DOI: 10.23817/2026.defarch.2-7

JUSTYNA KLESZCZ
ORCID: 0000-0002-7571-6367
Opole University of Technology, Poland

THE CITY AS A SOUND EXPERIENCE. THE CONCEPT OF THE SOUNDWALK AS A METHOD FOR IMPROVING THE ACCESSIBILITY OF URBAN SPACES

MIASTO JAKO DOŚWIADCZENIE DŹWIĘKOWE. KONCEPCJA SPACERU DŹWIĘKOWEGO JAKO METODY ZWIĘKSZANIA DOSTĘPNOŚCI PRZESTRZENI MIEJSKICH

Abstract

The ‘soundwalk’ concept is currently being re-examined through the lens of urban accessibility. Research reveals that neurodivergent individuals frequently avoid noisy public spaces. Consequently, cities like Bristol design networks of quiet urban corridors. However, this raises a critical question: do these specialised pathways truly solve systemic acoustic exclusion, or merely disperse the broader challenge of adapting cities to diverse human sensory experiences?

Keywords: *Bristol, soundscape, soundwalk, urban planning*

Streszczenie

Koncepcja „spaceru dźwiękowego” jest obecnie ponownie analizowana przez pryzmat dostępności miejskiej. Badania wskazują, że osoby neuroróżnorodne często unikają hałaśliwych przestrzeni publicznych. W związku z tym miasta takie jak Bristol projektują sieci cichych korytarzy miejskich. Rodzi to jednak istotne pytanie: czy te specjalnie zaprojektowane trasy rzeczywiście rozwiązują problem systemowego wykluczenia akustycznego, czy też jedynie odciągają uwagę od szerszego wyzwania, jakim jest dostosowanie miast do zróżnicowanych ludzkich doświadczeń sensorycznych?

Słowa kluczowe: *Bristol, pejzaż dźwiękowy, spacer dźwiękowy, urbanistyka*

1. INTRODUCTION

Although the concept of a ‘soundwalk’ is now over half a century old, it is currently enjoying a genuine renaissance. What had previously developed as a trend in the alternative interpretation of urban space has now become part of a movement aimed at improving the accessibility of public spaces for users with diverse needs. Ever since the concept of accessibility has moved beyond mere physical accessibility – understood as the absence of barriers – there has

been a broader consideration of other elements that shape human wellbeing in urban spaces. Acoustic comfort in cities also forms part of this trend.

1.1. MATERIALS AND METHODS

This study used a mixed-methods approach, primarily a case study supported by qualitative methods. It began with a semi-structured literature review using Web of Science and Scite.ai. The review was restricted to English-language academic journals and books, as no relevant Polish publications were found. Keyword searches (e.g., 'soundwalk', 'accessibility', 'space') showed the concept's evolution over 50 years toward urban accessibility, though the overall number of publications remains limited.

2. SOUNDWALK AS A CONCEPT RELATED TO THE DESIGN OF URBAN SPACE

'World Soundscape' is an international research project that pioneered modern research into acoustic ecology. In his book 'The Soundscape', its creator, R. Murray Schafer, defined the term 'soundscape'[1] and emphasised the importance of human sound perception in creating a healthier living environment. He also proposed so-called 'soundwalks' as a form of exercise and awareness-raising.

The very concept of a 'soundscape' first appeared in academic literature relating to architecture, planning and urban studies in the late 1960s, thanks to Michael Southworth and his work, 'The Sonic Environment of Cities', published in 1969[2]; however, it was Schafer who defined it as a sonic environment with particular emphasis on the way in which it is perceived, experienced and understood by an individual or society. As part of this concept, Schafer proposed soundwalks as practical field exercises to raise people's awareness of the audiosphere around them, teaching them to appreciate its qualities and identify unique sound sources. Another important step was the definition of a soundwalk by composer Hildegard Westerkamp (2007) as 'any excursion whose primary purpose is to listen to the surroundings'[3]. This definition encompasses both traditional mindfulness exercises without the use of recording technology and projects utilising advanced audio equipment. However, a single, universally accepted definition of the concept has yet to be formulated.[4]

Over the following decades, this method evolved into various artistic and technological practices. Christina Kubisch's 'Electrical Walks' (2004–2024) used induction headphones to reveal urban electromagnetic soundscapes, while Janet Cardiff's[5] 1999 project 'The Missing Voice' guided participants through London's layers[6]. Since 2006, Andrew Brown has overlaid edited field recordings onto live environments[7] to blur the boundaries between live and

[1] R.M. Schafer, *The Soundscape: Our Sonic Environment and the Tuning of the World*, Knopf, New York 1977.
[2] J. Liu et al., *Effects of landscape on soundscape perception: Soundwalks in city parks*, "Landscape and Urban Planning" 2014, no 123, pp. 30–31.
[3] A. Brown, *Soundwalking in Space-Time,* "Kaylla" 2024, no 3, p. 74.
[4] J. Liu et al., *op. cit.*, pp. 30–31.
[5] A. Brown, *op. cit.*, p. 75.
[6] *Ibidem*, pp. 75–76.
[7] *Ibidem,* pp. 77–78.

archival sound. Contemporary soundwalks, such as Sena Karahan's 'Acoustic Palimpsests', now integrate soundscape studies and spatial mapping via QR codes.[8]

As the 'city of sound' concept grows, awareness of noise's negative impact on wellbeing, especially for sound-sensitive groups, has increased. Research shows a lack of urban design theories tailored to neurodiverse people, despite data linking acoustic environments to health and cognition. Prolonged exposure to urban noise poses serious health risks, including sleep disorders and cardiovascular disease[9]. Consequently, urban design is shifting toward 'restorative experiences' to mitigate stress and protect residents' overall health[10].

Traditional design of open public spaces focuses almost exclusively on mitigating environmental noise to comply with legal regulations[11]. This approach overlooks the benefits of pleasant sounds for human well-being. Existing policies based solely on noise reduction are insufficient, as acoustic perception depends on context, activities, and visual stimuli. For instance, urban greenery significantly enhances the perceived level of tranquillity and calm within a public space[12].

Contemporary design approaches treat the city as a multisensory whole, where sound helps shape identity through placemaking. Projects like the 'OpenCity' sound walks operate in transitional and boundary[13] spaces to counteract the alienation of regulated metropolises[14]. Furthermore, this approach redefines non-urban areas as distinct forms of soundscapes[15].

The classical anatomy of the soundscape proposed by this approach introduced into spatial planning a division into background sounds (*keynotes*), foreground signals (*signals*) and unique soundmarks of particular cultural and social significance to a given community (*soundmarks*)[16]. It was noted at the time that cities' open public spaces should be designed on a human auditory scale – in terms of the frequencies and volumes natural to human activity – which directly determines the sense of place and a sense of belonging among its residents. Contemporary design guidelines in sensory urbanism emphasise holistic management of the sound environment rather than merely reactive noise abatement, advocating the integration of mindful listening practices with spatial education and planning processes[17].

The contemporary discourse on the city's sonic experiences has become markedly institutionalised and deepened, permeating architecture, urban planning, sociology and social geography under the banner of 'sounding epistemologies'[18]. The formal expression of this

---

[8] R. Bocquillon, *Sounding Epistemologies: Placemaking Through Sound*, "Space and Culture" 2025, no 28(1), pp. 5–6.

[9] L.M. Aiello et al., *Chatty maps: Constructing sound maps of urban areas from social media data*, "Royal Society Open Science" 2016, no 3(3).

[10] *Ibidem*, p. 1.

[11] Directive 2002/49/WE of the European Parliament and of the Council of 25 June 2002 relating to the assessment and management of environmental noise, OJ L 189, 18.7.2002, pp. 12–25, http://data.europa.eu/eli/dir/2002/49/oj (access: July12, 2026).

[12] L.M. Aiello et al., *op. cit.*, pp. 21–22.

[13] A. Brown, *op. cit.*, p. 80.

[14] B. Truax, *Acoustic sustainability in urban design: lessons from the World Soundscape Project*, "Cities & Health" 2019, no 5(1–2), pp. 122–126.

[15] R. Bocquillon, *op. cit.*, p. 5.

[16] B. Truax, *op. cit.*, p. 1.

[17] L. Velasco-Pufleau, *Listening is action: a soundwalk with Hildegard Westerkamp*, "PeRformance Philosophy" 2023, no 8(1), pp. 86–100.

[18] R. Bocquillon, *op. cit.* p. 5

scientific evolution has been the development and introduction of the international standard ISO 12913 (including ISO 12913-1:2014)[19], which defines a soundscape as an acoustic environment perceived, experienced or understood by a person or people in a given context[20]. Consequently, the definition of the soundwalk itself has also changed; it is now interpreted in accordance with ISO 12913-2 as a qualitative method for exploring a given area, the aim of which is to focus attention on the perceived sounds or noises of the surrounding environment, led by a facilitator who guides a group of participants along a designated route and provides them with guidance[21].

Traditional studies of the urban audiosphere have suffered from the lack of a universal, formal lexicon of sounds, difficulties in precisely mapping the relationship between objective sound and subjective human emotionality, and an inability to study acoustic phenomena on a citywide scale, which has confined analyses to small, isolated field surveys[22].

A significant advance in our understanding has been brought about by the implementation of methodologies based on the analysis of social media data and geolocated images (as exemplified by the 'Chatty Maps' research project[23]). The use of community detection algorithms has allowed for the development of the first taxonomy of urban sounds. This has made it possible to link the sound profiles of streets to an emotional dimension (based on Robert Plutchik's theory), demonstrating empirically that streets dominated by the sounds of machinery and transport generate fear and anger, while the presence of people and music directly correlates with the emotions of joy and surprise. With regard to the evaluation of human perception, the current state of knowledge is based on principal component analysis models (e.g. Axelsson's model), which group acoustic experiences along the following axes: pleasant, chaotic, vibrant, uneventful, calm, annoying, eventful, and monotonous[24].

Contemporary research links sound walks with social geography and spatial philosophy, viewing listening and walking as sources of embodied knowledge. Based on Doreen Massey's theories, urban space is treated as a dynamic product of evolving social relations[25]. Additionally, theories of hauntology allow researchers to interpret sound walks as tools for evoking 'haunted landscapes'[26], while the concept of the 'Phonocene' introduces a multi-species perspective that challenges anthropocentric urban planning. Consequently, the soundwalk has evolved into a sophisticated research tool for analysing urban structures, social inequalities, and sensory exclusions[27].

Participatory research, conducted in accordance with the principles of citizen science, often using mobile technology and apps such as *Hush City*, makes it possible not only to map problem areas – that is, the noisiest ones – but also to draw up a plan of quiet spaces, which are therefore safe and comfortable for those users who require such spaces, while also taking

[19] *ISO 12913-1:2014. Acoustics – Soundscape – Part 1: Definition and conceptual framework*. International Organization for Standardization, Geneva 2014.
[20] L.M. Aiello et al., *op. cit*., p. 2.
[21] S. Mancini et al., *Soundwalk*, *Questionnaires and noise measurements in a university campus: A soundscape study*, "Sustainability" 2021, no 13(841), p. 4.
[22] *Ibidem*, pp. 2–3; A. Brown, *op. cit*., pp. 78–79.
[23] L.M. Aiello et al., *op. cit.*
[24] *Ibidem*, pp. 13–16.
[25] A. Brown, *op. cit*., p. 74.
[26] *Ibidem*, pp. 81–82.
[27] R. Bocquillon, *op. cit*., p. 5

into account the temporal variability of the factor in question[28]. Although the methodology for researching the acoustic environment of cities has already been developed and is publicly available, comprehensive studies of urban space remain rare. To date, however, apart from conclusions regarding the need to create a network of quiet spaces within a given city, these studies have not led to any particular changes in planning policy[29]. Recent findings point to the need for long-term research and for combining traditional analyses based on urban noise maps[30], emphasising the potentially significant influence of the environment itself on differences in sound perception due to local context, rather than on the physical level of environmental noise alone. This has led to the emergence of 'sensuous urbanism' as a concept designed to overcome the aesthetic dualism of the classical approach to urban planning, based on a multisensory perception of urban space, linked not only to purely parametric factors but also to the very way in which humans perceive space, taking into account their experience, history, cultural traditions, and the variability of an individual's psychophysical parameters over time[31]. Recent research also highlights 'soundsitting' as a tool complementary to sound walks, which involves sitting motionless in a chosen location and listening to sounds occurring in situ, providing the participant or researcher with a fixed perspective and observation point within a defined soundscape context. This enables a deeper understanding of the space and the possibility of comparing the results with acoustic measurements of the average equivalent sound level, as it allows the participant to experience a kind of 'averaged steady state' of the phenomena occurring within a given soundscape, thereby facilitating greater objectivity in the research findings[32].

3. A SPACE FOR NEURODIVERSE PEOPLE IN THE CITY

Today, cities are home to the majority of the world's population, but due to their complex, ever-changing and unpredictable nature, they can be extremely challenging for neurodiverse people[33]. Knowledge about how neurodiverse people perceive urban spaces remains limited, meaning their perspectives, challenges, and everyday spatial experiences are largely overlooked in academic research[34]. Recent studies show that the primary design strategy in public spaces in this context should be so-called 'sensory zoning', which involves the deliberate

[28] S. Jennings et al., *A citizen science and soundscape approach to the investigation of quiet areas for Limerick City*, [in:] *Proceedings of the 10th Convention of the European Acoustics Association Forum Acusticum 2023*, A. Astolfi, F. Asdrubali, L. Shtrepi (ed.), Politecnico di Torino, Torino 2023, p. 214.

[29] S. Jennings et al., *op. cit.*, p. 215.

[30] J.V. Manzano, J.A.A. Pastor, R.G. Quesada, *The importance of changing urban scenery in the assessment of citizens' soundscape perception. On the need for different time-related points of view*, "Noise Mapping" 2021, no 8, pp. 138–161.

[31] C. Palmese, J.L. Carles Arribas, A. Rodríguez Antolín, *The soundscape and listening as an approach to sensuous urbanism: The case of Puerta del Sol (Madrid)*, "Urban Planning" 2024, no 9, art. 7206.

[32] N.S. Bruce, *Extending soundwalking practice: Soundsitting as an inclusive and complementary method to soundwalking,* "Acoustics" 2023, no 5, pp. 788–797.

[33] T. Kenna, *Neurodiversity in the city: Exploring the complex geographies of belonging and exclusion in urban space*, "The Geographical Journal" 2023, no 189, p. 374.

[34] *Ibidem*, pp. 373–374

separation of areas with high and low stimulus intensity. Sound is one of the main stimuli in this context. Research, therefore, highlights the need to introduce transitional (buffer) spaces between the main activity zones, designed to allow time for the senses to adapt to the new environment[35]. Complex and crowded public spaces, such as airports or government offices, should, in this context, provide special, safe, quiet rooms where people experiencing sensory overload can rest, reduce stress and regain their balance. Although research to date has only described solutions of this type within buildings, there have already been calls to implement similar solutions in crowded open spaces where it is not possible to create zones with varying levels of stimuli.

4. A CASE STUDY – BRISTOL

Given the complexity of the issue of accessibility in urban public spaces, an interesting example is a project being carried out in Bristol that combines a citizen-led research initiative, academic research, and local authority programmes designed to improve the acoustic accessibility of urban spaces. The Tranquil City project[36] complements the work of the University of Gloucestershire and the city's Bristol Quiet Areas Plan, funded by a grant from the Ecological Citizen(s) Network+ (EPSRC/UKRI EP/W020610/1), running from December 2025 to August 2026. As a result of the research undertaken, accessibility audits and sound surveys are being carried out in various areas of the city, with the aim of documenting as many locations as possible within the Bristol Quiet Areas and linking them into a network that enables people to move around the city while minimising their exposure to excessive, unpleasant noise. Three such pilot sites have now been identified: Temple Church Gardens, St Stephen's Church Gardens and the Millennium Promenade. Information about them is available on publicly accessible websites, including Visit Bristol & Beyond[37] and Visit West's Accessibility Hub. The use of the 'soundwalk' method involves both experts and local residents in the project activities.

5. CONCLUSIONS

The evolution of the concept of the 'soundwalk' reflects a fundamental shift in the way the city – perceived as a soundscape – is viewed and shaped. The contemporary approach to the acoustic environment moves away from traditional, parametric noise measurement and reduction, shifting towards holistic management of the soundscape in the spirit of 'sensory urbanism'. In this context, the deliberate adaptation of the city to the needs of neurodiverse people is becoming one of the most important challenges facing contemporary spatial planning.

---

[35] R. Ghazali, S.R. Sakip, I. Samsuddin, *Creating Positive Environment for Autism Using Sensory Design*, "Environment-Behaviour Proceedings Journal" 2019, no 4(10), pp. 19–26.

[36] Resources, "Tranquil City", https://www.tranquilcity.co.uk/resources (access: 12.07.2026).

[37] *Bristol Quiet* Areas, "Visit Bristol & Beyond", https://visitbristol.co.uk/bristol-quiet-areas/ (access: 12.07.2026).

In this context, it is “essential to shift the design paradigm, moving away from the dominance of expert knowledge towards the active participation of users in the process of co-creating accessible urban spaces. As demonstrated by examples based on the concept of citizen science, such as The Bristol Quiet Areas Plan, typical objective noise maps and expert audits prove insufficient without overlaying them with the subjective experiences of local residents. Involving direct users enables precise mapping of problem areas and the designation of safe spaces, taking into account the local context, spatial relationships, and the variability of phenomena over time.

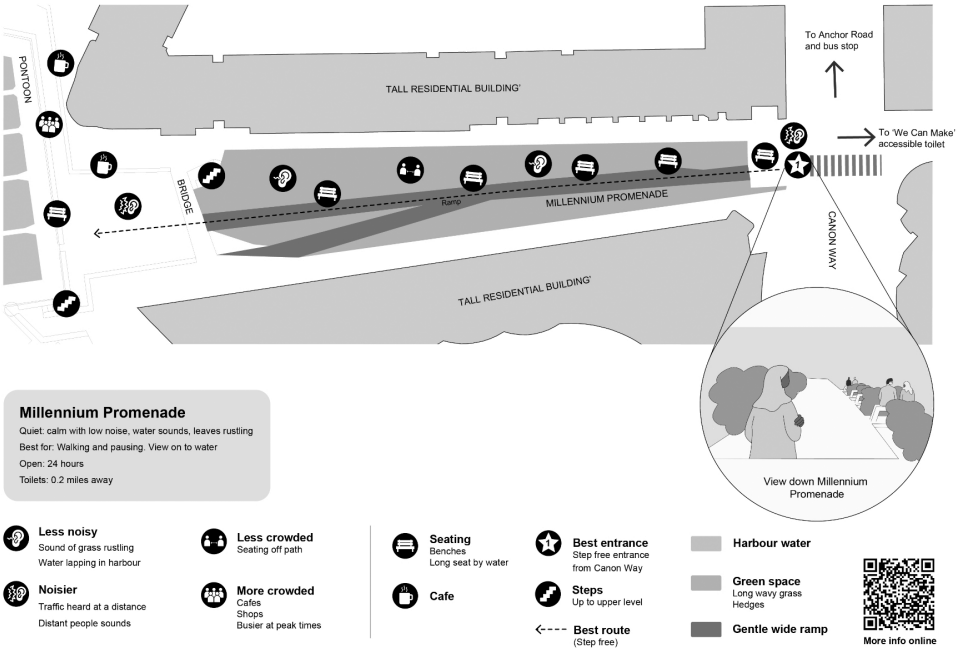
A multi-layered adaptation of the city to the needs of neurodiverse users is extremely important, as it directly counteracts the widespread yet often ignored problem of acoustic and sensory exclusion. This adaptation must go beyond simply confining the problem within separate buildings. It involves creating integrated networks of quiet corridors and buffer zones that allow vulnerable groups to use urban space without being exposed to excessive environmental stress. The acoustic environment thus becomes a factor determining the actual – rather than merely physical – accessibility of public spaces.

This process is extremely difficult to implement systematically. The complexity and dynamism of contemporary metropolises mean that urban space isconstantly changing. The fundamental difficulty lies in the impossibility of applying simple, architectural sensory zoning with varying stimulus intensities in open public spaces.

Achieving full accessibility of public spaces, therefore, requires combining field-based methods, such as shared sound walks and soundsitting, which have so far been used more in pilot research studies than in the implementation of urban policy, with long-term changes to urban planning, in which the right to a comfortable city is treated as one of the fundamental rights of every resident, including those who are neurodivergent.



Ill. 1. The Bristol Quiet Areas project website. The map shows the pilot locations. Source: https://visitbristol.co.uk/bristol-quiet-areas/ (access: 12 July 2026)



Ill. 2. Map of one of the pilot sites in The Bristol Quiet Areas programme – the Millennium Promenade. Source: https://assets.simpleviewinc.com/simpleview/image/upload/v1/clients/bristol/Bristol_Quiet_Areas_Site_Plans_Millennium_Promenade_41e437fc -5a05-4d10-a6af-fcfa6b-f66a61.jpg (access: 12 July 2026)

References

[1] Aiello L.M. et al., *Chatty maps: Constructing sound maps of urban areas from social media data*, "Royal Society Open Science" 2016, no 3(3), art. 150690.

[2] Bocquillon R., *Sounding Epistemologies: Placemaking Through Sound,* "Space and Culture" 2025, no 28(1), pp. 4–6.

[3] Brown A., *Soundwalking in Space-Time*, "Kaylla" 2024, no. 3, pp. 71–88.

[4] Bruce N.S., *Extending soundwalking practice: Soundsitting as an inclusive and complementary method to soundwalking,* "Acoustics" 2023, no 5, pp. 788–797.

[5] Directive 2002/49/WE of the European Parliament and of the Council of 25 June 2002 relating to the assessment and management of environmental noise, OJ L 189, 18.7.2002, pp. 12–25.

[6] Ghazali R., Sakip S.R., Samsuddin I., *Creating Positive Environment for Autism Using Sensory Design*, "Environment-Behaviour Proceedings Journal" 2019, no 4(10), pp. 19–26.

[7] *ISO 12913-1:2014. Acoustics – Soundscape – Part 1: Definition and conceptual framework*, International Organization for Standardization, Geneva 2014.

[8] Jennings S. et al., *A citizen science and soundscape approach to the investigation of quiet areas for Limerick City*, [in:] *Proceedings of the 10th Convention of the European Acoustics Association Forum Acusticum 2023*, A. Astolfi, F. Asdrubali, L. Shtrepi (eds.), Politecnico di Torino, Torino 2023, pp. 209–216.

[9] Kenna T., *Neurodiversity in the city: Exploring the complex geographies of belonging and exclusion in urban space*, "The Geographical Journal" 2023, no 189, pp. 370–382.
[10] Liu J. et al., *Effects of landscape on soundscape perception: Soundwalks in city parks*, "Landscape and Urban Planning" 2014, no 123, pp. 30–40.
[11] Mancini S. et al., *Soundwalk*, *Questionnaires and Noise Measurements in a University Campus: A Soundscape Study*, "Sustainability" 2021, no 13, art. 841.
[12] Manzano J.V., Pastor J.A.A., Quesada R.G., *The importance of changing urban scenery in the assessment of citizens' soundscape perception. On the need for different time-related points of view*, "Noise Mapping" 2021, no 8, pp. 138–161.
[13] Palmese C., Carles Arribas J.L., Rodríguez Antolín A., *The soundscape and listening as an approach to sensuous urbanism: The case of Puerta del Sol (Madrid)*, "Urban Planning" 2024, no 9, art. 7206.
[14] Schafer R.M., *The Soundscape: Our Sonic Environment and the Tuning of the World*, Knopf, New York 1977.
[15] Velasco-Pufleau L., *Listening is action: a soundwalk with Hildegard Westerkamp*, "Performance Philosophy" 2023, no 8(1), pp. 86–100.

Author's Note

Assoc Prof. Justyna Kleszcz, PhD, DSc, Architect

Practising architect living in Wrocław, professor at the Opole University of Technology and a chairperson of the scientific discipline council for architecture and urban planning. In 2014, she submitted a dissertation entitled "Animal Therapy in Urban Space. The Coexistence of Humans and Animals" and obtained a doctoral degree at the Faculty of Architecture, Wrocław University of Science and Technology, and in 2022 obtained her habilitation from the Faculty of Architecture at the PK Krakow University of Technology. Her scientific interests are based upon non-anthropocentric design and architecture of animal-aided therapy centres, as well as new trends in biophilic urban design. Her present research refers to the topic of theoretical and practical aspects of urban farming as well as the morphological and historical transformations of urban space.

j.kleszcz@po.edu.pl