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IMPROVING APPROACHES TO DETERMINING THE MAXIMUM AREA OF LAND PARCELS UNDER EXISTING BUILDINGS AND STRUCTURES

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Abstract.

The article substantiates directions for improving the methodological framework for forming state- and municipal-owned land parcels on which buildings and structures are located. A methodology is proposed for delineating such state and municipal land parcels that, in the course of parcel formation, explicitly accounts for the functional (land-use) designation, the technical specifications of buildings and structures, and their location in relation to other immovable property, red lines (street right-of-way lines), public-use areas and facilities, water bodies, territories and assets of the nature reserve fund, cultural

heritage sites, and other objects that impose special land-use regimes. It is proposed to establish a unified, quantitatively measurable approach to determining the permissible boundaries of these parcels through two interrelated parameters—the width of a basic service strip and a special adjustment coefficient for each class of buildings and structures. The proposed approach to forming state- and municipal-owned land parcels hosting buildings and structures will, overall, simplify the work of compilers of land management documentation by relying on a single set of quantitative parameters. At the same time, it will reduce instances of transferring excessive land areas without competitive bidding and accordingly increase the supply of land on the competitive market

Keywords: *land parcel formation, functional (land-use) designation, building codes.*

Introduction

Pursuant to part two of Article 134 of the Land Code of Ukraine, it is permitted to transfer land parcels without competitive bidding if private buildings or structures are located on them. At the same time, criteria for the ratio between the area of the immovable object and the area of the land parcel are absent, which in some cases enables compilers of land management documentation to form parcels that are dozens of times larger than the actual needs of servicing. The consequence is the gratuitous or preferential withdrawal of significant areas from the potential land market, a reduction in the revenues of the state and local budgets from the lease and sale of land parcels, and unequal conditions for other participants in land relations [3].

At present, in most countries of the European Union, the issue of forming a land parcel beneath existing buildings and structures is resolved through a strict regulatory limitation of the parcel area that may be transferred or formed without the application of competitive procedures. The general approach observed in the legal systems of Germany, France, Poland, and a number of other states is based on the principle of the “minimum necessary area” to ensure the operation of the relevant immovable property.

In Germany there is a single model building regulation that is adapted by legislative acts of each Land, the Musterbauordnung (in particular, § 6 “Abstandsflächen, Abstände”), according to which the minimum distance from the external wall of a building to the boundary of a land parcel is set at not less than three meters. This distance is formed as the so-called Abstandsfläche, a strip intended to ensure fire safety, natural lighting, ventilation, and access for technical maintenance. For standard residential and public buildings it equals 0.4 of the wall height, but not less than three meters; for industrial facilities it equals 0.2 of the height, again not less than three meters. The determination of the boundary of a land parcel, including in subdivision or formation, is carried out on the basis of a partition plan (Grundstücksteilung), which may not violate the boundary of the Abstandsfläche [13].

In Poland an analogous approach is enshrined in the Ustawa o gospodarce nieruchomościami (the Act on Management of Real Property, Article 37), which permits the sale of land parcels without competitive bidding only when the parcel “cannot be used independently” and is intended to improve the conditions of operation of the adjacent real property. In doing so, the gmina authority that adopts the alienation decision evaluates whether the requested area truly corresponds to the limits of operational need. In practice, this means that the parcel formed beneath an existing building includes only the external building footprint plus a technical setback (usually one to three meters), or existing internal driveways if they are demarcated. Any excess over this size is subject to separate approval and requires a resolution of the gmina council [14].

In France the legislative framework is contained in the Code général de la propriété des personnes publiques (General Code on the Property of Public Entities), namely in Articles L.3112-1 and L.3112-2. These provisions establish the possibility of transferring objects of state or municipal property without competition—the so-called cession amiable—exclusively if the respective property is “necessary to ensure continuity of use or to improve the conditions of operation of the adjacent object.” The transfer instrument must contain a plan of the parcel

boundaries prepared on the basis of cadastral materials, and, in accordance with the administrative instructions of the Directorate General of Public Finances of France (circular of 1 July 2016), such a boundary is limited to the emprise strictement nécessaire, that is, the strictly necessary area. In practice, this concept means the external contour of the building plus a technical setback of three meters, which may be increased only in the event of a substantiated need—for example, for railway stations, terminals, or industrial facilities [10].

Therefore, in Ukraine there has long been an objective necessity to develop methodological approaches to determining the area of land parcels required for servicing existing buildings and structures, the application of which will make it possible to minimize the risks of abuses in the disposition of state- and municipal-owned lands, as well as to prevent the formation of excessive and inefficient landholdings and land uses in built-up territories.

Review of Recent Research and Publications

Today, research on the formation of land parcels beneath existing buildings and structures in Ukraine lies at the intersection of land management, land law, and urban planning norms. Thus, the Land Code of Ukraine provides for the possibility of transferring parcels without land auctions in the event that private buildings or structures are located on them. At the same time, the absence in the Land Code of Ukraine of a quantitative criterion for the “minimum necessary area” creates a gap that enables the overstatement of areas when forming parcels for the servicing of immovable property. From the standpoint of the logic of the law of things (rights in rem), the “area necessary for servicing” is also enshrined through the connection between the building and the land: upon the transfer of title to a building or structure, the corresponding part of the land parcel passes in the dimensions defined by the contract, and if not defined, within the footprint occupied and the area necessary for its servicing. This approach is consistently reflected in court practice and in the educational and methodological materials of the Supreme Court

concerning the application of Article 120 of the Land Code of Ukraine and Article 377 of the Civil Code of Ukraine.

In the Ukrainian scholarly discourse, a significant contribution to the issues of the systemic nature of land relations, the land market, and cadastral support has been made by A. H. Martyn [5, 6]. Although these works do not focus exclusively on "parcels beneath buildings," they form a methodological foundation for quantitative and institutional approaches to parcel formation, including through an emphasis on procedural transparency, inventory, and the alignment of land law and urban planning regulations. Certain issues of the formation of state-owned and municipal-owned land parcels in Ukraine are disclosed in the works of O. S. Dorosh [2], I. O. Novakovska [7], and others.

Against the background of the domestic discussion, the approaches of the countries of the European Union are illustrative, both in legislative acts [10, 13, 14], which directly embed the principle of emprise strictement nécessaire ("strictly necessary area"), and in the scholarly works of J. Kaufmann and D. Steudler [12], I. Williamson and S. Enemark [11], and J. Wallace and A. Rajabifard [15].

Therefore, the body of scholarly and regulatory sources and scholarly studies confirms the advisability of developing a quantitatively measurable model for determining the maximum permissible area of a parcel beneath an immovable property object.

The purpose of the article is to improve the methodological foundations for the formation of land parcels of state or municipal ownership that are transferred for use or ownership without land auctions in the presence of immovable property located on them, in order to prevent the unjustified withdrawal of excessive areas from circulation and to ensure a proper balance between the right of the owner of immovable property to the proper operation of the building and the public interest of the community.

Materials and Methods

To achieve the stated objective, the monographic method and the methods of analysis and synthesis were applied. Materials were used from scholarly publications devoted to the formation of state-owned and municipal-owned land parcels on which buildings and structures are located, as well as from legislative and regulatory acts of Ukraine and of the countries of the European Union.

Results and discussion

In the authors' view, an effective and workable methodology for forming state-owned and municipal-owned land parcels on which buildings and structures are located can be based on a two-stage system of quantitative constraints. First, for each class of buildings and structures under NK 018:2023 "Classifier of Buildings and Structures," the width of a basic service strip must be determined, which makes it possible to establish a minimum technological corridor necessary for: safe operation, repair, and fire protection servicing; the laying and maintenance of internal engineering utility networks; and the manoeuvring of special-purpose equipment. For example, three meters for residential buildings ensure a circumferential passage and access for a fire-fighting pump unit; fifteen meters for industrial facilities meet the sanitary and fire protection requirements of hazard class IV and the turning radius of a twelve-tonne truck; fifty meters for thermal and nuclear power plants reflect the minimum of the first tier of the sanitary protection zone while preserving the possibility of forming a parcel without competitive bidding.

The second parameter must be coefficient K, which determines the upper limit of deviation from the basic service strip. It incorporates the public interest (a limitation on the withdrawal of land resources) as well as functional necessity (external open storage areas, parking areas, technological platforms, and so forth). Accordingly, for each group of structures it is advisable to take into account the minimum regulatory requirements for fire, technological, and sanitary servicing, which are usually already enshrined in the current State Building Codes of Ukraine

and State Sanitary Rules. This precludes conflicts between the methodology for forming parcels and sectoral building norms [4, 9].

For example, a value of six meters for most public and office buildings makes it possible to position emergency and rescue equipment on both sides (a standard of the State Building Codes of Ukraine V.2.2-40:2018), and fifteen meters for standard industrial buildings ensures the turning radius of a forklift truck and creates a buffer for the containment of process emissions [1].

The application of an increasing coefficient K in the interval from 1.5 to 3.5, which correlates with the average specific area of land that enterprises actually employ to service objects of the respective classes, will make it possible to move from the minimum "service strip" to the typical parcel area that is usually allocated for the respective objects. For residential development, with coefficient K equal to 1.5–2.2, the possibility remains to arrange individual access drives and areas for small architectural forms, but the creation of private open spaces at the expense of community lands is excluded.

Thus, the development footprint of a building or structure is established based on the results of a cadastral survey or a control geodetic survey as a vertical projection onto the ground surface:

- of the entire volume of above-ground structural elements of the building or structure (walls, balconies, bay windows, cantilever slabs, stair flights, permanent porches, ramps, and so forth);
- of the underground parts that extend beyond the external walls of the building or structure (foundations, underground parking facilities, galleries, technical retaining walls, basements, civil protection shelters, and so forth).

It is proposed that the width of the basic service strip (hereinafter, the width) for each class of building or structure be adopted in accordance with NK 018:2023 "Classifier of Buildings and Structures" [8], with the values shown in Table 1.:

Table 1. Values of the Width of the Basic Service Strip (W) and of Coefficient K*

Class under NK 018:2023	Name of the class of buildings and structures	Width of the basic service strip (W), meters	Value of coefficient K
1110	Single-family residential buildings	3	1.5
1110	Single-family residential buildings	3	1.5
1121	Residential buildings with two apartments	3	1.6
1122	Residential buildings with three or more apartments	6	2.0
1130	Residential buildings for collective residence	6	2.2
1211	Hotel buildings	6	2.5
1212	Other buildings for short-term accommodation	6	2.0
1220	Office buildings	6	2.0
1230	Wholesale and retail trade buildings	6	2.2
1241	Buildings for electronic communications, stations, terminals, and related buildings	15	3.0
1242	Garage buildings	3	1.3
1251	Industrial buildings	15	3.0
1251	Industrial buildings (hazard classes II–V)	30	3.5
1252	Tanks, silos, and warehouses	20	3.2
1261	Public leisure buildings	6	2.5
1262	Museum and library buildings	6	2.0
1263	Buildings of educational institutions and research institutions	6	2.5
1264	Buildings of healthcare institutions and social protection institutions	6	3.0
1265	Sports halls	6	2.2
1271	Non-residential agricultural buildings	10	2.5
1272	Memorial and religious buildings	3	1.8
1273	Historical monuments and protected monuments	3	1.8
1274	Other buildings not previously classified	6	2.5
2111	Public highways of national significance	10	1.2
2112	Streets and other roads	7	1.2
2121	Mainline railways	15	1.5
2122	Local railways	10	1.5
2130	Runways	20	2.0
2141	Bridges and overpasses	10	1.5
2142	Tunnels and subways	10	1.5
2151	Port facilities and navigable canals	20	2.5
2152	Dams	15	2.0
2153	Aqueducts, irrigation and drainage	10	1.8

Class under NK 018:2023	Name of the class of buildings and structures	Width of the basic service strip (W), meters	Value of coefficient K
	structures		
2211	Main oil pipelines and gas pipelines	10	2.0
2212	Main water pipelines	8	1.8
2213	Main lines of electronic communications networks	8	1.8
2214	Main power transmission lines	8	1.8
2221	Local gas supply pipelines	5	1.5
2222	Local water supply pipelines	5	1.5
2223	Local sewer pipelines	5	1.5
2224	Local lines of electronic communications networks and power transmission	5	1.5
2301	Mining structures	20	3.0
2302	Power plant structures (thermal and nuclear)	50	3.5
2302	Power plant structures (hydroelectric and wind)	20	3.0
2303	Structures of chemical industry enterprises	30	3.5
2304	Structures of heavy industry not previously classified	25	3.0
2411	Sports grounds	3	2.0
2412	Other sports and recreational structures	3	2.0
2420	Other engineering structures not previously classified	8	2.5

* Note: Author's development. The basic service strip of a building or structure does not replace protective zones, sanitary protection zones, or other restrictions on land use that may extend beyond the boundaries of the land parcel.

The basic service strip of a building or structure is a closed plane figure formed by offsetting the development footprint contour of the building or structure outward in parallel (radially) by the width of the basic service strip (W) in all directions. Taking into account that the basic service strip may also include: land with engineering utilities that serve exclusively this building or structure; land beneath household and technical structures that serve exclusively this building or structure; access roads with a minimum width of 3.5 meters that connect only this building or structure with public roads; technological platforms, raw-material or waste storage areas, and intra-workshop roads (for single property complexes), it is therefore advisable, for a complex of buildings and structures that belong to one

class under NK 018:2023 “Classifier of Buildings and Structures” and are owned by one person (or persons), to form one land parcel and one basic service strip [8].

The maximum permissible area of the land parcel (*Pmax*) is determined by the formula:

$$Pmax = (S + V) \times K,$$

where *S* is the area of the development footprint contour of the building or structure, determined as the area of the vertical projection of the development footprint onto the ground surface; *V* is the area of the basic service strip; *K* is the coefficient established for each class of building or structure under NK 018:2023 “Classifier of Buildings and Structures” and adopted in accordance with the values in Table 1.

The boundary of the land parcel is formed as the smallest polygon that completely encompasses the development footprint contour and the basic service strip, does not exceed the maximum permissible area of the land parcel (Pmax), does not infringe the boundaries of adjacent land parcels, and does not include roads or driveways that provide access to other land parcels and/or other buildings or structures; land beneath networks or structures that serve other land parcels and/or buildings or structures; objects, buildings, or structures, title to which belongs to other persons; or land that is necessary for the operation of other objects.

Thus, the coefficient K is applied to the sum of the area of the development footprint contour and the area of the basic service strip and guarantees that the final area will not exceed the generalised statistical limit of operational use. An area larger than that obtained by the formula may be allocated only through land auctions. This eliminates administrative discretion and renders the decisions of public authorities transparent and predictable.

Conclusions

Based on the study’s results, a quantitatively verified methodology has been developed for determining the maximum area of land parcels beneath existing

buildings and structures in state and municipal ownership that may be transferred without competitive bidding. The permissible parcel boundaries are defined by two interrelated parameters: the width of a basic service strip, assigned to classes of objects under the Classifier of Buildings and Structures NC 018:2023, and an adjustment coefficient that reflects technological, fire-safety, and sanitary requirements. The methodology integrates the object's functional designation, its typical technical characteristics, and spatial constraints, ensuring consistency with current building codes and land management procedures.

Implementation of the approach reduces administrative discretion, standardizes the work of compilers of land management documentation, lowers the risks of unjustified withdrawal of excessive areas outside the competitive framework, and increases the supply of land on the market, strengthening the fiscal base of communities. The model establishes a balanced compromise between the owner's right to the proper operation of real estate and the public interest in rational land use, bringing national practice closer to the European principle of the "minimum necessary area." The prospect of further research lies in the empirical calibration of parameters for different types of settlements and industries and in the development of exceptions for facilities with heightened safety or technological requirements.

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УДОСКОНАЛЕННЯ ПІДХОДІВ ДО ВИЗНАЧЕННЯ ГРАНИЧНОЇ ПЛОЩІ ЗЕМЕЛЬНИХ ДІЛЯНОК ПІД ІСНУЮЧИМИ БУДІВЛЯМИ І СПОРУДАМИ

Abstract. *У статті обґрунтовані напрями удосконалення методичних засад формування земельних ділянок державної, комунальної власності, на яких розташовані будівлі, споруди. Запропоновано методику формування земельних ділянок державної, комунальної власності, на яких розташовані будівлі, споруди, із урахуванням при формуванні земельних ділянок функціонального призначення, технічних характеристик будівель та споруд, а також місць їх розташування відносно інших об'єктів нерухомості, червоних ліній, територій та об'єктів загального користування, водних об'єктів, територій та об'єктів природно-заповідного фонду, пам'яток культурної спадщини, інших режимоутворюючих об'єктів. Запропоновано*

встановити єдиний, кількісно вимірюваний підхід до визначення допустимих меж такої ділянки через дві взаємопов'язані величини — ширину базової смуги обслуговування та спеціальний коефіцієнт для кожного класу будівель та споруд. Запропонований підхід до формування земельних ділянок державної, комунальної власності, на яких розташовані будівлі, споруди в цілому спростить роботу розробників документації із землеустрою завдяки єдиному набору кількісних параметрів. В той же час, буде забезпечено зменшення кількості випадків передачі надлишкових площ без торгів і відповідне збільшення пропозиції земель на конкурентному ринку.

Ключові слова: *формування земельних ділянок, функціональне призначення, будівельні норми.*