Development of The System of the Green Areas of Krakow from The Nineteenth Century to The Present, In The Context of Model Solutions

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Abstract. The shaping of green areas with varying degrees of arrangement and different forms of use, as well as of their structure in the form of a system within cities, are tasks that are aimed at, among other goals, the protection of the environment and nature, the integration of urban structure and the improvement of the quality of life. In modern cities, which develop in a multi-central manner, it is often impossible to develop model systems of green areas featured in literature, such as the belt, wedge, radiant or ring type. Currently these are most often mixed systems, to which terms like open, irregular and distributed are most often referred to. What is important is the continuous layout of areas of greenery, an appropriate access range and a hierarchical structure of use, ranging from the housing estate parks, that are the closest to our homes, to regional parks.

The article discusses the example of Krakow – a historical city, the second-largest in Poland. Krakow occupies a prominent position among cities that are both beautiful and picturesque, which have outstanding spatial qualities and a genius loci. The placement of the city in the Vistula River Valley, a diverse topographic layout, in addition to varied land cover all constitute its unique natural and landscape values. Conceptual designs and the implementation of plans of the shaping of areas of the greenery of Krakow have been compared with model solutions. The contemporary spatial structure of Krakow's areas of greenery has been shaped by natural conditions and the development of its urban structure. A particular role in this process has been played by: the campaign to embellish Krakow, when many streets were given the character of avenues, the founding of urban plantations in the place of former fortifications and the Trzech Wieszczy Avenues upon the embankment of the circumvallation rail and the the Planty Dietla park in place of the river bed of the Old Vistula. A key role was also played by the successive spatial development plans, starting in 1910, as well as concepts of the development of greenery and municipal policies. The most well-known model scheme of a wedge and ring system of areas of Greenery for Krakow was developed by A. Ptaszycka and J. Bogdanowski (the 1950's). It was based on the hydrographic system and the rocade roads of the Krakow Fortress. This concept, ideal in its expression, was not transferred onto spatial development plans, with the following factors being responsible: the territorial expansion of the city, its contemporary multi-centrality and changing geometric shape. In 1996, a greenery system was developed featuring so-called river parks, based on the hydrographic system (wedge model). A conceptual design was developed in 2017, showing the contemporary network of green areas in Krakow with the greatest level of detail. An integrating model was proposed - a mixed network model with legible wedges in the form of river parks and compact afforestation. The author participated in the development of the last two concepts.
1. Introduction
The introduction of green areas and open areas with varying degrees of arrangement and function, as well as of a structure of such areas as a system within cities, are tasks that serve, among others, the protection of the environment and nature, the integration of the urban structure and improving quality of life. In contemporary cities, which develop in a multicentre manner, it is often impossible to develop model systems of green areas that are described in literature, such as the wedge system, the radial – or ring – system, the ring and wedge system or the belt system, in contemporary cities [1, 2, 3, 4]. Currently these are most often various types of mixed systems, in relation to which the terms open, irregular and distributed are most often used. The continuous layout of areas of greenery, the provision of an appropriate reach and accessibility, a hierarchical structure of use, ranging from housing estate parks, which are the closest to home, to regional parks and arrangement standards. The compositional role of areas of greenery has been broadly analysed and described. In the composition of a city, greenery structures its layout, it connects, it divides, separates, isolates, covers, masks and decorates. As it has been proven in the past, the establishment of areas of greenery stimulates the development of neighbouring areas, playing the part of a citygenic factor. The arrangement of areas of greenery, in combination with flood protection, increases the attractiveness of plots in terms of development, leading to a city's development, often determining its form or the direction of said development [2]. The residents of cities want to live amidst greenery, which has been confirmed by studies and municipal policies, including the drafting greenery development strategies and Civic Budgets. Green cities are viewed more favourably than others.

The article discusses the historical city of Krakow, the former capital of Poland, which is currently the second-largest urban centre in the country. Krakow occupies a position of honour among the most beautiful and picturesque cities and is famous for its outstanding spatial qualities and genius loci. The location of the city within the Vistula River Valley, its diverse topographic layout and varied land cover constitute unique natural and landscape qualities. The goal of the work is to present the shaping of the system of urban open spaces of Krakow, from the nineteenth century to the year 2017. It began towards the end of the eighteenth century in the form of efforts to embellish the city. In 1912, Ebenezer Howard, who was at an Esperantist conference in Krakow, called the city a naturally developed garden city [5], while viewing the ring of Planty park – a public garden located in place of previously demolished fortifications, Błonia – a large public meadow which forms the tip of the city's western wedge of greenery and a housing estate for post office workers in Salwator (1911), along with Waszyngtona Avenue – oriented in the direction of the Kościuszko Mound (figure 1). The period after the war saw the appearance of model conceptual designs, including a wedge and ring-type one, as well as a combination of the two. The city has significantly expanded its territory since that time and developed along the east-west direction, losing its regular form.

2. The beginnings of Krakow's system of green areas
The contemporary spatial structure of Krakow's areas of greenery has been shaped by natural conditions and the development of its urban structure. A particular role in this process was played by: the city embellishment campaign, when many streets were given the character of avenues (the first plans developed in the years 1975-1801), the planting of a public garden in place of the former fortifications, as well as the Trzech Wieszczów Avenues atop an embankment of the circumvallation railway line, Planty Dietla ark in place of the riverbed of the Old Vistula and the successive spatial development plans, starting with year 1910. Poland was partitioned at the time, with Krakow being located in the Austrian partition, constituting the main city of Western Galicia. The beginnings of Krakow's public parks go as far as the end of the eighteenth century. In 1783, Poland's oldest botanical garden was established as a result of the efforts of the Krakow University (the Jagiellonian University). Entertainment gardens, which have not survived to this day and were located inside the Krakow Fortress, including, among other places, in the district of Wesoła, gained widespread popularity at the turn of the eighteenth and nineteenth century. Krakow's Planty park, the first complex
of municipal greenery (1817-1822), meant for use by the public, was quickly recognised as one of the most beautiful ornaments and attractions of the city. The Marskin Park (Park Strzelecki), opened in 1837, was also liked. The final two decades of the nineteenth century were a period of the establishment of large public parks outside of the then-city centre. This was done in a time of the decline in popularity and the later building up of entertainment gardens, which had previously been so eagerly visited. Three large public parks were established at the time. The Krakow Park, similar in character to Volkspark (Park Krakowski, 1885), Jordan's Park, meant for children (Park Jordana, 1888) as well as Bednarski Park, on the site of a former quarry located on the opposite site of the Vistula, in the city of Podgórze (1896), which was incorporated into Krakow in 1915 [2].

The planning of a city's system of green areas is a long-term task and currently only provisions of local spatial development plans (local law) can be conducive to the establishment of a previously designed model. In Krakow, this problem appeared during the urban planning competition for the Plan of the Regulation of Greater Krakow, which was organised in 1909. During that time, streets with trees, green squares and public parks were basic elements of designs of regulating and planning cities. The conditions of the competition for the plan of Greater Krakow proposed zoning, a concept that was seen as modern at the time, involving outlining specific types of land use within the plan. It included a provision concerning green areas: "Appropriately to the future increase in the population count of Greater Krakow, Jordan's Park, sports squares and playgrounds, to be placed in various parts of the city insofar as possibilities allow, as well as a people's park, should occupy a position of significance within the design. They should be designed on cheap buildable land, at a distance from street traffic and, to the greatest possible extent, on land owned by the municipality of Krakow, or the Royal Imperial Military Treasury, or on larger private areas." [7] (figure 2). In Galicia, the territory of the Austrian partition, the development of river boulevards was aided by an act on supporting national culture associated with water structures, which led to the construction of flood protection in many places, including Krakow.

After the regaining of independence by Poland, efforts began towards rebuilding cities and rural areas. The significance of systemic action was recognised, in addition to the achievements of modern urban planning, including in terms of establishing coherent areas of urban greenery. Comprehensive analyses and surveys of urban greenery were performed [2]. Ignacy Drexler wrote (1924): "The idea of surrounding entire cities or their individual districts with broad rings of greenery has been developed relatively recently, as a desired solution against the endless, non-rhythmic expansion of cities. They are to be uniform, at least several-hundred-metre wide belts of meadows and forests, in which parks, racing fields, ice skating rings, and similar arrangements would be found. The cost of purchasing land is usually very high, provided that a city has not taken ownership of it long ago. It is financial difficulties that often cause these designs to fail. Fortified cities, surrounded by areas where building is forbidden, can come into possession of these types of plantations relatively easily. The land in these areas is only of agricultural value and can be easily be purchased deliberately by the city, or can be expropriated for the use of the people [8]."

At the time when Drexler wrote this, Krakow already had its first green ring. It was composed of municipal plantations – an ornamental park established in place of demolished fortifications. The ring system surrounding the city, with either one or many belts, was established through mimicking the Parisian boulevards – which had trees planted along them – built in the seventeenth century in place of the city's fortifications. After the middle of the nineteenth century, this system became characteristic of many European cities, for instance in Vienna, Budapest, Brussels, Mannheim, Dresden, Brno, Copenhagen, Amsterdam. Layouts in which green rings were deliberately shaped were also being designed. In the plan of Greater Krakow of 1910 we can see an attempt at shaping a second green ring along the Trzech Wieszczów Avenues (from the west) and Planty Dietla park (from the east). The plan of Krakow developed in the years 1935-1938 under the supervision of Kazimierz Dziewoński,
presented a relatively simplified form of an urban greenery system, in which individual elements – "open areas" – had an expressive form, including urban parks, cemeteries or large suburban recreational areas, with some riverside areas, for instance along the Rudawa, Białucha and Drwinka rivers. Only Planty park formed a ring, while the area of Błonia, a fragment of the city's green wedge, was assigned for rural residential use.

3. On the ring and wedge system of Krakow's areas of greenery

After the Second World War, the problem of establishing a system of areas of greenery in Krakow appeared more broadly in the publications of Anna Ptaszycka. She was the director of the Municipal Urban Planning Studio in the years 1955-59 and worked on the general plan of Krakow at the time, particularly on its suburban recreational zone and the shaping of the system of green areas. This was not a new subject for Ptaszycka, as we can see based on her book Przestrzenie zielone w miastach (Green spaces in cities in Polish – transl. note) [9], which was published in 1950. In the preface, professor Tadeusz Tołwiński, an architect, as well as an urban planning historian and theorist, considered the publication important to the development of urban areas, particularly during the period of post-war reconstruction. He stated that Ptaszycka properly framed and described the variety of scales and functions of each element of greenery within a great "system of green areas" of a modern city in terms of its spatial and landscape composition [9]. These experiences gave A. Ptaszycka the perfect starting point for planning and design work on systems of areas of greenery. In 1955, in an article titled Zielony przyszłego Krakowa (The greenery of future Krakow in English – transl. note)[10], she wrote: "We stress the mutual connections between greenery and water in the city /.../ The latest periods of Krakow's development did not utilise the immense landscape opportunities that arise from its location along the Vistula and the creeks that flow into it. /.../ On the attached drawing we can see a conceptual design of making the city greener, performed in a schematic manner, through creating large open areas which encroach through a type of wedges into the city centre and connect with the ring of Planty park that surrounds the Old Town. These green wedges concentrically connect with each other in relation to the city. The second postulate concerning development is the already mentioned problem of water: enriching the waterways of the Vistula and the Rudawa, Wilga, Białucha and Dłubnia creeks through greenery". The plan included in the text depicted a mosaic of green areas combined into what appeared to be the openings of a fine net, a continuous system going far beyond the borders of Krakow at the time (figure 3).

However, the most well-known model scheme of a wedge and ring system of areas of greenery for Krakow was published by Ptaszycka in 1957. In the article Oblicze urbanistyczne współczesnego Krakowa (The urban face of contemporary Krakow in English – transl. note) [11] she described the "designed network of green areas" in the following manner: "The great expanse of Błonia introduces a motif of excellent visual perspectives into the city centre /.../ The green wedge that is the most precious to the city is the western complex including Błonia, Jordan's Park and sports areas, which is
connected with St. Bronisława's Hill and the Wola Forest with the wide space of the Rudawa River Valley. These are areas that feature great possibilities for new sports and park layouts"../.../ From the north, the green wedge was designed as running along the Białucha River, becoming wider in the non-built-up areas between the buildings of Prądnicka Street and the Warsaw railway line". Ptaszycka considered the hydrographic layout as an important element of composition: "The Vistula River Valley and the trails of small creeks, its confluences, are of particular significance. The use of these waterfronts for the purposes of greening, establishing belts and larger complexes of greening along the Rudawa, Białucha and Wilga is the subject of scientific studies and design work. The inappropriate regulation of fragments of Białucha and Wilga in the form of a fixed riverbed must be replaced by a modern method of creek regulation, based on taking into consideration their immense landscape values"/.../ "The planned network of green areas of Krakow is associated with the planning of appropriate areas for sports, parks and green squares, allotment gardens, cemeteries, along with their appropriate distribution of these areas throughout the city, in a manner that provides easy accessibility for the city's residents" [11]. The conceptual design presented in the publication stands out through the clarity of its composition, with expressively marked rings of the greening of fortress roads. It owes this form to Janusz Bogdanowski, who tied the model with the layout of the fortification rings of the Krakow Fortress. He wrote: "The system of greening in the general plan of Krakow from the middle of the 1950's, along with the ring of greening of the rocade road, looks almost like an ideal plan", he further described how this good plan started to be corrected by the dynamic expansion of the city [12].

The green rings in Krakow did not meet their basic role that has been ascribed to them since the period of Howard's concept of the garden city, which is the restrictive constraining of the uncontrolled spreading of the city. They also did not exert any considerable influence on the protection of the open landscape [13]. In Krakow, the wedge and ring model was not implemented due to difficulties arising from, among other things, administrative divisions, because under the borders of the time the fortress road was divided between the city and the voivodship and, as Bogdanowski wrote, due to the chaotic expansion of new housing estate and the completely unplanned spread of single family buildings practically everywhere. Successive plans [14, 15] did not change the situation (the plan of 1958), while the plan of 1966 no longer contained the green rings. A random, open layout, "groat-like" – as Bogdanowski called it – or, distributed resembled separate fragments instead of a legible system. In the beginning of the 1970's, when preparing another general plan of Krakow, the idea of the rocade road (connecting the individual forts) was returned to, but an integral policy of shaping such rings was never developed.

Figure 4. Diagram of the spatial development of Krakow, the idea of a radial-concentric greenery system, 1957 [11]

Figure 5. Krakow, the idea of radial-concentric greenery system, J. Bogdanowski 1994 [16]

Figure 6. Krakows’ system of green areas, called the River park system, and municipal parks [17]

An analysis of the successive local plans of Krakow (from 1953, 1956, 1958, 1964 and 1977) showed that the ring and wedge system of Krakow's urban greenery developed by Ptaszycka and Bogdanowski (1956, 1959) on the basis of the existing layout of green areas, waterways, topography and the system of fortification rings [11, 12], had not been put into practice. Bogdanowski wrote: "Nevertheless, the paradox is that in Krakow we can see the meticulous renovation of the nineteenth
century wreath of Planty park, along with an effective devastation of the second – Trzech Wieszczów Avenues – and finally, despite half a century of ineffective planning – the third ring of the rocade road is being torn apart" [18]. This was caused by the territorial development of the city, its contemporary multicentricity and changing geometric shape, which are not compatible with the principles of the radial-concentric system. These gaps in the continuity of some elements of this system, the ownership structure – as these were mainly privately owned areas – and thus, their accessibility and degree of arrangement, substantially set the successive plans apart from reality.

The subsequent local plans of 1988 and 1994 were developed under the supervision of Zygmunt Ziobrowski. In the plan of 1988, the elements that crystallised the layout of the city were, among others, the multifunctional groupings and paths of urban activity, historical structures and building complexes, manorial and park complexes, the fortification system, the rocade road system, the urban greenery system and the Vistula River and its confluences. It was assumed that providing spatial conditions for the improvement of the state of the natural environment, Than was to be implemented through, among other things, the protection of existing areas of arranged greenery, forests and tree stands, increasing the overall surface area of green areas, and particularly an expansion of the greenery system that constituted a continuation of ecological corridors in external areas and the organisation of a system of open areas along rivers, waterways and low-lying terrain, an increase in the amount of areas of arranged greenery in the vicinity of residential areas and an intensification of the development of greenery in non-built-up areas, protecting the surface of the soil from devastation and the recultivation of devastated areas [15].

4. The Krakow system of river parks – wedge layout

The spatial development plan of the city of Krakow of 1994 became the basis for the concept of a system of river parks that was developed in 1996, whose structure was based on the city's hydrographic layout [17]. An analysis of the plan showed that the Vistula and its confluences, along with the green zones of varying width, are an actually existing and clear system of areas of urban greenery, which, regardless of the effectiveness of successive spatial development plans and provisions "has defended itself". The hydrographic layout formed a wedge (radial) system. It was composed of the Vistula and its confluences – the main left-bank ones: the Rudawa, Prądnik, Potok Kościelnicki, as well as the right-bank ones – Wilga, Drwina along with Serafa, Podleżanka. The rings shaped on the basis of the fortification system, however, did not form a legible form, due to other "non-green" types of land use. In the case of Krakow, the system provides excellent external connections in the east-west direction between the Jura Park Complex (landscape parks – a form of nature protection) and the Niepołomice Forest and numerous ecological belts in the north-south direction [17] (figure 6).

The conceptual plan defined actions on the "macro" scale: the protection of existing greenery through making use of appropriate provisions of general and local law, as well as development of the forms of this protection through organising the system as a whole, including: ▪ the establishment of "river parks"; ▪ the establishment of "western green wedges"; ▪ the right and left-bank one; ▪ the construction of an internal system of recreational, pedestrian bicycle and water circulation, along with its furnishings; ▪ the protection of the connections between the system of urban greenery and the ecological system of the region; ▪ building recreational circulation connections with attractive areas of the region. Actions on the "meso" scale were also formulated: the protection and arrangement of district parks (for 18 districts) for everyday recreation, to be discussed with the councils of ancillary districts. Such a status was given to existing parks, including Planty park, as well as parks outlined for construction according to the Ranking list for the creation of new parks and public lawns in Krakow, formulated on the basis of proposals from the districts [17].

The proposal of "river parks" was included in various documents concerning the policy of the development of areas of public greenery and environmental protection. The river parks system was
also included in the spatial development conditions and directions studies being prepared in accordance with the Spatial planning and management act (2003): of 2000 (lead designer: Z. Ziobrowski, unapproved), of 2003 (lead designer: R. Kuzianik, the later one being prepared from 2008 (under the direction of J.M. Chmielewski, unapproved, [19, 20], as well as the approved one of 2014 (coordinator: E. Koterba).

The Spatial development conditions and directions study of the city of Krakow (2003) assumed the shaping of generally accessible open areas in the form of gardens and urban parks, their essential elements being river parks (figure 7). The potential of river parks, which resulted from their spatial distribution (radial layout) and linear character was highlighted in the diagnosis formulated in the Programme of environmental protection for the city of Krakow for the years 2012-2015 (2012) [21]. Directed towards the centre of the city, they crossed all the districts, connecting them together, also binding many areas under protection. The hydrographic layout, along with the adjacent areas, was deemed to be a skeleton of the city's greenery system, one that required protection. A zone of protection and a zone of development were delineated within its area. It was written that "areas of river parks should be made accessible through building pedestrian pathways and bicycle roads, as well as including them into the existing and planned urban systems. River parks are natural ecological corridors. After an indepth analysis of the natural absorptivity of habitats – they can be used as recreational zones. Their potential, apart from their natural qualities, is their lack of collision with urban infrastructure" [21]. The programme of environmental protection includes the adoption of high standards of the establishment and maintenance of areas of greenery, the recreation of particularly valuable natural systems and their protection through establishing forms of nature protection. The connections for the river parks on the scale of the region were also defined.

Areas covered with river parks are gradually coming under protection through local plans, which have a clearly protective character. It is important to preserve the continuity of the system through making it a part of publicly available arranged greenery. Permissible land use has been assigned as arranged pedestrian, rollerblade and bicycle paths, didactic trails, mountain bicycle trails, horse riding trails and for cross-country skiing along with the necessary infrastructure. In some cases plans allow land and water-based elements of kayak ports with jetties and other facilities necessary for practicing water sports and recreation.

The concept of river parks is being gradually introduced along with areas of greenery undergoing arrangement. As Krakow's strategies and planning documents have shown, river parks have become inscribed into the process creating a system of areas of urban greenery. However, it is the integration
of policies and the planning of a multifunctional landscape, followed by park management – which, due to their linear character, span various districts – that can guarantee the development of this concept.

5. Directions of the development and management of areas of greenery in Krakow for the years 2017-2030 – mixed network system

The new Spatial development conditions and directions study of the city of Krakow (2014) considers river parks to be an important element of the shaping of urban structure and their aesthetic and compositional values as the fundamental criterion of building a network of public spaces. Other important elements of the structure of greenery are areas under protection – including, among others, landscape parks, nature preserves, "Natura 2000" areas, as well as public parks and preserved elements of the system of fortress greenery. The continuous system and linear elements, e.g. avenues, were also highlighted.

In years 2015-2017, in order to define a coherent, planned and long-term development policy for areas of greenery, a document called Directions of the development and management of areas of greenery in Krakow for the years 2017-2030 was prepared [22]. This document, in the most detailed manner, shows the contemporary network of areas of public greenery. A series of basic studies were performed as a part of writing the document, which included, among other elements, analyses of existing planning documents, environmental surveys, an identification of existing areas of public greenery and supporting areas; the state of the preservation of the continuity of river parks, accessibility to areas of public greenery; deficit areas in terms of public greenery within the city, as well as development pressure on green areas. Public consultations had been carried out in 18 districts, with the results being used in the document. Due to the changes in the city limits, the implementation of one of the model systems was impossible, but all of Krakow's advantages were made good use of.

An integrating model was proposed – a mixed network model with legible wedges in the form of river parks and dense tree stands (figure 8). The basis for the concept of the system of areas of public greenery of Krakow constitutes a layout of river parks and complexes of fortress greenery, linked by pedestrian and bicycle paths – green corridors that have the character of rings. The planned system of areas of greenery is based on two main types of development and two supporting types, which are:

1. Areas of urban arranged greenery: Zone A+ which consists of areas of representative greenery of supralocal significance (7%), as well as Zone A – areas of urban greenery of local and district significance (22%). These are: public urban parks of various types, mounds, meadows, green squares, lawns, roadside greenery, buffer greenery, greenery in public spaces, in areas of the First and Second ring of the Krakow Fortress.

2. Areas of ecological and landscape greenery: Zone B+, which constitutes areas that are either covered or assigned to be covered by a form of environmental protection (15%), as well as Zone B which includes the remaining areas of greenery of a semi-natural character (56% in total). These are river parks, parks in areas of the Third ring of the Krakow Fortress and fortress greenery outside of parks, ecological parks, geoparks, meadows, community and state forests, forest parks, the biological envelope of waterways and reservoirs in public areas. Due to the occurrence of precious plant groupings and protected species sites in zones B+ and B, they will be dominated by Eco zones, while public functions will be performed by arranged enclaves.

3. The system of areas of greenery is supplement by Zone P – the greenery of public spaces.

4. Zone C – features support areas, but not always fully publicly accessible, e.g. agricultural areas and green land use, allotment gardens, cemeteries, monastic gardens, the greenery of sports areas, private forests and greenery accompanying public, industrial and rail buildings.

Each of the zones has had maintenance standards assigned to it – intensive in representative areas, basic in areas of district and local significance, and extensive in ecological and landscape areas.
Ecozonoes, which are enclaves that aid in the maintenance and improvement of biodiversity that are to be deliberately left undisturbed or placed within parks. They have been outlined in areas where precious groupings and sites of protected plant and animal species, old trees, nature monuments, as well as larger natural tree stands or water reservoirs are located. Ecozones will enable residents to have an up-close, individual contact with nature. They will become a place of education concerning the functioning of various habitats.

There are currently 1514 ha of areas of public greenery in Krakow, with an additional 400 ha being planned. These will include, among others, green corridors linked with an expanded network of bicycle paths. 75% of residents has access to areas of greenery within reach of walking distance. Up to the year 2030 that amount will increase to 86%, which will exceed the average for European cities. The city has a ratio of 8.3 m² of green space per resident on the scale of the city. A standard of 10 m² has been adopted, which will be achieved already during the first stage of implementation. The area of naturally precious areas under protection will increase from 15% to 17.5%. The plan includes the purchasing of areas in order to ensure the network's continuity [22].

6. Results and discussion
In Krakow, similarly to the majority of large cities which develop in a non-uniform manner and through numerous phases, during which surrounding localities are incorporated into them, it is currently difficult to plan model concepts. In such cases, it is not easy to preserve a stable structure and continuity of a system, as well as its compositional logic, with its legibility increasing through a system of linking avenues, promenades and greenways. The layout of areas of greenery that was proposed in 2017 has a mixed network character, in which the expressive structure of green wedges along the hydrographic layout was used, as well as the preserved fragments of rings, including those of the fortress roads.

Implementation is key to the new concept of areas of public greenery. It has a chance to be successful thanks to the establishment of the Municipal Greenery Authority on the 1st of July 2015, a new municipal office, whose main task is the management of existing and the establishment of new areas of public greenery in Krakow. There is also a chance for a better protection of natural areas, for which a local plan is currently being developed by decision of the Krakow City Council. The document will define areas of greenery that need to be unconditionally exempted from development, or on which development should be constrained for environmental reasons. The plan covers areas defined in the Spatial development conditions and directions study (2014) that are not covered by local plans. From the point of view of the policy of the shaping of the system of areas of urban greenery, it is an important decision.

7. Conclusions
The future of the city without nature is unimaginable. This has been shown to be true both throughout history, as well as by the latest trends in landscape architecture and urban planning, and when seen from the perspective of landscape architecture, it assumes a departure from traditional strategies of urban design in favour of ecological urban planning. Developing a plan of areas of greenery simultaneously with other types of infrastructure, e.g. flood protection or circulation, helps to more effectively form the remaining elements of a city's structure. It ensures the harmonious development of the urban environment. Areas of greenery have the capacity to create a network to the benefit of both the natural world, as well as that of people. They are perceived as an important element of the composition of a city, as a determinant, often defining its image. A system of urban greenery is a green infrastructure – a strategically planned network of areas of urban greenery of a varied character – natural ones, parks, greenways, protected areas, unarranged areas and those that maintain natural ecological processes.
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