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PEDESTRIAN ACCESSIBILITY TO PARKS IN ŁÓDŹ

DOSTĘPNOŚĆ PIESZA PARKÓW W ŁODZI

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ABSTRACT: The aim of the article is to assess the pedestrian accessibility to parks situated within the boundaries of Łódź. 43 park layouts of the total surface of 574.6 ha were inventoried in the analyzed area (www.zielonalodz.info; www.parki.org.pl; www.bip.uml.lodz.pl), of which 13 are historical (Studium...2010; Wycichowska 2008). The outcome of the analyses was presentation of the number of inhabitants within 0-5, 5-10 and 10-15-minute isochrones from the parks. To achieve this, the author used data from the City of Łódź Office. It was established that the largest concentration of potential park users (pre-working and post-working age population) can be found in the city centre and its vicinity. Regrettably, cultivated green areas occupy only a small surface there. Over half of the city inhabitants (56.3%) live within walking distance of parks. The largest number of people inhabit the areas near Staromiejski Park and Podolski Park. In turn, Nad Nerem Park (on the Ner River) in the south-western part of the city is characterized by the lowest pedestrian accessibility for Łódź inhabitants.

KEY WORDS: green areas, parks, Łódź, pedestrian accessibility

ABSTRAKT: W artykule za cel przyjęto ocenę dostępności pieszej parków zlokalizowanych w granicach Łodzi. Na analizowanym obszarze zinwentaryzowano 43 założenia parkowe, o łącznej powierzchni 574,6ha (www.zielonalodz.info; www.parki.org.pl; www.bip.uml.lodz.pl), z czego 13 jest zabytkowych (Studium...2010; Wycichowska 2008). Wynikiem analiz było przedstawienie liczby mieszkańców w izochronach 0-5 minut; 5-10 minut; oraz 10-15 minut od parków. W tym celu wykorzystano dane pochodzące z Urzędu Miasta Łodzi. Stwierdzono, że największa koncentracja potencjalnych użytkowników parków (osoby w wieku przedprodukcyjnym i poprodukcyjnym) występuje w centrum miasta oraz w jego sąsiedztwie. Niestety tereny zieleni urządzonej mają tam niewielką powierzchnię. W czasie dojścia do 15 minut od parków, mieszka ponad połowa mieszkańców miasta (56,3%). Najwięcej osób rezyduje w pobliżu parku Staromiejskiego i Podolskiego. Najłabszą dostępnością pieszą dla mieszkańców Łodzi charakteryzuje się kolei Park nad Nerem, położony w południowo-zachodniej części miasta.

SŁOWA KLUCZOWE: tereny zieleni, parki, Łódź, dostępność piesza.

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Introduction

Green areas play an important role in every city's environmental system (Świercz 2011; Wolch et al. 2014). The literature of the subject does not define them in an unequivocal way. They tend to be described as generally undeveloped areas (often interchangeably in this meaning with open areas) or as areas covered by vegetation, performing predominantly a recreational function (Giedych 2005). The Act on Environmental Protection as of 16 April 2004 contains an attempt at accounting for these two aspects. Article 5 Section 21 states that they are "areas together with technical infrastructure and buildings connected with them functionally, covered by vegetation, situated within the boundaries of a village, characterized by compact residential development or towns and cities, having aesthetic, recreational, health or protective functions, including – in particular – parks, green squares, promenades, boulevards, botanical and zoological gardens, game parks, historical gardens and cemeteries as well as greenery accompanying streets, squares, historical fortifications, buildings, waste disposal sites, airports, railway and industrial facilities". The areas in question perform different functions: social (aesthetic, recreational, relaxation, educational) and environmental (climatic, hydrological, biotic, soil protection, contamination absorption) (Bolund, Hunhammar 1999; Chiesura 2004; Tzoulas et al. 2007; Szumacher 2011).

Greenery can be defined as an element of city space which affects its environment as well as mental and physical health of inhabitants (Nielsen, Hansen 2007; Maas et al. 2006; Maas et al. 2009; Van Den Berg et al. 2010) and creates new landscape quality, concealing and restoring spatial order disturbed by the development of industry (Lakomy 2012). Open green areas play an important role for the quality of life of inhabitants in society which undergoes constant urbanization processes (Bonaiuto et al. 2003; Chiesura 2004; Tyrväinen et al. 2007; Comber et al. 2008).

There are different types of green areas according to their landscape features and environmental functions: parks, forests (Singh et al. 2010), green squares, gardens, cemetery greenery, traffic route greenery, protective greenery, creepers, greenery on roofs, farmland, meadows, pastures, orchards and undeveloped areas (swampy meadows), (Czerwieniec, Lewińska 2000: 11-15).

Green areas constitute one of the basic components of the spatial structure of Łódź. They represent an element of the city landscape deeply rooted in its urbanistic layout which is a reflection of the natural, social, economic and cultural environment of the urban unit. Green areas in Łódź include: parks, allotment gardens, community green spaces, accompanying and protective greenery as well as cemetery greenery. Green areas can be found in patches throughout the space of the analyzed city. They are scattered mainly in the form of small complexes, which is why they do not play a significant role in shaping the city's microclimate. The space of Łódź lacks compact wedges of park and forest greenery which would decisively penetrate Śródmieście (the city centre). Likewise, the outskirts of Łódź are deprived of this kind of complexes which would correspond to the existing complexes of suburban forests. Certain importance in localizing urban green areas is

attached to railway lines, especially the ring railway, as it is precisely along these lines that more compact forest and park areas, allotment gardens, community green spaces and accompanying, protective greenery are preserved or were located (Matczak 1994). "The distance from the centre of Łódź clearly differentiates the percentage share of different forms of urban investment areas. Built-up and transport areas tend to be most strongly connected with the centre, whereas the opposite is true about open areas which in the city centre are represented almost in their entirety by greenery. The larger the distance from the city centre, the bigger the role of open spaces which prevail in its peripheries. The growing distance from the centre brings about an increase in open areas and at the same time a drop in the significance of urban greenery in their structure" (Matczak 1994: 79).

In 2014, the biggest surface in the system of urban greenery of Łódź was occupied by forests, community green spaces and allotment gardens. Parks were ranked on the fourth position, representing about 2% of the city surface. In turn, the smallest surface was taken up by green squares (BDL 2016). In the subsequent part of the article, the author focuses only on park areas. Parks represent basic units of recreational greenery in the city. Vegetation in parks is arranged in compositions of trees and bushes complemented by areas of low vegetation. Park areas are sometimes decorated by ponds and fountains and intersected by pedestrian precincts. A park area intended for passive relaxation is referred to as a strolling park, whereas the park area which can be used for both passive and active recreation extended on a large area and equipped in sports, entertainment and auditorium facilities is called a park of culture and recreation. Forest parks, in turn, are a type of half natural green areas adopted for utility purposes (Czerwieniec, Lewińska 2000: 11).

Methodology of research

The aim of this work is to assess the pedestrian accessibility to parks located within the boundaries of Łódź. Accessibility is one of the key notions in the field of social sciences, especially human geography, spatial economics and economics (Wiśniewski 2015). In literature, accessibility is understood in a number of ways. The most general definition describes it as a possibility of the occurrence of a relation between at least two points (places). In accordance with the foregoing, accessibility has 3 attributes: space (relations take place in space); transport (relations take place by means of transport carriers); time (relations take place at the given physical time – at a certain time of the day or year, etc. and relocation takes certain time – expressed in minutes, hours, etc.) (Śleszyński 2014). This work conducts an analysis of time of access to parks in Łódź on foot. Walking time to 43 parks located in Łódź was adopted as a measure of accessibility (people walk at an average speed of 4.8 km/h). The outcome of the analyses was presentation of the number of inhabitants remaining within 0-5, 5-10 and 10-15-minute isochrones from the parks (as Table 1 shows, the walking time to reach a park should not exceed 15 minutes). To achieve this, the author used data obtained from the City of Łódź Office, together with a tool for network analysis in GiS.

In order to determine the needs with regard to area planning, it seems necessary to inventory the existing greenery and assess the resources of green areas in the city. To achieve this, one may use, for instance, the indicator of open areas in relation to the number of inhabitants. This approach, however, does not reflect, for example, the distribution of green areas, commonness of access to them or diversification of their function and character. These shortages may be made up precisely by an analysis of walking or driving time as well as conditions of reaching different types of green areas (Table 1) (Czerwieniec, Lewińska 2000: 63-64).

Table 1

Hierarchy of public open areas in urban and rural areas. Accessibility from places of residence

Type of green area	Isochrone		Conditions of access
	Walking time [min]	Driving time [min]	
Game parks for children	10	–	Collision-free pedestrian and bicycle routes
Recreational areas of level 2 – parks: – community spaces – commune spaces	10	– Up to 30	Pedestrian and bicycle routes, public transport
Recreational areas of level 3: – intercommunity parks – recreational complexes of a group of communes	15	– Up to 40	Pedestrian and bicycle routes, public transport
City-wide recreational areas Recreational areas on a regional scale		Up to 30 Up to 90	Pedestrian and bicycle routes, individual and public transport
Green squares	10-15	–	Pedestrian routes
Recreational forests		Up to 40	Pedestrian and bicycle routes, individual and public transport
Cemeteries		Up to 30	
Educational parks and gardens, exhibition areas		Up to 60	
Allotment gardens		Up to 30	
Swimming areas and natural beaches		Up to 30	

Source: Piątkowska 1983.

Characteristics of the parks in Łódź

As of 31 December 2015, there are 43 parks in Łódź (Table 1) of the aggregate surface of 574.6 ha (www.zielonalodz.info; www.parki.org.pl; www.bip.uml.lodz.pl), of which 13 are historical ones (Studium...2010; Wycichowska 2008). The distribution of all the parks is irregular as they are located mainly in the vicinity of the ring railway (Fig. 1)

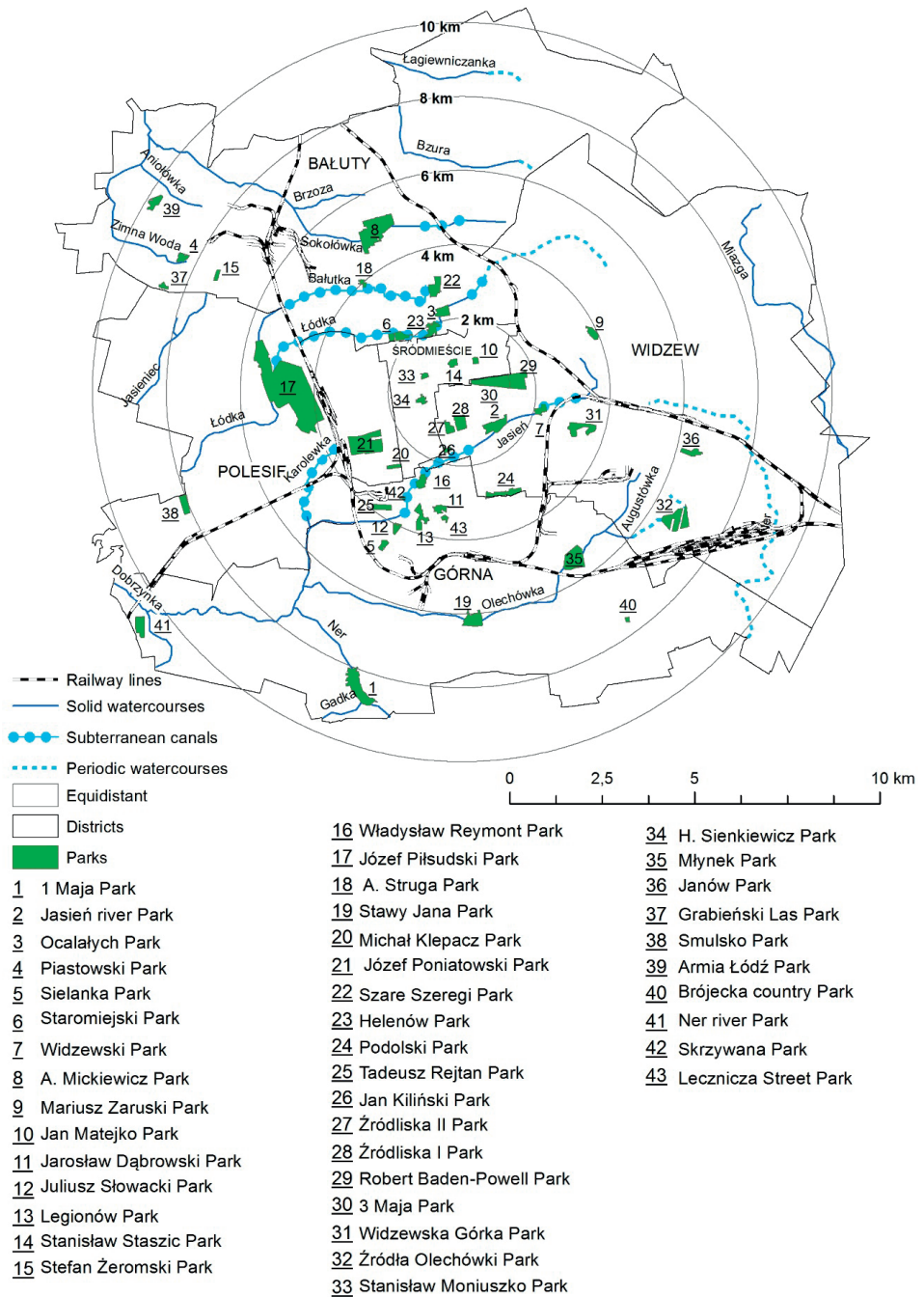


Fig. 1. Location parks in Łódź

Source: own study, 2016..

(Jakóbczyk-Gryszkiewicz 2008). The biggest number of this type of layouts can be found in the district of Widzew – 13 (including 4 historical). The smallest number of cultivated green areas in question are situated in the Śródmieście district – 4 (including 2 historical). Furthermore, there are 10 parks in the Bałuty district (including 2 historical), 8 in the Łódź – Górna district (including 2 historical), in Polesie – 5 (including 3 historical).

The history of the historical parks is closely connected with the development of textile industry in Łódź which dates back to the 19th and the beginning of the 20th century. (Wycichowska 2008). Those parks were established on forest or post-forest areas while others represent old-time garden layouts accompanying palaces and residences of Łódź factory owners, which were subsequently converted into public spaces (www.zzm.lodz.pl). The majority of these parks tend to be located near watercourses, which was connected with the initial period of the industrial development of the 19th-century Łódź. At that time factory and residential complexes were situated on rivers, which was connected with providing them with water power (Pic. 1). The factory owners' villas and palaces were erected near monumental factory complexes on rivers and they were surrounded by lavishly arranged parks and gardens. The project of river channeling carried out till the end of the 1960s had contributed to the disappearance of water in many parks (Wycichowska 2008; Koboжек, Koboжек 2005). With passage of time part of the park and garden residential architecture, as well as factories located near those parks, assumed new cultural functions connected with the history and traditions of Łódź. Thus, the Central Museum of Textiles is located near Reymont Park in Ludwik Geyer factory complex. In turn, Karol Scheibler palace within the boundaries of Źródłiska II Park houses the Museum of Cinematography. The building of Art Gallery is situated in Sienkiewicza Park, hosting European level art exhibitions, following its modernization in 2005 (Wycichowska 2008). After the year 2000, 10 new parks in total were established in Łódź, with the biggest number of them (4) in Bałuty.

As it was mentioned above, Łódź has 43 parks, of which 11 can be found in the close proximity to the city centre (up to 2 km),¹ 16 at a distance of 2 to 4 km, 5 at a distance of 4 to 6 km, 5 at a distance of 6 to 8 km, 5 at a distance of 8 to 10 km and 1 at a distance exceeding 8 km in the south-western part of Łódź (Nad Nerem Park), (Fig. 1).

Results

As of 31 January 2016 the population of Łódź is 658,573, of which the largest number of people live in Bałuty – 188,741 and Górna – 155,276, whereas Śródmieście has the smallest number of inhabitants – 58,143. In the case of Polesie and Widzew, the number of inhabitants is 128,465 and 127,948, respectively. The population of people available for work dominates among Łódź inhabitants, amounting to 57.5%. Pre-production and post-production age population represent 13.71% and 27.67% of the inhabitants,

¹ The centre was delineated as the city's centre of gravity.

respectively (Table 2). The biggest number of senior citizens can be found in Bałuty and Górna, and the same tendency applies to the youngest inhabitants. It is unfavourable, nevertheless, that there are twice as many post-production age inhabitants as pre-production ones.

Table 2

The number of inhabitants according to economic age groups in the districts of Łódź in 2016

Districts	The number of people in pre-production age	The share of the people in pre-production age	The number of people of production age	The share of the people in production age	The number of people in post-production age	The share of the people in post-production age
Bałuty	24 679	13.08	105 889	56.10	58 173	30.82
Śródmieście	8 291	14.26	35 343	60.79	14 509	24.95
Polesie	18 021	14.03	72 061	56.09	38 383	29.88
Widzew	18 702	14.62	74 309	58.08	34 937	27.31
Górna	21 294	13.71	91 010	58.61	42 972	27.67

Source: own study based on data from the Office of the City of Łódź.

The distribution of parks in the city alludes to the distribution of its population (Fig. 2). Only Nad Nerem Park, 1-Maja Park, Armia Łódź Memorial Park and Brójecka rural park are located at a distance of about 2 to 7 km from residential areas. The biggest concentration of potential park users can be found in the city centre and in its vicinity. Unfortunately, cultivated green areas occupy only limited space there.

Parks are used by people of different ages, yet it is the youngest (at pre-production age) and the oldest (at post-production age) who are most interested in them as they have more free time at their disposal than production age population (Jakóbczyk-Gryszkiewicz 2008).

Comparing the number of people at non-production age per every 1 ha of park, it was concluded that the most unfavourable situation is found to exist in Śródmieście (where there are almost 1,800 people/ha). In contrast, the inhabitants of Polesie are in the most advantageous position (Table 3).

3.14% of the surface of the analyzed city is located within the isochrone of 0-5 minutes away from the parks, 9.4% – within the isochrone of 5-10 minutes, while 12.4% – within that of 10-15 minutes. In total, 370,888 people (56.3% of Łódź inhabitants) live within these isochrones, out of which clearly the biggest group of inhabitants must walk for 5-10 minutes to reach a park (174, 842), while the fewest people must walk for 0-5 minutes (52, 064).² 21.9% of Łódź population, including 79,709 women and 64,273

² The number of inhabitants may have been underestimated due to the fact that the isochrones were delineated from the park centre. The centre was delineated as the park's geometrical centre. In the case of larger parks, the 0-5-minute isochrone partly overlaps with the individual park itself.

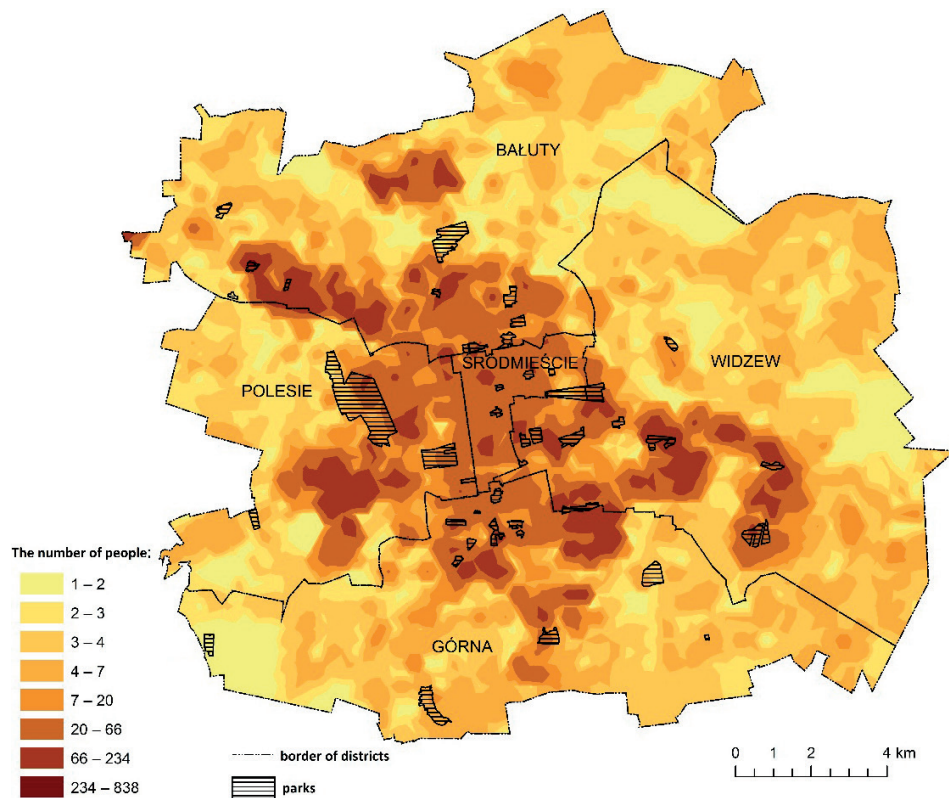


Fig. 2. Arrangement of parks in Łódź, against the background of population density

Source: own study based on data from the Office of the City of Łódź, BDOT, www.zielonalodz.info (accessed 03.24.2016); www.mosir.lodz.pl (accessed 24.03.2016)

Table 3

The number and surface of parks as compared to the number of population according to economic age group in Łódź

Districts	The number of parks	The surface of park [ha]	The average area of the park [ha]	The number of people in pre-production age / ha park	The number of people in post-production age / ha park	The number of people in non-production age / ha park
Bałuty	10	105.96	10.59	233	549	782
Górna	11	110.54	10.04	193	389	581
Polesie	5	227.67	45.50	79	169	248
Śródmieście	4	12.71	3.17	652	1142	1794
Widzew	13	117.72	9.05	159	297	456
Suma	43	574.60	—	—	—	—

Source: own study based on data from the Office of the City of Łódź

men, live farthest from any park. The largest group of people (40,231) live near Staromiejski Park, including – 21,747 women and 18,484 men, whose average age is 42-43 (the average age for Łódź is 38-39). The second position, considering the number of potential users, is occupied by Podolski Park located in Widzew. Altogether 38,836 people, including 13,355 women and 10,021 men live within the isochrone of a 15-minute walk to it. These people are 47-48 years of age on average. Nad Nerem Park, located in the south-western part of the city, away from residential buildings, is characterized by the lowest pedestrian accessibility for Łódź inhabitants. A mere 108 people live within the isochrones of 15 minutes from the park. Also, Na Młynku Park is located unfavourably, since the walking time to this park does not exceed 15 minutes only for 452 inhabitants. Similarly, low pedestrian accessibility is a feature of Armia Łódź Park (1,185 inhabitants), Brójecka rural park (1,445) and 1 Maja Park (1,983) (Fig. 3).



Fig. 3. Pedestrian accessibility to parks in Łódź

Source: own study, 2016.

Conclusions

The urban parks in Łódź have represented an integral element of the urbanistic layout development since its very beginning. It was due to historical rather than environmental factors that they were established. Most areas in question came into being in the 19th (13 parks) and the 20th century (20 parks), and part of them initially belonged to Łódź factory owners. After the year 2000, 10 cultivated green areas in total were established. Therefore parks represent relics of the old industrial Łódź and their distribution corresponds to the course of the ring railway, which is why it is rather irregular. As a result of that, large-panel housing estates built in the 1970s in the western part of the district of Widzew, the southern part of Górna and the south-western fragment of Bałuty are characterized by underinvestment concerning cultivated green areas (Nowak 2006). Within the boundaries of Łódź, the average size of parks amounts to approximately 14 ha, although there is clear dominance of those of up to 10 ha – 31 cultivated green areas, and only one, Piłsudski Park located in Polesie is very large, with its surface amounting to 168.73 ha.

As a result of the conducted analysis, it was established that half the city's population (56.3%) live within the walking time of up to 15 minutes from parks. The biggest number of people live in the vicinity of Staromiejski Park and Podolski Park. In turn, Nad Nerem Park in the south-western part of the city is characterized by the lowest pedestrian accessibility for the inhabitants of Łódź.

The biggest underinvestment with regard to parks in relation to the number of people at non-production age can be found in Śródmieście. There are merely 4 parks of the average surface of 3 ha. The most favourable situation is in Polesie, where the largest park is located.

In Łódź, like in other cities in Poland, there is a growing number of people of post-production age, which is a potential park user group. This is why new parks should be established close to their place of residence so that they can reach them, especially because, as many scientists point out, they have a beneficial influence on human health (Nielsen, Hansen 2007; Maas et al. 2006; Maas et al. 2009; Van Den Berg et al. 2010).

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