

A universal standard for health-promoting places. Example of assessment – on the basis of a case study of Rahway River Park

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Abstract: The purpose of this paper is to contribute to development of approaches to the evaluation of the design of public open green spaces (POS). This paper presents a universal standard for the design of health-promoting urban places. The standard is a conceptual framework which was developed after visiting over one hundred public parks and therapeutic gardens in Europe and the United States. The universal standard is a simple and effective tool that can be used by both professional designers and non-professionals to improve the health-promoting qualities of open green spaces. Rahway River Park, designed by Olmsted Brothers in 1925, serves as a case study.

Keywords: therapeutic landscapes, health-promoting places, universal standard of design, pattern of design

1. Introduction

The COVID-19 crisis highlighted human need to engage in open green spaces in cities. Current pressures due to urbanization have impacted the health and well-being of many people. Scientists confirm that everyday contact with nature is crucial for mental and physical health [1], [2]. Public parks can become places for mental and physical regeneration, physical activity, and social contacts. Green public spaces can act as therapeutic landscapes. Numerous researchers from various fields, e.g., environmental psychology, medicine, sociology, architecture, landscape design, and urban planning, have already described the main qualities of therapeutic landscapes [1], [2]. However, application of scientific approach is still needed [3]. The purpose of this study was to contribute to the development of methods of the evaluation of the design of public open green spaces (POS), particularly concerning therapeutic qualities of landscape for the promotion of the health of their users. The identified gap in knowledge results from the fact that existing quality assessment tools measure the physical activity infrastructure and

sustainable solutions, while the therapeutic qualities of public open green spaces are rarely measured. This universal standard could be used to evaluate public open green spaces (POS), encompassing practical implications of design recommendations and the justification of specific choices to facilitate the promotion of public health. It was developed after performing scoping literature review and on-site observation of over a 100 of POS in various countries (France, Poland, Sweden, and the USA).

2. Literature overview

Gesler (1996) defined therapeutic landscapes as places where “physical and built environments, social conditions and human perceptions combine to produce an atmosphere which is conducive to healing [4].” However, individual perceptions of therapeutic landscapes may vary. Erwin Zube (1987) noticed that experience, personal utility functions, and social and cultural contexts were involved in shaping perceptions and responses to landscapes [5]. The landscape is ‘a product of the human mind, and of material circumstances’ [6]. Spaces that are perceived as therapeutic by one person could be experienced as unsettling by another [7]. However, there are examples of places well-known for their enduring potential to promote healing, for example, Lourdes in France, St. Anne de Beaupre in Quebec, Canada, Epidaurus in Greece, and Bama village in China [8]-[11]. In practice, the term therapeutic landscapes usually refers to specific places of established salutogenic reputation. The term health-affirming landscapes is more extensive and refers to more common places that unite the qualities of therapeutic landscapes to influence people’s physical, mental and spiritual healing [12].

Both health-promoting places and therapeutic landscapes have therapeutic attributes. Though therapeutic landscapes are places which have an established reputation as well-known places of healing, the spiritual and symbolic aspects giving them an additional advantage. Material aspects alone can create human-friendly public spaces, but social conditions are needed to create health-promoting places, while spiritual and symbolic aspects further define therapeutic landscapes (Fig. 1).

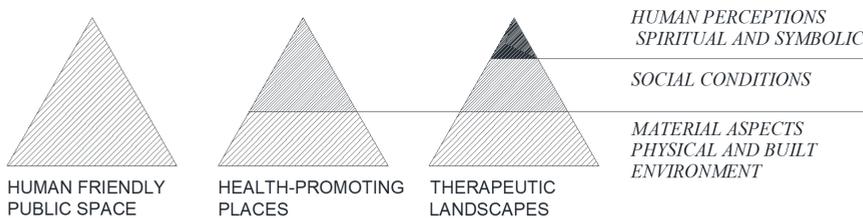


Fig. 1. Diagram showing the attributes directly related to therapeutic landscapes, overlapping with general qualities of human-friendly public spaces. *Source: author, 2020*

2.1. Healing contact with nature

Many researchers consider therapeutic landscapes as the presence of nature in the form of ‘green’ or ‘blue’ materialities [14]. Natural physical beauty is treated as a determinant of a salutogenic environment [15], [16]. Contact with nature can improve well-being and reduce stress level [17], [18]. Even watching nature can have a reassuring effect on patients before surgical operations and speeds up the post-surgery recovery [19]. Results of medical researches have shown that watching nature can stimulate significant physiological reactions within a few

minutes, i.e. can cause changes in the electrical activity of the brain, blood pressure, heart, and the muscular system [19], p 91].

Therapeutic landscapes provide an opportunity to slow down and gain a sense of being present and attentive to the world [7]. Healing has been linked to the fact that people have opportunity to focus on something other than their current problems. Therefore, elements which engage attention, stimulate senses, and provoke interest are attributed to *therapeutic landscapes* [20]-[22]. The human mind needs an optimal level of complexity and thrives in a sensory-rich environment [17, 23-24]. An experience of overcoming controllable danger, i.e., climbing a mountain, or crossing a river, demands full focus and provides a feeling of accomplishment [22], [25].

2.2. Social bonds

The therapeutic properties of landscape depend on the social context of the place [4]. Even superficial social contacts can have a beneficial influence on human health [18], [26]-[30]. Green public spaces are conducive both to having strong relationship with the living environment, and to giving opportunities for social contacts [28]-[29], [31], [32]. Designers may have little impact on the social environment, but they can facilitate bringing people together. Jan Gehl has listed three categories of outdoor activities in the public areas: “necessary activities”, “optional activities,” and “social activities” (2011) [33]. “Necessary activities” are activities that the participants have no choice about, such as walking to school. “Optional activities” depend on the participants’ desire to engage, such as going for a walk for pleasure. “Social activities” require engaging in contact with other people, such as children playing, friends talking, and passers-by briefly greeting each other. In a well-designed physical environment, the optional and social activities occur with high frequency. POS are places which can offer the possibility to restore mental health, as well as physical activity and social contacts.

2.3. Mental restoration

Salutogenic landscapes are often associated with places to rest in silence and solitude [19], [33]-[34]. Secluded gardens, which offer a sense of enclosure, have been mentioned in numerous researches over the years [20], [34], [35]. An interesting theoretical framework has been developed for the design of therapeutic gardens [36]. Many researchers have focused on the spiritual meaning of healing and the positive relationship between spiritual activity and health and well-being [14], [21], [37].

2.4. The importance of physical activity

Greenspace exposure is positively associated with moderate to vigorous physical activity and physical activity is directly linked to promotion of health and well-being [37]. A team of Japanese doctors led by Takehito Takano (2002) has already proven that a well-designed system of green areas encouraging walking is a factor which can directly affect the longevity of senior citizens [38]. According to Gibson’s theory, affordances of an environment are what it offers to users (2014) [39]. Affordances are all the possible actions that may occur in a place, and the actions needed to be discoverable by the user. The promotion of health is one of the possible affordances of public open green spaces (POS) [41]. With careful design, healing affordances should be easily perceptible to users and public open green spaces would “tell people what to do with them”, i.e., rest in silence and solitude, observe wildlife and other people’s activities,

engage in socializing with other people, play sports, etc. A recent study demonstrated the positive effect of a sensory garden on ‘apparently well’ people in the workplace [42].

2.5. Current frameworks for classifying parks

In this study, places are defined as public open green spaces (POS). POS are classified in the literature in many ways. The classification schemes are based on the size and distance to potential users, as well as their primary functions [42], [43]. A comprehensive typology was proposed by the Government of Western Australia (2012). It identifies three primary types of open spaces according to function (primary use and expected activities): recreation spaces, sport spaces, and nature spaces, as well as four categories based on catchment hierarchy (typical size and how far a user might travel to visit the site), which includes: local open space, neighbourhood open space, district open space, and regional open space.

2.6. Measure-oriented approaches to POS design

There are tools available for the assessment of a park users’ physical activity levels, e.g., SoPARC, SoPLAY, or EARPS. These can be used to foster the quality and for improvement of the POS. However, they do not include the evaluation of restorative qualities. Thus, despite growing attention to this topic, there is a lack of specific tools that enable a structured analysis of therapeutic qualities of the POS.

3. Methods

This long-term study began in 2001 with the aim of systematizing the qualities of therapeutic landscapes. It was driven by the objective to develop a universal standard of health-promoting places which could be implemented in various cultural settings.

The study was carried out by the author on over a hundred ($n=125$) public open green spaces (POS) and private therapeutic gardens in Europe and the United States. The choice of the cities in this study resulted from personal experience. The list mostly includes cities where the author has lived, worked or studied. Therefore, it includes well-known parks in New York and Paris, as well as several parks in Poland. A full list of the parks and gardens is presented in Table 2. Public parks and therapeutic gardens visited during the field research. The POS were visited frequently, on multiple occasions, which allowed for repeated observations in different time frames to give a broader and deeper perspective on users’ behaviour.

The aim was to visit and assess not only famous parks, but also less well-known places which have been referred to as favourite places of recreation by residents of the neighbourhoods. These human perceptions were treated as a social proof of the therapeutic qualities of a landscape.

This study has concentrated on determining what has worked well in the parks visited. The time spent in each of the public parks ranged from two to multiple hours. The length of stay usually depended on the size of a park and the number of its attributes. The data collection methods included study walks exploring the entire park territory, observation of users’ activities and preferences, as well as unstructured interviews with park users.

Table 1. Public parks and therapeutic gardens visited during the field research

Country	City and Vicinities	Number of Parks Visited	Public Parks and Therapeutic Gardens
USA	New York	12	Central Park, Paley Park, Bryant Park, Gramercy Park, Madison Square Park, Union Square Park, Washington Square Park, Stuyvesant Square Park, John Russel Wheeler Park in Linden, NJ, Rahway River Park, Cheesequake State Park, Rutgers University Gardens
France	Paris	50	Bois de Boulogne, Bois de Vincennes, Parc André Citroën, Jardin d'Acclimatation, Jardin Bagatelle, Parc de Belleville, Parc de Bercy, Parc George-Brassens, Parc de la Butte-du-Chapeau-Rouge, Parc des Buttes-Chaumont, Parc Floral, Parc Kellermann, Parc Monceau, Parc Montsouris, Parc de la Villette, Jardin Atlantique, Jardin de l'UNESCO, Jardin du Luxembourg, Jardins du Palais Royal, Jardin du Trocadéro, Jardin des Tuileries, Jardin des Plantes, Jardin Villemin, Promenade plantée, Promenade des Berges de la Seine, Square de Batignolles, Parc Martin Luther King, Grand Parc de Docks de Saint Ouen, Jardin thérapeutique- Grain de Vie Hôpital Curie, Jardin de L'Ile Seguin, Parc de Billancourt, Jardin Catherine Labouré, Square Boucicaut, Jardin Tino Rossi, Jardin de Reuilly, Square Jean XXIII, Square R.Viviani, Square du Vert Galant, Square Lois XIII, Jardin de la Vallée Suisse, Square L-Frapié, Jardin des Fougères, Square E.-Fleury, Square du Serment-de-Koufra, Parc des impressionnistes – Clichy, Parc de Sceaux, Parc de Versailles, Parc de Fontainebleau, Parc de Chantilly, Parc de Saint Cloud, Parc Du Chemin De L'Ile
Sweden	Stockholm	3	Djurgården, Tryggghansa, Kronobergsparken
	Poznań	19	Botanical Garden, Park Fryderyka Chopina, Park Cytadela, Park Czarneckiego, Park Jana Kasprowicza, Park Karola Kurpińskiego, Park Karola Marcinkowskiego, Park Adama Mickiewicza, Park Stanisława Moniuszki, Park Solacki, Park Tysiąclecia, Park Thomasa W. Wilsona, Park Henryka Wieniawskiego, Park Stare Koryto Warty, Spatial Orientation Park in Owińska, Malta, Park Wodziczki, Park Szelągowski, Park Zwycięstwa
	Cracow	16	Botanical Garden, Planty, Bulwary Wiślane, Park Strzelecki, Park Tadeusza Kościuszki, Park Henryka Jordana, Park Ludwika Decjusza, Park Wojciecha Bednarskiego, Park Wincentego a Paulo, Park Lotników Polskich, Stanisław Lem Garden of Experiences, Biblical Garden, Proszowice, Therapeutic Garden, Rabka, Park Zdrojowy, Rabka, Kalwaria Zebrzydowska, Archeological Museum
	Bydgoszcz	10	Botanical Garden, Park Dolina Pięciu Stawów, Park Balaton, Park in Mysłęcinek, Park im. Kazimierza Wielkiego, Park Jana Kochanowskiego, Park Henryka Dąbrowskiego, Park Księżycowy, Park Zbigniewa Załuskiego, Park in Ostromecko
	Gdańsk	15	Park Oliwski, Park Oruński, Park Kuźniczki, Park Haffnera, Park Steffensów, Park Ronalda Regana, Medicinal Plant Garden, Park Haffnera, Sopot, Park Kiloński, Gdynia, Kamienna Góra, Gdynia, Park im. A. Majkowskiego, Wejherowo, Kalwaria, Wejherowo, Tricity Landscape Park, Park Starowiejski, Rumia

4. Findings and analysis

During this study, a conceptual framework for a universal standard of health affirming places was developed in an iterative process. The first draft was gradually amended with new findings. The final draft of the standard is presented in Table 2. A universal standard for health-promoting urban places. The qualities were divided into five categories: 1. Sustainability, 2. Accessibility, 3. Amenities, 4. Design and 5. Placemaking. Those categories were used to organize the qualities of therapeutic landscapes in a legible manner.

Table 2. A universal standard for health-promoting urban places. *Source: updated by the author [44]-[46]*

1. SUSTAINABILITY	2. ACCESSIBILITY	3. AMENITIES	4. DESIGN	5. PLACEMAKING
1.1. Place Area	2.1. Distance to park	3.1. Psychological and physical regeneration	4.1. Architectural design	5.1. Enhancement of Social Contacts
Location	Width of sidewalk	Natural Landscapes	Human scale	Organization of events
Surrounding urban pattern	Evenness of surface	Green open space	Focal points and landmarks	Meeting places for groups
1.2. Environmental characteristics	Lack of obstructions	Presence of water	Structure of interior connections	5.2. Human perception -spiritual & symbolic
Soil quality	Slope	Places to rest in the sunshade	Framed views	Sacred places
Water quality	Sufficient drainage	Places to rest in silence and solitude	Long vistas (Extent)	Works of Art
Air quality	2.3. General conditions of walkways	3.2. Promotion of Physical Activities	Pathways with views	Monuments
Noise level	Maintenance	Sports and recreational infrastructure	Invisible parts of the scenery (Vistas which engage the imagination)	Culture and connections to the past
Forms of natural protection	Overall aesthetics	Community gardens	Possibility to watch other people	Thematic gardens
Green and Blue Infrastructure	Street art	Addressing the needs of people with disabilities	Possibility to see wildlife	Personalization
1.3. Biodiversity protection	Sufficient seating	3.3. Catering for basic needs	4.2. Salutogenic design	5.3. Community Engagement
Parts of open green space not available to visitors	Perceived safety	Safety and security (presence of guards, cleanliness, maintenance, etc.)	Optimal levels of complexity	Personalising the architectural process
Native plants	Buffering from traffic	Places to sit and rest	Engaging features	Participation of all stakeholders, including inhabitants and users
Native animals	Street activities	Shelter	Risk	Determining the rules of conduct and self- management
Natural maintenance methods	Vacant lots	Restrooms	Mystery/ Fascination	Space for social contacts – third places – fourth places
1.4. Sustainable water management	2.4. Traffic	Drinking water	Movement	
Rainwater infiltration	Speed	Food (possibility to buy food in the park or in the closest vicinity)	4.3. Sensory stimuli design	
Irrigation with non-potable water	Volume		Sensory stimuli: Sight	
1.5. Parks of Second (New) Generation	Number and safety of crossings		Sensory stimuli: Hearing	
1.6. Urban metabolism	Stop signs		Sensory stimuli: Smell	
1.7. Ecological energy sources	On-street parking		Sensory stimuli: Touch	
	Air quality		Sensory stimuli: Taste	
	Noise level		Sensory path	
	Sufficient lighting			
	Sunshine and shade			
	Visibility of nearby building			
	2.6. Public transport stops			
	2.7. Sufficient Parking			

4.1. Proposed methodology of assessment with the universal standard for health-promoting urban places

Each of the five categories includes sub-categories and individual attributes. The final draft of the universal standard of design for health-promoting places can be used for binary or detailed assessment. The binary assessment has only 2 categories (0;1):

0 – No, not observed.

1 – Yes, satisfactory.

The maximum number of points for binary assessment are presented in Table 3. Maximum number of points for binary assessment. Simple manual calculation method was used to add the points. A customized Excel spreadsheet was used to verify the results.

The detailed assessment required a written explanation why the researcher thought that the attribute was present, satisfactory, and worthy granting a point.

Table 3. Maximum number of points for binary assessment. *Source: author*

	MAXIMUM NUMBER OF POINTS
TOTAL	91
CATEGORIES	
1. SUSTAINABILITY	15
1.1.Place	Category with no points
1.2.Environmental characteristics	6
1.3.Biodiversity protection	4
1.4.Sustainable water management	2
1.5.Parks of Second (New) Generation	1
1.6.Urban metabolism	1
1.7.Ecological energy sources	1
2. ACCESSIBILITY	26
2.1.Distance to park	1
2.2.Sidewalk Infrastructure	5
2.3.General conditions of walkways	8
2.4.Traffic	5
2.5.User Experience	5
2.6.Public transport stops	1
2.7.Sufficient Parking	1
3. AMENITIES	15
3.1.Psychological and physical regeneration	5
3.2.Promotion of Physical Activities	4
3.3.Catering for basic needs	6
4. DESIGN	21
4.1.Architectural design	10
4.2.Salutogenic design	5
4.3.Sensory stimuli design	6
5. PLACEMAKING	14
5.1.Enhancement of Social Contacts	2
5.2.Human perception -spiritual & symbolic	6
5.3.Community Engagement	6

Proposed methodology for assessment of individual categories was provided in tables 4-8. Each of the tables provides the number of points possible to gain in each category for every individual feature as well as general description of requirements. For better clarity, the results of the assessment were grouped into five tables (Tables 4-8).

The standard consists of five categories.

1. Sustainability

This section is dedicated to assessments of the general characteristics of a local area (table 4). In the case of existing parks, most of these characteristics, e.g., place: area, location, surrounding urban patterns, are beyond the control of park designers. However, at the planning stage, decisions about the location of a park can be discussed. Design criteria should always be oriented on the location, its environmental characteristics, and landscape values.

Environmental characteristics (biodiversity, soil, water, and air quality) can significantly improve or undermine the therapeutic qualities of a location [46], [47].

This section includes all the aspects relating to the sustainable design of public parks: the protection of native fauna and flora and enabling the natural infiltration of rainwater and harvesting it for irrigation. Sustainable management of water and soil require special maintenance techniques and may limit the choice of plants, but it is beneficial for both our planet and people.

Table 4. Draft table for *sustainability assessment* (right column – number of points). *Source: author*

1. SUSTAINABILITY		15
1.1. Place		Category with no points
Area	Provide detailed description	Category with no points
Location	Provide detailed description	Category with no points
Surrounding urban pattern	Provide detailed description	Category with no points
1.2. Environmental characteristics		6
Soil quality	Sufficient for recreational use. No visible traces of pollution	1
Water quality	Sufficient for recreational use. No visible traces of pollution	1
Air quality	Sufficient for recreational use. No visible traces of pollution	1
Noise level	No nuisance to moderate noise nuisance	1
Forms of natural protection	Are there any forms of natural protection?	1
Green and Blue Infrastructure	Does the park form part of the green and blue infrastructure? If YES – 1 point	1
1.3. Biodiversity protection		4
Parts of open green space not available to visitors	Are there any secluded areas for biodiversity protection?	1
Native plants	Planting with native species	1
Native animals	Are there native species present in the park? If YES – 1 point	1
Natural maintenance methods	What kind of methods of maintenance are used? If only natural – 1 point	1
1.4. Sustainable water management		2
Rainwater infiltration	Porous, permeable surfaces.	1
Irrigation with non-potable water	If irrigation with non-potable water is used – 1 point	
1.5. Parks of Second (New) Generation		1
	Can the park be considered as a park of second (new) generation	1
1.6. Urban metabolism		1
	Is waste segregation facilitated? If YES – 1 point	1
1.7. Ecological energy sources		1
	Are there ecological energy sources used in the park? If YES – 1 point	1

2. Accessibility

In the case of health-affirming urban places, the qualities of the entrances and pedestrian routes leading to the park are as important as the design of the park itself (table 5). This category could be called the ‘walkability assessment’ [47]. Universal accessibility, understood as addressing the needs of people with disabilities, is directly linked to the therapeutic potential of a park and the possibilities for the promotion of health.

Table 5. draft table for *accessibility assessment* (right column – number of points). *Source: author*

2. ACCESSIBILITY		26
2.1.Distance to park		1/1
	Is it possible to walk to park? If YES – 1 point	1
2.2.Sidewalk Infrastructure		5
Width of sidewalk	Sufficient for walking	1
Evenness of surface	Sufficient for walking	1
Lack of obstructions	Lack of obstructions	1
Slope	Flat, no significant slope	1
Sufficient drainage	Sufficient for walking	1
2.3.General conditions of walkways		8
Maintenance	The park is perceived as clean. No visible traces of litter	1
Overall aesthetics	The park is perceived as aesthetically pleasing	1
Street art	The park is perceived as a safe place	1
Sufficient seating	Multiple benches	1
Perceived safety	The park is perceived as a safe place	1
Buffering from traffic	Sufficient	1
Street activities	Occasional events, organised or spontaneous	1
Vacant lots	No vacant lots adjacent to park. The park is perceived as a safe place	1
2.4.Traffic		5
Speed	Slow. The park is perceived as a safe place	1
Volume	Moderate. The park is perceived as a safe place	1
Number and safety of crossings	Numerous possibilities for crossing the street	1
Stop signs	Yes. The park is perceived as a safe place	1
On-street parking	Yes. The park is perceived as a safe place	1
2.5.User Experience		5
Air quality	Good. The park is perceived as a safe place	1
Noise level	Moderate. The park is perceived as a safe place	1
Sufficient lighting	Yes, numerous lamps. The park is perceived as a safe place	1
Sunshine and shade	Yes. Trees provide shade	1
Visibility of nearby buildings	Yes. The park is perceived as a safe place	1
2.6.Public transports stops		1
	There are bus stops near the park	
2.7.Sufficient Parking		1
	Yes, there are numerous parking spots in the park	1

3. Amenities

This section concerns sports and leisure equipment, as well as park facilities related to promoting physical and mental rejuvenation, encouragement of physical activities and moderate social contacts (table 6). A fourth category relates to the basic needs of park users, such as

shelter, restrooms, drinking water, food, and places to sit and rest. It also includes properties that bring a sense of safety and security: the presence of guards, cleanliness, and maintenance.

Table 6. Draft table for *amenities assessment*. (right column – number of points). *Source: author*

3. AMENITIES		15
3.1. Psychological and physical rejuvenation		5
Natural landscapes	Are there places which give an impression of a pristine natural landscape? If YES – 1 point	1
Green open space	Are there any green open spaces? If YES – 1 point	1
Presence of water	Is there any water in the park? If yes, in what form? If YES – 1 point	1
Places to rest in the sun and shadow	Multiple places to sit and rest in the sun and shadow	1
Places to rest in silence and solitude	Multiple benches to rest and enjoy silence and solitude	1
3.2. Physical Activity Promotion		4
Sports infrastructure	Are there any sports infrastructure in the park? Is it satisfactory for various age groups? If YES – 1 point	1
Recreational infrastructure	Is it satisfactory for various age groups? If YES – 1 point	1
Community gardens	Are there any community gardens? If YES – 1 point	1
Addressing the needs of people with disabilities	Are the pathways wide and even? Is the park area accessible? If YES – 1 point	1
3.3. Catering for basic needs		6
Safety and security (presence of guards, cleanliness, maintenance, etc.)	Assessed as a safe place. If YES – 1 point	1
Places to sit and rest	Are there any? Are they satisfactory? If YES – 1 point	1
Shelter	Are there any? Are they satisfactory? If YES – 1 point	1
Restrooms	Are there any? Are they satisfactory? If YES – 1 point	1
Drinking water	Are there any? Are they satisfactory? If YES – 1 point	1
Food (possibility to buy food in the park or close vicinities)	Are there any? Are they satisfactory? If YES – 1 point	1

4. Design

This section encompasses the distribution of functions within the park space and the organization of its grid of connections (table 7). It is important that the design of a park is comprehensible and the composition harmonious. Some attributes are important when it comes to engaging the interest of users, such as mystery, risk, and movement. A separate category is dedicated to multi-sensory stimuli and sensory paths.

Table 7. Draft table for *design assessment* (right column – number of points). *Source: author*

4. DESIGN		21
4.1. Architectural design		10
Human scale	Is the design respecting the human scale? If YES – 1 point	1
Architectural variety of urban environment	Is the Architectural variety observed in the surrounding urban environment? If YES – 1 point	1
Focal points and landmarks	Are there any clear landmarks? If YES – 1 point	1
Structure of interior connections	Is there a clear structure of interior connections? If YES – 1 point	1
Framed views	Are there any? Are they satisfactory? If YES – 1 point	1
Long vistas (Extent)	Are there any? Are they satisfactory? If YES – 1 point	1
Pathways with views	Are there any? Are they satisfactory? If YES – 1 point	1
Invisible parts of the scenery (Vistas which engage the imagination)	Are there any? Are they satisfactory? If YES – 1 point	1
Possibility to observe other people	Are there any possibilities to observe other people? Are they satisfactory? If YES – 1 point	1
Possibility to observe animals	Are there any possibilities to observe animals? Are they satisfactory? If YES – 1 point	1
4.2. Salutogenic design		5
Optimal levels of complexity	Are there any features in this category? Are they satisfactory? If YES – 1 point	1
Engaging features	Are there any features in this category? Are they satisfactory? If YES – 1 point	1
Controlled Risk	Are there any features in this category? Are they satisfactory? If YES – 1 point	1
Mystery/Fascination	Are there any features in this category? Are they satisfactory? If YES – 1 point	1
Movement	Are there any features in this category? Are they satisfactory? If YES – 1 point	1
4.3. Sensory stimuli design		6
Sensory stimuli: Sight	Are there any features in this category? Are they satisfactory? If YES – 1 point	1
Sensory stimuli: Hearing	Are there any features in this category? Are they satisfactory? If YES – 1 point	1
Sensory stimuli: Smell	Are there any features in this category? Are they satisfactory? If YES – 1 point	1
Sensory stimuli: Touch	Are there any features in this category? Are they satisfactory? If YES – 1 point	1
Sensory stimuli: Taste	Are there any features in this category? Are they satisfactory? If YES – 1 point	1
Sensory path	Are there any features in this category? Are they satisfactory? If YES – 1 point	1

5. Placemaking

The most important feature of a human-friendly landscape is a sense of safety and belonging of all users (table8). Public parks offer an ideal possibility for various kinds of social contacts for people from usually isolated and disadvantaged social groups (the elderly, disabled, etc.). Placemaking is related to the popularity of a park. Here, the attributes which

relate to the promotion of moderate social contacts and human perceptions have been combined into one category.

Table 8. Draft table for *placemaking assessment* (right column – number of points). *Source: author*

5. PLACEMAKING		14
5.1.Social Contact Enhancement		2
Organization of events	Are there any events organised? Are they popular/ frequented? If YES – 1 point	1
Meeting places for groups	Are there any? Are they satisfactory? If YES – 1 point	1
5.2.Human perception – spiritual & symbolic		6
Sacred places	Are there any features in this category? Are they satisfactory? If YES – 1 point	1
Works of Art	Are there any features in this category? Are they satisfactory? If YES – 1 point	1
Monuments	Are there any features in this category? Are they satisfactory? If YES – 1 point	1
Culture and connections to the past	Are there any features in this category? Are they satisfactory? If YES – 1 point	1
Thematic gardens	Are there any features in this category? Are they satisfactory? If YES – 1 point	1
Personalisation	Are there any features in this category? Are they satisfactory? If YES – 1 point	1
5.3.Community Engagement		6
Personalising the architectural process	Are the persons responsible for the design, construction and management known to the public? If YES – 1 point	1
Participation of all stakeholders, including inhabitants and users	Do all stakeholders, including inhabitants and users have a real influence on the design and maintenance through participatory process? If YES – 1 point	1
Determining the rules of conduct and self-management	Are there any rules of conduct and self-management established and publicly available? Are there any information boards with rules of conduct and self-management placed in the public space? Were the rules of conduct and self-management established in a participatory process? Do all stakeholders including inhabitants and users agree upon the common rules of conduct and self-management? If YES – 1 point	1
Space for social contacts	Is there an inclusive, accessible space for social contacts available to all? If YES – 1 point	1
– third places	Can it be the third place for anyone? If YES – 1 point	1
– fourth places	Can it be the fourth place for anyone? If YES – 1 point	1

5. Case study of Rahway River Park, NJ, USA

Rahway River Park in Union County, NJ, USA (Fig. 2) was chosen as a case study to demonstrate the way of using the universal standard. This park is well-documented in the history of landscape design and well-known internationally, as it was designed by the Olmsted brothers. Firstly, this place was recommended to the author by regular parkgoers who described it as a good place to disengage from the problems of everyday life. One of them described this experience: “After one hour spent in the park, the weariness of the daywork in front of the computer disappears. I come back home from this park with new energy.” The research question was what makes this park a health-promoting place in terms of the architectural and landscape design? (Fig. 2-10).



Fig. 2. Rahway River Park as seen from above. *Source* [48]



Fig. 3. Rahway River Park – wildlife. *Source: author's photography*



Fig. 4. Rahway River Park in the winter – play areas. *Source: author's photography*



Fig. 5. Rahway River Park – one of the smaller exercise areas. *Source: author's photography*



Fig. 6. Rahway River Park – play areas. *Source: author's photography*



Fig. 7. Rahway River Park – Central open space. *Source: Author's photography*



Fig. 8. Rahway River Park. *Source: Author's photography*

5.1. Description

The park was created by the Union County (New Jersey) Parks Commission in 1921 as one of the neighbourhood parks in a county-wide continuous linear park system – Rahway River Parkway. It was designed by landscape architect Percival Gallagher, a partner at the Olmsted Brothers company. The park was created for the enjoyment and psychological health benefits it could provide for its users. This was the original idea of the park commissioners along with the landscape architects, and it represented a shift away from the City Beautiful Movement method of planning; to design more for people's health and well-being.

5.2. Assessment

The park was evaluated using the final draft of the universal standard of design for health-promoting places. Both a binary and a detailed assessment were performed. The binary assessment has only 2 categories (0;1):

0 – No, not observed

1 – Yes, satisfactory

The binary assessment is reported under section points (Tables 9-13). The detailed assessment required a written explanation why the researcher thought that the attribute applies. The detailed observation required numerous visits to the park, studying the plans and maps of the park area, as well as scoping the literature evidence. For better clarity, the results of the assessment were grouped into five tables (Tables 9-13).

Rahway River Park was created to protect the natural scenic beauty of the area from development and possible destruction. One of the main early rules of Frederic Law Olmsted (1822-1903) was respect for scenery. This approach is still visible in the park.

The accessibility evaluation was carried out on one road – Parkway Drive – as it is the main access for pedestrians.

The beauty of the park is in the overlapping of nature and recreational activities within its boundaries. There are quiet places to sit and contemplate, observe wildlife or people from a distance. The park houses a variety of sport equipment and recreational amenities, including two circular loops frequented by joggers along with multiple sport fields.

Table 9. Assessment of Rahway River Park – part 1. *Source: author*

		POINTS
1. SUSTAINABILITY		10/15
1.1.Place		-/-
Area	124-acre	
Location	The park is cradled by the Rahway River, which serves as a backdrop and a natural buffer from the nearby houses to the north and west. The Rahway River Park forms part of a series of parkways along the Rahway River (Rahway River Parkway), (Fig. 3).	
Surrounding urban pattern	Suburban / urban tissue. Rahway River, Rahway River Cemetery, family houses	
1. 2 Environmental characteristics		6/6
Soil quality	Sufficient for recreational use. No visible traces of pollution [49].	1
Water quality	Sub-optimal, according to the Water Quality Report [50].	1
Air quality	Good, according to the Air Quality index (AQI) [51], good air circulation. The presence of the Rahway River influences the local microclimate.	1
Noise level	Moderate noise nuisance comes from traffic in Saint Georges Street adjacent to the park and slow traffic in Parkway Drive in the park itself.	1
Forms of natural protection	County park, part of the Rahway River Parkway.	1
Green and Blue Infrastructure	It is an important part of the green and blue infrastructure. The park is a part of the Rahway River Parkway – a green belt of parkland along the banks of the Rahway River.	1
1.3.Biodiversity protection		2/4
Parts of open green space not available to visitors	There are no secluded areas for biodiversity protection.	0
Native plants	Planting is a combination of native and non-native species.	1
Native animals	Both native and foreign species were observed.	1
Natural maintenance methods	Data n/a.	0
1.4.Sustainable water management		1/2
Rainwater infiltration	Porous, permeable surfaces. Turf used as walkways.	1
Irrigation with non-potable water	Data n/a.	
1.5.Parks of Second (New) Generation		0/1
	Not observed.	0
1.6.Urban metabolism		1/1
	Waste segregation.	1
1.7.Ecological energy sources		0/1
	Data n/a.	

Table 10. Assessment of Rahway River Park – part 2. *Source: author*

		POINTS
2. ACCESSIBILITY		26/26
2.1.Distance to park		1/1
	Most users drive to the park. Some local residents live within walking distance.	1
2.2.Sidewalk Infrastructure-		5/5
Width of sidewalk	Sufficient for walking.	1
Evenness of surface	Sufficient for walking.	1
Lack of obstructions	Lack of obstructions.	1
Slope	Flat, no significant slope, (Fig. 4).	1
Sufficient drainage	Sufficient.	1
2.3.General conditions of walkways		8/8
Maintenance	The park is well-maintained.	1
Overall aesthetics	Satisfactory.	1
Street art	None.	1
Sufficient seating	Yes, multiple benches.	1
Perceived safety	The park is perceived as a safe place, well-lit and well-maintained. The police cars are circulating in park regularly.	1
Buffering from traffic	Sufficient for safety.	1
Street activities	There are occasional events, both organised and spontaneous.	1
Vacant lots	No, the park is surrounded by the river and residential lots.	1
2.4.Traffic		5/5
Speed	Slow, traffic limits.	1
Volume	Moderate to low.	1
Number and safety of crossings	Numerous possibilities for crossing the street.	1
Stop signs	Yes, with speed limits.	1
On-street parking	yes	1
2.5.User Experience		5/5
Air quality	good	1
Noise level	Moderate, because of the road.	1
Sufficient lighting	Yes, numerous lamps.	1
Sunshine and shadow	Yes. Trees provide shadow.	1
Visibility of nearby buildings	Residential properties and fences on one side of the park, the scenery of the river from other sides.	1
2.6.Public transport		0/1
	There are bus stops near the park, but the bus schedule is not frequent.	
2.7.Sufficient Parking		1/1
	Yes, there are numerous parking spots in the park, as well as along the streets.	1

Table 11. Assessment of Rahway River Park – part 3. *Source: author*

		POINTS
3. AMENITIES		14/15
3.1. Psychological and physical rejuvenation		5/5
Natural Landscapes	Natural borders planted with mature trees give an impression of a pristine natural landscape.	1
Green open space	Extensive grass-covered grounds at the centre of the park.	1
Presence of water	The Rahway River, a reservoir pond.	1
Places to rest in the sun and shade	Multiple places including picnic areas and playgrounds concealed among the trees.	1
Places to rest in silence and solitude	Multiple benches to rest in silence and solitude.	1
3.2. Physical Activity Promotion		3/4
Sports infrastructure	A track & soccer field, a baseball field, four softball pitches, tennis courts, a swimming pool, many loops for running and walking, (Fig. 5).	1
Recreational infrastructure	Recreational infrastructure for all age groups, (Fig. 6).	1
Community gardens	No	0
Addressing the needs of people with disabilities	Pathways are wide and even, the majority of the park area is easy accessible to people with disabilities.	1
3.3. Catering for basic needs		6/6
Safety and security (presence of guards, cleanliness, maintenance, etc.)	Assessed as a safe place.	1
Places to sit and rest	Numerous benches.	1
Shelter	Multiple shelters, including picnic areas with roofed shelters.	1
Restrooms	Yes, two separate units containing restrooms on opposite sides of the park.	1
Drinking water	Yes, drinking fountains, refreshment stands.	1
Food (possibility to buy food in the park or close vicinities)	Snack bar, Food Stands, occasionally food trucks.	1

Table 12. Assessment of Rahway River Park – part 4. *Source: author*

		POINTS
4. DESIGN		19/21
4.1. Architectural design		10/10
Human scale	The entire neighbourhood respects human scale; park interiors are cosy thanks to design and tree canopy. (Fig. 7-8)	1
Architectural variety of urban environment	Single-family individual houses.	1
Focal points and landmarks	Clear landmarks.	1
Structure of interior connections	A clear structure of interior connections.	1
Framed views	Natural frames are created by the trunks and canopy of mature trees.	1
Long vistas (Extent)	Yes, the park offers numerous extensive vistas.	1
Pathways with views	Yes, the path along Parkway Drive provides interesting views.	1
Invisible parts of the scenery (Vistas which engage the imagination)	Yes, numerous designed vistas that engage the imagination, (Fig. 9-10).	1
Possibility to observe other people	Plenty of places to watch the activities of other people from a distance – sport competitions, people running, children playing, etc.	1
Possibility to observe animals	Plenty of places to see wildlife from a distance – wild goose and other birds, squirrels, small animals, colourful insects – e.g., butterflies, etc.	1
4.2. Salutogenic design		4/5
Optimal level of complexity	Yes, the park was designed to offer both legible composition and optimal level of complexity, (Fig. 7-8).	1
Engaging features	There are multiple elements which attract attention, e.g., wildlife, running water in the river, greenery, presence of other users.	1
Controlled Risk	Several elements offer a subjective feeling of overcoming controlled risk, e.g., walking along the river.	1
Mystery/Fascination	no	0
Movement	Flowing river water, shimmering greenery.	1
4.3. Sensory stimuli design		5/6
Sensory stimuli: Sight	Some elements such as colourful leaves in the autumn, flowers in the warm season.	1
Sensory stimuli: Hearing	Sound of water in the river.	1
Sensory stimuli: Smell	Flowers in the warm season.	1
Sensory stimuli: Touch	Trees, water, snow in the cold season.	1
Sensory stimuli: Taste	Refreshment stands, snack bar.	1
Sensory path	no	0

Table 13. Assessment of Rahway River Park – part 5. *Source: author*

		POINTS
5. PLACEMAKING		10/14
5.1.Social Contact Enhancement		2/2
Organization of events	Organized events, sports competition – softball, baseball, etc., cultural events, food truck days, etc.	1
Meeting places for groups	Multiple picnic areas, roofed gazebos with amenities, open green space used for informal gatherings, etc.	1
5.2.Human perception – spiritual & symbolic		2/6
Sacred places	no	0
Works of Art	no	0
Monuments	The Horsehead Copper Monument is located on St. Georges Ave. across the Rahway River Park. Revolutionary War Site Marker – St. Georges Avenue outside Rahway River Park. The Historical Rahway Cemetery located next to Rahway River Park.	1
Culture and connections to the past	A bench with a commemorative plaque is dedicated to the memory of park founder Arthur Rindge Wendell. It can be found in the Rahway River Park facing the lake.	1
Thematic gardens	No	0
Personalisation	No	0
5.3.Community Engagement		6/6
Personalising the architectural process	The authors of the design – Olmsted brothers were well-known landscape architects.	1
Participation of all stakeholders, including inhabitants and users	All stakeholders, including inhabitants and users have a real influence on the design and maintenance of the park.	1
Determining the rules of conduct and self- management	There are information boards with rules of conduct and self-management placed in well-visible places.	1
Space for social contacts	There are inclusive, accessible space for social contacts available to all (picnic areas, roofed gazebos with amenities for reunions, etc.) Park is often used for organising family reunions.	1
– third places	It is a third place for some parkgoers.	1
– fourth places	It is a fourth place for occasional users	1

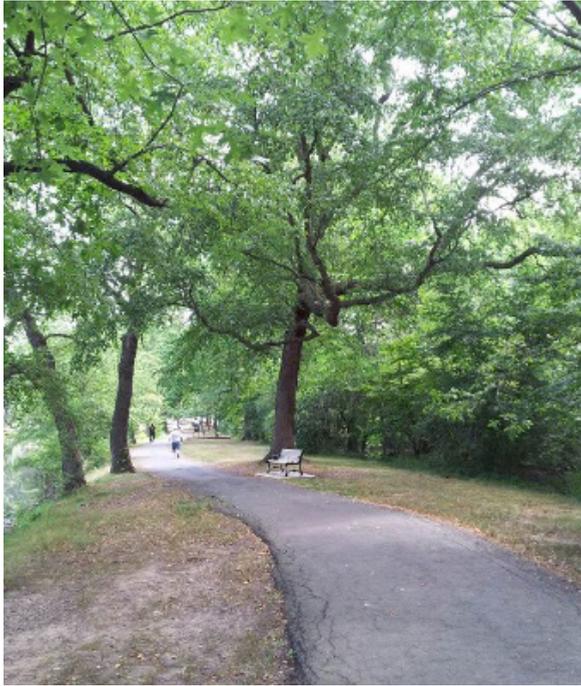


Fig. 9. Rahway River Park -walking and jogging loop. *Source: author's photography*

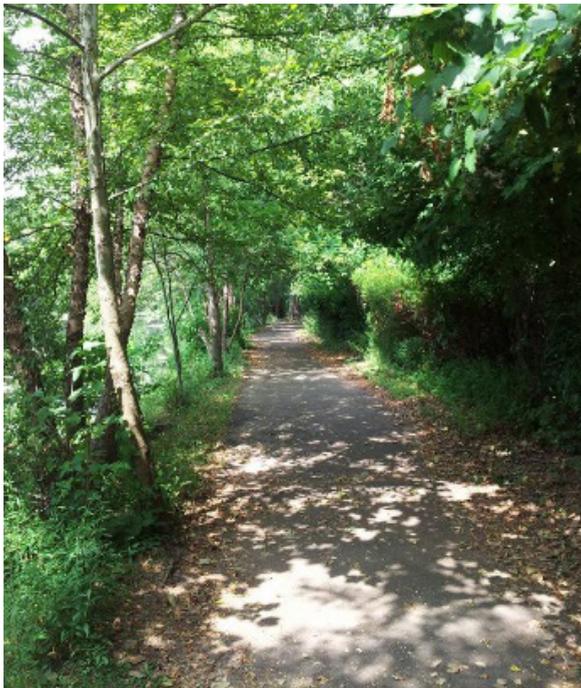


Fig. 10. Rahway River Park - one of the paths. *Source: author's photography*

6. Discussion

Nowadays, city residents need the contact with nature more than ever due to rapid urbanisation and shrinking areas of natural habitats. The results of numerous studies showed that regular visits to urban parks can stimulate the mental and physical regeneration, create social bonds, and facilitate physical activities.

Rahway River Park – built a hundred years ago to promote the health and well-being of Union County inhabitants – scored 86%, that is 79 out of a maximum 91 points. This result indicates that this is a health-promoting place. The universal standard method used in this research has helped to distinguish the material, social, spiritual & symbolic qualities of the park. Addressing the points that were missing, as observed by the author, might help to make the park more welcoming to people who are seeking a spiritual retreat, horticultural therapy sessions, sensory paths, etc.

There are limitations to this Universal Standard, because it is tainted by the subjectivity of perception. For example, section 4. – Design – includes points that require a more subjective assessment. The simplified scale does not allow for the evaluation of the quality and intensity of a given attribute. To mitigate this drawback, the binary assessment used here (0, 1) could be replaced with numerical grades (e.g. 0-10 or 0-100%), which would allow for more precise assessment of given attributes. In the case of more detailed assessments, the problem of subjectivity may be slightly mitigated with more comprehensive descriptions of the assessed attributes.

Previous work addressed the physical activity infrastructure and sustainable solutions assessment, but it did not provide the methods for measurement of therapeutic qualities of POS. This universal standard could be used to evaluate and justify the design choices of public open green spaces (POS). It was developed after scoping literature review and on site observation of over a 100 of POS in various countries in Europe and the USA.

The main identified limitation in its use stems directly from the subjectivity of perception during assessment. While many therapeutic attributes can be assessed objectively, some are more subjective due to the fact that perception of therapeutic landscapes may vary. Therefore, this universal model should not be used as a tool for statistical comparison of therapeutic values of different parks, but rather as an assessment tool. The subjectivity of assessments could be mitigated by providing more detailed descriptions of specific attributes or assessments by a team of researchers.

7. Conclusions

This paper presents a universal standard for health-promoting places. It was developed using an iterative process, after a long-term study of over a hundred public parks and therapeutic gardens located in Europe and the USA. The case study of Rahway River Park demonstrates that the proposed standard can be successfully used to identify the health-promoting qualities of an open green space and to find the areas for improvement.

The universal standard presents a significant advancement in the field of research of urban design and landscape architecture, because it merges an evidence-informed approach with systematic field study. This universal standard is a valuable tool based on research evidence (EBD) and post occupancy evaluation (POE). It could be used to facilitate decision making, justify choices, and incorporate research evidence into urban planning. It could also help in the design of therapeutic POS, as well as support other strategies for urban regeneration.

This universal model should be developed further, for example by including new attributes or determining which of the attributes should become mandatory prerequisites. COVID-19 by forcing social distancing and lockdowns emphasized the need for open urban green spaces. Remote work from home, unemployment, and health insecurity can increase stress level. Open green spaces should provide the opportunity for mental and physical restoration, physical activities, and allow for at least a bit of social contact. Public parks have become a refuge during the time when many sports and recreational facilities were closed. The criteria 2.1 Accessibility, Distance to a park and a question: Is it possible to walk to a park? proved to be the most important during the confinement when it was not possible to use public transport.

As the research was conducted in only a few regions of the Northern Hemisphere, further studies in the wider community may be required, as well as further validation, discussion, and development, in order for it to become a truly universal tool.

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