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## **CHANGE OF THE COMMUNICATION SERVICE MODEL ON THE EXAMPLE OF THE HOUSING FROM THE 2<sup>ND</sup> HALF OF THE 20<sup>TH</sup> CENTURY "POD DALNIA" IN KIELCE**

### **Abstract**

For years, the motorized and uncontrolled degradation of the public space of housing estates from the second half of the twentieth century in Poland has been appropriated. This has a negative impact on their functioning and image. The aim of the work is a detailed analysis of Kielce housing estate from the second half of the last century – Pod Dalnią, mainly in the spatial and communication aspect. The main focus was on the study of changes in the communication service model and the diagnosis of the parking problem, which also generates other tensions in the housing estate. This strives to formulate guidelines for comprehensive changes and strategies for the development of a housing estate that is not adapted to contemporary requirements and needs.

### **Key words**

block settlements, revitalization, urban units, housing estate, transport services, parking lots.

### **Introduction**

This study presents the results of the analysis of the parking problem in one of the housing estates from the second half of the last century in Kielce – "Pod Dalnią" housing estate. The work is part of the research conducted for the needs of the dissertation concerning the change in the model of communication service for Kielce housing estates from the second half of the twentieth century in the context of their revitalization. This is a significant issue in the era of appropriation by the motorized housing estate and reduction of its usability. Especially, nowadays in Polish cities the number of cars is growing faster than the number of inhabitants. Cars – one of the most valuable material assets that stand almost 96% of the time unused [1], force you to create additional space to store them. Space that is a valuable and scarce good and an important element in shaping the image of modern society, because it is supposed to be an area of social interaction, and seems to still not be.

The scope of research to diagnose Polish block settlements in the spatial and communication aspect as well as monitoring of changes taking place on them is small. This does not allow for the creation of a comprehensive recovery program that would inhibit degradation processes and prevent negative phenomena resulting from rapid civilizational changes. Due to the complexity of the subject being studied, it is necessary to use various research tools. In order to verify the authenticity and authenticity of the results of the research, the author undertook the so-called their triangulation, or confronting expert and participatory studies [2]. As part of the research of the "Pod Dalnią" housing estate, the following were carried out:

- analysis of literature dealing with housing estates from the second half of the twentieth century: their changes over the years, problems, revitalization, transport services, etc.,
- review of planning and strategic documents of the city of Kielce,
- analysis of the target development plan of the housing estate from the second half of the twentieth century,
- study of changes and development of the housing estate based on photomaps from various years,
- vision of the area with the collection of photographic documentation,
- urban inventory of the estate,
- observations and interviews with residents and employees of housing cooperatives,
- analysis of needs, problems and space changes based on the tasks reported and implemented from the Civil Budget.

It is also planned to conduct a survey in designated spatial units, the results of which will be confronted with the analyzes carried out. The author undertook to develop studies of a theoretical and empirical nature, bearing in mind also the future application dimension of research results. She strives to determine the possibilities of transformations and development directions of the Kielce housing estate in the context of changes in the model of its communication service and implementation of the goals set in the "Transport plan for the city of Kielce..." [3], where it is recommended in the field of parking policy to create parking measurements and surveys with parking users.

### **Spatial changes of housing estates from the second half of the 20th century**

Own research in Kielce and carried out in other Polish cities [4, 5, 6, 7] indicate that since the beginning of the systemic transformation, i.e. for almost 30 years, block settlements have been subject to intense uncontrolled changes in many dimensions. Even at the stage of implementing the development plans, they were deprived of essential elements, although in the majority they were planned as comprehensive, comprehensive housing complexes based on favorable norms regarding building orientation, insolation, communication, accessibility of services, public spaces and green areas. However, in the course of implementation, the focus was primarily on housing, in order to quickly satisfy the post-war "housing hunger". Many good, unconventional housing estates have become a boring mono-functional space [8]. By not realizing public utilities and public spaces associated with them, the layout of pedestrian routes began to develop quite chaotically. In this way, the spaces lost their uniqueness, character and functional and spatial diversity. Urban interiors became indefinite, deprived of life, implementing emotionally non-emotionally demanding needs.

Intensive development of individual transport has also contributed to this fact. In spite of appearing in the 1970s, the premises pointing to the increase in the number of cars, and postulates regarding the increase of the parking ratio to 1: 1 (one parking space per apartment) [9] no action was taken. Estates from the second half of the last century were designed according to contemporary standards – 1 parking space for several apartments. Currently, the demand for the number of parking spaces in residential housing units is at least 1 space per flat<sup>1</sup>. Over the years, we have managed to get accustomed to the appropriation and degradation of housing estate by motorists, hence there is a social acceptance of the current principle of subordinating everything to parking needs, with progressive damage to our health and the quality of the housing environment. Parking has become a kind of social practice that causes tensions in neighborly relations, affects the limitation of social contacts and the appearance of space, which is a very important element of this practice.

In addition to spontaneous activities caused by changes in civilization and technological development, we can also distinguish targeted activities aimed at improving the image and improving living conditions in the settlements from the second half of the last century. They are usually taken by entities responsible for housing estates, mainly housing co-operatives, communities, municipal authorities and increasingly non-governmental organizations. Their activities are usually limited to technical modernization and improvement of the quality of buildings and public space, carried out in a punctual manner and insufficiently focused problematically and territorially [10]. The problem is also the lack of linking infrastructural projects with social and economic projects and the preparation of projects without a comprehensive diagnosis of the situation of a given area and defining detailed objectives of the planned activities [11]. Another difficulty is the diversified ownership structure of the housing estates, as it requires very good communication and cooperation between the entities managing the housing estates.

### **Research in the Kielce housing estate "Pod Dalnią"**

The "Pod Dalnią" housing estate is one of the many estates built in the second half of the 20th century in Kielce - a post-socialist city with less than 190,000 inhabitants (as of May 18, 2018 according to population records). The city developed in a large part urban and social after the Second World War in the years 1950-1990. The text of the Local Revitalization Program of urban, post-industrial and post-military areas in the city of Kielce for

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<sup>1</sup> The required number of parking spaces is determined in the local spatial development plan, or in the decision on land development and development conditions. Such a minimum indicator was also defined in the draft "National Urban Regulations" of August 17, 2010.

2014-2020 [12] draws attention to the importance of multi-family housing estates built in the second half of the last century, development of the commune and their individual high development potentials. In housing complexes from the second half of the 20th century, still live 1/3 of citizens of Kielce. Due to the lack of comprehensive research and modernization activities undertaken over the years, Kielce housing estate faces many problems and threats related to the ongoing technical and social degradation. The results of the questionnaire, commissioned by the Kielce city authorities [13], show that the greatest negative impact on the comfort of living in "blocks of flats" has too few parking spaces, nuisance related to traffic and improper parking cars and too little decorated park and garden areas. However, in the "Transport Plan for the City of Kielce ..." [3] parking policy is listed as one of the main elements of sustainable city mobility management with a developed offer of public transport, bicycle and pedestrian traffic, integration of spatial planning with transport planning and educational and promotional activities. The transport plan also assumes a reduction in the share of car journeys and the value of the number of vehicles per household (one flat) to 0.75. In addition, attention is paid to the creation of functionally diverse spatial units, with good access to public transport, an extensive bicycle system and high quality of local housing areas available on foot. This justifies the need to monitor the parking situation on the housing estates, to restore the balance between pedestrian, bicycle and vehicular traffic and to invest in an attractive, functionally diverse space adapted to the needs of residents, and not only for cars.

The main purpose of the research carried out by the author in the Kielce housing estate "Pod Dalnią", created in the second half of the twentieth century, is to diagnose its condition mainly in the spatial and communication aspect and to show the changes that have taken place in its structure for years. The main focus was on the change of the communication service model and the parking problem, which generates other problems in space. The housing estate according to the diagnosis from the Local Revitalization Program<sup>2</sup> is one of the least degraded housing assumptions in Kielce, "with a relatively very good situation" [12], nevertheless has similar problems, contributing to the degradation of space, like other Kielce settlements. A thorough diagnosis of the condition and monitoring of housing developments is necessary to develop a comprehensive strategy for the transformation and development of the housing estate. It is assumed that such a strategy would help to curb the spatial and social degradation process and protect against negative phenomena and threats that occur in other settlements with a higher degree of degradation in Kielce.

"Pod Dalnią" housing estate is located in the western part of Kielce, at the feet of Karczówka, between the Czarnów, Ślichowice and Gwarków settlements (Fig. 1). Its border from the east is marked by Adama Naruszewicza street and a single-family housing estate, Piekoszowska street from the south, and Grunwaldzka main street from the west. From the north-west, the estate borders the avenue of Jerzego Szajnowicza-Iwanowa with a much larger housing estate, Ślichowice, which is managed by the same housing cooperative "Domator", hence it is often perceived as part of a large complex of the Ślichowice estate. Despite the rather peripheral location, it is well connected with the rest of the city. It is 4.7 km away from Kielce market, which takes about about 15 minutes by car or public transport (18 daily bus lines and 1 night bus).

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<sup>2</sup> The diagnosis of settlements in the Local Regeneration Program of urban, post-industrial and post-military areas in the city of Kielce for the years 2014-2020 was carried out according to 10 partial indicators (9 indicators of quantitative analysis and one indicator of qualitative analysis).



Fig. 1. Location of the "Pod Dalnia" housing estate on the map of Kielce.  
*Source: Author's.*

The housing estate is a complex of blocks of flats built in the second half of the 1980s with the so-called "Big plate", in W-70 MK<sup>3</sup> technology. On the eastern side of the estate, along Naruszewicza street there are also several single-family houses. The big-plate building consists of 24 residential buildings, which were built in a short period of time, from August 1988 to September 1989<sup>4</sup>. They were designed by the Investment Design and Services Department "INWESTPROJEKT". The final implementation plan for the "Pod Dalnia" housing estate dates from 1985 and presents a comprehensive solution to the entire foundation with an extensive communication service system and a road system that facilitates contact with educational buildings and other service buildings (Fig. 2).

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<sup>3</sup> The open system of the big plate used in Poland, developed in 1973.

<sup>4</sup> Date of commissioning of the first and last building. Source: Information obtained at the "Domator" Housing Cooperative.



- parking spaces organized by housing co-operatives, separated at the expense of reducing green areas (some parking spaces were created according to the project of the target traffic organization commissioned by co-operatives for the entire housing estate (Fig. 4)),
- parking lots next to commercial and service buildings, which are also used by residents,
- private guarded parking in the western part of the estate, payable on a monthly subscription of 95 PLN gross,
- the multi-level "Park & Ride" parking lot planned by the city for 420 seats, which would act as a transfer parking and communication service for the housing estate (Fig. 5).



Fig. 3. Illegal parking spaces in the housing estate "Pod Dalmią".  
Source: Author's photo.

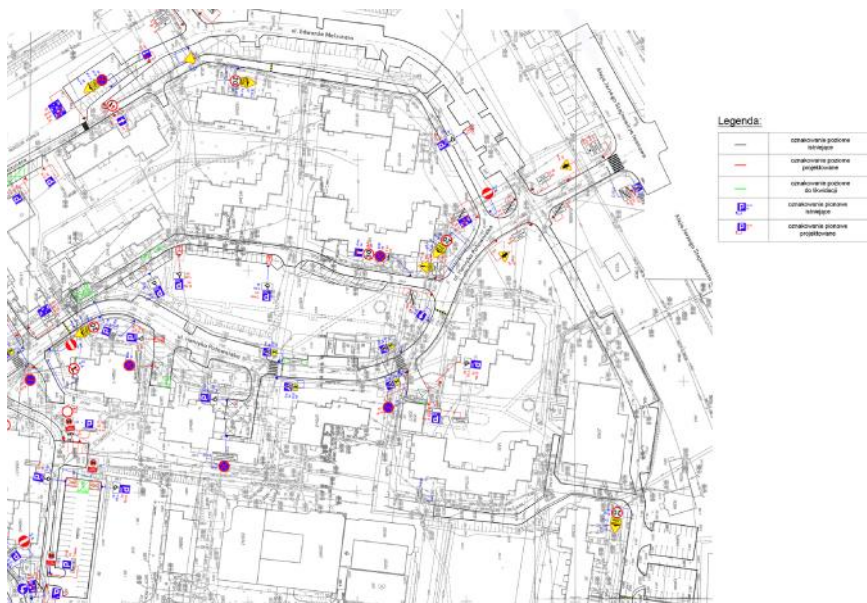


Fig. 4. The project of the target vehicular movement for the "Pod Dalmią" housing estate.  
Source: Materials provided by "Domator" cooperative.



Fig. 5. The multi-level "Park & Ride" parking lot planned by the city in the "Pod Dalią" housing estate.  
Source: <http://www.um.kielce.pl/programy-i-actions/parkingi-wielopoziomowe-raport/>.

A fundamental element of the research of the estate is the urban inventory, in the form of functional and spatial analysis and communication, with particular emphasis on the type and amount of parking spaces. The illustration below (Fig. 6) shows the current functional and spatial structure of the housing estate after changes that have been occurring for almost 30 years since its creation.

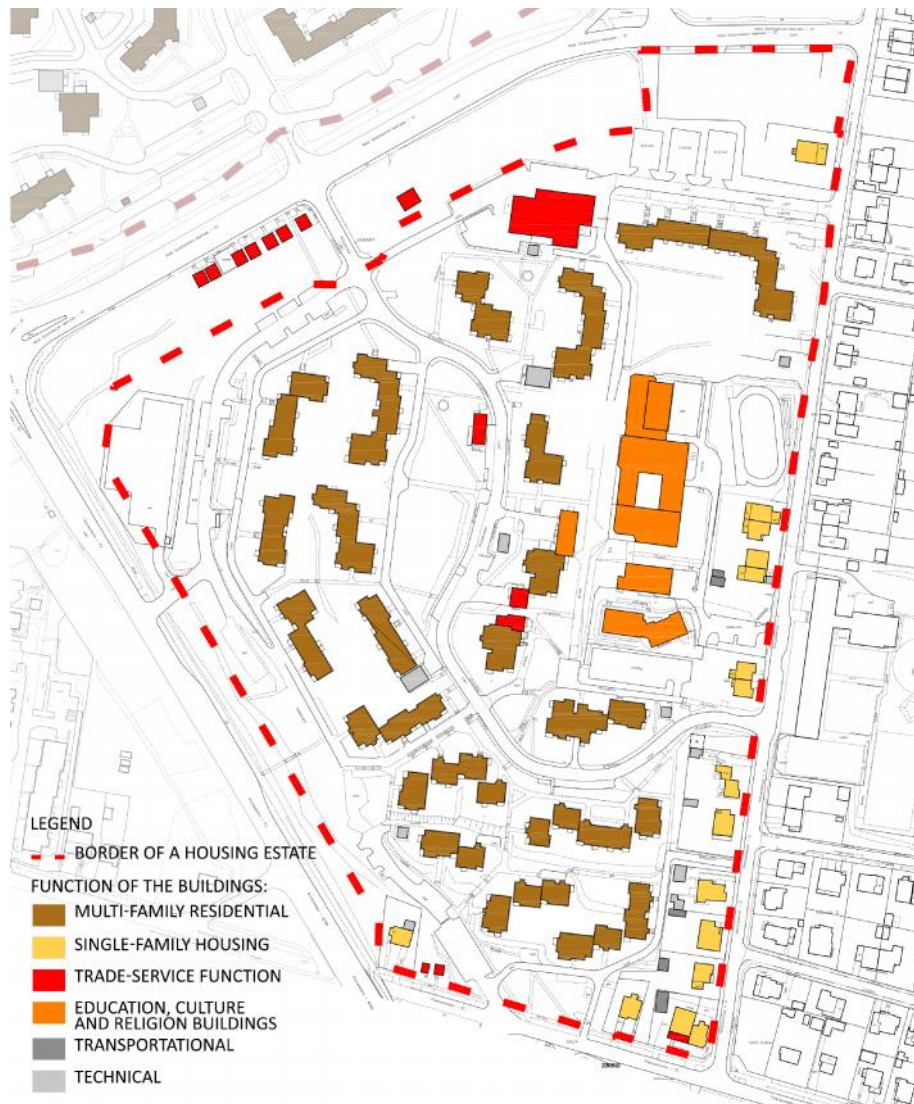


Fig. 6. Functional and spatial analysis of the "Pod Dalia" housing estate.

*Source: Author's.*

Commercial and service pavilions that are on the target development plan have not been implemented to date, only small additions to the commercial and service infrastructure of the housing estate are visible. The shortages in the building, however, did not cause a negative tendency, occurring on other housing estates from the second half of the twentieth century, filling gaps in the space with new residential buildings. There is still the possibility of deliberate development of these areas, taking into account functional, spatial and social needs.

In the second place, the author analyzed the communication service system of the housing estate based on archival plans, current maps, field vision and own counting of separate parking stands and parked in unacceptable places of cars (Fig. 7). The counting was carried out on weekdays between 18:00 and 21:00, that is at the time of the day, when the residents return to their place of residence after work.



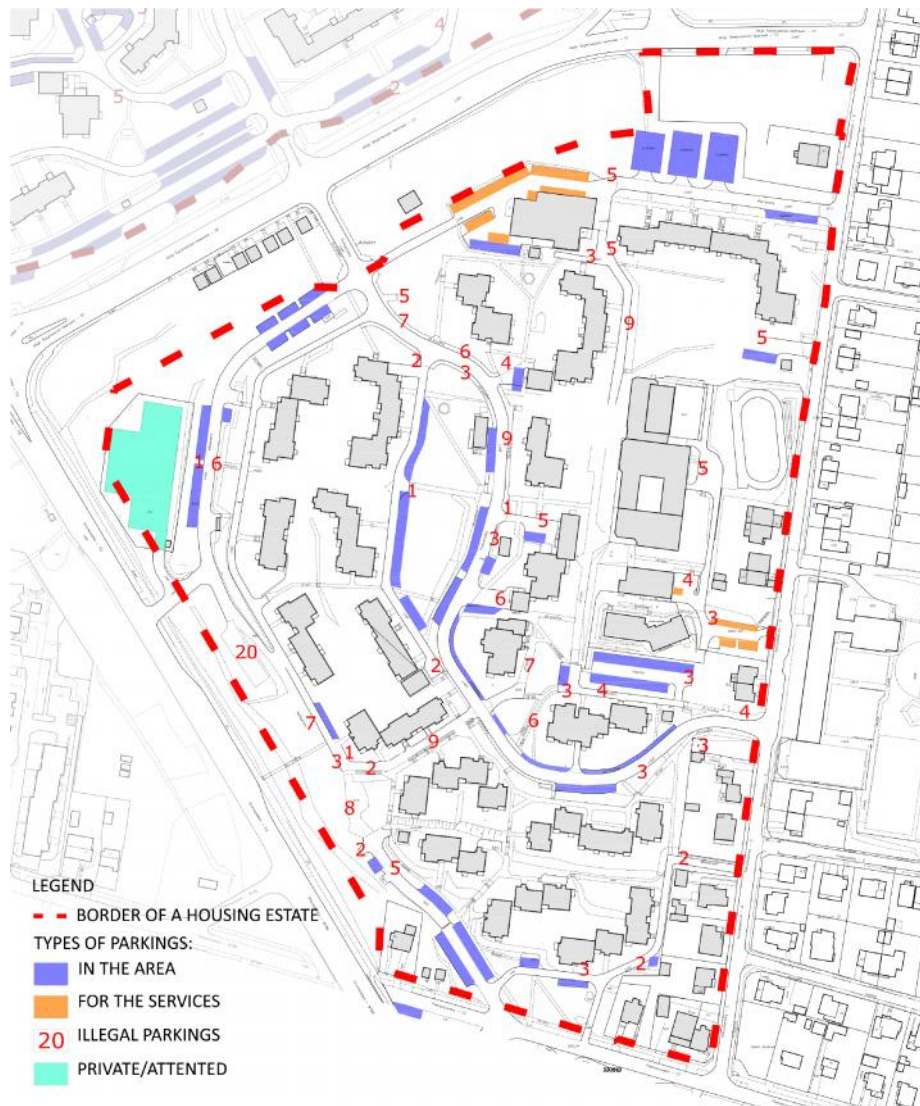


Fig. 7. Functional analysis of the communication system of the "Pod Dalmią" housing estate.

Source: Author's.

The communication service system in the development plan was designed as a loop-extractor [14] and consisted in locating car parks on the outskirts of the team and along the inner street passing through the middle of the housing complex. Thanks to this solution, cars were not introduced into the space between buildings, which created the best opportunities for social bonds. Thanks to this solution, cars were not introduced into the space between buildings, which created the best opportunities for social bonds. Pedestrian routes running along the buildings allowed only emergency entry of the fire brigade or ambulance. Over the years, the development of individual transport and shortages in infrastructure have caused the motorists to take up a number of estate spaces that were intended for green areas and pedestrian communication. Car traffic penetrated into the estate area, but not so strongly due to the topography of the area. Horizontal zoning of pedestrian and car traffic<sup>6</sup>, on the basis of which the housing estate project was created, has been disturbed in many places. The project assumed an index of 110 parking spaces per 1000 inhabitants<sup>7</sup>, currently there are 162 dedicated places (not including places with services and guarded) per 1000 inhabitants, or 0.49 flat. This is half of the current design indicator, which is at least 1 parking space for one flat. Analysis of the communication service system presents the location and distribution of various types of parking spaces throughout the entire

<sup>6</sup> The necessity of communication and functional zoning depending on the type and intensity of traffic was emphasized in the norm of 1974 [13].

<sup>7</sup> Data from the technical description of the Detailed Implementation Plan of the "Pod Dalmią" housing estate made available by the housing estate administration.

estate. It is worth paying attention to the "scattered" red numbers, indicating the number and location of cars parked in forbidden, unmarked places. In this way, it can be assumed that the demand of the residents of the housing estate is 0.75 parking space per apartment, and after adding private car parks and services, which also benefit residents, this ratio increases to 0.94. The table (Table 1) collates various types of parking spaces and their percentage share<sup>8</sup>. The "Pod Dalnią" housing estate distinguishes itself from other Kielce housing estates with only terrestrial parking spaces.

Table 1. Data summary on the transportation system of the "Pod Dalnią" housing estate.

	The number of flats	The number of residents	The number of parking spots (for the disabled)				The number of illegal car parks	The number of private car parks	The number of car parks for services	
			Sum	In the area	Under ground	Garages in the building				Freestanding garages
<b>Value</b>	754	2 262	366 (11)	366 (11)	-	-	-	<b>197</b>	<b>90</b>	<b>58 (2)</b>
<b>Part %</b>	-	-	100%	100%	-	-	-			
<b>Parking indicator</b>	<b>0,49</b>									

Source: Source: Author's.

The "Pod Dalnią" housing estate and other fully planned Kielce housing complexes from the second half of the 20th century are too broad in their structure to deal with the problem of communication service in general and find one suitable solution. The author has divided the estate into urban units in order to carry out detailed research within their borders. The estate was divided into five units based on the spatial layout of buildings, the communication system, the ownership structure of the land, the border of plots and street axes. Separately, the area 2.E was designated and marked in red as a service unit, on which there are buildings of education and culture. The spatial arrangement of units on the map (Fig. 8) shows the layout, the communication service model and the distribution of various types of parking lots within the boundaries of the designated areas. The tabulated combination of data and indicators (Table 2) gives the opportunity to diagnose and compare the scale of the parking problem in each unit.

<sup>8</sup> The division of parking spaces into various types has been made on the basis of ways of storing cars in other settlements in Kielce in order to be able to compare data (type, number of places and percentage share) between them.

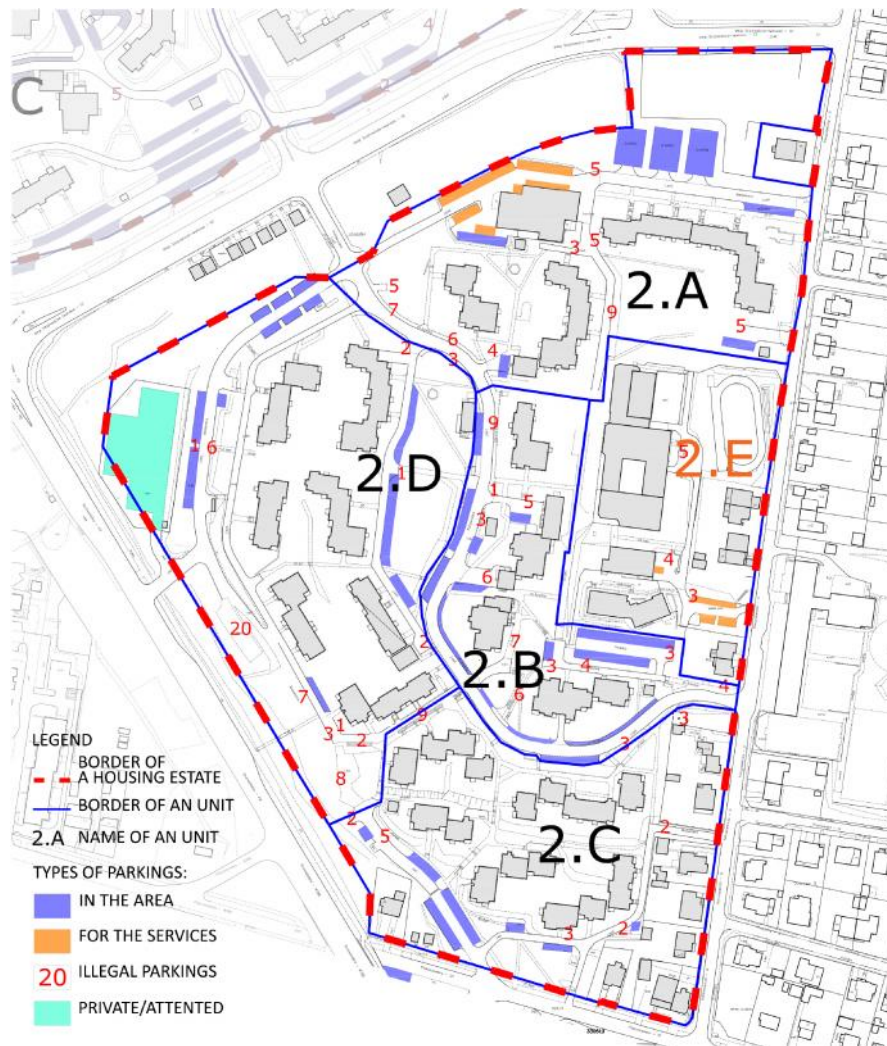


Fig. 8. The original division of the "Pod Dalnią" housing estate into urban units.  
Source: Author's.

Table 2. List of data and indicators of urban units of the "Pod Dalnią" housing estate.

Unit number	Unit area	Building area	Building intensity	The number of flats	The number of residents	The number of parking spots (for the disabled)					Parking indicator	The number of illegal car parks	The number of private car parks	The number of car parks for services
						Sum	In the area	Under ground	Garages in the building	Freestanding garages				
2A	31 032 m <sup>2</sup>	3 814 m <sup>2</sup> (12%)	0,44	154	462	86	86	-	-	-	0,56	52	-	46 (1)
2B	16 633 m <sup>2</sup>	2 423 m <sup>2</sup> (15%)	1,06	183	549	126 (6)	126 (6)	-	-	-	0,69	54	-	-
2C	25 974 m <sup>2</sup>	4 826 m <sup>2</sup> (19%)	0,63	177	531	49	49	-	-	-	0,28	26	-	-
2D	36 736 m <sup>2</sup>	4 380 m <sup>2</sup> (12%)	0,55	240	720	105 (5)	105 (5)	-	-	-	0,44	53	90	-
2E	16 594 m <sup>2</sup>	3 987 m <sup>2</sup> (24%)	0,46	-	-	-	-	-	-	-	-	12	-	12 (1)
THE SUM OF WHOLE	126 969 m <sup>2</sup>	19 430 m <sup>2</sup> (15%)	0,59	754	2 262	366 (11)	366 (11)	-	-	-	0,49	197	90	58 (2)

Source: Author's.

The table compiles information on building area (percentage share of buildings in the unit's area), building intensity, number of flats, residents and parking spaces. Thanks to the data on the number of flats and separate parking spaces, the author calculated a parking indicator for each unit, thus distinguishing the area 2.B, with the smallest indicator – 0.28 space for a flat and the largest need for the organization of additional parking spaces. The number of unmarked illegal parking spaces, counted during the local vision, provides information about motorized needs and distinguishes individuals and specific spaces that are struggling with their large amount.

The analysis in the spatial (on the map) and tabular form allows for a detailed diagnosis of the problem of communication service in each unit and the distinction of areas that face the biggest parking problem. On this basis, also calculated that the Park & Ride car park planned by the city for 420 places would change the parking situation in the 2.D unit from 0.44 to 2.19 parking space per one flat, and from 0.49 to 1.04 throughout the estate. The analysis also shows the parking lots located near the services and the possibilities of their use in meeting the needs of the communication service of the units. Assuming that the private car park located at the retail pavilion in unit 2.A is fully used by the residents of the unit, its parking situation changes from 0.56 to 0.86 flat. This is an example of a solution that uses an existing communication service infrastructure.

Due to the complexity of the problem under investigation, the author plans to complete urban analysis of units with participatory research, in the form of a survey and interviews with residents. They are aimed at recognizing opinions and needs in terms of the number and availability of parking spaces, the preferred length of access to the car park, the monthly parking fee, the inconvenience generated by the current communication service and meeting residents' ideas for solving the parking problem. The research is planned to be carried out within the boundaries of the spatial units of the housing estate, so that the results are more accurate and complement the urban analysis.

In order to enrich the knowledge about the needs of the residents of the Kielce housing estates studied, the tasks submitted to the Kielce Civil Budget (CB) in all its editions were analyzed (Table 3).

Table 3. List of tasks reported in 4 editions of the budget by residents of housing estates from the second half of the twentieth century.

THE NAME OF THE HOUSING ESTATE	2016												SUM												ADM.	UNA D.	THE SUM OF THE HOUSING'S TASKS					
	TASKS ADMITTED						TASKS UNADMITTED						TASKS ADMITTED						TASKS UNADMITTED													
	LARGE			SMALL			LARGE			SMALL			LARGE			SMALL			LARGE			SMALL										
	O	R	I	O	R	I	O	R	I	O	R	I	O	R	I	O	R	I	O	R	I	O	R	I								
1. ŚLICHOWICE	1			1	1	1				1	1				2	3	2	1	5(1)	1	0	1	1	0	1	2	3	10(1)	6	14(1)	5	19(1)
2. POD DALNIĄ	1			1	2(1)				1						3(1)	1	0	1	3(1)	0	0	0	2	0	0	0	4(1)	4(1)	2	8(2)	2	10(2)
3. CZARNÓW		1	1	1	3(1)	1				2	1	1	2		2	4	6	5(1)	5(1)	1	0	2	7	1	4	4	8(1)	15(1)	18	23(2)	18	41(2)
4. HERBY	1				1	2			1			2		2	1	6	1	2	3	0	0	4	0	0	3	3	3	16	15	7	22(0)	
5. JAGIELLOŃSKIE	1				1					1				2	0	1	0	3	0	0	1	3	2	0	0	4	4	4	6	6	12(0)	
6. PODKARCZÓWKA	1			1	1	1						1		5(1)	0	1	1	0	3(2)	0	0	2	0	0	1	6(2)	0	7(2)	11(4)	3	14(4)	
7. CHĘCIŃSKIE			1	1	1									0	0	4	1	2	0	0	0	1	0	0	0	1	2	5	7	1	8(0)	
8. AL. LEGIONÓW	3(1)													12(2)	0	0	1	0	1	1	0	2	1	0	0	15(2)	0	3	14(2)	4	18(4)	
9. BARWINEK				1	1				1					2(1)	0	2	2(1)	(1)	1	1	0	4	0	0	0	5(2)	1	7(1)	8(4)	5	13(4)	
10. KOCHANOWSKIEGO	1			1										3	0	1	2(1)	0	0	0	1	0	1	0	0	6(1)	1	1	6(1)	2	8(1)	
11. CZARNOCKIEGO		1				1			1					0	1	2	0	0	3(1)	0	1	2	0	0	0	0	2	7(1)	6(1)	3	9(1)	
12. ZAGÓRSKA	2	1		2(1)					1			1	4	4(1)	2	4(2)	3(2)	1	0	1	0	0	0	1	8(2)	8(3)	4	18(5)	2	20(5)		
13. SANDOMIERSKIE	1			2	1					2				2(1)	1	5	5(2)	3(2)	(1)	0	0	12	1	0	1	8(3)	4(2)	19(1)	17(6)	14	31(6)	
14. NA SKARPIE								1	1					2(1)	0	0	0	0	0	1	1	1	0	1	0	3(1)	2	1	2(1)	4	6(1)	
15. SĄDY			1	3								2	1	1	2	2	3	1	1	0	0	2	0	4	2	4	7(1)	7	10(1)	8	18(1)	
16. SZYDŁÓWEK					1	1								0	0	3	1	8(2)	2	0	0	2	0	1	1	9(2)	8	14(2)	4	18(2)		
17. BOCIANEK									1					2	1	0	4(1)	0	0	0	0	0	1	0	1	7(1)	1	1	7(1)	2	9(1)	
18. SŁONECZNE WZGÓRZE					3	1								2(1)	1	0	1	5	2	0	0	1	0	1	0	3(1)	7	3	11(1)	2	13(1)	
19. UROCZYSKO	1			1										5(1)	0	2	3	0	0	0	0	1	2	0	0	10(1)	0	3	10(1)	3	13(1)	
20. ŚWIĘTOKRZYSKIE														2(1)	0	0	0	1	0	1	0	0	0	0	1	3(1)	1	1	3(1)	2	5(1)	
21. NA STOKU						1			1			2		3(1)	4	1	4	2	1	0	1	2	0	3	1	7(5)	10(2)	5	15(7)	7	22(7)	
NUMBER OF TASKS O,R,I	13	3	3	15	15	8	1	0	11	3	6	8	56	23	40	40	44	21	4	9	49	9	15	18	109	91	128					
THE SUM OF SMALL AND BIG TASKS				19/22		38/56			12/19		17/30		119		105		62		42													
THE SUM OF ADMITTED AND UNADMITTED				57/78					29/49				224(43)		306		104/208									224		104				
THE SUM OF ALL HOUSINGS' SUBMITTED TASKS						86/127										328/514										328(43)						328(43)

Source: Author's.

Residents of the "Pod Dalnią" housing estate submitted 10 projects during four editions, including 4 for education (E), 4 recreational areas (R) and only 2 for technical and communication infrastructure (I). Reported infrastructure tasks related to large, expensive parking infrastructure projects, among others a task named by the applicants "Multilevel parking lot of our dreams", therefore they were not allowed to vote already at the verification stage. The rest of the submitted tasks show the demand for a recreational space on the estate. The results of the analysis also provide a lot of information about the activity of the inhabitants of Kielce block settlements and their participation in efforts to change their immediate environment.

### Summary and conclusions

The presented study is an important source of information on the state of the Kielce housing estate from the second half of the 20th century "Pod Dalnią" mainly in the spatial and communication aspect, and forms the basis for subsequent stages of research. The analyzes carried out allowed to identify one of the most serious problems in the housing estate - a parking problem, whose monitoring is recommended in the "Transport plan for the City of Kielce ...".

Based on the research carried out, the author formulated guidelines that are planned to be extended in the future with more detailed proposals for solving the parking problem and directions of housing development in the context of sustainable mobility:

- Monitoring and analysis of the communication service model and the parking situation on the estate, which is the basis for the development of specific parking policy measures and transport plan. (Fig. 7, Tab. 1)
- Division of the housing estate into smaller urban units in order to carry out detailed analyzes of their communication service. The housing assumptions of the second half of the twentieth century are too extensive in their structure to deal with the parking problem in general and try to find one suitable solution. (Fig. 8, Table 2)
- Based on the global trends of decreasing the share of car travel and parking indicator (up to 0.5 parking spaces per flat) [15] and recommended in the "Transport Plan for the City of Kielce ..." indicator at 0.75, determining the parking indicator for the housing estate that will be saved in planning documents for this area. The author proposes to determine the maximum indicator of the number of parking spaces per apartment (and not so far in Polish planning records - the minimum indicator), in order to avoid oversupply of parking spaces and not to limit spatial development of the housing estate. Its determination should take into account the spatial and communication status of the estate, its development potential, user preferences and the availability of alternative means of transport.
- Supplementing the strategic and planning documents of the city with a broader approach to the development of bicycle infrastructure, public transport and pedestrian space, and the promotion of alternative means of transport for the car. In addition, the author recommends the creation of a plan for revitalization and development of the housing estate, because the spatial policy of the settlements from the second half of the 20th century in Kielce is in no way limited by planning documents, in the form of local spatial development plans [15].
- On the basis of urban analyzes and surveyed preferences of the residents, designation of areas for the construction of parking lots in the border of the estate. At the same time, it is necessary to limit the number of parking spaces in the streets and in estate interiors. The indicated parking lots should be part of the overall plan for revitalization of the housing estate and indicate the entities that manage these areas.
- Restoration of balance and proper segregation of car, bicycle and pedestrian traffic, thus limiting the penetration of car traffic into the housing estate. The basis for this assumption is the detailed urban research of the estate carried out by the author, supplemented soon with participatory research and other activities of the sustainable transport plan conducted and financed by the City of Kielce.
- Introduction of regulations in the form of cooperative regulations, markings (signs or belts dividing parking places), parking fees, identifiers or barriers for better organization of communication service, as well as control of respecting these regulations and regulations.
- Collaboration between all entities responsible for the estate area, i.e. community management, cooperative, municipal authority, residents, private entrepreneurs, institutions and non-governmental organizations operating in its territory, in order to achieve the objectives of transport policy and sustainable development of the housing estate. The main leader of the transport policy should be the City of Kielce, with the possibility of financing policy measures from own resources or EU funds, while the estate manager (housing communities, cooperative) should carry out tasks in their area, cooperating with the self-government bodies of Kielce and institutions and organizations operating on the estate. Such cooperation will be possible when the housing estates become auxiliary units of the Kielce commune and will conduct financial management within the city budget. At present, the city does not have an administrative division into housing estates, which means that residential areas are not fully managed, heavily divided by ownership, with modest budgets for revitalization activities.

Based on the above guidelines and planned detailed solutions to change the model of communication service, the author seeks to determine the strategy of transformations and development directions of the housing estate. With the modern increase of spatial mobility, it is important to increase the communication accessibility of the housing estate, improve the quality of life of residents and the quality of public space, where you can move safely and comfortably.

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