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## Landscape design possibilities of the settlement fringe

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### Abstract

I considered the last built-up plot/parcel and a 200-meter-long landscape belt from its boundary, as the settlement fringe area. The objective of the research is to interpret the structure of the settlement fringe and determine its landscape structure and features as well as its green space, and by using this knowledge, to interpret the settlement fringe from a landscape architectural point of view. My interpretation of the settlement fringe and its characteristics regarding the landscape structure, green surface offers a new approach to landscape planning research concerning settlement planning. The results highlight the appearance of the municipal green border and the need for landscape protection treatment.

### Introduction

The focus of my research is the interpretation of the settlement fringe from a landscape architectural point of view. The settlement fringe is a visual element of the landscape, though its structural interpretation and its treatment as a planning tool have not previously been analysed. Landscape architectural tasks mainly focus on larger landscape details, on landscape planning proposals, or on the tasks to be solved within the built-up parts of the settlement, especially the green space system. My practical and professional experience confirms that although landscape architecture recognizes the prominent role of settlement fringes, this landscape element has thus far not been well-defined in practice. Domestic landscape architecture has not yet developed a rigorous method for defining the professional tasks around settlement fringe organisation.

I am convinced that landscape architecture can play an important role in the rethinking of settlements and their surroundings, as well as the fact that settlement fringes are to be treated as an area of priority. The formulation of landscaping tasks for this specific area can help make this sensitive area act as an intermediary zone between the landscape and the settlement. Through conscious design, the settlement fringe can become a more valuable part of the landscape in terms of the use of landscape structure, landscape ecology, and scenery.

### Background and Literature Review

International research (2015, 2016 2018) was conducted before developing of the settlement fringes' analysis aspects. From the Hungarian landscape planning research point of view, Attila Csemez (2008) dealt with landscape use conflicts, Péter Csima (2009) with cultural and historical values, settlement character studies, Zsuzsanna Illyés (Illyés Varga 2019, Illyés et al. 2019) on landscape use change assessment, ecological issues of settlement planning, Kinga Szilágyi Mezősné (2009), Réka Ildikó Báthoryné, Ágnes Sallay (Ormos Imre Alapítvány 2017) on the methodology of green infrastructure network development. I consider the scientific work and publications of the

above authors as the scientific background related to my topic from the perspective of the landscape planning discipline.

## Method and Data

The research method is based on the creation and processing of a data set as well as perceptual examination. I analysed settlements' fringe areas – regarding to settlements and landscape connection – by field surveys and by using aerial photograph. I considered the last built-up plot/parcel and a 200 m long landscape belt from its boundary, as the settlement fringe area. In the examined belt, I've discovered built-up characteristics of these edge areas, land use types surrounding them and their green space elements. Based on the aerial photo (2018), I used the field survey to refine the actual land uses, building features and presence of wooded area. I digitized the field data, plotted the surveyed data of the study area on a map, and entered its spatial data into an excel spreadsheet. The aerial and field analysis was complemented by the use of thematic maps, databases and documents. In order to shed light on the inter-connections of the various data regarding the delimitation of the settlement fringes' characteristics, I've carried out statistical analyses and allocated settlement and landscape features to the results.

When choosing the sample settlements, I selected those that have not grown together with other settlements, that do not have population in excess 5,000 (according to KSH data of 2018), maintained their compact structure, and are situated in a transforming and developing area but are only slightly affected by them. Therefore, in my research I deal with settlements that are relatively closed, have a compact structure, are moderately growing, and typically settled edges. I ensured that the settlements in the sample study are located in an area in which the settlements show variations regarding their natural characteristics and therefore form groups of settlements with different natural conditions. This choice provided an opportunity to examine the different characteristics of settlement fringes and to identify similarities and relationships within settlement groups. Accordingly, the subject of my research is the settlement fringe of 21 settlements from six different sectors of the Budapest agglomeration. From the northern sector of the agglomeration: Csomád, Csörög, Sződ, Vácrátót; from the south-eastern sector: Felsőpakony; from the southern sector: Majosháza, Pusztazámor, Sósút; from the western sector Herceghalom, Perbál, Tinnye; from the north-western sector Csobánka, Dunabogdány, Kisoroszi, Pilisjászfalu, Pilisszántó, Pilisszentkereszt, Pilisszentlászló, Pócsmegyer, Szigetmonostor, Visegrád.

## Results

I determined the settlement fringe's demarcation and its functionally separated structural elements from a landscape architectural perspective. I demonstrated the correlation and factors of these structural elements through a pilot study (Figure 1).

Structural elements of the settlement fringe:

- fringe line: the real boundary of the compact settlement area
- inner periphery (A): the last built-in area
- outer periphery (B): variable width of the denoted landscape strip measured from the plot boundary, actual size to be proportional to settlement size, 200-meter in case of the sample settlements
- fringe Zone (C): a 20-meter denoted strip from the land border

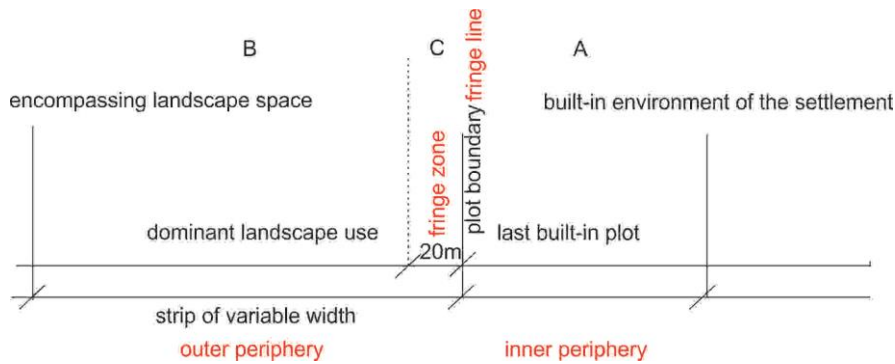


Figure 1. The structure of the settlement fringe

Based on the study of the sample area, the following settlement fringe features can be described:

The function of the inner periphery fringe (A) is similar settlement’s transportation network and economic space (Figure 2). The land use of the outer periphery (B) is adapted to the natural environment, and its characteristics influence the structure by of providing or impeding openness (Figure 3). Thus, the structure of the settlement fringe is influenced by the natural spatial system in which the settlement is formed, as well as by the farming traditions that continue to exist in the settlement, and the involvement of the settlement with the transportation network.

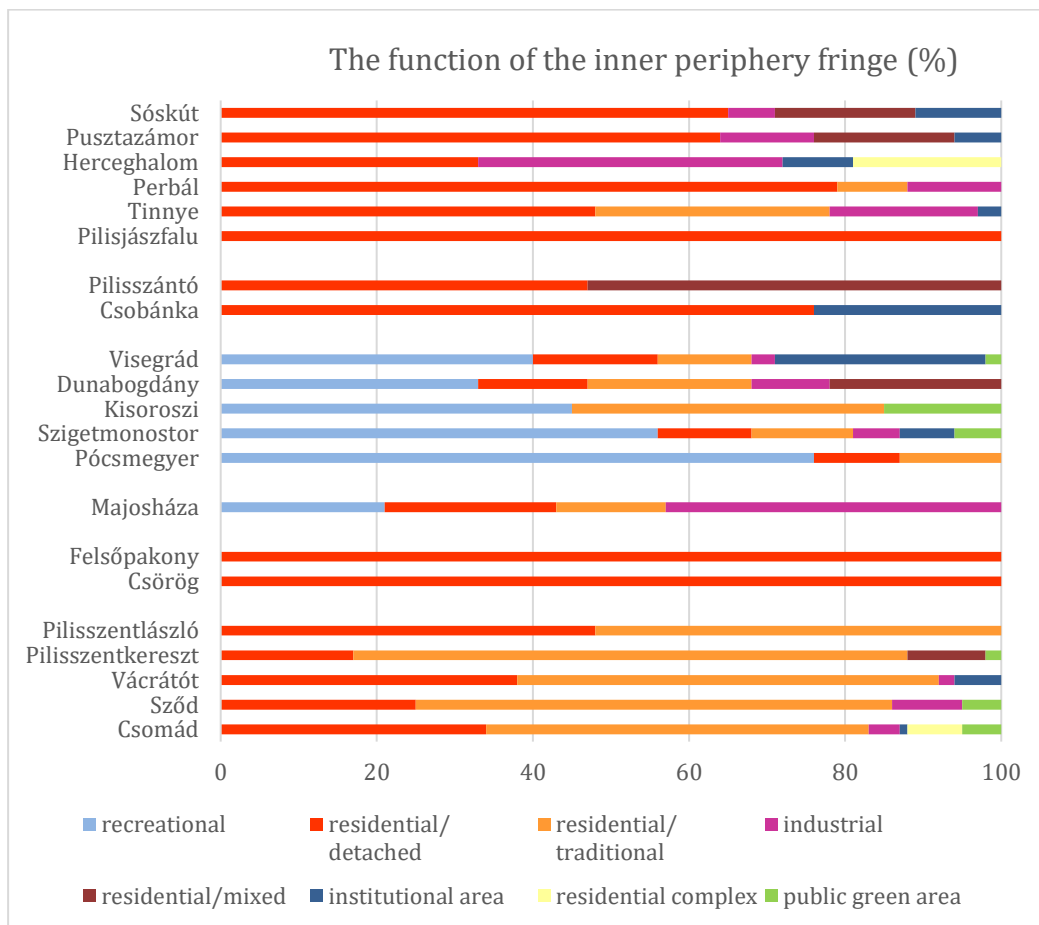


Figure 2. The function of the inner periphery fringe (%)

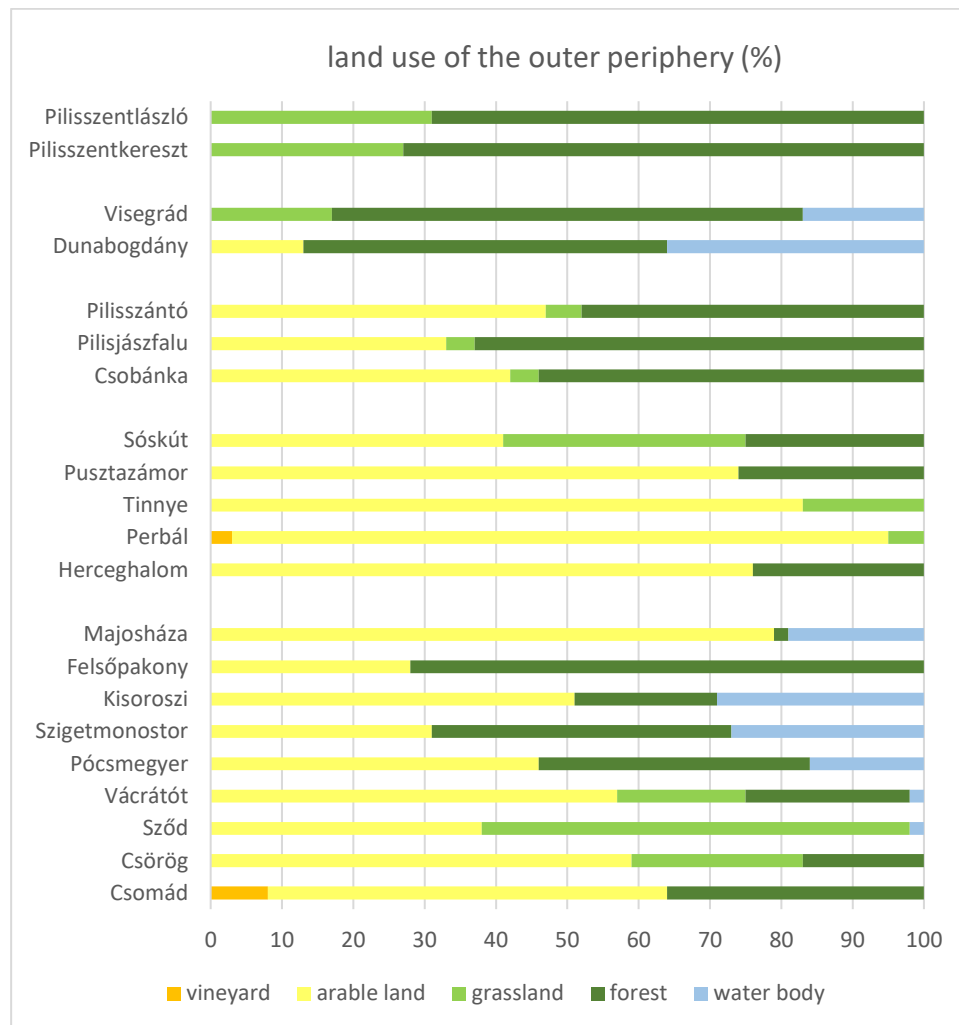


Figure 3. The land use of the outer periphery fringe (%)

The fringe zone (C) is a structurally separate landscape element of the settlement border. Its functional detachment from the landscape (new settlement features) results in the appearance and varied design of the fringe zone (Figure 4).

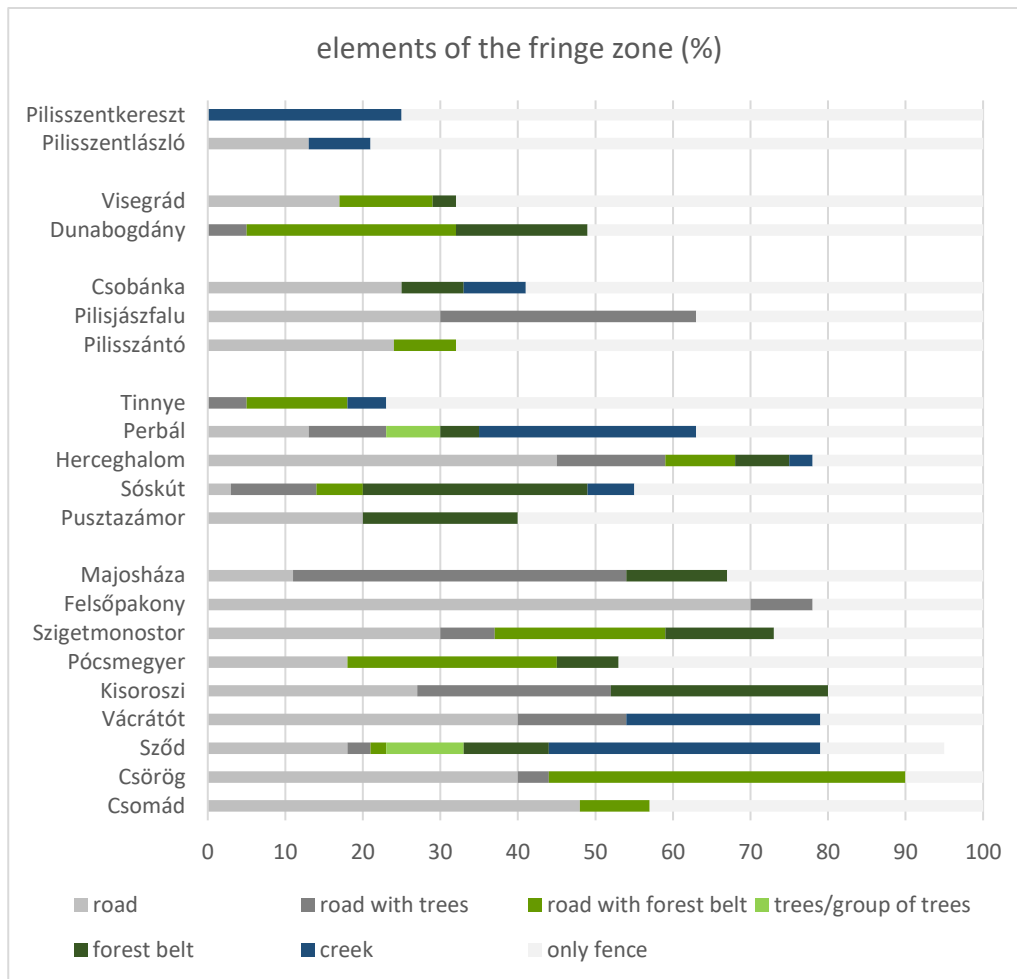


Figure 4. The element of the fringe zone (%)

The proportion of green space elements is large in the fringe zone and on the outer periphery, with 50-75% as the defining value. The sample plot results confirm the existence of the settlements' green fringe.

The tree stands of the functionally separated structural elements of the settlement fringe complement each other and combined, they form the characteristics of the settlement fringe's green space character. Eventually, it is perceived as an intertwined closed system, which is the result of the approach to the natural spatial system, the efforts of municipal afforestation, spontaneous shrub initiation at the outskirts of the settlement (Figure 5).

The system of the green areas of the settlement fringe can be classified into different types. The typology is determined by the hierarchy between the structural elements that make up the green spatial system. Based on this, the following patterns can be described: leaning on an outer green ring (1), made of intermittent / island-like elements (2), built on an inner green ring (3), blending into the outer green ring (4) (Figure 5):

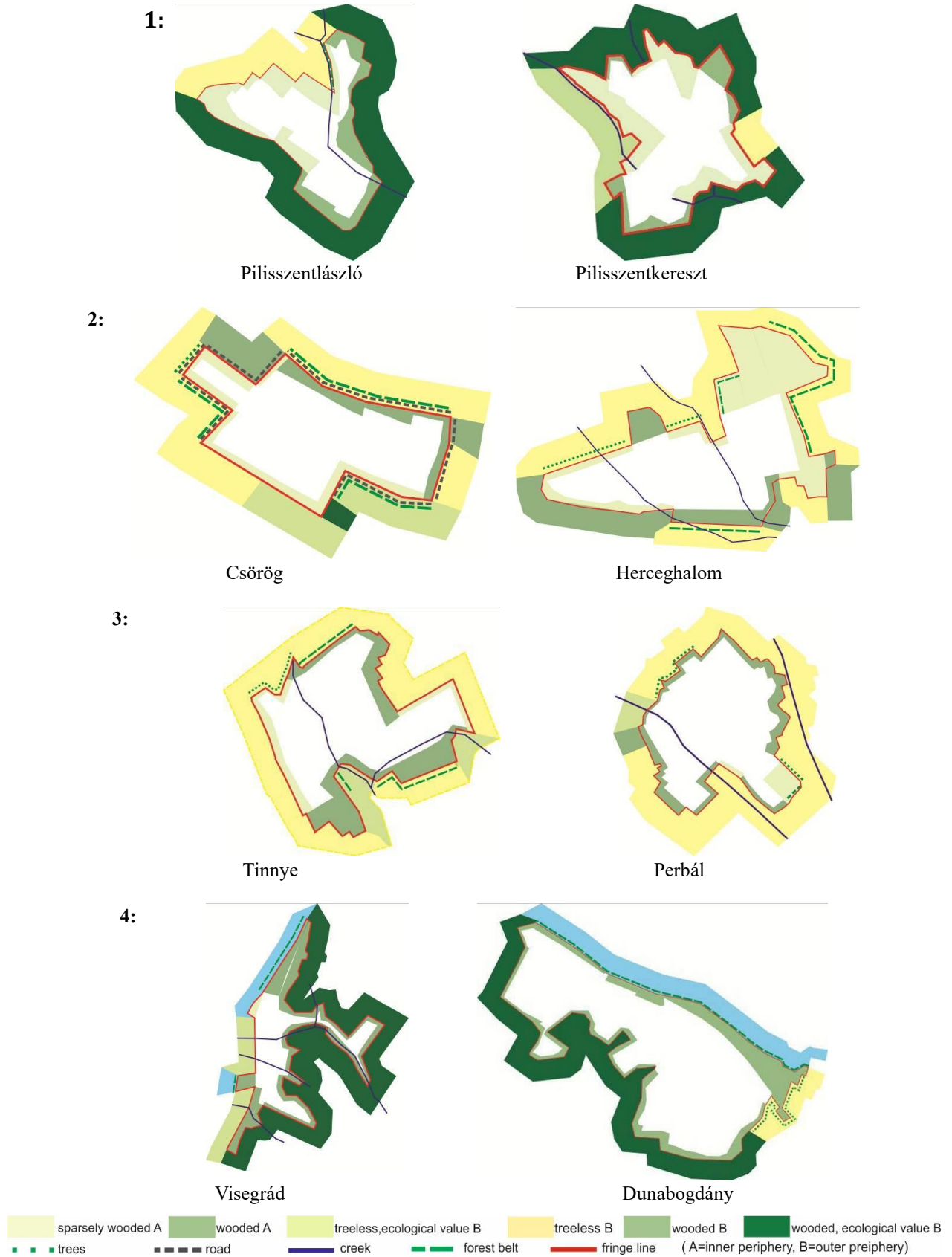


Figure 5. Green space edge types

1: leaning on an outer green ring: Oriented towards the surrounding natural environment, basing itself on natural elements, protected natural features form the green framework of the edge of the settlement.

2: made of intermittent / island-like elements: The green space system shows a lack of hierarchy, with no dominant structural element defining the green space character. The green space elements of the settlement fringe are predominantly composed of ornamental plants, spontaneously growing trees and the green space of the transport elements.

3: built on an inner green ring: The inner periphery's gardens giving the characteristics of the green space, settlements within a poor natural space system surrounded by areas of predominantly arable land. Ornamental plants and spontaneous afforestation processes play a major role in the green space system of the periphery.

4: blending into the outer green ring: Fading into bordering semi natural spaces, with the inner and outer peripheral areas also being green space like elements, it contains a mixture of the ornamental garden character created in the inner periphery areas and the semi-natural elements.

The occurrence of green space edge types shows a variety of landscape units. The typology groups provide an opportunity to determine the development and management objectives of the green space related to the settlement's integration into the environment.

Through the research of the sample areas, I proved that the settlement fringe is an element of the landscape to be treated with priority. It is to be treated with priority as a landscape unit, as a green surface element, and as a landscape feature. The connection of the structural elements and the quality of the green surface depends on the landscape utilization, green surface and landscape aesthetic relationship of the built and unbuilt landscape strip. Consequently, it functions as an intermediary zone between the landscape and the settlement. The settlement fringe is, thus, an important domain of how settlements organize and fit within the landscape.

## **Discussion and Conclusion**

The structural interpretation of the settlement fringe facilitates the understanding of the relationship between the settlement and the landscape. The differences in the structure of the settlement fringes are related to the landscape. The results of the analysis show that the structure of a settlement fringe is influenced by the natural spatial system in which the settlement has developed, the farming traditions in the settlement and its accessibility to the transport network. The fringe zone is a structurally autonomous landscape element of the settlement fringe. Its recognition and conscious formation is an important element of landscape protection. The results highlight the appearance of the municipal green border and the need for landscape protection treatment.

The method can be used for settlements of similar scale and with similar settlement structure characteristics to the sample settlements, which still retain a relatively compact structure. The study of peripheral areas of agglomerated settlements with a complex structure requires a more complex analysis. The evaluation method used to determine the characteristics of the settlement fringes and the principles of settlement planning can serve as a basis for landscape planning guidance that



extends the current practice of settlements and includes the landscape of the settlement.

My interpretation of the settlement fringe and its characteristics regarding the landscape structure, green surface, and landscape offers a new approach to landscape planning research concerning settlement planning. The results support the introduction of new research aspects of green space system design and the necessity of extending urban planning tools.

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