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The influence of urban design standards on services accessibility shown as a case study comparison of Nowa Huta and Ruczaj neighbourhoods

Introduction

Cities, since the very beginning of their existence, have been multifunctional centres of intensified human settlement. The former and dense character of an ancient, medieval or renaissance city resulted in the concentration of various objects within a relatively small area [1]. It allowed its citizens to fulfil different needs and accomplish a variety of daily tasks easily. Housing often abutted craft workshops, or commercial, religious and administrative facilities. As civilization has evolved and grown so has the city. Nowadays we often recognise their division into monofunctional areas or districts, among which we can distinguish housing, office and administrative, commercial and industrial areas. However, it must not be forgotten that, despite various challenges assigned to cities, it is people, as their residents who should always be at the centre of all issues related to urban planning.

Contemporary residential complexes should provide people with the best possible access to places to meet their needs, especially the basic ones. Theoretically, in urbanised areas this task should be easier, as the increased population density positively affects the economic justification for many investments. Unfortunately, newly built Polish residential complexes often implement these assumptions to a very limited extent. Developers usually focus on housing and typically commercial functions. Such issues often occur in Cracow, where new estates are not accompanied by the development of adequate infrastructure. As a result, not only a decreasing quality of new housing areas and rising dissatisfaction of inhabitants is observed but also an

increased demand for transport, often private [2]. Another commonly appearing issue is insufficient medical and educational infrastructure, to handle the increased number of people. Unfortunately, the actions of authorities usually are both late and constitute a reaction to an already existing problem. This paper is a case study and a comparison between two residential complexes established in Cracow at different times and in different political and economic conditions, i.e., Nowa Huta and Ruczaj.

State of research

Housing environment is a complex issue not only connected with numerous fields of research but also urban design standards and the notion of sustainable development. The origin of contemporary urban design theory could be traced back to the turn of the 19th and 20th century. The ideas that emerged at that time were a response to the problem of rapidly expanding cities in the era of the Industrial Revolution. One important example from this period is Ebenezer Howard's concept of the Garden City [3]. It shows not only urbanistic but also a socio-economic vision for new urban sites. Residential, industrial, green areas and public facilities such as town hall, museum, library, hospital, schools with sports grounds, etc. were included to provide optimal living, work, and leisure conditions for inhabitants. Due to their population (around 30 thousand), garden cities can be treated as complexes where every basic need can be reached within walking distance. Yet another interesting concept was the Neighbourhood Unit by Clarence Perry [4]. This idea assumes that the city is divided into smaller units, separated by main traffic arteries. Consequently, traffic in a particular unit would be reduced, providing safety and comfort for pedestrians. Furthermore, residents would have access to

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Table 1. Population density vs. city public infrastructure
(elaborated by K. Klus based on [3, p. 242])
Tabela 1. Gęstość zaludnienia a rozwój infrastruktury miejskiej
(oprac. K. Klus na podstawie [3, s. 242])

Infrastructure elements	Population density		
	50 persons per hectare	100 persons per hectare	150 persons per hectare
Service accessibility	only 50% of the population lives within 500 m radius (walking distance) from basic services	increased variety of social structure and service accessibility	possibility of provision of all necessary services
Transport	use of a private car is preferred, public transport is unprofitable	bus public transport is optimal	increase in other types of public transport profitability

schools, green spaces, commercial and service premises. All that would allow satisfying all basic needs of people living inside a unit. The document that had a huge impact on the urban planning of the 20th century was the *Athens Charter* written down by Le Corbusier during CIAM (International Congresses of Modern Architecture) in 1933 [5]. Despite criticisms of many of its arguments, some of them are still valid. It focused on people's living conditions, e.g., accessibility to public education and green spaces. Furthermore, point 79 refers to a very important aspect of urban design – time: *The cycle of everyday functions: to live, to work, to rest, will be governed by urban planning using economical time management*¹ [5, p. 206].

Another text that analyses modern housing environment is *Wyzwania zrównoważonego rozwoju w Polsce* [Challenges of sustainable development in Poland] [6] published by the Sendzimir Foundation. Tomasz Jeleński, one of the authors of this publication, argues that within walking distance (5 to 10 min or 300–800 m) there should be [...] *all necessary services and workplaces, but also entertainment venues [...], trade centres, clinics, nurseries, kindergartens, primary schools, gathering spots for the local community, widely available sports facilities, small gardens and parks*² [6, p. 242]. He argues further the need for deliberate increase in the population density of an urban area, as it favours the development of social infrastructure and the protection and increase in the size of green areas. Three levels of population density are proposed: 50, 100, and 150 persons per hectare. It creates pedestrian access to the basic city functions and also to public transport (Table 1).

A necessity of urban design standards is fully recognised by Grażyna Dąbrowska-Milewska in her article *Czy w Polsce potrzebne są krajowe standardy urbanistyczne dla terenów mieszkaniowych?* [Do you need national urban standards for residential areas in Poland?]. She raises the case of liberalization of laws defining urban design standards at the time of political transformation in Poland [7]. As the author points out, this change moved responsibility

on the local government. Furthermore, after analysing various studies of conditions and directions for the spatial development of the cities and zoning and local zoning plans, she indicates the omission of many factors, the internal inconsistency of laws, and vast differences between distinctive administrative units. Yet another interesting factor is the economical one. Urban norms adopted in 1974 were developed in a different political and economic system. Financial profitability was a secondary priority at that time, thus allowing more of green space between buildings. Dąbrowska-Milewska picks out the fact that a financial profit resulting from local zoning plans is a dominant incentive governing urban planning, which leads to avoiding the public benefit investments i.e. schools and roads. Summarising the article, the author proposes the introduction of state-wide urban design standards in order to organise public spaces in Poland. Another paper of hers further elaborates on the idea and specifies what particular standards ought to be introduced [8]. She indicates a need to cover the requirements, including access to public services such as education, medical care, as well as their specific urban planning requirements (see: Table 2).

Basic, modern tools for implementing the above knowledge in Poland by local government is through local zoning plans. Unfortunately, they are not always given due attention, as it is noted by Konrad Henning [9]. He underlines that despite the common consensus on the necessity of designing plans for the whole country, no legal obligation was imposed on the municipalities. Some of them resign from creating zoning plans because of a negative financial impact due to the emergent obligation to buy some land from the private sector. Surprisingly enough, effects of uncontrolled, chaotic spatial development create hidden costs. According to PAN's calculation cited by Henning, they reach up to 84.3 billion PLN annually and keep on rising [9]. In his paper, the author also argues for a necessity of creation of state-wide urban design standards, which would be a foundation for future local zoning plans and decision on land development and management conditions (WZiZT)³.

¹ Own translation.

² Own translation.

³ In Henning's text, the main focus is put on urban sprawl, traffic infrastructure capacity and adequateness of building's volume.

Table 2. Urban indicators and standards for social infrastructure and education (source: [8])
 Tabela 2. Wskaźniki i standardy urbanistyczne dla infrastruktury społecznej w zakresie usług opiekuńczo-wychowawczych i edukacyjnych
 (źródło: [8])

No.	Urban indicators and standards	Level of educational facility			
		nursery	kindergarten	primary school	lower secondary school*
1	percentage of inhabitants using services [%]	0.3	3	6	3
2	recommended capacity [number of children]	60	120	500–700	300–600
3	facility's area [ha]	0.3	0.4	1.5–2	1.5–2
4	quantity of inhabitants per one facility	20 000	4000–5000	10 000	10 000–20 000
5	area per one inhabitant [m ²]	0.15	0.9	1.8	1.0–1.5
6	optimal maximal pedestrian access radius	1000	500	500 800**	800 1000**
7	maximal pedestrian access radius according to the 1974 urban law	500	500	500	–

* In 2017 lower secondary school was dissolved for primary school extension [author's remark].

** Values accepted only in low population density area.

Research

Selection of examples and their history

During the Polish People's Republic time, certain urban design norms were in use, which were later abandoned by the newly formed Republic of Poland [7]. The norms regulated building density, accessibility to services and green spaces. Naturally, those norms and other laws regulating the field were centrally governed, restraining bottom-up or private initiatives. At the same time, living standards were important incentives for urban designers. Thanks to that, along with the new residential buildings, schools, medical facilities, shops and other needed services (according to norms) were built. After the political transformation of the early 1990s and the abandonment of a centrally driven economy, urban design norms were no more valid. According to Andrzej Grudziński, it took place under the pressure of the environment designing implementation studies to facilitate the designing work [10]. Since that time, many projects created in Cracow are the examples of how badly this change affected Polish urban space [11]. In order to illustrate this problem better, a comparison between two important Cracovian residential complexes was made. The selection of examples aims to show the differences between urban project in the case of top-down strict regulations (Nowa Huta) and project with substantial inventive freedom not covered by detailed zoning regulations (Ruczaj).

Nowa Huta dates back to the 1950s. It is a product of the work of a team of many architects and urban planners, led by Tadeusz Ptasiński – the head designer [12]. It is worth noticing that one of the most important elements, in a way “smuggled” from the West, was the neighbour-

hood unit [13]. Originally, Nowa Huta was planned to be a sovereign city, but it was quickly incorporated into Cracow. By design, its main citizens were the working class of a vast industrial complex called Vladimir Lenin Steelworks (today Tadeusz Sendzimir Steelworks). Other jobs in the city were those focusing on maintaining the city (schools, healthcare, shops etc.). Hence Nowa Hutas' inhabitants were economically dependent on Steelworks as its main income provider. This has become problematic during not only the political and economic shift but also the shrinking industrial market. Nevertheless, education, healthcare, commerce and service, as well as culture were provided for the whole district.

Ruczaj is located in the south-western part of Cracow. It dates back to the mid-1980s when its northern part was slowly occupied by the first blocks of flats made with the large panel building technology⁴ [14]. The next chapter in Ruczaj evolution is strictly connected with the development of the Jagiellonian University Campus on the north-western border of the neighbourhood (Grota-Roweckiego Street). Although the idea of Campus was conceived already in the seventies, the first design decisions were made two and a half decades later [15]. The building of the Campus was followed by the construction of a nearby science and technology park accompanied by a special economic zone. At the same time, though, at an advanced stage of work on such an important, city-facilitating project (Campus), no local zoning plans were developed for neighbouring Ruczaj. The area started to attract more and more people to the neighbourhood,

⁴ Typical building technology for the block of flats in Poland from the communist period.

consequently bringing attention and money from real estate investors, resulting in new residential buildings. Even though only two local zoning plans for the area have been passed: “Park Ruczaj-Lubostroń”, validated in 2016 and “Ruczaj-region ul. Czerwone Maki” in 2017. It must be noted that the former plan concerns the protection of existing green spaces whereas the latter covers areas far away from the Campus. The lack of efficient urban management, creating buildings and residential complexes based on WZiZT decisions and a profit-focused attitude of private real estate agents (i.e. maximisation of profit by raising floor area ratio) led to spatial chaos. Dense urban development, lack of parking space, fences crossing pedestrian communication routes, lack of public infrastructure became characteristic for this part of Cracow, often criticised by the local press [16].

Research methodology

Our research was divided into three steps. The first one is the analysis of the spatial and demographic environment as a foundation for further work. The research used publicly accessible data published by city geoportal (Miejski System Informacji Przestrzennej – MSIP), city zoning plans, and aerial photographs. The second step was the analysis of accessibility of services. Due to the significant diversity of services, only one type was chosen, namely public educational institutions. The selection was made on the basis of two criteria. The first was defined as the need to ensure the easiest possible access to a given place from a housing unit. The second criterion was to limit the research to the public sector, which is not always financially viable. Accordingly, nurseries, kindergartens, and primary

schools were chosen. The total number of functioning units in this area was compared with the demand for educational services. The last research step was the analysis of pedestrian accessibility of those units to educational services. It is worth noting that such services are considered to be the most reliable. In comparison to other basic services, i.e. healthcare, they are indistinguishable and homogeneous. They have radical spatial demands, which restrict the possibility of frequent location changes, and they do not need periodical contract renewals contrary to healthcare, for example, with the National Health Fund (NFZ).

Research description

When determining exact areas for the analysis, the main traffic arteries were chosen as borders (Fig. 1). In the case of Nowa Huta, the study covered the area encompassed by Jana Pawła II Avenue, Bulwarowa, Kocmyrzowska and Bieńczycka Streets, summing up to 256.6 ha. Accordingly, the area of Ruczaj was determined by: Koberzyńska, Babińskiego, Buncha, Bobrzyńskiego, Grota-Roweckiego Streets, summing up to 223.9 ha. Nowa Huta is occupied mostly by multi-family housing, with a distinctive gradient of height and density increasing towards Plac Centralny. Furthermore, it is a completed design [17] protected by conservation laws, which means that no significant new development is planned. On the other hand, Ruczaj is characterised by varied development types. The northern part is dominated by so-called Plattenbau housing from the 1980s. Along Grota-Roweckiego, Bobrzyńskiego axis down to the cemetery on Czerwone Maki Street is landscaped mainly by densely populated, contemporary multi-family housing. Presently further south,



The boundary of the analysed area.

Fig. 1. Orthophotomap of Nowa Huta and Ruczaj from 2019 (source: [18])

Il. 1. Ortofotomapa Nowej Huty i Ruczaju z 2019 r. (źródło: [18])

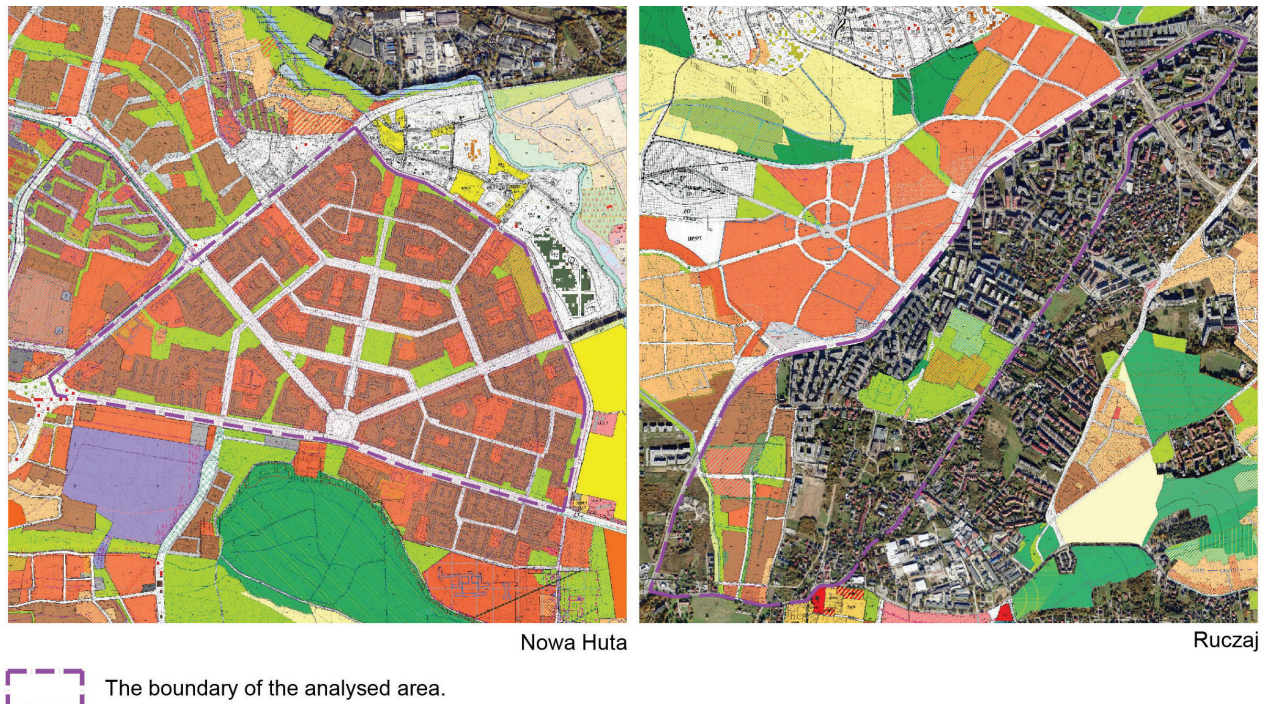


Fig. 2. Scans of rasters of MZPZPs concerning Ruczaj and Nowa Huta compiled with ortophotomap in the background (source: [18])

II. 2. Skany rastrów MPZP na terenie Ruczaju i Nowej Huty na tle ortofotomapy (źródło: [18])

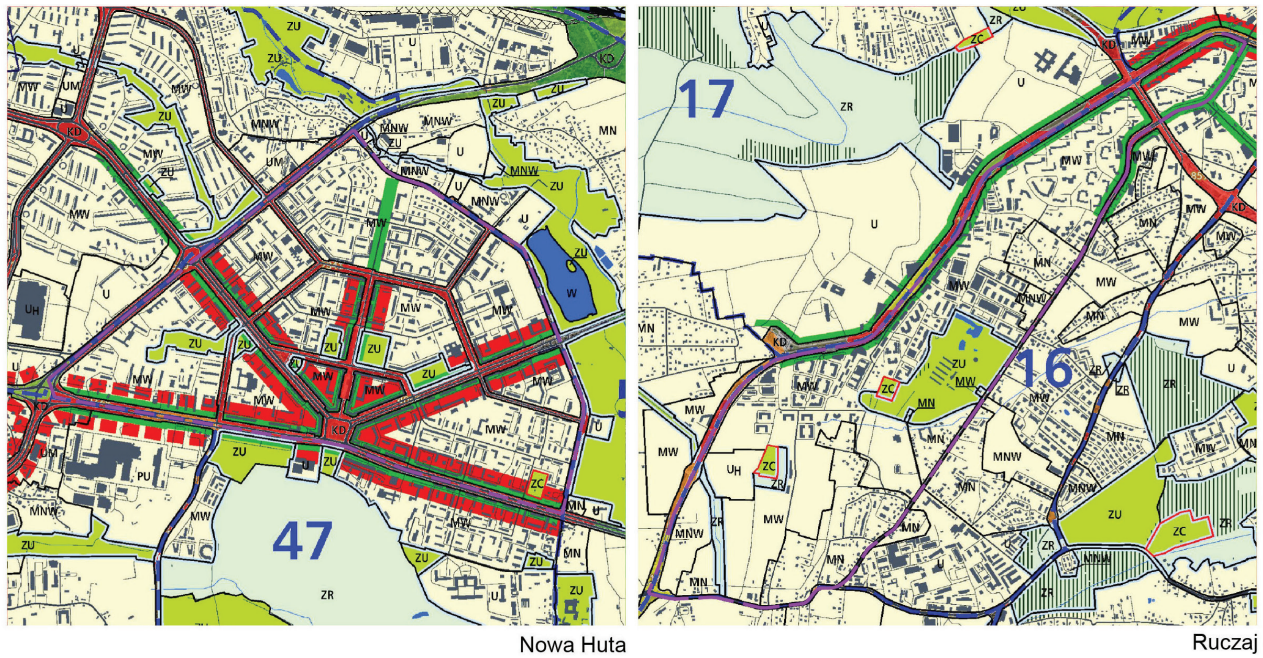
along Piltza Street, new residential buildings of that type are being built. Between the cemetery and Bunscha Street there is a new shopping mall, which from the southern side borders on a still undeveloped terrain. In the vicinity of Babińskiego Street there is loose single-family housing whereas on Kobierzyńska Street we mostly see enclaves of low-height and intensive single-family housing.

During the search for design documentation of the neighbourhoods the existence of local zoning plans for the whole Nowa Huta [18], as well as additional protection in the form of a culture park (chronologically the second after the Old Town and Wawel) was noted [18]. On the other hand, Ruczaj has got only two local zoning plans, covering 26.5% of the area (Fig. 2) [18]. That was the reason for using a study of conditions and directions for the spatial development of the city of Kraków (Fig. 3) [19]. In this document, Nowa Huta is dominated by multi-family housing – approx. 78%, the rest of the territory is marked – amongst others – as road infrastructure and green space. In Ruczaj case for housing went 80.5% of the terrain, among which 58.1% for multi-family housing, 4.2% for low-height multi-family housing, and 18.3% for single-family housing. It should be noted that 35 ha are not developed yet, out of which 23 ha are planned as multi-family housing (Table 3).

Based on the data from MSIP, the number of inhabitants for both areas was estimated (Fig. 4) [18]. Thus, Nowa Huta is inhabited by approx. 36 000 people, while Ruczaj by only 18 500 people – in both cases, the numbers refer to people officially registered as permanent residents. That means that groups like higher education students – a significant part of Ruczaj population – are not included in this number. Moreover, a considerable part is yet to be

developed, further flattening or even turning around the disproportion. Consequently, population densities for Nowa Huta are 140.3 persons/ha and 82.6 persons/ha for Ruczaj. Of course, there are locally occurring deviations. In the case of Nowa Huta, they are smaller, correlating with the development density gradient. The lowest density occurs along Bulwarowa Street (the most distant from the centre) and amounts to 87 persons/ha. The highest, however, is observed in the Blok Szwedzki area and Przyjaźni Avenue, amounting to around 251 persons/ha. In Ruczaj, these differences are more significant. The lowest measured density was along Kobierzyńska Street, perpendicular to Lubostroń St. being only 16 persons/ha⁵, while the highest was for *plattenbau* complex reaching ca. 172 persons/ha. Development along Grota-Rowieckiego and Bobrzyńskiego Street measures around 111–153 persons/ha. According to Table 1, the threshold of 100 persons/ha enables economically viable public bus transportation and varied urban development structure, while 150 persons/ha allows for a varied and easily accessible service offer and justifies different types of public transport. Thus, it creates a better environment for public investments in Nowa Huta. Another indicator is the age structure (Table 4). The first example is inhabited by a significant group of the elderly (retired), making about 31.6% of the population. The percentage of youth under 18 is equal to 13.7%. In Ruczaj, these proportions are different: children and adolescents constitute approx. 24.0%, while seniors approx. 15.8%. In both of these cases, indicators differ from the average for the entire city, which is respectively 17.2% and 23.6%

⁵ Areas completely free of buildings were omitted.




 The boundary of the analysed area.

Fig. 3. Study of conditions and directions for the spatial development of the city of Cracow, K1 – Spatial structure – directions and rules of development (source: [18])

II. 3. Studium uwarunkowań i kierunków zagospodarowania przestrzennego Miasta Krakowa, K1 – Struktura przestrzenna – kierunki i zasady rozwoju (źródło: [18])

Table 3. Terrain development in line with study of conditions and directions for the spatial development of the city of Kraków (elaborated by K. Klus)

Tabela 3. Przeznaczenie terenów według Studium Uwarunkowań Przestrzennych (oprac. K. Klus)

Research area	Nowa Huta		Ruczaj	
	[ha]	[%]	[ha]	[%]
Total	256.6	100	223.9	100%
Multi-family housing area	200.2	78.0	130.0 (23)*	58.1
Multi-family housing with low development density area	0	0.0	9.3 (5.5)*	4.15
Single-family housing area	0	0.0	40.9 (6.5)*	18.3
Other	56.4	22.0	43.7	19.5

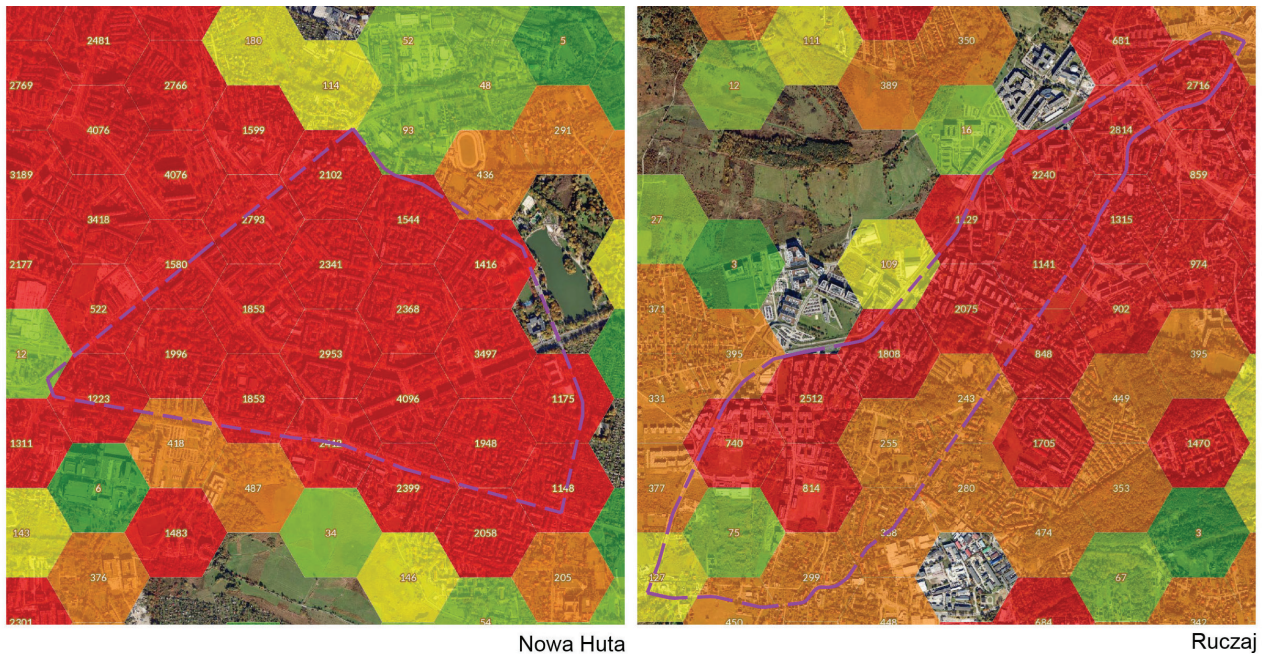
* Undeveloped area in brackets.

[20], which is caused by the unique history of the formation of these cases [21].

Before describing the following parts of the research, each type of educational facility should be characterised. To accomplish that, the study of Dąbrowska-Milewska was used [8]. Looking at the 2035⁶ GUS forecast and considering the number of pre-school children that stay at home,

the author elaborated her own school accessibility guidelines (Table 2). However, since the liquidation of lower secondary schools and the extension of primary school education, these guidelines need to be adjusted for further work. According to the study by Dąbrowska-Milewska, 3% of the whole population would be attending lower secondary schools, so it should be assumed that one grade (out of three) constitutes 1% of the population. Thus, after the education reform, the percentage of the students attending primary schools would increase from 6% to 8%.

⁶ Published in 2009.




 The boundary of the analysed area.

Fig. 4. Number of registered permanent residents of Nowa Huta and Ruczaj (source: [18])

Il. 4. Liczba zameldowań stałych w Nowej Hucie i na Ruczaju (źródło: [18])

Table 4. Demographic structure of analyzed case-studies against Cracow (elaborated by K. Klus based on [18], [20])
Tabela 4. Struktura demograficzna wybranych zespołów mieszkaniowych na tle miasta (oprac. K. Klus na podstawie [18], [20])

Population	Nowa Huta*		Ruczaj*		Cracow**	
Total	36 000	100%	18 500	100%	779 115	100%
Pre-working age	4932	13.7%	4440	24.0%	134 008	17.2%
Working age	19 692	54.7%	11 137	60.2%	461 236	59.2%
Post-working age	11 376	31.6%	2923	15.8%	183 871	23.6%

* Estimated on data from [18].
** Source: [20].

As a consequence, based on the above-mentioned publication and taking into account the education reform, one should adopt the requirements for accessibility to schools according to Table 5.

Considering only the total population, one could expect twice as many educational facilities in Nowa Huta. The reality is that disparities are even bigger, despite a similar number of people at a pre-work age (Table 6). Nowa Huta has a rich educational offer. Today there are 3 public nurseries (some closed [22]), 14 kindergartens and 7 primary schools (Figs. 5–7). Additionally accessible on foot, there are two kindergartens and one school. In comparison in Ruczaj

we will find only 7 kindergartens⁷ (Figs. 5–7). Furthermore, educational facilities in the latter example are often in locations originally not designed for the purpose, thus their area and design standards are worse than their counterparts in Nowa Huta. In Ruczaj no public nurseries and primary schools are provided. There are 4 kindergartens and 2 primary schools in the close neighbourhood and they

⁷ No distinction between proper kindergarten and substitute, small day care centres for young children (usually with lower urban standards than a proper kindergarten) was made.

Table 5. Urban indicators describing demand on education facilities
(source: [8] with update by K. Klus)
Tabela 5. Wskaźniki urbanistyczne określające zapotrzebowanie na dostęp do placówek oświatowych
(źródło: [8] ze zmianami K. Klusa)

Urban indicators	Nurseries	Kindergartens	Primary schools
Percentage of inhabitants using service [%]	0.3	3	8**
Recommended number of students/children in facility [number]	60	120	500–700
Site area [ha]	0.3	0.4	1.5–2
Inhabitants per facility	20 000	4000–5000	7500**
Area per inhabitant [m ²]	0.15	0.9	1.8
Recommended maximum pedestrian access radius [m]	1000	500	500 (800*)

* Values acceptable in areas with a low development density.

** Updated data – own study.

Table 6. Education facility in analysed areas
(elaborated by K. Klus)
Tabela 6. Oferta edukacyjna na badanych obszarach
(oprac. K. Klus)

		Nowa Huta	Ruczaj
Total inhabitants number*		36 000	18 500
Nursery	percentage of population using facility**	0.3%	
	number of children using facility	108	56
	recommended number of facilities**	2	1
	actual number of facilities	3	0
Kindergarten	percentage of population using facility**	3%	
	number of children using facility	1080	556
	recommended number of facilities**	7–9	4–5
	actual number of facilities	14 + 2***	7 + 4***
Primary school	percentage of population using facility**	8%	
	number of children using facility	2880	1480
	recommended number of facilities**	5	2–3
	actual number of facilities	7 + 1***	0 + 2***

* Data from MSIP – a significant increase of inhabitants is expected due to the area under development.

** According to Table 5.

*** Number of facilities located outside analysed areas but within walking distance.

Table 7. Areas of pedestrian accessibility to public education facilities (elaborated by K. Klus)
Tabela 7. Obszary dostępności pieszej do placówek oświatowych (oprac. K. Klus)

Facility type	Nowa Huta		Ruczaj	
	[ha]	[%]	[ha]	[%]
Nursery	211.6	82.5	0	0
Kindergarten	244.1	95.1	123.3	55.1
Primary school	207.1	80.7	21.73	9.7

cover a small percentage of the analysed area. Another interesting issue is high schools – omitted in the research due to better autonomy and mobility of students and also due to specialization of high schools. Nevertheless Nowa Huta houses 14 of them (5 secondary schools, 4 technical colleges, 5 vocational schools and 1 technical colleges and 1 vocational school in the close neighbourhood). For inhabitants of Ruczaj, the closest high school is secondary school on Czackiego Street and technical college on Monte Cassino Street. The most optimal transportation time using public transport is respectively 23 and 15 min [23].

Apart from the quantity of education facilities, equally important is their accessibility. In all the analysed cases here, this ought to be a walking distance. In accordance with the data from Table 5, distances of 1000 m for nurseries and 500 m for kindergartens and primary schools

were assumed [8]. In the research, a simple radius was considered to be an insufficient way to evaluate accessibility. Pedestrian infrastructure was instead taken into consideration, thus providing more accurate estimates regarding walking accessibility that agrees with the above guidelines (Table 7).

In Nowa Huta the percentage of area in the accessibility distance is substantial. For nurseries it is 82.5% – the western part of the neighbourhood is excluded (Fig. 5). The highest percentage is for kindergartens – 95,1% (Fig. 6). Pedestrian reach to primary schools is 80.7% of the area (Fig. 7). It should however be noted that the area outside the walking distance exceeds the restrictions only by a small margin.

In the case of Ruczaj these areas are much smaller. The highest percentage is for kindergartens – 55,1% (Fig. 6).

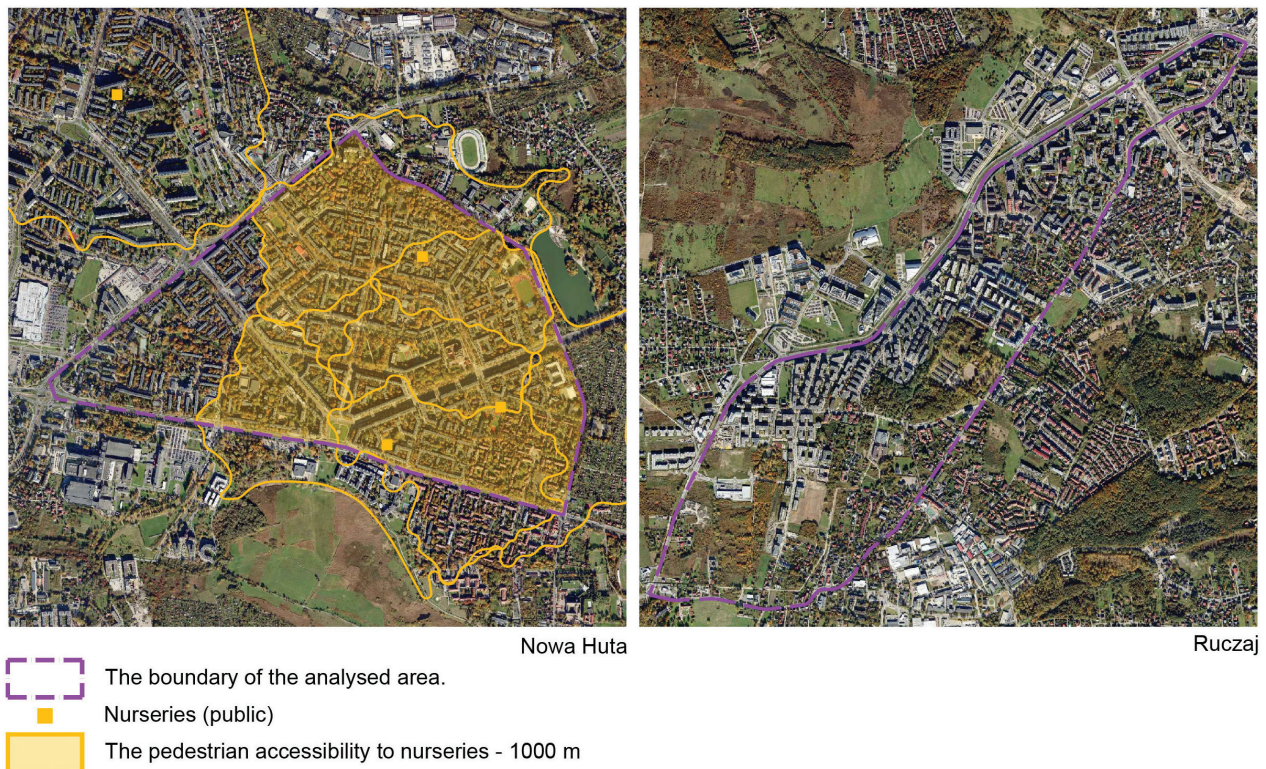


Fig. 5. Analysis of accessibility to nurseries (elaborated by K. Klus, underlay map: [18])

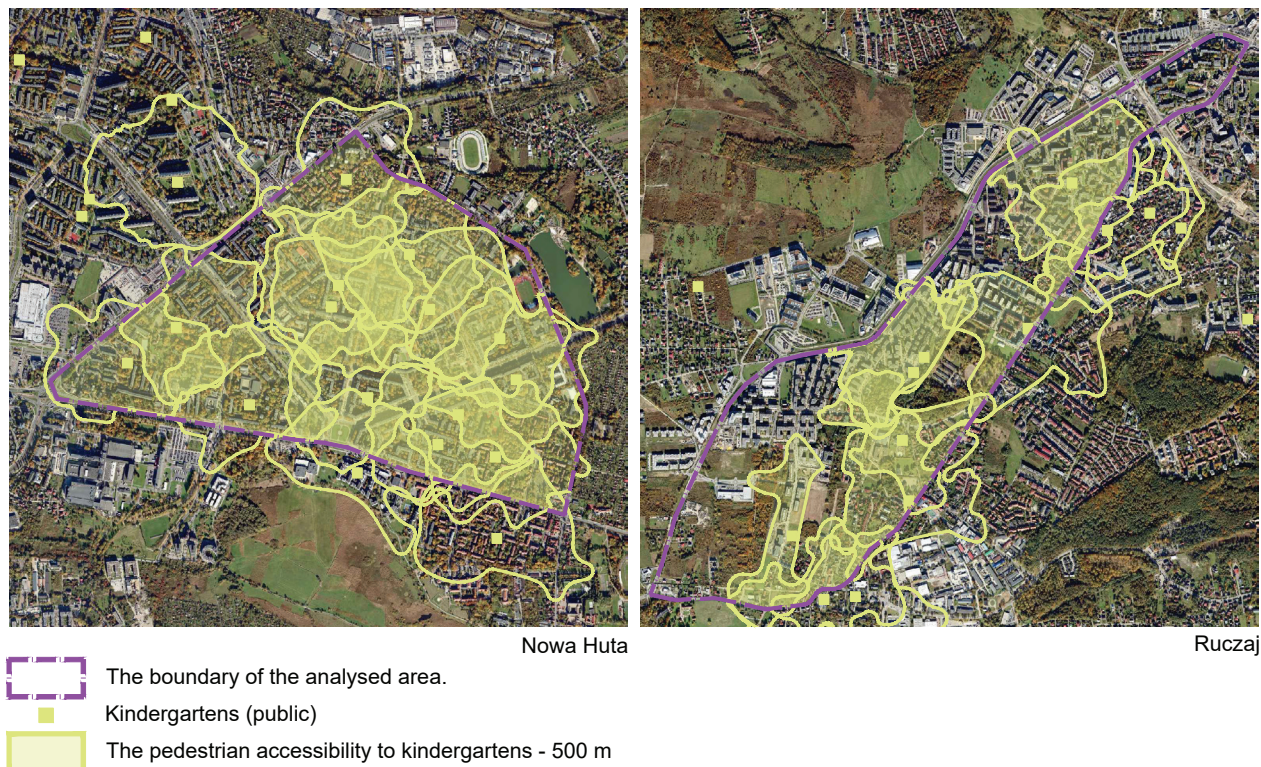


Fig. 6. Analysis of accessibility to kindergartens
(elaborated by K. Klus, underlay map: [18])

Il. 6. Analiza dostępności przedszkoli
(oprac. K. Klus, podkład: [18])

Unfortunately there are areas of intensive multi-family housing not in the range, i.e. Europejskie neighbourhood, Bobrzyńskiego and Przymiarki Streets. Only half of the large panel building blocks complex and areas of low and one-family housing development is within walking distance. Access to primary schools is covered only for 9.7%, which are located outside of Ruczaj (Fig. 7). Additionally the area covered is a small fragment of residential complex in the northern part of the neighbourhood and the second one is part of single-family housing near Kobierzyńska Street in the southern part. Lastly it should be noted that small parts of Ruczaj that are covered are sparsely populated, thus the percentage of people living there will be respectively smaller.

One more informative aspect of accessibility to schools is worth mentioning. While determining actual areas of pedestrian accessibility, vast disparities between the analysed areas were discovered. For Nowa Huta they vary between 32.0 ha – 43.5 ha averaging at 38.5 ha. Comparatively in the case of Ruczaj variation is between 20.5 ha – 39.9 ha averaging at 29.6 ha. Conclusion can be drawn that a well planned neighbourhood goes in pair with better accessibility to various services.

For the last part of the research description, other kinds of services – not as thoroughly analysed – need to be accounted for [22]. Worth mentioning is the fact that Nowa Huta has a good coverage of cultural facilities. 3 municipal libraries and 2 famous Cracovian theatres (Ludowy Theatre and Łażnia Nowa Theater) can be found here. Ad-

ditionally in the centre there is Nowohuckie Centrum Kultury, an institution known for its rich cultural activity (also another theatrical scene). There used to be three cinemas: Świt (now a shopping mall with a film cafe on the first floor), Światowid (now a museum) and Sfinks (an independent cameral cinema – still functioning). Three museums are found here (two municipal: Nowa Huta Museum, Nowa Huta Underground and Museum of the Armed Act). Of course Nowa Huta was developed as a tool of socialist propaganda. The exemplary communist city – Nowa Huta has a short but rich history, which without a doubt has an influence on the cultural facility landscape in the area. Therefore Ruczaj should not be directly compared with the first study example. However it should be noted, that outside one municipal library and the Library of the Pontifical University of John Paul II, no other object of this type can be found.

A corresponding case can be presented for sport facilities. The most important sport venues in Ruczaj is a horse riding club and a sports centre on Kobierzyńska Street. By comparison, in Nowa Huta every school incorporates some kind of sport facilities (sports Halls and sport fields), in two of them even indoor swimming pools – respectively Ruczaj lacks even a single school. Furthermore in the area of Bulwarowa Street lies an inter-school sport centre and an open door swimming pool. Nearby Nowa Huta there are two sport stadiums: Hutnik and Wanda (with dirt track) and Com-Com Zone sport centre. On the other hand, a strictly commercial offer in both analysed cases is



Fig. 7. Analysis of accessibility to primary schools (elaborated by K. Klus, underlay map: [18])

Il. 7. Analiza dostępności szkół podstawowych (oprac. K. Klus, podkład: [18])

more or less similar. It has to be noted that only after the political shift the building of Świt cinema was changed into a shopping mall, at least two supermarkets in Nowa Huta and one shopping centre in nearby Czyżyny district have been created. This proves an underestimation of such service during the planning phase. In the case of Ruczaj, more diverse jobs are observed. Not only does a university campus lie in a close proximity but also a special economic zone. What is more, various office, administrative and industrial (mainly on Zawila St.) objects are situated in bordering areas. On the other hand, Nowa Huta is a housing dominated area. The main job provider for the complex ought to be the Steelworks and supporting industrial facilities, what impacted negatively during the time of decreasing industrial production.

Conclusions

Summarising the research, it must be stated that a detailed urban plan of the whole area of Nowa Huta is characterised by a better accessibility to education infrastructure. An advantage is not only simply with numbers but also with better design of pedestrian infrastructure, which enlarges the area of accessibility. Furthermore, it has been determined that the demands proposed by Dąbrowska-Milewska on the service were met by a wide margin. In the case of Ruczaj, the education infrastructure is limited and insufficient for the inhabiting population and pedestrian accessibility, especially when considering

development opportunities in the area. It is similar with other social services, where financial success has a secondary priority. It is worth mentioning that surprisingly a socialist “city of the worker” contains far richer education, sport and cultural infrastructure than Ruczaj, a neighbourhood developed in a close proximity of a university campus – implicitly for the intelligentsia. In the case of commercially driven objects and job opportunities, both places appear to have similar proportions, even with a slight advantage of the younger neighbourhood. Basic correction actions in order to improve the quality of life in Ruczaj should include the elaboration and introduction of local zoning plans, prioritizing undeveloped areas. Furthermore, new education infrastructure and other types of lacking service infrastructure should be constructed. First and foremost, any specific actions for the region should become a topic of debate between specialists, inhabitants and city planners.

Concluding the research, it has to be stated that introducing strict norms and deriving detailed local zoning plans is beneficial for the service accessibility, especially with regard to public services. Of course some freedom for a bottom-up, financial driven initiative is recommended. However, leaving too much freedom for a private sector, without norms results not only in spatial chaos, but also in limitations in the accessibility to a number of services – especially those non-commercial. The role of state and local governments is to foster the spatial order and the life quality of citizens. Having that in mind, establishing

urban design standards, understood as codified in the form of either bill, regulation, codex or norm containing a set of rules defining minimal standards of accessibility to various facilities and services, primarily those of a public domain, is considered to be crucial. The author believes that legislation should apply, above all, to the local government during the development of local zoning plans. The design process ought to contain estimations of a target population, which would be a basis for elaborating demand for a given type of service. Having said that, it is important to limit the number of investments that proceed with WZiZT decisions, by covering the whole country with local zoning plans. Arguably, a way of achieving that state would be to put legislative, social and media pressure on local government units. A guarantee of meeting these requirements should be obligatory to get an investment approval. It must not be forgotten that provision of public services lies in the hands of the local government. For that reason, an expense of building such objects should not be paid by a private real estate developer, even if he decides to build a residential estate for several thousand residents. Clearly building a healthcare facility or a school is an expensive investment for a local government, however it

would reimburse the costs in taxes. Taking into consideration a state-wide housing shortage and limited budget of the local government, an optimal solution seems to be a public-private partnership. Due to a high risk of fraud, such solutions must be precisely monitored.

Plans that are in accordance with the idea of the neighbourhood unit and the 15-minute city [24] ought to provide all basic services within walking distance. Additionally pedestrian infrastructure should be welcoming, safe and attractive, so it would convince people to resign from using their cars. In that aspect, housing development density is important. This should be achieved with the approval of citizens, because it fosters better accessibility to various facilities. Such a process does not have to be accompanied by a negative, subjective feeling of “concreting” a city. The presented cases are proof of that. In accordance with the data presented in *Research* part of this paper, Nowa Huta, considered one of the greenest districts in Cracow, has significantly higher population density than Ruczaj, which is perceived as a symbol of “concreting” the city.

Translated by
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Abstract

The influence of urban design standards on services accessibility shown as a case study comparison of Nowa Huta and Ruczaj neighbourhoods

An important element of any residential complex is accessibility to various services. Restriction of this accessibility affects the quality of residents' life. Furthermore, it causes negative side effects i.e. traffic intensification. Unfortunately, as an outcome of the Polish systemic change of 1989, centrally-driven urban design standards that controlled appropriate rules were abolished. Those rules were instead left to local authorities and private development. Currently, the only tool allowing local authorities to control specific residential complexes' functional structure is the local zoning plans. Since their beginnings, they have not yet been introduced to vast areas in the country.

In this paper, the author compares the results of a central, holistic urban design to almost unrestricted freedom of a private sector. For this purpose, two residential complexes developed during different political and economical conditions were chosen. The first one is Nowa Huta, built as a model socialist city. The whole complex was carefully designed by a team of urbanists and architects, inspired not only by Eastern but also Western Block's examples. On the contrary, the second one, a Cracovian neighbourhood named Ruczaj was brought to life only by a private sector, only restricted by decisions on land development and management conditions. Neither a central programme nor plan was created for this area.

The study compares the accessibility of basic educational facilities (nurseries, kindergartens, primary schools) considering them essential. Firstly their numbers were compared, showing significant disproportions between two neighbourhoods. For Ruczaj a significant deficiency of such facilities was observed. The next step taken was a comparison of pedestrian accessibility. To achieve that, areas of walking distance were determined. 500 m for schools and kindergartens and 1000 m for nurseries. That even more highlighted the previously observed difference. Of course for all of the analyses, current spatial and demographic conditions were taken into consideration.

Based on the research done in the paper, the author shows the positive influence of a well run centrally driven, spatial policy of a city on the services accessibility. As a consequence, the author is willing to support postulates demanding new centrally driven urban design standards.

Key words: urban design standards, spatial design, urbanistic, residential complex, Cracow

Streszczenie

Wpływ standardów urbanistycznych na dostępność usług w zespołach mieszkaniowych na przykładzie krakowskich zespołów Nowej Huty i osiedla Ruczaj

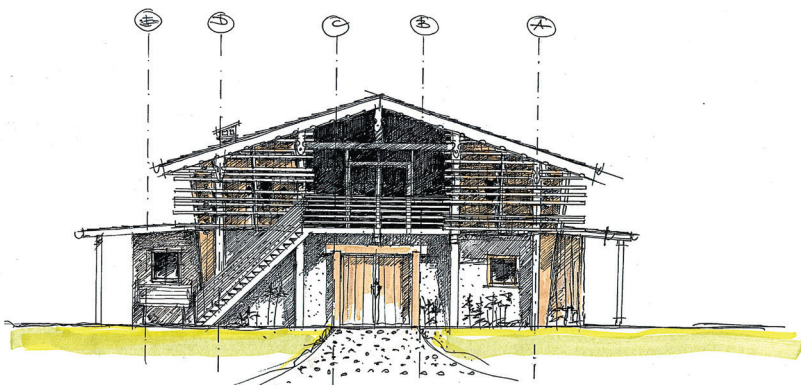
Ważnym elementem każdego zespołu mieszkaniowego jest dostępność do różnorodnych usług. Ograniczenie tej dostępności wpływa na jakość życia mieszkańców. Niesie za sobą negatywne skutki takie jak chociażby zintensyfikowany ruch samochodowy. Niestety w wyniku przemian ustrojowych zrezygnowano z ogólnie określonych normatywnych urbanistycznych określających tego typu parametry. Pozostawiono w tej dziedzinie dużą autonomię samorządom i prywatnym inwestorom. Aktualnie jedynym narzędziem pozwalającym wpływać władzom lokalnym na strukturę funkcjonalną poszczególnych zespołów są miejscowe plany zagospodarowania przestrzennego, które w dalszym ciągu nie pokrywają sporych obszarów.

Autor artykułu postanowił porównać skutki ogólnego, holistycznego planowania przestrzennego z niemal całkowitą swobodą inwestycyjną prywatnych podmiotów. W tym celu zdecydował się na porównanie dwóch zespołów mieszkaniowych powstałych w odmiennych uwarunkowaniach polityczno-ekonomicznych. Pierwszym jest Nowa Huta zbudowana w okresie komunizmu jako wzorcowe miasto socjalistyczne. Cały zespół został starannie zaprojektowany przez architektów i urbanistów czerpiących wzorce nie tylko z bloku państw socjalistycznych, ale także z Zachodu. Drugim badanym przypadkiem był krakowski Ruczaj, wznoszony przez prywatnych inwestorów jedynie na podstawie decyzji o warunkach zabudowy. Nie posiada on ogólnie narzuconego programu czy planu.

W badaniu tym porównano dostępność do placówek edukacyjno-oświatowych (żłobków, przedszkoli i szkół podstawowych) jako tych najbardziej podstawowych. Najpierw porównano ich liczbę, co ukazało znaczące dysproporcje między badanymi zespołami. Na Ruczaju stwierdzono znaczące niedobory tego typu obiektów. W dalszym etapie porównano obszary dostępności pieszej do tych placówek. W tym celu wyznaczono obszary dostępności pieszej o rzeczywistej długości dojścia nieprzekraczającej 500 m dla szkół i przedszkoli oraz 1000 m dla żłobków. Badanie to dodatkowo wykazało dysproporcje między analizowanymi zespołami. Oczywiście analizy i porównania były prowadzone z uwzględnieniem aktualnych uwarunkowań przestrzennych i demograficznych tych obszarów.

Na podstawie przeprowadzonych badań autor wskazuje pozytywny wpływ ogólnej, dobrze prowadzonej polityki przestrzennej miasta na dostępność do usług. Dlatego też na podstawie prezentowanych badań przychylił się do postulatów domagających się wyznaczenia nowych, ogólnokrajowych standardów urbanistycznych.

Słowa kluczowe: standardy urbanistyczne, planowanie przestrzenne, urbanistyka, zespół mieszkaniowy, Kraków



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Leogang (Austria), conceptual design of
stables for the Hotel Forsthofgut,
nord façade, design by W2 Manufaktur,
Bmstr. A. Walth, arch. B. Krynicka
(drawing by B. Krynicka)