STRNJENOST POZIDANIH POVRŠIN KOT MERILO ZA DOLOČANJE OBMOČIJ MESTNIH NASELIJ

CONTINUOUS BUILT-UP AREAS AS A MEASURE FOR DELINEATION OF URBAN SETTLEMENTS

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IZVLEČEK

V prispevku predstavljamo problemska izhodišča, ki kažejo na pomen in potrebo po oblikovanju metodologije za celovit zajem dejanske rabe prostora. Opredeljena je urbana raba prostora, ki jo kot pojem uvajamo na novo ter zajema in delno nadomešča tudi sedanja, najpogosteje uporabljena pojma stavbna in pozidana zemljišča. Za določanje območij in raziskovanje urbane rabe prostora ter opredelitev podrobnejših kategorij je treba upoštevati formalna, funkcionalna in fiziognomska oziroma morfološka merila. Zaradi obsežnosti tovrstnega raziskovanja se v prispevku osredotočamo le na morfološka merila za določitev območij mestnih naselij. V metodološkem delu so izbrana morfološka merila podrobneje razčlenjena. S kazalniki razdalje med stavbami, gostote prebivalstva in gostote stavb s hišnimi številkami je opisano merilo strnjenosti pozidanih površin, na podlagi katerega je bila izvedena raziskava razmejitve mestnih naselij od drugih vrst rabe prostora na izbranih testnih primerih treh slovenskih mest: Maribora, Zgornjegorenjskega somestja in Postojne. Rezultati so potrdili pravilnost postavljene delovne hipoteze, da je morfološko merilo sicer potreben, vendar ne zadosten pogoj za določitev in razmejitev območij mestnih naselij od drugih vrst osnovne rabe prostora.

KLJUČNE BESEDE

strnjenost pozidanih površin, morfološki pristop, razdalja med stavbami, gostota stavb s hišnimi številkami, gostota prebivalstva, dejanska raba prostora, urbana raba prostora, mestna naselja

ABSTRACT

In this paper, we first discuss importance and need for studying the methodology of capturing actual land use. The term 'urban land use' is defined; the new term is introduced to replace the currently used terms of 'construction land' and/or 'built-up land'. When studying urban land use and defining detailed categories, several factors and measures need to be considered, such as formal, functional and physiognomic, i.e. morphological, ones. In view of the large scale of such research, we focused here solely on the morphological measures for delimitation of urban settlements. The chosen morphological measures are discussed in greater detail in the Methodology section. Using the indicators of distance between structures, population density and density of house numbers, the measure of continuity of built-up areas is described, serving as a basis for the study on the test examples of three Slovenian cities (Maribor, Upper Gorenjska conurbation and Postojna). The results showed and confirmed the correctness of the working hypothesis, i.e. that the morphological measure is a necessary, but not a sufficient, requirement for the determination and delimitation of urban settlements from other basic land use types.

KEY WORDS

continuous built-up areas, morphological approach, distance between buildings, density of addresses, population density, actual land use, urban land use, urban settlements

1 INTRODUCTION

The system of territorial monitoring is based on a set of indicators used to check the state and procedures affecting spatial changes. Land use is among the key indicators of spatial change, which is studied as intended (planned) land use and as actual land use. Both types of land use are important in territorial monitoring; however, in the paper we focused on the delimitation of actual land use, with a special focus narrowed down to the delimitation of continuous urban settlements and settlements with urban character (hereinafter urban settlements), based on selected morphological criteria. Urban settlements are understood as part of urban land use, which includes other, more narrow, categories of urban land use, such as metropolitan regions, towns and cities, villages, developments along motorways, transport, communication, energy and environmental infrastructures and areas for business, commercial centres and industries, which can be separated from other urban areas. According to their purpose and use, the areas for recreation, play and sports, parks and gardens, graveyards and green areas are also urban land use areas. In the present Slovenian land administration system, urban, agricultural, forest, water(side) land uses and others are the basic land use categories; they are presented in a unified data layer of actual land use (land cadastre) and intended land use (spatial documents).

In the introduction, the thematic starting points and other starting points are presented, which are important for the understanding of the topic. In the continuation, the focus is on the methodological approach to the delimitation of urban settlements from other types of basic land use. The results of the study are shown on selected cases of urban settlements, i.e. Maribor, *Zgornjegorenjsko somestje* (Upper Gorenjska conurbation), which consists of the towns of Radovljica, Bled and Jesenice, and Postojna.

1.1 Thematic starting points

Monitoring of actual land use and its changes over time is one of the key indicators used to determine the state of spatial development and realization of goals of national development documents, particularly the Spatial Development Strategy of Slovenia (hereinafter: SPRS) (2004). A rational and efficient spatial development is among the goals set out in SPRS, which can be best assessed through realisation of spatial documents and monitoring of actual land use. In doing this, in the last two decades we have encountered many problems, as the delimitation and competences of different sectors responsible for recording and maintenance of data for individual types of actual land use are not defined by clear criteria. In the past, in Slovenia the data on detailed actual land use for each individual land plot, or its part, was at disposal in the land cadastre system – at first for land taxation purposes, and later for the purpose of spatial planning and implementation of land policies. However, these data were not systematically updated, particularly in the last two decades (Lisec et al., 2013). A major legislative change in the field was introduced by the Recording of Real Estate, State Border and Spatial Units Act of 2000 (ZENDMPE, 2000), which introduced general categories of land use; this concept was taken over by the current Real-Estate Recording Act (ZEN, 2006; see also Triglav, 2012).

Indeed, the agricultural sector quickly responded to the problem of the incompleteness of data on actual land use. The current database on actual land use, which is the only nationwide database, has been set up by the ministry responsible for agriculture (hereinafter MKO); however, these data are primarily intended for the agricultural sector and are only conditionally suitable for assessment of spatial conditions, and

even then only for agricultural and forest land (see Pišek, 2012; Lisec et al., 2013). Next to agricultural and forest land use, under the sectoral responsibility of MKO, the Database of actual agricultural and forest land use (hereinafter MKO Database of Actual Land Use) contains the data on built-up and related land (hereinafter use 3000), water(side) and other land, which are under the competence of other sectors. The criteria of the MKO Database of Actual Land Use are not intersectorally coordinated for the determination of individual land use areas (e.g. they do not take into account the issued building permits, permits of use and other recorded intervention affecting actual land use), based on which the Database could be regularly and properly updated.

The data captured and upgraded by MKO, which are also used in the land cadastre database kept by the Surveying and Mapping Authority of the Republic of Slovenia (GURS), are currently the only available data on actual land use for Slovenia. MKO has collected and managed these data since 1997, when a decision was made to set up a nationwide geographic information system (hereinafter GIS) to determine and manage the data on actual land use (spatial use). The aim was to set up a database for agriculture that was to be regularly maintained and updated (MKGP, 2003; MKO, 2013a; MKO, 2013b; Miličić and Udovč, 2012).Today, these data are used as the platform for elaboration of spatial design documentation, as they are included as an obligatory data layer in the presentation of territorial conditions (Pravilnik, 2008). The presentation of territorial conditions is part of the obligatory groundwork for elaboration of all spatial documents.

The classification of land use categories in the MKO Database of Actual Land Use is well designed; but along the years, the methodology of data capture has been changing to such an extent that the data are not suitable for comparison and identification of actual land use change in different time periods (Arh, 2012), or they are only partially suitable (Pišek, 2012; Lisec et al., 2013). Furthermore, the data with the designation 'land use 3000' (Slovene: 'raba 3000' – code for built-up and related land) are not captured at a detailed level, as the management of these areas falls under another sector, outside the competence of MKO. As a result, there is no land use 3000 data capture methodology available (i.e. there is no methodology for determination of such areas nor for capture of detailed land use). Despite the attempts of adjusting the land use 3000 data capture methodology in the recent years, these data fail to reflect actual territorial conditions. Early on, we can establish that the MKO Database of Actual Land Use is only partially applicable in spatial planning. The long-term, on-going land use studies at the University of Ljubljana, Faculty of Civil and Geodetic Engineering, Chair of Spatial Planning and Chair of Geoinformatics and Real-estate Cadastres (hereinafter UL FGG) also suggest that for spatial planning purposes and territorial monitoring the MKO data are not reliable enough (Čeh, 2002; own records of KPP UL FGG, 2013; Arh, 2012; Pišek, 2012; Lisec et al., 2013).

1.2 Urban land use

The legislative framework for efficient land use in Slovenia has been set up as early as in the mid-20th century; but all along, in both practice and research the focus has been on the planning of intended land use, while less (or none at all) focus has been on monitoring of territorial conditions and change. As a consequence, in the national legislation and spatial planning practice there is no suitable terminology that would clearly delineate the types and categories of land use at different levels of observation. A review of the literature revealed that elsewhere, particularly in Great Britain (Harrison, 2006) and the

USA (LBCS, 2001), the monitoring system of conditions and change of land use has been implemented for several decades. In such a long time, in both theory and practice the proper terminology has been developed and established, distinguishing between five and nine land use categories. In line with the main purpose of the paper, the focus here is on urban land use that relates to the areas of intensive use and spatial change, signifying the built environment (Anderson et al., 1978; EEA Technical report No 9, 2007, EU-LUPA, 2012).

In Slovenia, until the adoption of the 2007 Rules on the content, format and drawing-up of municipal spatial plan and on criteria for specifying dispersed settlement areas in need of restoration and for specifying areas for new settlements (hereinafter: OPN Rules, 2007) there was no established, single classification of land use categories. Today, based on the aforementioned OPN Rules (2007), urban land use is mostly referred to by the term 'building plots'; however, only as a type of the basic intended land use, not as a type of actual land use (ZPNačrt, 2007). In practice, actual land use is referred to as 'land use 3000' (built-up and related land) in the aforementioned MKO Database of Actual Land Use. We feel that the term 'built-up and related land' in the existing MKO database is suitable, as it does not determine the use of land, but rather its status. This is why we suggest the introduction of a new term, i.e. *urban land use* (Slovene: *urbana raba*).

1.3 Built-up area continuity as a criterion for delimitation of urban settlement areas

The morphological criteria for delimitation of urban settlements are used to analyse the spatial distribution of residential and commercial buildings or buildings with house numbers, and how these buildings make up the continuous built-up areas of a certain area (cf. ESPON 1.4.1., 2005). In many European countries, the definition of continuous built-up areas (Slovene *strnjene pozidane površine*) is the first step of differentiating urban areas from rural ones. The criterion of built-up area continuity can be used to demarcate the areas with urban land use (in our case: urban settlements) or to measure the geographical progression of urban types of settlements (see Le Gléau et al., 1997). When defining continuous built-up areas, in European countries two parameters are most commonly used (ESPON 1.4.1., 2005; Table 1):

— the distance between buildings that must be below a given threshold, and
— the total population that must exceed a certain density threshold.

Table 1: The most commonly used indicators for demarcation of continuous built-up areas in European countries: the minimum distance between buildings and population threshold (ESPON 1.4.1., 2005).

Country	Minimum distance between buildings (distance threshold)	Population threshold
Finland, Sweden, Denmark	200 m	200 inhabitants
Norway	50 m	200 inhabitants
Wales (UK)	50 m	1000 inhabitants
Scotland	50 m	3000 inhabitants
Greece	200 m	10,000 inhabitants
Ireland	200 m	50 occupied dwellings
Belgium	250 m	200 inhabitants

In European countries, the thresholds differ for both parameters; for the first parameter the threshold ranges from 50 m in England, Scotland and Norway to 250 m in Belgium. In most of the countries, the threshold for the first indicator is set at 200 m, as recommended by the United Nations (Le Gléau et al., 1997). Some countries use qualitative approaches to delimitation of continuous built-up areas, but without formal thresholds. For Slovenia, a criterion was put in place where the maximum distance between the continuous built-up areas of an urban settlement on the one hand, and the suburban settlement on the other hand should not exceed 300 m (Pavlin et al., 2003).

Interestingly, different types of land use are not considered in the same way across Europe. For example, in France commercial and industrial areas are excluded from the analysis of continuous built-up areas, while this is not the case in other countries, such as Belgium and Ireland. As a result, urban areas in France appear far more fragmented. The continuous built-up area can only be considered as an 'urban' area if its aggregated population exceeds a certain threshold. Similarly, these values differ widely from one country to another. The population threshold in continuously built-up areas is from 200 inhabitants in Belgium to 3000 inhabitants in Nordic countries. In Scotland and England, the threshold was set at 1000 inhabitants, in France at 2000 inhabitants, and in Austria and Greece at 10,000 inhabitants. In Ireland, the number of occupied dwellings is used instead of the population figure. In countries such as Spain, Italy, Poland and Germany the population criterion is not used (ESPON 1.4.1., 2005).

In the Netherlands, the Statistical Office defined urbanisation using the parameter of the density of addresses (buildings with house numbers) per square kilometre. Based on the results, five degrees of urbanisation and three types of areas in view of the urbanisation degree were established (ESPON 1,4.1., 2005, Table 2).

Table 2: Types of areas related to the level of urbanisation in the Netherlands (ESPON 1.4.1., 2005).

No. of addresses/km²	**Urban development level**	**Zone type**
2500 addresses or more	extremely urbanised	urban areas
1500 to 2500 addresses	strongly urbanised	
1000 to 1500 addresses	moderately urbanised	intermediate, semi-urban areas
500 to 1000 addresses	hardly urbanised	
fewer than 500 addresses	not urbanised	rural areas

In the past, Slovenian researchers (Ravbar et al., 1993; Rebernik and Vrišer, 1993; Vrišer, 1994; Drozg, 1998; Ravbar, 2001; Prosen et al. 2008) have addressed the delimitation of urban areas. One of the most interesting studies is the study entitled *Criteria for delimitation of settlement areas, theses and a proposal of a set of indicators* (Ravbar, 2001), which represents a wide set of physiognomic and/or morphological criteria and indicators, such as population density (at least 300 inhabitants/km² in the suburbs and at least 1000 inhabitants/km² in towns and cities), the dynamics of residential construction, degree of infrastructure of settlements, building continuity (the distance between buildings must not exceed 200 m) and typology of residential buildings. A more recent study is *The significance of small and medium-sized towns for urban development* (Prosen et al., 2008), which primarily addresses the determination of small

and medium-sized towns in the Slovenian urban system, but to some extent also the differentiation of urban settlements from other land use types.

The foreign and domestic experiences with delimitation of urban settlements show that the approaches among the individual countries differ greatly. Based on the experience from abroad and Slovenia to define uniform criteria and indicators for delimitation of urban settlements, we decided to include the morphological criterion of built-up area continuity in our further research (internal materials by KPP UL FGG, 2013), which was an upgrade of the aforementioned study by Prosen et al. in 2008.

2 RESEARCH QUESTION AND METHOD

In the chapter on methodology, we pass from the topical and theoretical groundwork to the actual differentiation of urban settlements from other basic land use types, on the basis of determination of built-up area continuity in Slovenia. In the study, we wanted to test the validity of the working hypothesis, i.e. *built-up area continuity is the necessary, but not sufficient, condition for delimitation of urban settlements from other basic land use types.*

2.1 Choice of test cases – study areas

The study was focused on three selected cases of urban settlements (Figure 1): Maribor, Zgornjegorenjsko somestje (Upper Carniola conurbation) consisting of Bled, Radovljica and Jesenice, and Postojna. The test cases were chosen to ensure the inclusion of the characteristics of small and medium-sized towns in different parts of Slovenia.

Maribor has a unique position in the Slovenian urban system. Next to Ljubljana, it is the only city with international significance, comparable with other medium-sized European cities. In comparison to Ljubljana, the capital city and the national centre with indisputable international significance, the role of Maribor in the Slovenian and European urban systems is being proven and tested time and again, as it depends on different factors. According to the RePUS project (2007) typology, Maribor, similarly to Ljubljana, has its own urban characteristics, and is not comparable to any other Slovenian town, but, on the other hand, it is comparable to similar cities in Europe. Maribor is also interesting because of its developed network of 21 morphologically and functionally connected settlements (urban settlements according to Pavlin et al., 2003) which are part of the Maribor urban region, and due to the proximity to the neighbouring cities of Graz and Ptuj.

The choice of the **Upper Gorenjska conurbation Jesenice–Radovljica–Bled** as a case in point originates from the assumption that the three towns constitute a functional conurbation, constituting a (sub) regional centre in the urban network of Slovenia. Individually, none of the three towns can be a strong enough centre. In SPRS (2004), the conurbation of Jesenice and Radovljica (without Bled) is classified as a centre of national significance. Some studies (Klement, 2006; RePUS, 2007; Prosen et al., 2008) may, indeed, indicate that the approach to the three towns as a whole does not contribute much to their significance; however, for Upper Gorenjska, which has shown the tendency to establish its own region in the process of institutional regionalisation of Slovenia, the functioning of the conurbation and cooperation within the wider urban area of the three towns is of paramount importance. The analysis includes

the urban settlements of Radovljica, Bled, Jesenice, and Koroška Bela and Lesce, which are functionally and morphologically associated with Jesenice or Radovljica, but which also meet the criteria for an urban settlement according to Pavlin et al. (2003).

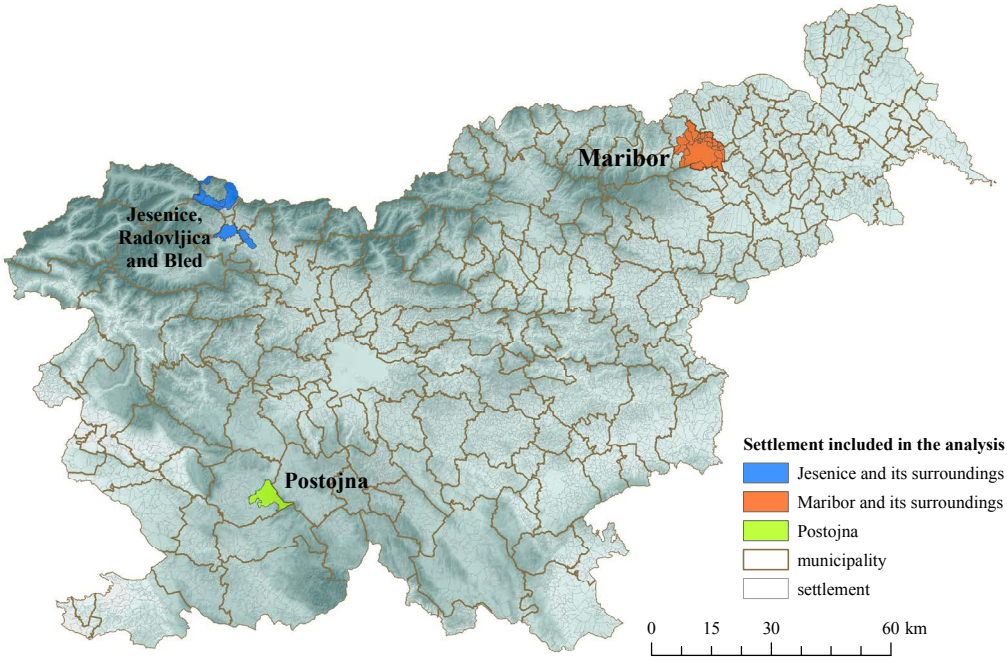


Figure 1: Urban settlements and settlements with urban character included into the analysis of test areas (source of data: GURS, 2011; own presentation).

In comparison to the Upper Gorenjska conurbation and Maribor, **Postojna** is a town situated in the centre of a poorly populated countryside, distant from the neighbouring centres. This is why the integration into a functional conurbation is not possible, despite its compactness. Also, Postojna does not have a strong hinterland, as its wider area is scarcely populated, and it also lacks a network of suburban settlements. Nevertheless, despite the low population in the town and its surroundings, Postojna has strongly developed urban central functions.

2.2 Selection of indicators for delimitation of built-up area continuity

The basic purpose of the study was to show when a settlement can be regarded as a continuous urban settlement; hence, we analysed three selected indicators which helped to determine the boundary of built-up area continuity for each given settlement (Table 3).We also wanted to find to what extent the indicators of population density and density of house numbers are similar, i.e. if, in fact, they are significant for the purpose of this study.

Methodologically, the procedure involved several steps, which were the same for all selected indicators and all selected test cases. The spatial analyses of the indicators were performed using the *ArcGIS* software. The data used in the analyses, based on the selected indicators, were obtained at SURS (2010) and GURS (2011).

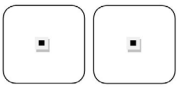
Table 3: Selection of indicators for delimitation of built-up area continuity with given thresholds and data sources.

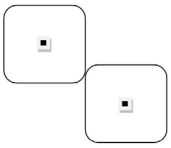
Indicator	Threshold value	Data source
1 Distance between buildings	50 m, 100 m, 150 m and 200 m	Building cadastre (GURS, 2011)
2 Population density	above 200 inhabitants/ha: areas with the highest density of apartment buildings	Number of inhabitants in a building with a house number (SURS, 2010)
	101–200 inhabitants/ha: areas with strong density of apartment buildings	
	51–100 inhabitants/ha: area with a high density of individual buildings and apartment buildings	
	21–50 inhabitants/ha: area with low density of individual buildings	
	up to 20 inhabitants/ha: dispersed buildings and dispersed hilly settlements	
3 Density of buildings with house numbers	11 buildings with house numbers/ha: extremely urbanised	Register of house numbers (GURS, 2011)
	6–10 buildings with house numbers/ha: strongly urbanised	
	4–5 buildings with house numbers/ha: moderately urbanised	
	2–3 buildings with house numbers/ha: hardly urbanised	
	1 building with a house number/ha: not urbanised	

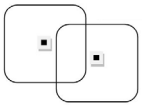
2.2.1 Continuity of built-up areas

According to Gabrijelčič et al. (1997) the Slovenian settlement patterns have a high granularity, which means that at the chosen distances of 150 m and 200 m, built-up area continuity is very high. With this in mind, first all less complex and simple structures (buildings) with a floor area smaller than 30 m^2 were eliminated from the Building Cadastre database (GURS, 2013), (Uredba o vrstah objektov glede na zahtevnost (Regulation on classification of construction with regard to their complexity), 2008; 2013). These are ancillary buildings, such as garages, sheds, huts, woodsheds, beehives, which are the characteristic of rural areas rather than urban areas, and could interfere with the results. In urban settlements, these buildings often accompany single-family houses, which are situated in condensed morphological units, while such buildings can also appear independently in open or rural areas, giving the wrong impression about the building continuity. In cities, this also excludes allotment garden areas (the case of Maribor), which are part of recreational areas in terms of their structure and purpose; however, they cannot be the basis for establishing built-up area continuity in urban settlements.

In the second step, by using GIS software, we calculated 25-, 50-, 75- and 100-m buffer zones around the analysed buildings. In the graphical representation of buildings we thus obtained a buffer of a previously determined size around each building from the Building Cadastre (GURS, 2011), except for the buildings that were excluded in the first step. After the analysis, three cases were established:

a)  Buffer zones are separate, i.e. there is no overlap between them. In this case, the built-up areas are not continuous, as the distance between buildings is larger than the selected distance.

b)  There is contact between the buffer zones around the buildings, meaning that the distance between the buildings is no more than the maximum selected distance; the buildings are part of continuous development; however, not necessarily part of continuous built-up areas.

c)  There is an overlap between the buffer zones around the buildings. The development is continuous, the distance between buildings is smaller than the selected one; hence, they make up continuous built-up areas.

In this way, the first result of delimiting the continuity of built-up areas was achieved. Again, it became evident that the results were still affected by different ancillary buildings and non-residential buildings, which, however, exceeded the given 30 m^2 limit (e.g. straight-line hayracks in the case of the Upper Gorenjska conurbation). In the next step, irrespective of the continuity of the development, we excluded all the areas that were without buildings with house numbers. This helped to exclude all other buildings lying in open areas, i.e. rural areas, which were part of non-urban dispersed settlement patterns. Then all buffer zones that contained buildings with house numbers were joined into one uniform zone. This provided a graphical overview of continuity of built-up areas in urban settlements.

2.2.2 Population density

The population density was calculated and shown in a raster of 100 × 100 m (1 ha) by taking into consideration the data of the Central Population Registry and the Records of House Numbers (SURS, 2010). The population density classes were established in a way to ensure the highest degree of clarity. The high population densities above 200 inhabitants/ha were not further elaborated, as these areas are rare and geographically limited. The population densities up to 200 inhabitants/ha represent the vast majority of the areas and hold the relevant information about the settlement structure. In the class up to 20 inhabitants/ha are areas of dispersed building and dispersed hilly settlements etc.; in the class of 21–50 of inhabitants/ha there is a prevalence of areas with low density of individual buildings, such as village centres and organised construction of single-family houses; in the class of 51–100 inhabitants/ha there is a prevalence of areas with a high density of individual and apartment buildings; while in the highest classes (101–200 and 200 inhabitants/ha and more) there is a prevalence of town/city centres and dense areas of apartment buildings. The research into population density also reveals much about the building types, characteristic of urban settlements. In settlements with high population density, most inhabitants live in apartment buildings or even high-rise buildings. It should be kept in mind that in urban settlements there are also business zones whose main use is business and commerce, not residential use.

2.2.3 House number density

Building density, expressed with house numbers per hectare, was used to identify the level of urbanisation in the selected areas (Table 3), similarly to the case in the Netherlands (ESPON 1.4.1., 2005). To enable the comparison with the results of the population density analysis, we chose hectare grid cells. It was revealed that at such a detailed level the results show inner city development rather than the degree of urbanisation. The house number/ha density of 11 and above represented the extreme (highest) degree of urbanisation in urban centres, where the population density was also the highest. The thresholds of 6–10 and 4–5 of house numbers/ha still represented urban areas constituting the edge of urban settlements with a built-up area continuity high enough. However, the density of house numbers/ha below 3 suggested areas with a lower degree of development continuity and areas of dispersed building.

In the final part of the study, a further synthesis of the results, using all three indicators, helped us to justify the continuity of built-up areas as the needed criterion for delimitation of urban settlements and their differentiation from other basic land use types.

3 RESULTS OF RESEARCH ON THE CONTINUITY OF BUILT-UP AREAS

Based on the aforementioned methodological approach to the delimitation of urban settlements from other basic land use types we performed analyses of chosen settlements using the selected indicators. In the continuation, we only show the most significant results of the study.

3.1 Continuity of built-up areas related to the distance between buildings

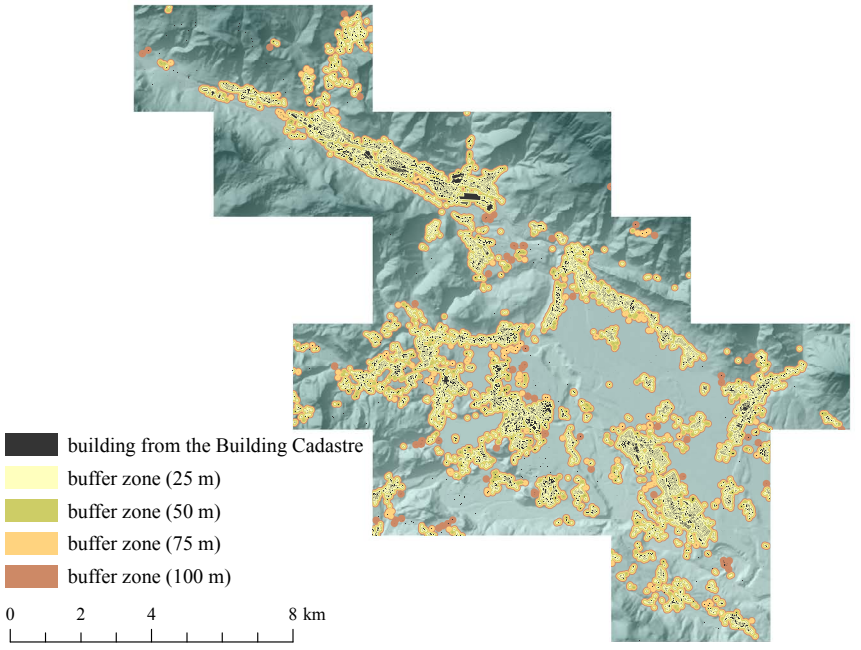


Figure 2: Continuity of built-up areas for 50-, 100-, 150- in 200-m distances between the buildings from the building cadastre (> 30 m²) with house numbers – Jesenice (source of data: GURS, 2011; own calculations and presentations).

The choice of urban settlements was influenced by the diversity of the Slovenian territory, as stressed in the Methodology section. The results of the analysis of continuity of built-up areas have confirmed the correctness of the selection; indeed, on the one hand, they show the diversity within the individual urban settlements, and, on the other hand, there are major differences among the selected cases. The analysis was performed separately for each chosen urban settlement and for each previously determined distance between the buildings. Figure 2 shows the combined result of all four chosen sizes of the distance between buildings (for the buildings from the building cadastre with an area above 30 m^2, with a house number), for the case of Jesenice in the Upper Gorenjska conurbation. This clearly shows the differences between the results of the analysis for the observed distances between buildings within the urban settlement.

The result is the most clear for the case of Postojna, as this is a small urban settlement with a very distinct edge. In this case, the edge of the urban settlement could be determined based on the criterion of distance between buildings only, hence delimiting it from other types of the basic land use.

However, the results have shown that based on the indicator of distance between buildings, for Maribor it was not possible to delimit the urban settlement area. Namely, the transition of the city area to Slovenske Gorice is practically continuous (see Figure 5 showing population density in the Maribor area). A similar situation is observed in Jesenice (Figure 2), which is territorially highly restricted due to the terrain features in the north and the newly situated motorway in the south, while in all transversal valleys there is a strong trend for dense and continuous development. The valley expands towards Bled and Radovljica, which means a higher degree of built-up areas, which seems almost continuous in the presentation that involves a 200-m distance between buildings. In the delimitation of continuous built-up areas it was revealed that, on the one hand, the buffer zone with a 50-m distance between buildings eliminates too many continuous built-up areas, while, on the other hand, the buffer zone with a 200-m distance between buildings captures too many continuous built-up areas, i.e. which have hardly any urban character and are, indeed, part of rural areas. Figures 3 and 4 show the case of Bled with Gorje. The same can be observed in the north-eastern part of Maribor, where the city passes into Vinske Gorice.

Based on the comparison of results of delimitation of continuous built-up areas based on 50-, 100-, 150- and 200-m distances between buildings for the selected cases it was revealed that for Slovenian urban settlements the most suitable distance between buildings was 100 m (Bled, Radovljica, Postojna) and 150 m in some other cases (Jesenice, Maribor).

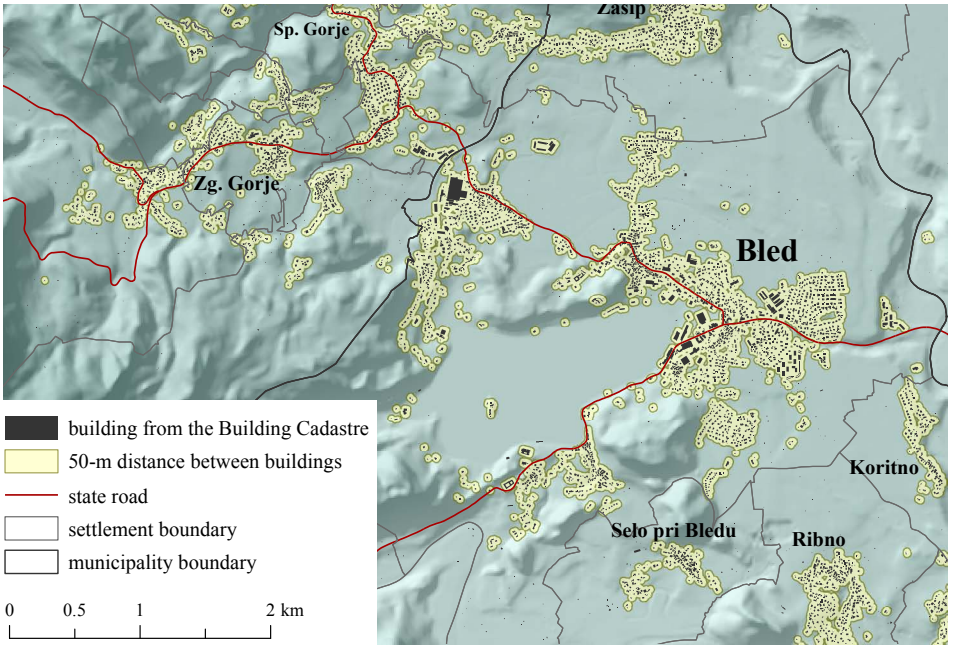


Figure 3: A detailed section from the map of continuity of built-up areas for a 50-m distance between buildings from the building cadastre (> 30 m²) with house numbers – the case of Bled with Gorje (source of data: DRSC, 2011; GURS, 2011; own calculations and presentations).

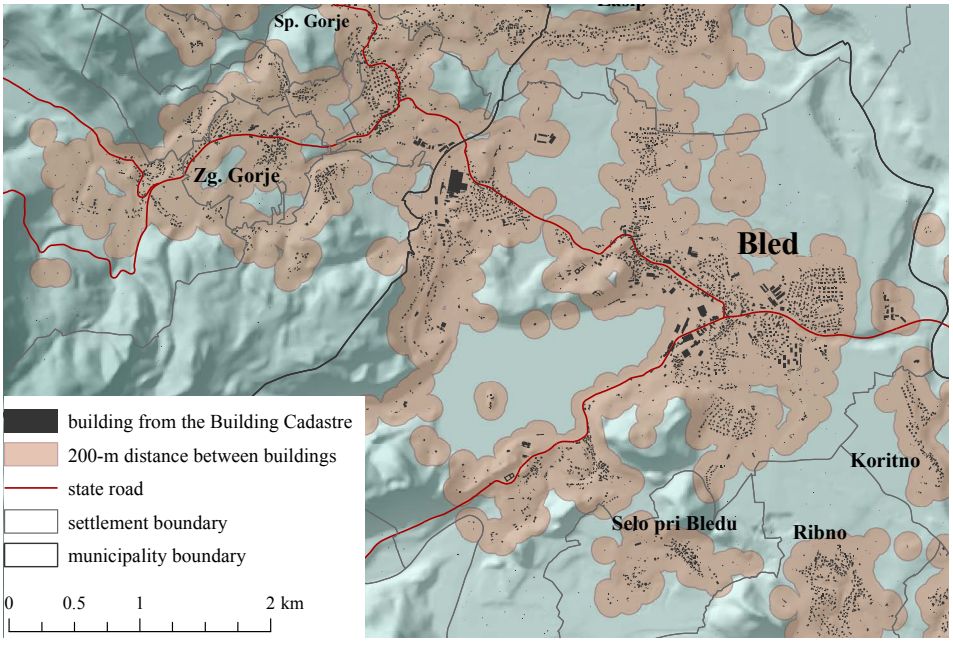


Figure 4: A detailed section from the map of continuity of built-up areas for a 200-m distance between buildings from the building cadastre (> 30 m²) with house numbers – the case of Bled with Gorje (source: DRSC, 2011; GURS, 2011; own calculations and presentations).

3.2 Population density in the analysis of continuity of built-up areas

The analysis of population density was complementary to the analysis of continuity of built-up areas, as it also indicated the inner structure of settlements related to land use (ESPON 1.4.1., 2005), which is, however, not addressed in detail in this paper. It was expected that medium-sized urban settlements, including Maribor, have a higher population density in comparison to small urban settlements. The highest densities (above 200 inhabitants/ha) in the investigated areas were only found in the centres of Maribor and Jesenice.

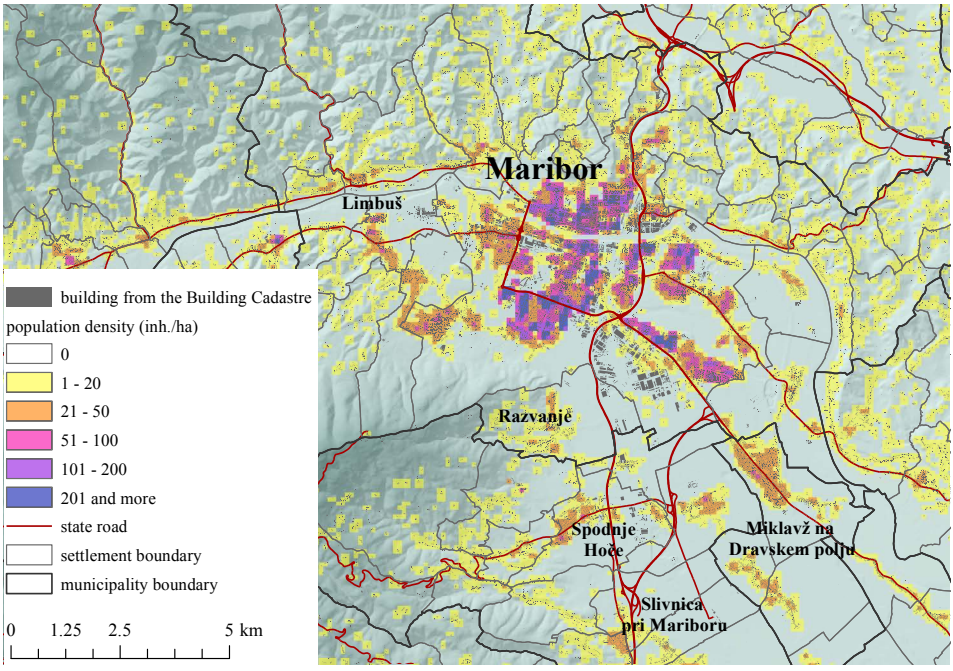


Figure 5: Population density per ha for the case of Maribor and its surroundings (source of data: DRSC, 2011; SURS, 2010; GURS, 2011; own calculations and presentations).

Population densities in the area of Maribor vary widely, e.g. at the edges of the Maribor urban area, i.e. at the edge of Slovenske Gorice, they never exceed the density of 20 inhabitants/ha (Figure 5). The settlements of urban character in the south and west, in the Drava valley, show moderate population densities, presented by mass individual residential buildings in vast areas, without or with few central activities. This is particularly the case in Limbuš, Razvanje, and in morphologically independent settlements, such as Miklavž na Dravskem polju and Slivnica pri Mariboru.

Notably, in urban settlements of Jesenice and Radovljica with Lesce, there are dense population areas (101–200 inhabitants/ha; Table 3). At the edge of the Upper Gorenjsko conurbation, there are many villages and settlements that form relatively homogeneous and dense rural areas with a relatively low population density (mostly not above 51 inhabitants/ha).

In Postojna, population densities rarely exceed 101 inhabitants/ha. In continuous built-up parts of the town, there is a prevalence of areas with densities between 51 and 100 inhabitants/ha, and at the outer edge of the urban settlement, the densities are below 50 inhabitants/ha (compare with Figure 6). The morphological fusion of settlements and a higher extent of suburbanisation are not unusual, as Postoj-

na lies in scarcely populated areas of the Notranjsko-kraška statistical region. Among the investigated urban settlements, the population density situation is the most clear in Postojna, distinctly showing the continuous character of the entire urban areas and, hence, their homogeneity. As already established for the indicator of continuity of built-up areas, we find that in Postojna the delimitation of the urban settlement from other basic land use types is the easiest.

3.3 Density of house numbers in the analysis of continuity of built-up areas

The analysis of density of house numbers per hectare revealed similar results to those obtained in the analysis of population density per hectare in all investigated urban settlements. In this case, the densities are the highest in Maribor and Jesenice, while in all other settlements they did not reach the medium value (Table 3); at their edges the densities of house numbers are low (below 3 per hectare). In Postojna there is again a very clear edge of continuous built-up areas (Figure 6), while in other settlements the indicator does not contribute significantly to the delimitation of urban settlements from other basic land use types. Only in some industrial and business areas, where the building density is high and the population low, the indicator complemented the indicators of distance between buildings and population density per hectare.

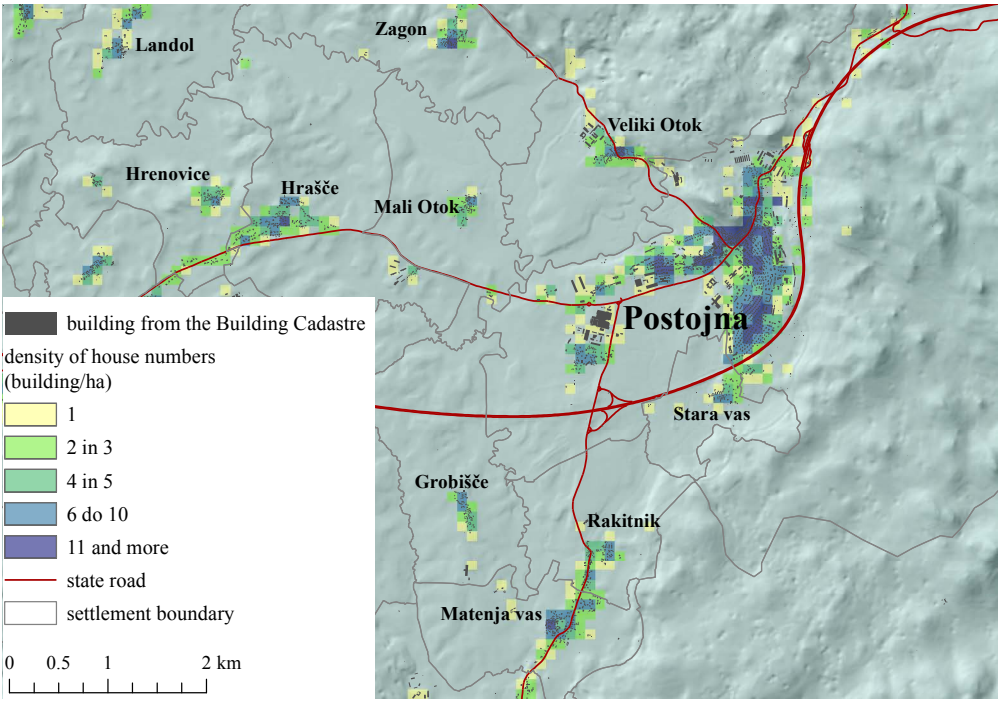


Figure 6: Density of house numbers for the case of Postojna (source of data: DRSC, 2011; GURS, 2011; own calculations and presentations).

The results of analysis of density of house numbers additionally revealed that this is a highly suitable indicator for delimitation of urban development; however, it should be elaborated for the entire territory of Slovenia. For establishment of continuity of built-up areas, the analysis of population density per hectare is, indeed, more suitable.

3.4 Final findings of studying continuous built-up areas

In the final part of the research, we elaborated a synthesis, i.e. we identified the continuity of built-up areas based on all three indicators, for the individual selected area of the urban settlement. The indicators of population density per hectare and density of house numbers per hectare are simple and give similar results; however, with the indicator of the distance between buildings we had to decide on one of the given values. We chose the 100-m distance between buildings, although in all investigated cases both 100-m and 150-m distances were suitable for delimitation of continuous built-up areas based on the distance between buildings. After all, a uniform threshold for the indicator cannot be determined, as terrain conditions, placement of infrastructure, and settlement typologies in the different areas are indeed highly diversified.

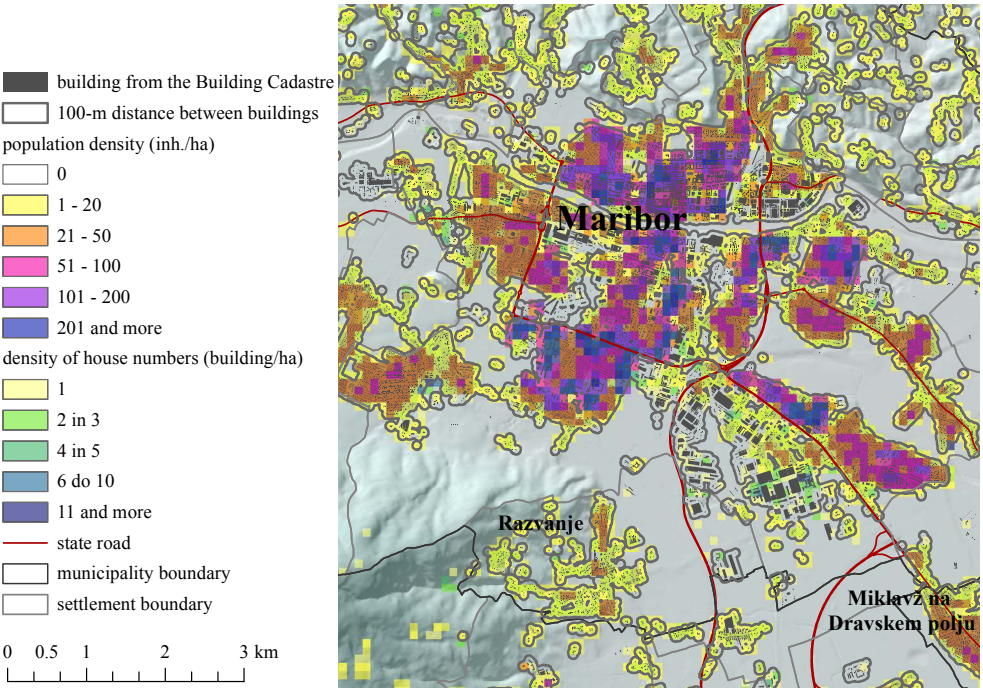


Figure 7: Synthesis of results of all three indicators for the case of delimitation of continuous built-up areas for the case of Maribor (source of data: DRSC, 2011; SURS, 2010; GURS, 2011; own calculations and presentations).

The synthesis has shown that based on the selected indicators, it was not possible to delimit the areas of urban settlements from other basic land use types in any of the investigated urban settlements. The most telling examples are the cases of Maribor (Figure 7) and Postojna (Figure 8). For the case of Maribor, we can distinguish between the urban settlement and dispersed building, which continuously passes to Slovenske Gorice. Similar situations are in the Upper Gorenjsko conurbation and Postojna. Among the investigated urban settlements, Postojna is the only where urban land use can be fairly unambiguously delimited from other basic land use types.

Additionally, the results of the research showed that the indicators of population density and density of house numbers analytically complement the analysis of continuity of built-up areas based on the distance

between buildings, while they also enable a more correct interpretation of results. By combining all three indicators, we acquired a more objective result, i.e. areas of continuous urban settlements. Nevertheless, we find that in order to define the urban edge using the morphological criterion of continuity of built-up areas, we can, without prejudice, leave out the indicator of density of house numbers per hectare and use the indicator for other purposes, such as determination of the degree of urban development in Slovenia.

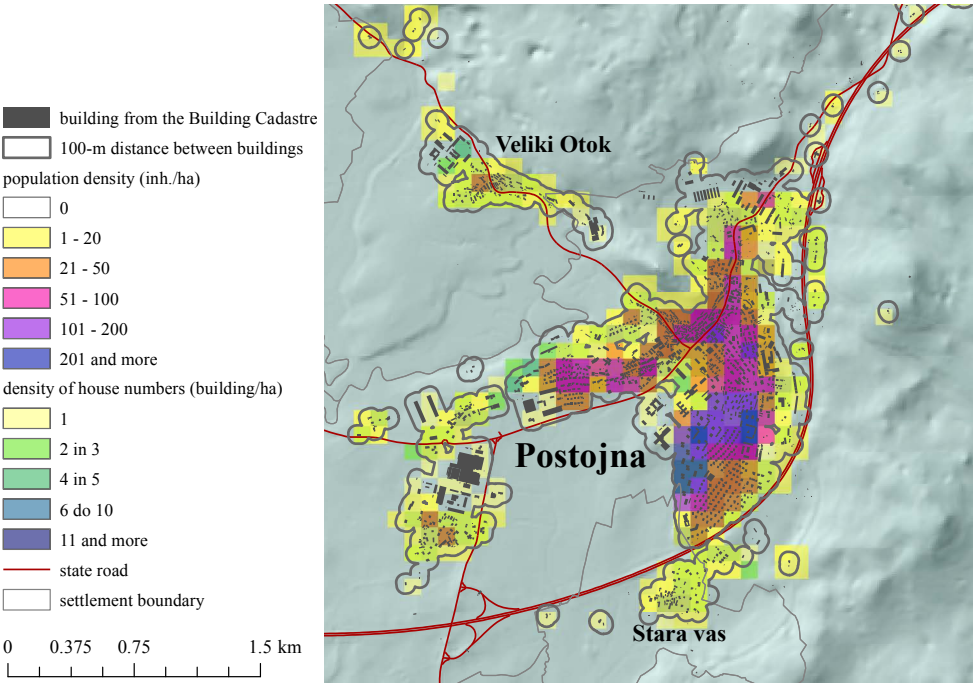


Figure 8: Synthesis of all three indicators for the case of Postojna (source of data: DRSC, 2010; SURS, 2010; GURS, 2011; own calculations and presentations).

We have shown that the criterion of continuity of built-up areas is a necessary, but not sufficient, condition for determination of urban settlements as part of urban land use. In the future, the formal and functional criteria will have to be explored, which will, along with the morphological criteria, make up a sufficient set of criteria and indicators that will enable an accurate enough delineation of urban land use from other basic land uses.

4 CONCLUSIONS AND DISCUSSION

The key indicator of territorial trends is to monitor the procedures of changing the actual land use. This can only be based on quality and reliable data, which are presently not available in Slovenia. For better territorial decisions we shall have to set up and regularly maintain data on actual land use for the entire territory of Slovenia and continuously for all basic land use types and their categories on different observation levels.

The problem of abandoning the relevant information on land use in the land cadastre and incompleteness of data of the MKO Database of Actual Land Use for the purpose of monitoring territorial changes, as

has been in recent years stressed by many authors, encouraged us to start a systematic research on urban land use determination and delimitation of urban land use from other land use types, such as agricultural, forest, water(side) and other land uses. To achieve this, we should also define the areas of urban land use, which would enable a proper dialogue between all holders of data on basic land use types. As established by (Arh, 2012), a quality intersectorally coordinated database on actual land use could provide adequate information for monitoring the territorial situation, changes and spatial planning.

In the paper, we focused on the determination and delimitation of urban settlements from other basic land use types, which was tested with the described methodology on the selected cases. We have shown that the morphological criterion of continuity of built-up areas, as described with the three indicators, cannot be the only criterion for determination of urban settlement boundaries. In future studies, formal and, particularly, functional criteria will have to be addressed, such as different urban activities (residential buildings, especially apartment buildings, central activities, industrial, commercial and business zones, major transport buildings, such as railway stations ...), presence of urban green areas (parks, recreation and sports grounds, urban forests as part of urban recreational grounds, allotment gardens, urban greens, cemeteries, water(side) areas, patches of agricultural land as potential undeveloped building land ...) road and railway network and presence of other public infrastructures.

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STRNJENOST POZIDANIH POVRŠIN KOT MERILO ZA DOLOČANJE OBMOČIJ MESTNIH NASELIJ

OSNOVNE INFORMACIJE O ČLANKU:
GLEJ STRAN 69

1 UVOD

Sistem spremljanja stanja prostora temelji na naboru kazalnikov, s katerimi preverjamo stanje in postopke, ki vplivajo na spremembe v prostoru. Med ključnimi kazalniki sprememb v prostoru je raba prostora, ki jo proučujemo kot namensko (plansko) rabo ter kot dejansko rabo prostora. Čeprav sta za spremljanje stanja prostora pomembni obe, smo se v prispevku omejili na določanje dejanske rabe prostora, in še to le na ožji del določitve območij strnjenih mestnih naselij in naselij mestnega značaja (v nadaljevanju: mestna naselja) na podlagi izbranih morfoloških meril. Mestna naselja razumemo kot del urbane rabe prostora, v katero sicer spadajo še podrobnejše kategorije urbane rabe prostora, kot so metropole, mesta, vasi, pozidava ob avtocestah, prometna, komunikacijska, energetska in okoljska infrastruktura ter območja, namenjena trgovskim, komercialnim središčem in industriji, ki so lahko tudi ločena od drugih urbanih območij. Območja za rekreacijo, igro in šport, parke in vrtove, pokopališča in druge zelene površine se po namenu in rabi prav tako uvrščajo med območja urbane rabe. V sedanjem sistemu zemljiške administracije v Sloveniji so urbane, kmetijske, gozdne, vodne in druge rabe prostora temeljne kategorije rabe prostora in so predstavljene v enotnem podatkovnem sloju dejanske rabe prostora (zemljiški kataster) in namenske rabe prostora (prostorski akti).

V uvodnem delu so predstavljena problemska in druga izhodišča, pomembna za razumevanje obravnavane vsebine. V nadaljevanju prispevka je največji poudarek na metodološkem pristopu za razmejitev mestnih naselij od drugih vrst osnovne rabe prostora. Rezultati raziskave so prikazani na izbranih primerih mestih naselij, ki so Maribor, Zgornjegorenjsko somestje (sestavljajo ga Radovljica, Bled in Jesenice) ter Postojna.

1.1 Problemska izhodišča

Spremljanje dejanske rabe prostora in njenih sprememb v času je eden ključnih kazalnikov za ugotavljanje razvoja v prostoru ter uresničevanje ciljev razvojnih dokumentov države, še posebej Strategije prostorskega razvoja Slovenije – SPRS (2004). Racionalen in učinkovit prostorski razvoj je namreč cilj SPRS, ki ga najlažje merimo prav z uresničevanjem prostorskih aktov in spremljanjem dejanskega stanja v prostoru. Pri tem se v zadnjih dveh desetletjih srečujemo s številnimi težavami, saj razmejitev in pristojnosti med posameznimi resorji, pristojnimi za evidentiranje in vzdrževanje podatkov za posamezno vrsto dejanske rabe prostora, niso določene z jasnimi merili. V preteklosti smo v Sloveniji imeli podatke o podrobni

dejanski rabi prostora za vsako posamezno zemljiško parcelo ali del zemljiške parcele v sistemu zemljiškega katastra – prvotno za namene zemljiškega davka, pozneje pa tudi za prostorsko načrtovanje in izvajanje zemljiških politik. Ti podatki se v preteklosti niso sistematično posodabljali, predvsem ne v zadnjih dveh desetletjih (Lisec in sod., 2013). Veliko zakonsko spremembo na tem področju je prinesel Zakon o evidentiranju nepremičnin, državne meje in prostorskih enot v letu 2000 (ZENDMPE, 2000), s katerim so bile uvedene le splošne kategorije rabe zemljišč, ta koncept pa je prevzet tudi v aktualnem Zakonu o evidentiranju nepremičnin (ZEN, 2006; glej tudi Triglav, 2012).

Na težavo pomanjkanja podatkov o dejanski rabi prostora se je zelo hitro odzval kmetijski sektor. Sedanjo podatkovno bazo o dejanski rabi prostora, ki edina zvezno pokriva območje celotne Slovenije, je vzpostavilo ministrstvo, pristojno za kmetijstvo (v nadaljevanju: MKO), vendar so ti podatki namenjeni predvsem kmetijskemu sektorju, zato so le pogojno primerni za ocenjevanje stanja v prostoru, in še to le za kmetijska in gozdna zemljišča (glej Pišek, 2012; Lisec in sod., 2013). Poleg kmetijske in gozdne rabe, za kateri je sektorsko pristojno kmetijsko ministrstvo, vsebuje Evidenca dejanske rabe kmetijskih in gozdnih zemljišč (v nadaljevanju: Evidenca dejanske rabe zemljišč MKO) tudi podatke o območjih pozidanih in sorodnih zemljišč (v nadaljevanju: raba 3000), vodnih ter drugih zemljišč, ki pa so v pristojnosti drugih sektorjev. Evidenca dejanske rabe zemljišč MKO ne vsebuje medsektorsko usklajenih meril za določanje območij posameznih rab prostora (ne upoštevajo se na primer izdana gradbena in uporabna dovoljenja ter drugi evidentirani posegi, ki vplivajo na spremembe dejanske rabe prostora), na podlagi katerih bi jo lahko redno in kakovostno vzdrževali.

Podatki, ki jih zajema in posodablja MKO in jih v podatkovno bazo zemljiškega katastra prevzema tudi Geodetska uprava Republike Slovenije (GURS), so tako edini dostopni podatki o dejanski rabi prostora za Slovenijo. Ministrstvo, pristojno za kmetijstvo, zbira in vzdržuje podatkovno bazo od leta 1997, ko je bila sprejeta odločitev, da bo za celotno Slovenijo vzpostavljen geografski informacijski sistem (v nadaljevanju: GIS) za določanje in vzdrževanje podatkov o dejanski rabi zemljišč (prostora). Namen je bil vzpostaviti bazo podatkov za področje kmetijstva, ki se redno vzdržuje in posodablja (MKGP, 2003; MKO, 2013a; MKO, 2013b; Miličić in Udovč, 2012). Danes se ti podatki uporabljajo tudi kot podlaga za izdelavo prostorskih načrtov, saj se kot obvezen podatkovni sloj vključijo v prikaz stanja prostora (Pravilnik, 2008). Prikaz stanja prostora je obvezna strokovna podlaga za pripravo vseh prostorskih aktov.

Razvrstitev kategorij rabe zemljišč je v Evidenci dejanske rabe zemljišč MKO sicer dobro zasnovana, vendar se je metodologija zajema z leti spreminjala, tako da so podatki za medsebojno primerjavo in ugotavljanje spreminjanja dejanske rabe prostora v različnih časovnih presekih neprimerni (Arh, 2012) oziroma le pogojno primerni (Pišek, 2012; Lisec in sod., 2013). Poleg tega se podatki z oznako raba 3000 ne zajemajo na podrobni ravni, saj področje upravljanja teh zemljišč spada v drug sektor in MKO za njih ni pristojno. Posledično ni bila izdelana metodologija zajema podatkov za rabo 3000 (metodologija za določitev območja te rabe in za zajem podrobne rabe). Kljub poskusom v preteklih letih, da bi prilagodili metodo zajema podatkov rabe 3000, podatki ne odražajo dejanskega stanja v prostoru. Tako lahko že uvodoma ugotovimo, da so podatki Evidence dejanske rabe zemljišč MKO za namene prostorskega načrtovanja le delno ustrezni. Poleg tega so raziskovanja rabe prostora, ki se že nekaj let izvajajo na Univerzi v Ljubljani, Fakulteti za gradbeništvo in geodezijo, Katedri za prostorsko planiranje – KPP ter Katedri za geoinformatiko in katastre nepremičnin – KGKN (v nadaljevanju: UL FGG), pokazala, da podatki

MKO za potrebe prostorskega načrtovanja in spremljanja stanja v prostoru niso dovolj zanesljivi (Čeh, 2002; Interno gradivo KPP UL FGG, 2013; Arh, 2012; Pišek, 2012; Lisec in sod., 2013).

1.2 Urbana raba prostora

Čeprav je skrb za smotrno rabo prostora v Sloveniji zakonsko predpisana že od sredine prejšnjega stoletja, je v praksi in raziskavah največji poudarek na načrtovanju namenske rabe prostora, manj ali sploh nič pa na spremljanju stanja in sprememb v prostoru. Zaradi tega se v slovenski zakonodaji in prostorskoplanerski praksi ni uveljavilo ustrezno izrazje, s katerim bi jasno razmejili vrste in kategorije rabe prostora na različnih ravneh opazovanja. Študij literature je pokazal, da imajo v drugih državah, predvsem v Angliji (Harrison, 2006) in ZDA (LBCS, 2001), sistem spremljanja stanja in sprememb rabe prostora ustaljen že desetletja. V tako dolgem časovnem obdobju se je v teoriji in praksi uveljavilo in ustalilo tudi ustrezno izrazje, ki osnovne vrste rabe prostora deli na od pet do devet kategorij. Glede na namen tega prispevka izpostavljamo predvsem urbano rabo prostora, ki se nanaša na območja intenzivne rabe in sprememb ter označuje grajeno okolje (Anderson in sod., 1978; EEA Technical report No 9, 2007; EU-LUPA, 2012).

Vse do Pravilnika o vsebini, obliki in načinu priprave občinskega prostorskega načrta ter pogojih za določitev območij sanacij razpršene gradnje ter območij za razvoj in širitev naselij iz leta 2007 (v nadaljevanju: Pravilnik OPN, 2007) v Sloveniji ni bilo uveljavljene enotne razvrstitve kategorij rabe prostora. Danes se na podlagi Pravilnika OPN (2007) za urbano rabo prostora najpogosteje uporablja pojem stavbna zemljišča, vendar le kot vrsta osnovne namenske rabe, ne pa tudi kot vrsta dejanske rabe prostora (ZPNačrt, 2007). V praksi je za dejansko rabo uveljavljen pojem raba 3000 (pozidana in sorodna zemljišča) iz že navedene Evidence dejanske rabe zemljišč MKO. Menimo, da izraz pozidana in sorodna zemljišča v sedanji evidenci MKO ni neustrezen, saj določa predvsem status zemljišča in ne rabe. Prav zaradi tega bi za rabo prostora morali uvesti nov pojem, pri čemer predlagamo izraz *urbana raba.*

1.3 Strnjenost pozidanih površin kot merilo za določitev območij mestnih naselij

Z morfološkimi merili za določitev območij mestnih naselij analiziramo, kako so prostorsko razporejene stanovanjske in poslovne stavbe oziroma stavbe s hišnimi številkami ter kako oblikujejo strnjeno pozidavo na nekem območju (prim. ESPON 1.4.1., 2005). V mnogih evropskih državah je določitev strnjenosti pozidanih površin (angl. continuous built-up area) prvi korak pri ločevanju urbanih in ruralnih območij. Merilo strnjenosti pozidanih površin lahko uporabimo tudi za določitev območij urbane rabe prostora (v našem primeru mestnih naselij) oziroma rast urbanega tipa naselij v prostoru (glej Le Gléau in sod., 1997). Za opredelitev strnjenih pozidanih površin se v evropskih državah najpogosteje uporabljata dva kazalnika (ESPON 1.4.1., 2005; preglednica 1):

— razdalja med stavbami, ki mora biti pod določenim pragom, in
— skupno število prebivalcev, ki mora dosegati najmanjši prag gostote.

Velikost praga za oba kazalnika se med evropskimi državami razlikuje in se za prvi kazalnik giblje od 50 metrov v Angliji, na Škotskem in Norveškem do 250 metrov v Belgiji. V največ državah je prag pri prvem kazalniku za določanje urbanih območij pri 200 metrih, kar so predlagali tudi Združeni narodi (Le Gléau in sod., 1997). Ponekod se uporabljajo tudi kvalitativni pristopi za določanje strnjenih pozidanih

območij, vendar brez določenih vrednosti. Za Slovenijo je bilo za določitev mestnih naselij oblikovano merilo, da največja razdalja med sklenjeno pozidanimi površinami mestnega naselja na eni strani in obmestnega naselja na drugi strani ne sme presegati 300 metrov (Pavlin in sod., 2003).

Preglednica 1: Najpogosteje uporabljena kazalnika za opredelitev strjenih pozidanih površin sta v evropskih državah najmanjša razdalja med stavbami in prag števila prebivalcev (ESPON 1.4.1., 2005).

Država	Najmanjša razdalja med stavbami	Prag števila prebivalcev
Finska, Švedska, Danska	200 metrov	200 prebivalcev
Norveška	50 metrov	200 prebivalcev
Wales (Anglija)	50 metrov	1000 prebivalcev
Škotska	50 metrov	3000 prebivalcev
Grčija	200 metrov	10.000 prebivalcev
Irska	200 metrov	50 lastnikov stanovanj
Belgija	250 metrov	200 prebivalcev

Zanimivo je, da se kategorije rabe površin ne upoštevajo enako po vsej Evropi. Trgovska in industrijska območja so v Franciji izključena iz analize strnjenosti pozidanih površin, druge države, na primer Belgija in Irska, pa jih vključujejo. Zaradi tega so urbane površine v Franciji bolj razdrobljene. Sklenjeno pozidana območja pa veljajo za urbana pod pogojem, da na strnjenem območju živi določeno število prebivalcev. Tudi te vrednosti se po posameznih državah razlikujejo. Prag števila prebivalcev na strnjenih pozidanih območjih se giblje od 200 v Belgiji do 3000 v severnih evropskih državah. Na Škotskem in v Angliji je prag določen pri 1000, v Franciji pri 2000, v Avstriji in Grčiji pri 10.000 prebivalcih. Na Irskem namesto števila prebivalcev uporabljajo število lastnikov stanovanj. V državah, kot so Španija, Italija, Poljska in Nemčija, se merilo števila prebivalcev ne upošteva (ESPON 1.4.1., 2005).

Na Nizozemskem je statistični urad opredelil urbanizacijo na podlagi kazalnika števila naslovov (stavb s hišnimi številkami) na kvadratni kilometer. Na podlagi rezultatov so oblikovali pet stopenj urbaniziranosti in tri tipe območij glede na stopnjo urbaniziranosti (ESPON 1,4.1., 2005; preglednica 2).

Preglednica 2: Tipi območij glede na stopnjo urbaniziranosti na Nizozemskem (ESPON 1.4.1., 2005).

Število naslovov / km²	Stopnja urbaniziranosti	Tip območja
2500 naslovov in več	najbolj urbanizirana območja	urbana območja
1500 do 2500 naslovov	zelo urbanizirana območja	
1000 do 1500 naslovov	zmerno urbanizirana območja	mešana, polurbana območja
500 do 1000 naslovov	šibko urbanizirana območja	
manj kot 500 naslovov	neurbanizirana območja	ruralna območja

Slovenski raziskovalci (Ravbar in sod., 1993; Rebernik in Vrišer, 1993; Vrišer, 1994; Drozg, 1998; Ravbar, 2001; Prosen in sod. 2008) so se v preteklosti že ukvarjali z določanjem mestnih območij. Med zanimivejšimi je raziskava z naslovom *Kriteriji za določitev poselitvenih območij, teze in predlog nabora indikatorjev* (Ravbar, 2001), v kateri je predstavljen širši nabor fiziognomskih oziroma mor-

foloških meril in kazalnikov, kot so gostota poseljenosti (najmanj 300 prebivalcev/km^2 v obmestjih in najmanj 1000 prebivalcev/km^2 v mestih), dinamika stanovanjske gradnje, stopnja infrastrukturne opremljenosti naselij, strnjenost pozidave (razdalja med stavbami praviloma ne sme presegati 200 metrov) in tipologija stanovanjskih hiš. Med novejšimi je raziskava *Pomen majhnih in srednje velikih mest za razvoj urbanih območij* (Prosen in sod., 2008), v kateri je obravnavano predvsem določanje majhnih in srednje velikih mest v slovenskem urbanem sistemu, le delno pa razmejitev mestnih naselij od drugih vrst rabe prostora.

Predstavljene tuje in domače izkušnje z določanjem območij mestnih naselij kažejo, da se pristopi po posameznih državah precej razlikujejo. Glede na tuje izkušnje in dosedanje poskuse v Sloveniji, da bi opredelili enotna merila in kazalnike za določanje območij mestnih naselij, smo se odločili, da za nadaljnje raziskovanje uporabimo morfološko merilo strnjenost pozidanih površin (Interno gradivo KPP UL FGG, 2013), s katerimi smo nadgradili raziskavo, ki so jo opravili Prosen in sodelavci v letu 2008.

2 RAZISKOVALNO VPRAŠANJE IN METODA

V metodološkem poglavju prehajamo od problemskih in teoretičnih izhodišč h konkretnemu razmejevanju mestnih naselij od drugih vrst osnovne rabe prostora na podlagi določanja strnjenosti pozidanih površin v slovenskem prostoru. Z raziskavo smo želeli preveriti pravilnost delovne hipoteze, *da je strnjenost pozidanih površin potreben, vendar še ne zadosten pogoj za razmejitev mestnih naselij od drugih vrst osnovne rabe prostora*.

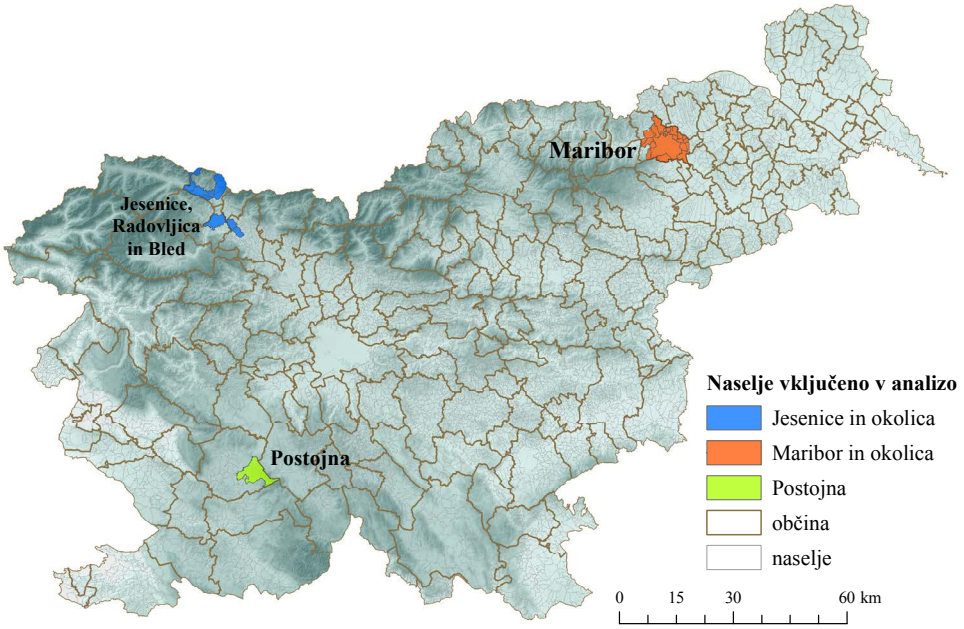
2.1 Izbor testnih primerov – območja raziskave

V raziskavi smo obravnavali tri izbrane primere mestnih naselij (slika 1): Maribor, Zgornjegorenjsko somestje, ki ga sestavljajo Bled, Radovljica in Jesenice, ter Postojno. Testni primeri so bili izbrani tako, da v študijo vključimo lastnosti majhnih in srednje velikih mest na različnih območjih v Sloveniji.

Maribor je v slovenskem urbanem sistemu posebnost. Je edino mesto poleg Ljubljane, ki ima mednarodni pomen, in je primerljiv s srednje velikimi evropskimi mesti. V primerjavi z Ljubljano, ki je glavno mesto in že zaradi funkcij državnega središča ni dvoma glede njenega mednarodnega pomena, je treba vlogo Maribora v slovenskem in evropskem urbanem sistemu vedno znova dokazovati in preverjati, saj je odvisna od več dejavnikov. Po tipologiji projekta RePUS (2007) je Maribor, podobno kot Ljubljana, svoj tip mesta in ni primerljiv z drugimi slovenskimi mesti, je pa primerljiv s podobnimi mesti po Evropi. Zanimiv je tudi zaradi razvitega omrežja enaindvajsetih morfološko in funkcionalno povsem povezanih naselij (naselja mestnega območja po Pavlinu idr., 2003), ki so del mariborske urbane regije, ter zaradi bližine sosednjih mest, kot sta Gradec in Ptuj.

Izbor **Zgornjegorenjskega somestja Jesenice-Radovljica-Bled** za testni primer izhaja iz predpostavke, da ta tri mesta sestavljajo funkcionalno somestje, ki v urbanem omrežju Slovenije pomeni (sub)regionalno središče. Nobeno od treh mest ni dovolj močno središče samo zase. V SPRS (2004) je to somestje, ki zajema le Jesenice in Radovljico (brez Bleda), določeno za središče nacionalnega pomena. Čeprav nekatere študije (Klement, 2006; RePUS, 2007; Prosen in sod., 2008) kažejo, da skupna obravnava treh mest ne prispeva bistveno k njihovemu pomenu po uveljavljenih kazalnikih, je za Zgornjo Gorenjsko,

ki v postopku institucionalne regionalizacije Slovenije kaže težnje po ustanovitvi lastne regije, delovanje somestja in sodelovanje znotraj širšega urbanega območja treh mest odločilnega pomena. V analizi so upoštevana mestna naselja Radovljica, Bled, Jesenice, Koroška Bela in Lesce, ki sta funkcionalno in morfološko vezana na Jesenice oziroma Radovljico, vendar po Pavlinu s sodelavci tudi sama dosegata merila za mestno naselje (2003).



Slika 1: Mestna naselja in naselja mestnega značaja, vključena v analizo testnih območij (vir podatkov: GURS, 2011; lastni prikaz).

V primerjavi z Zgornjegorenjskim somestjem in Mariborom je **Postojna** mesto, ki leži sredi redko poseljenega podeželja in je odmaknjena od sosednjih središč. Povezovanje v funkcionalno somestje kljub majhnosti tako ni mogoče. Postojna nima niti močnega zaledja, saj je njeno širše območje redko poseljeno, niti nima omrežja primestnih naselij. Kljub majhnemu številu prebivalcev v mestu in okolici pa ima močno razvite urbane centralne funkcije.

2.2 Izbor kazalnikov za določanje strnjenosti pozidanih površin

Osnovni namen raziskave je pokazati, kdaj lahko posamezno naselje štejemo za strnjeno mestno naselje, zato smo analizirali tri izbrane kazalnike, s katerimi je bilo za vsako obravnavano naselje mogoče določiti mejo strnjenosti pozidave (preglednica 3). Hkrati smo želeli preveriti, koliko sta si kazalnika gostote prebivalstva in gostote stavb s hišnimi številkami podobna in ali sta sploh potrebna za izkazani namen raziskovanja.

Metodološko je postopek potekal v več korakih, za vse izbrane kazalnike in na vseh izbranih testnih primerih enako. Prostorske analize kazalnikov smo izvedli v programskem orodju *ArcGIS*. Podatke za analize na podlagi izbranih kazalnikov smo pridobili na SURS (2010) in GURS (2011).

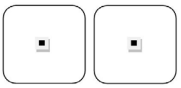
Preglednica 3: Izbor kazalnikov za določanje strnjenosti pozidanih površin z določenimi pragovi in viri podatkov.

Kazalnik	Vrednosti opazovanih pragov	Vir podatkov
1. razdalja med stavbami	50 m, 100 m, 150 m in 200 m	Kataster stavb (GURS, 2011)
2. gostota prebivalstva	nad 200 prebivalcev/ha: območja z najvišjo gostoto večstanovanjske gradnje;	Število prebivalcev v stavbi s hišno številko (SURS, 2010)
	101–200 prebivalcev/ha: bolj zgoščena območja večstanovanjske gradnje;	
	51–100 prebivalcev/ha: območja gostejše individualne gradnje in večstanovanjskih stavb;	
	21–50 prebivalcev/ha: območja redkejše individualne gradnje;	
	do 20 prebivalcev/ha: razpršena gradnja in razložena hribovska naselja.	
3. gostota stavb s hišnimi številkami	11 stavb s h. št./ha: močno urbanizirano območje;	Evidenca hišnih številk (GURS, 2011)
	6–10 stavb s h. št./ha: zelo urbanizirano območje;	
	4–5 stavb s h. št./ha: zmerno urbanizirano območje;	
	2–3 stavbe s h. št./ha: šibko urbanizirano območje;	
	1 stavba s h. št./ha: neurbanizirano območje.	

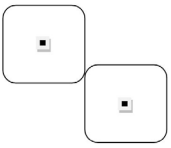
2.2.1 Strnjenost pozidanih površin

Gabrijelčič in sodelavci (1997) so pokazali, da so slovenski poselitveni vzorci zelo gostozrnati, kar pomeni, da je pri izbranih razdaljah 150 metrov in 200 metrov strnjenost pozidave zelo velika, zato smo iz podatkovne baze katastra stavb (GURS, 2013) najprej izločili vse nezahtevne in enostavne objekte (stavbe) s tlorisno površino, manjšo od 30 m^2 (Uredba o vrstah objektov glede na zahtevnost, 2008; 2013). To so namreč pomožne gospodarske stavbe, kot so garaže, ute, lope, drvarnice, čebelnjaki, ki so prej gradnik podeželskega kot urbanega prostora in bi lahko pomenile motnjo v rezultatu. V mestnih naseljih se največkrat pojavljajo ob enodružinskih hišah, ki pa so že postavljene v strnjenih morfoloških enotah, medtem ko lahko takšne stavbe v odprtem oziroma podeželskem prostoru nastopajo tudi samostojno in popačijo sliko o strnjenosti pozidave. V mestih s tem izločimo tudi območja vrtičkov (primer Maribor), ki po strukturi in namenu spadajo med rekreacijske površine, ne morejo pa biti podlaga za ugotavljanje strnjenosti pozidanih površin v mestnih naseljih.

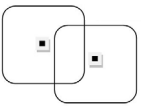
V drugem koraku smo s programskimi orodji GIS izračunali 25-, 50-, 75- in 100-metrska sklenjena območja odmika (angl. *buffer*) od analiziranih stavb. Tako smo v grafičnem prikazu stavb dobili okrog vsake stavbe iz katastra stavb (GURS, 2011), ki jih nismo izločili v prvem koraku, sklenjeno območje oddaljenosti s predhodno določeno razsežnostjo odmika. Po analizi so bile ugotovljeni trije primeri:

a) 

Sklenjena območja odmika (angl. *buffer*) stavb so ločena in se med seboj ne prekrivajo. Pozidava ni strnjena, saj je razdalja med stavbami večja od izbrane.

b) 

Sklenjena območja odmika (angl. *buffer*) stavb se med seboj dotikajo, kar pomeni, da so stavbe med seboj oddaljene največ glede na izbrane razdalje; stavbe že sestavljajo strnjeno pozidavo, ne pa nujno tudi strnjenih pozidanih površin.

c) 

Sklenjena območja odmika (angl. *buffer*) stavb se med seboj prekrivajo. Pozidava je strnjena, stavbe pa so na manjši medsebojni oddaljenosti od izbrane, tako da sestavljajo tudi strnjene pozidane površine.

Tako se je pokazal prvi rezultat določevanja strnjenosti pozidanih površin. Spet se je izkazalo, da se v rezultatu še vedno pojavljajo motnje zaradi različnih pomožnih in gospodarskih stavb, ki pa presegajo prej določeno mejo 30 m^2 (na primer stegnjeni kozolci v Zgornjegorenjskem somestju). V nadaljnjem koraku smo zato ne glede na strnjenost pozidave iz analize izločili še vsa območja, v katerih ni stavb s hišno številko. Tako smo izločili vse druge stavbe, ki ležijo v odprtem oziroma podeželskem prostoru in pomenijo del neurbanih razpršenih poselitvenih vzorcev. Nato smo vsa sklenjena območja odmika, na katerih je stavba s hišno številko, združili v enotno območje. S tem smo dobili pregleden grafični prikaz strnjenosti pozidanih površin v mestnih naseljih.

2.2.2 Gostota prebivalstva

Gostota prebivalstva je bila izračunana in prikazana na rastru 100 x 100 m (1 ha) z upoštevanjem podatkov Centralnega registra prebivalstva in Evidence hišnih številk (SURS, 2010). Razredi gostote prebivalstva so določeni tako, da je prikaz čim bolj razumljiv. Visoke gostote prebivalstva nad 200 prebivalcev/ha niso nadalje razčlenjene, saj so ta območja redka in prostorsko omejena. Gostote prebivalstva do 200 prebivalcev/ha pa pomenijo veliko večino površin in povedo nekaj tudi o strukturi naselitve. V razredu do 20 prebivalcev/ha so območja razpršene gradnje in razložena, hribovska naselja ipd.; v razredu 21–50 prebivalcev/ha prevladujejo območja redkejše individualne gradnje, kot so vaška jedra in območja organizirane gradnje enodružinskih hiš; v razredu 51–100 prebivalcev/ha prevladujejo območja gostejše individualne gradnje in večstanovanjskih stavb, v najvišjih razredih (101–200 in nad 200 prebivalcev/ha) pa prevladujejo mestna jedra in bolj zgoščena območja večstanovanjske gradnje. Raziskovanje gostote prebivalstva veliko pove tudi o stavbnem tipu, ki je značilen za mestna naselja. V naseljih z visoko gostoto poselitve večina prebivalcev živi v večstanovanjskih stavbah ali celo nebotičnikih. Tu ne smemo pozabiti, da so v mestnih naseljih tudi območja poslovnih stavb, v katerih prevladuje poslovna funkcija in ni veliko stanovalcev.

2.2.3 Gostota hišnih številk

Z gostoto pozidave, ki smo jo izrazili s hišno številko na ha (h. št./ha), smo podobno kot v primeru Nizozemske (ESPON 1.4.1., 2005) ugotavljali stopnjo urbanizacije na izbranih območjih (preglednica 3). Zaradi možnosti primerjave z rezultati analize gostote prebivalstva smo izbrali hektarske mrežne

celice. Izkazalo se je, da rezultati te analize na tako podrobni ravni bolj kot stopnjo urbanizacije prikazujejo notranji razvoj mest. Gostota 11 in več hišnih številk/ha pomeni najbolj urbanizirana območja v jedru mestnih naselij, ki so tudi najbolj gosto poseljena. Pragova 6–10 in 4–5 hišnih številk/ha še vedno pomenita urbanizirana območja, ki z dovolj veliko strnjenostjo pozidave tvorijo rob mestnega naselja. Gostote hišnih številk/ha pod 3 pa že nakazujejo območja z manj strnjeno zazidavo in območja razpršene gradnje.

V sklepnem delu raziskave smo z dodatno sintezo rezultatov analize po vseh treh kazalnikih strnjenost pozidanih površin utemeljili kot merilo, ki ga potrebujemo za določanje mestnih naselij in njihovo razmejitev od drugih vrst osnovne rabe prostora.

3 REZULTATI RAZISKOVANJA STRNJENOSTI POZIDANIH POVRŠIN

Na podlagi opisanega metodološkega pristopa k razmejitvi mestnih naselij od drugih vrst osnovne rabe prostora smo izvedli analizo izbranih naselij po izbranih kazalnikih. V nadaljevanju prikazujemo le najpomembnejše rezultate izvedene raziskave.

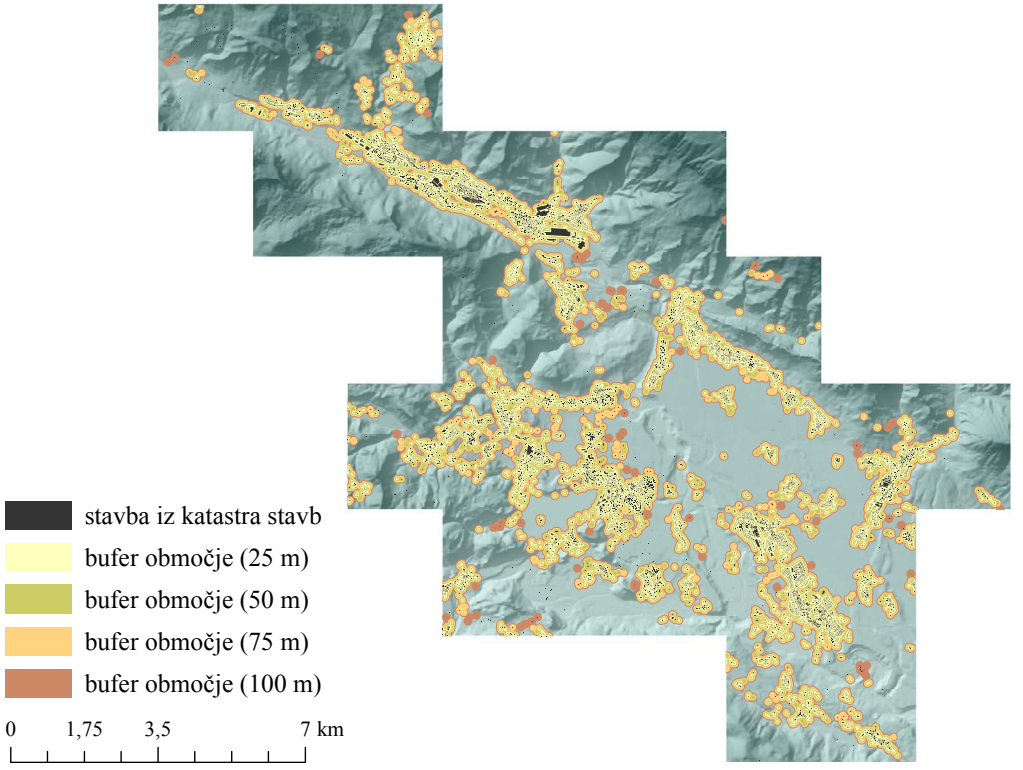
3.1 STRNJENOST POZIDANIH POVRŠIN GLEDE NA RAZDALJE MED STAVBAMI

Na izbor mestnih naselij je vplivala raznolikost slovenskega prostora, kar je poudarjeno že v metodološkem poglavju. Rezultati analize strnjenosti pozidanih površin so potrdili pravilnost izbora, saj na eni strani kažejo veliko raznolikost znotraj posameznega mestnega naselja, na drugi pa velike razlike med njimi. Analiza je bila narejena za vsako izbrano mestno naselje in vsako predhodno določeno razdaljo med stavbami posebej. Na sliki 2 je prikazan združen rezultat vseh štirih izbranih velikosti odmika od stavb (za stavbe iz katastra stavb s površino, večjo od 30 m^2, ki imajo hišno številko) za primer Jesenic v Zgornjegorenjskem somestju. Tako so nazorno prikazane razlike med rezultati analize za opazovane razdalje med stavbami v mestnem naselju.

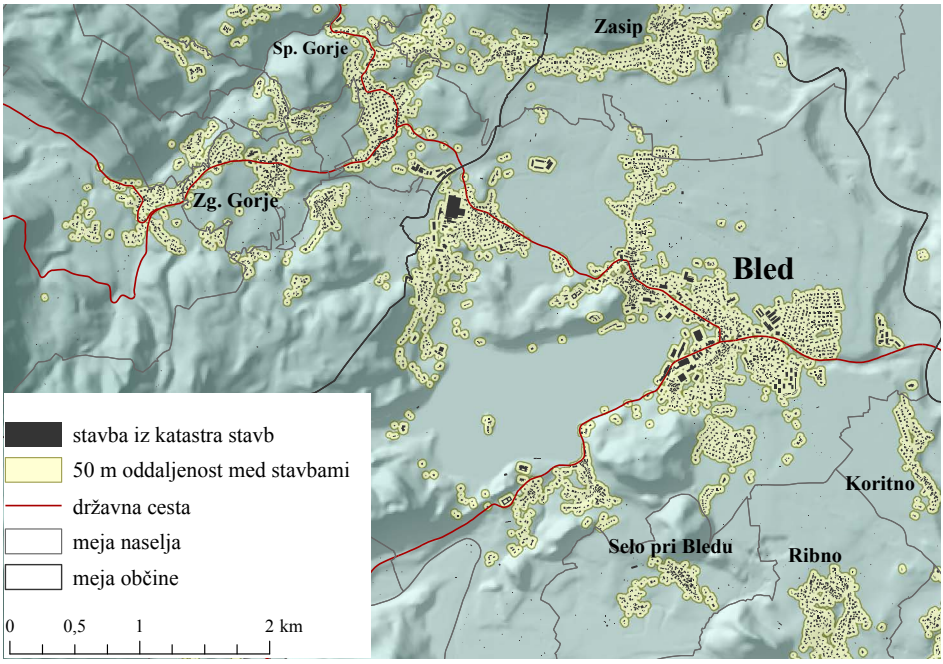
Še najbolj jasen je rezultat na primeru Postojne, ki je majhno mestno naselje z zelo razpoznavnim robom. Tu bi lahko že na podlagi merila razdalje med stavbami določili rob mestnega naselja in ga tako razmejili od drugih vrst osnovne rabe prostora.

Rezultati so pokazali, da za Maribor območja mestnega naselja ni mogoče določiti le na podlagi kazalnika razdalje med stavbami. Prehod strnjenega mesta v Slovenske gorice namreč praktično ni prekinjen (glej sliko 5, na kateri je prikazana gostota prebivalstva na območju Maribora). Podobno je na Jesenicah (slika 2), ki so zaradi reliefnih značilnosti na severu in nove avtoceste na jugu močno prostorsko omejene, v vseh prečnih dolinah pa se kaže močna težnja po gosti, strnjeni pozidavi. V nadaljevanju se proti Bledu in Radovljici dolina širi, kar pomeni tudi bistveno večjo pozidanost območja, ki pri prikazu 200-metrske razdalje med stavbami skoraj ni več prekinjena. Tako se je pri določevanju območij strnjenih pozidanih površin pokazalo, da na eni strani sklenjeno območje odmika, ki določa 50-metrsko razdaljo med stavbami, izloča preveč območij strnjene pozidave, na drugi pa sklenjeno območje odmika, ki določa 200-metrsko razdaljo med stavbami, zajame preveč območij strnjene pozidave, ki nimajo več mestnega značaja in spadajo v podeželski prostor. Na slikah 3 in 4 je prikazan primer Bleda z Gorjami. Enak pojav lahko opazujemo na severovzhodu Maribora, kjer mesto že prehaja v vinske gorice.

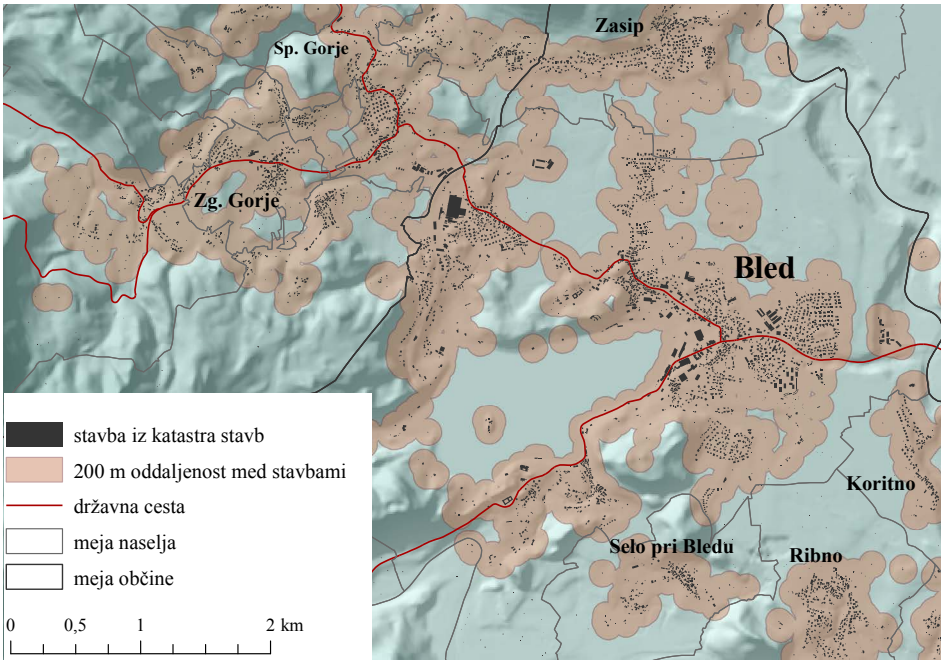
Na podlagi primerjave rezultatov določevanja območij strnjenih pozidanih površin na temelju 50-, 100-, 150- in 200-metrskih razdalj med stavbami na izbranih primerih se je pokazalo, da ja za slovenska mestna naselja najprimernejša razdalja med stavbami 100 metrov (Bled, Radovljica, Postojna), včasih pa celo 150 metrov (Jesenice, Maribor).



Slika 2: Strnjenost pozidave za 50-, 100-, 150- in 200-metrske razdalje med stavbami iz katastra stavb (> 30 m^2), ki imajo hišno številko – Jesenice (vir podatkov: GURS, 2011; lastni izračuni in prikazi).



Slika 3: Podrobnejši izsek iz karte sklenjenost pozidave za 50-metrsko razdaljo med stavbami iz katastra stavb (> 30 m²), ki imajo hišno številko – primer Bled z Gorjami (vir podatkov: DRSC, 2011; GURS 2011; lastni izračuni in prikazi).

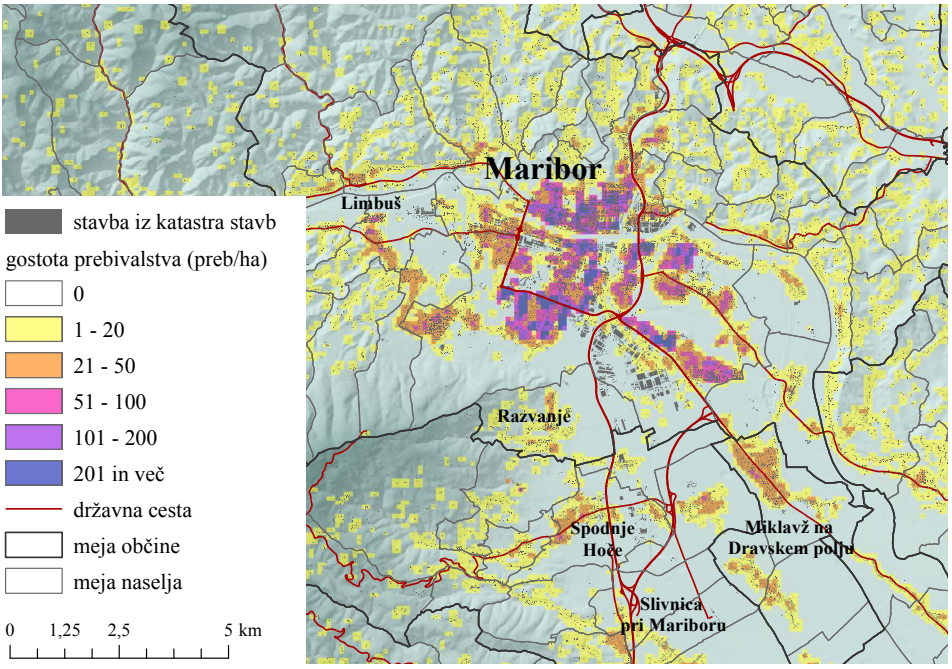


Slika 4: Podrobnejši izsek iz karte sklenjenost pozidave za 200-metrsko razdaljo med stavbami iz katastra stavb (> 30 m²), ki imajo hišno številko – primer Bled z Gorjami (vir podatkov: DRSC, 2011; GURS, 2011; lastni izračuni in prikazi).

3.2 Gostota prebivalstva pri analizi strnjenosti pozidave

Analiza gostote prebivalstva dopolnjuje analizo strnjenosti pozidanih površin, saj pokaže tudi na notranjo strukturiranost naselij v povezavi z rabo prostora (ESPON 1.4.1., 2005), ki pa je v tem prispevku ne obravnavamo podrobneje. Pričakovano je bilo, da imajo srednje velika mestna naselja, kamor spada Maribor, v primerjavi z majhnimi mestnimi naselji višjo gostoto prebivalstva. Najvišjo gostoto (nad 200 prebivalev/ha) na obravnavanih območjih najdemo le v jedru Maribora in Jesenic.

Na območju Maribora gostota prebivalstva sicer precej niha, saj na obrobju mariborskega mestnega območja, torej na robu Slovenskih goric, nikjer ne presega 20 prebivalcev/ha (slika 5). Naselja mestnega značaja na jugu in zahodu, v dolini Drave, kažejo srednjo gostoto poselitve, kar je predvsem posledica množične individualne stanovanjske gradnje na velikih površinah, brez ali z malo centralnih dejavnosti. To velja za naselja Limbuš, Razvanje, pa tudi za morfološko samostojni naselji, kot sta Miklavž na Dravskem polju ali Slivnica pri Mariboru.



Slika 5: Gostota prebivalstva na hektar na primeru Maribora z okolico (vir podatkov: DRSC, 2011; SURS, 2010; GURS, 2011; lastni izračuni in prikazi).

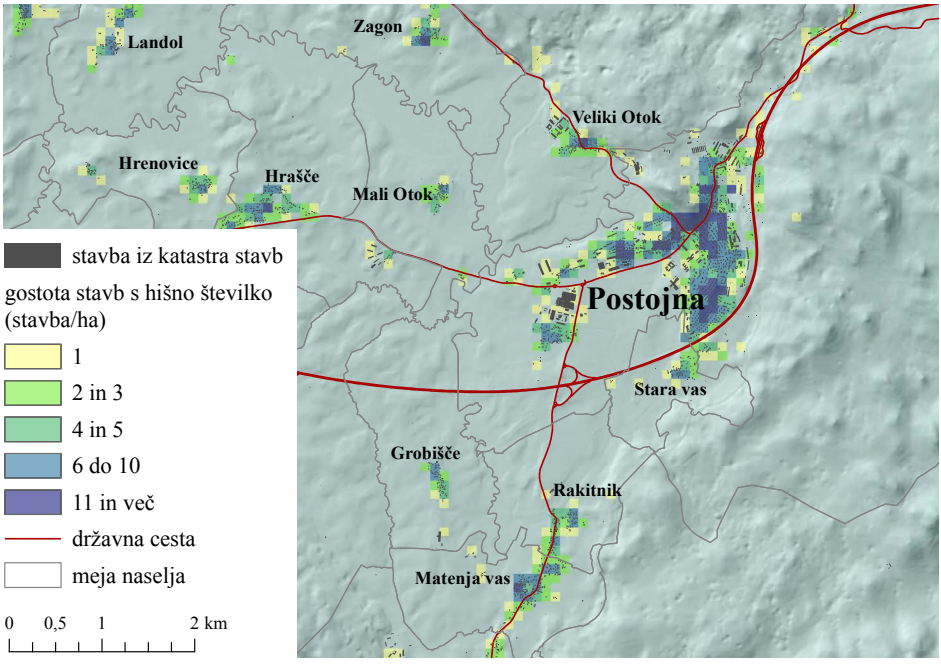
V mestnih naseljih Jesenice in Radovljica z Lescami so še zgoščena območja prebivalstva (101–200 prebivalcev/ha; preglednica 3). Na obrobju Zgornjegorenjskega somestja so številne vasi in naselja, ki sestavljajo razmeroma homogeno in gosto podeželsko območje s precej nizko gostoto prebivalstva (le redko nad 51 prebivalcev/ha).

V Postojni gostota prebivalstva le redko dosega višje vrednosti od 101 prebivalca/ha. V strnjenem delu mesta prevladujejo območja z gostoto med 51 in 100 prebivalcev/ha, na zunanjem robu

mestnega naselja pa tudi pod 50 prebivalcev/ha (primerjaj s sliko 6). Prav tako ni nenavadno, da ni morfološkega zlivanja naselij in večjega obsega suburbanizacije, saj Postojna leži na zelo redko poseljenem območju notranjsko-kraške statistične regije. Od vseh obravnavanih mestnih naselij je v Postojni slika gostote prebivalstva najbolj jasna ter izrazito kaže na strnjenost celotnega mestnega območja in s tem tudi na njegovo homogenost. Kot smo ugotovili že pri kazalniku strnjenosti pozidanih površin, tudi tu lahko sklenemo, da je za Postojno razmejitev mestnega naselja od drugih vrst osnovne rabe prostora najlažja.

3.3 Gostota stavb s hišnimi številkami pri analizi strnjenosti pozidave

Analiza gostote stavb s hišnimi številkami na hektar je v vseh obravnavanih mestnih naseljih pokazala podobne rezultate kot analiza gostote prebivalstva na hektar. Tudi v tem primeru je gostota najvišja v Mariboru in na Jesenicah, v vseh drugih naseljih dosega srednje vrednosti (preglednica 3), na njihovih obrobjih pa nizko gostoto stavb s hišnimi številkami (pod 3 na hektar). V Postojni se spet kaže zelo jasen rob strnjenih pozidanih površin (slika 6), medtem ko v drugih naseljih kazalnik ne pripomore bistveno k razmejevanju mestnega naselja od drugih osnovnih rab prostora. Le na nekaterih industrijskih in poslovnih območjih, kjer je gostota stavb velika, število prebivalstva pa majhno, ta kazalnik dopolnjuje kazalnika razdalje med stavbami in gostote prebivalstva na hektar.



Slika 6: Gostota stavb s hišnimi številkami na primeru Postojne (vir podatkov: DRSC, 2011;GURS, 2011; lastni izračuni in prikazi).

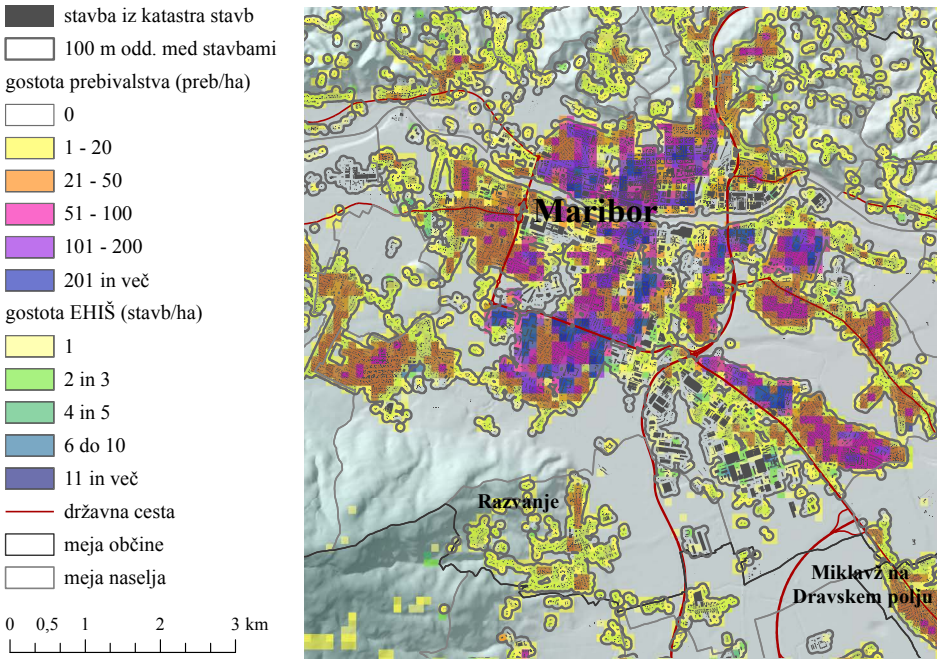
Rezultati analize gostote stavb s hišnimi številkami so dodatno pokazali, da je kazalnik zelo primeren za ugotavljanje urbanizacije, vendar bi jo morali izvesti na ravni celotne Slovenije. Za

ugotavljanje strnjenosti pozidanih površin pa je dejansko bolj primerna analiza gostote prebivalstva na hektar.

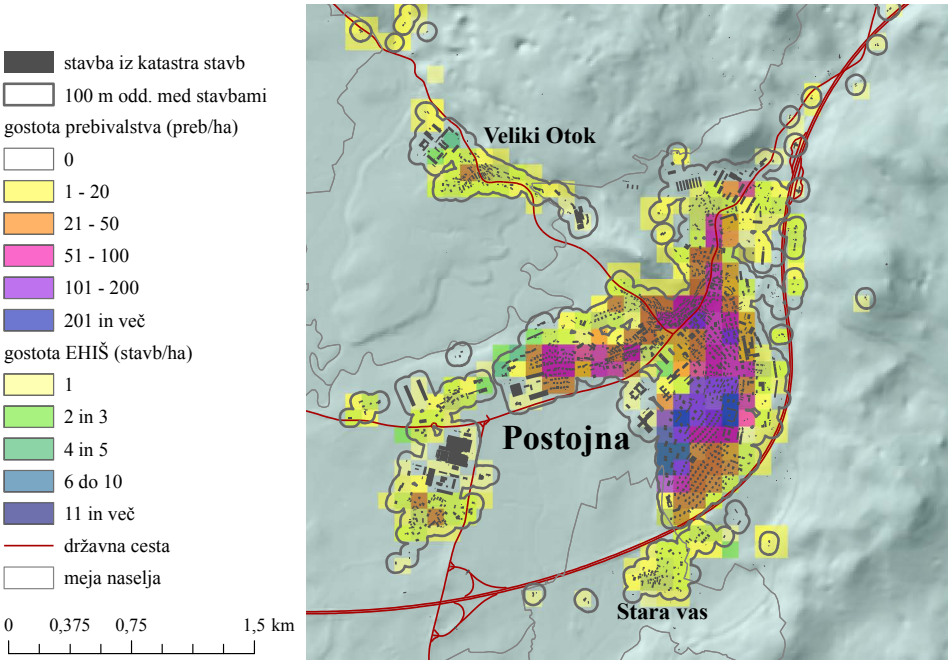
3.4 Sklepne ugotovitve raziskovanja strnjenih pozidanih površin

V sklepnem delu raziskave smo izdelali še sintezno analizo, in sicer smo določevali območja strnjene pozidave na temelju vseh treh kazalnikov, za posamezno izbrano območje mestnega naselja. Kazalnika gostote prebivalstva na hektar in gostote hišnih številk na hektar sta enostavna in dajeta podobne rezultate, medtem ko smo se pri kazalniku razdalje med stavbami morali odločiti za eno izmed obravnavanih vrednosti. Izbrali smo 100-metrsko razdaljo med stavbami, čeprav sta se kot primerni za določanje sklenjenosti pozidave na podlagi razdalj med stavbami v vseh obravnavanih primerih pokazali tako 100- kot 150-metrska razdalja. Enotnega praga za ta kazalnik vendarle ne moremo določiti, saj se predvsem reliefne razmere, umestitev infrastrukture v prostor in tipologija poselitve na različnih območjih preveč razlikujejo med seboj.

Sintezna analiza je pokazala, da v nobenem od obravnavanih mestnih naselij ne moremo le na podlagi izbranih kazalnikov razmejiti območja mestnega naselja od drugih vrst osnovne rabe prostora. Najbolj nazorna sta primera Maribora (slika 7) in Postojne (slika 8). Pri prvem poznamo razmejitev med mestnim naseljem in razpršeno gradnjo, ki se kontinuirano nadaljuje v Slovenske gorice. Podobno je v Zgornjegorenjskem somestju in Postojni. Slednja je edino od obravnavanih mestnih naselij, v katerem lahko urbano rabo prostora dokaj nedvoumno razmejimo od drugih vrst osnovne namenske rabe prostora.



Slika 7: Sinteza rezultatov vseh treh kazalnikov za določevanje območij strnjenih pozidanih površin na primeru Maribora (vir podatkov: DRSC, 2011; SURS, 2010; GURS, 2011; lastni izračuni in prikazi).



Slika 8: Sintezna analiza vseh treh kazalnikov na primeru Postojne (vir podatkov: DRSC, 2010; SURS, 2010; GURS, 2011; lastni izračuni in prikazi).

Rezultati raziskave so dodatno pokazali, da kazalnika gostote prebivalstva in gostote hišnih številk analitično dopolnjujeta analizo strnjenosti pozidanih površin na temelju razdalje med stavbami ter hkrati omogočata pravilnejšo interpretacijo rezultatov. S kombinacijo vseh treh kazalnikov smo torej dobili objektivnejši rezultat, območja strnjenih mestnih naselij. Kljub temu ugotavljamo, da za določanje mestnega roba po morfološkem merilu strnjenosti pozidanih površin brez škode izpustimo kazalnik gostote hišnih številk na hektar, kazalnik pa uporabimo za druge namene, kot je na primer določanje stopnje urbanizacije v Sloveniji.

Pokazali smo, da je merilo strnjenosti pozidanih površin potreben, ne pa tudi zadosten pogoj za določanje območij mestnih naselij kot dela urbane rabe prostora. Poleg tega bo treba raziskati formalna in funkcionalna merila, ki bodo skupaj z morfološkim sestavljala zadosten nabor meril in kazalnikov, s katerimi bo mogoče dovolj natančno razmejiti urbano rabo od drugih vrst osnovne rabe prostora.

4 SKLEP IN RAZPRAVA

Ključni kazalnik trendov v prostoru je spremljanje postopkov spreminjanja dejanske rabe prostora. To omogočajo kakovostni in zanesljivi podatki, ki pa jih v Sloveniji za zdaj nimamo. Za kakovostnejše odločitve v prostoru bo treba vzpostaviti in redno vzdrževati podatke o dejanski rabi prostora za celotno Slovenije in zvezno za vse osnovne vrste rabe prostora ter njihove kategorije na različnih ravneh opazovanja.

Zaradi opuščanja podatkov o rabi zemljišč v zemljiškem katastru in pomanjkljivosti podatkov v Evidenci dejanske rabe zemljišč MKO za namen spremljanja sprememb stanja v prostoru, na kar so v preteklih letih

opozarjali številni avtorji, smo pristopili k sistematičnemu raziskovanju na področju določanja urbane rabe prostora in njenega razmejevanja od drugih osnovnih rab prostora, ki so še kmetijska, gozdna, vodna in druge rabe prostora. V ta namen bi morali med drugim določiti območja urbane rabe prostora, kar bi omogočilo ustrezen dialog med vsemi nosilci podatkov osnovnih vrst rabe prostora. Kot ugotavlja že Arh (2012), bi s kakovostno podatkovno bazo o dejanski rabi prostora, ki je medsektorsko usklajena, pridobili tudi ustrezne podatke za spremljanje stanja in sprememb v prostoru ter prostorsko načrtovanje.

V prispevku smo se omejili na določanje in razmejitev mestnih naselij od drugih vrst osnovne rabe prostora, kar smo preverjali z opisano metodologijo na izbranih primerih. Pokazali smo, da morfološko merilo strnjenosti pozidave, ki ga opisujemo s tremi kazalniki, ne more biti edino za določanje meje mestnih naselij. V prihodnjih raziskavah bo treba upoštevati še formalna, predvsem pa funkcionalna merila, kot so različne dejavnosti v mestih (stanovanjska gradnja, predvsem večstanovanjskih stavb, centralne dejavnosti, industrijska, obrtna in poslovna območja, večje prometne stavbe, kot je železniška postaja …), prisotnost urbanih zelenih površin (parki, rekreacijske in športne površine, urbani gozd kot del mestnih rekreacijskih površin, območja vrtičkov, urbane zelenice, pokopališča, vodne površine, manjše enklave kmetijskih površin, ki pomenijo potencialna nezazidana stavba zemljišča …), cestno in železniško omrežje ter navzočnost druge javne gospodarske infrastrukture.

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