

*Original research paper*

## Studying the ways of effective taxation of objects of underground commercial space

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**Abstract:** In this article, the classification of underground space types is analyzed. It is established that there are objects that are taxed in the tax code of Ukraine and there are those that are not taxed. The results of the research are justified by the lack of mechanisms and technical solutions of three-dimensional objects of commercial space taxation, which have been intensively developing in Ukraine. The ways of solving legal conflicts regarding registration and taxation of real estate objects are suggested. Based on the study of the legislative base and normative legal documents in the sphere of land relations, a classifier of three-dimensional space objects, which today are fully or partially used for commercial purposes in various types of economic activity has been proposed. The analysis of the regulatory and legal framework regarding the taxation of underground space facilities has been carried out. Objects for which the taxation of land is charged and those objects for which there is no charge for the use of underground space have been identified. A methodology for the justified calculation of a decreasing percentage ratio for calculating a normative monetary evaluation (NME) is developed for the cases where the object of an underground commercial space is located at a distance from the center in one of the proposed zones.

**Keywords:** normative monetary evaluation, underground commercial space, taxation, cadastral registration, real estate

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## 1. Introduction

Due to the rapid growth of investors' interest in underground construction, we can conclude that the use of ground and above-ground space is not limit the possibilities of land use intensification. There is a growing interest in the use of underground space. Moreover, now this concerns not only transport and engineering infrastructure, but the development of underground space is also important for all spheres of life. This is facilitated by: customer demand for land in the city centers and as a result – the high cost of land; limited construction in the central parts of the city, in order to avoid point construction; preservation of the historic center of the city; limitation of the construction storeys number; increase in the number of cars on the roads entails the need to resolve two problematic issues at once: the organization of traffic flows on city streets and the organization of parking and storage of cars.

If we talk about the engineering communications, we must admit that their underground laying is the most rational, architecturally aesthetic and the most reliable way, in terms of conservation. The question of spatial ordering is described in the works (De Moor, 2015; Elizarova et al., 2012; Hartvigsen, 2014, 2015; Stoter, 2004; Stoter et al., 2002; Thomas, 2006, 2012; Vitikainen, 2004; Valstad, 2005) and others.

At present, the issues of legal regulation of relations on the use of terrestrial, above-ground and underground spaces of the land area by various subjects are relevant. In accordance with Article 79 of the Land Code of Ukraine (The Land Code of Ukraine, 2002), a land plot is a part of the earth's surface with established boundaries, a defined location, with certain rights regarding it. Property rights on the land extend within its limits to the surface (soil) layer, as well as to water bodies, forests and perennial plantations located on it, unless otherwise established by law and does not violate the rights of others (Malashevskiy and Palamar, 2016). Property rights on the land extend to space above and below the surface of the plot to the height and depth required for the construction of residential, industrial and other buildings and structures.

Imperfect legal requirements for formalizing the right to use the underground space have led to a situation, when the land tax for the use of underground areas without land registration is not charged, except when the parts of the underground complex protrude above the surface of the land plot, and the separate land plots occupied by them can be taxed on a general basis. This position is controversial and insufficiently reasoned, since, according to a general principle, any use of land is paid. The law provides for the need to pay in the event of actual use of land, without specifying – the entire land or part thereof. Underground spaces with objects, which are located on them are not subjected to land registration and cannot be displayed in the cadastral system, while engineering and transport infrastructure objects exist in registration systems on the rights of easements and restriction contracts.

Having considered domestic legislation, it can be concluded that it restricts the use of lands by certain spatial boundaries, but there are no clear principles and criteria for this restriction in the law. In modern conditions, the use of land can be associated with a deepening, sometimes significant, for the construction of multi-storey buildings under the land surface. In our opinion, the excavation of such pits or arrangement of deep

foundations should be considered as one of the parties to the economic land use itself, the land plot, and not the subsoil (Sidorenko et al., 2016).

The use of land under the surface should be considered and used as an object of commercial use. Legislative shortcomings are one of the reasons for the emergence of law enforcement problems, and also serves as a basis for discussion about the use of lands, which are not related to engineering development for the needs of the community, which should be considered from a commercial point of view.

Based on the world experience in setting land tax rates (Art. 266 property tax), as well as the application and further development of land management practice, urban planning and tax services, their improvement and use of advanced GIS – technologies should serve as a boost in the development of the country's economy in general and in the land management industry.

Recently, in view of the rapid pace of population growth all over the world, it can be concluded, that the use of terrestrial and aboveground space is not the limit possibilities of land use intensification, which affects the main factors:

- 1) intensive development of aboveground and underground space – construction of bridge crossings, road junctions, overpasses, advertising structures, increase in the number of underground engineering networks and communications, pipelines, tunnels, underground parking, underground shopping complexes etc.;
- 2) construction of complex multi-level urban development projects (residential, cultural, entertainment, administrative and other complexes);
- 3) the need to identify zones with special conditions of use (restrictions and encumbrances, pollution zones, etc.).

To date, the cadastral registration of real estate objects is two-dimensional, i.e. which provides the mapping of objects in the  $x$  and  $y$  coordinate system, excluding coordinate  $z$ . Such registration systems do not consider the development of construction in the urbanized environment and the ever-growing number of construction projects, which are increasingly becoming multi-level to date.

Sooner or later, almost every metropolis is faced with the need to explore the underground space. In the advanced European capitals – Paris, Berlin, Vienna – such a need arose already in the 50's of the last century. As a result, in just a few years, multifunctional complexes appeared here, the features of which are: significant sizes, a complicated organization of input nodes and levels, and the use of underground space. Underground construction is actively used in the majority in large cities. In recent years in the underground space of cities, the multi-tiered, multifunctional complex of cultural and consumer services and engineering support of the modern city are placed.

## **2. Materials and methods**

Modern underground construction is dominated by three main directions. These directions are presented in the example of the Kyiv city:

1. Commercial underground real estate – underground trade and shopping and entertainment areas, parking lots, shopping areas in underground pedestrian crossings (Figure 1).

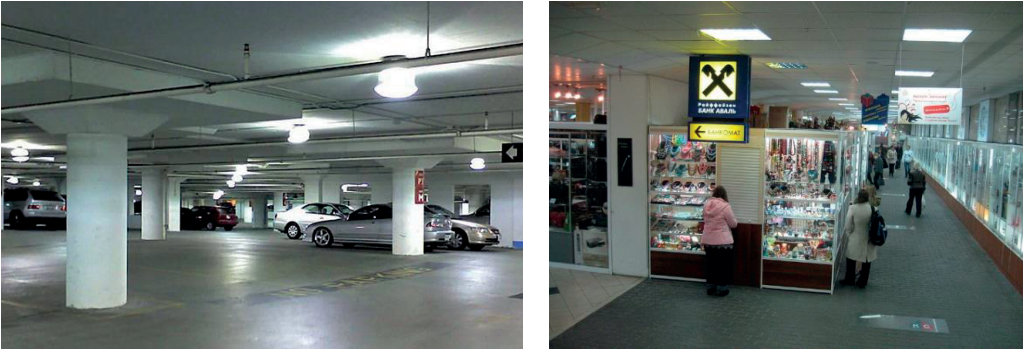


Fig. 1. Commercial underground real estate

Underground objects are located under lands of different types and functional use, different forms of ownership and under a variety of buildings and structures. The allocation of land for the placement of construction sites requires the registration of rights to the land plot, its mapping and mandatory registration of objects. According to the current legislation, for the functioning of individual underground objects, the terrestrial part of the land is not allocated.

2. Building of transport arteries – road tunnels, subway (Figure 2).

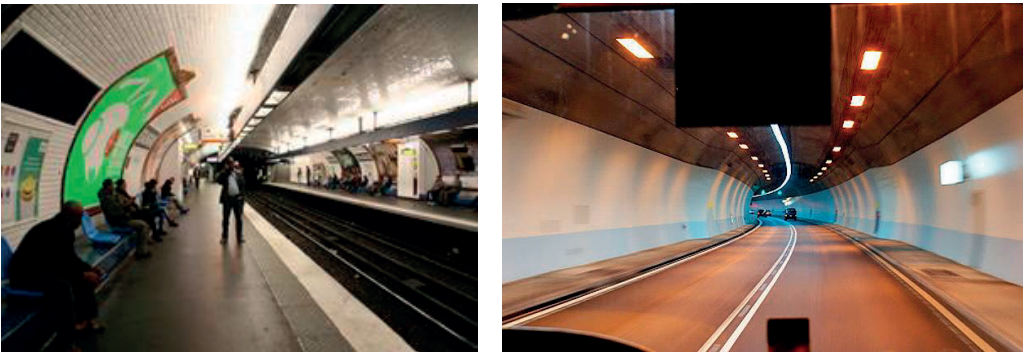


Fig. 2. Transport arteries

3. Engineering infrastructure (Figure 3).

Recently in Ukraine due to acute shortage of the territory work on the underground construction of areas and roads in the central areas are conducted. However, the process of separate objects construction and the development of pre-project proposals is complicated not only by the conditions of a market economy, for which the choice of sites for the design and construction of underground shopping complexes is dictated primarily by the commercial purposes of customers.

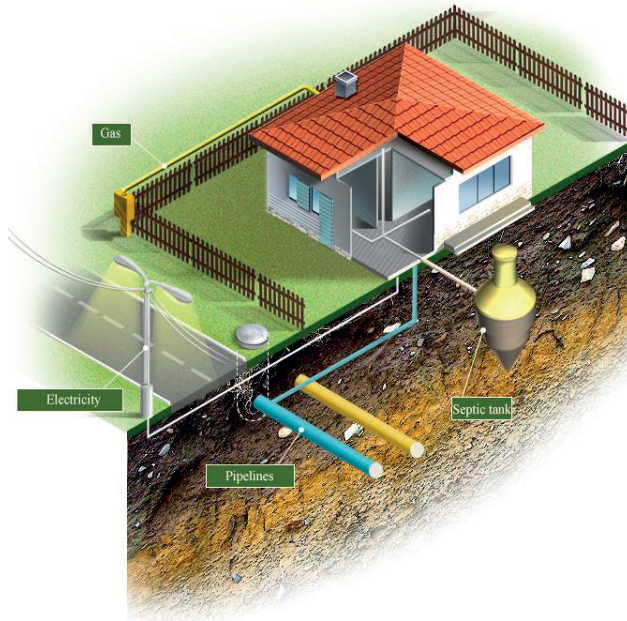


Fig. 3. Engineering infrastructure

To solve the problem, as well as for the full development of cities, everything must be done in a comprehensive and balanced way. To do this, it is necessary to solve the problem of internal yard space correctly. Moreover, until now the question of parking has not been fully solved: the number of cars is constantly increasing, and yard spaces remain the same or decrease. Therefore, it is necessary to change priorities in major cities of Ukraine.

Yards should be absolutely pedestrian, and parking should be built separately – underground, aboveground, separate multi-level. Also, multi-level parking areas near the center are needed, which “will cut off” the external transport. This will unload the central part of the city, make it cleaner and more attractive.

In legal terms, these objects constitute a kind of “a three-dimensional property” with a possible unequal amount of rights to its “part” at different levels. At the same time, on the earth’s surface, where underground or above-ground structures are located, there can be the objects of various purposes (roads, landscaped and other common areas, structures, elements of improvement, etc.) state or municipal (public), or private property. Moreover, subjects of rights on the construction of the “underground” and “surface facilities”, as a rule, can not be combined in one person.

In most cases, the problem of construction and future use of buildings and structures that are “underground” is solved concerning such objects of “non-land real estate” while the rights to land are not formalized.

Despite the economic and sometimes environmental relevance of the “vertical development” intensification of the settlements land areas, this state cannot be considered

satisfactory in any way. Analyzing the requirements of Articles 125 and 126 of the Land Code of Ukraine, it can easily be concluded that there are no exceptions to the need for paperwork and registration of rights to land plots in the case of using their aboveground or underground areas (parts) (The Land Code of Ukraine, 2002).

To date, quite often there are cases when a part of objects that are in the underground space is taxed despite the fact that the tax code does not deal with them at all, and the calculation is based on general principles.

It is known that to calculate the normative monetary evaluation of the relevant objects, the following documents are required:

1. Statement.
2. A copy of the certificate of the Kyiv City Statistics Office is indicating the Classifier of economic activities.
3. A document confirming the size of the land plot (state act, land lease agreement, materials of cadastral land inventory).
4. Documents are confirming the total area of buildings and structures on the land (reference of the main balance-maker).
5. A document confirming ownership of the building or its share or the right to use them.
6. Permission for construction works (in case of conducting them).

Let's consider some examples of typical objects located in the underground space and used for commercial purposes (Table 1). In the first case, the underground parking is considered, in the second case the basement of a residential building used for hairdressing is considered (Figure 4).

Table 1. Calculation of normative monetary evaluation

Tax object	Parking	Basement premise of a house
The area of the land plot part	21,000 m <sup>2</sup>	3,934.47 m <sup>2</sup>
Basic cost of 1 m <sup>2</sup> of land	4,098.17 UAH/m <sup>2</sup>	2,169.21 UAH/m <sup>2</sup>
Type of land	– land for commercial use	– land for residential development: 3,701.33 m <sup>2</sup> ; – land of transport and communications: 233.14 m <sup>2</sup>
The coefficient for functional use of land	2.50	1.00
The generalising local coefficient	1.61	1.32
Normative monetary evaluation of a land plot part	346,397.8193 UAH.	15,565,188.55 UAH.

In addition, it should be noted, that such objects of underground commercial space can be divided into two categories:

- 1) underground objects as part of engineering objects;
- 2) objects that are intended for the general use of the community – personified.

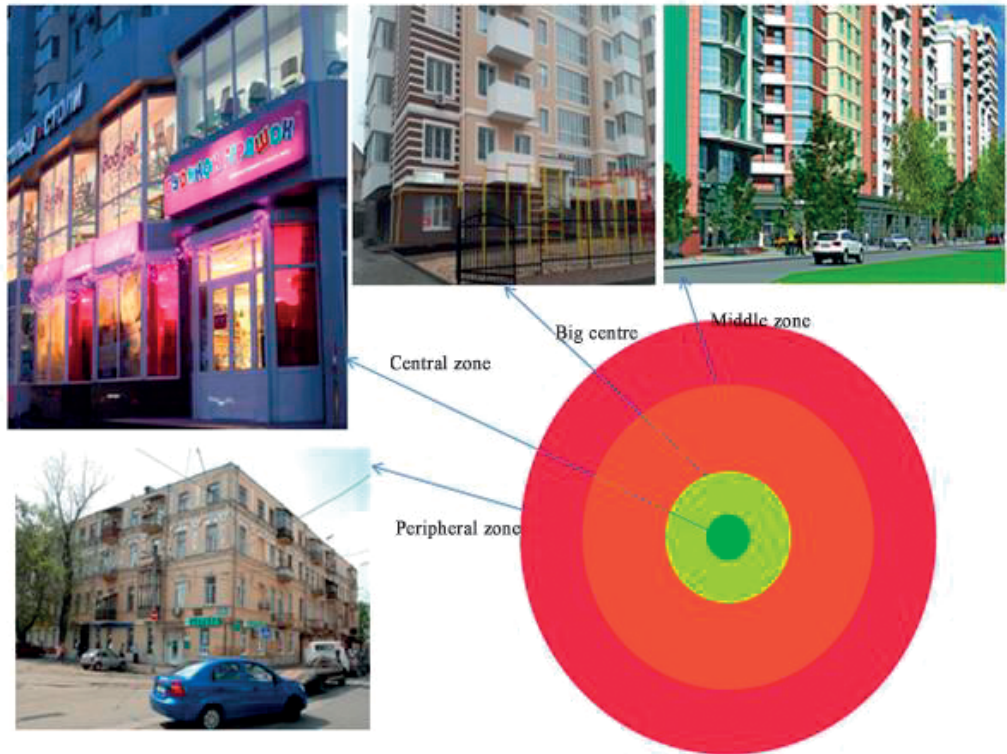


Fig. 4. Use of commercial objects in residential buildings

In determining the normative monetary evaluation of such objects, it can be noted, that some of these objects are not on the earth's surface and are not always located in attractive places. From these considerations, it is advisable to consider the measures, which could partially reduce the normative monetary evaluation of the calculated objects.

Let's consider the following method from the practice of determining the market value of the valued area land. Preliminary the land plot is considered by several parameters of attractiveness and its location to the main public facilities (Figure 5).

In turn, this use of the presented ratio coincides with the decision of the Kyiv City Council from 04/04/1988 (On the definition of economic planning zones) (Figure 6) and is constantly used by land market experts to determine the previous attractiveness of its location.

In the city, the value of land is caused by their location and socio-economic factors. As well as distances of the evaluation object to the main transport objects of the city:

- city center;
- river station;
- central bus station;
- central railway station;
- airport;
- subway station.

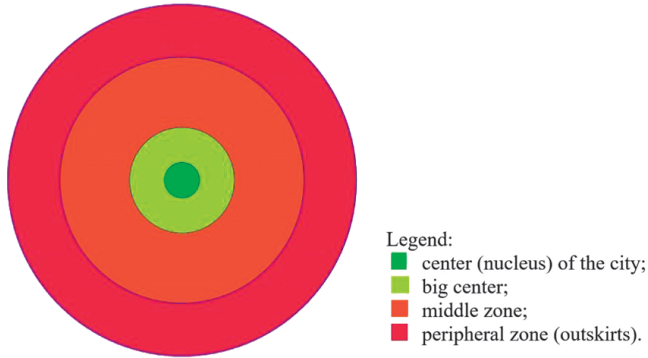


Fig. 5. Classification of the city's attractiveness zones

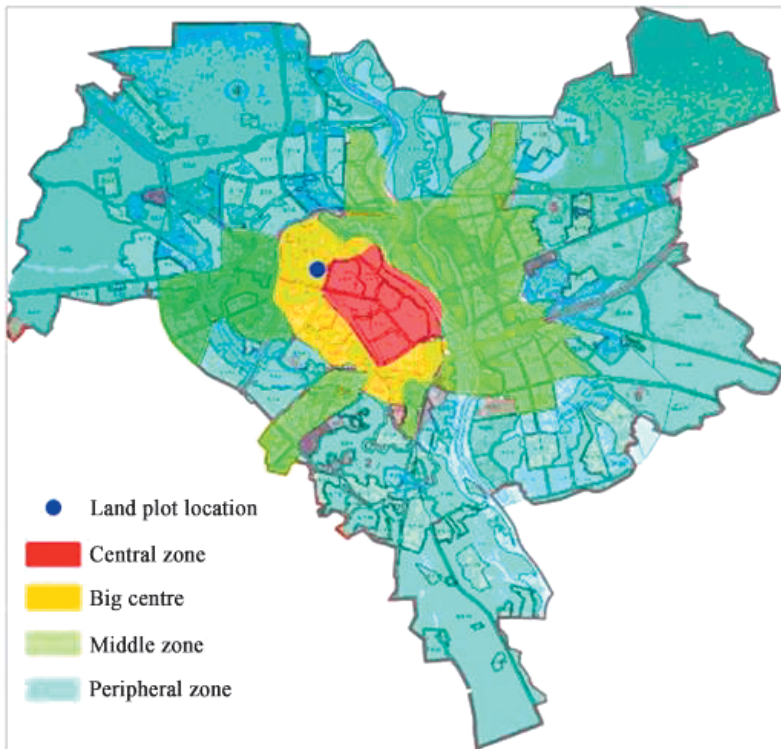


Fig. 6. Estimated zones of the city

It is known that the reference center for the land plot attractiveness is the post office of the corresponding settlement. So we take it as the center. After that, we will conduct eight directions from the city center in different directions clockwise (Figure 7).

The next step in the calculation is to put a grid of squares on our zones. According to SBC-360-92 (state building codes). It is known that the zone of pedestrian accessibility



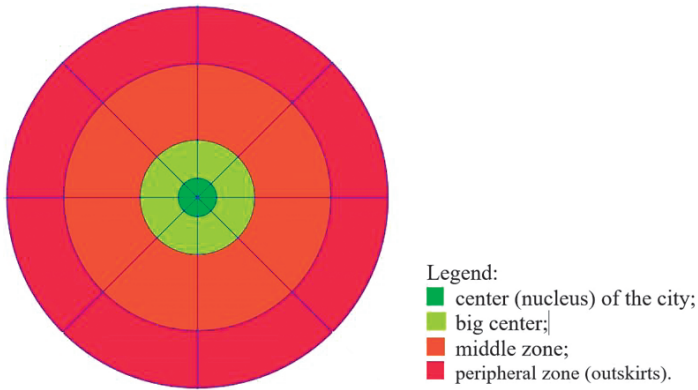


Fig. 7. Determination of the city's zones directions

of public centers is 300–500 m, depending on the size and nature of the town planning structure. Pedestrian accessibility of high-speed urban and external passenger transport facilities should be accepted: for exits of underground stations and stations of the high-speed tram – 500 m; for the remaining objects – 500–1,000 m.

That is why, for our study, we take the value of each square of 1,000 m<sup>2</sup>. Then we apply the proposed grid of squares to our zones Figure 8.

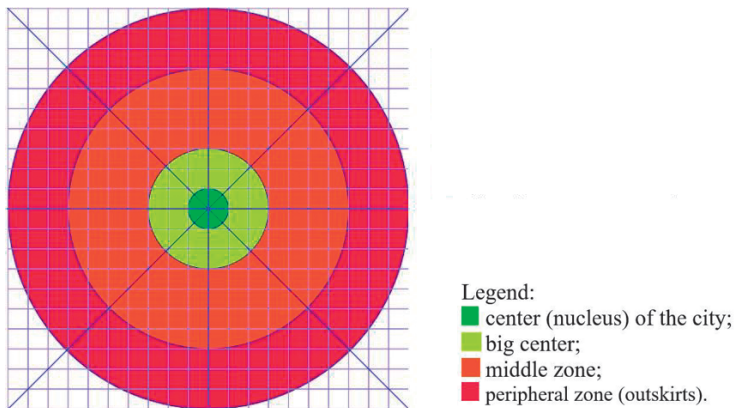


Fig. 8. The structural attractiveness distribution of the city zones

After that, in each zone and for each of the eight directions, we determine the base cost of a square meter of the corresponding land plots in the squares through the which the direction passes, using the scheme of economic and planning zoning from the technical documentation (Figure 9).

If the land plot of the underground commercial space, for which the normative monetary evaluation is calculated, is located between two directions, e.g. in the second zone, the correction factor is determined by the interpolation method (Figure 10).



Fig. 9. Scheme of economic planning zoning of the city

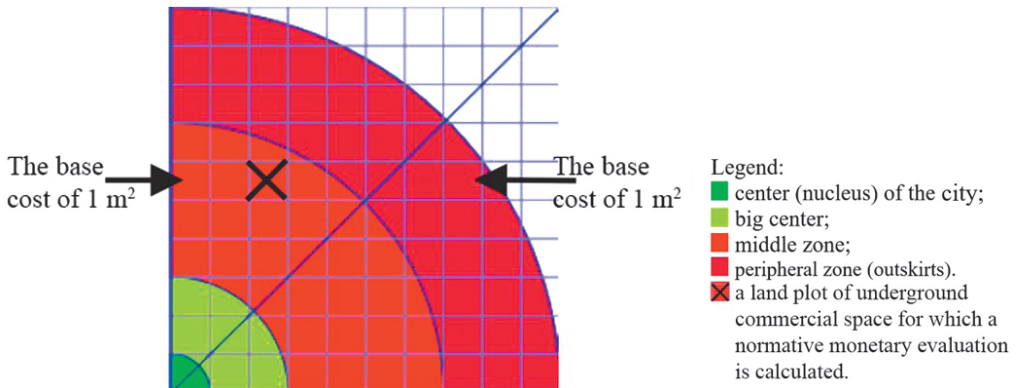


Fig. 10. Determination of the correction factor

In addition, it would be useful to establish a minimum and maximum percentage rate for a section of underground commercial space. From the practice of technical documen-

tation developing on normative monetary evaluation, it is known that there are minimum and maximum percentage rates of the local factors product. The value of the generalizing local coefficient should not be less than 0.50 and above 1.50. If the coefficient value is less or greater than the specified values, it is accepted at the level of the limit value.

### 3. Results

Therefore, in our case, carrying out studies of the change in the value of land in each of the proposed zones almost all coincided with the boundaries indicators of economic planning zones approved in 1988. In each area into 10 sections, which are identical in size and are engaged in commercial activities, the distance depending on changes in the infrastructure. By comparing this study with the previous map, which is still used, we found a similar ratio on this map. According to experts of the land market, it conditionally divided into four territorial zones: center (core) of the city; great center; zone adjoined to the center (middle); periphery (outskirts). For each of the specified zones, we will focus on the minimum and maximum rates ranging from 5 to 15% tax from the normative monetary evaluation of the land.

There is much debate, about how it is possible to use and tax the above objects since underground communications are located under their surface. Let's consider an example when the subject of economic activity pays a tax for a part of the territory of an underground shopping complex, architectural part of which comes to the surface of the earth (Figure 11).

In this case, at the Independence Square in the central part of the Kyiv city there is only a part of the territory, which comes to the earth surface, but in fact, it is a part of the underground shopping complex. Let's calculate the normative monetary evaluation of given parts of individual land plots, underground space of which is used for commercial purposes (Table 2).

It is important to note that the land area of aboveground space of the Globus shopping center is only 1,122.74 m<sup>2</sup>. Moreover, the total area of the underground space is 10,006.81 m<sup>2</sup>. So the object owner limits the use of 8,884.07 m<sup>2</sup> because the underground space of this object is much higher than the aboveground one.

In other words, the owner of the Globus shopping center should pay rent, which is determined according to the current legislation by a fair approach to taxation of the territory for which a restriction has been introduced. In accordance with the decision of the city council [On approval of the Provision on the lease of the territorial community property of the Kyiv city" dated 22.09.2011 No. 34/6250] – rental rates for the use of commerce integral property complexes, on the organization of concerts and entertainment activities, movie screening, the issue of lottery tickets and lottery conducting, liquor and wine industry, the rate is 10% of the normative monetary evaluation (The Land Fund of Ukraine, 2016).

Let's make some calculations, which will show budget losses on the example of several objects. Let's calculate the rental rate using calculations results for land normative

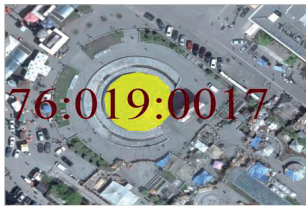



Legend:

- the actual boundary of the Independence Square (public land);
- the boundaries of land plots;
- the actual boundary of the underground commercial space of the Globus shopping center.

Fig. 11. Globus shopping center

Table 2. Calculation of normative monetary evaluation

Tax object	 <p>Kyiv, Shevchenko district, Independence Square</p>	 <p>Kyiv, Shevchenko district, st. Instytutska 2 a</p>
The area of the land plot part	491 m <sup>2</sup>	4,800 m <sup>2</sup>
Basic cost of 1 m <sup>2</sup> of land	4,290.38 UAH/m <sup>2</sup>	4,159.95 UAH/m <sup>2</sup>
The coefficient for functional use of land	land for commercial use 2.50	land for commercial use 2.50
generalizing local coefficient	1.76	1.76
Normative monetary evaluation of a land plot part	14,138,949.66 UAH	134,019,886.12 UAH

monetary evaluation presented in Tab. 2 and according to the data of Globus territory, which leases out its premises:

$$Pr = 14,138,949.66 \text{ UAH}/10\% = 14,138,94.966 \text{ UAH.} \quad (1)$$

Summing up, we can say that the legal entity pays only for part of the Globus territory, namely “dome”, and as noted above, the rent of 10% of NME is 1,413,894.966 UAH, which corresponds to the calculations of the declared area. So it is done for decreasing and evasion of tax. That is, in fact, a legal entity must pay a tax on the entire area of the complex, which is 21,000 m<sup>2</sup>.

#### **4. Discussion**

The conducted studies allow to prove the indicators, on the reduction of normative monetary evaluation in the case when the object of underground commercial space is the part of the engineering infrastructure, if the object is located separately, it is not used as an object of infrastructure and it should decrease by 10%, as indicated on the map (Fig. 11) in each territorial zone of the city. That is, the farther away from the city center, the less is the normative monetary evaluation of the land.

These calculations in previous studies make it possible to assert that there are objects of commercial space that are not described in the tax code. Therefore, there are facilities that are not prescribed in the tax code, but they are taxed (parking lots, shops, etc.), although they are at the same level as the underground part of the city.

It would be advisable, in our opinion, to pay attention to the city budget replenishment in this matter due to the taxation of the underground commercial space.

#### **5. Conclusions**

The state land cadastre is the most important instrument of state management of the land fund, it provides the necessary information to public authorities and local self-government bodies, enterprises, institutions, organizations and citizens in order to regulate land relations, rational use and protection of land, as well as determining the amount of payment for land, the level of filling local budgets with land payment depending on the completeness and reliability of the state land cadastre data. The peculiarities of taxation of land plots (within populated areas) were investigated, and it was determined that, by the current legislation of Ukraine, taxpayers are:

- owners of land plots, land shares;
- land users.

Objects of taxation are:

- land plots owned or used;
- land shares owned.

The basis of taxation are:

- normative monetary evaluation of land plots, considering the indexation coefficient, which is determined in accordance with the procedure established by this section;
- area of land normative monetary evaluation is not carried out;

- the land tax rates are determined in accordance with Articles 272-280 of the Tax Code of Ukraine. Tax rates are very diverse. The land tax rates determining also depends on whether a land normative and monetary evaluation is carried out or not.

According to calculations, the area of ground areas of the above-ground space of the Globus shopping centre which is only 1,122.74 m<sup>2</sup>, and the total area of the underground space of the Globus shopping and entertainment centre is 10,006.81 m<sup>2</sup>. So the owner of this object limits the use of 8,884.07 m<sup>2</sup> because the underground space of this object is much higher than the above-ground.

That is, in fact, the owner of the Globus shopping centre must pay a rent determined by current legislation and a fair approach to taxation of the territory on which a restriction has been introduced.

Drawing conclusions one can say that a legal entity pays only for part of the Globus territory, namely the “dome”. So as already noted in the article, the rent of 10% of the NME is 1,413,894.966 UAH, which corresponds to the calculation of the declared area, which is done to tax reduction and evasion. That is, in fact, a legal entity must pay a tax on the entire area of the complex, amounting to 21,000 m<sup>2</sup>.

The conducted researches allow proving the indicators on the reduction of the normative monetary estimation in the case when the object of the underground commercial space is a part of the engineering infrastructure.

If the object is separately standing, then it is used not as an infrastructure object, and it should decrease by 10%, as indicated in each territorial zone of the city. That is, the farther away from the city centre, the less is the normative monetary estimate of the land.

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