Accessibility of the Urban Green Areas for People with Disabilities on the Example of Planty Park in Białystok, Poland

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Abstract
In this work has been presented the issue of planning the accessibility of urban green areas for people with disabilities, in particular for people moving on wheelchairs and blind. Problematic aspects are discussed on example of analysis of Planty Park in Białystok (Poland) in terms of the accessibility of space for such people. There are collected a number of design guidelines and on their basis there are conducted field studies. As a result there are prepared a map showing the accessibility of the park for the disabled. Carried out analysis is discussed and the author searches for the most problematic areas to propose some solutions for the issues.

Key words: designing for disabilities, urban green areas, universal design.

Anotacija

Reikšminiai žodžiai: dizainas neigaliesiems, miesto žaliųjų plotai, universalus dizainas.

Introduction

In almost every city there are many green areas. In general their purpose is to increase the quality of life for the inhabitants through enabling connecting human with nature. Unfortunately in many cases, during designing those spaces, there are not included people with disabilities. In the results of such actions a lot of disabled cannot use those urban green areas. This is inter alia contrary to the Constitution, which states about equality of all people.

According to World Health Organization we can say that:

Disabilities is an umbrella term, covering impairments, activity limitations, and participation restrictions. An impairment is a problem in body function or structure; an activity limitation is a difficulty encountered by an individual in executing a task or action; while a participation restriction is a problem experienced by an individual in involvement in life situations. Thus disability is a complex phenomenon, reflecting an interaction between features of a person's body and features of the society in which he or she lives (definition: http://www.who.int/topics/disabilities/en/).

There are many classifications of people with disabilities related to their impairments. The division proposed by J. Kozłowski in Psychologia kliniczna osób niepełnosprawnych (Kozłowski, 2014) seems to be the most appropriate in the context of designing accessible space:

1. People with sensory disabilities:
   a) the blind and visually impaired,
   b) people who are deaf or hard of hearing,
   c) deaf and blind people.

2. People with physical disabilities:
   a) people with impaired movement,
   b) people with chronic diseases of internal organs.
3. People with mental disabilities:
   a) people mentally retarded with an intellectual disability,
   b) mentally ill people with personality disorders and behavior.

4. People with complex disabilities, affected more than one disability
   – Here can occur the various, listed above disability combined, eg., a blind person
     with a mental disability, a person with impaired movement and mental disorders, etc.

Polish Central Statistical Office estimates in 2011, that in Poland there are about 12.2% (from
the entire country population) people with various dysfunctions (Adach-Stankiewicz, 2012). It
shows how wide range covers this problem. Of course, not every person from those almost 4.7
million people (12.2 % from entire population of Poland in 2011) is unable to move independently.
However, people who are responsible for spatial planning should include people with disabilities in
their works, because every person has the same right to use the public space. Moreover it has been
noted that from year to year an increasing number of people in the whole world are disabled, and
therefore the action in this direction is strongly advisable (Złowodzki, 2008).

The main aim of this work is to analyse the Planty Park in Białystok in terms of the
accessibility of space for people with disabilities. An additional aspect is to prepare criteria useful in
universal design – it means for everyone. These guidelines will be helpful during field studies.

Methodology

On the basis of law and accessibility standards related to universal design, there was collected
a number of design guidelines. These guidelines were the basis for the analyses of accessibility in
the discussed area. They concerned the following parameters:

- communication paths,
- ramps,
- terrain stairs,
- park equipment (such as rest places, trash can, information boards, fountains),
- associated infrastructure (such as parking space, pedestrian crossing, bus stops).

Above parameters were used during field studies in order to collect the information about the
green urban space for analysis. Own observations and collected information allowed to determine
the degree of accessibility of individual places at the park. On this basis, it was also carried out
inventory of the park utilizing the aforementioned parameters.

The results were used to create map showing the accessibility of the park for the disabled, and
in particular moving on wheelchairs and the blind. Carried out analysis had been evaluated, and in
consequence, there were identified problematic areas – hindering people with disabilities moving
about at the urban green areas.

Results

On the basis of Polish law and literature, there were collected a number of design guidelines,
which served as evaluation criteria during field studies. The most important parameters which were
taken into consideration in case of accessibility of urban green areas were discussed below.

Communication paths. It is important to pedestrian routes to be rectilinear, and changes of
directions should be as close as it possible to the right angle. The longitudinal slope should not
exceed 6 %, and 2 % transverse. However, to provide more comfort for people moving in
wheelchairs the first value is estimated at 5 % (Kowalski, 2010). Next important parameters are
width and surface of paths. Users of the public spaces, who need the most space to move around are
definitely people in wheelchairs. Providing them the right amount of space, the needs of other users
were also satisfied. It is assumed that the width should be not less than 150 cm, because of allowing
to freedom of manoeuvring the wheelchair. It is possible to reduce the width to 120 cm, if the length
of this section does not exceed 20 m. However, in the case of the main avenues, where there is the increased traffic on both sides, the width should provide comfortable passing by, so it should be at least 200 cm (Kowalski, 2011). The surface must be flat and rough enough to eliminate the possibility of stumbling or slipping. Technical condition has also impact on these aspects (Czarnecki, Siemiński, 2004). However, blind people need additional elements on surfaces. The so-called tactile paths, which have a different factures depending on the functions. Three main factures could be highlighted: attention, direction and warning.

**Ramps.** When there is a height difference, which prevents the planning of smooth slope, in addition to the stairs should be also included the ramps. The width of the plane of movement of the ramp for persons with disabilities must be at least of 120 cm, and the length of a single section of the ramp cannot exceed 9 m. However, if it is necessary to use longer ramps, they should be divided into shorter sections utilizing landings. Landing cannot be shorter than 1.4 m, and if there is a change of direction, there should be ensured in the movement area with minimum dimensions of 1.5 m x 1.5 m. At the end and the beginning of the ramp, it has to be placed movement plane of at least of 1.5 m on the horizontal surface (Kowalski, 2010). On both sides of the ramp it should be arranged a handrail at heights of 75 cm and 90 cm, parallel to the surface (Budny, 2009). Allowable slope depends on the height differences and location (Table 1.).

<table>
<thead>
<tr>
<th>Height difference</th>
<th>Max. slope inside or under cover</th>
<th>Max. slope outside</th>
</tr>
</thead>
<tbody>
<tr>
<td>up to 15 cm</td>
<td>15%</td>
<td>15%</td>
</tr>
<tr>
<td>15–50 cm</td>
<td>10%</td>
<td>8%</td>
</tr>
<tr>
<td>over 50 cm</td>
<td>8%</td>
<td>6%</td>
</tr>
</tbody>
</table>

**Terrain stairs.** Single steps should be avoided, because they create a risk of tripping. In the case of more than 10, there must be applied landings. Height of steps should be between 12 cm to 15 cm each, while their depth should be minimum of 35 cm. It has a direct influence on comfort of usage. There is no need to design railings, when the height difference is less than 0.5 m. Usable width of stairs should be at least of 1.2 m, and the railings should be attached as in the case of the ramp, except that the lower one is not obligatory (Kowalski, 2010). Important aspects are the signs for the blind and visually impaired. The first and last step of a flight of stairs should be marked with a contrasting stripe. There should be also 0.5 m of tactile pavement (warning field) 0.6 m – 0.8 m before the steps on the lower and higher side (Polski Związek Niewidomych, 2009).

**Park equipment.** It is important to the park equipment to be grouped together and form rows, which are parallel to the axis of movement (Building for Everyone, 2002). They also should not reduce the usable width of the path. Information boards should be placed outside the paths and the rules of their safe arrangement are illustrated below (Fig. 1). Parking meters should be also available for people with disabilities which can drive a car including those on wheelchairs.

![Fig. 1. Rules of the safe arrangement of information boards (Kowalski, 2011)](http://www.krastotvarka.vhost.lt/documents/177.html)
Therefore the nearest space should be enough for manoeuvring as that was told earlier. Next thing is the height of functional parts of this device. It cannot be further than arm of man in wheelchair can reach what is estimated as 130 cm maximally (Nowak, Budny, 2008). Important information on the park equipment should be also written in Braille language and those elements should be marked with help of tactile pavement (field of attention). Fountains must be separated from the pedestrian parts with utilizing belt of greenery or through the use of warning components.

**Associated infrastructure.** Despite the fact that associated infrastructure is not the element of the park, its presence has an influence on use of this green public space. Car parks located near the park should contain parking places for disabled with special dimensions. Their number depends on the number of all places (Table 2). Pedestrian crossings are also an important aspect. If there is a curb higher than 2 cm, there should be attached ramps with a maximally 5 % slope (Kowalski, 2010). An important security for the blind and visually impaired people is warning fields before pedestrian crossings. They should be located along the street and their width should be at least 0.5 m. The use of traffic light with audible signal and montage of buttons that activate green light is also of great importance. Their height should be from 0.9 m to 1.1 m (Wysocki, 2010).

<table>
<thead>
<tr>
<th>All of places</th>
<th>Minimum number of places for disabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 25</td>
<td>1</td>
</tr>
<tr>
<td>26 to 50</td>
<td>2</td>
</tr>
<tr>
<td>51 to 75</td>
<td>3</td>
</tr>
<tr>
<td>76 to 100</td>
<td>4</td>
</tr>
<tr>
<td>101 to 150</td>
<td>5</td>
</tr>
<tr>
<td>150 to 200</td>
<td>6</td>
</tr>
<tr>
<td>201 to 300</td>
<td>7</td>
</tr>
<tr>
<td>301 to 400</td>
<td>8</td>
</tr>
<tr>
<td>401 to 500</td>
<td>9</td>
</tr>
<tr>
<td>501 to 1000</td>
<td>2% of total</td>
</tr>
<tr>
<td>Over 1000</td>
<td>20 plus 1 for every 100 places</td>
</tr>
</tbody>
</table>

**Planty Park.** Planty Park is the about 14.94 ha green area in Białystok city. This area is located between the current streets: Legionowa, Mickiewicza, Świętojańska, Akademicka and it links together Park Konstytucji 3. Maja, Park Poniatowskiego and the Branicki Palace complex. Currently existing, the park of modernist composition was designed by Stanislaw Grall. The main axis of the park is Aleja Zakochanych (what could be translated as Avenue of Lovers). Path called Bulwary Kościałkowskiego together with side pathways completes the communication scheme.

Park Planty is a good place for rest and relaxes in the shadows of tree. The most common species are oaks (*Quercus robur*), hornbeams (*Carpinus betulus*), maples (*Acer platanoides*) and spruces (*Picea abies*). A characteristic feature of the park is a row of impressive, evergreen northern white-cedars (*Thuj a occidentalis*) with conical forms. The complex also includes fountains, statues, flower beds and ponds. But the key question is: can people with disabilities use this park in normal way?

**Inventory of the site.** Thanks to collecting the guidelines, on their basis were carried out field studies. As a result of inventory, the information about the current state of the greenery has been obtained. These data made it possible to carry out analysis and assessment of the accessibility of space for people with disabilities.

The analysed area is an integral part of the city and is not fenced off in any way. For this reason, there are many entrances to it from all sides. Some of the entrances to the park are preceded by a pedestrian crossing. They are marked with a different facture on the surface. However, only those from the south and west side can be described as tactile warning field. The whole area of Planty Park is for pedestrian traffic. The only exception is the part of Akademicka Street that
intersects it in the south. The main communication routes are paved, but most of the side paths are ground (Fig. 2). Not including trampled by the people paths, their width is appropriate. Benches and garbage bins are located along the paths and do not interfere with pedestrian traffic. There are 31 terrain stairs in the park and over a half of them contains ramps (16). However, it does not mean that all are adapted for disabled. 2 of 3 water reservoirs is located directly nearby the sidewalks and the strip of lawn with a width of 2 m separates them. This one on the main avenue contains fountains.

Fig. 2. Map of the park (Own work on the basis of basic map)

In the place where Akademicka street intersects the park, there are black bollards that block the entrance for cars. They can be an obstacle for the blind and visually impaired people. Pedestrian crossing does not include traffic lights or sound signals, but it is not too busy street. In the nearest area of the park there are 223 parking spaces, of which 9 are for disabled people. This is 4 % of the total.

Discussion

Data that had been collected during the field studies were used to make a map that contains a rating of accessibility of the park (Fig. 3). Unfortunately, a big part of the park is not fully accessible for people with disabilities. Places highlighted in green represent the paths, where movement does not cause troubles. These are mostly the main (paved) avenues which show that crossing through the park is unproblematic. People with disabilities can also use the main functions
of the park. Entrances to the park are mostly accessible too. Whereas most of the side paths are not as accessible as paved paths. Places marked in yellow are medium available and may require help of non-disabled people. This is caused by uneven ground, slopes and too steep ramps, which are more suitable for mothers with prams. Unfortunately, there are also places, which people with disabilities should avoid. These are highlighted in red. However, these are less significant paths or shortcuts.

The whole park is definitely less accessible for the blind and visually impaired people. This is evidenced by poor marking stairs, or lack of them, and the use of tactile pavement only at some of pedestrian crossings. Most of the difficulties are caused by the ground paths that are uneven. Their improvement could significantly increase the accessibility at least for people in wheelchairs. An important space in the park that requires modernization is definitely a place in the eastern part. There is a water reservoir with a sculpture called Praczki and groups of coniferous shrub plantings. The surface there is in a very bad condition, which practically prevents access for people with disabilities.

**Conclusions**

It's hard to say about the Planty Park as a place fully accessible. However, it can be seen that there are changes for the better, such as the new ramp on the main avenue or tactile warning field...
before pedestrian crossings. But this is still not enough and it is necessary to introduce further changes and modernization if park would become a disabled-friendly place.

Many disadvantages of planning the availability are the results of the lack of definition the specific accessibility standards for Białystok city. In the near future, this should be changed as it is in other Polish cities. It certainly will help to obligate the design offices to plan better accessibility in public procurement. Economic aspects also not conducive to improving the situation, but every investment aimed at improving accessibility can be spread over time. A progressive modernization may compensate high disposable costs. Polish law also requires changes to make consistent standards and obligate to use them.

**Note.** The article was prepared in frames of the statutory work S/WBiS/2/2016 realized by ZDAK, WBiIŚ, PB

**References**

10. Rozporządzenie Ministra Infrastruktury z dnia 12 kwietnia 2002 r. w sprawie warunków technicznych, jakim powinny odpowiadać budynki i ich usytuowanie (Dz.U. 2002 Nr 75 poz. 690, z późniejszymi zmianami).