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SPATIAL DIFFERENTIATION OF BELGRADE ACCORDING TO THE DEGREE OF URBANITY

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Abstract: Papers dealing with cities often use terms such as urban, suburban and peri-urban, as well as central business district, inner city and others. However, there is no clear, widely accepted theoretical and methodological basis for their conceptual and spatial definition and delimitation. Terminology used varies greatly between states, and sometimes depends on subjective spatial perception of the author. Additional problems caused by the high degree of spatial and administrative aggregation (settlements and municipalities) make it almost impossible to observe the internal differences of the city. In this paper, an attempt was made to emphasize the importance of the application of precise and relevant indicators in the differentiation of urban units of the area covered by the Master Plan of Belgrade, such as the size of residential buildings, the presence of urban physical infrastructure, and the structure of employed population by the sector of activity. This type of delimitation could represent a starting point in applicative geographic and other research, as well as in further theoretical and methodological discussions on the issue of internal urban spatial division.

Key words: urban, suburban, periurban, delimitation, Belgrade.

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Introduction

In the scientific literature on the phenomenon of cities, from geographic, planning, social, economic, or any other aspect, there is a vast freedom and individuality evident in understanding and application of terms such as urban, suburban and periurban space, central city core, etc. These terms do have their spatial dimensions, but they are often abstractly defined or completely omitted. Spatial differentiation, used methods and terminology vary significantly depending on the researchers and the scientific paradigm.

The city is a multidimensional and multifunctional open system, making it more difficult an object to research as well as to create its internal spatial division. Probably the most common definitions of the city in urban and regional studies are of legal character. However, in real space, the legal (de jure)
boundaries rarely coincide with the city’s physical volume (formal boundaries). Additionally, the legal city exists as a part of wider environment, causing its boundary to be very porous in functional terms, resulting in a limited validity of this definition in numerous scientific analyzes. Contributing to this issue, Parr (2007) discusses four definitions of the city: the built city, the consumption city, the employment city and the workforce city. The built city is the initial definition of the city referring to its built-up area (continuous or nearly continuous zone) mainly dedicated to utilities such as housing, industrial and commercial activities, transportation and public space. The weakness of this concept lies in the fact that the border of the built city reflects inadequately the functioning of labor and real estate markets, the system of providing services etc. The consumption city is defined as the area in which most of the consumption of goods and services takes place in the built city. The employment city is the area in which most of the employees work in the built city, and reflects, in terms of workplaces, the dependence of the outer area on the built city. The workforce city is the area from which the built city attracts majority of the needed labor, and reflects, in terms of workforce, the dependence of the built city on the surrounding area.

The geographic reality is that the distinction between urban, on the one hand, and rural, on the other hand, is becoming increasingly diffuse and unclear. The elements of urbanization reach the farthest places, these often rural settlements. The physiognomy of the village changes by the introduction of new functions, and it is difficult to draw a clear dividing line, despite the existing differences, the between rural and urban way of life and culture, among other things, due to an increasing individualism and a loss of communalism in the villages (Antrop, 2005). The transition between urban and rural areas is very dynamic, causing the boundaries to be unstable through time, too (Frey & Zimmer, 2001) which certainly complicates the issue of delimitation of urban areas and brings doubts into the accuracy (update) of statistical data.

Researchers and creators of urban development strategies often frame their analysis within the central city–suburban area dichotomy (see, for example: De Maesschalck, 2011). This approach obscures the heterogeneous character of suburban settlements within metropolitan areas – demographic, social, economic, and residential, as well as according to physical characteristics and conditions. The Dictionary of Human Geography (Gregory, Johnston, Pratt, Watts & Whatmore, 2009, p. 731-732) defines suburbanization as a process in which the housing, but also industry and retailing, spread out beyond traditional urban areas, forming a dispersed landscape connected to cities through commuting. This definition, however, does not offer a clear methodology for delimiting urban and suburban. Suburbanization involves conquering the non-urban space by urban elements and functions – first, by residential ones, and then by others, too. Over time, what was suburban – becomes urban. Residential suburbanization followed by industrial and commercial
suburbanization, at an advanced stage can lead to the formation of the edge cities. Significant change in the late 20th century was an erosion of the central city as a business center, whose dominance was undermined by a development of nodes at the edges of central cities – by edge cities (Garreau, 1991; Leigh, 2000).

Carter (1995), for example, observes the dynamics of urban features and functions penetrating the rural space through the distinction of four zones (from center to periphery): 1) concentrated city or core built-up area; 2) rural-urban fringe, additionally divided into the inner and the outer fringe (the former with a tendency towards an intense urban-oriented spatial transformations, and the latter showing basically rural attributes where urban elements have just appeared; 3) urban shadow, a zone with rare examples of non-agricultural contents and with a population primarily employed in agriculture, while the non-agricultural population commutes to the city; 4) rural hinterland.

Some recent urban studies which increase the level of spatial differentiation and focus on the suburban area, distinguish between the inner and the outer ring (Lee & Leigh 2005; Lucy & Phillips 2000; Smith, Caris & Wyly 2001). Thus, Lee & Leigh (2007) discuss the socio-economic differences between the four subareas: the downtown, the inner city, inner-ring suburbs, and outer-ring suburbs. The inner city is usually defined as the main area of gentrification, which primarily consists of older residential zones near the city core (downtown) (Gregory et al., 2009). The issue of revitalization, particularly gentrification of the inner city has become a subject of numerous scientific discussions, since this large-scale phenomenon was perceived in North American and European cities during the 1970s (e.g., Smith & Williams 1986). This introduced a spectrum of possible explanations for the middle class re-immigrating to the inner city (Ley, 1986). However, standard methods for identifying appropriate internal urban boundaries still do not exist. In addition, besides the term “inner-ring suburbs”, the voluminous scientific literature refers to old suburbs, first suburbs, first-tier suburbs, and post WW II suburbs, where all these reference most likely do not relate to the same subarea (Lee & Leigh, 2007).

Determining spatial dimensions (size) of the city, as well as its external and internal delimitation despite the numerous problems and present inconsistencies is of crucial importance for determining deeper geographic correlations of social, demographic, economic and other indicators.

The issue of the internal division of Belgrade in official documents and research papers

In a content of the Regional Physical Plan for the Administrative Territory of the City of Belgrade (Регионални просторни план административног подручја града Београда [РПП АП Београда], 2004), it is possible to allocate several territorial units.
Central business district in this document is identical to the central city core (РПП АП Београда, 2004, p. 404, p. 417) comprising municipalities of Stari Grad, Zemun, and Vračar. A spatially bigger unit comparing to the central business district, is the so-called “Belgrade central zone (in a broader sense)” or the main city center. It corresponds to the central zone determined in the Master Plan of Belgrade (Генерални план Београда; ГП Београда, 2003) and defined as the zone “with a mainly formed functional and physical profile” (РПП АП Београда, 2004, p. 4003). A formed “profile” may indicate that the main criterion for the distinction of this zone is the level of it being built-up. However, there was no adequate argumentation for the outer delimitation of the Belgrade central zone (in a broader sense). According to the Plan, different centers are also possible to extract in the city’s subunits, and they are composed of mostly formed linear concentrations on the main directions of the development outside the central zone. It is important to note that the central business district, central zone, and centers of city’s subunits are all located within the boundaries of the Belgrade settlement.

The Belgrade settlement, which is also termed as narrower city area in the Plan (p. 416) includes urban municipalities of Stari Grad, Vračar, Savski Venac, Novi Beograd, Rakovica, and Zvezdara, as well as the parts of the urban municipalities of Zemun, Čukarica, Voždovac, and Palilula. The document also refers to a broader segment of the urban zone of Belgrade, which “consists of the built-up areas of other urban districts” (excluding the central business district, i.e. municipality of Stari Grad, Savski Venac and Vračar), “but without the parts that come into the category of periurban area” (РПП АП Београда, 2004, p. 404). This zone is vaguely defined, particularly its outer border, but we can assume that it also encompasses the area within the Belgrade settlement. At the same time, a part of the Belgrade settlement and the total area outside the Belgrade settlement up to the outer boundaries of the Administrative Territory (AT) of the City of Belgrade (i.e. City of Belgrade, meaning 17 city’s municipalities2) with the exception of the municipalities of Obrenovac, Mladenovac and Lazarevac are considered to be periurban. These three municipalities are abstractly named the “transitive case”, based on centrality, development potential and the characteristics of their centers (РПП АП Београда, 2004, p. 404).

The Regional Plan (2004) refers also to the suburban belt, which covers nonurban parts of the municipalities of Voždovac, Zemun, Palilula, and Čukarica. In this way, the suburban is seen as a part of the wider periurban, capturing only the municipalities that partially form the Belgrade settlement.

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2 These are municipalities: Stari Grad, Vračar, Savski Venac, Novi Beograd, Zemun, Surčin, Čukarica, Rakovica, Voždovac, Zvezdara, Palilula, Grocka, Mladenovac, Sopot, Barajevo, Lazarevac and Obrenovac.
Spatial differentiation of Belgrade according to the degree of urbanity

Text of the document further indicates diversity of suburban settlements, some of them “having the characteristics of a town (Borča, Ripanj, Surčin, Padinska Skela, Dobanovci, Sremčica etc.)” (РПП АП Београда, 2004, p. 424), but with economic structures based on commuters, causing them to be in a function of Belgrade, i.e. they do not act as independent centers.

The Plan also defines the **urban center of Belgrade**, which consists of 11 municipalities (Stari Grad, Vračar, Savski Venac, Novi Beograd, Zemun, Surčin, Čukarica, Rakovica, Voždovac, Zvedara, and Palilula). It represents the base of a broader functional (nodal) region. **Metropolitan of Belgrade** (or the **Belgrade Region**) contains the AT of the City of Belgrade and the additional municipalities, and is determined in the context of the spatial reach of economic, cultural and social impacts of the City. Spatially and functionally more complex is the **macro region of Belgrade**.

All the above mentioned terms referred to in the Regional Physical Plan for the AT of the City of Belgrade (2004) do have spatial dimensions, while their boundaries (changeable across time) are more or less accurately determined, based on the administrative, physiognomic, and/or functional criteria. Although the City of Belgrade is not functionally, but administratively-regulatory determined unit, promoting cohesion of that space is stated as one of the main objectives of the Plan, which should be achieved primarily through the development and improvement of a network of physical infrastructure. The Plan emphasizes the importance of linking the settlement network in the City of Belgrade and its affirmation as an “administrative, economic, and social entity,” (РПП АП Београда, 2004, p. 401) which would give this area besides the administrative, a planning-development and functional dimension too. The City of Belgrade is defined in the document as a **single urban-rural area**.

The **Spatial Plan of the Republic of Serbia: 2010 – 2014 – 2021** (Просторни план Републике Србије: 2010 – 2014 – 2021 [ППРС], 2011) pays much attention to the functional dimension of cities. Functional urban region (FUR), according to the ESPON classification, represents a variable space that includes morphological urban area of a city (or settlement) and its wider surroundings that generate city’s workforce at the 45-minute distance from the place of residence (ППРС, 2011). It is evident that the city is here observed in a broader context (FUR is a region, not a city) however, there are certain parts of the Plan which may be taken into consideration in the process of delimitation of Belgrade. Thus, according to the share of urban and agricultural population in total, the degree of urbanity is determined, and the following categories of municipalities are named: urban, urbanized, urban-rural and rural

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3 The importance of stressing the functional (and not administrative) urban regions in Serbia is discussed in numerous papers (see: Живановић, Тошић и Ђорђевић, 2010; Тошић и Невенић, 2007).
ones. Besides the Belgrade agglomeration, urban centers of Novi Sad, Niš, Kragujevac and Užice, as well as the subsystems of the outer ring of the Belgrade metropolitan region (Smederevo and Požarevac) belong to the category of municipalities and cities with the highest degree of urbanization. The Plan, in several places, discusses issues of suburbanization, suburban areas and suburban settlements / villages, with no clear criteria of their distinctions.

In the articles that directly or indirectly treat Belgrade or the cities in Serbia prevails a generalized and differently understood (sometimes criticized) administrative spatial division.

For example, in article written by V. Lukić and B. Tosić (Љукић и Тошић, 2009), employees commuting in Serbia are studied at the inter-municipality level, where the ten municipalities of the Belgrade settlement are treated as one unit and inter-municipal commuting identified with commuting within the settlement. Somewhat differently, S. Stamenković and D. Gatarić (Стаменковић и Гатарић, 2009) study the intra-urban commuting of employees, pupils and college students in Belgrade. Studied commuting is of an internal character, meaning that it refers to the area of the Belgrade settlement, but is generalized to the municipality level, and essentially identified with inter-municipal one.

A. Knežević discusses residential and other social problems of Roma population in AT of Belgrade (Кнежевић, 2010), accepting only the spatial dichotomy – peripheral settlements and narrower city area, with no clear demarcation.

D. Matijević (2005) examines demographic and social aspects of the transformation of rural settlements in the northern part of the Belgrade periurban space, in order to indicate the expansion of “urban transition” from periurban to rural zone, which corresponds, according to the author, to the expansion of the Belgrade urban region as well. Influenced by the city, agricultural zone forms the rural-urban continuum / zone / ring or the transitive area. Although she studies settlements outside of the AT of Belgrade, D. Matijević believes that periurban area starts immediately outside the boundaries of the Belgrade settlement, and ends with the outer boundaries of the functional region of Belgrade.

S. Stamenković and D. Gatarić (Стаменковић и Гатарић, 2009) give contribution to the Belgrade zoning, stating that Belgrade can be interpreted differently: 1) as an urban tissue of a considerable area with its planned and formal boundaries, or as the Belgrade settlement; 2) as an urban territory in the narrower sense, containing ten urban municipalities, whereof six urban municipalities (Stari Grad, Vračar, Zvezdara, Savski Venac, Rakovica, and Novi Beograd) are included in Belgrade’s continuous urban territory, while four municipalities (Voždovac, Čukarica, Palilula and Zemun) partially occupy the suburban rural-urban belt with 19 individual settlements, too (rural, mixed, and urban ones); 3)
as an administrative-regulatory area (a collectivity of municipalities) – The City of Belgrade or the metropolitan regulatory area of Belgrade, with 17 municipalities – ten abovementioned urban and seven “other” municipalities (Surčin, Grocka, Mladenovac, Sopot, Barajevo, Lazarevac, and Obrenovac), which form a part of the suburban (peripheral) belt of the Belgrade settlement.

G. Vojković, R. Miletić and D. Miljanović ( Војковић, Милетић и Миљановић, 2010) deal with demographic and economic processes in Belgrade agglomeration, adopting the same thrice conception of Belgrade as S. Stamenković and D. Gatarić (Стаменковић и Гатарић, 2009). However, for the urban tissue or the Belgrade settlement, they use the term a wider area of central agglomeration, while the suburban rural-urban area is also labeled as periurban ring, and the suburban (peripheral) zone of the Belgrade settlement, simply – as suburban municipalities. In addition to these spatial units, the urban cores of Belgrade and Zemun are mentioned, but without an apparent explanation, as in the further text, only one core is explicitly extracted – the old Belgrade core (municipalities of Stari Grad, Vračar and Savski Venac).

B. Tosić and J. Đorđević (2004) study the physical and functional organization of the settlements in the region of Belgrade, which is identified with AT of Belgrade. In this region, they distinguish three entities: the inner-city area (which actually, in the article, corresponds to the settlement of Belgrade), periurban area (also referred to as the rural-urban belt), and six peripheral municipalities. In periurban area, they distinguish dormitory suburbs, weekend settlements, and residentially-industrial settlements.

Figure 1 – Distinguished zones of the Administrative Territory of Belgrade (see on page 110)
Note: Despite inconsistencies in used terminology, distinguished zones can be provisionally labeled as: zone 1 – central business zone; zone 2 – Belgrade settlement; zone 3 – suburban belt; zone 4 – periurban belt; zone 5 – transitive area.

Regional Physical Plan for the Administrative Territory of the City of Belgrade (РПП АП Београда, 2004), and presented papers of a recent date mention several territorial units that are, due to inaccurate determination, impossible to display cartographically. The rest of the spatial determinants can be grouped into five zones (Figure 1) which, however, leave a lot of confusion. Thus, in Figure 1 Surčin is presented as a part of zone 4, but this municipality, depending on the author and the period referred to in the article4, “moves” between zones 3 and 4. Zone 1, in different sources, presents the central business zone, as well as the central or old city core. Zone 1 combined with zone 2 presents the Belgrade settlement, but also the narrower city area, and the urban tissue with its planned and

4 Municipality of Surčin was formed by separating from the municipality of Zemun, in 2004.
formal boundaries, as well as the wider area of central agglomeration, and the inner-city area. Zone 3 is called the suburban belt, but also, the periurban and suburban rural-urban belt. Zone 4 is the periurban belt, transitive area or rural-urban zone, as well as the suburban (peripheral) belt of the Belgrade settlement, and the peripheral municipalities. Zone 1, allied with zones 2, 3 and 4, represents the urban center of Belgrade, but without municipality of Surčin, it is also labeled as the Belgrade urban territory in a narrower sense. Zone 5 is the transitive case or area, but also the periurban and the rural-urban zone, or peripheral municipalities. In comparison to the AT of Belgrade, spatially bigger are the functional and metropolitan regions of Belgrade, but also its periurban and rural-urban zone, as well as its transitive zone (where the AT of Belgrade is termed as metropolitan regulatory area of Belgrade).

Differentiation of the area included in the Master Plan of Belgrade

It is obvious that there is no consensus in local literature regarding terminology and methodology related to the internal spatial entities of Belgrade. Additionally, a high degree of spatial-administrative aggregation in existing studies highlights a need for finding an applicable and in terms of parameters clearly defined method for internal delimitation of the area included in the Master Plan (MP) of Belgrade (ГП Београда, 2003), as a (functionally and physiognomic) relevant heterogeneous planning-regulative unit.

In this study, internal division of the area of the MP of Belgrade is carried out successively on two levels: the level of cadastral municipalities, and the level of statistical circles (which are the smallest territorial units). Territorial division on the cadastral municipality level is used for the initial delimitation of the area into three zones which are frequently used in domestic and international literature: urban, suburban and periurban zone. After defining the urban zone, this very zone is further divided at the level of statistical circles into: the central zone, the inner, middle, and the outer urban ring.

The zoning of Belgrade on the first level (cadastral municipality) is based in this study on the understanding of the existence of the two extremes – urban and periurban (or out-of-urban) areas, together with an active process of suburbanization. A simple consideration that treats suburban area as the main source of the workforce for the urban center is hardly applicable to the area of the MP of Belgrade. According to the census data in 2002 (Републички завод за статистику [РЗС], 2002), 446,615 employed residents lived in this area. A detailed analysis reveals that out of this contingent, 426,235 residents had also their workplaces in the area of the MP of Belgrade (Ratkaj, 2009). These residents, with their living and working places, form a relatively closed system of workforce commuting. Thus, according to the aforementioned criteria, suburban area would expand to the external borders of the MP of Belgrade.
In delimiting urban, suburban and periurban areas in Belgrade, one should not bypass the role and effects of a relatively long system of central planning and its heritage (Петовар, 2003; Раткај, Мартиновић и Сибиновић, 2010; Петровић, 2004). Despite the egalitarian ambitions and the public ownership of housing, the former socialist cities are characterized by a spatial differentiation related to the quantitative and qualitative attributes of the residential function, and accessibility of public services and working places, as well as to the environmental characteristics of surroundings (see: Alexandrova, Hamilton & Kuznetsova, 2004; Gentile & Sjöberg, 2006; Morton 1980; Smith, 1996; Szelényi 1983; Sýkora 1999; Todorić & Ratkaj, 2011), which is not only a consequence of the capitalist heritage, but also of the functioning of socialist central planning that actually reproduced the socio-spatial differentiation through the system of residential building construction and the allocation of limited resources. The lack of housing space has been identified by several authors as essential for the creation and expansion of urban social and physical structures (Vujović, 1986; Andrusz, Harloe & Szelényi, 1996). In this way, Belgrade and other cities in Serbia mostly have a weakly urbanized periphery, largely comprised of informally built, often substandard individual family houses, and of insufficient social and physical infrastructure.

For delimiting urban, suburban and periurban space, a relatively high level of aggregation (cadastral municipalities) was used, mainly for practical reasons, i.e. availability of data and simple correlation with the results of possibly different methodological approaches. On the other hand, in this study, I consider the level of municipal division, even if often present in domestic literature, to be an inappropriately over-aggregated division.

Simplified definition, which designates city as an area with concentration of population (the threshold varies between countries), with a professional structure dominated by service and industrial sectors, as well as an area of a specific architecture and a large number of available services, offers researcher numerous indicators for determining the degree of urbanity5. In this paper, three indicators are selected – land use, population density, and the quality of dwellings.

Economic structure is certainly an important indicator of the degree of urbanization. However, according to the 2002 census (P3C, 2002), non-urban activities (primary sector) have a negligible share in the activity structure of the employed population on the territory of the MP – only 1.61%. Based on the share of the employed in the primary sector of activities in the total of the employed population, we can question the urbanity of only three cadastral municipalities: Veliko Selo (58.14%), Slanci (52.85%) and Ritopek (40.97%). Therefore, the land use, i.e. the share of non-agricultural land, is taken as a more adequate economic indicator. This indicator can specify the real significance and the presence (or the absence) of agriculture in a given

5 See some of available indicators of urbanity, for example, in: Turcotte, 2008.
cadastral municipality. In order to analyze the land use precisely, digital thematic map of the Institute of Urbanism in Belgrade (Урбанистички завод Београда, 2003) is used as the basis.

The second indicator relates to the population density. We could have used what at first sight seems to be a direct measure: the number of inhabitants per square kilometer. However, some cadastral municipalities cover relatively large areas, while their smaller parts have residential purposes – the rest can be occupied by commercial buildings, and natural obstacles such as river flows, etc. Consequently, even if population density is relatively high in the residential area itself, in the entire cadastral municipality it may be low, thus deforming the image of this indicator. Urbanity implies a higher concentration of people and functions, as well as a more intense and more efficient use of (more expensive) land. Starting from this idea, a higher level of urbanity corresponds to a dominant presence of condominiums (multiple-unit dwellings), and to a lower presence of dwellings that occupy most space per resident – individual family houses. Due to cultural specifics, in this research, buildings with one or two dwelling units are all treated as individual family houses. Residential buildings with three or more housing units are considered as multiple-dwelling objects. The share of housing units in condominiums or similar multiple dwelling objects in the total number housing units, according to the 2002 census (РЗС, 2002) is taken as an indirect indicator of population density (or type of housing units).

The third indicator is the quality of dwellings. Out of the total number of dwellings for permanent residence (РЗС, 2002), we extract the percentage of dwellings that lack any of the following: bathroom, kitchen, electricity, outdoor walls made of hard materials, connection to public water supply and sewer system. In this way, a distinction is made between standard and substandard (“bad quality”) housing. Detailed analysis of the data indicates that the vast majority of substandard dwellings belong to this category due to the lack of electricity, public water supply, or sewer system. Thus, this indicator in fact shows the level of presence of basic urban infrastructure in some residential parts of the area included into the MP of Belgrade, which is of particular importance for the cities of the former centralized planning system and the strategy of rapid industrialization (see: Andrusz, Harloe, & Szelényi, 1996). The urban character of a given area implies that it is well equipped in terms of infrastructure.

By these three indicators the spreading of urban, suburban and periurban zone of Belgrade is defined (Figure 2). It is considered that an urban area must have the value for every indicator that is bigger than 50%. On the other side is the periurban area, which is, according to the values of all indicators (less than 33.3%), positioned in an early stage of urbanization, with sparse urban facilities.

6 Only dwellings for the permanent residence (according to the definition of the Statistical Office of the Republic of Serbia) are considered.
Spatial differentiation of Belgrade according to the degree of urbanity

and functions. Between these two extremes there is a suburban area, with some dimensions (indicator values) that are closer either to urban or periurban zone.

Figure 2 – Zoning the area of the Master Plan of Belgrade (see the page 114)
Note: 1st indicator is the land use; 2nd indicator is the population density; 3rd indicator is the quality of dwellings

The next phase of spatial analysis involves differentiation of the urban zone into: central zone, the inner, middle and outer ring. The use of statistical circles as the smallest territorial unit, at this stage, allows a more detailed division of space, and avoids the pitfalls implied in the application of large administrative units in this densely built, but functionally heterogeneous area. Spatial delimitation is performed by a single indicator – the accessibility of workplaces (according to the 2002 census) to the centroids (gravity centers) of statistical circles. All places of work, in this context, represent an approximation of available activities and services – they can be actual or potential workplaces, health and educational facilities, retailing centers etc. The size, i.e. attractiveness of these sites (potential destinations) is further approximated by the number of employees. The number and/or density, as well as the diversity of activities and services on the one hand, and their insufficient spatial presence and relative uniformity on the other hand, define one of the major distinctions between urban and rural areas. The accessibility and variety of services can be additionally observed as an added value of the space, or the “physical capital” (Marcus, 2010), with its physiognomic, social, and economic expression, which is much higher in urban than in rural areas. Furthermore, despite their limitations, economic models of urban land use reflect clearly the role of accessibility in the spatial structuring of a city, as well as the concentration of service sector in its central part, and the relocation of other functions, such as residential, to the periphery (Pacione, 2005). In the zone which is here defined as urban, there are approximately 89% of all workplaces in the area of the MP of Belgrade, of which 77% belongs to the various tertiary and quaternary activities (Ratkaj & Grčić, 2010). The accessibility of statistical circles in urban zone is calculated using the gravity model, with the negative exponential function as impedance measure for the modified Euclidean distance (directed toward bridges)7, and with the coefficient β of 0.5 (for details on the methodology see: Ratkaj, 2009). The internal urban zones are defined statistically, using standardized values (number of standard deviations from the mean values): the central zone – st. values higher than 0.5; the inner ring – st. values ranging from -0.5 to 0.5; the central ring – st. values ranging from -1.5 to -0.5; the outer ring – st. values lower than -1.5.

The methodology of delimiting the area included in the MP Belgrade allows further fragmentation of the suburban zone and examination of the distribu-

7 The analysis refers to the data from 2002, causing the Ada Bridge (Most na Adi) to be excluded.
tion of the indicators with their low values (<50%), which caused given cadastral municipality not to be considered as the urban one. For example, Borča, Mirijevo, Višnjica, and several other cadastral municipalities located immediately next to the urban zone, have small shares of non-agricultural land, while other indicators are on the urban level. Sremčica and Veliki Mokri Lug, on the other hand, have a relatively lower share of agricultural land, an acceptably high quality of dwellings, and the presence of urban infrastructure, but the dominant type of dwellings – the family houses, is spatially inefficient and untypical for urban space. Interesting examples are Ostružnica, Rušanj, Pinosa, Rakovica (village), Zuce, and Boleč, which cannot belong to the urban zone according to the values of all three indicators. These cadastral municipalities, in fact, based on population density (housing type) and dwellings quality (presence of urban infrastructure), would belong to the periurban area, but they have low shares of agricultural land – under two thirds of the total. If we took into account their slightly worse conditions for agriculture (the relief influence), and the presence of the forest areas, we could, eventually include them in the periurban belt.

Conclusion

This paper points at the shortages of the application of administrative or legislative divisions of urban areas in demographic, social, economic or other studies. In addition, domestic scientific literature and legal documents, almost arbitrarily divide the settlement or the administrative territory of Belgrade with no explicit methodological and theoretical basis. This article certainly will not permanently solve the issue of the physiognomic and functional division of the territory of Belgrade, but it suggests and explains a possible methodological approach and the indicators of urbanity. It presents advantages of using multiple complementary indicators, as well as of the hierarchical approach in spatial differentiation of a city. The indicators applied are of a multidimensional character, confirming their relevance in variety definitions of the city, while the hierarchy of territorial units provides a basis for a detailed analysis of the cause of the existing spatial pattern of defined zones. I hope that this article will encourage a new range of geographic, planning, urban and other studies which will contribute to further insights and understanding of the subject and of the relevance of the internal division of Belgrade with a different perspective.

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References (see on page 116)