Social Connection and Resilience:

Design for Humans over Hazards

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Social connection can save your life.

Day-to-day, social isolation is a deadly personal risk, equivalent to as much as three quarters of a pack of cigarettes per day, according to the U.S. Surgeon General ^[1] And, against a backdrop of spiraling disasters, from heatwaves to fires to floods, social connection boosts your odds of personal survival and broader community resilience in a crisis.

Lethal loneliness has many factors, but one that is all-too-often overlooked is the design of our buildings and cities. And even when we do consider the built environment, we tend to zoom in on questions of "hard" infrastructure at the expense of less tangible "soft" values like social connectivity. Physical structures, after all, have unambiguous metrics – footprint area, dollars/cents, fossil fuel consumption et al. When faced with resilience funding choices, seawalls, e.g., come with ready-made specs; social connectivity, not so much. In making design decisions, planners and architects take stock of parameters of interest – construction budget, carbon impact, sustainability, service life, and such -- assigning each one a weighting according to our collective priorities. Hard goals that are easily and concretely measured win out over softer goals, like sociality, that may be at least as important but whose metrics are intrinsically subjective, unblessed by any generally accepted standardizing authority. As a result, when we can't agree on a numeric value for a given parameter, it's all too easy to neglect it, implicitly weighting it at zero.

In this paper, we set out to level the design-decision imbalance between "hard" physical data and the less readily quantified "soft" goal of building places that support social connection. Using new AI tools, gaming technology and research input from the University of British Columbia's Social Cognition and Emotion Lab, we have prototyped FLUID Sociality.

It's a pubic-good tool in development that uses agent-based modeling to assess sociality among building design options through the more measurable proxies of connectivity's enabling conditions, e.g. face-to-face encounters of user/ agents interacting in a digital model of a building. We measure how often you see your neighbour in differing design options, and how setting the stage for those interactions may support the establishment of valuable acquaintance networks.

No single tool can be an all-purpose panacea for design of built environments. We're not dismissive of "hard" infrastructure. But- as FLUID develops, it and other tools will offer a step towards restoring the value and measurability of sociality to its rightful importance in architectural and urban planning deliberations.

Nor is FLUID potentially relevant just for averting doomsday downsides. One goal is to promote our joy in living together as social animals, both in our everyday interactions and even in times of stress. Well-documented cases show how disasters can bring out the best in resourceful mutual care among seeming strangers, as long as there's an underlying substrate of sociality.

FLUID invites us to imagine a way of building that encourages our human freedom to connect with each other in service of personal well-being, community strength, and pleasure.



This report was started as a collaboration between Sadhu Johnston and Human Studio Architecture and Urban Design (<u>humanstudio.ca</u>). When Bruce Haden, the co-lead author of the paper left Human Studio and founded FLUID Architecture (<u>fluidarchitecture.ca</u>) the primary collaboration was between Sadhu Johnston and FLUID Architecture. Human Studio continued to contribute to the paper, with work being led by Sarah Klym. Our work was supported by the Innovation Network for Communities.

Sadhu Aufochs Johnston

Sadhu Johnston was the City Manager of Vancouver, Canada from March 2016 until January 2021. As City Manager he spearheaded initiatives to address the growing housing and climate change crisis in Vancouver. He also became aware of the reality that social isolation lay at the root of many of the city's challenges. Prior to his role in Vancouver, Johnston was the Chief Environmental Officer of Chicago and Deputy Chief of Staff to Mayor Richard M. Daley. Johnston also previously served as the Executive Director of the Cleveland Green Building Coalition. Johnston is co-author of "The Guide to Greening Cities" published by Island Press in 2013. In 2008, Johnston co-founded the Urban Sustainability Directors Network (USDN) and served as the Chair of the Executive Committee of STAR community sustainability rating system. Johnston served on the selection committee for the Partners for Places Fund, a partnership between USDN and the Funders Network for Smart Growth and Livable Communities as well as the Greenest City Fund in partnership with the Vancouver Foundation.

Bruce Haden

Architect AIBC, MRAIC, LEED AP FLUID Architecture

Bruce Haden, AIBC, MRAIC, LEED AP, leads FLUID Architecture in Vancouver, Canada. His architecture focuses on interaction, indigeneity and intimacy. The interaction focus is best exemplified by the FLUID software tool described in this paper. The indigeneity focus comes from Bruce's history of work with native communities from the Yukon to Mexico, and also speaks to a broader mission; using architecture to anchor our human understanding of place. The word intimacy foregrounds a focus on craft and reminds us that architecture is only ever directly experienced at the scale of the human body. Prior to founding FLUID Architecture, Bruce led multiple high-profile projects as partner at Human Studio and Dialog (formerly Hotson Bakker Boniface Haden). He also co-authored "Urban Magnets: How Activity Subcultures can be a Catalyst for Rejuvenating Cities." Bruce is an active member of the Canadian design community. He is a founding board member of the Urbanarium, has twice chaired the City of Vancouver's Urban Design Panel. He was the Jury Chair for the international design competition for Block 2 on Ottawa's Parliament Hill. in Ottawa.

Sarah Klym Human Studio Sarah is a Design Strategist at Human Studio Architecture + Urban Design in Vancouver, Canada. Sarah leads Human's ongoing research into design for social comfort and connection. She is also an Adjunct Professor at the University of British Columbia, where she teaches Design Media at the School of Architecture.

Why We Care: Authors' "Aha!" Moments of Insight Around Design and Social Connection

"Growing up in intentional communities attuned me to the upside of community connectedness, but it was only after coming to work in the Chicago Mayor's Office in the wake of a massive heatwave that had killed almost 1,000 people that I fully realized the deadly downside of weak community.

My focus in Chicago was to "green" the city. We developed one of North America's first big-city plans for climate adaptation and carbon emission reduction, deploying such measures as an urban heat map, reflective roofing ordinances, and green roof mandates for big box stores and high rises.

These infrastructural interventions proved relatively straightforward, with clear-cut investment opportunities and well-funded capital plans. The harder challenges were the socio-economic factors and inequities that left far too many people to die alone in their apartments without air conditioning or a community network to check-in on them.

Moving to Vancouver, I learned the toll of lethal loneliness in a different context: the opioid epidemic. As City Manager, I witnessed far too often the tragic irony of belatedly dispatching emergency response teams to overdose cases that might have been forestalled just by offering more social connection opportunities to these Single Room Occupancy loners.

Without preemptively addressing this loneliness crisis, cities are left to play catch-up, wasting billions of dollars (and tragically lost lives) to deal with the results of people living in isolation. Instead, with the right tools, we can proactively design our buildings and neighborhoods to passively create social connectedness. That's the inspiration for this paper. "- Sadhu Aufochs Johnston

"A commission that was especially meaningful to me was the design of a new branch library with a social housing just a couple of blocks from my home in Vancouver's Strathcona neighbourhood. The plan called for four-stories of subsidized apartments, about 40 units, atop the library block as long-term residences for single women with children.

Many of these tenants, mothers and kids, would be dealing with the aftermath of troubled relationships and even threats of violence. There would be security considerations and they'd be spending a lot of time at home, so a socially connected support group could make a big difference.

With this in mind, we worked up two alternative designs for the rooftop housing. There was the basic so-called "double-loaded corridor scheme" for such applications – a four storey, C-shaped stack of one-floor apartments, with a strip of apartments facing towards the main street, and a strip of units across the corridor facing the other way. But we also offered an alternative plan; an elevated courtyard surrounded by two storey townhouses. And in that layout, residents could step out onto an open-air corridor from which they'd overlook a rooftop garden/playground and see almost all the other front doors in the complex.

This was far better, of course, from a social connectivity standpoint – just being able to easily say 'hi' to your neighbors would matter a lot to these women. But how to measure that difference? There was no standard metric to capture it in the same unambiguous way we can reckon "hard" numeric construction cost factors like exterior wall area. And, as it turned out, the "basic" plan entailed 30% less exterior wall area than the courtyard, so that's what got built – "hard" numbers won out over "soft" aspirations.

Ironically enough, just a few years later a similar social housing project came up, evoking a similar pair of design submissions. But by then we'd worked up FLUID, which tipped the decision to the courtyard versus the double-loaded-corridor. So, as you can see, just having numbers can make all the difference." - **Bruce Haden**

"My first professional experience out of grad school was working on supportive housing for individuals with severe physical trauma. We were aware of the value of a healing environment, and aimed to design comfortable spaces for connection with natural light and ventilation. However, the client opted to deliver a below-budget building instead of providing units with sufficient windows or livable dimensions. We were unable to communicate the importance of our values to the client, and it led us to resign from the work rather than profit at the expense of residents.

This experience opened my eyes to the reality of finance in architecture. It showed me the importance of a clear position, and advocating for design that prioritizes human needs within budget constraints. It strengthened my commitment to building evidence-based arguments to support socially connected and humane spaces in the face of immense inertia." - **Sarah Klym**

Executive Summary

This paper outlines the under-appreciated upside benefits of social connection and downside risks of social isolation in terms of individual and community health, crisis resilience (particularly regarding the climate emergency) and equity. We show how community and building design can support more socially connected spaces. We diagnose why sociality is all-too-often overlooked in planning and offer tools to redress this imbalance.

Social Isolation and Individual Health

Social connection is a bedrock of human well-being, cognitively, emotionally, and physically. Without it, research has shown, isolation and loneliness increase our risk of sickness and early death. Quality relationships are the single most important predictor of a high-quality life.

Social Isolation and Community Health

Social interaction, at both the individual and collective levels, contribute to the cumulative reserves of trust, and collaboration within a community. This adds up to social capital, which comes in three flavors:

Bonding capital (strong links within similar groups), **Bridging capital** (weaker ties between disparate groups), **Linking capital** (relationships with formal community institutions).

All three forms of social capital are crucial for happy and healthy communities.

Social Isolation and Climate Emergencies

Around the world, billions are being spent to improve the physical resilience of cities and infrastructure to withstand climate emergencies. While most of these "hard infrastructure" measures are necessary, the vast majority of global investments in more resilient communities are not adequately addressing the "soft infrastructure", the social connections within buildings and communities that are some of the most significant determinants of community resilience.

Research indicates that communities with high levels of social capital and sociality are better equipped to respond to environmental disasters. Such communities can coordinate efforts, share resources, and recover more quickly. Conversely, socially isolated individuals are less likely to prepare effectively for disasters, to seek help or to evacuate during disasters. The importance of socially connected communities becomes more important as government disaster response resources are increasingly strained in the face of overlapping emergencies. Building strong, connected communities is crucial for addressing the ongoing climate emergency.

Resilience

Communities worldwide are reeling under accelerated "stress tests" of climate and associated emergencies like heat- and cold-waves, droughts, floods, refugee flows, civil and geopolitical conflict. Billions are spent to "harden" our resilience to these crises, from physical dikes and walls to militarized policing. Far less goes to the "soft infrastructure" of social connections within buildings and communities. Yet research shows that strong social capital reserves better equip us to resile (literally to "bounce back") from disasters through prior planning, coordinated efforts, shared resources, joint appeals for aid or (if need be) orderly evacuation.

SOCIALITY VS SOCIABILITY

When we set out to work on our evidence-based tool for design and social connection, we dubbed it "FLUID Sociability." We've now rechristened it as "FLUID Sociality" to reflect a subtle but, we think, important distinction. "Sociability" describes an individual trait roughly akin to conviviality; "Sociality" on the other hand, is an emergent property of a community in aggregate, which is more within our ambit as architects, designers and planners. For example, small towns often rank higher in sociality just by dint of their likelier day-to-day social connections. We hope, with the right tools, to help upscale these benefits to the urban level.

ACQUAINTANCESHIP

The Cambridge Dictionary defines Acquaintanceship as "a relationship between two people who have met but do not know each other well". We use this term in design because acquaintanceship is valuable in itself as a "weak tie" and also, acquaintanceship can lead to friendship. We recognize that design itself can't lead to friendship, but the day to day contact that supports the development of acquaintances can set the stage to do so.

Equity

Social isolation disproportionately affects marginalized communities, including the poor, the aged and people of color. Communities committed to building sociality can mitigate the harms of discrimination and lack of access to resources.

Sociality Focused Design

Although there's room for a lot more study and development of evidence-based tools to promote social connection, prior research shows that properly designed public spaces, street plans, and transport links all help promote sociality. Most of this work, though, focuses overmuch on the urban scale vs. the equally important individual building level. And prevalent tools such as precedent studies are better adapted for ex post analysis of existing features rather than predictive assessment of new design proposals.

The FLUID Sociality Tool

FLUID, on the other hand, yields data to support social connection during the design process itself. The software tool uses agent-based modeling to compare building design alternatives for their sociality potential. For each design option FLUID calculates its likely yield in

Encounters (how often the virtual agents get to see each other), Greetings (how often they hail each other) Acquaintanceships (how many residents might recognize each other through recurrent encounters)

On this ladder of connectivity, acquaintanceship can ripen into friendship and mutual support, the currency of social capital and community resilience.

Conclusions & Recommendations ----

We must do more to reduce isolation and promote social connection. To do so, we need to embrace and refine our evidence-based toolkit for sociality-focused architecture and urban design.

APPENDIX 1

Design and Social Connection: An Ecosystem Map

A list of key organizations engaged in evidence-based research and/or action to promote sociality. The players are positioned according to their relative prioritization among three main mission-focii: design, resilience and social connectivity.

APPENDIX 2

People and Organizations Interviewed for This Paper This Appendix lists individuals that were interviewed to contribute to the paper.

APPENDIX 3 Endnotes

RECOMMENDATIONS				
01	Recalibrate the relative weighting of social connection initiatives vis à vis physical upgrades to support resilience.			
02	Prioritize sociality in design and community building			
03	Expand our toolkit to assess and improve the sociality of built environments			
04	Build a community of shared interest to support human health, longevity and resilience through urban and architectural design for social connection			

Social Isolation

Summary of Issues and Dangers, Including Literature Highlights



1.1 Individual Health Risks And Benefits

The importance of strong social connections, while intuitively obvious, has only relatively recently come under more academic scrutiny. Since the 1980s, a growing body of research has shown that interpersonal bonds are a core pillar of overall well-being^[2]. Humans are "wired" to be social; our bodies and minds are designed for social and physical proximity^[3].

We need to belong.

Denial of this most fundamental need bodes dire repercussions for an individual's cognitive processes, emotional patterns, behavior and physical health^[4]. Research implicates loneliness as a key determinant of an individual's self-rated physical health, regardless of other factors^[5].

Specifically, loneliness is empirically shown to impair executive functioning, sleep, and mental and physical wellbeing^{[6] [7] [8] [9] [10]}. And these correlations hold for both real and perceived social isolation, regardless of demographic characteristics or preexisting health problems^[11]. Not to even mention the loner's heightened risk of death in emergencies and disasters, as we discuss below.

"Loneliness is far more than just a bad feeling—it harms both individual and societal health. It is associated with a greater risk of cardiovascular disease, dementia, stroke, depression, anxiety, and premature death. ...And the harmful consequences of a society that lacks social connection can be felt in our schools, workplaces, and civic organizations, where performance, productivity, and engagement are diminished."

"The mortality impact of being socially disconnected is similar to that caused by smoking up to 15 cigarettes a day"

U.S. Surgeon General Vivek Murthy^{12}

Conversely, on the upside, social contact and connection have many documented benefits, increasing the odds of survival in old age by as much as 50% ^[13]. This matters for North America's aging population, where research points to a significantly higher risk of loneliness among older adults due to living alone, the loss of family or friends, chronic illness and sensory impairments ^[14]. Boosting social capital reserves would allow older adults to be more resilient in the face of chronic health issues, reducing the strain on overburdened medical systems ^[16] - a powerful form of preventative care.

"...... from weight management, diabetes, cardiovascular disease, cancer, and depression. Some psychiatrists go so far as comparing social connection to vitamins: "just as we need vitamin C each day, we also need a dose of the human moment— positive contact with other people...... this could indeed be the social cure for which the United States has been longing."

Jessica Martino, Jennifer Pegg, and Elizabeth Pegg Frates, M.D 2021 in the American Journal of Lifestyle Medicine: "The Connection Prescription^[16]

Social connection is also crucial to the quality of life, not just its quantity. The longitudinal Harvard Grant Study^[17] has been following a group of men for more than 80 years. As summarized by the emotional intelligence consulting group Six Seconds,^[18] the study shows that "strong relationships [are] better predictors of long and happy lives than social class, wealth, fame, IQ, or even genes." On the other hand, the study's current director, psychiatry Prof. Robert Waldinger of the Harvard Medical School, has no doubt that "Loneliness kills. It's as powerful as smoking or alcoholism."



Sociality in public spaces bolsters community wellbeing and cohesion.

Social interaction in public spaces plays a critical role in shaping the attitude and character of a community. Public encounters create opportunities to promote tolerance, raise spirits, and reinforce links or create bridges^[19]. A sense of the "friendliness of strangers" creates a climate of security^[20]. Through social interactions, isolated individuals come to realize they "matter;" they can be recognized and counted on by others^[21]. Newcomers feel more "at home" among trusting and welcoming neighbors^[23]. This comfort and sense of belonging is as much focused on "weak ties" as intimate friendships. The importance of those "weak ties" and acquaintance level relationships is becoming better understood as an individual and community health benefit^[24].

Since it's at the neighborhood level that diversity gets negotiated, communities need to cultivate "micro spaces," semi-public domains that encourage cross-group connection^[25]. This fosters inclusivity and tolerance, even if there is no more than superficial contact between disparate identities. Studies ^[26] ^[27] ^[28] show that the mere physical presence of others in shared public space, by shifting attitudes towards what is normal, can encourage higher social awareness and prosocial behavior. On the other hand, when groups are spatially segregated, they are likelier to lie to each other and less prone to collaborate^[29].

Through face-to-face communication, informal social interactions help communities solve problems, learn from mistakes and accelerate creativity^[30]. Knowledge spread through community networks comes layered with sentiment that lends it more impact than information from impersonally neutral channels^[31].

In sociological jargon, these benefits sum up as "social capital" – a measure of the information, social support, and collaboration gained as a tangible resource from a community's network of social relationships and trust^{[33] [34] [35]}. The term attained wider circulation with the Y2K publication of Robert Putnam's popular book Bowling Alone: The Collapse and Revival of American Community"^[36]. The book specifies two distinct types of social capital: **bonding capital**, comprising strong affinities and trust between similar individuals within a group; and **bridging capital**, the weaker ties between people in different groups or socioeconomic classes^[37]. To this duality, Szreter and Woolcock^[38] in 2004 added a third strand: "**linking" capital** to denote the norms of respect and networks of trust that disparate constituent groups might hold in common toward the formal institutions or authorities of the wider community^[39].

All three forms of social capital play a role in shaping happy and healthy communities.

While the benefit of social capital can often seem ambiguous, it can have specific and measurable positive results. For example, with respect to crime. The New York Times on August 01, 2023^[40] included the following closing in an article on guns and crime:

".... one of the best things that cities can do to reduce fear is to increase social connections among residents. Studies show that the more ties people have to one another in their communities, the less fearful they are of becoming crime victims, perhaps because they know they can count on others for protection and support or because other people may keep our fears in perspective. While fear can chip away at those ties, government, nonprofits and the private sector can all play a role in fortifying what the author & sociologist **Eric Klinenberg** has called the "social infrastructure" of cities."

p.**10**

1.3 BOUNCING BACK FROM THE BRINK

Re·sil·ience

(noun) - /ri- 'zil-yən(t)s/

"present participle of resilire to jump back, recoil, from re- + salire to leap" [41]

-Merriam-Webster Dictionary

Accelerating climate change presents unprecedented challenges for societies worldwide. Its effects will not be felt equally; through disruptively changing landscapes of ecology and equity, many will be left behind^[42]. Research suggests the places best equipped to respond will be those with rich social connectivity^[43]. There, residents better coordinate disaster response and recovery^[44]. Conversely, communities with looser social ties are less likely to seek help and medical attention, or to evacuate^[45].

Positive examples of tight-knit communities' resilience can be found around the world. For instance:

Event	Location	Result
1995 quake	Kobe, Japan	Neighbourhoods with a tradition of joint activities responded more proactively in reconstruction ^[46]
Hurricane Katrina 2005	New Orleans	Tightly-bonded Vietnamese neighborhoods rebuilt up to 90+ percent of their original capacity within one year; wealthier French Quarter communities saw less than 20% of their population return more than a decade later ^[47]
COVID-19	2700 U.S counties	By controlling for other variables, a 2021 review hypothesized that social capital-rich communities use more hygienic practices due to their pre-existing trust networks ^[48]
2015 Influenza	Taiwan	Face mask usage correlated with all forms of social capital; handwashing scrupulosity and vaccine receptivity correlated with bonding- and linking- capital ^[49]
Gasoline Explosion	Guadalajara, Mexico	Victims' survival chances proved to be directly proportional to whether they had acquaintances among the rescuers who knew where they'd likely been at the time of the blast ^[50]

Nor are such heartening outcomes confined to recent decades. In her book, "A Paradise Built in Hell: The Extraordinary Communities That Arise in Disaster," Rebecca Solnit chronicles instances of altruism and mutual support among socially connected communities in the aftermath of five major disasters: the 1906 San Francisco earthquake, the 1917 Halifax Explosion, the 1985 Mexico City earthquake, the September 11th attacks in the U.S. and Hurricane Katrina^[51]. Solnit's work brings to life the "humanity and mutual support that can arise in the aftermath of catastrophe"^[52].

Conversely, a deep social capital deficit inflates the toll of disaster. Drawing on his exhaustively researched "Social Autopsy" of Chicago's death-dealing 1995 heat wave^[53], Eric Klinenberg cited (in a publisher's interview^[54]) a perfect storm of indirect causes that were all unlisted in coroner's' accounts of the hundreds of deaths: "an increased population of isolated seniors who live and die alone; the culture of fear that makes city dwellers reluctant to trust their neighbors or, sometimes, even leave their houses; the abandonment of neighborhoods by businesses, service providers, and most residents, leaving only the most precarious behind; and the isolation and insecurity of single room occupancy dwellings and other last-ditch low-income housing"^[55].

"We always talk about the physical engineering that we need to protectpeople during crises. We have failed to recognize the significance of our social infrastructure, when a real disaster strikes, it's the social stuff that might make the difference between life and death"^[56].

Eric Klinenberg in an NPR interview

Unfortunately, the lessons of Chicago were not followed effectively in the 2021 Heat Dome in the Pacific northwest of the US and Canada. The British Columbia Coroner's Report notes: "Fifty-six per cent of those who died lived alone, while almost every death – 98 per cent – occurred indoors" [57].

When invoking sociality for resilience, however, it matters which type of social capital is deployed. Linking capital -- "social engineering" solutions by "competent authorities" to forestall or mitigate disasters -- can all-too-readily turn counterproductive, as seen in China's nationwide 2022 spontaneous Covid lockdown protests^[58] or Canada's "Freedom Convoy" of truckers in Ottawa the same year. Without a balance of due attention to bonding- and bridging- social capital, a sole reliance on officialdom can prove inadequate to a crisis. By the same token, some types of "bonding" carry risks of their own. With unscrupulous or fearful leadership, a favored "in-group" can all-too-readily bond by targeting some "out group" to fear and hate.

Nonetheless, the overwhelming evidence suggests that the accelerating erosion of connection of late is the most potent danger. Even more so as the accelerating climate emergency confronts us with overlapping disasters like simultaneous wildfires and floods. Current planning for disaster response assumes a depth of official resources that will allow a multi-faceted response to individual catastrophes. However, authorities that might be able to deal with each single crisis could become overwhelmed by such knock-on concurrences. Then citizens would find themselves on their own, reliant upon their cumulative social capital reserves.

"Much of the contemporary discussion about emergency planning assumes that community members "panic" and that strong authority is necessary. The vocabulary of "command and control" suggests chaos rather than citizen adaptability and creativity. [Yet] Social capital is our most significant resource in responding to damage caused by natural and other hazards, such as terrorism"^[59]

Russell Dynes, sociologist, author, and co-founder of University of Delaware's Disaster Research Center



FIG. 02 Social ties help communities coordinate their efforts in the wake of disaster.

Weather, the Bible assures us, "falleth on the just and on the unjust" (Matthew 5:45 KJV). But when the climate – meteorological, political or economic – veers into crisis, the impact is far from impartial. Burdens of social isolation hit harder on the victims of exclusion, systemic racism and poverty, as well as the very young and very old.

Statistically, low-income communities and people of color, especially women, are most at risk of experiencing the harms of loneliness^[60]. In North America, for instance, Black communities suffer physical and mental health debilities that are worsened by cumulative socioeconomic disadvantage, discrimination, and limited access to external resources ^{[61] [62] [63]}.

The COVID-19 pandemic also highlighted the effects of lockdowns and loneliness on children and adolescents, who were more prone to depression and anxiety when isolation was enforced by local authorities^[64]. These effects continue to play out unpredictably into the future; long-term longitudinal studies show that social isolation in childhood can lead to a form of chronic stress that makes for a clustering of coronary disease risk factors for later in life^[65].

By the same token, social disconnection in emergency scenarios hastens cognitive decline among the aged. The 2011 Fukushima earthquake and tsunami presented a natural experiment focused on a group of East Japan seniors whose cognitive health had been under rigorous study for seven months prior to the disaster. Post-quake follow-up study found that "experiences of disaster (particularly, housing damage) are associated with the increased risk of cognitive impairment, while social capital seemed to buffer that association"^[66].

Such research underscores the urgency of redressing social capital imbalances across the ever-widening privilege gaps of modern societies in the face of mounting environmental crises.



Sociality-Focused Design

Much as we might long for deep sociality, it keeps receding away from us; social isolation is on the rise. In North America, our legacies of colonialism, racism, patriarchy and privatization all fuse into an individualist ethos that erodes community connections. To set things right will entail a long-term shift in values. But for an upfront quick start now, one powerful lever often remains overlooked: the built environment. FLUID is a developing tool that will require more data input to prove out.

The weave of our cities channels how we meet and bond with one another. Exclusionary designs, by privatizing public space, narrow down our scope of where, when and with whom we get to interact^[67]. Conversely, shared spaces that feel welcoming and safe can foster meaningful connections.

In the U.S. Surgeon General's report on social isolation, the first of Murthy's "Six Pillars to Advance Social Connection" is to "Strengthen Social Infrastructure in Local Communities." And to do so, his topmost practical prescription is to "Design the Built Environment to Support Social Connection"^[68].

Planners and architects have long considered how to mitigate climate change and improve individual well-being. Sociality-focused design hits both these goals, yet it's an all-too-commonly overlooked piece of the puzzle. Public space, after all, is the natural habitat of "The Familiar Stranger," a term that describes people whom we see frequently but don't get to know well^[69]. For each of us in our own milieu, the figure of the Familiar Stranger fosters a sense of psychological safety and belonging.

And in the aggregate, a community of Familiar Strangers who habituate to each other at a distance can add up to an almost invisible small-world contact network (or "structure of co-presence," in sociological jargon). And these "structures," in turn, cumulate into a greater phenomenon of "collective regularity," in which human mobility follows quasi-synchronous patterns of movement^[70] – the pulse of urban life. Daily routines, such as commuting or mealtimes, make for repeated encounters, even at very large population scales. As designers, we can tap into this "collective regularity" to shape spaces that promote familiarity.

The Familiar Stranger exemplifies a (very) weak social tie. But in designing for sociality we implicitly set up a hierarchy of relationships from stranger to Familiar Stranger to acquaintance to friend. Resilient, healthy urban and architectural ecosystems must embrace this full spectrum.

Yet for far too long, prevailing planning parameters have skewed in the opposite direction. Zoning, for example, has traditionally prioritized privacy – an important value, no doubt, but by definition exclusionary rather than conducive to social connection. In this way we undercut such options as co-housing, which will become increasingly crucial under the inevitable densification of our cities.

The relationship of sociality to urban and architectural design was first studied in detail by New York's "Project for Public Spaces", and since then has been so well studied that we have by now a fair idea of how public spaces – parks, plazas, community centers & cie – can play a crucial role in spurring social interaction and community building^[71]. More recently, Danish architect Jan Gehl has presented an evidence-based (if intuitively unsurprising) recipe of key features: comfortable seating, access to food, diverse crowd-watching and accessible outdoor areas ^{[72] [73]}.

Gehl's 2013 follow-up study^[74], in collaboration with Birgitte Svarre, spelled out concrete ways to optimize these preferences through, e.g., placement of seating, orientation and enclosure of buildings and visual access to enhance spontaneous social interactions. They found that smaller-scale, mixed-use buildings, by promoting walkability, increase connectivity^[75]. So does "universal design," which prioritizes accessibility for people of all ages and abilities^[77]. And even before anything gets built, prior public participation in the design process bolsters a sense of community ownership and cohesion^[78].

Such prescriptions, though, notably focus almost entirely on the exterior public realm. But in North America and Europe nearly 90% of our time is spent indoors. We need a lot more attention on how to foster social connection inside of buildings. So far, we rely on three main tools to get at these questions:



[Expedia - 2024

2.1 PRECEDENT STUDIES

The first and still the most obvious and widely used way to find out what people think about the sociality of where they live and work is simply to go and ask them. For example, Vancouver, Canada's "Hey Neighbour Collective"^[79] has documented many studies of various strategies for entire buildings as well as specific details like corridors and lobbies in terms of physical design, amenities and social connection.

This work is very important, well organized and accessible. However, of necessity, the conclusions viz. "people like working here and feel connected," without a less clear break-down of the many complex factors that make for that sense of community.

Then, too, precedent studies can skew towards existing biases, e.g. touting the presumed social connection benefits of an activated atrium space without accounting for the many extant examples of dull and lifeless atria. It's all too facile to just zoom in on eye-candy, but an image of a smiling mother and child chatting up a neighbour in a shiny new building does not really attest to the day-to-day social connections of that building as it ages.

2.2 SITE INHABITATION ANALYSIS

To boost the specificity of precedent studies, researchers like Jan Gehl and the Project for Public Spaces (PPS) have pioneered the use of such site inhabitation measurement tools such as cameras and in-person observation to understand why and how people used (or sometimes shunned) public spaces. This approach sheds valuable light on urban sociality but remains primarily focused on the exterior public realm of cities.

And even when they venture indoors, these analysts still mostly confine themselves to large, publicly accessible spaces. Much of this reticence is due to privacy safeguards – a laudable concern, but one that nevertheless hobbles a lot of much-needed research.

2.3 BIOMETRIC MONITORING

For even more granularity in these studies, researchers like Happy Cities and Colin Ellard monitor biomarkers like heart rate using bodily sensors to gauge people's emotional and physiological reactions to built environments. But, as with PPS and Gehl, biometric pioneers Ellard and Happy Cities remain focused on the public urban realm. No one, so far as we know, has attempted a biometric assay of multi-unit residential building interiors from the standpoint of social connection.

Yet just such an assay is most critical for resilience because residential complexes and integrated neighbourhoods are precisely the most fruitful loci for the kinds of interactions that can lead from acquaintanceship to friendship to greater resilience through enhanced sociality. As wearable smart devices continue to evolve and proliferate, we can hope for a more robust and data driven understanding of what aspects of design encourage social connection. Properly anonymized for privacy, real world data could answer questions for which we lack data. These include:

Are conversations more likely to occur in natural light or not?

How do acoustics affect the likelihood of greeting?

Is acquaintanceship more sensitive to frequency or duration of recurrent interactions?







FLUID Sociality

FLUID is a public good, online software tool that uses agent-based modeling to compare options for multiunit residential building at an early in their design in terms of social connectivity.

FLUID models the frequency of three tiers of social interaction:

Encounters:

the physical opportunity for a social connection among residents based on the simulated movement around the building of their digital agents as specified by 'calendars' of particular agent types (viz. "Externally Employed Adult").

Greetings:

the probability of verbal or gestural interaction, modeled on many factors but largely dependent on familiarity, i.e. a digital resident is likelier to greet someone that they meet frequently.

Acquaintanceship:

the number of fellow residents that you "Encounter" often enough that you might know their name, say 'hi' when you meet and potentially ask for help when needed. We posit that this metric is critical to social resilience and can be strongly affected by design.

Given the complexity of social interaction, with its many cultural and social factors, we can't responsibly claim FLUID tells us what connections will occur in any specific building design option. Instead, the tool intends to allow users to compare whether any given design scores lower or higher than others for a particular metric. This self-imposed limitation has the goal of "canceling out" most potential errors arising from over-abstraction or exogenous variables like ethnicity. That will lend stability to its comparative judgments. Even if, e.g., the estimated trips per day of the population were way off base, the relative sociality-potential ranking of each design should still hold.

A goal of the FLUID team is to create a relative sociality rating for buildings and neighbourhoods akin to the "Walk Score"^[80]. This will allow an easy public entry point to an understanding of this nuanced issue.

To date, the FLUID team has struggled to align FLUID modeling results with residents perceptions of sociality in existing buildings. Our current best guess is that this is because we need a much larger data set to separate architectural issue from other factors.

Aside from residential buildings and neighborhoods, the tool could also be adapted to other built environments. So far, our "use cases" have included multi-unit public

SOCIAL CONNECTION, HEALTH, RESILIENCE, AND EQUITY IN DESIGN

Prepared for the Summit Foundation by Sadhu Johnston, FLUID Architecture, and Human Studio Architecture + Urban Design

3.1 HOW DOES FLUID AGENT-BASED MODELING WORK?

The way we each move through our days can be approximated as a set of specific types of activity that we typically engage in at particular hours, based on our age, place of employment, family structure, role and general circumstances. From this set we can generate schedules that our avatar/agents can perform with a given likelihood in the context of a computer model.

FLUID models each agent as an independent entity of a specific type (externally employed adult, child, senior & cie.) that live alone or in a "family" of other known agent-types. Agents also have "memory" of other agents and accumulate statistics on their encounters and interactions with other agents.

At the start of a simulation FLUID creates a "calendar" of activities for each agent that's active in the model. This includes all their activities and their respective journeys for each interval of the simulation. In this way, the exact location of all agents can be determined at all times. The agents then move through a virtual architectural model in patterns that mimic the long-term occupants of a building.

Agents "plan" their journeys sifting through various possible routes that are scored according to metrics of several factors. For example, an "externally employed adult" agent will default to the shortest route from unit to exit when setting out for the workday. However, if the model specifies a courtyard building and it's raining (as per FLUID's onboard location-specific weather data), the agent will likelier avoid the courtyard to take a route that is longer, but dry.

As the agents circulate, they cross paths. The simulation flags three kinds of intersection in ascending order of sociality potential: **encounters, greetings and acquaintanceships**. The tool cannot predict which encounters will escalate into greetings or conversations, but FLUID can suggest how architectural interventions such as attractive "hang-out" seating could increase the odds of social connection.

For more information on how FLUID works, see https://fluidsociality.circle.so/c/what-is-fluid/



FIG. 05 FLUID Simulator's Structure

p.**18**



FIG. 06 Under the hood: FLUID's hyperparameters



Encounters

An encounter is the moment of setting the stage for social interaction. It means that two or more agents are close enough to greet each other if they choose to do so.



Greetings

A greeting is exactly what it says. It is important to understand greetings because those simple casual contacts are known to have a public health benefit, where just the opportunity for social contact does not. One way to think of this is that there are many situations of crowding, such as a transit station platform, where there are lots of opportunities for social interaction, but it rarely occurs.

FLUID assumes that the primary (but not only) determination of the likelihood of greeting is familiarity. For example, the tool would generate a much higher probability of agents greeting each other if they live on the same floor and see each other regularly, than if they live on floors ten levels apart and see each other once a year.



Acquaintanceship

The above metrics are measuring frequency of opportunities for social connection with ANY neighbour. However, it is critical to understand how design can influence the number of neighbours that you see repeatedly and frequently enough to become "acquaintances". FLUID supports an understanding of this. Preliminary results seem to indicate that this crucial metric is even more influenced by building design than the volume of Encounters and Greetings.

For example, in three test designs done with an early version of FLUID for the City of Calgary's affordable housing agency, in the least sociable design the percentage of residents with one or more Acquaintances was 31%, while the average number of Acquaintances for those 31% or residents was only one. This meant the FLUID tool estimated that more than two thirds of residents (69%) would not see anyone in the building frequently enough to become Acquaintances.

In contrast, for the most socially connected design, the percentage of residents with one or more Acquaintances was 78%, while the average number of Acquaintances for those 78% or residents was four. This meant the FLUID tool estimated the most sociable design ways had a dramatically higher Acquaintanceship Potential.

A caveat on the Calgary results noted above is that they almost certainly overestimate the Acquaintanceship potential of all the designs due to hyperparameters in the model that we have since revised. Their is an absence of research on the spatial and circulation patterns of buildings that could help prefigure acquaintanceship.

The FLUID team believes that Acquaintanceship Potential is the most important design metric to support resilience. It could be thought as a measure of how many neighbours could you know well enough to ask for support when needed.

More information is available here: <u>https://fluidsociality.circle.so/c/social-parameters/</u>



FIG. 07 FLUID Simulator Overview

3.2 FLUID USER EXPERIENCE AND WORKFLOW

FLUID is designed to be used at the very early stages of a project. For multi-user residential buildings, all you need is a 3D model made in Autodesk's Revit software that has floors, walls, doors and vertical circulation. That way we can start out early with the simplest possible building information model (BIM) so FLUID can influence the basic building anatomy from the get-go. This model can then be "tagged" with Revit "families" downloaded from the FLUID website. Door tags (e.g. Three Bedroom Unit) allow FLUID to generate digital residents ("agents") that occupy the building. Destination tags such as "Lobby" create building elements that generate agent movement.

Once tagged, users export to an Autodesk Filmbox (*.fbx) file, which can be ported from Revit to the FLUID site, where dropdown menus allow the user to specify the length of the simulation in days and the location of the proposed building for accurate real-time or historic weather data.

After the simulation run, modeling results are displayed. FLUID visualizes results in both statistical and graphic formats. For example, on the results "landing page" users can see a numeric readout of the average number of times typical residents encounter each other per day. They can also toggle to display options such as "Greetings Lasers," which graphically depict the density and locations of social interaction. The building itself appears on the results webpage as a partially transparent 3D model that can be rotated and viewed from different angles. Floor levels may be turned on or off to allow viewers to understand the sociality of components of the building.

Vienna House is a BC Housing social housing project in the City of Vancouver that includes a collaboration with the City of Vienna.

The project is intended to be leading edge in multiple ways. The FLUID Sociality team presented our (then very early) work to the Vienna House technical committee. Public Architecture, the architects for Vienna House, called us that day. They had laid out a double loaded corridor option (Vienna House J), and a courtyard option (Vienna House O), and strongly believed the courtyard option would be more social – but it had a higher predicted embedded cost because of the added exterior wall area, leading BC Housing to prefer the double loaded corridor option.



Our team modeled both options, and our FLUID tool indicated that the odds of crossing paths daily with your neighbour would be roughly 50% higher in the courtyard version, as seen above. This numeric understanding was enough to swing the BC Housing team to support the courtyard option moving to construction. It was the first time the FLUID tool was used to support a major design decision. We believe Vienna House will have more and stronger relationships between neighbours as a result.

FIG. 08 Images from the FLUID Sociality web tool, comparing simulated social connections in two different design schemes.

Conclusions

Sociality enhances individual and community health and resilience -- all the more vital in the face of mounting and overlapping crises triggered by climate change. Built environments can be designed to promote sociality in ways that merit much further study.

To really get a handle on how to design for social connectivity, we'd need to learn a lot more about the interaction between built form, population identities, programming and culture. One crucial precondition would be a shared set of metrics. FLUID makes a start on this, but there's plenty of room for refinement.

One lens on the value of a focus on design and social connection is the multisolver concept. Multisolving is a term coined by Elizabeth Sawin, co-director of the think tank Climate Interactive, that describes the process of combining expertise, funding, and political will to solve multiple problems with a single, collaborative investment. Investment in sociality focused design can support individual health, community health and resilience.

As set out in the Ecosystem Scan section below, many groups are looking at the interaction of sociality and built environment design, but not necessarily as their central concern. The urgency of the issue calls for more shared energy and focus.

Recommendations

01

Upgrade the priority of social connection relative to "hard" physical infrastructure as a bulwark of resilience.

Climate mitigation by physically "hardening" our cities, while indisputably urgent, can prove to be drawn-out and expensive, compared with the more cost-effective and readily actionable options of designing for sociality to support community resilience. Irrespective of the current state of physical infrastructure, existing communities with limited resources could still benefit from relatively modest sociality-oriented tweaks.

Such interventions dramatically prove their worth when overlapping disasters overwhelm government response teams, throwing communities back on their own resources. Nor is the benefit of sociality-oriented design confined to disaster resilience; even in 'normal' times, it pays dividends in terms of individual health, longevity and well-being.

Recommended Future Actions:

- Carry out cost/benefit analyses to compare socialityoriented initiatives vs. physical infrastructure interventions in various risk cases.
- Carry out cost-benefit analyses of multi-solver sociality focused design that addresses sociality, climate resilience, and health.
- Undertake stress analysis on the odds of government response forces getting overwhelmed by overlapping disasters and so leaving communities to respond to crises on their own.

Expand the range of sociality-oriented design tools.

FLUID is a work in progress, and there's plenty of room for more evidence-based understanding of how design affects sociality.

Recommended Future Actions:

02

- Enhance and test artificial intelligence and agent-based modeling to better predict human interaction in cities and buildings.
- Analyze and compare sociality metrics (e.g. Encounters, Greetings and Acquaintanceship) for built environment design.
- Detailed monitoring of existing buildings to identify what works and to refine our understanding of the physicality of social connection in relationship to space.
- Compare the sociality impact of factors like social programming vs. physical layout.
- Devise ways to factor in the effects of aspects like culture, gender, race, ethnicity and / or income upon social interaction in buildings and urban spaces.
- Assess the sociality impact of design in marginalized communities.

Recommendations

03

Advocate for sociality in design and community-building.

Politicians, city planners, government housing providers and other official "gatekeepers" of the built environment can be recruited to advance policies that measure and promote sociality-oriented design practices.

Recommended Future Actions:

- Emphasize evidence-based parameters for authorities to enhance sociality in the built environment.
- Incorporate sociality in civic authorities' evaluation criteria for housing developments, neighborhood plans, street and public realm design.
- Promote resilience-through-sociality as a priority in the design, development and operation of public housing projects.
- Require emergency risk-bearers like FEMA, banks and insurance companies to include evidence-based sociality metrics among their project evaluation criteria.

04

Build a community of shared interest in socialityoriented design to support human health, longevity and resilience.

Any movement towards positive change requires a constituency of advocates.

Recommended Future Actions:

- Host a global conference including professionals, educational institutions, resilience specialists and other key contributors focused on social connection as a resilience priority.
- Encourage philanthropic and governmental supporters of resilience initiatives to prioritize funding for sociality research and require grantees to give due importance the "soft" human side of resilience work.
- Encourage future collaboration to bridge the gap between research and practice, supporting both research and designers with access to rich data and the tools to make positive change.

Design and Social Connection An Ecosystem Map

Several research disciplines converge on questions of sociality and resilience in new and modern contexts.

Among them:

- Environmental psychology explores the relationship between people and the built environment, including the impact of architecture on human behavior, emotions, and wellbeing^[81].
- Architectural studies research shows that such features as natural elements, ventilation and access to daylight can boost mental and physical health, reducing stress and improving mood^[82].
- Emerging disciplines like Environmental Neuroscience, Trauma-informed Design, and Social Contact Design also rethink the ways we plan and build our environments.

However, these research results remain high-level and broad-brush, lacking the specificity for designers to make informed decisions, so few practicing architects or developers are up to date on their findings. Environmental psychology and architecture are distinct disciplines, after all, that have historically been siloed from one another, with limited collaboration and cross-disciplinary communication^[83].

Going forward, we need to bridge this gap, equipping both researchers and designers with access to rich data sets and tools for positive change.

In this Ecosystem Map we highlight actors who are specifically engaged in evidencebased research and/or action on how the design of communities and buildings affects social isolation and its inverse, social connectivity. Many players concern themselves with community resilience, but we reference only those who home in on social resilience alongside physical infrastructure.

And even among those, we had to bypass many laudable architects and planners who care deeply about sociality but have yet to embrace evidence-based strategies and tools to support that work, in accordance with our focus in this paper. Nor did we include groups working exclusively on resilience without a substantive focus on the link between social resilience and design.

Nevertheless, we did reference some groups (viz. The Einhorn Collaborative and The Happiness Lab) that are dedicated to understanding and supporting sociality but whose work so far has had only a limited focus on design. They belong in this ecosystem, we feel, because their findings to date manifestly point to design applications.

We are well aware that the following Venn diagram must be far from complete due to gaps in our selection criteria and our awareness of relevant players. We apologize to those we have missed; we know many of you care deeply about these challenges.

But we hope and trust that the constituent sets of our Venn diagram will continue to fill out and their overlaps will increase.

Ecosystem Map

A1.2



Einhorn Collaborative



 Funding
 Einhorn Collaborative addressing America's addressing America's addressing America's

 Website Location United States
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 Einhorn Collaborative aims to understanding, and relationsh to listen, learn, and share difference seeing themselves, each other to listen, learn, and share difference dimensional, enabling us to see Einhorn Collaborative has particular to the test of the see in test of the see in the test of the see in test of the sec in test of test of the sec in tese in tese in test of the sec in tesec in test of test

Einhorn Collaborative is a nonprofit foundation dedicated to addressing America's growing crisis of connection.

Einhorn Collaborative is a nonprofit foundation dedicated to addressing the growing crisis of connection in the United States. They believe that rediscovering our common humanity is critical for solving the nation's greatest challenges.

Einhorn Collaborative aims to advance the science and practice of empathy, mutual understanding, and relationship building. They believe that when people sit down to listen, learn, and share different perspectives, they unlock entirely new ways of seeing themselves, each other, and the needs and values they share.

The foundation is inspired by a prism; Einhorn Collaborative believes that moving from welcoming one perspective to many allows us to enter a world that is multidimensional, enabling us to see humanity in a new light.

Einhorn Collaborative has partnered with various organizations and initiatives to advance their mission. For example, they have partnered with the Center for Policing Equity to address systemic racism in policing and have supported initiatives focused on strengthening relationships between law enforcement and communities. Einhorn Collaborative also funds research and supports public education campaigns related to social connection and well-being.

Gehl Architects

Urban Design

Research

Website <u>gehlpeople.com</u> Location **Denmark + United States** Gehl Architects, renowned for pioneering people-centered urban design, focus on enhancing social connections in cities by creating vibrant, livable spaces.

Gehl Architects (whose work is referenced above in 2.2) was founded by architect Jan Gehl in Copenhagen, Denmark. Gehl and his team have been active in research and design for decades. The work focuses on an evidence based understanding of how and why people use public spaces. This passion first was explored in the 1971 book "Life between Buildings". More recently, the 2013 publication "How to Measure Public Life" cataloged a series of approaches and tools to bring rigor to the complex process of understanding how people use public spaces and connect with others in those spaces.

Gehl's team's work has been instrumental in supporting the move towards pedestrian and bike friendly neighbourhoods, supplied with creative public spaces that support human lingering and connection.

Gehl's team has done work in Australia, Canada, the US and Europe, and has offices in Copenhagen, New York and San Francisco.

Foundation for Social Connection

Advocacy

Non-Profit

Websitesocial-connection.orgLocationWashington, DC

Contact

Edward Garcia Founder, Board Chair edward@social-connection.org Research

Foundation for Social Connection is leading the translation of research into action by fostering the development and implementation of evidence-based models to address social isolation, loneliness, and social connection.

The Foundation for Social Connection is leading the translation of research into action by fostering the development and implementation of evidence-based models to address social isolation, loneliness, and social connection.

They publish resources for public use in partnership with a network of practice partners and a Scientific Advisory Council. One of these resources is the SOCIAL Framework, which is designed to accelerate progress towards a society that values social connectedness across the lifespan and in all societal domains.

In order to combat social isolation, loneliness, and a lack of social connection, FSC provides guidance to government agencies, non-government organizations (NGOs), and other stakeholders on the most effective methods for comprehensive data collection and assessment strategies. Their ultimate goal is to ensure that all citizens of the United States have access to the opportunities and evidence-based supports that are necessary to participate actively in society.

Happiness Lab

Media

 Website
 drlauriesantos.com

 Location
 New Haven, Conneticuit

The Happiness Lab podcast, hosted by Yale professor Dr. Laurie Santos, explores the science of happiness and how to live a more fulfilling life.

In several episodes, the podcast examines the importance of social connections for our well-being, exploring topics such as loneliness, friendship, and community.

For example, in the episode "The Power of Connection," Dr. Santos talks with social psychologist Dr. Julianne Holt-Lunstad about the health risks of social isolation and the benefits of strong social connections. They discuss the importance of quality over quantity when it comes to social relationships, and offer tips for how to strengthen existing relationships and form new ones.

In another episode, "The Lonely American Man," Dr. Santos explores the unique challenges faced by men when it comes to forming social connections and combating loneliness. She speaks with journalist Billy Baker about his own experiences with loneliness, and explores how societal expectations and gender roles can contribute to men's social isolation.

Throughout the podcast, Dr. Santos emphasizes the importance of social connections for our happiness and well-being, and provides practical advice for how to cultivate and maintain these connections.





 Research
 Media

 Website
 healthdesignlab.com

 Location
 Philadelphia, PA

The Health Design Lab is a multidisciplinary research and innovation center at Thomas Jefferson University, dedicated to improving healthcare outcomes and experiences through human-centered design.

The lab's team includes researchers, designers, healthcare providers, and students who collaborate on projects that range from physical space design to digital tools and services.

The lab is led by Dr. Bon Ku, an emergency medicine physician, Professor of Medicine and Design, and the Associate Dean for Health & Design who is passionate about using design to improve healthcare. Dr. Ku teaches courses on design thinking and healthcare innovation. He has been recognized for his work with numerous awards and has given TEDx talks on design in healthcare. He also hosts the Design Lab Podcast to discuss his areas of expertise.

Under Dr. Ku's leadership, the Health Design Lab has become a hub of creativity and innovation, working on projects that range from redesigning hospital waiting rooms to developing new tools to support patient-provider communication. The lab is committed to using human-centered design to address complex healthcare challenges and create solutions that are both effective and patient-centered.

Happy Cities



Happy Cities, referenced in 2.3 above, is a consulting, design and engagement firm that focuses on the key ingredients for urban happiness.

Founded by Charles Montgomery, author of "Happy City", the team brings an evidenced based approach to design. They also were early leaders in the use of biometric monitoring to understand the human body's physiological reaction to different urban settings.

Happy Cities uses a well being framework to understand and enhance the urban realm. They have also researched and published on the topic of well being in multi unit residential buildings.

One area of focus is that of trust. Happy Cities believes that a fundamental indicator of the strength or weakness of urban mental health is trust in other citizens. For example, the expectation of having a lost wallet returned they consider a useful proxy for how much the citizens of a particular place trust each other, and whether or not that trust is justified.

Human Flourishing Program

Advocacy



Research

Website <u>hft</u> Location **Ca**

hfh.fas.harvard.edu Cambridge, MA The Human Flourishing Program was established by Harvard's Institute for Quantitative Social Science in 2016, with a mission to study and promote human flourishing and to develop systematic approaches to the synthesis of knowledge across different disciplines.

Traditionally, topics related to human well-being such as happiness, meaning, purpose, and virtue have been studied by humanities, especially philosophy and theology. However, a significant empirical research literature on these topics has emerged from sociology, political science, economics, psychology, medicine, public health, and other sciences.

The Human Flourishing Program's research aims to integrate knowledge from the quantitative social sciences with that of the humanities to better understand human flourishing and how to achieve it. The program hopes to bring greater unity to the empirical social sciences and the humanities and seeks to contribute to the broader question of how to synthesize knowledge across disciplines on questions of human flourishing.

The program's research publications focus on various topics related to human flourishing, including happiness, meaning, virtue, and religious community, among others. The program also sponsors educational activities such as courses, seminars, and conferences for the Harvard community to foster interdisciplinary collaboration and reflection on how knowledge from different disciplines might form a coherent whole.

Social Life Project



 Research
 Advocacy

 Website
 https://www.sociallifeproject.org/

 Location
 Global

 Contact
 Image: Contact in the second s

Fred Kent Founder fred@sociallifeproject.org

The Social Life Project is an initiative focused on enhancing the social fabric of communities through the transformation of public spaces.

By emphasizing the importance of social interactions and community engagement, the Social Life Project seeks to create public spaces that are vibrant, inclusive, and reflective of the people who use them. The initiative advocates for placemaking strategies that prioritize human connections and the social potential of spaces, believing that well-designed public areas can foster a stronger sense of belonging and community. The Social Life Project works closely with local communities to identify and amplify the social dynamics that make public spaces thrive, promoting a bottom-up approach to urban design and development. Their work highlights the role of public spaces in improving quality of life, social equity, and community resilience, making them more than just physical locations but integral parts of a community's social life.

Healthy Places by Design

Advocacy

Consulting

Website <u>healthyplacesbydesign.org</u> Location Nationally Focussed; in USA remote team

Contacts

Risa Wilkerson

Executive Director risaw@healthyplacesbydesign.org

Jamie Elliott Senior Project Officer

jamiee@healthyplacesbydesign.org

"Healthy Places by Design's adaptability during COVID enabled us all to leverage timing and technology for greater learning. As a result, our investment in six projects on social isolation led to national conversations which are increasing knowledge and advancing solutions for sustainable change."

— Sharon Roerty, Senior Program Officer, RWJF

Grassroots

Healthy Places by Design is a non-profit organization committed to advancing community-led action and proven, place-based strategies to ensure health and wellbeing for all.

Healthy Places by Design works as strategic partners for communities and investors, helping turn visions of health equity into lasting impact. They connect community leaders with inspiring success stories, lessons learned, and each other to deepen their capacity as change-makers, drawing on their experience supporting hundreds of community partnerships.

Healthy Places by Design's ultimate goal is to create a nation of healthy, equitable communities where everyone reaches their full potential. They believe that health and well-being are essential human rights and seek to create impact where it is most needed, respecting and honoring the voices of people who face the starkest health disparities and whose stories too often go unheard. Through their work, they aim to enhance efforts to grow an enduring culture of health and well-being.

Healthy Places by Design believes socially connected communities are not a personal choice or individual problem, but one that is rooted in community design, social norms, and systemic injustices. In recent decades, people in the United States and around the world have experienced soaring rates of social isolation, with profound impacts on health and well-being.

To reduce social isolation, Healthy Places by Design believes we must reshape our communities in ways that support meaningful social connection among residents, improve trust between neighbors, and strengthen an overall sense of belonging and community. Their 2021 report, Socially Connected Communities: Solutions for Social Isolation offers five recommendations for creating socially connected communities, starting with public spaces, transportation, and housing. It also includes complementary action guides that local government leaders and grant-making organizations can use as tailored supplements to the Socially Connected Communities report.

Case Studies



HEALTHY PLACES BY DESIGN Activating Public Green Spaces for Social Connection and Health



https://healthyplacesbydesign.org/activatingbostonpressrelease/

Healthy Places by Design is coordinating Activating Boston in collaboration with John Hancock, the City of Boston's Age Strong Commission and other agencies, AARP Massachusetts, and UMass Boston. Activating Boston aims to grow the capacity of neighborhood organizations, community members, and partners to increase social connectedness where they live and work, with a focus on public greenspaces.

In 2022-2023, two grantees – Asian Community Development Corporation (Chinatown) and Four Corners Main Streets (Dorchester) – piloted the initiative. Each had a strong record of working alongside community members and within diverse neighborhoods experiencing severe heat and other environmental stresses. Project coordinators used community-informed processes to elevate and celebrate the uniqueness of the neighborhoods. ACDC worked with residents and partners in Chinatown to create a public art project that enhanced an outdoor space and brings people together across generations, cultures, and socio-economic backgrounds. Four Corners Main Street's project supported youth and "community ambassadors" to prioritize, improve, and activate a public space to support neighbor-to-neighbor social connections. Healthy Places by Design provided ongoing technical assistance and facilitated peer learning and exchange sessions to strengthen cross-community relationships.

END SOCIAL ISOLATION AND LONELINESS ACTION FORUM

USA Annual Conference



The End Social Isolation and Loneliness Action Forum is an annual event that is held with the purpose of addressing the crisis of connection that is plaguing the United States. The event brings together thought leaders and change-makers from all over the world. The purpose of the event is to increase awareness of the problem, exhibit innovative solutions to the problem, motivate pledges to action, and support true evidence- and system-based change in order to make the future more socially linked.

The 2022 Action Forum featured a wide range of professionals, including Goldie Hawn, Dr. Vivek Murthy, U.S. Surgeon General, as well as scientific experts, leaders from the private sector, community activists, and more. One of the primary objectives of the forum is to encourage nationwide organizational commitments to action. In 2022, sixteen commitments from organizations such as Humana, UnitedHealthcare, the AARP Foundation, ACTNow for Mental Health, Peoplehood, Wider Circle, The Motion Picture & Television Fund, DOROT, USAging, Building H, the National Partnership for Healthcare and Hospice Innovation, NeverTechLate, and Visible Network Labs were highlighted as part of the forum's efforts to achieve this objective.

The goal of each year's End Social Isolation and Loneliness Action Forum is to involve more stakeholders and inspire more pledges.

Hey Neighbour! Collective

Advocacy

Non-Profit

Website <u>heyneighbourcollective.ca</u> Location **Vancouver, BC**

Contact

Michelle Hoar Project Director mhoar@sfu.ca

Research

Hey Neighbour! Collective recognizes that multi-unit housing types often have lower levels of connection and community between neighbours, but they believe that it doesn't need to be that way. They are working towards a future where more of Canada's multi-unit housing communities are socially connected, neighbourly, health-promoting, and resilient.

Hey Neighbour Collective is an initiative in British Columbia, Canada, focused on strengthening social connections and resilience among neighbours in multi-unit housing communities. The Collective believes that strong social connections benefit individuals and communities, making them healthier and more resilient. They work to address the epidemic of loneliness and social isolation that has become a cause for concern globally, and particularly in densifying communities, where multi-unit housing is becoming the norm.

The Collective comprises a Community of Practice, which includes non-profit and for-profit rental housing operators, non-profits, and researchers. They are committed to experimenting, learning, and making change together. In addition to the Community of Practice, the Collective includes many other important "learning network" partners, such as Landlord BC, BC Non-Profit Housing Association, City of Vancouver, City of Victoria, City of New Westminster, Metro Vancouver, and Vancouver Coastal Health.

The Collective has identified four key strategies to achieve their goal of strengthening social connections and resilience among neighbours in multi-unit housing. First, they prototype and pilot community-building programs and activities in a variety of multi-unit affordable housing contexts, with a focus on rental housing. Second, they conduct action research and learning to generate evidence-based data and inspiration for residents, housing operators, and policy makers. Third, they share their stories, practices, and evidence related to improved programming, management, design, and community culture of multi-unit housing. Fourth, they engage housing professionals and policy makers to foster healthier and more resilient housing communities through shifts in policy, programming, and practice.

Hey Neighbour Collective is housed at Simon Fraser University's Centre for Dialogue.

Innovation Network for Communities [INC]

Advocacy

Non-Profit

Research

Websitein4c.netLocationUnited States

,..... Contact

Peter Plastrik Project Director The Innovation Network for Communities (INC) is a USbased nonprofit organization that helps cities achieve carbon neutrality and long-term resilience to climate disruptions. They work to foster sustainable and equitable communities through a variety of initiatives, including research, technical assistance, and capacity building.

INC's main focus is on climate resilience and sustainability, working with cities and communities to develop strategies that mitigate the impacts of climate change and build a more resilient future. Their work in this area includes research on climate adaptation and mitigation, as well as helping cities develop policies and programs that promote sustainability and resilience.

In addition to their work on climate change, INC also focuses on other topics, such as social-impact networks and workforce development. They believe that sustainable and resilient communities are built on strong social networks, and they work to help communities develop these networks through collaboration and engagement.

INC partners with a range of organizations and stakeholders, including community groups, nonprofits, government agencies, and private sector entities. Through these partnerships, they aim to foster sustainable and equitable communities that are better prepared to address the challenges of the future.

Innovation Network for Communities is a leading organization in the field of climate resilience and sustainability, and their work is helping to create more resilient and equitable communities across the United States. The INC Team has authored several books on the subject, as well as many publicly available reports and resources.





 Research
 Advocacy
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The Loneliness Lab is focused on designing connection into the places where people live, work, and play to address the growing issue of urban loneliness.

The Loneliness Lab is a global collective founded in 2018 by Lendlease and Collectively. The Lab seeks to address the structural drivers of loneliness in cities. Its growing network collective consists of over 800 place makers, policy makers, and loneliness campaigners who work together to understand the causes of urban loneliness and experiment with solutions in real spaces and places. They also aim to influence policy and industry change to make designing for connection a normal part of city planning.

The Loneliness Lab's approach is focused on using design to create meaningful connections in the built environment. They have published a report titled "Using Design to Connect Us," which offers a crowd-sourced guide to tackling loneliness through design. Their work includes exploring insights into what drives urban loneliness, experimenting with solutions, and advocating for change. By bringing together a diverse group of individuals and organizations, The Loneliness Lab hopes to create a more connected and less lonely urban environment, addressing the root causes of the issue rather than simply asking individuals to be better neighbors. Through their work, they aim to create a new standard for city planning that prioritizes social connection and human flourishing.

MIT Social Machines Lab



Research

Advocacy

Website <u>media.mit.edu/groups/social-</u> <u>machines/overview/</u> Location **Cambridge, MA** The Social Machines Lab (SML) at the MIT Media Lab is a research group dedicated to using natural language processing, machine learning, network science, and user experience design to understand and improve human networks.

The lab is now merged with the MIT Center for Constructive Communication. The interdisciplinary team of researchers comes from diverse backgrounds, including natural language and speech processing, machine learning and AI, interaction design, cognitive science, child development and learning, journalism, and marketing.

The SML focuses on various research topics, such as social networks, humancomputer interaction, artificial intelligence, civic media, civic technology, social media, urban planning, and wearable computing. The SML has successfully collaborated with external organizations, including newsrooms, community organizations, schools, and libraries.

The SML's research efforts have the potential to make a significant impact on society, especially in the area of communication and network-building. With the rise of social media and other digital technologies, human networks are becoming increasingly complex and sophisticated, and understanding how they function is essential. The SML's work could lead to the development of tools and strategies for improving communication and connection, promoting deeper learning and understanding, and ultimately enhancing human well-being.

Case Studies



HEY NEIGHBOUR! Practice Guides



SUPPORTING RESIDENTS TO BECOME COMMUNITY CONNECTORS IN MULTI-UNIT HOUSING Practice Guide #1

https://www.hevneighbourcollective.ca/guides/practice-guides/

Innovation Network for Communities [INC] Connect > Innovate > Scale Up Peter Plastrik, Madeleine Taylor, and John Cleveland

2022



With multi-unit housing becoming increasingly popular in fast-growing urban areas, Hey Neighbour! aims to identify effective approaches for nurturing neighbourly social connections and reaping their benefits. To achieve this, Hey Neighbour created <u>five practice guides</u> tailored to different groups involved in multi-unit housing. These include residents, landlords, housing operators, non-profit organizations, and municipal governments. The guides provide a summary of Hey Neighbour Collective's key learnings and insights on how each group can contribute to promoting neighbour-to-neighbour connectedness and social resilience in multi-unit housing.

In the practice guides, Hey Neighbour highlights the top tips, tactics, and strategic approaches that are most effective in promoting social connectedness in multi-unit housing. They also describe the most common benefits that can result for all parties involved. By providing targeted and practical guidance, Hey Neighbour Collective aims to help foster more connected and resilient communities in multi-unit housing across Canada. The organization recognizes the importance of collaboration and the involvement of multiple stakeholders in achieving this goal, and the practice guides serve as a useful resource for each group to play its part in creating a more socially connected future.

In collaboration with Happy Cities, Hey Neighbour has conducted case studies inspiring socially connected places in the context of both <u>multi-unit housing</u>, and <u>housing for older adults</u>. Both of these studies are strong examples of how Hey Neighbour is helping inform all parties involved in the design and development of housing.

"Connect > Innovate > Scale Up" is a book authored by Peter Plastrik, Madeleine Taylor, and John Cleveland, who are also the authors of "Connecting to Change the World." The book provides practical frameworks, advice, and insights for building networks that can develop and grow social innovations. Drawing on the experiences of more than 20 successful networks, the authors delve into five key topics, including systems change, social innovation development, pathways to scale, network design, and social innovation network leadership.

The book fills a gap in social innovation by providing world-tested knowledge that can inspire confidence, hope, and guide action. The book prioritizes inclusiveness and collaboration, stating that those working in social innovation are not alone, and that they can make a significant difference. One of the main themes of the book is the importance of networks in driving social innovation. Networks can be the key to finding new solutions to complex problems, as they can bring together diverse perspectives, experiences, and expertise.

The book provides a comprehensive framework for designing and leading effective networks, including practical tips on how to create the conditions for collaboration and shared purpose. It also explores how to develop and scale social innovations within networks, and how to build the necessary infrastructure and leadership to support these efforts.

Another key theme of the book is the importance of systems change in social innovation. The authors argue that social problems are often deeply rooted in complex systems, and that addressing these problems requires systemic change. The book provides a practical guide to understanding systems and how to develop strategies for changing them. It includes examples of successful systems change efforts and explores how networks can help drive these efforts forward.

Resilience Hubs by the Urban Sustainability Directors Network



Consulting

Advocacy

Website <u>usdn.org/resilience-hubs.html</u> Location **United States** Resilience Hubs focuses on transforming community spaces into multifunctional resilience centers, addressing climate adaptation and resource conservation, extending beyond traditional emergency preparedness.

Resilience Hubs, the concept that is led by the Urban Sustainability Directors Network (USDN) are, as stated on their website "community-serving facilities augmented to support residents, coordinate communication, distribute resources, and reduce carbon pollution while enhancing quality of life. Resilience Hubs can meet a myriad of physical and social goals by utilizing a trusted physical space such as a community center, recreation facility, or multi-family housing building as well as the surrounding infrastructure such as a vacant lot, community park, or local business."

They define resilience as " the ability of people and their communities to anticipate, accommodate and positively adapt to or thrive amidst changing climate conditions and hazard events. Resilient communities enjoy a high quality of life, reliable systems, and economic vitality, and they conserve resources for present and future generations. The term resilience is often used interchangeably with emergency preparedness and response, but these elements only address part of this important concept." The concept of resilience hubs can be integrated into the design and construction of facilities.

Space Syntax

Consulting

Urban Design

Website <u>spacesyntax.com</u> Location **London, UK**



The Space Syntax idea structure was conceived by Wiliam Hillier, Julienne Hanson and colleagues at the Bartlett School of Architecture at University College, London, in the late 1970s to early 1980s to develop insights into the relation between society, human circulation and space. The team has identified that certain measures have been found to correlate with human spatial behavior, and space syntax analysis is now used used to forecast likely effects of architectural and urban space on users. The general Space Syntax idea is that spaces can be broken down into components, analyzed as networks of choices, then represented as maps and graphs that describe the relative connectivity and integration of those spaces.

The Space Syntax tools allow multiple ways of understanding spatial relationships at the building scale and the urban scale. Perhaps the most important is Integration. Theoretically, the integration measure shows the cognitive complexity of reaching a street, and is often argued to 'predict' the pedestrian use of a street. That is, the easier it is to reach a street, the more popular it should be. From Integration and other analytic components Space Syntax shows it to be possible to quantify and describe how easily navigable any space is. Space Syntax has also been applied to predict the correlation between spatial layouts and social effects such as crime, traffic flow, and sales per unit area. An example of Space Syntax's applicability is the work they did to quantitatively understand the dramatic enhancement that the addition of the cross Thames Millennium pedestrian bridge would be to London's pedestrian network.

UBC Social Cognition and Emotion Lab

Research

Website Location dunn.psych.ubc.ca Vancouver, BC The Social Cognition and Emotion Lab is a research lab in the Psychology Department at the University of British Columbia. The lab primarily focuses on how to optimize the use of time, money, technology, and carbon to enhance human happiness and well-being.

The Lab was founded and is led by UBC Psychology professor Dr. Elizabeth Dunn. Dr. Dunn conducts experimental research examining how time, money, and technology shape human happiness.

The Lab, under Elizabeth Dunn's leadership, has collaborated with the FLUID Sociality team to build the FLUID tool. Dr. Dunn has supported the team in building the fundamental structure of the FLUID tool, and in working towards measuring the right components of sociality. As part of this work, Dr. Dunn and her team have worked to test important parameters around the physicality of sociality. These include, for example, the most likely physical distance that separate two people when they greet each other.

Urban Design for Health (UD4H)

Consulting

Research

Website <u>urba</u> Location **Unite**

urbandesign4health.com United States

Urban Design 4 Health works with public and private sectors to measure and make policy recommendations around social impact, health and quality of life goals through urban planning.

The firm's evidence-based and objectively-measured data and tools are used to promote human health, social equity, environmental resilience, and economic development. Founded by Dr. Larry Frank of UC San Diego, the team is known for identifying, for example, the health effects (eg increased risk of diabetes) of car oriented (typically suburban) development patterns.

UD4H specializes in measuring the place-based relationships between land development, transportation, and activity and travel behavior patterns. An early pioneer in social determinants of health research, UD4H uses large datasets in conducting research and applying it to real-world situations.

Although UD4H has primarily focused to date on measures of physical wellness, their methodology is ripe for expansion to the field of the relationship between built form and social connection.

Reimagining the Civic Commons





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Bridget Marquis

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Non-Profit

Non-Profit

Reimagining the Civic Commons is an initiative that aims to foster social and environmental resilience through the revitalization of public spaces.

By transforming underutilized civic assets – such as parks, libraries, and plazas – into vibrant, inclusive hubs, the organization seeks to bridge divides in communities, enhance social interaction, and promote equity. Their approach is grounded in the belief that well-designed public spaces can drive positive social outcomes, such as improved public health, stronger community bonds, and greater civic engagement. With a focus on collaboration and innovation, Re-imagining the Civic Commons works with local stakeholders to create adaptable, sustainable spaces that reflect the diverse needs of the communities they serve. Their work not only addresses the physical transformation of spaces but also measures the impact of these changes on social connection and economic vitality.

Project for Public Spaces

Consulting

Design

Website Location https://www.pps.org United States

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Nate Storring Co-Executive Director

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Project for Public Spaces (PPS) is a nonprofit organization dedicated to creating and sustaining public spaces that build stronger communities.

Founded in 1975, PPS uses a place-based approach to planning, designing, and managing public spaces that prioritize people over cars and infrastructure. By focusing on placemaking – a collaborative process that empowers communities to shape their public spaces – PPS works to transform streets, parks, markets, and waterfronts into vibrant places where people can connect, engage, and thrive. Their expertise in community-driven design has been applied globally, influencing urban development that enhances social equity, fosters local economies, and improves overall quality of life. With a commitment to creating accessible, safe, and welcoming environments, PPS continues to lead the movement in rethinking how public spaces can serve as vital resources for community resilience and well-being.

Placemaking X





Placemaking X is a global network committed to accelerating placemaking as a strategy for creating inclusive, resilient communities.

By bringing together a diverse coalition of practitioners, policymakers, and community leaders, Placemaking X promotes the exchange of ideas and best practices that enhance public spaces and empower local communities. The organization emphasizes the importance of collaborative processes, where residents actively participate in shaping the spaces around them, ensuring that developments reflect local needs and cultures. Placemaking X's efforts focus on not only transforming physical spaces but also fostering social connection, equity, and environmental sustainability. Through their work, they aim to create public spaces that are not just destinations but are also catalysts for broader social and economic change. With a global reach and a commitment to local impact, Placemaking X continues to inspire and support communities in reclaiming and reinventing their public spaces.

People and Organizations Interviewed for this Paper

Deb Butler American Society of Adaptation Professionals Nicole Miller B3.8 Biomimicry Institute Rachel Hahs B3.8 Biomimicry Institute Jason Santeford Gensler Adele Worsley Gensler Beth Gibbons Farallon Strategies Trey Reffett HUD **Tyler Horton CMHC** K Baja USDN Risa Wilkerson Healthy Places by Design Jamie Elliott Healthy Places by Design Lawrence Frank UC San Diego - Department of Urban Studies and Planning Matt Strand Quadreal Kevin Ng Rick Hansen Foundation Wes Regan Vancouver Coastal Health Laura Chow Vancouver Coastal Health Edward Garcia Foundation for Social Connection Pete Bombaci Genwell Project Steve Downs Building H **Ryan Holmes** Joe Khalifa Kevington **Denise Williams** Leigh Stringer Perkins and Will Abi Bond City of Toronto, Housing Secretariat Noah Slater City of Toronto, Housing Secretariat Eric Olsen Transsolar Joyce Coffee Climate Resiliance Consulting Erin Peavey HKS William Azaroff Brightside Homes Erica Sagert BCNPHA Matt Anderson City of Coral Gables, Florida Galen Treuer Miami-Dade County Missy Stultz City of Ann Arbor Office of Sustainability and Innovations James Arnott Aspen Global Change Institute Nicholas Rajkovich University of Buffalo School of Architecture and Planning Carlos Martin Harvard Joint Center for Housing Studies Jessica Boehland Kresge Foundation

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Partners
Innovation Network for Communities [INC]

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Endnotes

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LIMITATIONS

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