UNIVERSITY OF ZIELONA GÓRA

CIVIL AND ENVIRONMENTAL ENGINEERING REPORTS

CIVIL AND ENVIRONMENTAL ENGINEERING REPORTS

E-ISSN 2450-8594

CEER 2025; 35 (3): 0160-0180
DOI: 10.59440/ceer/205777
*Original Research Article*

# REVITALISATION OF THE 'SUPERUNIT' IN KATOWICE IN THE CONTEXT OF AN AGEING POPULATION. A CASE STUDY

Barbara PIERŚCIONEK, Dominik PUCHAŁKA, Justyna KLESZCZ[1]
Opole University of Technology, Faculty of Civil Engineering and Architecture,
Department of Architecture and Urban Planning, Poland

A b s t r a c t

The ageing population problem is frequently raised in economic and social contexts. In architecture, there is also a need to look for new solutions to improve the quality of life of senior citizens. Fundamentally, the question of improving the accessibility of existing facilities, which, with time, no longer meet the needs of the residents, is fundamental. This article aims to present a proposal for revitalising the 'Superunit' in Katowice based on research into the quality of life of senior citizens in Poland. Based mainly on a qualitative research method to assess the quality of the existing space, as well as on the results of a survey with open-ended questions and in-depth interview on the living conditions of senior citizens in the Superunit, a quantitative and statistical research method to identify user groups and their numbers, based on population-wide statistical data collected using mixed methods by the Statistics Poland (GUS) and the Public Opinion Research Centre (CBOS). As a result, the project to revalue the building, transforming it into a vertical housing estate, is fully adapted to older people's needs and meets the requirements for new residential facilities and solves problems related to the quality of the building's construction and the limitations of the architecture of the communist period. The revitalisation concept helps prevent social exclusion and supports seniors in adapting to new life circumstances. It enhances their life satisfaction, encourages greater activity, and fosters stronger social connections, contributing to improved physical and mental health. The presented approach can be implemented in the revitalisation process of specific buildings and entire housing estates, as well as at the design stage of new investments that meet the needs of older people. This will help improve the housing situation by increasing the accessibility and usability of residential units, while also reducing the amount of raw materials used to produce building materials, which will positively impact their cost.

Keywords: superunit, Katowice, revitalisation, modernist architecture, senioral architecture, social relations

## 1. INTRODUCTION

[1] Corresponding author: Opole University of Technology, Faculty of Civil Engineering and Architecture, Department of Architecture and Urban Planning,ul. Katowicka 48, 45-061 Opole, Poland, j.kleszcz@po.eu.pl, +48 77 449 8602

According to Statistics Poland, in 2021, 50.6% of households included at least one older person, and 25.4% were made up solely of seniors [1]. The 2021 National Census confirms the growing challenge of an ageing population - people aged 60 and over represented 25.7% of the population, up 5.5 percentage points from a decade earlier. By 2030, this group is projected to reach 29%, and 40.4% by 2050 [1].

According to the research, 64% of Poles intend to live in their flats in old age with the help of family, friends or neighbours. Meanwhile, 17% of respondents were willing to share a flat with their family or seniors. Only 5% of people were willing to use private (3%) or public (2%) retirement homes. Just 2% preferred co-housing with other older adults, and none expressed willingness to rent out space for care in return [2].

The core issue is not just the shortage of new senior housing or care facilities, but the challenge of adapting existing buildings. This requires more than removing physical barriers - it involves understanding deeper fears. According to CBOS (2012), 56% of seniors fear losing independence and becoming a burden; 32% worry about poor living conditions and loneliness; 16% are concerned about future care arrangements; and 6% fear feeling useless [3].

The adaptation of existing buildings also poses a challenge regarding current regulations, which are mainly related to stricter safety requirements regarding fire prevention and energy efficiency. Buildings designed according to old standards and using so-called 'closed' technologies prevent internal transformations [4], and the materials used in construction do not meet modern fire, evacuation or insulation requirements. It is essential to look for individual solutions for each facility that allow buildings to be adapted to current standards.

The necessity to adapt modernist facilities, the assessment of their suitability and the practices used have been described in the trade press [4] and scientific publications [5, 6]. The preferences and limitations of older people and the need to adapt buildings to their needs have been discussed in scientific articles [7] and monographs [8; 9]. This article highlights the importance of a holistic approach to adapting buildings for an ageing population - one that considers both functional efficiency, technical feasibility, and sociological relevance.

Previous research has shown the most significant impact of the difficulty of achieving the legally required thermal insulation coefficients with the help of simple technical solutions on implementing revitalisation processes in modernist, partly prefabricated housing estates in Poland. In the opinion of the Authors, much more critical in the whole process, in the case of each of the housing complexes, whether referring directly to Corbusier's idea or only loosely related to it, is the development of an appropriate scenario for far-reaching structural and functional transformations of the settlements in order to meet the most up-to-date social needs by the principle of variability in time and adaptability, which formed the basis of the designs of these settlements.

Previous research in this area has been limited to analysing only the physical and chemical parameters of the facilities as those to be achieved in each project, or on the contrary, in the case of seniors' architecture, has been limited to pointing out guidelines for the creation of new housing, without attempting to analyse the possible transformations in the place where the elderly live, without them having to move into newly built structures. This research shows that such measures are not only possible but have many additional positive effects on urban space.

To carry out the research, a facility was selected to provide the best solutions due to its style, age and assumptions. The Aggregated Housing Unit building is in the centre of Katowice, close to the Spodek. The facility, completed in 1972, is one of Poland's most significant residential buildings. Designed by Mieczysław Król during the communist period, the building struggled with many problems in the aftermath of post-war Europe's economic and social situation [10]. The detailed history of the project itself and the stage of realisation have already been described in almanacks of contemporary

Polish architecture of the period, such as the studies by Prof. Przemysław Szafer [11, pp. 137-147], in the trade press of the period [12], as well as - already critically, because from a contemporary perspective - in Aneta Borowik's studies on the phenomenon of architecture in Katowice [10].

Despite the iconic character associated with its form and location, the facility never reached its potential. This was due to the failure to realise some of the designer's objectives and economic constraints. In addition, a change in the social structure of the people living in the building, degradation, the facility's failure to keep up with the improving standard of new buildings with a residential function, or social resentment linked to bad memories of the communist period, resulted in a reduction in the total number of residents in the building and reduced interest in the facility.

For several years now, the 'Superunit' building has been an object of interest to researchers regarding its significance for the heritage of modernist architecture and its adaptability, which aligns with sustainable development. There is evidence that it has also been an object of analysis in research on the ageing of society (including the project 'Built space and the needs of seniors - socio-cultural and urban dilemmas of shaping the environment of residence of seniors', grant no. PBZ-MEIN-9.2/2006, 2007-2010 carried out at the Silesian University of Technology) [13].

The article aims to present the research results based on a qualitative research method to assess the quality of the existing space and quantitative and statistical research methods to identify user groups and their numbers [14]. The results of a literature study and archive search are also presented, as well as a revitalisation concept that will improve the residents' quality of life, adapt the facility to the needs of the elderly and allow 'Superunit' to regain its shine as an icon of communist architecture.

## 2. FACTORS INFLUENCING THE FORM AND PERCEPTION OF 'SUPERUNIT'

The picture of Katowice after the Second World War differed from the landscape of Warsaw, Gdansk or Wroclaw. Due to the small amount of destroyed urban fabric, the city concentrated on setting up industrial plants and organising the administration, which significantly influenced the direction and dynamics of the city's development. Politics also played its part. Significant was the figure of General Jerzy Ziętek holding the most important posts in the voivodeship since 1945 at the turn of the three decades. Due to the positions he held, he was responsible not only for voivodeship policy but also for investments. His influence allowed many projects to be implemented faster, even when encountering serious obstacles [15].

In 1948 the Polish United Workers' Party (PZPR) was founded. Many changes occurred with its founding, significantly affecting architecture and the entire private sector. The restrictions imposed and the lack of state commissions meant architectural offices could not survive. The entire construction sector suffered as a result of the imposed restrictions. Large companies were subject to nationalisation, and others that did not meet the relevant criteria could not survive without state commissions [15]. In 1948, a branch of the Central Bureau of Architectural and Building Projects (later Miastoprojekt) was opened in Katowice. It quickly became the largest employer for local architects. Specialised design offices were established in response to the growth of various industries. The architects who were part of the design teams dealt with industrial facilities and office, cultural or leisure facilities, which were the subject of investments undertaken by individual workplaces [15].

### 2.1. Problems of architecture in the PRL period

The interference of politics in architecture was not limited to the nationalisation of enterprises. In 1949, the National Party Meeting of Architects took place, at which a new trend to guide designers was adopted top-down. The ambiguity of the objectives led architects to look for prevailing trends in Soviet

architecture. Socialist-realist buildings were designed until 1955, although a gradual departure from this style could already be seen two years earlier [15].

A new chapter in the history of communist Poland began in 1956 as a result of social and political events. Designers were urged to draw inspiration from Western architecture. They gained more freedom. Innovative solutions began to emerge, and people were increasingly willing to experiment. Decorative elements in buildings appeared less frequently for economic reasons. This was one of the most dynamic periods in terms of the number of projects carried out. Public buildings, industrial and cultural facilities, railway stations and new housing estates were built [15].

The high volume of developments, the high cost, and the time-consuming design process, combined with a housing shortage, have provided the push to find new technologies. Prefabricated construction was supposed to solve the existing problems effectively. From the mid-1950s onwards, prefabricated elements became increasingly popular [15]. The introduction of the modular system was intended to help with both the design and the construction itself. The prefabrication was supposed to eliminate the randomness of construction due to the individual elements' specific dimensions [16]. In retrospect, using modularity and prefabrication to shape cheap, fast and affordable construction was correct, but the quality deviated significantly from the accepted standards [15]. The method took its toll on plasticity and utility value. It significantly limited the possibilities for creating new forms of facilities [16]. Designers' freedom was further restricted by the order to use prefabricated elements and by the newly created norms. Their role was limited to completing elements to put them together. Prefabricated components dominated housing construction in almost every city in Poland [15]. Strict limitations did not apply to designers of public facilities. Such realisations created the closest vicinity of the Superunit, starting with Spodek and the railway station in Katowice, through the Voivodeship Park of Culture and Recreation in Chorzów [15].

### 2.2. Foundations of modernist architecture

Mieczysław Król used the guidelines of modernism when designing the 'Superunit' building, and the inspiration for the project came from well-known buildings constructed in this style. The following chapter aims to provide a history of the development of the premises of modernism over the years, which will allow us to better understand the design decisions of the author of Katowice's icon.

Modernism as an architectural trend began to form after the First World War. The assumptions of modernism in Poland were a response to the country's problems after the First and Second World Wars. Providing access to housing, health, recreational, cultural and educational facilities became a priority—the term's meaning changed during the communist period. [17].

The assumptions of modernism strongly influenced the development of housing in Poland. Social housing was developed to counteract purely profit-oriented developments in which living conditions and the wellbeing of the residents were not taken into account. By moving away from the creation of cramped, dark and overcrowded flats with windows facing narrow courtyards, housing culture was improved. Sunny flats with access to fresh air and basic amenities have become available not only to the wealthy. Green courtyards, communal spaces, amenities such as laundry facilities and central heating to help keep the flats tidy were the main features describing social housing [18].

In creating new buildings, architects could decide whether the fully formed plan was to determine the shape of the building or whether the building façade was to define the plan layout. The desire to improve accessibility to new housing led planners to frame construction, which allowed for the rapid creation of typical dwellings. The limited possibilities for transforming plans meant that housing had to be adapted to meet the needs of many types of families [19]. Due to the varying needs of people in terms of required space, standards were created that specified the amount of recommended space per person

for each type of dwelling. Differences in the amount of recommended space were due to the fixed size of bathrooms, kitchens or hallways for different kinds of homes [20]. Typical flats also had to meet the characteristics of developable housing. The ability to adapt living spaces by changing the internal layout became very important [21].

The living room became the main room in the flats, serving as a living room, dining room and bedroom for older children, depending on the time of day [22]. By taking over the tasks of other rooms, its floor area was expanded at the expense of the area of corridors, storage rooms [19], or kitchens, which were replaced by kitchen alcoves equipped with an ergonomic set of furniture adapted to the order in which the work was carried out [22]. The furniture design trend has also moved into other rooms, enabling more efficient space use [19]. Bedrooms have been reduced in size, with their role limited only to satisfy the need for rest, and bathrooms and kitchens have been grouped to save on the lengths of the risers and levels of the various plumbing runs [19]—direct access to daylight and natural ventilation in as many rooms as possible also became essential aspects.

The units successfully allowed for the regeneration of both mental and physical strength [23]. Residents were able to satisfy their basic needs within their flats. For example, we can mention listening to music, reading books, meeting with friends or working outside of work [24]. However, due to the small size of the designed spaces, not all functions could be fulfilled within the individual units. It became necessary to create collective facilities to meet the other living needs of the residents, as well as collective spaces to fulfil the need for health care, entertainment, and relaxation [23].

The concept of indirect enrichment of dwellings through collective facilities was quickly adopted by the residents of the newly established settlements, who understood that such a solution was cheaper and more valuable than improving their units. An example is the residents' initiative of Warsaw's Rakowiec district, which built wooden buildings with social functions before a kindergarten, laundry or community centre was erected [25].

The holistic approach to the design of the housing estates was the basis for chalking out the following guidelines to raise the standard of the new flats. A small kitchen, toilet, and bathroom with a bath or shower had to be designed for each unit [24, 25]. The estate had to have a central boiler room, laundry, bathing facilities and a health clinic. In addition to facilities to meet basic needs, addressing the residents' social activities was necessary. It was recommended that the housing estates should have daycare centres, libraries or meeting rooms to enable social bonds between residents [24]. The designed settlements were also intended to provide a safe space for pedestrians by limiting vehicular traffic [25]. Access to green spaces within a radius of up to 200 m and the opening of farmland, meadows, orchards, or forests within a distance of 500 to 1,000 m have also become very important. People living in the city daily had the opportunity to interact with nature and the environment [26]. Treating housing estates as complete developments allowed for greater individualisation of typical dwellings.

Years later, modernist architecture was increasingly losing its supporters. The characteristics of the materials used, the poor quality of the craft or the lack of proper care for the common spaces meant that most of the facilities built were poorly aged.

Over time, the standard of living of the residents changed dramatically. Once prestigious flats with access to many amenities became forgotten units of the lowest standard. Neglected common areas became potentially dangerous places where residents went only as a last resort [17]. The norms, injunctions, and restrictions created to reduce the size of living areas, corridors, and common spaces and maximise the new housing amount have led to creating spaces that did not anticipate an ageing population. Small flats, cramped and dark bathrooms and corridors, and lifts that are not accessible everywhere prevent older people who struggle with deteriorating eyesight and mobility problems from functioning freely. The use of closed prefabrication systems has resulted in the impossibility of individualising each building, with the consequent occurrence of the same issues in many of the

buildings at the same time, and currently makes it impossible to freely transform the functional layout without interfering with the structural system [4].

Polish modernism was initially a solution to post-war problems. It had many advantages. Unfortunately, it was only after time that it was possible to verify its principles due to the long waiting period for the effects of the newly erected facilities. Among the many erroneous rules, eight principles can be singled out that had the worst impact on the image of modernism's architecture:

- disregard for the spatial context,
- the overuse of concrete,
- the creation of dehumanised spaces due to their monotony and monumentalism,
- the overriding position of motorised transport, linked to the division of the city into functional zones,
- the treatment of individuals as part of a mechanism rather than an organism,
- ideological totalitarianism is associated with ignoring the needs of individuals and attempting to control their fate.
- rejection of tradition and lack of connection to the spatial context,
- treating simple forms as easy has led to many undeveloped spaces and bland buildings [17].

Over the years, many renovations and modernisations have been carried out on modernist architecture in Poland. The approach to individual buildings is customised and depends on the needs, but it is mainly based on thermal modernisation and adequate insulation to counteract the corrosion of structural joints. There are a few examples where the authors of the revitalisation have taken the trouble to take care of the historic fabric while bringing the buildings up to current standards. These include the modernisation of the blocks of flats located at Plac Nankiera in Wrocław, where the authors maintained the original character of the façade by preserving the depth of the woodwork, and the renovation of Wrocław's 'Manhattan', where the designers focused on securing the structural elements, improving the thermal parameters and revitalising the degraded pavilion while maintaining the iconic character of the façades [5].

The issue of revitalising modernist facilities has also been raised in other countries, aiming to renovate the historic fabric of the buildings and introduce new elements to adapt the facilities to the latest needs of their users. The approach has been used in many iconic buildings worldwide, enabling them to regain their radiance while increasing their functionality. Modern strategies allow the quality of the space to be improved without much interference with the original fabric of the buildings, making the techniques used reversible and adaptable to subsequent needs. The Park Hill premises in Sheffield have been supplemented with office, retail and cultural functions, redesigned flats, and revitalised communal spaces. Finlandia Hall in Helsinki increased accessibility and was supplemented with an underground technical area. The Unité d'Habitation flats in Marseille were redesigned and complemented with modern amenities, and the complementary spaces were refreshed and updated. Habitat 67 in Montreal has retained its original layout while incorporating modern technologies to improve thermal comfort and energy efficiency. The interiors of the Velasca Tower in Milan have been revitalised and enhanced with new functionalities while preserving the iconic character of the tower [30].

### 2.3. The Aggregated Housing Unit

Mieczysław Król was ordered to work and ended up on the third floor of Katowice's Miastoprojekt, where the most critical projects in Silesia were created. To realise the concepts designed here, tenement houses were demolished, and the old fabric was transformed to bring more sunshine, greenery, and ventilation to the city.

Downtown Katowice was to be transformed into the city's commercial, administrative and cultural centre. According to the plans, the space was to gain a lot of green and sunny areas. Armii Krajowej Street was to become the city's showcase, where the most representative facilities would be erected in line with modernism. Competitions began to be organised for concepts for developing individual building quarters in line with the new guidelines. Mieczysław Król won first prize in a contest for a development proposal for the western part of the city centre, in which he designed a facility based on Le Corbusier's Unité d'Habitation [31].

A plot on Armii Krajowej Street was chosen as the location for the 'Superunit', and the facility was to counterbalance the 'Spodek', built on the opposite side of the General Jerzy Ziętek roundabout. Due to the swampy ground, a massive amount of concrete had to be used to make this project possible. When the problem with the foundations was solved, construction was halted by a decision made by the central authorities. General Jerzy Ziętek, who did not always obey the orders coming from Warsaw, allowed the work to continue, as he was keen that the investments made in the centre of Katowice should put the rest of the country to shame [31].


Fig. 1. View from Chorzowska Street showing ‘Superunit’ under construction, 1966. (Photo by John William Reps [32])

The height of the 'Superunit' did not exceed 50 m due to the limited height of cranes in Poland and the maximum length of lift cables available. Lifts were also not a widely available commodity. To limit their number, Mieczysław Król designed an innovative circulation system based on his research on the maximum waiting time for a lift that does not irritate. Although the system was very ingenious, lifts stopping at every third floor did not cause delight among residents [31].

The designed underground parking for 240 cars was also an innovative solution. According to the norms, the entire facility had four parking spaces, consisting of 762 flats prepared for 3823 residents. It was not easy to convince the central authorities to use the underground storey for this purpose. Still, the idea was implemented, which in retrospect proved to be a significantly important solution [31].

The 'Superunit' was designed as a single building with nine segments connected by corridors on floors 2, 5, 8, 11 and 14. This solution enabled more living space on the floors through which the corridors did not run. Among the nine segments, we can distinguish three types: an end segment, a segment with lift shafts and a standard one. Each segment with a lift was located between two other

segments. The space of the high ground floor was left free of development, not counting the communication shaft. The upper floors in each segment were repetitive and consisted of 3 types of flats of different sizes.

The flats have been designed according to a repeating pattern, in which one finds a living room, bedroom, kitchen, bathroom and hallway. The more extensive flats gained a storage room; the largest in the outer segment had two additional rooms. Economic constraints and the need to use a prefabrication system also meant that the kitchens in all flats were given indirect light. A window between the naturally lit bedroom and the blind kitchen was used. Also, the lack of access to high-pressure radiators necessitated other solutions. Heating walls were used to provide heat to the flats [31]. The individual partition walls were designed with a modular furniture system to fit each flat, saving space.

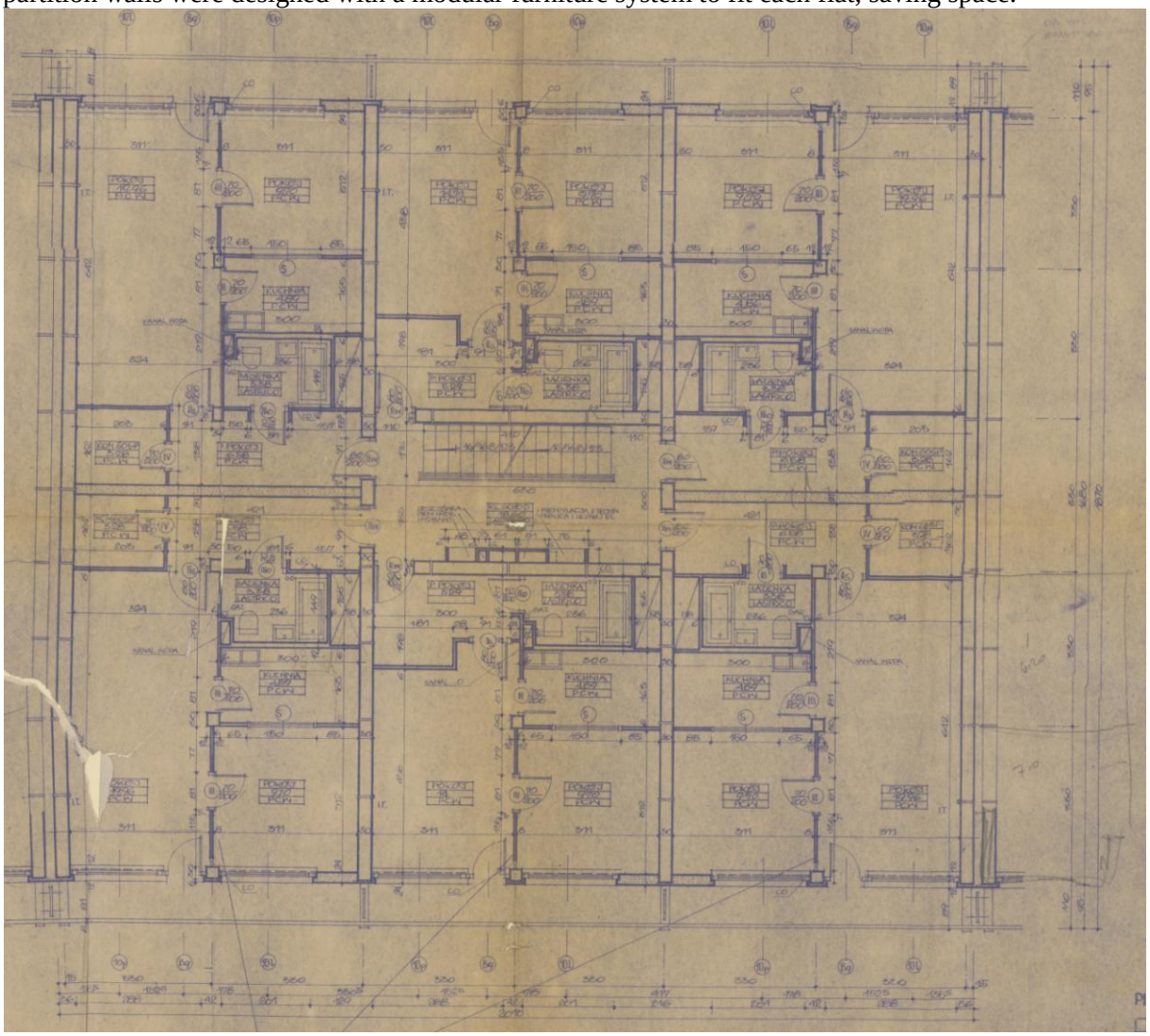

Fig. 2. Repeated floor plan in segments C4 and C7 - fragment of the technical design (floors no. 1, 3, 4, 6, 7, 9, 10, 12, 13, 15). Designer M Król, draughtsman Z. Knosała. Source: Śląska Biblioteka Cyfrowa [33]

Some premises could not be implemented due to the reality of the communist period. Mieczysław Król designed a kindergarten and a standard room for tenants in the building, taking Le Corbusier's

Unité d'Habitation as an example [34]. Still, it was ordered that more flats be designed in their place. The supply department only had green paint and proposed using damaged chairs from a furniture factory to create the decoration. The building, which was initially intended to become a Polish flat machine, only bears a slight resemblance to the Marseille counterpart [31].

The premises for the 'Superunit' housing unit have not stood the test of time. First, it was decided to build the Katowice Business Centre on a site originally intended for outdoor recreation for residents. However, the biggest problem was not the facility; it had been unfinished for almost 13 years. Then, the demolition of the Wedding Palace, standing in front of the building, began to erect two skyscrapers that would completely obscure the downtown icon. In the meantime, attempts were made to improve the quality of the space. The façade was renovated, and the eastern balconies of the facility were decorated with flowers thanks to a grassroots initiative [31].

The space inside the building has also deteriorated. The easy access to the facility and the widespread anonymity of tenants in such a large establishment encouraged the development of activities that differed significantly from the residential function. The brothels run in many of the units, and the dark corridors full of homeless people are just the tip of the iceberg of the site's accumulating problems [35].


Fig. 3. View from the area of Park Powstańców Śląskich, 2024. (Photo by Marek Mróz, CC BY-SA 4.0 [36])

## 3. THE CONCEPT OF REVITALISING THE ‘SUPERUNIT’

Using data from Statistics Poland, we can consider the leading group of current facility users to be seniors, who are part of 50.6 per cent of households in Poland in 2021, and seniors occupy 25.4 per cent of all households [1]. However, it is essential to adapt the facility to the needs of other age groups to diversify the age structure of the residents. This will make it possible to create a society where each age group plays its part.

To transform the facility into a vertical housing estate, it is essential to create additional spaces for residents to meet their needs. The willingness to be active and the type of activity are mainly dependent on a person's age and individual preferences. Although age plays a significant role in the case

of activity, the functions and types of activity are very similar between age groups and most often differ only in intensity and frequency. Each activity carried out by an individual has a specific purpose and can fulfil multiple functions.

Based on literature studies on activities undertaken by older people, two main categories of breakdown can be distinguished: the functions performed by the activities carried out and the types of activities. Activities performed by seniors can have a function:

- adaptive - allows seniors to better adjust to new situations,
- integrative - integrates seniors into different groups and helps to fill in gaps,
- educational - leads to the development of individual characteristics and aptitudes,
- recreational and leisure - helps cope with stress and regain a zest for life,
- psychosocial - helps improve the quality of life and leads to satisfaction [7].

The second division category is the types of activities that seniors consider essential. Among these, we can mention activities:

- domesticity - related to taking care of the household and family life,
- cultural - relating to, for example, participating in cultural events, being a member of clubs,
- occupational - it helps to fulfil the need to feel needed and valuable,
- social - it leads to feelings of satisfaction and enables relationships to be built,
- educational - it enables people to improve their skills and exercise their minds continually,
- religious - relating to the increased importance of the spiritual sphere in the lives of seniors,
- recreational - relating to physical exercise and leisure needs [8].

### 3.1. Functional programme

An analysis of the facility's structure and operational mode showed that the best results would be achieved if the building were theoretically divided into smaller units, facilitating residents' integration and providing greater identification with the local community. The individual units were created based on the existing communication system in the facility, which features the use of corridors over five floors linking the different segments together. Within the three main circulation routes that run the length of the entire facility and connect the nine building segments, units have been delineated that should contain functions to accommodate the majority of undertaken activities. Within the six circulation paths connecting the three adjacent building segments, units have been delimited to provide the opportunity to meet the needs for the most critical activities, among which are cultural, professional, social, and educational.

Complementary functions differ in their purpose and nature. Among these, an autonomous function can be mentioned, which can operate separately due to its characteristics. This is the nature of the kindergarten, the clinic and the hairdressing salon, which people from outside the building can also visit. The functions have been located on the ground floor, thus increasing the number of people in the Super Unit, consequently improving residents' safety and quality of life [32]. Another group is formed by core functions, which focus on meeting the most critical needs and enabling the integration of the residents of the individual units. Such functions include a reading room, where residents have the opportunity to meet outside their own homes, exchange books they have already read or spend some quiet time, and a work and study area, which can serve as a place for remote work or a place where students can study and solve assignments together. Another group includes unique functions located along the three main circulation routes, which will encourage the residents of the individual units to integrate with the other residents of the building. The location of the particular unique functions has been chosen so that most types of activity are possible on each floor and are related to the area of the other spaces in the facility. The cycling room, group activity room, and gym have been located on

different floors to allow residents to engage in sporting and recreational activities in a form and intensity that suits their needs. The standard room provides opportunities for younger and older children to relax and meet, as well as a space for play and study. The cinema room allows for cultural events, film screenings or theatre performances. The location of the daycare centre and cinema room is linked to the area of the kindergarten, allowing children to perform plays for their parents and improving communication. The shop and the residents' club have been located in the central part of the building to ensure equal access for all residents. The residents' club combines a meeting place, a relaxation area and a workshop to allow residents to develop their interests and organise events for the whole building. A place of tranquillity provides for meetings, meditation or prayer, alone or in a group. The location of the restaurant and café is linked to facilitating the use of their services by residents on the roof, which consists of 4 new spaces. The community garden offers the possibility to organise events, the vegetable garden to grow plants, and the terraces will allow residents to relax and integrate.

The current dwelling types were designed following the NTP-1959 guidelines [4], which define the size of individual dwellings by the number of persons in the household. The number of particular types of flats and their surface areas have been determined based on archival floor plans provided in the Katowice City Hall building archives (Table 1). The norms defining the size of the different types of flats and the individual rooms included were intended to ensure optimal housing conditions in newly constructed buildings. However, due to the difficult housing situation during the communist period, the norms established artificial assumptions, including a place to sleep in the living room, kitchens without the possibility of eating, or small bedrooms, which, over time, no longer met the needs of the inhabitants, and their standard increasingly diverged from the assumptions of newly constructed buildings. The normative floor area of the flats and the limitations of prefabricated construction offer little scope for transforming the functional layouts to meet the current needs of the residents. It became necessary to reduce the number of residents in the normative category of dwellings, which will allow greater freedom in shaping the interiors and adapting them to the individual needs of the residents [4]. Combining the individual apartments allows the creation of new flats, the floor area and functional design, which will meet the needs of large or multi-generational families (Table 2). A clear functional division and reduction of housing categories will allow for the redesigning of the flats and increasing the area of individual rooms, which will increase the accessibility of the space for persons with mobility difficulties. The demand for each type of new flats was determined based on data from Statistics Poland on the percentage of households with different numbers of people in cities in 2021. [1] (Table 3.). It was then checked whether there was sufficient supply to meet the demand for each type of housing with the minimum area indicated [37].

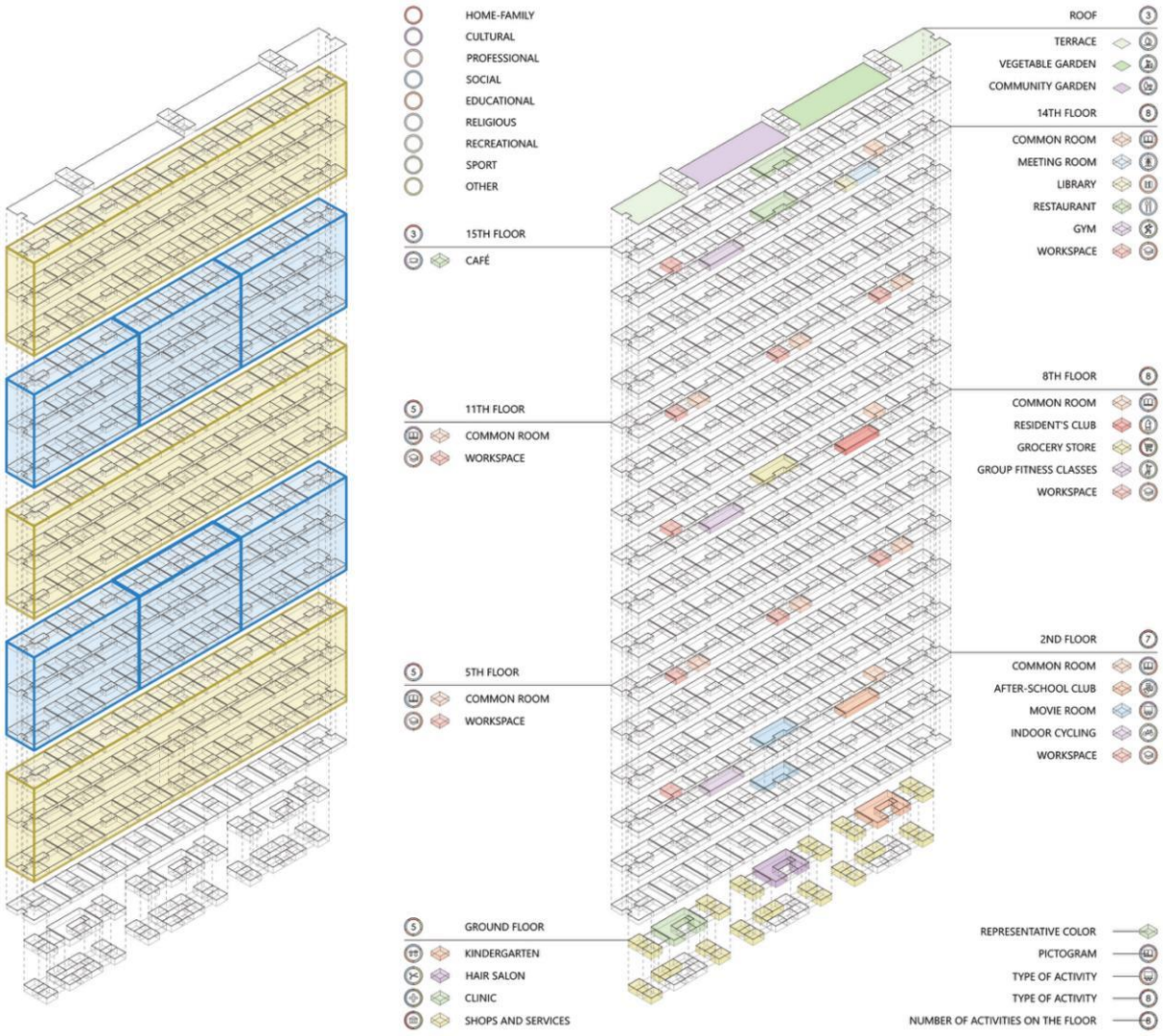


Fig. 4. a) Diagram of the division of the facility into neighbourhood units; b) Functional diagram (Author's own elaboration)

Table 1. Overview of existing housing types (Author's own elaboration)

| Number of people in the household | Existing apartment types according to NTP-1959 | Floor area of apartments according to NTP-1959 | Area of existing apartments | Number |
|---|---|---|---|---|
| 1 | - | 17 - 20 $m^2$ | - | - |
| 2 | - | 24 - 30 $m^2$ | - | - |
| 3 | M3 | 33 - 38 $m^2$ | 38,00 $m^2$ | 297 |
| 4 | M4 | 42 - 48 $m^2$ | 44,92 $m^2$ | 408 |
| 5 i więcej | M5 | 51 - 57 $m^2$ | 55,58 $m^2$ | 60 |

Tabela 2. Overview of designed housing types (Author's own elaboration)

| Number of people in the household | Types of designed apartments | Minimal floor area of apartments according to the guidelines | Area of designed apartments | Number |
|---|---|---|---|---|
| 1 | A2 (*M3*) | 25 $m^2$ | 38,27 $m^2$ | 134 |
| 2 | | 32 $m^2$ | | |
| 3 | A3 (*M4*) | 44 $m^2$ | 48,35 $m^2$ | 304 |
| 4 | A4 (*M5*) | 52 $m^2$ | 57,82 $m^2$ | 60 |
| 5 and more | A5 (*M3+M3*) | 63 $m^2$ | 76,23 $m^2$ | 14 |
| | A6 (*M3+M4*) | 69 $m^2$ | 86,67 $m^2$ | 94 |

Tabela 3. Demand for different housing types (Author's own elaboration)

| Number of people in the household | Percentage of households | Demand for different apartment types | Minimal floor area of apartments according to the guidelines | Required number of apartments with an indicated minimal floor area | New housing that meets the condition |
|---|---|---|---|---|---|
| 1 | 26,9% | 163,0 | 25 $m^2$ | 100% | 606 |
| 2 | 28,2% | 170,9 | 32 $m^2$ | 73,2% | |
| 3 | 19,5% | 118,2 | 44 $m^2$ | 45,0% | 472 |
| 4 | 14,5% | 87,9 | 52 $m^2$ | 25,5% | 168 |
| 5 and more | 11,0% | 66,7 | 63 $m^2$ | 11,0% | 108 |

## 3.2. Revitalisation concept

The ground floor of the building, consisting of 3 main circulation shafts and six staircases of individual segments, has been transformed to increase its functionality and improve security by reducing the number of unauthorised people entering the building. Each central circulation core, containing an entrance area, staircase, lift shafts, technical rooms, and a litter storage room, was connected to the entrances and staircases of the adjacent segments by glazed curtain walls.

This made it possible to create a spacious entrance hall, a bicycle storage room in place of the former entrance area and rooms for additional services. Fire protection doors have separated the hitherto open staircase in the main module, and the corridor between the lift shafts, the technical rooms, and the litter storage room has received new joinery. The floors on the ground floor have been replaced, insulated and levelled. A ceiling supported by reinforced concrete columns was constructed around the staircases of the adjoining segments, making it possible to create additional service rooms on level 2 of the high ground floor. Spaces for a hairdressing salon, a medical practice and a kindergarten were prepared by combining the existing rooms and replacing the window frames. Unobstructed passageways were retained between the three main circulation risers.

Due to the extent and level of intrusion, revitalisation of the ground floor would be the most costly element of the development. Despite the high cost, revitalisation would improve residents' wellbeing and give them greater access to particular services. The housing association could finance the investment, which would receive funds from renting the service spaces once completed. Another funding source is investors who pay upfront for the ownership deed of individual service spaces.

Intervention in the structure of the building on the upper floors has been limited to creating additional spaces and transforming the individual flats according to previously accepted premises. The spaces were designed respecting the installation and structural grid of the building. Weakened elements in the structure of the building were reinforced using steel beams and CFRP strips [38]. The window joinery in the facility has not been replaced, thus retaining its original character, and the façade has retained its existing rhythm. The balconies gained elongated pots, which are located directly on the external wall of the facility, in place of the existing metal balustrade extending the wall, allowing the façade to be enlivened by the introduction of extensive greenery. The pots were made of metal painted white, which creates a coherent composition with the white-painted façade. Part of the balcony has also been arranged for light pots to plant higher greenery. Some of the balconies also have plant pots, which are located on the window sill. In addition, a modular wall of wooden planks has been designed on the balconies, which, when unfolded, form a set of garden furniture and a clothes drying rack.

The revitalisation of the balconies and the improvement of the façade could be carried out in the first stage. Transforming the residential spaces for complementary functions would be a lengthy stage and much more challenging to implement. It would involve the housing association buying out individual flats after obtaining consent from the owners. Given the large number of currently unoccupied apartments, this stage would have been quicker in particular parts of the facility. In contrast, in others, it would have involved postponing the redevelopment process due to the residents' refusal to move. The spaces acquired by the housing association could be transformed through a process of public participation by the residents, and the investment cost would be limited to the cost of materials only. The transformation of the flats and the change in housing types is a matter for the owners, although it is essential to aim for the assumed percentage of the different housing types.

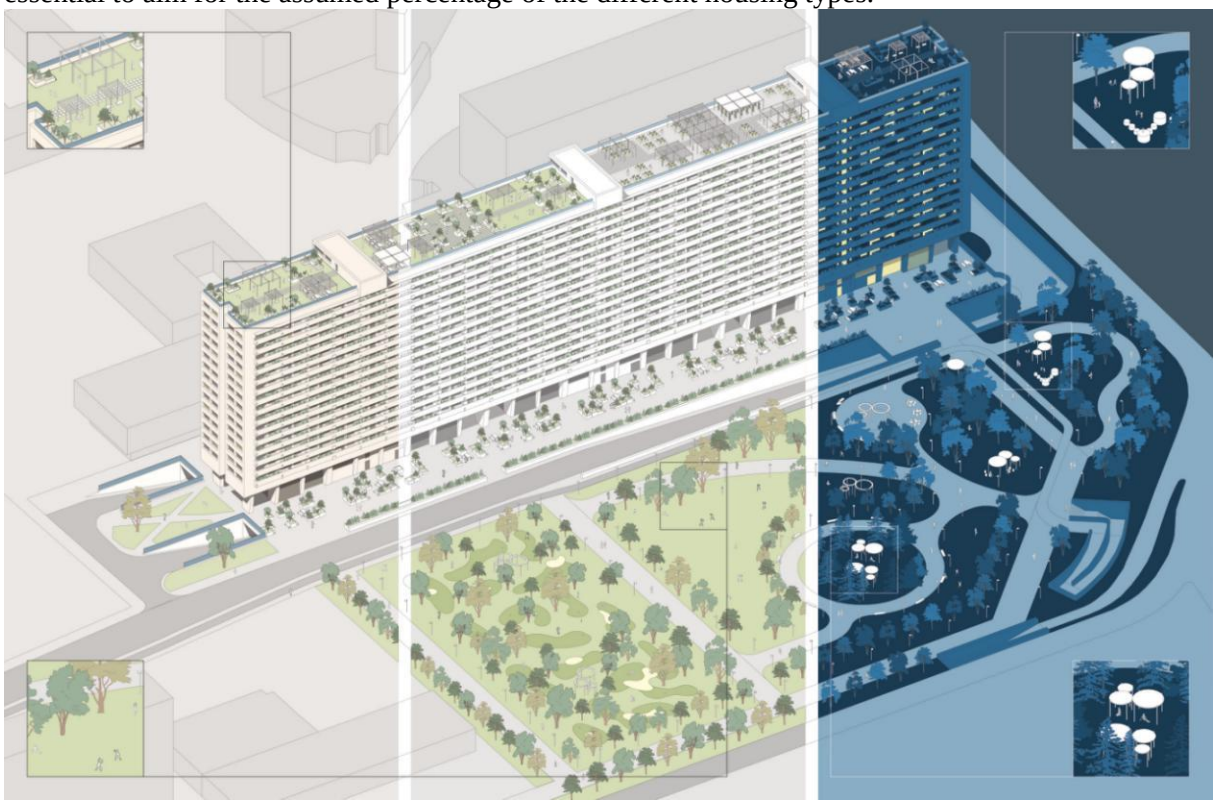

Fig. 5. Visualising the effects of revitalisation (Author's own elaboration).

The facility's roof has been given a new appearance by converting the flat roof into a green one. The space has been used to locate two residents' terraces, a community garden and a vegetable garden. The terraces have been provided with new pavilions, swings, plant pots, and landscaping, which act as quiet places for residents to relax. The vegetable garden has pots for planting fruit, herbs, and hydroponic towers. Some pots have been adapted for wheelchair users by raising the base to allow a wheelchair to get under the pot. The different zones of the garden have been designed with the different sunlight requirements of the plants in mind. The location of the sides of the world and the various types of pavilions are responsible for regulating the intensity of the light. The community garden has pavilions, swings, greenery pots and small architecture. It makes it possible to organise events for residents and private special events. In the superstructures, rooms have been designed to house deckchairs and gardening equipment for residents' use.

Changing the roof type would require the most significant financial outlay, but could be funded by available grants to implement green roofs and vertical gardens. Other roof features could be funded from housing association funds or sponsorships obtained.

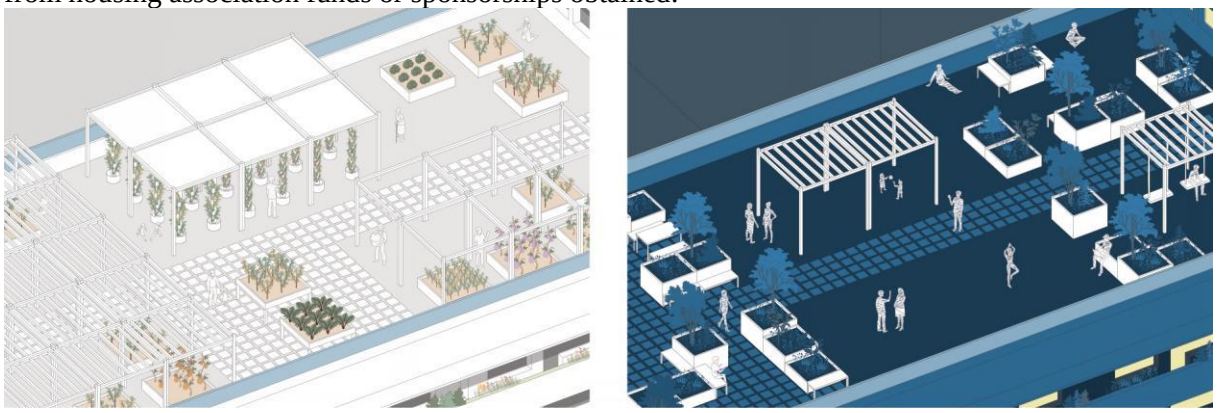

Fig. 6. a) Visualisation of a rooftop vegetable garden; b) Visualisation of the community garden on the roof (Author's own elaboration).

## 3.3. The site plan

It is also essential to redesign the area around the building to provide space for residents to carry out outdoor activities. To this end, an analysis was carried out of the area around the 'Superunit', which is within reach of residents walking for a maximum of 15 minutes, resulting in the area between Franz Winckler Street and Wojciech Korfanty Avenue being used for the implementation of a functional programme.

The facility mainly occupies the western part of the site, and the area around the building is paved due to the location of the underground garages directly below the site. Previously, the space has been used for overhead car parking. Due to a change in the character of the ground floor of the building, an increase in the number of services present and the desire to dedicate this space to pedestrians, the overhead car park was converted into a pedestrian walkway on the west side and a pedestrian/pedestrian walkway on the east side to allow access and waste collection from the ground floor areas. The new pedestrian routes received new paving and were enhanced with designed plant pots for greenery and landscaping elements.

The eastern part of the site is connected by a transition over the road in the northern zone of the development area, which provides a convenient and safe connection. The park part has been developed based on the archival landscaping design and the area's existing pedestrian routes and cycle paths. The

new paths have delineated distinctive spaces that, like the complementary functions in the building, have been tailored to allow for the previously mentioned activities and individual goals and needs. Among the uniquely shaped zones, the playground in the northern part is dictated by the kindergarten's location in the building's northern part. Where the cycle path intersects with the transition connecting the two parts of the plot, a city bike station has been located, allowing residents to access an ecological form of transport. To the south of the city bike station is a small square with a body of water and water pavilions, where tables for table games and many seating areas have been designed. In the eastern part of the plot, we can find a pavilion with an overhead library, which will allow the residents of the entire district to borrow books and exchange items already read. In the central part of the plot, we can find a place of tranquillity made up of several pavilions hidden among many coniferous trees. This allows residents to escape from the city's noise and bustle and realise the need for spiritual activity in the fresh air in silence. The community can perform various activities in the large open area in the western part of the site. The space can also be used to organise group activities transferred to the fresh air from the various complementary rooms in the Super Unit. The southern part of the site has been landscaped for mini-golf, which helps to diversify and encourage outdoor physical activity for seniors.

The entire site has been enhanced with a new stand of trees that are going to help with thermoregulation and provide shade in the different parts of the plot. The amount and location of planting have been chosen to achieve the best possible conditions in the designed areas and to replicate their unique character. An isolating green belt has been designed on the north and east sides, which will help reduce the effects of noise emissions generated by the streets: Drogowa Trasa Średnicowa and Wojciech Korfanty Avenue.

The openness and size of the designed green space allow it to be used by the residents and the whole neighbourhood. The site's revitalisation would enable the development of another parking space in the city, which is particularly important given its location and the lack of public green spaces in the immediate vicinity, so it could be implemented as a public-private partnership.


Fig. 7. The site plan concept (Author's own elaboration).

## 4. CONCLUSIONS

Every year, the effects of an ageing population become increasingly apparent. They bring with them many difficulties that affect all areas of society. In architecture, they are also making it necessary to look for new solutions to counter the problems that are arising. Adapting existing facilities to the needs of older people and people with disabilities is only part of the solution, which often overlooks other aspects such as emerging illnesses, loneliness, lack of independence, lack of care, fear of being a burden to others or fear of being useless.

It is essential to understand the needs of older people to enable them to function freely in everyday life. Based on literature studies on activities undertaken by older people, we can identify the types of activities, their purpose and their effects. Seniors' activities not only fill their leisure time but also help them adapt to new situations and cope with stress, develop qualities and skills, improve their quality of

life, and increase satisfaction [7, 8]. Enabling seniors to carry out individual activities should be one of the primary considerations when adapting facilities to the needs of older people, as this will significantly enhance their quality of life.

To implement the outlined premises, a building of the Aggregated Housing Unit was selected, which, in addition to being unsuitable for older people, suffered from several problems related to the economic and social situation during the communist era. The facility was transformed into a vertical housing estate, within which, in addition to the residential spaces, additional functions were proposed, which were selected in such a way that the activities within them would enable the residents to realise home-family, cultural, professional, social, educational, religious and recreational activities [8]. The choice was also influenced by the preferences of different age groups regarding leisure activities to find the best possible fit and to enable the realisation of individual goals [39].

The presented design solutions applied in the 'Superunit', preceded by extensive analyses and literature studies, show how important it is to take a broader view of the needs and limitations of elderly people and the need to create a space for them that will prevent exclusion and help them adapt to their new condition. A well-prepared environment and surroundings will increase the life satisfaction of seniors, mobilise them to be more active and deepen their social relations, consequently contributing to better physical and mental health.

The applied solutions provide universal guidelines that can be used for other buildings and entire housing estates, which is particularly important given the large number of buildings designed to the same standards over a similar period. Revising more buildings will allow them to regain their splendour, extend their life, increase residents' comfort and improve the quality of urban spaces. Focusing primarily on revitalising existing buildings will reduce the amount of new construction and building materials used. Improving the quality of individual buildings will also increase interest and revitalise forgotten urban districts. Implementing environmentally friendly elements such as green roofs, rainwater retention systems, properly executed thermal insulation, and material recycling will help reduce the carbon footprint of individual buildings and prepare them for the effects of ongoing climate change.

Before embarking on the revitalisation process, it is important to test the functioning of the aforementioned model on a smaller scale in order to obtain more accurate data on the activities undertaken by senior citizens. The model should be implemented gradually, limiting itself in the first stage to proposing communal spaces enabling the realisation of cultural, social, professional and educational activities. It is also important to continue researching the needs of senior citizens and the possibilities of transforming housing spaces according to the form of housing ownership.

An important aspect is verifying and updating data obtained from open-ended questionnaires and in-depth interviews. The collected opinions are subjective, often difficult to interpret clearly, and may become outdated. It is also crucial to conduct surveys among residents of specific buildings or housing estates, as their needs and perspectives can vary significantly.

Despite the numerous benefits of revitalising modernist buildings, developers may hesitate to undertake such projects due to potential challenges. To encourage them, local authorities can support revitalisation projects through various subsidies. Tax incentives and simplified legal procedures could motivate developers to modernise old buildings. It is also crucial to implement regulations that define key elements to be adjusted to ensure the space meets the necessary standards and is suitable for older adults.

The presented revitalisation model is an important voice in the discussion on the importance of adapting cities to the needs of an ageing population, but also on the obligation to develop guidelines for new investments and a plan to move towards accessible, barrier-free and people-friendly cities.

## REFERENCES


1. Główny Urząd Statystyczny 2023. *Narodowy Spis Powszechny Ludności i Mieszkań 2021. Rodziny w Polsce w świetle wyników NSP 2021 [National Population and Housing Census 2021. Families in Poland in the light of the Census 2021 results]*, https://stat.gov.pl/spisy-powszechne/nsp-2021/nsp-2021-wyniki-ostateczne/rodziny-w-polsce-w-swietle-wynikow-nsp-2021,7,2.html (accessed 01.04.2024).
2. Starzyk, A 2017. Architektura senioralna – studium problemu wobec nowych wyzwań XXI wieku [Senior Architecture – Study of the Problem Facing the New Challenges of the 21st Century]. *Kwartalnik Naukowy Uczelni Vistula, **4***, 21–30.
3. Centrum Badania Opinii Społecznej 2012. *Polacy wobec własnej starości [Poles in the face of their own old age]*, https://cbos.pl/SPISKOM.POL/2012/K_094_12.PDF (accessed 01.04.2024).
4. Korzeniewski, W 2021. O problemie przydatności użytkowej zasobów mieszkaniowych w budynkach z wielkiej płyty zbudowanych przed rokiem 1990 [On the problem of the usability of the housing stock built in large panel system constructed before 1990]. P*rzegląd Budowlany **10***, 27–31.
5. Jabłońska, J and Wojciechowski Ł 2022. Renovation of Modernist Architecture Study Based on Selected Cases. *Buildings, **12***, 195.
6. Turecki, A, Tur, M, Czarnecki, B, Januszkiewicz, K and Fiuk, P 2022. Renovation of Modernist Housing Developments in the Pursuit of Modernity for Wellbeing and Clean Energy. *Energies, **15***, 3737.
7. Mielczarek, A 2010. *Człowiek stary w domu pomocy społecznej. Z perspektywy polityki społecznej i pracy socjalnej [ An elderly person in a nursing home. From the perspective of social policy and social work]*. Toruń: Wydawnictwo Edukacyjne AKAPIT.
8. Orzechowska, G 2001. *Aktualne problemy gerontologii społecznej [Current issues in social gerontology]*. Olsztyn: Wydawnictwo Uniwersytetu Warmińsko-Mazurskiego.
9. Sim, D 2022. *Miasto życzliwe [A friendly city]*. Kraków: Wydawnictwo Wysoki Zamek.
10. Borowik, A 2021. *New Katowice: the form and ideology of the Polish post-war architecture based on the example of Katowice (1945–1980)*. Warszawa: Neriton.
11. Szafer, P 1977. *Polska architektura współczesna [Polish contemporary architecture]*. Warszawa: Wydawnictwo Interpress.
12. Gierlinska, K 1963. Superjednostka [The Superunit]. *Fundamenty, **22***, 8–9.
13. Komar B and Kucharczyk-Brus, B 2011. „Superjednostka" w Katowicach w aspekcie idei rozwoju zrównoważonego [„Superunit" in Katowice in the aspect of sustainable development]. in: Z. Bać (red.) *Habitaty - zrównoważony rozwój środowiska miejszkaniowego.* Wrocław: Oficyna Wydawnicza Politechniki Wrocławskiej, 179–181.
14. Niezabitowska, E 2014. *Metody i techniki badawcze w architekturze [Research methods and techniques in architecture]*. Gliwice: Wydawnictwo Politechniki Śląskiej.
15. Syska, A 2021. *Spodek w Zenicie. Przewodnik po architekturze lat 1945-1989 w województwie śląskim [Spodek in Zenith A Guide to the Architecture of 1945-1989 in the Silesian Voivodeship]*. Warszawa: Narodowy Instytut Architektury i Urbanistyki.
16. Kleyff, Z 1952. Projektowanie architektoniczne w systemie modularnym [Modular system of architectural design]. *Architektura, **6***, 157–159.
17. Kępkowicz, A, Sosnowska, M and Woźniak-Kostecka, I 2021. *Modernizm między budynkami [Modernism between buildings]*. Warszawa: Wydawnictwa Uniwersytetu Warszawskiego.
18. Toeplitz, T 1929. Społeczne budownictwo mieszkaniowe [Socially-oriented housing]. *Dom Osiedle Mieszkanie, **1***, 16–18.

19. Brukalski, S 1930. O planach małych mieszkań [About the plans for small flats]. *Dom Osiedle Mieszkanie,* ***3,*** 8–10.
20. Goryński, J 1973. *Mieszkanie wczoraj, dziś i jutro [Housing yesterday, today and tomorrow]*. Warszawa: Wiedza Powszechna.
21. Skibiniewska, H 1974. *Rodzina a mieszkanie [Family versus housing]*. Warszawa: PWN.
22. Brukalska, B 1929. Kuchnia współczesna [Contemporary kitchen]. *Dom Osiedle Mieszkanie,* ***1***, 8–10.
23. Piotrowski, R 1938. Urządzenia społeczne w osiedlach robotniczych [Social facilities in workers' settlements]. *Dom Osiedle Mieszkanie*, ***1***, 2–8.
24. Brukalska, B 1948. *Zasady społeczne projektowania osiedli mieszkaniowych [Social design principles for housing estates]*. Warszawa: Trzaska, Evert i Michalski.
25. Syrkus, H 1976. *Ku idei osiedla społecznego. 1925-1975 [Towards social housing. 1925-1975]*. Warszawa: Państwowe Wydawnictwo Naukowe.
26. Czerny, W 1972. *Architektura zespołów osiedleńczych [Architecture of settlement complexes]*. Warszawa: Arkady.
27. Głuszczak, J 1968. Architektura przyszłości kat. Wystawy w Muzeum Architektury i Odbudowy we Wrocławiu, grudzień 1968 – styczeń 1969 [Architecture of the future. catalogue of the exhibition in the Museum of Architecture and Reconstruction in Wrocław, December 1968 - January 1969], komisarz wystawy: K. Turkiewicz, red. Katalogu: Czerner O., Wrocław: Muzeum Architektury i Odbudowy we Wrocławiu, 1968.
28. Drzewiecki, P 1934. Modernizm w architekturze i budownictwie [Modernism in architecture and civil engineering]. *Wiadomości Literackie,* ***35***, 4.
29. Bielecki, C 1978. Ciągłość w architekturze [Continuity in architecture]. *Architektura*, ***3***–***4***.
30. Eduardo, S 2025. Material Strategies for Updating and Repurposing Modernist Classics. *ArchDaily*. https://www.archdaily.com/1026214/material-strategies-for-updating-and-repurposing-modernist-classics (accessed 12.03.2025).
31. Springer, F 2022. Źle urodzone. Reportaże o architekturze PRL-u [Badly Born. Reports on the architecture of the PRL era]. Kraków: Karakter.
32. https://fotopolska.eu/John-William-Reps,autor.html?galeria_zdjec=&w=4&autor=John-William-Reps&f=1001609-foto (accessed 19.02.2025).
33. Klimek, F and Król, M 1966. *Projekt techniczny budynku mieszkalnego "Superjednostka" w Katowicach – rzut piętra [Technical design of the residential building 'Superunit' in Katowice - floor plan]*. Katowice: Miastoprojekt - Katowice. Śląska Biblioteka Cyfrowa, sygn. oai:www.sbc.org.pl:350194. https://www.sbc.org.pl/dlibra/publication/edition/350194 (accessed 19.02.2025).
34. Kania, J 2017. Wpływ jednostki mieszkaniowej le Corbusiera na powstanie „Superjednostki" w Katowicach [The impact of Unite d'Habitation on the formation of Superjednostka in Katowice]. *Teka Komisji Architektury, Urbanistyki i Studiów Krajobrazowych,* ***12(1)***, 7–15.
35. Klemens, N 2011. Refleksje z badań warunków życia seniorów w Superjednostce i na Zatorzu [Reflections from the research of senior's living conditions in Super-unit and at Zatorze]. *Zeszyty naukowe Politechniki Śląskiej, seria: Architektura,* ***1855***, 105–110.
36. Mróz, M 2024. *Katowice - Śródmieście. Aleja W. Korfantego 16-32. Superjednostka [Katowice - Midtown. Aleja W. Korfantego 16-32. Superunit]*. https://commons.wikimedia.org/wiki/Category:Superjednostka#/media/File:2024-04_Katowice_Superjednostka_(3).jpg (accessed 19.02.2025).
37. Rozporządzenie Rady Ministrów z dnia 7 listopada 2007 r. w sprawie warunków i trybu udzielania kredytów i pożyczek ze środków Krajowego Funduszu Mieszkaniowego oraz niektórych wymagań

dotyczących lokali i budynków finansowanych przy udziale tych środków [Order of the Council of Ministers of 7 November 2007 on the conditions and procedure for granting credits and loans from the National Housing Fund and certain requirements for premises and buildings financed with the participation of these funds] (Dz.U. 1995 nr 133 poz. 654).
38. Piątek, B and Siwowski, T 2016. Wpływ kotwienia mechanicznego taśm CFRP na efektywność wzmocnienia belek żelbetowych [The influence of mechanical anchoring of CFRP strips on the effectiveness of reinforced concrete beams]. *Inżynieria i Budownictwo*, ***12***, 659–662.
39. Banach, M and Gierat, T 2013. *Formy spędzania czasu wolnego [Forms of leisure activity]*. Kraków: Wydawnictwo scriptum.