Neurodiversity, Zen Urbanism, and Neuro-Comfortable Urban Social Infrastructure: Three Case Studies

Charles Josefson

PhD Candidate, Department of Geography, King's College London, London, United Kingdom

charles.josefson@kcl.ac.uk | josefsoncharles@gmail.com

ORCID: https://orcid.org/0009-0003-9426-2035

Abstract

This article explores how the intersection of Zen urbanism and neuroinclusive urban design could inform a more inclusive framework for urban social infrastructure. Grounded in the neurodiversity paradigm (Walker, 2021; Singer, 1999), and responding to Cuthbert's (2008) call for urban theory embedded in broader socio-political structures, it engages with an emerging neuro-urban research agenda (Kenna, 2022, 2023). It also extends Latham and Layton's (2019, 2020) framework on social infrastructure to incorporate neurodivergent inclusion. The article argues that Zen minimalist design—centred on calmness, spatial clarity, and intuitive legibility—resonates with neuroinclusive urbanism's aims, such as reducing sensory overload, supporting cognitive ease, and providing moments of sensory refuge. As urban design begins to acknowledge cognitive diversity, the article advocates for designing from neurodivergent experience rather than toward neurotypical norms. Through case study analysis of Zen-inspired institutional urban social infrastructure by SANAA, Junya Ishigami, and Sou Fujimoto, the article examines how these environments may facilitate emotional regulation, sensory integration, and cognitive comfort. It concludes by calling for co-designed, sensitive cross-cultural approaches to social infrastructure that reimagine public spaces as socially, sensorily, and cognitively inclusive for people of all neurotypes.

Keywords: *neurodiversity, Zen urbanism, urban social infrastructure, inclusivity, interdisciplinarity*

Introduction

a) Rethinking Urbanism

As part of my PhD research, I have been leading neuro-urban sensory walks with neurodivergent individuals in London, seeking to better understand how public urban spaces are experienced by those with diverse sensory profiles. During one such walk, we encountered a sudden atmospheric shift: moving through the dense, raucous spaces of central London, we were suddenly transported into what felt like a rural Japanese mountain landscape. This sensory shift was induced by Tadao Ando's installation: an elliptical, granite-edged pool enveloping two trees, designed to evoke tranquillity through the elemental interplay of water, mist, light, and natural form (Figure 1). As we approached the pool, a soft mist emerged rhythmically above the water, timed to erupt every seven

minutes, producing a gently enveloping cloud that softened the visual field and introduced a cooling, tactile sensation. Our own rhythms slowed, and our sensory confusion eased, as we stopped to experience the calming affects of these Japanese Zen aesthetics.

Recollecting this moment of sensory reprieve later caused me to reflect upon the broader interrelationship between modernist Zen minimalist design traditions and emerging approaches to neuroinclusive design. Drawing on a range of empirical, principally psychological studies, Roe and McCay (2021) in their framework for the “Sensory City” describe how Japan’s Zen design tradition is closely attuned to how the sensory effects of materials and spatial design can play a fundamental role in shaping the emotional and cognitive states of urban inhabitants, supporting wellbeing. Their work invites further exploration of how such principles might be integrated into neuroinclusive urbanism: an emergent praxis dedicated to creating public spaces that accommodate a diversity of sensory and cognitive needs.

This article advances Roe and McCay’s (2021) inquiry through an examination of the intersection between Zen modernist minimalism and neuroinclusive urban design. It situates this focus within Cuthbert’s (2008) call for socially embedded urban theory and Kenna’s (2022, 2023) agenda for neuro-urban geography, while also drawing on Latham and Layton’s (2019a, 2020) work on social infrastructure and insights from neurodiversity (Walker, 2012) and (dis)ability studies (Oliver, 1990; Hall & Wilton, 2017). The article begins by introducing the concepts of neurodiversity and Zen urbanism, and exploring their interrelationship. The theoretical and methodological foundations of this research are then discussed. Through examining case studies of Zen-inspired institutional social urban infrastructures, designed by Sejima And Nishizawa And Associates (SANAA), Junya Ishigami, and Sou Fujimoto, this article argues that essential elements from both Zen philosophy and neuroinclusive urban design—such as calming atmospheres promoting sensory regulation, intuitive spatial organisation with subtle wayfinding, and the incorporation of transitional and refuge spaces—should be incorporated into urban environments to alleviate cognitive overload. In doing so, it advances the concept of “neuro-comfortable” cities: environments that not only accommodate the diverse sensory and cognitive needs of neurodivergent individuals but also foster sensory wellbeing and mental ease for all urban residents.

Figure 1. ***Silence by Tadao Ando and Blair Associates, Belgravia, London.***



Source: The author.

b) Neurodiversity and Urban Spaces

The United Nations (2022) calls for inclusive, accessible public spaces for all by 2030. Updates to the UN Charter on Public Space reflect growing recognition that neurodivergent perspectives on urban environments—what Meraz et al. (2024) term the neurodivergent urban "sensorium"— offer valuable insights, or what some call "crip wisdom". Yet, contemporary urban design often prioritises "efficiency", economic output, and the neurotypical *normate* (see Garland-Thomson, 1997, p. 8, for *normate*), often marginalising individuals with sensory or perceptual sensitivities (Kenna, 2022, 2023; Vanolo, 2023).

Neurodiversity refers to the varied, equally valid ways people perceive and interact with the world (Baumer & Frueh, 2021). Around one in seven people, including myself, are neurodivergent the term encompassing neurotypes such as ADHD, autism, dyslexia, dyspraxia, and more. Popularised by Judith Singer (1998: cf. Botha et al., 2024) the concept of neurodiversity challenges deficit-focused, pathologising models and promotes a strengths-based, identity-affirming perspective (Walker, 2012; Milton, 2014; Chapman, 2019).

The foundational moment for (dis)ability studies—which would reverberate across disciplines—came with Michael Oliver's (1983, 1990) Social Model of (Dis)ability, which reframed (dis)ability as a product of societal and environmental barriers, not individual impairments. Hall and Wilton (2017), drawing from the revised relational social model of (dis)ability and earlier geographical research on (dis)abled spatialities (e.g., Imrie, 1996; Imrie & Edwards, 2007; Kitchin,

1998; Kitchin & Wilton, 2000), proposed a "relational material approach" within (dis)ability geographies. The relational material approach sees disability not simply as socially constructed, nor purely as an individual/medical issue, but as something produced through the dynamic interplay of bodies, social relations, and material environments (Hall & Wilton, 2017). Viewed through this relational material lens, urban geography is increasingly engaging with neurodivergent experience and the emerging field of neuroinclusive design (Kenna, 2022, 2023; Vanolo, 2023; Olund, 2024).

c) Tradition as Catalyst: The Rise of Zen Urbanism and Neuroinclusive Design

Zen minimalist urbanism promotes psychological wellbeing by cultivating calming atmospheres and spatial clarity. Minimalist design, defined by Pawson (1996) as the reduction of elements to essentials, offers a counterpoint to overstimulating modern environments. Drawing on Buddhist philosophies of *dhyāna* (quiet contemplation), Zen design cultivates mindfulness through spatial restraint, natural materials, and harmonious proportions (Chen & Ran, 2017), emphasising light, texture, and scale over ornamentation - as a form of "perceptual therapy" (Milan & Dragana, 2017).

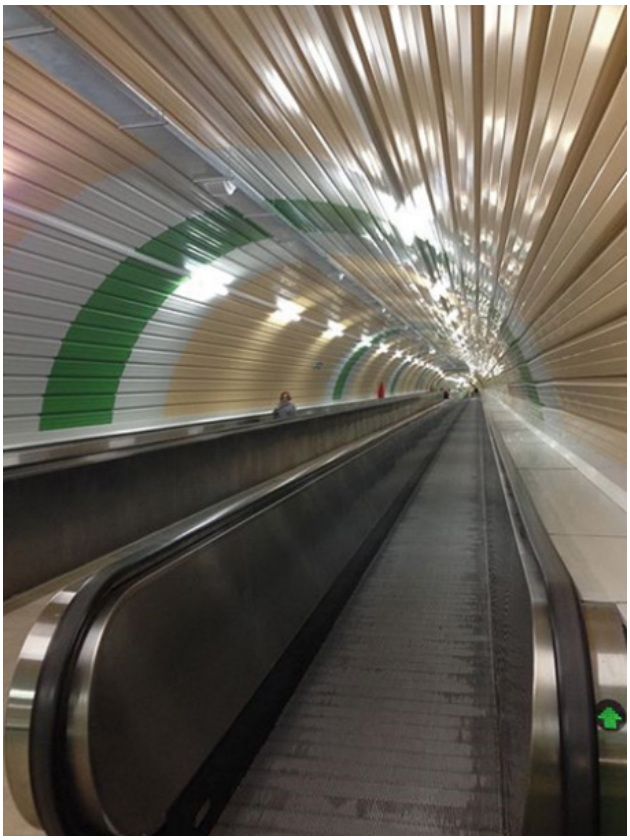
The Western notion of dedicated public urban space only emerged in Japan in the late twentieth century (Dimmer, 2012). Traditionally, Japanese cities lacked formal public squares, instead conceptualising streets themselves as fluid, adaptable public spaces, often enclosed with end-gates to create temporary civic realms for communal events (Hidaka & Tanaka, 2001). Following Japan's reopening after the Meiji Restoration in 1868, the country embarked on widespread modernisation, including architecture (Nute, 2000). Frank Lloyd Wright (1867–1959) was deeply influenced by Japanese aesthetics, particularly the principle of "eliminating the insignificant", even prior to his time working in Japan (Nute, 2000). During the construction of Wright's Imperial Hotel in Tokyo (1917–1922, demolished 1968), Japanese apprentices trained under him and later mentored future generations of architects, embedding cultural exchange into modern Japanese architectural practice (Nute, 2000).

In the West, modernist minimalist urbanism was advanced by Gropius, van der Rohe, and Le Corbusier. Japanese architects such as Junzo Sakakura and Kunio Maekawa, who worked directly with Le Corbusier, played key roles in blending Western modernism with Japanese traditions (Brown, 2016). Postwar urban development in Japan often replaced indigenous forms with fragmented modernist landscapes, creating what Carmona and Sakai (2014, para. 1) call "one of the most vibrant and distinctive cityscapes in the world". Bharne (2014) describes this contrast as "Zen and Neon": the coexistence of the quiet, spiritual spaces of temples, teahouses, and gardens with the intense sensory experiences of high-speed, post-industrial urban environments.

While an earlier generation of Japanese architects translated Western modernism into Japanese architecture, a later generation—including Kenzō Tange, Tadao Ando, and their followers—expanded this translation by integrating approaches from Japanese Zen design philosophies. Kenzō Tange (1913–2005), a pioneering architect, planner, and academic, was the

founder of what has latterly been termed “Zen Urbanism” (Bharne, 2014). His celebrated Hiroshima Peace Memorial Park (1949–1955) introduced a new prototype combining modernist architecture with Japanese cultural heritage (Cho, 2012; Maki & Niihata, 2020). Tange’s subsequent projects—including the post-earthquake reconstruction of Skopje and urban accessibility proposals for Spoleto (Figure 2)—demonstrated how Japanese urban design approaches could be adapted to diverse global contexts (Lozanovska, 2012; Ribera & Cucco, 2019). Tange observed, “The role of tradition [is] that of a catalyst... no longer detectable in the end result” (Hyatt Foundation, 2025, para. 8).

Figure 2. ***Spoleto’s Mobilita Alternativa***



Note: Spoleto’s *Mobilita Alternative* consists of three underground lines, incorporating moving walkways (travelators), lifts and escalators.

Source: Manuelarosi (2015), CC BY-SA 3.0, https://commons.wikimedia.org/wiki/File:Mobilit%C3%A0_alternativa._Spoleto_2.jpg

Following Tange’s lead, Tadao Ando (b. 1941), a self-taught architect, has become widely regarded as the leading figure of Japanese minimalist-modernist architecture, drawing deeply on Zen principles to explore the interplay of light, shadow, and raw materials in creating more “mind-friendly” or neuro-comfortable, affective atmospheres. His first project, *Row House (Azuma House)* in Sumiyoshi, Osaka (1976), exemplified his Zen-influenced design philosophy: a windowless,

fortress-like structure creating an intimate, inward-facing refuge centred on an open-air courtyard where natural elements dynamically soften the space. This ethos continues in his sacred spaces, most notably the *Church of Light* in Ibaraki, Osaka (1989), where a cruciform void channels natural light to produce a profoundly immersive spiritual experience (Chen & Ran, 2017). Ando extends this Zen minimalist philosophy to urban contexts in projects such as the *Modern Art Museum of Fort Worth*, Texas (2002) (Figure 3), and the concrete landscaping of *Awaji Yumebutai* complex (2000), where layered terraces, gardens, pools, temples, and sea views generate tranquillity and sensory calm (Pires, 2021).

Figure 3. ***Modern Art Museum of Fort Worth, Fort Worth, Texas.***



Source: Joe Mabel (2007), CC BY-SA 3.0, https://commons.wikimedia.org/wiki/File:Ft_Worth_Modern_03.jpg

Ando's Zen-inspired design prioritises sensory balance, tranquillity, and seamless spatial transitions—supportive elements for individuals susceptible to sensory overload. His approach can be distilled into four key principles of Zen urbanism: cultivating calm Zen atmospheres, providing gentle wayfinding, incorporating transition spaces, and providing refuge spaces. These four key design principles align with the objectives of neuroinclusive design, which advocates for a "softer" public realm and the reduction of sensory overload (Mostafa, 2021) (see Table 1). Core elements of neuroinclusive urban design include low-stimulation environments (Decker, 2014; MacLennon et al., 2022), comprehensive wayfinding systems (Chan, 2018; Taylor & Symons, 2023), transitional zones that help modulate social and sensory engagement (Mostafa, 2014; Tola et al.,

2021), and dedicated retreat spaces that support sensory regulation (Mostafa, 2014; Decker, 2014; MacLennon et al., 2022).

The legacy of Ando—the ways his works integrate tradition, technology, and cognitive accessibility—has influenced a global discourse on sensory urbanism and is evident in the work of contemporary Japanese modernist minimalist architects such as SANAA (Kazuyo Sejima and Ryue Nishizawa), Junya Ishigami, and Sou Fujimoto. Their projects exemplify a contemporary Zen urbanism that attends to sensory needs and contributes to cognitively-soothing social infrastructure, particularly vital for neurodivergent individuals navigating sensory and cognitive demands in urban environments.

Table 1. ***Neuro-Comfortable Benefits of Zen Design***

Principle	Description	Neuroinclusive Benefit
Calming Zen Atmospheres	Inspired by Zen Buddhism, design minimises visual and auditory clutter, using light, shadow, and materiality to encourage mindfulness.	Promotes inner calm and reduces overstimulation through spatial simplicity and sensory restraint.
Gentle Wayfinding	Uses subtle spatial cues—walls, corridors, sightlines—to guide movement fluidly and intuitively.	Supports ease of navigation, reducing cognitive load and disorientation in those with sensory sensitivities.
Transition Spaces	Carefully modulated thresholds mediate shifts between spaces, allowing time for sensory adjustment. C.f. Farhady and Nam (2011) identify four typologies of thresholds.	Gradual transitions ease environmental change, preventing sensory shock and enhancing spatial comfort.
Refuge Spaces	Spaces are intentionally minimal, calm, and soft textured—providing a retreat from overstimulation and a chance for stillness, reflection, and psychological restoration.	These spaces enable moments of decompression and emotional regulation, especially vital for those susceptible to cognitive overload

Social Infrastructure Analysis: Theory and Method

This study has three theoretical foundations. First, it is grounded in the neurodiversity paradigm (Walker, 2012), which reframes neurological differences as natural and valuable forms of human variation rather than as deficits to be remedied. In the previous three decades, a growing body of social science research has reconsidered norms of cognition, perception, and behaviour across educational, social, and spatial contexts. This shift has more recently informed the development of a neuro-urban research field, which explores how urban environments can better accommodate cognitive and sensory diversity (Roe & McCay, 2021; Kenna, 2022, 2023). In this study, the neurodiversity paradigm provides the theoretical lens through which Zen-inspired design elements

in the architectural case studies are analysed for their potential to support neuroinclusive urban social infrastructure - particularly in terms of reducing cognitive overload, enhancing sensory regulation, and enabling intuitive spatial navigation.

Second, the research responds to Cuthbert's (2008) theory of urban space, which critiques dominant urban design traditions for neglecting the political, economic, and social structures that shape space. Cuthbert argues for a spatial political economy approach that reconnects urban design with societal processes, contending that design practice has remained relatively uninformed by theory. This study extends Cuthbert's critique by incorporating socio-political insights from neurodiversity studies. It contributes to a neurodiversity-paradigm informed urbanism—one that repositions cognitive and sensory accessibility as central to equitable spatial politics (Kenna, 2022, 2023; Vanolo, 2023; Olund, 2024).

Third, the research draws on Latham and Layton's (2019a, 2020) framework for social infrastructure, particularly their fourth definition: public and quasi-public spaces that enable social connection. Spaces in which everyday sociality and civic inclusion are made possible. Latham and Layton (2019a) identify five categories of social infrastructure, and this article focuses on one: public institutions (e.g. libraries, museums, art galleries, universities, schools, memorials, squares, plazas, and parks). While their work addresses inclusion across lines of age, race, class, gender, and sexuality, this study extends those concerns to encompass neurodivergent inclusion, arguing that sensory and cognitive accessibility must also be recognised as critical to the effective functioning of social infrastructure.

Instead of the ethnographic methods used by Latham and Layton (2019b), this study employs an exploratory, qualitative case study approach, using secondary data from architectural literature. In line with Amin's (2008) concept of "social surplus"—the unexpected, affective, and collective value generated in well-designed public space—the selected Zen urbanism case studies discussed here—SANAA's *Rolex Learning Center* (2010) and *Grace Farms* (2015), Ishigami's *Kanagawa Institute of Technology Plaza* (2021), and Fujimoto's *The Grand Ring* (2025)—are analysed for how their spatial and atmospheric qualities may contribute to reducing cognitive overload and enhancing neuro-comfort for diverse users.

Case Study Analyses

a) Case Study 1 – SAANA: Better "Co-Being"

SANAA is a Tokyo-based architecture firm founded in 1995 by Kazuyo Sejima (b. 1956) and Ryue Nishizawa (b. 1966) (RIBA, 1995). Known for their minimalist aesthetics and fluid spatial compositions, SANAA works internationally across disciplines, encompassing residential, interior, and large-scale architectural projects, as well as furniture and urban planning. Central to their practice is the creation of inclusive, high-quality, Zen-minimalist social infrastructure that are both visually and sensorily soothing. This section explores two key projects that exemplify SANAA's

approach: the 2010 *Rolex Learning Center* in Lausanne; and their 2015 *Grace Farms* in Connecticut.

The Rolex Learning Center (2010)

Located at the École Polytechnique Fédérale de Lausanne, the *Rolex Learning Center* (Figures 4 and 5) redefines public institutional spatial accessibility and sensory comfort through its unique architectural language (Fairs, 2010). Requiring new construction methods, the building's undulating form creates a continuous, open interior of gentle slopes, terraces, and patios (Weilandt et al., 2009). The absence of sharp transitions and the interplay of natural light cultivate a tranquil atmosphere that supports both individual and communal activities (Fairs, 2010). These features directly align with neuroinclusive design principles by promoting low-stimulation environments that help reduce sensory overload (cf. Decker, 2014; MacLennon et al., 2022). The flowing spatial sequence enables intuitive wayfinding, supporting users who may experience spatial anxiety or difficulty navigating abrupt, high-stimulus spaces (cf. Chan, 2018; Symons, 2025). Moreover, the inclusion of varied zones—quiet reading areas, social spaces, and semi-enclosed retreats—offers users opportunities to modulate sensory input and social engagement according to their needs, which is a recurring theme in neuroinclusive design literature (e.g. Mostafa, 2014; Tola et al., 2021). Designed as a low-stimulation, high-comfort environment, the 20,000-square-metre centre includes libraries, cafés, and gathering areas within a unified composition that fosters sensory regulation and spatial calm.

Figure 4. ***The Rolex Learning Center, Lausanne.***



Source: Mikado1201 (2012), CC BY-SA 3.0, https://commons.wikimedia.org/wiki/File:Rolex_Learning_center.jpg

Figure 5. ***Interior of The Rolex Learning Center, Lausanne.***



Source: Hpschaefer (2013), CC BY-SA 3.0, https://commons.wikimedia.org/wiki/File:Lausanne-sannaa-rolex-learning-center_innen.jpg

Grace Farms (2015)

In 2009, SAANA conceived an amoeba-like structure for its Serpentine Pavilion in London's Hyde Park. A lightweight, "floating" aluminium canopy supported by slender columns (Serpentine Gallery, 2009). Wrapping organically around existing trees, the wall-less design connected multiple zones—such as a café, music area, breakout space, and event zone—creating a fluid, multi-use environment that encouraged free movement and varied sensory engagement (Arquitectura Viva, 2009). This idea for a public institutional space found permanent expression in New Canaan, Connecticut.

At *Grace Farms* (Figure 6) SAANA designed a continuous, flowing walkway structure, described as an "architectural river", meandering through a rolling 80-acre landscape (Solanki, 2022). A long, curving roof floats over a sequence of transparent pavilions, each tailored for different community uses: a sanctuary, amphitheatre, large commons area (14,400 sq. ft.), café, performance space, and multi-use recreation facility (Grace Farms Foundation, n.d.). The architects (cited in Grace Farm Foundation, n.d., para. 3) sought to inclusively "foster a sense of community and place" and maximise wellbeing affects from the surrounding landscape:

> We designed a long roof following the topography, which floats on the site centrally. Winding and crossing the site freely, this structure creates many covered buffer spaces across the expansive property while also forming courtyards . . . creating different views and atmospheres. For example, from one room, one may see the large pond in the distance and from another, one can overlook the wetland which stretches into the landscape below. This singular roof also gives way to a variety of ambience such as a lively room facing a lively courtyard and a calm space with sunlight trickling through the foliage of the trees (cited in Grace Farm Foundation, n.d., para. 4)

This architectural approach also offers significant neuroinclusive benefits, particularly for neurodivergent individuals who may experience sensory processing differences or heightened sensitivity to crowded or overstimulating environments (cf. Grancich, 2014; Mostafa, 2014; MacLennon et al., 2022). The continuous, gently flowing design of the roof creates a spatial rhythm that is intuitive and non-disruptive, helping to reduce cognitive overload (cf. Mostafa, 2014; MacLennon et al., 2022; Symons, 2025). The transparency and openness of the pavilions, coupled with access to nature and natural light, provide calming visual stimuli and opportunities for retreat or quiet reflection (cf. Ezell et al., 2018; Taylor & Symons, 2023). Hence, *Grace Farms* fosters an architectural affective atmosphere that is both legible and soothing.

Figure 6. ***Grace Farms in New Canaan, Connecticut*.**



Source: Karl Thomas Moore (2017), CC BY-SA 4.0,
https://commons.wikimedia.org/wiki/File:Grace_Farms_XXVI.jpg

SAANA and "Co-Being"

Pointing to future projects on the same theme, for Expo 2025 Osaka, SAANA collaborated with Hiroaki Miyata, a professor at Keio University, to create the *Better Co-Being Pavilion*, promoting the idea of cities as "ecosystem communities", where diverse individuals can gather, share knowledge, and collectively shape their urban environment (Zeitoun, 2024). Across their body of work, SANAA consistently advances an architectural language of openness, fluidity, and sensory

responsiveness that supports “co-being”—a shared, inclusive experience of urban space that is attuned to the full spectrum of human perception and cognition.

b) Case Study 2 – The New Comfortabilities of Ishigami

Junya Ishigami (b. 1974), one of Japan’s most innovative Zen-minimalist architects of the younger generation, seeks to “expand architecture into the future by creating new comfortabilities” (cited in Belogolovsky, 2019, para. 1). After working at SANAA for four years, he founded *Junya Ishigami + Associates* in 2006 (Griffiths, 2021). Ishigami explains his enduring focus is “to re-interpret the boundary between landscape and architecture” (cited in Barker, 2023, para. 4). In Groot Vijversburg Park, Ishigami replaced traditional structural columns with ultra-thin glass walls, enabling uninterrupted views between indoor and outdoor spaces (Liotta, 2018). Similarly, the Kanagawa Institute of Technology (KAIT) Workshop features a network of slender white columns within an all-glass perimeter, evoking a delicate forest and allowing light to diffuse softly throughout the space. These light-touch interventions produce serene environments that prioritise visual calm, spatial legibility, and gentle sensory stimulation—key aims of neuroinclusive space design (cf. Mostafa, 2014; MacLennon et al., 2022).

Ishigami’s Zen minimalist approach to public institutional space design can also be seen in the otherworldly multipurpose covered plaza he designed for KAIT. An adaptable social environment for students to rest, meet, and gather, the plaza is sheltered by a 100-metre-wide, ultra-thin steel canopy only 12 mm thick, held aloft without supporting columns by a carefully calibrated curved geometry (Griffiths, 2021; Liotta, 2018). Its chequerboard-patterned roof contains 52 apertures that allow sunlight and rainfall to permeate the space, cultivating an immersive sensory experience that is both calming and stimulating (Stephens, 2021). Creating a calming sensorial experience, the space allows visitors to feel the gentle breeze, observe the shifting patterns of light, and hear the soft patter of falling rain—while still sheltered from the elements (Stephens, 2021). When it rains, water descends through the roof openings in soft vertical streams, forming ephemeral “pillars” of rain that soak into the asphalt below, enveloping users in a meditative, hazy, dream-like atmosphere without removing them from shelter (Stephens, 2021).

This unique sensorial environment aligns closely with neuroinclusive design strategies that prioritise soft, ambient stimuli over intense sensory input (Mostafa, 2021). The interplay of natural light and shadow, open airflow, and subtle environmental cues creates a low-stimulation setting that helps reduce sensory overload (cf. Decker, 2014; MacLennon et al., 2022). One potential caveat may be that, on bright days, the whiteness may be too sensorily stimulating for some. The plaza’s open and legible spatial organisation supports intuitive navigation, which is essential for those with neurodivergent cognitive profiles, such as autism or ADHD, who may experience spatial disorientation in cluttered or rigidly zoned environments (Chan, 2018; Symons, 2025). Additionally, it functions as a transitional zone—as a semi-sheltered space between social gathering points and

the wider campus—that allow users to modulate their engagement with sensory and social stimuli (cf. Tola et al., 2021).

c) Case Study 3 – The Grand Ring

A final showstopping example of Zen Urbanism, Sou Fujimoto's *The Grand Ring* (Figure 7), designed for Expo 2025 Osaka, is the world's largest wooden architectural structure (Crook, 2025). Serving as the Expo's main circulation route, it provides a sheltered, legible, sensory-friendly pathway that protects visitors from wind, rain, and sun (Expo, 2025). A rooftop "skywalk" garden, lush with greenery, offers sweeping views of Mount Rokko and the Seto Inland Sea. Inspired by natural forms such as caves and forests, the design inverts the typical forest structure: the vegetation of the rooftop "floor" shelters the path below. Fujimoto explains: "If architecture is created like a forest, it will be a place of complexity, rich in diversity—much more than in the architecture of today's cities" (cited in Gerst, 2025, para. 10).

The Grand Ring was built using *nuki* joints: a traditional Japanese technique, used in the crafting of historic Japanese temples and shrines, that slots beams together without nails (Crook, 2005). Some of Shintoism's most revered structures, including the famous *Ise Grand Shrine*, have been regularly torn down and rebuilt over the centuries. *The Grand Ring* or parts can be dissembled and reused elsewhere. Its timber was sourced through a transnational effort: 70% of the timber, including cedar and cypress, comes from Japan; the remaining 30%—pine—was imported from Scotland (Crook, 2025). The project highlights the potential of sustainable engineered timber as a low-carbon alternative to concrete (Holland, 2025).

Figure 7: ***The Grand Ring at Expo 2025 Osaka.***



Source: Wikimedia Commons, CC0 1.0.

The Grand Ring shows how Zen urbanism aligns closely with neuroinclusive design approaches that advocate for a softer public institutional realm, one that minimises sensory overload and supports diverse sensory and cognitive needs (cf. Mostafa, 2021). Sheltered walkways are helpful for hypersensitive neurodivergent individuals who prefer open-air environments over overstimulating indoor spaces, as they provide shade, seating, and opportunities to regulate sensory input and social interaction (Grancich, 2014). These architectural elements are also becoming increasingly important for all neurotypes in the context of intensifying climate change. This approach aligns closely with Cecchini et al.'s (2021) concept of neuro-comfortable urban enabling paths, which support neurodivergent individuals in navigating the city safely, efficiently, and with reduced sensory stress.

The Grand Ring's expansive wooden canopy and forest-inspired form create a low-stimulation environment (cf. Decker, 2014; MacLennon et al., 2022), using natural materials, muted textures, and rhythmic spatial patterns to avoid visual and auditory chaos. Its clear, legible layout with signage and maps offers a comprehensive wayfinding system (cf. Chan, 2018; Ezell et al., 2018; Taylor & Symons, 2023), reducing the cognitive demands of navigation. Along its path, transitional zones—shaded openings, shifting light patterns, and the gentle flow of indoor–outdoor boundaries—allow users to modulate sensory and social engagement at their own pace (cf. Tola et al., 2021). Above all, the integration of calming rooftop gardens and secluded viewing areas offers retreat spaces that foster moments of sensory regulation and personal grounding (cf. Mostafa, 2014; Decker, 2014; Ezell et al., 2018; MacLennon et al., 2022). In this way, Fujimoto's design is not only materially sustainable but also socially and cognitively inclusive, demonstrating how Zen-inspired spatial softness and wayfinding can meet the needs of neurodivergent users in dynamic urban social settings.

Conclusion: Towards a Zen Neuroinclusive Urbanism

While the works of SANAA, Junya Ishigami, and Sou Fujimoto are not explicitly conceived as neuroinclusive social infrastructure, they contain spatial and sensory elements that align with the access needs of neurodivergent individuals. For instance, SANAA's use of diffused natural light, soft edges, and open, intuitive circulation paths (seen in the *Rolex Learning Center*) produce low-stimulus environments that help reduce sensory and spatial overload. Ishigami's architectural language, characterised by openness to the natural environment, as in KAIT Plaza, encourages intuitive exploration and flexible use while offering a calm atmosphere with gentle sensory stimulation. Fujimoto's use of semi-permeable boundaries and layered refuge spaces in *The Grand Ring* creates a spatial experience that is both open and protected—allowing users to maintain visual connection with their surroundings while accessing quieter, less stimulating zones for retreat. These design features respond to common neurodivergent needs, such as the desire for

predictable spatial layouts, low-sensory environments, and opportunities for withdrawal without isolation. The looping, intuitively navigable pathway enhances wayfinding by offering a continuous, legible route that reduces cognitive load and spatial disorientation. Together these Zen urbanism case studies show that neuroinclusive social infrastructure need not be overtly inclusive; rather, neuroinclusivity can be achieved through attentive atmospheric design, material sensitivity, and spatial legibility, enabling diverse bodies and minds to engage with urban space on their own terms.

Although this study focuses on urban public institutional typologies, its insights are applicable across a wide range of social infrastructure. Further interdisciplinary research is needed to uncover the precise mechanisms underlying neuro-comfortability, including cross-cultural perspectives that draw on diverse spatial traditions and design knowledge. Achieving this requires sustained urban design inquiry and co-creative processes with neuromixed neurodivergent groups, reflecting the long-standing (dis)ability rights maxim: “nothing about us without us.” The principle of “designing from the extremes” (Mostafa, 2021), which centres neurodivergent sensory experience, offers critical insight for creating environments that benefit all neurotypes.

At the same time, several risks must be acknowledged. Aestheticising Zen calm without addressing structural inequality risks creating tranquil yet exclusionary spaces. Likewise, neuroinclusive design may become tokenistic—what Neumeier (2018) calls “neurodiversity-lite”—if not accompanied by systemic change in planning paradigms, governance, and institutional values. Cross-cultural borrowing also requires humility and care; without cultural sensitivity and participatory co-design, it risks appropriation or philosophical dilution. Yet, as Lomas et al. (2017) argue, Zen principles are not geographically or culturally fixed— they can be meaningfully adapted into Western urbanism. Dismissing them outright risks reinforcing orientalist assumptions (Said, 1995), reducing Zen to an exoticised and unusable “other”.

Ultimately, an emerging theory and praxis of Zen neuroinclusive urbanism for urban social infrastructure can help to challenge the neuronormative assumptions embedded within the social infrastructure literature. While social infrastructure discourse (e.g., Klinenberg, 2018; Latham & Layton, 2019) highlights the role of shared spaces in fostering social cohesion, it has hitherto overlooked the sensory and cognitive barriers such environments may present for neurodivergent users. Zen urbanism—through its emphasis on spatial minimalism, sensory modulation, and contemplative spatial rhythms—foregrounds atmosphere and affect in ways that can meaningfully support neurodivergent individuals navigating anxiety, sensory overload, or disorientation in overstimulating urban settings. Integrating Zen neuroinclusive urban design principles, therefore, offers a valuable approach to reimagining social infrastructure not only as spaces for social interaction but also as environments that provide refuge, sensory ease, and neuro-comfort—elements essential for neurodivergent inclusion and neuromixed urban wellbeing.

References

Amin, A. (2008). Collective culture and urban public space. City, 12, 5–24. https://doi.org/10.1080/13604810801933495

ArchEyes. (2024, 25 September). Row House by Tadao Ando (Azuma House): Light, Space & Concrete. *ArchEyes*. https://archeyes.com/row-house-by-tadao-ando-azuma-house-light-space-concrete/

Arquitectura Viva. (2009). Serpentine Gallery Pavilion 2009, London. *Arquitectura Viva*. https://arquitecturaviva.com/works/pabellon-de-la-serpentine-gallery-2009-2

Barker, N. (2023, 23 October). 'I don't want to make crazy buildings' says Junya Ishigami. *Dezeen*. https://www.dezeen.com/2023/10/24/junya-ishigami-interview/

Baumer, N., & Frueh, J. (2021). What is neurodiversity? *Harvard Medical School*, pp. 1–10. https://www.health.harvard.edu/blog/what-is neurodiversity-20211123264

Belogolovsky, V. (2019, 17 February). 'Architecture from Someone's Imagination is not Enough': Interview with Junya Ishigami. *ArchDaily*. https://www.archdaily.com/904732/architecture-from-someones-imagination-is-not-enough-interview-with-junya-ishigami

Bharne, V. (2024). Zen spaces and neon places: reflections on Japanese architecture and urbanism. ORO Editons.

Botha, M., Chapman, R., Giwa Onaiwu, M., Kapp, S. K., Stannard Ashley, A., & Walker, N. (2024). The neurodiversity concept was developed collectively: An overdue correction on the origins of neurodiversity theory. *Autism*, 28(6), 1591-1594. https://doi.org/10.1177/13623613241237871

Brown, J. (2016, 5 January). The Relationship Between Japanese and Modernist Architecture. *Medium*. https://medium.com/design-culture-history/the-relationship-between-japanese-and-modernist-architecture-7faef7e3b1ab

Carmona, M., & Sakai, A. (2014). Designing the Japanese city – An individual aesthetic and a collective neglect. *Urban Des Int* 19, 186–198. https://doi.org/10.1057/udi.2013.29

Cecchini, A., Congiu, T., Talu, V., & Tola, G. (2018). Mobility Policies and Extra-Small Projects for Improving Mobility of People with Autism Spectrum Disorder. *Sustainability*, 10(9), 3256. https://doi.org/10.3390/su10093256

Chan, E. R. L. (2018). Neurodivergent Themed Neighbourhoods as A Strategy to Enhance the Liveability of Cities: The Blueprint of an Autism Village, Its Benefits to Neurotypical Environments. *Urban Science*, 2(2), 42. https://doi.org/10.3390/urbansci2020042

Chapman, R. (2021). Neurodiversity and the social ecology of mental functions. *Perspectives on Psychological Science*, 16(6), pp.1360-1372. https://doi.org/10.1177/1745691620959833

Charles, S. (2025, 31 March). Kengo Kuma tops sunken museum with garden in Taiwan. *Dezeen*. https://www.dezeen.com/2025/03/31/kengo-kuma-cmp-inspiration-museum-taiwan/

Charter of Public Space. UN-Habitat. https://habnet.unhabitat.org/sites/default/files/documents/Charter%20of%20Public%20Space.pdf

Chen, M., & Ran, K. (2017, April). The Application of Zen Culture in Space Design. In 2017 International Conference on Innovations in Economic Management and Social Science (IEMSS 2017) (pp. 74-80). Atlantis Press. https://doi.org/10.2991/iemss-17.2017.16

Cho, H. (2012). Hiroshima Peace Memorial Park and the Making of Japanese Postwar Architecture. *Journal of Architectural Education*, 66(1), 72–83. https://doi.org/10.1080/10464883.2012.720915

Crook, L. (2025, 24 April). World's largest wooden structure encircles Expo 2025 Osaka. *Dezeen*. https://www.dezeen.com/2025/04/24/the-grand-ring-expo-2025-osaka/

Cuthbert, A.R., (2008). Urban design: requiem for an era–review and critique of the last 50 years. Urban Design International, 12, 177-223. https://doi.org/10.1057/palgrave.udi.9000200

Decker, E. 2014. A City for Marc: An Inclusive Urban Design To Planning for Adults With Autism. A Report. Kansas State University. Available at: krex.k-state.edu/dspace/handle/2097/17606

Dimmer, C. (2012). Reimagining public space: The vicissitudes of Japan's privately owned public spaces. In *Urban Spaces in Japan* (pp. 74-105). Routledge.

Fairs, M. (2010, 17 February). Rolex Learning Center by SANAA. Dezeen. https://www.dezeen.com/2010/02/17/rolex-learning-center-by-sanaa/

Farhady, M., & Nam, J. (2011). Thresholds in the pluralistic architecture of Tadao Ando. *Journal of Asian Architecture and Building Engineering*, 10(1), pp.31-36. https://doi.org/10.3130/jaabe.10.31

Fischli, F., & Olsen, N. (2024). Itsuko Hasegawa: The pioneering Japanese architect on Postmodernism, tradition, and wildflowers. *PIN–UP*, 37. https://www.pinupmagazine.org/articles/itsuko-hasegawa-interview

Garland-Thomson, R. (1997). *Extraordinary bodies: Figuring physical disability in American culture and literature*. Columbia University Press.

Gerst, G. (2025). United by the Grand Ring. *Ubm Magazine*. https://www.ubm-development.com/magazin/en/grand-ring-expo-2025/

Grace Farm Foundation. (n.d). SAANA. https://gracefarms.org/sanaa

Grancich, D.D. (2014). Exploring Urban Design Theory: A Qualitative Study Integrating "Autism-Friendly Environments" As an Emerging Perspective. University of California, Irvine.

Griffiths, A. (2021, 15 February). Junya Ishigami completes covered plaza with sloping floor for Japanese university. *Dezeen*. https://www.dezeen.com/2021/02/15/junya-ishigami-semi-outdoor-plaza-kanagawa-institute-of-technology/

Hall, E., & Wilton, R. (2017). Towards and relational geography of disability. *Progress in Human Geography*, 41(6), pp. 727–744. https://doi.org/10.1177/0309132516659705

Hidaka, T., & Tanaka, M. (2001). Japanese Public Space as Defined by Event. In: Miao, P. (eds) Public Places in Asia Pacific Cities. The GeoJournal Library, vol 60. Springer, Dordrecht. https://doi.org/10.1007/978-94-017-2815-7_5

Holland, O. (2025, 10 April). Architect Sou Fujimoto: Expo 2025 is 'a precious opportunity to come together'. *CNN Style*. https://edition.cnn.com/2025/04/10/style/expo-2025-sou-fujimoto-japan-hnk-intl/index.html

Hyatt Foundation. (2025). Kenzo Tange Biography. https://www.pritzkerprize.com/laureates/1987#laureate-page-93

Imrie, R., & Edwards, C. (2007). The geographies of disability: Reflections on the development of a sub-discipline. *Geography Compass*, 1(3), pp.623-640. https://doi.org/10.1111/j.1749-8198.2007.00032.x

Imrie, R., 1996. Ableist geographies, disablist spaces: towards a reconstruction of Golledge's' geography and the disabled'. *Transactions of the Institute of British Geographers*, pp.397-403. https://www.jstor.org/stable/622489

Kenna, T. (2022). Cities of neurodiversity: New directions for an urban geography of neurodiversity. *Area*, 54(4), pp.646-654. https://doi.org/10.1111/area.12803

Kenna, T. (2023). Neurodiversity in the city: Exploring the complex geographies of belonging and exclusion in urban space. *The Geographical Journal*, 189(2), pp.370-382. https://doi.org/10.1111/geoj.12512

Kitchin, R. (1998). 'Out of Place',' Knowing One's Place': Space, power and the exclusion of disabled people. *Disability & Society*, 13(3), 343-356. https://doi.org/10.1080/09687599826678

Kitchin, R., & Wilton, R. (2000). Disability, Geography and Ethics: Introduction. *Philosophy & Geography*, 3(1), 61–65. https://doi.org/10.1080/13668790008573694

Klinenberg, E. (2018). Palaces for the people: How social infrastructure can help fight inequality, polarization, and the decline of civic life. London: Penguin.

Latham, A., & Layton, J. (2019a). Social infrastructure and the public life of cities: Studying urban sociality and public spaces. Geography Compass, 13(7), e12444. https://doi.org/10.1111/gec3.12444

Latham, A., & Layton, J. (2019b). Publics and their problems: Notes on the remaking of the South Bank, London. International Journal of Urban and Regional Research, 43(6), 1148-1167. https://doi.org/10.1111/1468-2427.12832

Liotta, S. J. (2018). Junya Ishigami in Paris: freeing architecture, structures, contexts. *Domus*. https://www.academia.edu/download/56444915/Junya_Ishigami_in_Paris__freeing_architecture__structures__contexts_-_Domus.pdf

Lomas, T., Etcoff, N., Van Gordon, W. & Shonin, E. (2017). Zen and the art of living mindfully: The health-enhancing potential of Zen aesthetics. *Journal of religion and health*, 56, pp.1720-1739. https://doi.org/10.1007/s10943-017-0446-5

Lozanovksa, M. (2012). Kenzo Tange's Forgotten Master Plan for the Reconstruction of Skopje. *Fabrications*, 22(2), 140–163. https://doi.org/10.1080/10331867.2012.733159

MacLennan K., Woolley C., @21andsensory E., Heasman B., Starns J., George B.,& Manning C. (2022). 'It is a big spider web of things': Sensory experiences of autistic adults in public spaces. *Autism in Adulthood*. https://doi.org/10.1089/aut.2022.0024

Maki, R., & Niihata, T. (2020). Landscape design in hiroshima peace memorial park: transition of the design by kenzo tange. *Japan Architectural Review*, 3(2), pp.193-204. https://onlinelibrary.wiley.com/doi/full/10.1002/2475-8876.12136

Mclellon, L. (2022, 4 August). The Architecture of Kenzo Tange, and it's Impact on Japanese Design. *HomeStratosphere*. https://www.homestratosphere.com/architecture-kenzo-tange/

Meraz, F., Nicoletti, E., & Barakat, M. (2024). Architectural inclusivity: Adaptive spaces for aural wellbeing of individuals with dissimilar sensorium. IN-PRESENCE/THE BODY AND THE SPACE, p.675.

Milton, D. E. (2012). On the ontological status of autism: The 'double empathy problem'. *Disability & society*, 27(6), pp.883-887. https://doi.org/10.1080/09687599.2012.710008

Mostafa, M. (2015) 'Architecture for autism: Built environment performance in accordance to the autism ASPECTSS™ design index'. *Design Principles and Practices*, 8(1), 55-71. DOI:10.18848/1833-1874/CGP/v08/38300

Mostafa, M. (2021). Autism friendly design – an interview with Magda Mostafa. Cities. People. *Love*. https://citiespeoplelove.co/article/autism-friendly-design-an-interview-with-magda-mostafa

Neumeier S (2018). '"To Siri with love" and the problem with neurodiversity lite', rewire news group, 9 February. https://rewirenewsgroup.com/article/2018/02/09/siri-love-problem-neurodiversity-lite/

Nute, K. (2000). Frank Lloyd Wright and Japan: The role of traditional Japanese art and architecture in the work of Frank Lloyd Wright. Psychology Press.

Oliver, M., 1983. *Social Work with Disabled People*. Macmillan.

Oliver, M., 1990. *The Politics of Disablement*. Macmillan.

Olund, E. (2024). Neurodivergent Spatialities: A Geographical Reading of Recent Empirical Work in Neurodiversity Studies. *Disability Studies Quarterly*, 43(4). https://doi.org/10.18061/dsq.v43i4.8947

Patowary, K. (2015, 12 August). The 100 Stepped Garden of Awaji Yumebutai. *Amusing Planet*. https://www.amusingplanet.com/2015/08/the-100-stepped-garden-of-awaji.html

Pawson, J. (1996). *Minimum*. Phaidon Press.

Pires, S. (2021, 21 May). Architect Tadao Ando, The Master of Light and Concrete. *My Modern Met*. https://mymodernmet.com/tadao-ando-buildings/

Roe, J. and McCay, L. (2021). *Restorative cities: Urban design for mental health and wellbeing*. Bloomsbury Publishing.

Said, E. W. (1995). *Orientalism: Western conceptions of the orient*. Penguin.

Serpentine Gallery. (2009). The 2009 Pavilion was designed by Kazuyo Sejima and Ryue Nishizawa of leading Japanese architecture practice SANAA. https://www.serpentinegalleries.org/whats-on/serpentine-gallery-pavilion-2009-kazuyo-sejima-ryue-nishizawa-sanaa-0/

Solanki, H. (2022). 15 Iconic Projects: SAANA. *Rethinking the Future*. https://www.re-thinkingthefuture.com/design-studio-portfolios/a8278-sanaa-15-iconic-projects/

Stephens, P. (2021, 14 January). Junya ishigami completes plaza of kanagawa institute of technology. *Designboom*. https://www.designboom.com/architecture/junya-ishigami-plaza-of-kanagawa-institute-of-technology-japan-01-14-2021/

Symons, D. (2025). Places and Spaces with Everyone in Mind: Designing For Neurodiversity and Mental Health. A white paper from WSP. https://www.wsp.com/en-us/insights/inclusive-design-places-spaces

Tola, G. Talu, V. Congiu, T. Bain, P. and Lindert, J. (2021) 'Built Environment Design and People with Autism Spectrum Disorder (ASD): A Scoping Review'. *International Journal of Environmental Research and Public Health*, 18, 3203. https://doi.org/10.3390/ijerph180632

United Nations. (2022). The sustainable development goals report 2022. https://unstats.un.org/sdgs/

Vanolo, A. (2023). Autistic cities: critical urbanism and the politics of neurodiversity. *City*, 27(1-2), pp.190-208. https://doi.org/10.1080/13604813.2023.2178273

Walker, N. (2012). Throw away the master's tools: liberating ourselves from the pathology paradigm. In: Bascombe, J. (Ed). *Loud Hands: Autistic People, Speaking. Autistic Self Advocacy Network*. 225–237. https://neuroqueer.com/contact/

Weilandt, A., Grohmann, M., Bollinger, K. & Wagner, M. (2009, December). Rolex Learning Center in Lausanne: From conceptual design to execution. In Symposium of the International Association for Shell and Spatial Structures (50th. 2009. Valencia). Evolution and Trends in Design, Analysis and Construction of Shell and Spatial Structures: Proceedings. Editorial Universitat Politècnica de València. https://riunet.upv.es/bitstream/handle/10251/6726/PAP_GROHMANN_654.pdf

Yan, L. (2022, November). A discussion of minimalism style in interior design. In 2022 International Conference on Science Education and Art Appreciation (SEAA 2022) (pp. 122-128). Atlantis Press. https://doi.org/10.2991/978-2-494069-05-3_16

Zeitoun, L. (2024, 20 June). SANAA's ethereal pavilion at expo 2025 osaka explores a future of 'better co-being'. *Designboom*. https://www.designboom.com/architecture/sanaa-ethereal-pavilion-expo-2025-osaka-future-better-co-being-06-20-2024/