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### Abstract

It is needed to reinterpret the concept of plots and internal systems in the context of urban structure and the built environment due to the urban planning decisions of the 20th century. The study deals with tears of historic urban tissues (roads, new urban structures), and settlement-like or individual enclaves of buildings in the post-World War II period. In the focus of the research methodology and criteria system of discussed in the study stands the street network (space syntax), the plot structure (urban morphology) and the construction, i.e. the relationship between buildings and open spaces (space syntax: convex analysis, visibility analysis; urban morphology). The criteria system, even the city itself, has several layers. The study of the three cities that once belonged to the Austria-Hungary, Miskolc, Košice (SK) and Subotica (RS), reveals the location- and country-specific nature of the structural changes and can provide a basis for further studies.

### Keywords

tears in urban tissues, urban morphology, Space Syntax, Miskolc, Subotica, Košice

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# Tears in the Fabric of Cities in the Socialist Successor States of Austria-Hungary after World War II

## Introduction

The fabric of cities is never seamless. This is due to the fact that the structure of cities is the imprint of decisions about urban planning, as well as decisions and plans might lead to the formulation of layers, or they veil layers that formed earlier. The desire for rationality was not the sole motive behind decisions in the 20<sup>th</sup> century. We find that economic, political and social pressure were also important factors in planning. In the 1930s, the outstanding Hungarian poet Attila József described tears as if they were subject to law:

*“I looked up from under the evening  
at the gear wheels of the skies -  
from glistening threads of chance  
the loom of the past was weaving law,  
and again, I looked up at the sky  
from under the vapours of my dreams  
and I saw that the fabric of the law  
was always bursting apart somewhere.”*<sup>1</sup>

1 Attila József: Eszmélet. Translated by Michael Beevor. In Thomas Kabdebo (ed.): Attila József: Poems. London, 1966. <https://www.mathstat.dal.ca/~lukacs/ja/poems2/jozsef-eng.htm#11>

These thoughts may refer to the rules that determined the urban fabric around the turn of the 19<sup>th</sup> and 20<sup>th</sup> century. Decisions about urban planning overwrote the rules as they attempted to respond to changes and new demands that arose, first, after World War I, and then after World War II. Because of these new directions, one needs to revise notions that describe urban morphology, as well as the internal rules of settlements in the context of urban structure and built environment.

In the present paper, breaks and tears of urban texture are studied, based on common criteria, by looking at certain selected areas of Miskolc (Hungary), Košice (Slovakia, in Hungarian: Kassa) and Subotica (Serbia, in Hungarian: Szabadka); towns that adopted the models of state socialist type of urban structures.

The main criteria we applied for selecting the three towns were as follows:

- before 1920, they were regional centres within the territory of the Hungarian Kingdom in a position that was neither central nor peripheral;
- their location fell on the territory of three different countries after 1920;
- the towns kept their regional importance as centres, even if their positions and weight within the spatial pattern of the new country differed from their previous situation;
- came closer to international borders;
- they underwent significant changes during the 20<sup>th</sup> century;

As parts of the Austro-Habsburg Empire, the three towns that we study shared a lot in terms of the urban development plans that influenced them, yet, subsequently, for most of the 20<sup>th</sup> century, they developed as part of three different states. Differences and similarities between these urban plans are also part of the research project.

It is a common feature of the selected areas that the system and location of the plots, including the buildings, underwent a complete transformation as a result of which hardly any traces of the original fabric left. The area thus transformed looks as if there were a break in the compact urban structure. All three areas selected are bordering parts of the town centre where the original fabric is present. This way, the rupture becomes tangible.

The broken fabric no longer functions as a historic layer in the selected areas: the new texture has overwritten it. Although in his theory of spatial hierarchy<sup>2</sup>, Mi-

2 The relative weight of factors (urban structure, the pattern of streets, land-use and functions) that matter in studying cities depends on their spatial and temporal longevity. Therefore, urban structure has the greatest importance while temporary functions are less important. Conzen and Conzen, *Thinking About Urban Form*.

chael Robert Günter Conzen (M.R.G. Conzen – as he is known in the literature) argued that the most permanent element of the urban structure is the “town-plan”<sup>3</sup>. In the studied areas, only functions and the land-use were partially preserved, while plots and the network of streets were totally erased.

The three areas that we selected are the Vörösmarty Housing Estate (the former Gordon neighbourhood) in Miskolc, the Aleja Maršala Tita in Subotica (Marshal Tito Avenue, commonly known as Radijalac, meaning avenue) including its surroundings, and the Komenského street with its surroundings in Košice. Each of the three areas carries all the characteristics based on which we may call them areas where the urban fabric is torn. Just like the cities, the interdisciplinary methodology applied also consists of multiple layers. It makes possible to read the fabric in a complex way, as if it were the imprint of needs and thought patterns that changed over time. The present study compares the post-World War II texture to the one that it had replaced: the urban texture during the time of Austria-Hungary. For classifying and characterizing original textures, the study uses Éva Lovra’s catalogue of urban fabrics with its labels.<sup>4</sup>

This multi-layered methodology applies urban morphology and space syntax simultaneously. As Sam Griffiths posits: “a language of historical space cannot emerge from theory building; it starts with the empirical task of description”.<sup>5</sup> Both urban morphology and space syntax makes conclusions about the spaces it analyses based on shapes and correlations that one may clearly define through empirical research.

One may define the morphology of cities and urban fabrics through studying the interaction among elements of the urban environment – built environment, gradual spatial and horizontal development, and elements of the urban texture (streets, squares and green areas). The map of a town shows one of the morphological features in macro scale, the extent and shape of built areas signal the key directions of development, while the changes and size of individual plots reflect the area of the foundation of the town and the topography of that period.<sup>6</sup> Contours of buildings

3 By urban layout, we mean the combination of urban blocks and plots that form the structure of a given locality.

4 Lovra, *Városok*, 74–83., 199–201.

5 Griffiths, “Temporality”, 93.

6 Lovra, “Typology of the Urban Fabric”, 238–244.

constitute the master lines but other elements such as empty plots and public spaces play a part, too. “Spontaneous or planned organization of elements produce the structure of the city.”<sup>7</sup>

“Space syntax is a set of techniques for analysing spatial layouts and human activity patterns in buildings and urban areas. It is also a set of theories linking space and society.”<sup>8</sup> Space syntax observes cities as networks, and studies the role of certain places in the whole, involving the configuration of the network itself. By “space”, we mean an area with well-defined physical boundaries, similar to what it means in architecture. Space is a room in a building surrounded by walls, an urban square enclosed by buildings, a street with buildings in an unbroken row (in the latter case the space is elongated), and all other spaces that have other built elements along their boundaries. In this paper we use the notion of space as an area that has boundaries and we do not only refer to it in the sense that urbanism does. In the future, the combination of urban morphology and space syntax can be complemented with social history, since the development of a certain town cannot be interpreted without taking trends in urban development, historic and social aspects into account.

With this methodology, we cannot only reveal those features of changes in the urban structure that are specific to a country or a place but political, social and economic aspects, too. The objective of the two-step analysis (social history based on configurational-morphological study) is to render tears visual and presentable. This way we may interpret configurational-structural aspects of the planning activities of the 20<sup>th</sup> century using a pre-set-criteria, then, we may link these to the historic, social and political background.

The network of streets (space syntax), pattern of plots (urban morphology), and the relationship between built and empty spaces (space syntax together with urban morphology) are at the centre of the methodology and criteria applied here. Studies of Éva Lovra have attempted a comparative analysis of the textures of Central European towns for the pre-1918 period. Moravčíková *et al* discussed the housing estates of the 20<sup>th</sup> century in Slovakia<sup>9</sup>, Zsuzsa Körner and Mária Nagy did the same

7 Lovra. *Városok*, 52.

8 The Space Syntax Online Training Platform

9 Moravčíková *et al.*, *Bratislava Atlas*

in a descriptive manner for Hungary<sup>10</sup>, and Éva Lovra for Serbia.<sup>11</sup> Tamara Zaninovic carried out research using the methods related to space syntax for Zagreb.<sup>12</sup>

Apart from changes of the urban structure, we can also look into the transformations that occurred within the given texture how internal relations and systems changed fully or partially because of new constructions. By analysing three towns from three countries, the present study also places the types of transformations of the fabric into historical perspective. Hence, we may apply a common set of criteria to study the former Habsburg Central Europe. The methodology laid out here prepares the common ground for future comprehensive comparative studies. The aim of the present paper is not to describe and assess a chronology and the development of housing estates, but to visualise the tears of the fabric and to study them by using methods of morphological analysis and space syntax.

### **Sites of analysis: Košice - SK (Kassa), Subotica - RS (Szabadka) and Miskolc – H**

Camillo Sitte is one of the key figures of urban planning at the turn of 19<sup>th</sup> and 20<sup>th</sup> century. If we disregard the urban landscape and the built environment (historicism as style) his impact is identifiable on the post-1945 urban fabric as well: “The picturesque cityscape that he and his followers advocated did not only mean that the structure of cities should change accordingly, but also included different dynamics of the cityscape. His work reflected that historicism was in full bloom. He broke the rigid geometry of urban network by introducing avenues diagonally. He closed these with buildings that determined the focal point of roads”.<sup>13</sup> However, Sitte stressed the importance of reconstituting continuities with the past as well as of reinstating enclosed spaces. These were exactly the aspects that did not remain intact in periods when the urban fabric was torn.

10 Körner and Nagy, “Az európai és a magyar telepszerű lakásépítés”, Körner, ”A telepszerű lakásépítés”

11 Lovra, *Szabadka urbanizmusa*

12 Zaninović et al., “Urban Landscape”, 274–305.

13 Lovra, *Városok* 135.

At the turn of the 19<sup>th</sup> and 20<sup>th</sup> centuries, the daily called *Felsőmagyarország* discussed the development of Košice and came to the conclusion that it was unplanned due to the lack of proper, official plans for expansion.<sup>14</sup> The city developed along the inherited fabrics without plans and with regulation that regarded only individual buildings. However, in 1921, it gained an urban development plan that defined the main directions (László Wurga – Jenő Lechner)<sup>15</sup>, that only partially touched the area of the later Komenského street (curved roads and the squares dividing them). During the First Czechoslovak Republic, between 1918 and 1938, the geopolitical position of Košice changed and this resulted in new demands that concerned urban plans, too (Josef Choccol 1938).<sup>16</sup> Thus, the Komenského street gained a new profile during the interwar period. Until the 1920s, public buildings (such as schools like the Cadet's School at the end of the street and the School of Agriculture opposite to it), spaces of recreation, and smaller residential quarters dominated the urban fabric. First streets emerged between the educational institutions with typically elongated plots, perpendicular to the streets. Then, during the interwar period, the construction of residential buildings gained momentum (civil servants' estates at the end of the road). These buildings in unbroken rows appeared where the free plots were in the streets inhabited by single-floor houses. Four pavilions were erected at the juncture of the two main streets that were to be permanent structures. However, as the joint work of Priatková, Sekan and Tamáska established, the construction projects between 1919 and 1938 did not follow a plan. Rather, buildings emerged where plots were the least expensive.

“After the war, the socialist system continued the construction through the further development of the block structure, and it was this particular era when the street that could thank for its unified appearance.”<sup>17</sup> Designing urban squares and focal points are characteristics of the Socialist Period. The space that became the centre of the quarter came into being as a result of demolishing the existing fabric at the juncture of Komenského Street and Letná Street. In 1952, contemporaries celebrated the official post-war plan (authors: F. Koči, J. Hruža) that laid down Kosice's urban

14 *Felsőmagyarország*

15 Sekan, “Kassa városrendezésének története”, 60.

16 Sekan, “Kassa városrendezésének története”, 61.

17 Priatková, Sekan and Tamáska, “The Urban Planning of Košice” 86.

development plan as a great achievement of socialist urban planning.<sup>18</sup> However, another plan that came to force in 1961 (authors: Milan Hladký, Ján Kurča, Iván Bányai) was a return to modern urban design.<sup>19</sup> This latter envisioned a less compact urban structure but maintained the closed and complex features of it. The final development of Komenského street took place within this framework. (See Figure 1 and 2)

The stadium of Lokomotiva Košice sports club was built at one end of the current main axis of the town. Yet, the next urban plan of 1976 treated the city as an area administered as a unit but consisting of separate parts.<sup>20</sup> Thus, the urban structure ceased to be a compact one.

Although Subotica had notable urban planning document dating to the pre-World War II era (authors: Mihály Könyves-Tóth 1884<sup>21</sup>, Kosta Petrovic 1927/28),<sup>22</sup> these did not alter the actual structure of the city to any significant extent. The period after 1948 prompted the introduction of new methods in urban planning, increasing the density of population, building infrastructure and a number of new apartments. The bombings of 1944 destroyed a large proportion of buildings in the city.<sup>23</sup> In 1948, following the formation of second Yugoslavia (from November 1945 the official name was Yugoslavian Democratic Alliance, then in 1946 it changed to Yugoslavian Federal Republic), the government launched preparatory works for a general regulation plan.<sup>24</sup> The Urban Regulatory Plan of Subotica, finished in 1951, was

18 Priatková, Sekan and Tamáska, “The Urban Planning of Košice” 80.

19 Priatková, Sekan and Tamáska, “The Urban Planning of Košice” 82. In his work on Kosice, János Sekan writes about Bohuslav Fuchs’ plan of 1951. He calls it “the plan denied”. The plan of 1961 adapted Fuchs’ solutions almost fully.

20 This plan was still in force in 2018. It went through a revision in 1993. Bél Alexander prepared the detailed urban plan in 1976. I was based on the concept (prepared by a team: architects Němec, Krásný, Hexner and Zajíc) that authorities thought to be the best one from the pool of plans submitted to their call in 1972. Sekan, *Kassa városrendezésének története*. 72–73.

21 Mihály Könyves Tóth’s proposal is at the Historical Archives of Subotica (henceforth: TLSZ), F:003 3.2.1.4.

22 TLSZ F:047 II-70/1927.

23 TLSZ F:003 3.2.1.71. TLSZ F:070 1629/1945 és TLSZ F:070 6078/1945.

24 De Negri et al., “Stambena izgradnja”



based on this. It came to force in 1952 and remained applicable until 1959.<sup>25</sup> 2000 of the existing flats did not meet the minimum requirement in terms of sanitation and it turned out that there was a shortage of 2300 flats on top of that.<sup>26</sup> In 1954 a preliminary urban plan was also prepared that saw the solution in constructing multi-story buildings in place of the bombed and single floor houses next to the city centre.<sup>27</sup> The proposed residential quarters included new public buildings among the residential houses. Subsequently, the construction of the first four-story buildings began in 1958, based on uniform plans.<sup>28</sup> The 1959 excerpt of the general plan on mass housing divided the city into central zones and outskirts.<sup>29</sup> The Radijalac (Aleja Maršala Tita) area studied in this paper is part of Microzone number 15, meaning that it is part of the very central part. The idea of the new avenue originates earlier than the second part of the 20<sup>th</sup> century: it first occurred in István Frankl's plan of 1910<sup>30</sup>, which followed the ideas of baroque style urban planning since the allée with trees planted along it would have connected to the area called Sétaerdő to the town hall that was under construction at the time. (The designers of the town hall were Marcell Komor and Dezső Jakab, and it was built between 1908 and 1912.) The allée also appears in Petrović's plan of 1927/28. Eventually, the construction of the Marshal Tito Avenue began in 1958 under the supervision of Franjo (Ferenc) De Negri and was completed ten years later. By that time, the head engineer was Dragutin Karlo De Negri, Franjo's son. (See figure 3 and 4).

Karlo De Negri described the development project in the following terms: "This was the period when the Marshal Tito Avenue materialised. It was no less than one of the most successful and most drastic urban development projects in the history of Subotica. In this case, we can talk about the rehabilitation and reconstruction of the urban texture. In the spirit of modern urbanism, by replacing the ageing and substandard flats, a functional link came into being between the Sétaerdő (Dudova šuma), which

25 De Negri et al., "Stambena izgradnja". 89.

26 Dulić, "Subotica". 157.

27 TLSZ F:003 3.3.1.42.

28 TLSZ F:138 1956.

29 TLSZ F: 138 1959. akta br. 16158

30 TLSZ F:003, 3.1.1.14. és TLSZ F:003, 3.1.2.74.

is the sports and recreation hub and the city centre.”<sup>31</sup> By looking at the process of the making of the avenue, we can also trace the development of the technology of construction<sup>32</sup>: while the buildings of the first section (progressing from the centre towards the Dudova šuma) feature the brick of the 1950s, the so-called Antić-type solitary houses used a technology based on sliding formworks, and the last section had pre-fab elements, as well as cladding made of aluminium. These technologies were novelties in the 1960s.

In Subotica, the main changes concerning the texture of the centre, including the construction of the Avenue and its environment, took place before 1975. Even though the development of the area is still an ongoing process, the landscape of the Avenue has not changed. In Subotica, there were two “massive complexes” inconsiderately inserted to the inherited fabric Aleja Maršala Tita itself and residential quarter called Prozivka. These constitute a new spatial structure that cause a significant rupture in the outlook of the historical centre.”<sup>33</sup> (see **Map 4**)

In Miskolc, the studied area is the Vörösmarty Housing Estate – the former Gordon neighbourhood – south of Szinva stream and southeast of the historic centre of the city. The corresponding sheets of the first military survey of Hungary date back the late 18th century and show that this area had already been inhabited at that time, and we can also make out the network of streets from this survey. The cadastral maps of the late 19th century<sup>34</sup> reflect a situation that was very similar to the one that aerial photographs of the 1970s reflect.<sup>35</sup> The area had an organic fabric where some larger streets and many smaller ones ran through. The larger streets did not follow a straight line. The smaller streets gained their names after trades such as Butcher, Smith, Mason, Hatter, Confectioner and Turner. Most houses were single-floor but in larger streets multi-storey and public buildings existed too, for instance, the orthodox Jewish bath at the juncture of the erstwhile Pece stream and the Szinva. The

31 Mitrović, “Naša arhitektura je bila” 16.

32 Lovra, *Szabadka*, 32–45

33 Generalni plan Subotica–Palić do 2020. Subotica, 2006. 167.

34 Papp, Somorjai and Tóth, *Miskolc régi térképeken* 27.

35 Source of photograph: [www.fentrol.hu](http://www.fentrol.hu) Lechner Nonprofit Kft. Downloaded 15 May 2020

Gordon area used to be diverse both ethnically and socially.<sup>36</sup>

By opening some wider roads that would have run from North to South, the regulation plan of 1897 proposed that less variance should occur among the size of plots, but this would not have impacted the density of buildings in the area.<sup>37</sup> This plan was not realised, the structure and urban layout remained practically unchanged until 1959, when the headquarters of the trade unions was built there. The headquarters emerged at the most important juncture of the quarter: where the highway to Budapest reached the area. The freestanding building follows the standards of modernist architecture. Consequently, it looked alien in the otherwise dense urban fabric. According to Béla Horváth, "the choice about the kind of space the trade unions' headquarters should stand in represents the sense of arrival. One feels that beyond the spacious and green neighbourhood of the Felszabadítók [Liberators'] Road (today's Görgey Road) we are approaching a more closed and rather dense city centre."<sup>38</sup> Horváth also published a proposal about his vision about the environment of the building. According to that, the then existing network of streets would have been preserved. In 1951, a propagandistic poster that László Mennér and Ottó Péri designed also suggests that the existing patterns of buildings would remain.<sup>39</sup>

In contrast, the urban plan of 1968 foresaw "the overall modification of the current structure".<sup>40</sup> A series of demolitions began when the age of pre-fab housing set in.<sup>41</sup> According to Csaba Bodonyi's recollection, "[...] they needed to make room so they demolished buildings. At many places they removed the past of the town. It is even worse that they did not only destroy houses, but they also got rid of urban structures and networks of streets. [...] For example, within the Vörösmarty housing estate, the old streets disappeared and no new ones were created."<sup>42</sup> Another important architect of the time, Károly Dósa, recalled that the process of demolition would

36 Lengyel, "Szilánkos," <http://beszelo.c3.hu/cikkek/szilankos-mennyország> Downloaded: 15 May 2020

37 Lovra, *Városok*, 144.

38 ifj. Horváth, Marjalaki Kiss and Valentiny, *Miskolc*, 129.

39 Hajdú and Nagy, *Új város*, 14.

40 Hajdú, "Új város épül," 181.

41 Dobrossy, *Miskolc Mindszent*. See Chapter 3 for more about the demolition.

42 Hajdú and Nagy, *Új város*, 27.

have reached the city centre, too.<sup>43</sup> He designed the headquarters of the Hungarian Socialist Workers' Party in the western part of the area. On this, he wrote that while he was making the design, no urban plan existed that he could have taken as a point of reference.<sup>44</sup> (Figure 5) It is telling that the site of the first pre-fab building of the city was selected based on concerns for infrastructure and not because an urban plan demanded it: this was the path of the main sewage channel from the Avas Hill to the Szinva stream.<sup>45</sup> Aerial photographs taken in the 1970s (Figure 6) and reports in newspapers were talking about a gradually vanishing neighbourhood.<sup>46</sup> The new main north-south roads (the current Corvin Street and Király Street) cut through the urban space without any regard for pre-existing fabric. The position of Király Street is especially accidental: it erased the Jewish bath, and, at the same time, it left a significant pair of buildings with towers, one block to the west from the bath, at the juncture of the imputed Munkácsy Street in a way that looks incoherent in terms of the micro-urban scale.<sup>47</sup>

## Methodology

For a comparative study of tears in urban fabric, a unified set of criteria is needed and analyses that produce quantitative results. In order to follow through this engineering minded methodology, we divide the studied areas into geometric elements and transform them into graphs so that we can analyse the relationship between them.<sup>48</sup> Thus, in our analysis we only include the configuration and relationship between the morphological elements that we defined in identical ways in all three cities and in both periods.

43 "Then, instead of church towers, ten-storey pre-fab houses would characterise the city centre." Hajdú and Nagy, *Új város*, 14.

44 Hajdú and Nagy, *Új város*, 30.

45 Hajdú and Nagy, *Új város*, 35.

46 Pedestrian way in the place of Munkácsy Street. Design of the block of flats at the city centre. Hajdú (ed.), *Új város* 74.

47 Dobrossy, *Miskolc írásban*, 102–109.

48 Lovra, *Városok*, 55–59.



F1: Košice, Komenského - Street with Watsonova Street left in front of the buildings, 1967. (Fortepan / Fortepan / Album004 number: 93813)



F2: Košice, the juncture of Tomášikova Street – Tolstého Street 1967. (Fortepan / Fortepan / Album004 number: 93812)

For describing the spaces for the descriptive analysis, we mainly applied two methods. The first one is that Éva Lovra called an integrated urban morphology in his monographic study of Central European cities.<sup>49</sup> Within this method, the morphological study consists of several steps, however, in this paper we focus on the first step. This step is about distinguishing between types of fabrics, identifying them and then describing their main characteristics (network of streets, position of plots, built area, green area etc.) Lovra assigned codes to these types of fabrics using letters of the Latin alphabet.<sup>50</sup> For a more in-depth study of the neighbourhood, the method of micro-urbanism shall be applied.<sup>51</sup>

Besides this integrated urban morphology method, we also make use of some tools of space syntax. Space syntax observes cities as configurations and primarily studies the way how individual elements are connected.<sup>52</sup> It distinguishes two main characteristics of architectural spaces (meaning both architecture and urban architecture): intrinsic and extrinsic features. Features that we directly notice, such as shape, scale and proportions, are intrinsic ones. The way we take notice of the relationship between spaces or the place of a certain space within the layout of the building or city is indirect. “Extrinsic properties cannot be seen all at once, but must be pieced together through movement, inference, recollection and so on. Our picture of them is, in consequence, much less clear.”<sup>53</sup>

Space syntax primarily uses dual graphs for analysing relations between spaces. In these graphs, nodes mark spaces while edges refer to connections. **(Graph 1-5)** This method is adequate for analysing architectural spaces and spatial connections, as well as for deciphering the configuration of entire cities. In case of buildings, the nodes of graphs are convex spaces, while in cities the nodes of graphs are axes binding the network of streets and squares.<sup>54</sup>

49 Lovra, *Városok*, 55–59.

50 Regarding the catalogue and codes assigned to different types of fabrics of the 1867–1918 period see Lovra, *Városok*, 74–83., for pre-1867 types see 199–201. Studying and classification post-1918 urban fabrics is subject to ongoing research.

51 Lovra, *Városok*, 138–141.

52 Kropf, *The Handbook of Urban Morphology*. 17.

53 Hillier, “Space as paradigm” 56.

54 In the 2000s segment maps and analysis emerged as new methods. Axial maps had been in use as a tool of analysis since 1984. Turner, “Angular analysis”, 30.1–30.11.; Turner, “Could a Road-centre Line”, 145–60.

This would be mere intellectual play if it had not been aimed at understanding the impact of spaces on humans and society. However, the title of the book that laid down the ground for space syntax, *The social logic of space*, tells that it is very much concerned with the social dimension.<sup>55</sup> Since the publication of that book, a number of research has indicated that there is a close link between quantified indicators that space syntax analysis produced and actual social phenomena.<sup>56</sup>

Although space syntax analysis has been mostly used for studying the current situation of cities, lately, a growing number of works chose to tell the development of cities through historical maps. This method includes two stages. The first step is to describe features of the space using descriptive techniques while the second is to look for correlations that is to study the impact of features on social phenomena and vice versa.<sup>57</sup> By using historical maps, the main goal is to understand processes that took place in the past as well as to see if these have an impact on present conditions. One must highlight the importance of some authors such as Sam Griffiths, Paulo Pinho and Vítor Oliveira in both laying down the theoretical ground and applying these.<sup>58</sup> Sam Griffiths is the key author to note for research on Central European topics.

The objective of our study is to visualise and understand the tears in urban fabric especially with a view on post-World War II developments. The second step that we can only touch on in this paper is based on just this: linking construction activities and the socio-cultural background. Quoting Sam Griffiths: “the premise of space syntax for historians is that it provides a way into conceptualizing and thinking about the role of »space« and its relation to life in the built environment that does not rely uncritically on powerful images imported from well-established historical discourses.”<sup>59</sup>

The extent of the tears that we examine falls at the intermediary scale in terms of urban architecture. The number of streets is limited, hence, we only study the indicators that are relevant for such smaller networks and spatial systems.

55 Hillier and Hanson, *The social logic*.

56 For a recent presentation of the method see: *Rashid*: “Space Syntax,” 230–237.

57 *Rashid*, *Configurational Approach*

58 Griffiths, “Temporality”

59 Griffiths, “The Use of Space Syntax”



F3: Subotica, the eastern edge of the main avenue before 1965 (Lovra, *Szabadka* 116.)

One of the most important indicators that space syntax uses is integration: „Integration is a normalised measure of distance from any space of origin to all others in the system. In general, it calculates how close the original space is to all other spaces, and can be seen as the measure of relative asymmetry (or relative depth).”<sup>60</sup> Here, distance does not refer to metric distance but to a topological one: the distance between certain nodes of the graph. For studying integration of urban spatial systems (system of streets and squares), first the axial map of the observed area has to be drawn, where straight axes indicate connected spaces.<sup>61</sup>

Regarding pre-1920 conditions, it was quite clear where the boundaries of the studied spaces are located. Since within these fabrics private plots and public spaces can be easily distinguished and the building lines follow the line of streets, the boundaries of the space network polygons are practically the boundaries of blocks of plots.

In the maps of the transformed 20th century areas, such boundaries do not correlate to that extent. Thus, in the latter case, we needed to draw the relevant polygons on current municipal maps relying on our preliminary knowledge of the area. These

60 The Space Syntax Online Training Platform

61 Turner et al. ”From isovists to visibility”



polygons usually include those areas where one can move around (on foot or by car) freely, such as streets, pavements, parking lots and accessible green spaces.

We also drew visibility graphs on the areas and analysed them.<sup>62</sup> A visibility graph shows, as its name suggests, how visible a given point of space is from other parts of the space. Values grow with the quantity of spots from where the point is visible.

For studying visibility in pre-1920 times, we could use the same map that we applied for the integration analysis. This was so, because in these types of fabrics the development is either in unbroken row, or fences filled the gaps between buildings. Thus, boundaries of visibility areas overlap with the boundaries of the spatial network.

For looking at visibility on the maps of the 20<sup>th</sup> century areas – the tears in the urban fabric – we could not use the map that we used for integration analysis. In these areas, buildings hardly follow the boundaries of networks used for traffic and human movement: on the field, these (e.g. kerbs) are at ground level, thus do not influence visibility. Therefore, while carrying out analysis of the latter period, we made use of maps that only indicate buildings as elements that block the visibility.

## **Morphological and configurative analysis of the tears in the urban fabric**

The areas under study fell under different categories in the initial, pre-1920 period. On the map of Košice dating from 1912 we see that the area under analysis is at the periphery and is just about being populated with buildings. (**Map 1**) In Lovra's typology, it fits to a category that is one of the typical pre-1867 textures (label in the catalogue: *Ah*). It is characterized by “*irregular network of streets that follow the varied geomorphology of the terrain. Plots are oriented in one of the following two ways: a) they are either divided into two parts where the house and the courtyard occupies the front area close to the street, and the garden takes up the larger part of the plot in the backyard; b) or the plot is divided between the house, supplementary*

62 Pinho and Oliveira. "Cartographic analysis"

*buildings and the courtyard. The residential building is of 'L' shape, but the central part of it is in the middle of the whole plot. In the case of type a) there is an intermediary space/courtyard between the main building and the garden.*"<sup>63</sup> This type of fabric also appears in other parts of Košice, typically in the areas that are directly next to the medieval city walls, on the outside. For instance, in the map from 1912, on the eastern side of today's Moyzesova (then Rákóczi boulevard) and on the western side of today's Štefánikova (then Múzeum Street). At these locations, the type of fabric persisted until today. (Map 2)



F4: The Avenue in the 1960s. The photo is Architect Dragutin Karlo De Negri's property. (Lovra, Szabadka 102.)

63 Lovra, Városok, 200.

In the map of 1912, another typical fabric of the period, the Dualist Austria-Hungary, can be identified, its label is *C* in the catalogue. This type contains “*regular shaped plots along streets that follow straight lines. The size of plots varies and they are mainly on the corners. They might be single or double plots but the number of plots that form a block is maximum five. The buildings (rarely more than one) stand freely on the plots. These buildings tend to stay near the centre of the plot and are typically public buildings, or, less frequently, villas. Extensive green areas or planned parks surround the buildings.*”<sup>64</sup> Thus, planning appears in the area, but only at a local level.

In Subotica, another pre-1867 type of fabric can be identified (label in the catalogue: *Bc*). Its characteristic is the following: “*The network of streets is irregular. Plots are partly regularly shaped: their shape is close to elongated rectangles. Buildings are freestanding, and are located at the front third part of the courtyard. In some cases, agricultural buildings can be found among the supplementary buildings.*”<sup>65</sup> (**Map 3**) With slight modifications, this type of texture survived in adjacent areas of the studied area and also in the peripheral part of the wider centre. Since the reconstruction of the buildings is an ongoing process, the locations where we can observe these patterns are shrinking.

In Miskolc, the initial texture of the Gordon quarter was a pre-1867 type (label in the catalogue: *Ac*). Features: “*Plots of long rectangular shape where the position of the buildings follow a common pattern or rhythm. The main building and the adjacent additional ones form a partial boundary to the inner courtyard. Buildings are in alignment with the line of the street and there is an empty space between the street and the line of buildings. Courtyards may interfere with the closed line of buildings. Buildings or fences separate backyards from front yards.*”<sup>66</sup> Such fabrics are densely built areas both in terms of the number of plots and buildings. (**Map 5**) Today, this fabric can be found in the centre of Miskolc, especially in the area that falls north of the eastern part of the main street (Széchenyi utca). This so-called Bazaar Block was partially demolished but the transformation was not as extensive as in the case of the studied area. (**Map 6**)

64 Lovra, *Városok*, 74.

65 Lovra, *Városok*, 200.

66 Lovra, *Városok*, 200.

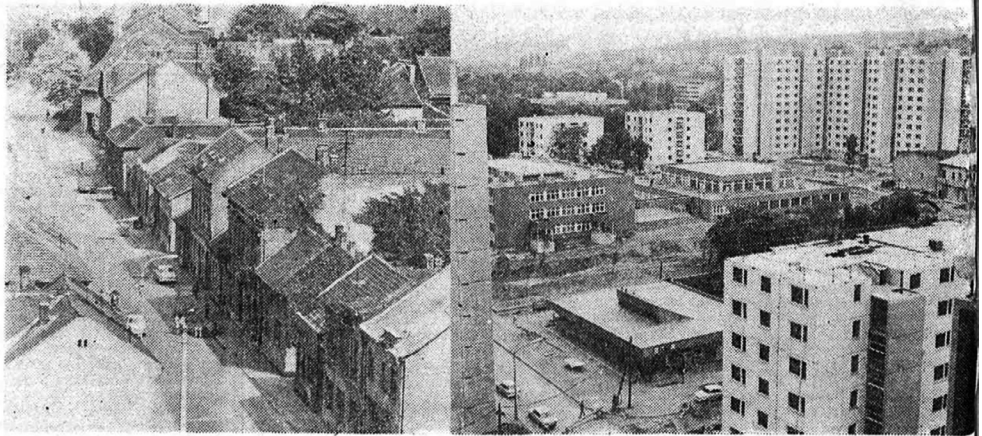
In the case of Miskolc and Subotica, we applied the same raw space syntax analyses for both periods (pre-World War I texture, and the present conditions): measuring axial integration of the network of streets, and visibility analysis of spatial systems. For Košice, we applied a different approach because, as we have seen, the area of the Komenského street was partially empty in the pre-1920 period. The density of buildings is sufficient for identifying the types of textures that existed but it is insufficient for space syntax analysis. We can read tendencies nonetheless.

In the map of axial integration, a colour scheme refers to different grades of integration. Colours change gradually. Red axes are the most integrated, while the blue ones are the least. It is beneficial if the integration values are relatively even across a quarter since services and institutions tend to appear at sites with the highest level of integration. If there are large gaps in terms of integration, it is likely that all life will take place in few (or a single) streets with high integration value, while the other streets become deserted with all the negative consequences. In the maps showing axial integration of Miskolc and Subotica and the graphs representing these links, it can be seen that the pre-1945 conditions were more balanced than the current situation.

**(Map 7 and 8; Graph 1 and 2)**

In Subotica, the pre-1945 spatial hierarchy was fairly balanced. The area with the highest value (red) is the former Herczeg Street that has an east-west orientation and is in the north of the studied area. Another street with relatively high value (orange colour) is Fűzfás Street that has a link to Herczeg Street. The other streets fall in the yellow or green category and only the shortest small streets have dark blue (very low) values. Graph 1 is based on the map of the level of integration.

In the case of Miskolc, it is obvious that the main street of the quarter was the Vörösmarty Street (the former Alsó-Gordon Street) that runs east-west. **(Map 8 and Graph 2)** Its middle section, the part that is located between the former Zrínyi Street and Alsó-Szirma Street, has the highest value of integration (red on both the map and on the graph). Moreover, other sections of the streets and streets perpendicular feature high values, too (light red and orange colours on the map and on the graph). Minor streets do not fall far behind: most of them are yellow or greenish yellow. Streets on the western and eastern edge of the area have the lowest values (dark blue on the map and blue on the graph) but this is the consequence of studying the quarter separated from the larger network of streets in the city. Looking at these streets from



„Élőben” 100 méter távolság szines a két felvétel között. A bal oldali képen még a „megmaradt” Vörösmarty út, míg a jobb oldali képen — az előbbi városrésztől nem messze — a belvárosi lakótelep egy részlete látható.

Laczó József felvétele

JEGYZET

F5: Miskolc, the Vörösmarty Housing Estate under construction in the place of the former Gordon in 1977.

(Észak-Magyarország, 29 May 1977, without page number. Photo credit: József Laczó)



F6: Aerial photo of the Vörösmarty Housing Estate in Miskolc, 1975.  
(fentrol.hu Lechner Nonprofit Kft.)

the perspective of the entire town, it is clear that they would have relatively high integration values and that they are not marginal spots.

In contrast, when studying the maps of axial integration for the current situation and the graphs based on these maps, we encounter one or two strong axes with the rest of the streets remaining subordinate in all three cities. There are hardly any yellow parts that would represent intermediate values and the extremes dominate: red-orange and blue.

It is not surprising that the Avenue and the shorter street perpendicular to it, Petar Leković Street, stand out in Szabadka. (These are indicated with red on **Map 9 and on Graph 3**) Other streets crossing the Avenue also show relatively high values, while the other axes are clearly subordinate.

In Miskolc, Vörösmarty Street remained important and it even gained traction as its western part became straighter. However, the north-south oriented Király Street (that, until recently, was of Highway no. 3) has even higher values. This street is the outcome of an insensitive intrusion to the urban texture. The other new axis, Corvin Street, also shows similarly high values. The values of other streets fall much lower. Thus, we can read the principles that Modernism follows in traffic management: we see high speed roads and service roads instead of the earlier fabric that had a well-integrated network of streets.

The map and graph for current Košice is rather similar to the one we saw for Subotica. (**Map 11 and Graph 5**) Although Komenského Street is not an avenue, it acts as a strong axis much like Marshall Tito Avenue. It is also a feature in both cities that perpendicular axes have high integration values, while other streets are inferior in this sense.

We conducted the visibility graph analysis in order to assess the extent to which spaces are enclosed, visually determined, and convex. In chapter three of his influential work *Der Städtebau nach seinen Künstlerischen Grundsätzen* (1889), Camillo Sitte discussed the importance of enclosed urban spaces.<sup>67</sup> Within a convex space one sees each point from every other point of the space, while concave spaces have sections that are not visible from other spots. 18<sup>th</sup> century buildings, – mainly prisons – designed in a way that the inhabitants of cells running around their perimeter

67 Sitte, *Der Städtebau*, 38–47.

should not see each other while those standing in the middle of the space should be able to observe everything, are extreme examples of concave spaces.<sup>68</sup> A well-functioning urban space is just the opposite of this extreme in terms of visibility.

On the visibility graphs, the well-defined and transparent spaces are indicated with blue colour. On the other end of the spectrum, marked with red, one can find those spaces that are visible from many other points. These mostly have an amorphous shape.

It emerges from the visibility graphs of the studied areas that historic fabrics consisted of systems of spaces with visually clear boundaries. This was the consequence of the unbroken row of the buildings and the curves of the streets. Sitte emphasised that designing streets with curves was an important principle of urban design that enhances transparency.<sup>69</sup> In the visibility graphs of the original urban texture of Subotica (**Map 12**) and Miskolc (**Map 13**), those straight streets produced higher values that served as roads linking distant parts of the city: in Subotica we shall mention the Széchenyi Square in the southwestern part of the studied area, which was a continuation of Magyar Street, while in Miskolc such examples are Szemere Street in the western part of the area and Soltész Nagy Kálmán Street in the eastern part.

On the visibility graphs prepared for the period of the torn urban fabrics, we see that although the number of free-standing spaces increased, these do not have a clear function or shape. The only significant exception is the Marshal Tito Avenue that has clear boundaries and rectangular shape, thus it appears in red-orange between the buildings on the map. (**Map 14**) This area acts as a convex space despite its high visibility values. On the location we can confirm this if we observe that inhabitants use the Avenue (especially the middle strip that is park-like) as a promenade.

In case of Miskolc, we see a large amorphous red spot in the middle of the studied area: this is a juncture of two double laned roads that does not look like an urban space at all. (**Map 15**). On the location, this area is not transparent, hence, inhabitants do not spend time there. In contrast to Subotica, the lack of planning is evident.

In Košice, we also see a large red-orange area on the map close to the centre of the area we selected. (**Map 16**) Its shape is in between the results of Subotica

68 Hillier and Hanson, *The social logic of space*, 187–188.

69 Lampugnani. "Vienna Fin-de-siècle".

and Miskolc: it is not so defined as in Subotica but it is also less amorphous than in Miskolc. In Košice, the red zone is the actual centre of the studied area. This latter feature has to do with the fact that it has a convex shape and has clear boundaries. It is worth observing that while in the map representing axial integration, Subotica and Košice seemed to have common features, the visibility graphs of the two cities are quite different from one another.

Overall, the most important common feature among the three visibility graphs is that empty spaces emerged. However, in terms of shape geometry, and, thus, in terms of the use of spaces, they differ. It is the visibility graphs that indeed tell if interventions were spontaneous or well-planned. In case of the Avenue in Subotica, we can identify the plan even if it only partially came to completion.<sup>70</sup> As far as Miskolc is concerned, based on the recollections of contemporary architects we know that restructuring took place without a coherent concept.<sup>71</sup> Košice falls between these two examples.

Looking back from the present, we see that not the urban fabrics themselves were responsible for the problems that finally led to their demolition. For instance, the area of the centre of Miskolc, that is currently under protection, belongs to the same type of fabric as the Gordon that was referred to as a slum in the contemporary (propaganda) press. According to contemporary documents, the reason for demolishing the Gordon quarter was its bad condition and lack of infrastructure.<sup>72</sup> This, however, was not a valid reason for demolishing the entire network of streets. Moreover, the construction of prefab mass housing did not resolve social issues.<sup>73</sup> It is the task of future research to specify the correlations between social phenomena and spatial configuration.

70 Lovra, *Szabadka*, 32–45.

71 For example: Hajdú, *Új város*, 30.

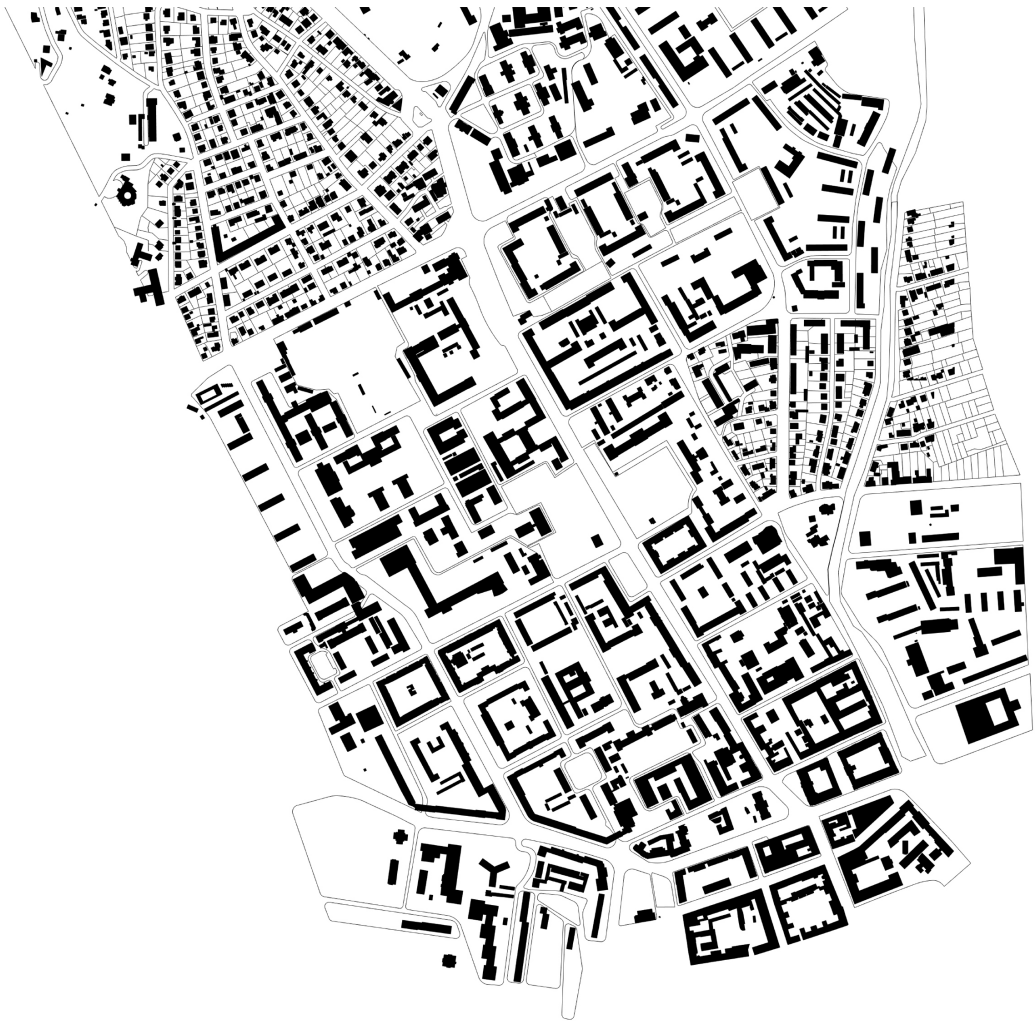
72 Hajdú and Nagy, *Új város*, 31.

73 Darázs, *A Célváros*, 23.





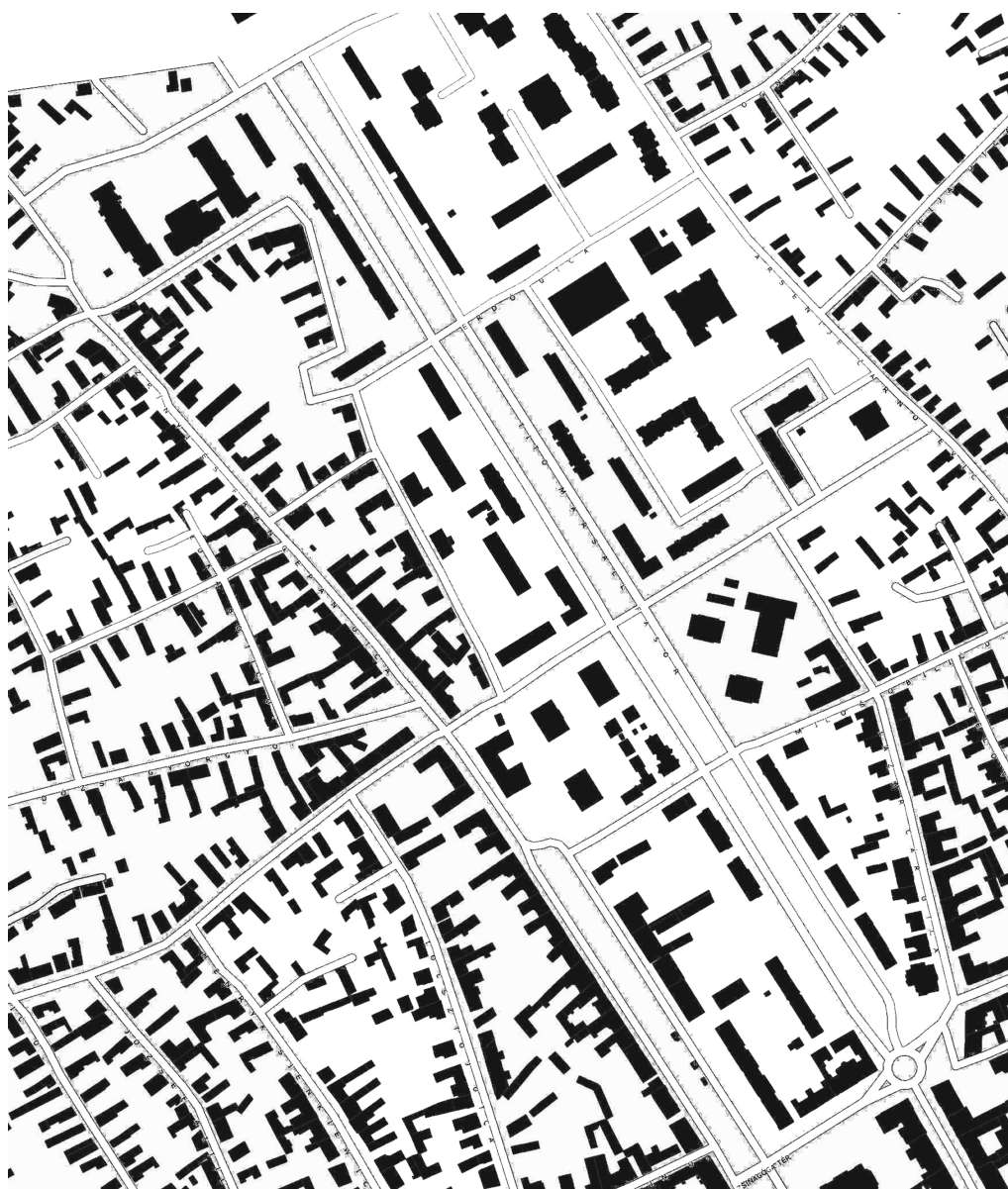
**Map 1** Košice, the surroundings of the Komenského Street in the early 20<sup>th</sup> century. Drawn by Abdullah Alrammo (Urban Systems Engineering MSc student at the University of Debrecen), based on the map called *1912. évi Törv. hat. jog. fel. szab. kir. város belsőségének és környékének átnézeti térképe* (Zbierka máp a plánov v Archíve mesta Košice II 15/1-3).



**Map 2** Komenského Street and its surroundings today. Drawn by Abdullah Alrammo based on the official municipal map of Košice ([gis.esluzbykosice.sk](http://gis.esluzbykosice.sk))



**Map 3** Subotica, the area that was to become the Avenue (Radijalac) in the 1880s. Drawn by Bashar Mahfoud (Urban Systems Engineering MSc student at the University of Debrecen) based on the cadastral map of Subotica from 1882. (TLSZ F.086).



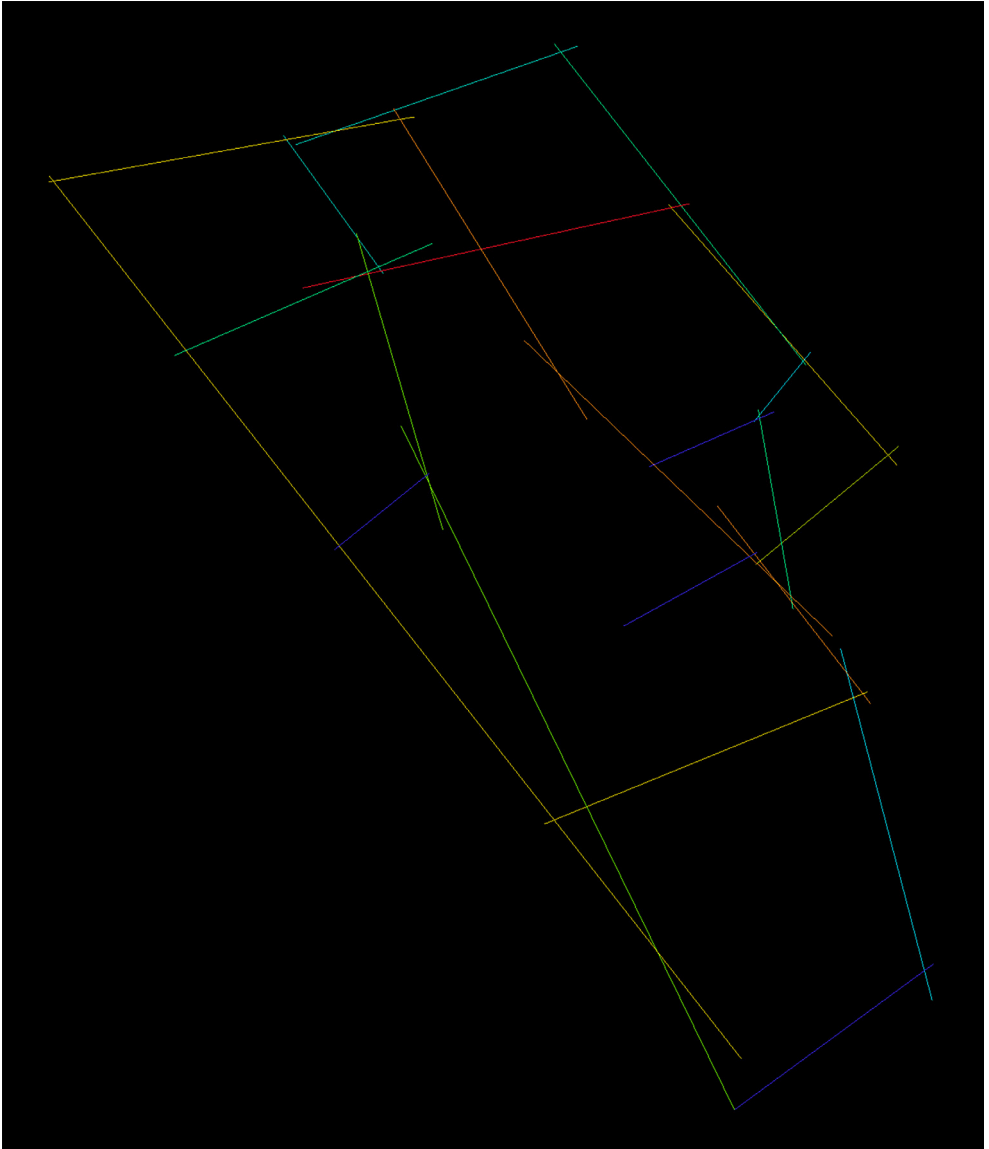
Map 4 The Radijalac today – Drawn by Zoltán Berezki based on the official municipal map ([suboticagis.rs](http://suboticagis.rs))



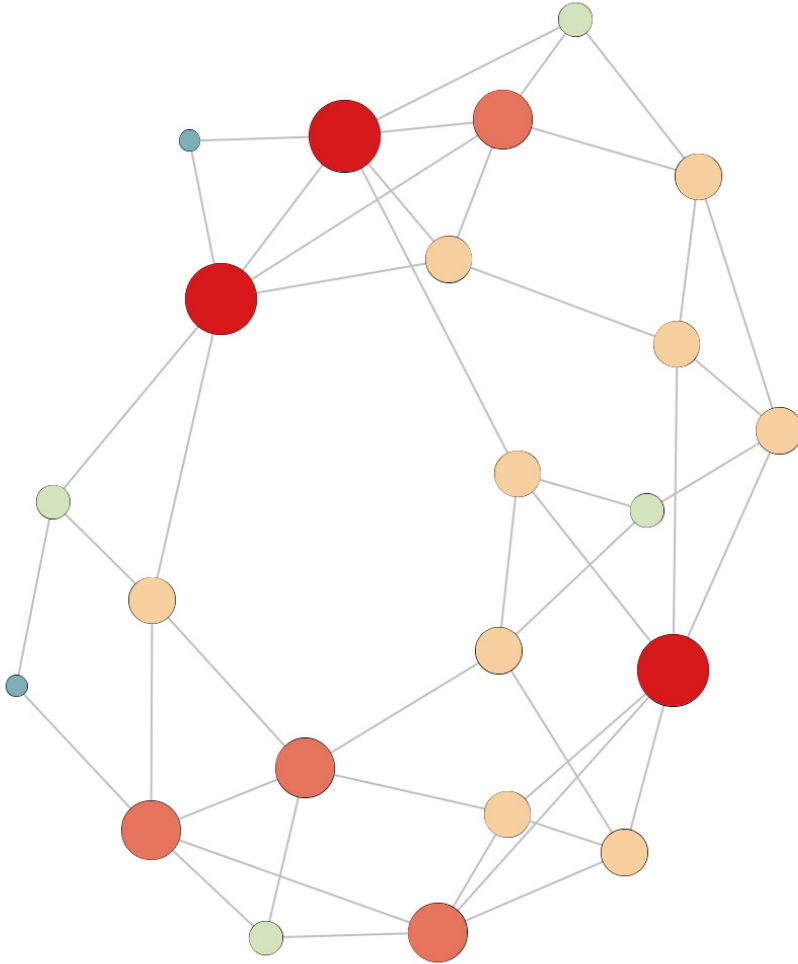
**Map 5** Miskolc, the Gordon neighbourhood in the 1890s. Drawn by Abdo Mhrez (Urban Systems Engineering MSc student at the University of Debrecen) based on a contemporary cadastral map.



**Map 6** Miskolc's Vörösmarty Housing Estate in the area of the former Gordon neighbourhood, nowadays. Drawn by Abdo Mhrez based on the official municipal map of Miskolc



**Map 7** Axial integration map representing the late 19th century situation of the area of the later Radijalac (Avenue), Subotica – The scale runs from red to blue, with red indicating high level of axial integration and blue referring to low. (Created by Zoltán Bereczki)

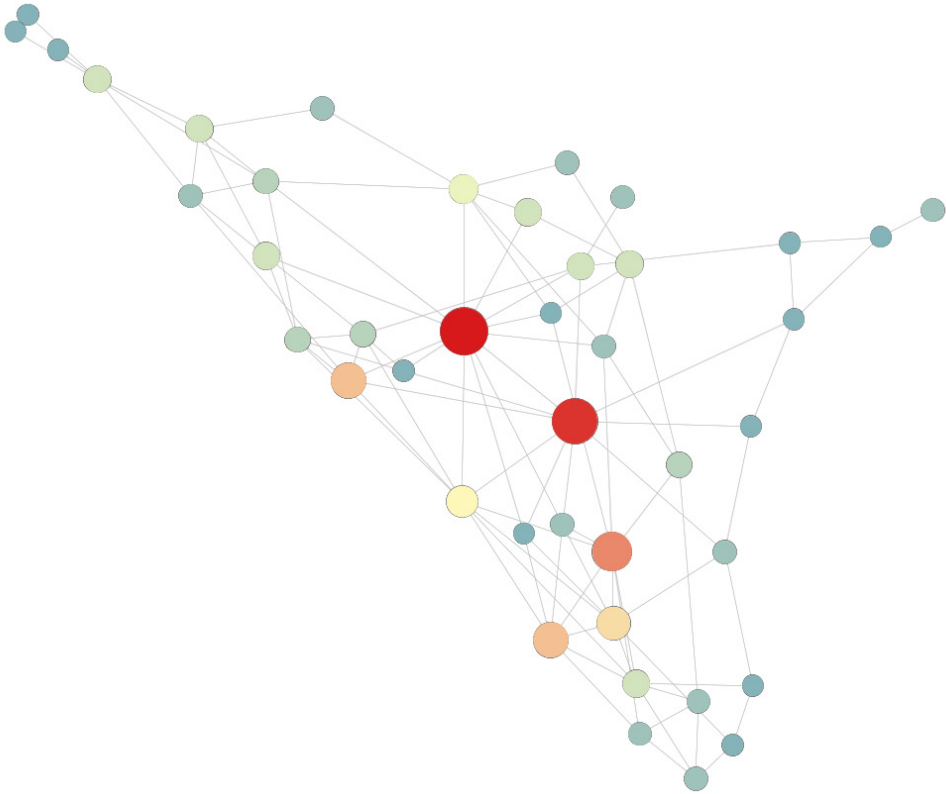


**Graph 1** Subotica, integration level and connections seen on Map 7, on a graph. The red colour scale represents those nodes corresponding to the axis that have high integration value, while the blue scale refers to low integration level. (Created by Zoltán Bereczki)





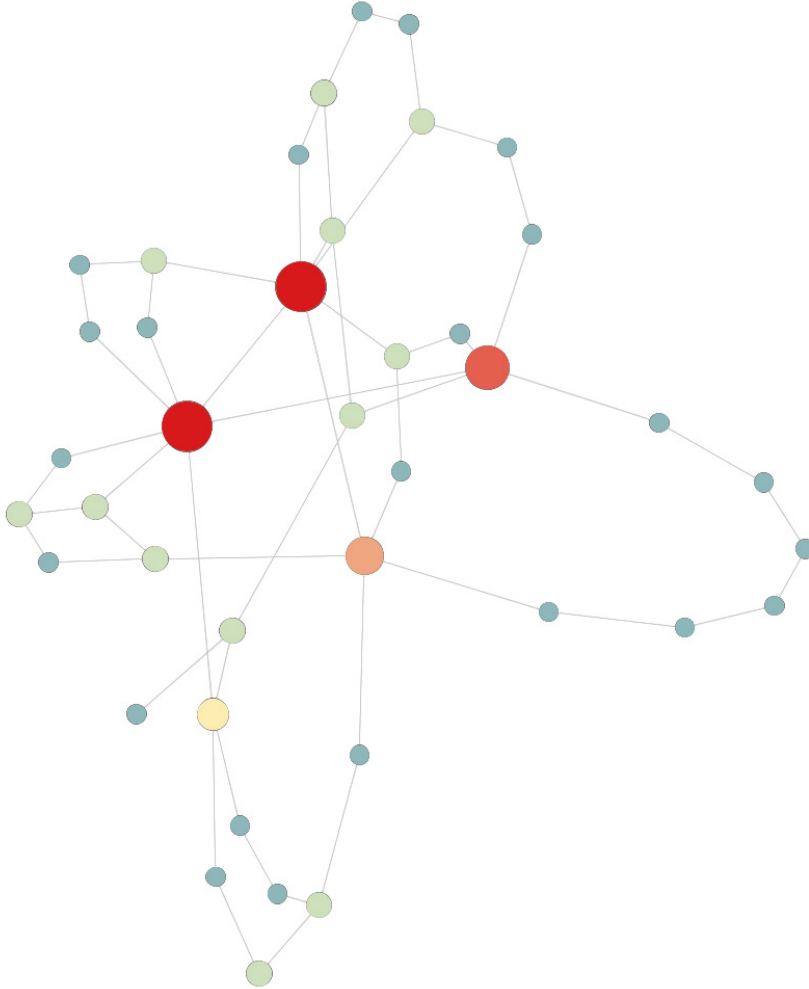
**Map 8** Axial integration map of Miskolc-Gordon representing the late 19th century situation – The scale runs from red to blue, with red indicating high level of axial integration and blue referring to low. (Created by Zoltán Bereczki)



**Graph 2** Miskolc-Gordon, integration level and connections seen on Map 8 on a graph. The red colour scale represents those nodes corresponding to the axis that have high integration value, while the blue scale refers to low integration level. (Created by Zoltán Bereczki)



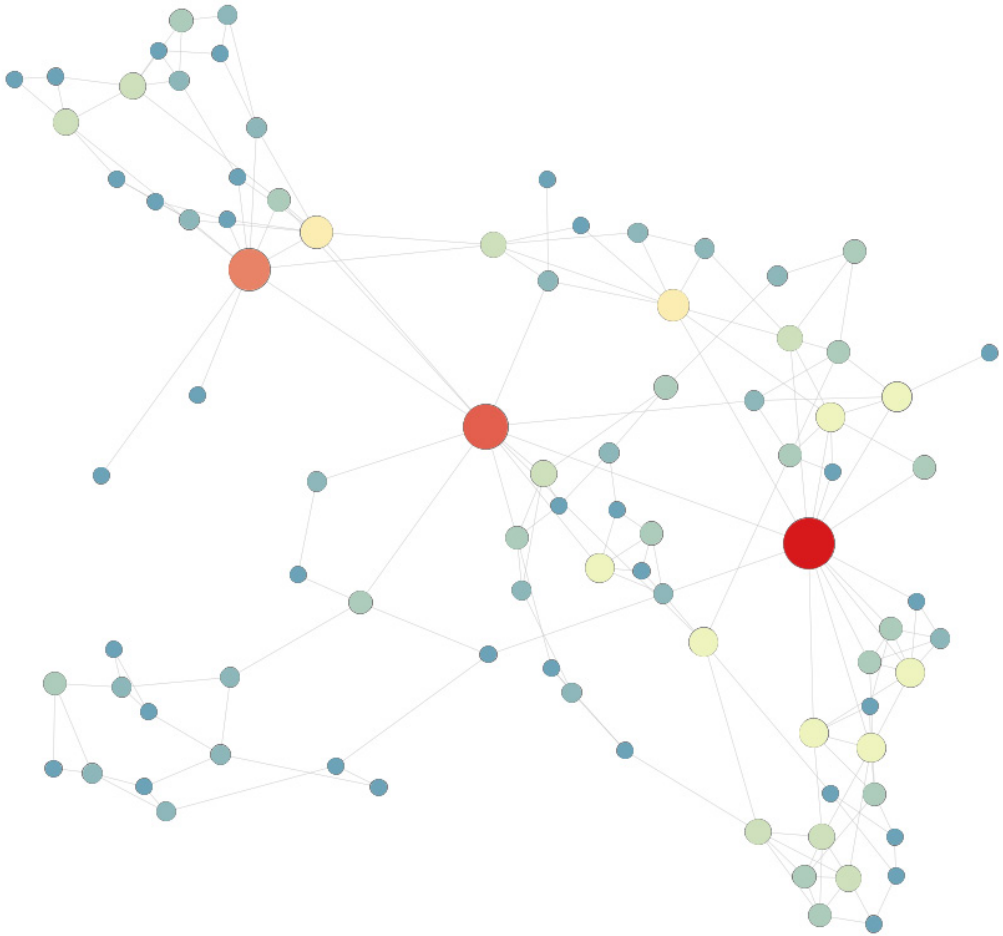
**Map 9** Axial integration map of the Avenue and its surroundings in Subotica (Marshal Tito Avenue) – nowadays – The scale runs from red to blue, with red indicating a high level of axial integration and blue referring to low. (Created by Zoltán Bereczki)



**Graph 3** Subotica, integration level and connections seen on Map 9, on a graph. The red colour scale represents those nodes corresponding to the axis that has a high integration value, while the blue scale refers to a low integration level. (Created by Zoltán Bereczki)



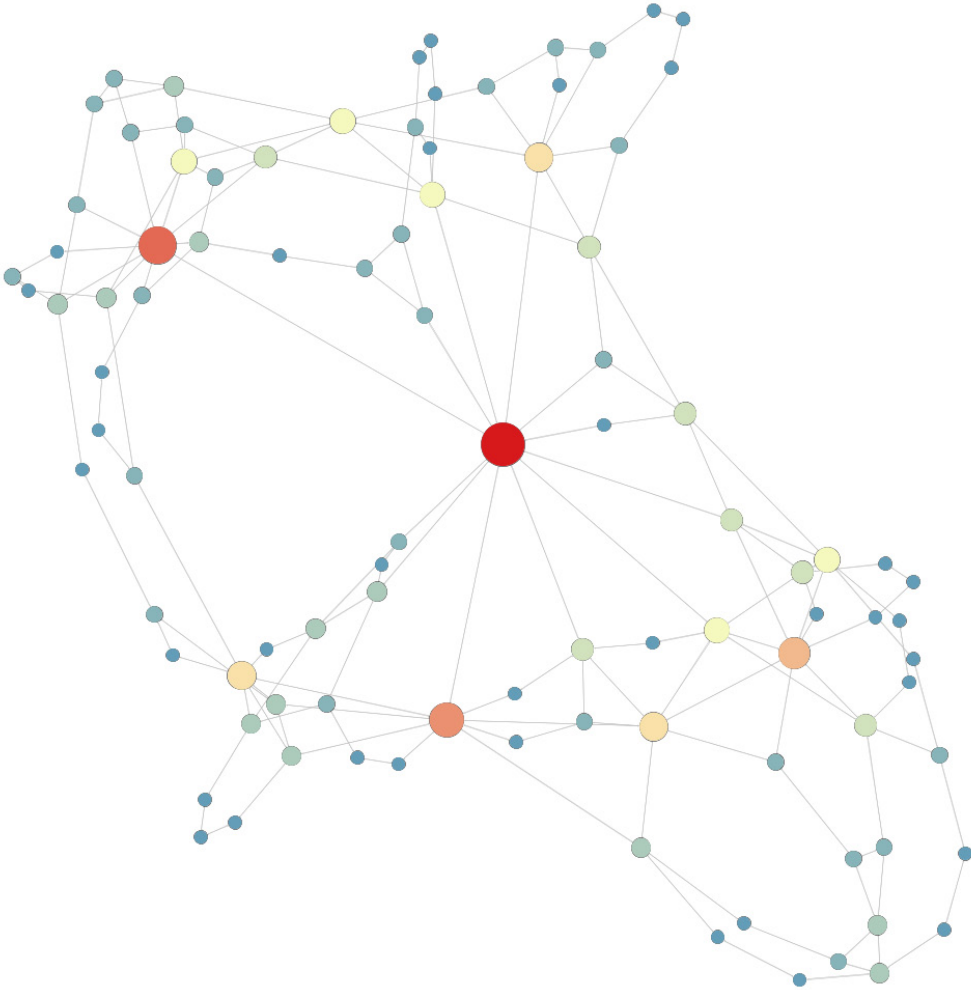
**Map 10** Axial integration patterns in Miskolc's Vörösmarty Housing Estate (former Gordon neighbourhood). The scale runs from red to blue, with red indicating a high level of axial integration and blue referring to low. (Created by Zoltán Bereczki)



**Graph 4** Miskolc, the integration level and connections seen on Map 10 on a graph. The red colour scale represents those nodes corresponding to the axis that has a high integration value, while the blue scale refers to low integration level. (Created by Zoltán Bereczki)



**Map 11** Košice – The Komenského Street and its surroundings – The scale runs from red to blue, where red indicates a high level of axial integration and blue referring to low. (Created by Zoltán Bereczki)



**Graph 5** Košice, the integration level and connections seen on Map 11, in a graph. The red colour scale represents those nodes corresponding to the axis that has a high integration value, while the blue scale refers to a low integration level. (Created by Zoltán Bereczki)

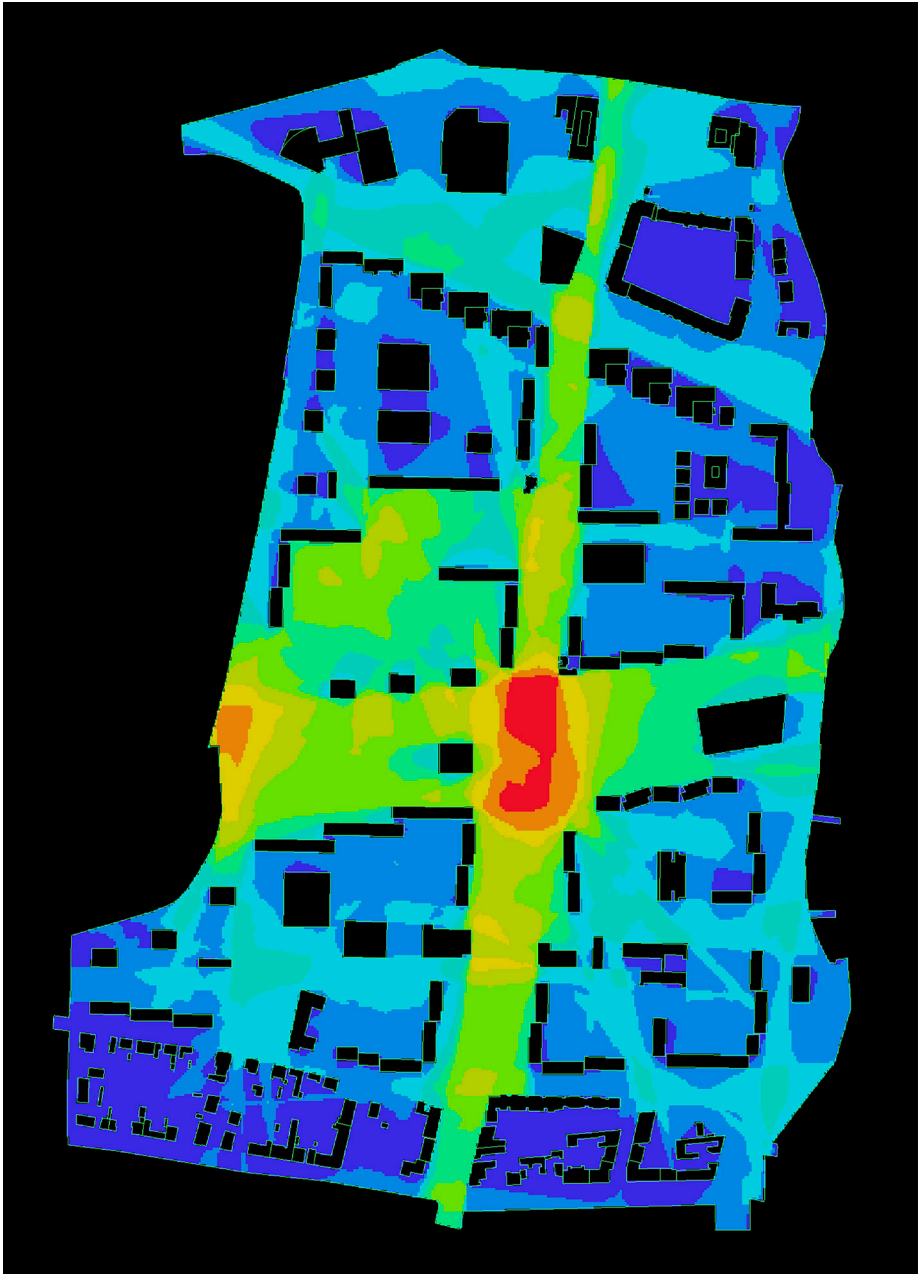




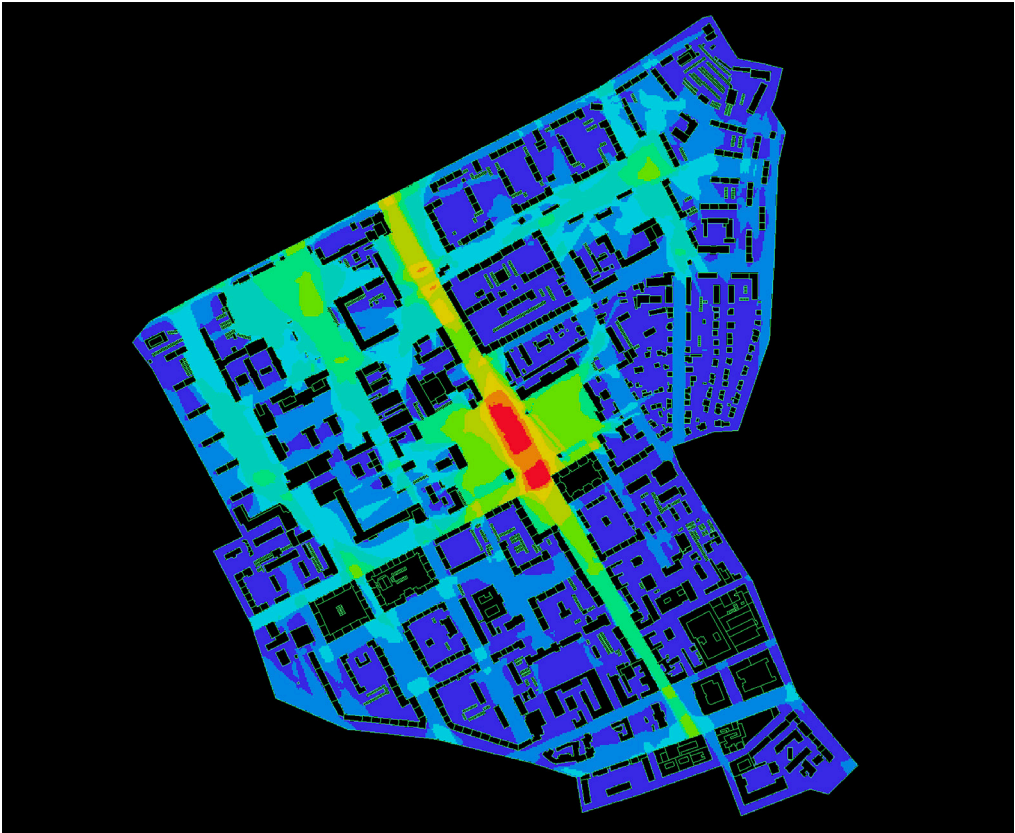
**Map 12** Subotica, the visibility graph of the area of the Avenue based on the late 19th century situation. Red indicates more visibility, while the blue scale refers to a lower level of visibility. (Created by Zoltán Bereczki)



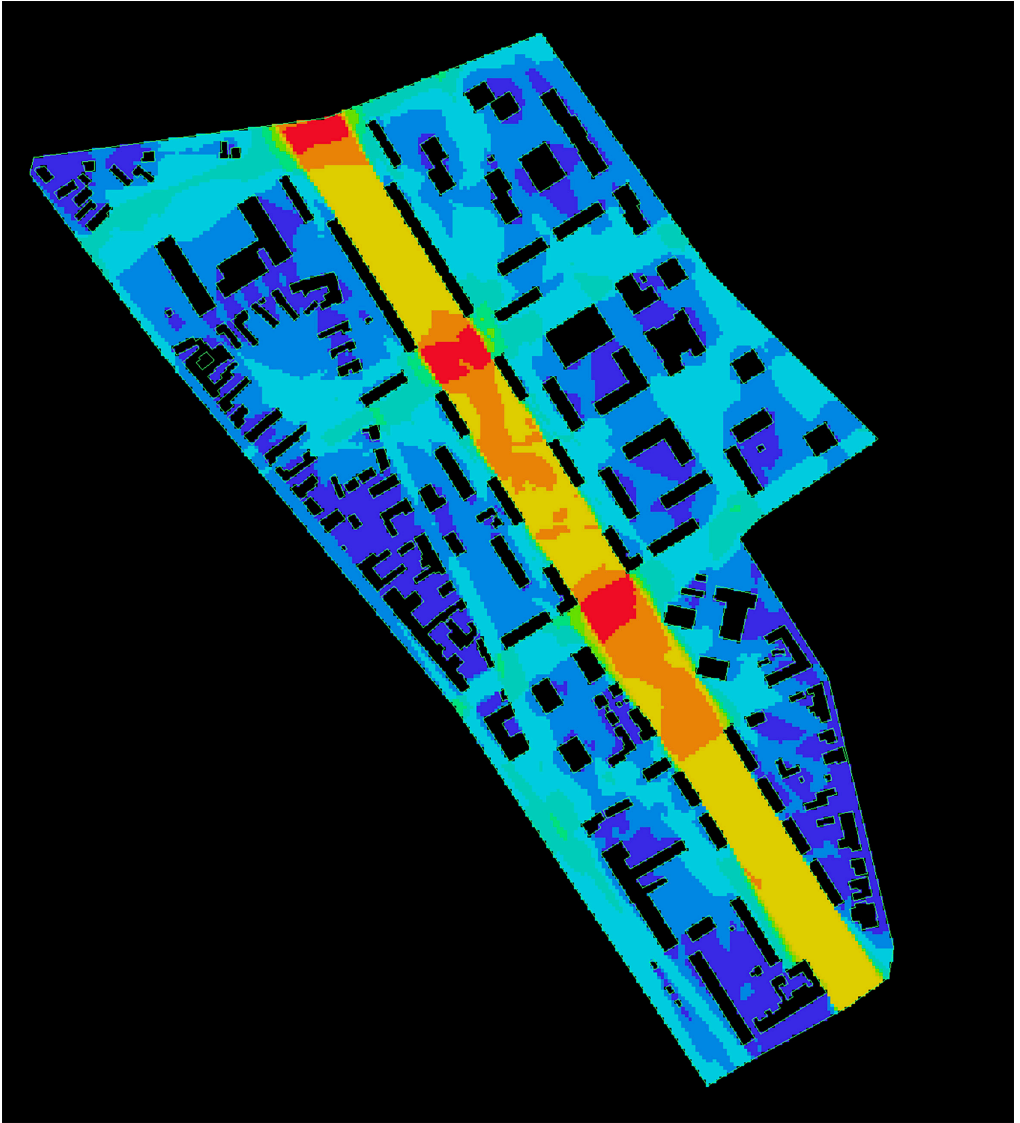
**Map 13** Miskolc-Gordon quarter, the visibility graph of the area based on the late 19th century situation. Red indicates more visibility, while the blue scale refers to a lower level of visibility. (Created by Zoltán Bereczki)



**Map 14** Subotica - Avenue (Marshal Tito Avenue) based on the current situation – Red indicates more visibility, while the blue scale refers to a lower level of visibility. (Created by Zoltán Bereczki)



15 The visibility graph of Miskolc's Vörösmarty Housing Estate and its neighbourhood based on current patterns. – Red indicates more visibility, while the blue scale refers to a lower level of visibility. (Created by Zoltán Bereczki)



**Map 16** The visibility graph of Košice's Komenského Street and its neighbourhood based on current patterns. – Red indicates more visibility, while the blue scale refers to a lower level of visibility. (Created by Zoltán Bereczki)

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