

REIMAGINING URBAN MENTAL HEALTH: A SALUTOGENIC APPROACH TO DESIGNING SPIRITUAL INFRASTRUCTURE IN PUBLIC SPACES

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ABSTRACT

While urban design has made substantial progress in addressing physical health through grey and green infrastructures, the mental health challenges embedded in urban life remain overlooked. This research repositions urban mental health not as a problem to be solved, but as a human condition that design can engage with meaningfully. Drawing from Aaron Antonovsky's Salutogenesis Theory, which shifts attention from disease prevention to health promotion, we explore how the built environment might support emotional resilience and mental well-being through a supplemental layer of spiritual infrastructure. Using Tokyo and New York as testing plots, we examine how design interventions can transform underutilized urban spaces into emotionally supportive environments. The results demonstrate that the "Urban Tree Hole Plan" can effectively reframe loneliness through cultural and ecological lenses, creating intimate refuges grounded in Japanese aesthetic traditions that enhance users' comprehension and management of solitude. Similarly, the "Small Plug-In Plan" in New York has the potential to address pandemic-induced social disorientation by activating closed-off public spaces with modular, participatory interventions that strengthen the community's sense of coherence through collective rituals and flexible, spatially adaptive solutions. Both projects apply a scenario-based method to identify Specific Resistance Deficits (SRDs) and develop Specific Resistance Resources (SRRs) that directly strengthen the Sense of Coherence (SOC), directly supporting emotional resilience and expanding the role of public spaces. This study advances the emotional function of public space beyond relaxation and recreation to include spiritual regeneration, culminating in site-informed design proposals and a new framework for emotionally resilient urban environments.

Keywords

Salutogenesis Theory, Urban Mental Health, Sense of Coherence, Emotional Resilience, Public Space

1 INTRODUCTION

1.1 Challenges

The growing mental health crisis in cities across the globe is an urgent yet under-addressed dimension of public health. The building industries are committed to organizing not only the spaces we inhabit but also the underlying systems that support them, all in pursuit of a better living environment that enhances public health. To meet this collective desire for health, design professionals produce instruments of service—representations in various media that translate design ideas into physical spaces or systems (Christoforetti & Reidel, 2025). While these design and planning efforts have significantly contributed to physical health, they have yet to develop an equivalent system to support mental health in everyday urban life, and mental issues of the urban milieu have long been neglected. The growing disconnect between people's mental needs and their living environments calls for greater engagement from the design disciplines.

The challenge lies not only in identifying relevant mental needs but also in crafting spatial strategies that proactively promote emotional resilience. Design has long influenced the physical health of cities through grey and green infrastructures. However, another dimension—addressing the spiritual and emotional needs of urban inhabitants—remains largely unexplored. This paper addresses that gap by proposing the concept of spiritual infrastructure: an emergent layer of urban intervention designed specifically to foster mental well-being. Drawing on the Salutogenesis Theory, the concept of spiritual infrastructure embraces a shift from a pathogenic model of eliminating illness to a salutogenic model that cultivates health, resilience, and a sense of coherence (SOC).

1.2 Literature Review

The salutogenic approach, developed by medical sociologist Aaron Antonovsky, emphasizes identifying and enhancing factors that support human health and well-being rather than focusing solely on disease prevention (Antonovsky, 1996). Central to this approach is the Sense of Coherence (SOC), composed of comprehensibility, manageability, and meaningfulness. Comprehensibility refers to the extent that one perceives internal and external stimuli as ordered, structured, and intelligible; manageability denotes the belief that sufficient resources are available to meet life's demands; and meaningfulness is the conviction that these demands are worthy of emotional investment (Antonovsky, 1996). Together, these pillars shift the focus of health promotion from simply reducing risks to empowering individuals to interpret, cope with, and find purpose in their challenges. This framework guides the creation of spaces mentioned later in this paper that actively engage users cognitively, emotionally, and socially to foster psychological resilience.

In healthcare environments, Golembiewski has advocated for the salutogenic approach by promoting designs that reinforce patients' SOC through clear, navigable spaces, personalized features that increase manageability, and environments with familiar and meaningful aesthetics (Golembiewski, 2010). Similarly, salutogenic principles are applied by public health specialists in hospital settings, demonstrating design features such as natural lighting, views of nature, and spaces that allow for personal control significantly improve patient recovery times and satisfaction (Dilani, 2008).

Urban public spaces have also been examined through the salutogenic lens. A salutogenic urban design framework in Edinburgh was developed and tested by urban researchers, applying Antonovsky's Sense of Coherence, to evaluate local high streets and their positive impact on mental well-being (Brunelli, Smith, & Woolrych, 2022). The study demonstrated that integrating SOC principles into local street designs—such as clear wayfinding, convenient access to amenities, and socially engaging elements—can enhance the emotional and social experiences of users, especially older adults. Another study demonstrated that salutogenic urban planning strategies can create inclusive, walkable, and socially meaningful spaces, thereby enhancing residents' well-being and reducing health disparities (Maass et al., 2022).

Landscape scholars further explore salutogenic design through therapeutic gardens and parks. Key salutogenic landscape characteristics, such as biodiversity, serene environments, and areas for social interaction, which significantly contribute to psychological restoration, are identified, and the Emotional Character Line Method is developed to provide designers with a practical tool to evaluate and enhance the salutogenic potential of green spaces (Maikov, 2016). Similarly, recent studies integrate salutogenic principles with cognitive behavioral therapy to design neighborhood parks that effectively support cognitive restoration and stress reduction using thoughtful landscape features (Thani et al., 2023).

Collectively, these studies underscore the potential of salutogenic design to transform diverse built environments into spaces that promote health and community well-being. However, no prior studies have systematically deployed a salutogenic design across everyday urban life to specifically target mental health conditions and aim at enhancing emotional resilience through the design of public space. This study is among the first to explicitly embed salutogenic principles to establish "spiritual infrastructure" across multiple public space typologies aimed at addressing urban mental health issues and implementing mental-sensitive public spaces.

2 RESEARCH OBJECTIVES

2.1 Identifying Neglected Urban Mental Health Conditions

While the prevailing design–health paradigms—the biophilia hypothesis, stress reduction theory, and attention restoration theory—are blamed for their narrow focus on “turning away from the built environment toward nature” (Golembiewski, 2012), the limitations of nature, or landscape, in tackling urban mental health are rarely mentioned and studied. In site scale, although therapeutic landscapes and healing gardens demonstrate restorative potential, they are typically confined to hospitals or senior-care facilities and are not universally accessible. Parks and plazas are accessible to the public, but they offer only a generic sense of relaxation and are not supposed to address specific mental health needs. It aligns with the perspective that although design can enhance the quality of life, its capacity to mitigate mental fatigue remains mysterious—and is often relegated to a secondary outcome of physical design strategies (Thwaites et al., 2005).

In city scale, urban planning has been predominantly centered on grey infrastructure—comprising roads, highways, utility networks, transit corridors, and major transport hubs. Although landscape architects have advanced the concept of green infrastructure through initiatives such as rain gardens and bioswale systems, these interventions still primarily address physical needs. The emotional and psychological dimensions of urban life, however, have largely been neglected.

The objective of this paper is to advocate for the concept of "spiritual infrastructure" as an additional, systematic layer of spatial intervention that complements existing grey and green infrastructures. It aims to explicitly identify, define, and demonstrate neglected mental health conditions prevalent in urban settings. This innovative framework aims to create environments that not only support physical health but also nurture mental resilience, thereby providing urban populations with the means to cope with and transform mental health challenges into opportunities for positive self-engagement. By doing so, we seek to bridge the longstanding divide between physical and mental health interventions in the urban realm.

2.2 Investigating the Salutogenic Approach

Although salutogenesis has been extensively applied in healthcare contexts, its application in the design domains for explicitly addressing urban mental health remains underexplored. The current approaches in planning and design regarding urban mental health tend to adopt a pathogenic mindset, framing psychological challenges as problems to be eradicated. Consequently, urban mental health has frequently been overlooked, and there is limited recognition of how urban living exacerbates conditions like social isolation, anxiety, stress, and depression (Brunelli et al., 2022; Maass et al., 2022).

Though Salutogenesis redirects focus from disease prevention to active health promotion—emphasizing well-being, robustness, and recovery (Antonovsky, 1996), existing salutogenic interventions predominantly target physical and environmental wellness, often neglecting the broader mental health benefits inherent in Antonovsky’s framework (Dilani, 2008; Golembiewski, 2010). The absence of targeted interventions underscores a critical gap in urban mental health provisions.

This research advocates a paradigm shift: urban mental health challenges could be viewed as opportunities for growth and resilience rather than pathologies to eliminate. This research aims to investigate and illustrate the potential of applying salutogenesis specifically to urban mental health. Through detailed analyses and public demonstrations, the objective is to elevate public awareness, foster community engagement, and encourage proactive responses to urban mental health issues, ultimately leading to a more holistic urban health approach. By systematically exploring Antonovsky’s Sense of Coherence—comprehensibility, manageability, and meaningfulness—in urban design, this study seeks to

establish comprehensive and effective strategies that holistically foster psychological resilience within urban environments.

3 METHODS

3.1 Conceptualizing A Salutogenic Design Lens for Urban Mental Health

At the core of this study lies the Salutogenesis Theory. Unlike the conventional pathogenic approach, which concentrates on risk reduction and disease prevention, Salutogenesis shifts attention toward the active promotion of health, well-being, and resilience. Within Salutogenesis, dis-ease arises when a person's Generalized Resistance Resources (GRRs)—the collective social, material, and personal assets needed—are insufficient to counteract life's stressors, and the goal is to foster the sense of coherence (SOC) that facilitates the movement toward health (Antonovsky, 1996). As discussed earlier, the theory posits that mental-health challenges can be better understood, managed, and even appreciated through the empowerment of the individual and by strengthening a Sense of Coherence within the built environment. Urban mental stressors are framed not as conditions to eradicate but as opportunities for positive transformation.

Despite this potential, a pathogenic perspective still dominates mainstream planning and design practice, though its influence often goes unnoticed. At the conceptual stage, designers routinely prescribe large “gathering spaces,” sizing them to accommodate outdoor concerts, market spaces, and other gathering events. These success metrics—crowd density, constant activity, and majority use—implicitly exclude users whose mental states may not thrive in such conditions. A similar bias appears in visualization tools: contemporary renderings showcase racial, gender, and age diversity, yet emotional diversity is almost always absent. Figures are uniformly cheerful and socially engaged, masking the reality of urban users who may be anxious, depressed, or simply seeking solitude. By omitting these mental-health minorities, designers inadvertently perpetuate environments optimized for the visibly “healthy,” thereby reinforcing a pathogenic mindset and marginalizing those in psychological distress.

Adopting a salutogenic lens requires more than adding greenery or programmable space; it demands a systematic critique of the values embedded in spatial programs, performance metrics, and visual representations. By foregrounding mental and emotional diversity, we reposition public space as a scaffold for psychological resilience rather than merely a stage for social performance. This stance aligns with Antonovsky's dynamic health-disease continuum (Antonovsky, 1996), which rejects binary categorizations of health and opens design possibilities across a broad spectrum of mental states.

3.2 Selecting Sites and Identifying the Specific Resistance Deficits

Antonovsky recognized that generalized resources alone may be insufficient to support a robust SOC, leading him to define Specific Resistance Resources (SRRs) and Specific Resistance Deficits (SRDs) for targeted health issues. In the urban context, existing green spaces provide generalized mental resources—like relaxation—but often fail to address specific mental health needs (Cai & Cai, 2021). This gap calls for SRRs in our cities and public spaces delivered through the tool of design intervention.

However, a central challenge in addressing urban mental health through design is the inherent difficulty of quantifying psychological states and translating abstract mental health concepts into tangible design solutions. This challenge complicates efforts to effectively communicate and validate mental health interventions in urban planning and design practice (Maikov, 2016). Following Antonovsky's view that stressors are omnipresent and not inherently harmful, Golembiewski notes that some stressors can be negotiated or even celebrated if adequate resources exist (Golembiewski, 2012).

Building on such a theoretical foundation, our research strategy has two key steps. First, identify cities with significant mental health challenges. While mental issues are universal, we prioritize cosmopolitan centers characterized by high population density and a rich mix of cultural, social, and political dynamics. In theory, these regions amplify both the need for and the limits of salutogenic resources, offering abundant GRRs—comprehensive transit, diverse services, cultural assets, and constant social opportunities. Yet these same environments generate equally complex stressors (crowding, anonymity, hyper-competition, sensory overload) that can erode individuals' Sense of Coherence if those resources are not targeted, context-specific supports that make everyday stressors comprehensible, manageable,

and meaningful. Second, calibrate on pressing urban mental issues. Mental health challenges rarely occur in isolation and thus need resources from different aspects. In this paper, we want to focus on issues that are directly linked to public space and thus have great potential to be enhanced through the improvement of design, ensuring our study is both context-specific and implementable.

Tokyo and New York were selected as pilot cities to apply these theoretical foundations and design strategies. Tokyo combines extreme population density with cultural norms that valorize emotional restraint, indirect communication, and social distance, which lead to a fundamental collective mental status: loneliness. By focusing on Tokyo's loneliness, we can examine how culturally conditioned stressors outstrip generic GRRs and therefore demand finely tuned SRRs that respect local aesthetic traditions while fostering safe, introspective refuge.

New York's heterogeneous socio-political context revealed its own vulnerabilities during the COVID-19 pandemic: while the city's extensive park network and civic amenities function as GRRs in ordinary times, pandemic closures revealed how quickly those resources can become inaccessible, leaving residents without the specific spatial and procedural supports required to manage collective trauma and social disorientation. Studying New York, therefore, allows us to test salutogenic interventions and prototype SRRs that restore social meaning and mental safety within a disrupted public realm.

3.3 Applying Salutogenic Approach through Speculative Designs

Speculative design transcends the constraints of conventional practice by offering bold, conceptual solutions that challenge established paradigms, yet remains highly relevant to the in-situ social, cultural and political aspects. Engaging with scenarios generates ideas that, although not immediately implementable, stimulate critical discourse about future possibilities in urban design. This method enables a focus on particular groups and their unique mental needs, laying the groundwork for interventions that integrate seamlessly into the urban fabric.

The "Urban Tree Hole Plan" for Tokyo and the "Small Plug-in Plan" for New York represent two distinct approaches set within different spatial and temporal contexts. Yet, both projects adhere to the salutogenic framework and employ a scenario-based methodology to advance their designs. This method dissects the multifaceted socio-cultural experiences of urban life by categorizing diverse mental states and interactions with public space into distinct scenarios. As a storytelling tool, each scenario, grounded in specific spatial and temporal contexts, constructs a narrative that illuminates how individuals relate to their environments.

Incorporating these scenarios into the speculative design process not only transcends the limitations of conventional practice but also articulates innovative strategies for mitigating urban mental health challenges through creative, theoretically grounded spatial interventions – the embodied SRRs. In the two speculative design projects we are going to explore in the next section, the everyday moments of encountering stressors we mapped in the scenarios are the Specific Resistance Deficits (SRDs) in urban life, while the forthcoming design interventions function as Specific Resistance Resources (SRRs) that strengthen the Sense of Coherence through comprehensibility, manageability, and meaningfulness (Figure 1).



Figure 1. The application of salutogenic approach in speculative public space design to tackle urban mental health issues (2019-2020). Diagrams by the authors.

4 RESULTS

4.1 An Urban Tree Hole Plan for Tackling Loneliness

The research on urban mental health began in 2019 with a speculative design for Tokyo, a metropolis known not only for its vast population but also for its pronounced mental health challenges. Recent demographic trends reveal a global shift toward solo living arrangements: Japan's National Institute of Population and Social Security Research projects that by 2040, approximately 40% of Japan's population will live alone, while European Union Eurostat reports that single-resident households account for 26% in Canada and 34% across the European Union (Bubblefutures, 2019). Such statistics emphasize the urgency of incorporating mental health-focused public realm strategies to foster social connection and emotional resilience.

However, Tokyo's pervasive loneliness extends beyond solo living. Cultural norms of self-restraint and social distance, compounded by immense work pressure and limited public space exacerbate isolation: only 6% of Tokyo's urban area is designated as open space (Tokyo Metropolitan Government, 2010). Yet, loneliness in Tokyo carries a deeper cultural meaning. Rooted in Japanese aesthetic traditions such as Wabi-sabi and Mono no aware, solitude is often revered as a path to self-reflection, widely depicted in art and literature.

This complex socio-cultural pattern challenges the common assumption that loneliness is a problem to be solved. Traditionally, loneliness has been framed as a harmful condition, opposing social engagement and connection. Society, following a pathogenic model, focuses on the risks of loneliness, fostering fear and reducing the issue to an illness to be eradicated. The "Urban Tree Hole Plan," initially conceived for an international competition themed "Eliminate Loneliness," subverts this perspective. Titled "From Eliminating to Elevating," the project reframes loneliness as an experience to be embraced. Drawing from the Salutogenesis Theory, it posits that spatial design can reshape societal perceptions by creating environments that support the sense of coherence (SOC), coexistence with solitude, ultimately promoting mental resilience and well-being.

In Tokyo, where social norms emphasize self-restraint and minimal disturbance to others, many lonely individuals seek not just company but also privacy—an intimate space where they can process their solitude without societal judgment. Rooted in Wabi-Sabi aesthetics, solitude carries cultural depth in Japan and is seen as introspective, not pathological. According to the healthy/dis-ease continuum theory,

the sense of coherence depends on the opposing forces of the SRRs – in this case, the culture-infused social tendency toward solitude and being alone – and the SRDs – the societal judgment and the stigma that being different is a problem. If our built environment can enhance the chance for inhabitants to gain Salutogenic resources and protect them from encountering deficits, it is possible that public space can help people orient toward the healthy end of the continuum.

Thwaites highlights a shift in urban design toward a network of small, restorative spaces rather than large, discrete open areas, emphasizing their accessibility and impact on mental well-being (Thwaites et al., 2005). Aligning with this vision, the "Urban Tree Hole Plan" introduces the concept of the "tree hole" as a refuge for these individuals: a space that is easily accessible, yet enclosed and undisturbed, providing a safe and comfortable retreat. Lonely individuals are less concerned about the feeling of loneliness itself than about how society perceives and responds to it. By integrating natural elements into urban spaces, the project cultivates an aesthetic of shared solitude—an understanding that both humans and nature coexist in moments of reflection. The "urban tree hole" thus offers an empathetic retreat, a place where people can temporarily escape social expectations and engage in an intimate dialogue with nature.

Besides the consideration of the tree hole space itself, the project tries to involve natural elements as a critical part of promoting mental well-being. Similar to the urban inhabitants, natural elements like trees, sky, and water exist as quiet, often-overlooked characters in contemporary cities, mirroring the loneliness experienced by individuals in dense urban environments. The design scheme proposes "tree holes" that integrate natural elements long overlooked by city dwellers. In doing so, these urban sanctuaries foster an empathetic connection between humans and nature, where loneliness is neither stigmatized nor suppressed but embraced as a shared experience.

The Urban Tree Hole Plan introduces three spatial interventions that integrate hidden, small-scale public sanctuaries within Shibuya's urban fabric. Tree Hole 01 renovates street retail spaces by embedding reflective facades that blur the boundary between the user and the city, allowing individuals to momentarily retreat while reconnecting with overlooked urban landscapes and nearby street trees. Tree Hole 02 reclaims sky corridors between high-rises, where obstructed views and tilted mirrors redirect attention to the sky beneath one's feet, fostering an unexpected moment of solitude and reflection in the vertical cityscape. Tree Hole 03 transforms underground spaces beneath busy intersections into quiet refuges, utilizing rain gardens and cascading water features to filter runoff while creating a meditative atmosphere shielded from urban noise. Collectively, these interventions establish a new form of spiritual infrastructure, subtly embedded within Tokyo's dense environment to provide moments of contemplation and empathy between people and nature (Figure 2).

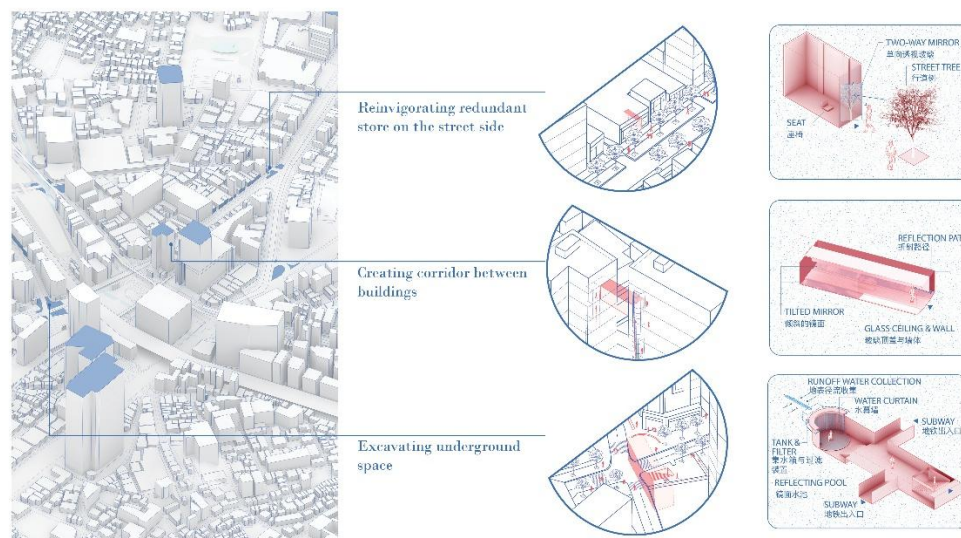


Figure 2. Potential urban tree holes in Shibuya district that collectively form the spiritual infrastructure network in the city (2019). Diagrams by the authors.

The concept aligns with Roger Ulrich's research on the restorative effects of natural environments. His study demonstrates that exposure to natural views, particularly those including water and vegetation, significantly reduces anxiety, enhances mood, and promotes faster recovery (Ulrich, 1984). These findings underscore that natural elements do more than visually please; they have measurable restorative effects on mental health, a principle our design interventions explicitly harness. Ulrich's work also reveals that such restorative benefits extend beyond clinical settings, implying that incorporating nature into urban public spaces can effectively reduce stress and improve overall well-being. In this regard, the Urban Tree Hole Plan is a prime example of applying Ulrich's insights—by integrating views of the sky, water, and trees, the project creates immersive experiences that facilitate mental restoration and foster a deep, empathetic connection between individuals and their natural surroundings.

The Urban Tree Hole Plan thus reimagines urban solitude as an opportunity for self-reflection and human-nature dialogue, guided by a salutogenic approach that shifts the focus from eradicating loneliness to fostering resilience through spatial and emotional well-being. By amplifying the aesthetics of loneliness between people and nature, the project attempts to establish a form of oriental empathy, where solitude becomes a bridge rather than a barrier—an experience that both human and nature can temporarily share and communicate (Figure 3).

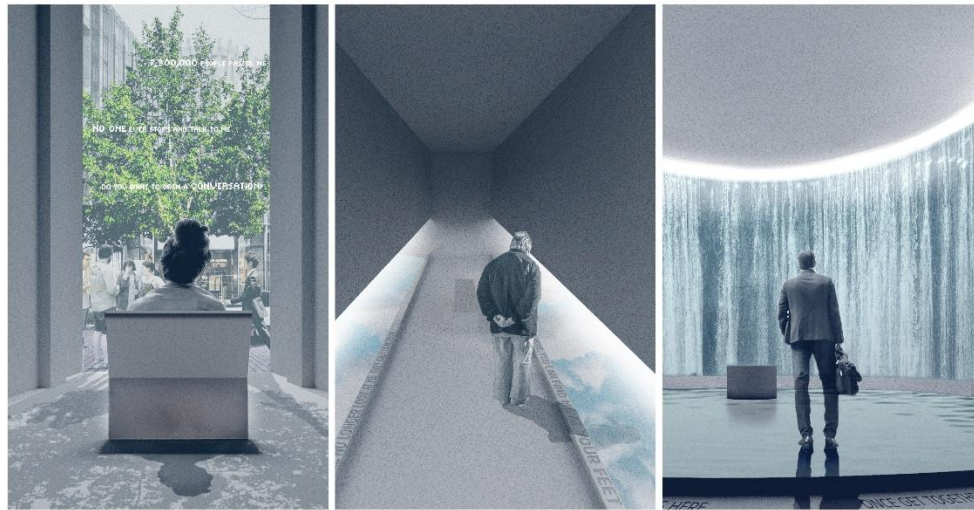


Figure 3. Design representation: Three types of tree hole space providing immersive experience with natural elements (2019). Diagrams by the authors.

Beyond spatial design, the Tokyo Loneliness Tree Hole Plan explores both the personal experience of solitude and the collective use of these new public spaces. To foster shared engagement, the project introduces the Tokyo Loneliness Tree Hole Guide, a resource that maps tree hole locations, provides usage instructions, and serves as a message board where users can share personal reflections on loneliness. Additionally, to balance privacy and accessibility, each “tree hole” is designed for single occupancy and operates on a “One Person, One-Time” reservation system, ensuring an orderly and secure experience. This structured approach redefines urban public space management, transforming urban tree holes into a new kind of spiritual infrastructure that supports both individual contemplation and a subtle, citywide network of shared solitude.

4.2 A New Open Space Protocol for Pandemic Era

The COVID-19 pandemic reshaped urban life in unprecedented ways, forcing millions into isolation and exposing vulnerabilities in the built environment. In efforts to curb viral transmission, cities worldwide restricted access to public spaces by shutting down parks, plazas, and waterfronts or by imposing severe limitations on their use. Recent data confirms that during the COVID-19 pandemic, urban open spaces suffered dramatically. In New York City, public open space—comprising approximately 33,630 acres

(about 16% of the city's total land area), including streets that function as de facto public spaces (Kim & Civic Data Design Lab, 2020)—was significantly affected. At the peak of the pandemic, nearly 30% of NYC's open spaces—equivalent to about 12 Central Parks—became inaccessible due to closures or restrictions on recreational areas, according to Kim and Civic Data Design Lab's research. This abrupt reduction in shared environments and accessible public space disproportionately affected residents, underscoring the critical role of public space in supporting both physical and mental well-being.

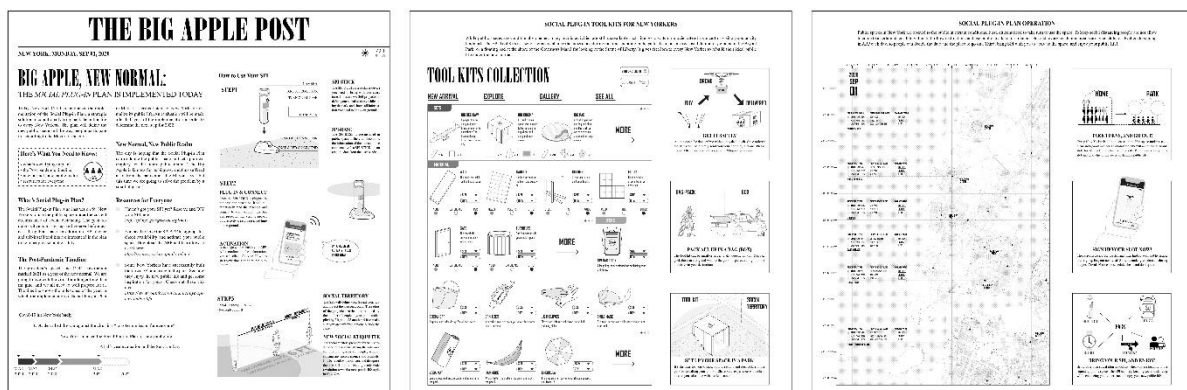
The pandemic laid bare a twofold problem: on one hand, the inequitable distribution and underutilization of open spaces became evident as transportation and public services plummeted, leaving many neighborhoods with scarce or even completely closed parks; on the other, a pervasive fear emerged. Individuals were not only at risk of virus exposure when leaving home but they also faced societal blame for venturing outside—an environment where simply being in public came to be regarded as a potential source of infection. From a salutogenic perspective, both phenomena represent profound losses of manageability and meaningful social contact, two pillars of the Sense of Coherence (SOC). Generalized Resistance Resources (e.g., a big park or plaza) suddenly proved inaccessible or insufficient, and no Specific Resistance Resources (SRRs) were in place to compensate—an equity failure that disproportionately burdened communities already lacking high-quality public space. A deeper analysis, therefore, raises critical questions: Is the reluctance to use parks during the pandemic a natural response, or is it shaped by external factors such as social judgment and policy decisions? Who exactly creates and perpetuates this fear, and do public-health measures unjustly curb the universal right to open space? By separating residents from resources that make stressors manageable and social life meaningful, abrupt shutdowns jeopardized community-wide SOC and exposed how existing policies privilege physical safety over mental-health equity.

A number of quick-fix spatial solutions emerged during the pandemic in response to the sudden demand for safe public gatherings. One of the most widely adopted tactics was the use of white-painted circles on lawns or paved surfaces—Domino Park in Brooklyn, New York, is a good example—to define “personal space.” At first glance, these solutions offered a simple, visual approach to maintaining social distancing. Yet, viewed through a salutogenic lens, the circles addressed comprehensibility (“stand here”) while doing little for manageability (users lacked control over size, duration, or group configuration) or meaningfulness (the circles offered no cues for social connection, cultural rituals, or varied activities). First, the circles were static in size and location, suitable only for single users and incapable of accommodating families, couples, or pet owners. Second, the design assumed a homogeneous user base, overlooking diverse public-space activities such as conversation or exercise. Third—and perhaps most critically—this strategy lacked temporal flexibility: no mechanism regulated how long any one person or group could use the space. The result was a first-come, first-served system that magnified inequities in access, often leading to under-use in some districts and overcrowding in others, thereby compounding SOC deficits rather than remedying them.

An ideal model should move beyond this one-dimensional solution by integrating design with governance, user diversity, and behavioral dynamics. Instead of relying solely on visual cues painted on surfaces, future public space protocols should be developed as holistic systems that combine spatial flexibility with time-based management and equitable access. First, such a system should accommodate different group sizes and allow a range of activities by offering variable spatial arrangements rather than fixed geometry. Second, it should provide an inclusive strategy that addresses users' varying psychological needs—including the need for privacy, safety, and social interaction—without reinforcing stigma or exclusion. Third, it must be dynamic: not only managing capacity, but distributing access fairly across time and geography, ensuring that parks and public areas remain shared civic resources. Finally, these efforts must extend beyond physical design to include new operational policies, digital tools, and culturally sensitive engagement strategies that support mental well-being during public health crises.

In response, the Small Plug-In scheme was developed to provide resources that allow safe use of public spaces while mitigating the psychological burden of exposure during the pandemic, and posits that safe, flexible, and equitable access to open space constitutes an urban right, even under a pandemic condition. By fictionally enacting policy changes that clarify responsibilities for social distancing and health protection, the SPI (Small Plug-In) Plan rejects the notion that sweeping closures are the only strategy for curbing infection. Instead, it redefines the concept of public space and proposes a behavioral mode in

At the heart of the SPI Plan are three major components: a portable SPI Device, a suite of SPI Tool Kits, and an SPI Map that coordinates usage times and locations (Figure 4). First, the SPI Device leverages AR technology to project a “Social Territory”—a spatial radius on the ground that adjusts dynamically according to the number of people in one’s group—ensuring each party maintains an appropriate distance from others. Second, the SPI Tool Kits provide citizens with a catalog of easy-to-assemble modules, enabling a wide range of activities in reopened parks: temporary outdoor cinemas, performance stages for small gatherings, or floating pads along waterfronts for unique sightseeing experiences. These kits aim to accommodate diverse needs—families, solo visitors, or groups of friends—while honoring safety protocols. Lastly, the SPI Map operates as a digital reservation platform, allocating time slots and park spaces according to population density and geographic distribution, thus preventing overcrowding and ensuring equitable access across the five boroughs. By integrating these SRRs, the design interventions balance the stressors of pandemic-induced public isolation—fear of exposure and the social blame associated with leaving home—with measures that enable safe and meaningful use of urban space. In doing so, the interventions not only address immediate public health concerns but also promote long-term mental resilience by leveraging the restorative benefits of nature and collective participation, as demonstrated in previous research (Ulrich, 1984).



Further, the Plan culminates each year in a ritual called Survivor Day, scheduled on March 14th—the anniversary of New York’s first reported COVID-19 fatality. By inviting all residents to gather (with SPI Devices) and collectively transform Central Park into a luminous memorial and citywide celebration, the Survivor Day serves as a collective SRR that reframes outdoor activity from a risky behavior to a source of communal resilience.

This project conceives a dynamic network that nurtures emotional resilience and supports urban mental health, underscoring the community's right to shared space, and affirms that public life can be sustained through innovative policy and purposeful design. The design strategy provides a narrative blending inventiveness with social sensibility, with a DIY ethos that deliberately eschews elaborate aesthetics of human-centered solutions. By imagining a new code for conviviality and unplainair activities in a post-pandemic era and seeing public space as a resilient, salutogenic asset, this project offers a blueprint for fostering sustainable well-being and reestablishing public life in a transformed urban landscape (Figure 5).



Figure 5. The Survivor Day in introduced to New York Central Park as a collective SOC for survivors of the pandemic (2020). Diagrams by the authors.

5 DISCUSSION

5.1 Design for Whom

Public space is conventionally designed with the public in mind, yet defining "the public" as the majority risks neglecting the diverse needs of marginalized or underrepresented groups. Many public space designs cater primarily to individuals who feel comfortable engaging in social interactions and spontaneous encounters, often overlooking those who experience discomfort in crowded environments or who seek solitude. Among them are individuals who prefer low-stimulation settings, avoid disturbances, and navigate public space with unease. These so-called "lonely" individuals represent a user group whose emotional needs deserve equal consideration in urban public space design. Rather than treating urban interventions as one-size-fits-all solutions, a salutogenic approach emphasizes the development of a Sense of Coherence (SOC) by addressing varying stressors and equipping individuals with resources to interpret, manage, and find meaning in their environments. Designing exclusively for the majority may enhance manageability for some, but it fails to provide comprehensibility and meaningfulness for others whose interactions with public space are shaped by psychological, cultural, or social complexities.

The question of how to define public versus private space is central to this discourse. In the Tokyo Urban Tree Hole Plan, designated micro spaces offer individualized SRRs for those experiencing urban loneliness, enabling moments of self-reflection and secure solitude within a public setting. The Small Plug-In Plan developed for New York reframes pandemic-era public space usage, proposing interventions that preserve both safety and access. The integration of SPI devices, reservation systems, and collective rituals presents multiple SRRs that counteract pandemic-related stressors while reinforcing users' capacity to maintain social connections. By blurring rigid public-private dichotomies, these interventions promote inclusivity through the spatial distribution of resources that support emotional resilience. More broadly, they invite reflection on how salutogenic design principles can reframe not only who urban space is for, but also how spatial experiences are shaped by the interplay of stressors, resources, and individual agency.

5.2 Limitations and Challenges

While the proposed design interventions demonstrate promising applications of Salutogenesis Theory—transforming public spaces into SRRs—significant challenges remain in both the design process and the broader theoretical framework. The Urban Tree Hole Plan for Tokyo and the Small Plug-In Plan for pandemic-era New York illustrate targeted, context-specific responses; yet these projects raise questions about the scalability and generalizability of such interventions. Although these designs effectively address specific stressors during crises or within particular cultural settings, it is still unclear whether Generalized Resistance Resources (GRRs) must also be provided city-wide. In other words, should the spiritual-infrastructure network advocated here integrate both SRRs—tailored, situational responses—and GRRs that support mental well-being in more typical urban contexts?

Furthermore, the broad concepts of comprehensibility, manageability, and meaningfulness, while helpful for understanding mental resilience, are difficult to operationalize in complex urban settings. The speculative-design methodology encourages flexible imagination free from real-world constraints, yet it does not lead directly to implementation. Constructing a new layer of spiritual infrastructure, whether by occupying abandoned sites in Tokyo or introducing a new open-space protocol in New York, will require collaboration with municipal governments, community groups, and other stakeholders. At this stage, the research remains conceptual and must advance toward further testing.

In short, although integrating SRRs through speculative design offers a novel pathway to promote emotional resilience and foster spiritual infrastructure, further research is needed to determine how these interventions can be complemented by more general, adaptable resources suited to varied urban contexts. Addressing these limitations will involve refining design strategies and expanding the salutogenic framework to account for the multifaceted nature of urban mental-health challenges.

5.3 Future Research Directions

Transitioning from speculative concepts to practical implementation will require three complementary lines of inquiry. First, rapid-assessment tools—including questionnaires, interviews, and behavioral mapping—should monitor changes in perceived manageability, social connectedness, and overall mood before and after prototype use. This empirical layer can translate salutogenic concepts into measurable outcomes, supplying the evidence needed by planners, public-health officers, and funders.

Second, pilot installations should be co-developed with municipal agencies, community partners, and private sponsors. Iterative design informed by ongoing community feedback will refine the SRR catalogue to align with local culture, building standards, and stewardship capacities. This co-design process will identify unforeseen barriers—such as social stigma, jurisdictional regulations, or seasonal maintenance needs—and feed those insights back into an evolving salutogenic toolkit, thereby moving spiritual infrastructure from visionary concept to actionable urban policy.

Third, an implementation roadmap accompanied by a detailed cost-estimate framework should support future grant and funding applications. A proposal that clearly articulates both projected costs and benefits will help cities and sponsors weigh salutogenic value against capital and operational expenditures. Robust cost data will also clarify whether a network of micro-interventions (e.g., tree holes) or modular kits (e.g., plug-ins) offers a stronger return on investment than conventional amenity upgrades.

6 CONCLUSION

This study set out to investigate how Salutogenesis Theory, originally developed in health science, can inform a new layer of spiritual infrastructure capable of supporting urban mental well-being. A comprehensive literature review established that, while salutogenic principles have been applied in healthcare architecture and therapeutic landscapes, their explicit use for everyday public space and urban mental health remains limited. Building on this gap, we articulated two research objectives: (1) identify neglected urban mental-health conditions, and (2) investigate the urban applicability of the salutogenic approach.

Methodologically, we first conceptualized a salutogenic design lens, critiquing the implicit pathogenic norms—density metrics, visualization conventions, majority user assumptions—that shape public-space production. We then developed a site-selection logic grounded in Antonovsky's framework: dense, culturally complex cities amplify stressors while exposing the limits of generic GRRs; therefore, they provide fertile ground for testing SRRs. Tokyo and New York were chosen because they embody different but equally pressing mental-health deficits: Tokyo's culturally reinforced loneliness and New York's pandemic-induced conflict between collective safety and individual desire for public life.

Within these contexts, we applied a scenario-based speculative method to map everyday stress encounters and design targeted SRRs. The Urban Tree Hole Plan reclaims interstitial Tokyo spaces to pair chosen solitude with discreet natural companions—trees, sky, water—allowing users to comprehend, manage, and ultimately find meaning in their loneliness. The Small Plug-In Plan for New York layers a portable device, modular tool kits, and a reservation protocol to re-establish a manageable and

meaningful public realm in the wake of COVID-19 closures, culminating in a collective ritual ("Survivor Day") that restores mental strength.

In both prototypes, design elements translate salutogenic theory into experiential cues that help users move along the health–dis-ease continuum toward a stronger SOC. By diagnosing SRDs, delivering SRRs, and aligning interventions with local culture, the projects demonstrate how speculative design can bridge psychological theory and spatial practice.

The last part of this study underscored the question of design for whom, challenging majority-centric norms in public space design. We recognized the limitations of this study and the speculative design methodology, looking into the future agenda of the research: focus on pilot testing, cost modelling, and community co-design process to transform concepts into evidence-based, economically viable interventions.

Ultimately, this research argues that mental health deserves parity with physical and ecological goals in urban design. By envisioning spiritual infrastructure as an integrated, salutogenic layer—adaptive to local culture yet transferable across global cities—we offer a roadmap for planners, policymakers, and communities seeking to foster emotional resilience in an increasingly complex urban world.

REFERENCES

- Antonovsky, A. (1996). The salutogenic model as a theory to guide health promotion. *Health Promotion International*, 11(1), 11-18.
- Brunelli, L., Smith, H., & Woolrych, R. (2022). A salutogenic urban design framework: The case of UK local high streets and older people. *Health Promotion International*, 37(5), daac102.
- Bubblefutures. (2019). *ISO: Lation, spaces and places that fight loneliness*. Bubblefutures.
- Cai, G. and Cai, M. (2021). Urban mental desire—Tokyo loneliness tree hole plan. *Landscape Architecture Frontiers*, 8(6), 120-131.
- Christoforetti, E.B., & Reidel, J. (2025). Instruments of service. *Harvard Design Magazine*, (52), 10-11.
- Dilani, A. (2008). Psychosocially supportive design: A salutogenic approach to the design of the physical environment. *Design and Health Scientific Review*, 1(2), 47-55.
- Golembiewski, J. A. (2010). Start making sense: Applying a salutogenic model to architectural design for psychiatric care. *Facilities*, 28(3/4), 100-117.
- Golembiewski, J. A. (2012). Salutogenic design: The neural basis for health-promoting environments. *World Health Design Scientific Review*, 5, 62-68.
- Kim, L. & Civic Data Design Lab. (2020). *COVID-19 open spaces: Numbers and reality in NYC*, Retrieved April 8, 2025, from <https://blog.civickatadesignlab.mit.edu/covid-19-open-spaces-numbers-and-reality-in-nyc>
- Maass, R., Lillefjell, M., & Espnes, G. A. (2022). Applying salutogenesis in towns and cities. In M. B. Mittelmark (Eds.) et. al., *The Handbook of Salutogenesis* (2nd ed., pp. 361–370). Springer. https://doi.org/10.1007/978-3-030-79515-3_34.
- Maikov, K. (2016). Exploring the salutogenic properties of the landscape: From garden to forest [Doctoral dissertation, Eesti Maaülikool].
- Thani, S. K. S. O., Hussein, H., Föhn, M., & Ng, S. C. (2023). Salutogenic landscape design with cognitive restoration stimuli for stress intervention. *Environment-Behaviour Proceedings Journal*, 8(25), 133-140.
- Thwaites, K., Helleur, E., & Simkins, I. M. (2005). Restorative urban open space: Exploring the spatial configuration of human emotional fulfilment in urban open space. *Landscape research*, 30(4), 525-547.
- Tokyo Metropolitan Government. (2010). *Tokyo statistical yearbook*. Tokyo, Japan: Tokyo Metropolitan Government Bureau of General Affairs, Statistics Division, Management and Coordination Section.
- Ulrich, R. S. (1984). View through a window may influence recovery from surgery. *Science*, 224(4647), 420-421.