesthetics and providing all essential accessory functions; all contributed to the outflow of inhabitants from peripheral sites and from poor quality housing
  - location in relation to the city and transport connections – due to the peripheral location Grünau, in spite of an excellent transport system the bond with the city is not discernible; conversely, as far as Millennium estate is concerned, despite considerable distance from the very city centre, the bond is easily discernible and Katowice landmarks are noticeable from the estate, likewise, the vicinity of urban recreation areas (Silesian Leisure Park) exerts a positive impact on the identification of the location as urbanized
  - ownership policy – the privatization process in both estates does not positively influence their further development: in Leipzig, because of the distribution of property rights, the processes of empty flats reduction (demolition of buildings) cannot be logically implemented, for example, by complex liquidation of one part of the estate; likewise, Polish privatization measures involve considerable spread of ownership rights and make it impossible to implement major improvements of the technical and functional quality of buildings, and, in consequence, create obstacles in planning further reasonable growth.
3. The differences in the ownership structure stem from diverse attitude towards flats in Poland and in Germany in view of financial status. In Poland inhabitants strive for obtaining property rights to the flats that they occupy and treat the possession of a flat as security of their financial assets. It is quite common to own several flats in good locations and offer them for hire. In Germany, a flat is not considered as a safe investment. Its price may fall, the technical quality of buildings may get worse, therefore, German inhabitants prefer renting, which translates into better mobility of people, as they put their money in other ventures. That is why in Germany privatization entailed entire buildings, where flats are renovated and adjusted to the needs of their prospective inhabitants (for example, for the elderly) and offered for hire. In Poland the issues involved in the construction of housing for hire are not sufficiently regulated by the law, what really matters is profitability, so, the privatization of the entire buildings and their renovation schemes are not so common.

The directions of further development entail:

- the layout of the urban system – in Grünau buildings are demolished or upper floors in high buildings liquidated to reduce the number of flat vacancies; the sites created as an outcome of demolition works are spontaneously or systematically turned into green areas (pocket parks, garden allotments), which increases the distance between residential buildings and arises unpleasant sensation of empty, unnecessary space which cannot be intended for other investments, as located in the middle of a residential area; therefore demolitions should be planned as the complex work to release the whole part of the estate from the buildings eg. the most distant part; whereas, in Millennium estate, despite many protests of the part of the inhabitants, the settlement is being further compacted with developers' projects including the erection of new houses and service facilities, also, new playgrounds, recreation sites for adults and parking places; modern buildings introduce modern quality and new residents, often with higher incomes, which may improve the image of the entire estate [22];
- buildings – in Grünau the buildings taken over by private investors were subjected to complex renovation, including addition of elevators, entrances, roofing, thermal insulation of the external walls, implementation of modern energy-efficient systems, all to improve the attractiveness of flats for hire, but still some of the owners struggle with a high vacancy rate, so maybe (...) in some areas some dwellings may not be wanted anymore (...) [22] and it would be better to implement the reasonable plan of demolition (as mentioned above); as far as Millennium is concerned – buildings were renovated and thermally insulated, elevators, entrance doors and windows replaced to reduce energy intensity of buildings but still do not fully meet the requirements for contemporary multi-family buildings – eg. non-availability of the ground floor (because of stairs) and the upper floors for people with disabilities (because elevators stop at mid-landings – lack of possibility of improvement);
- flats – in Germany flats are subjected to partition or consolidation works in accordance with the requirements of those who wish to rent them; also measures are implemented to adjust the flats to specific needs of the disabled and seniors; conversely, in Poland, because of distributed ownership, administrators' interference in the layout of flats is practically impossible.

The directions of further development of the studied estates will be presented by means of SWOT analyses and scenarios to be prepared in the next tasks undertaken within the framework of the Project.

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