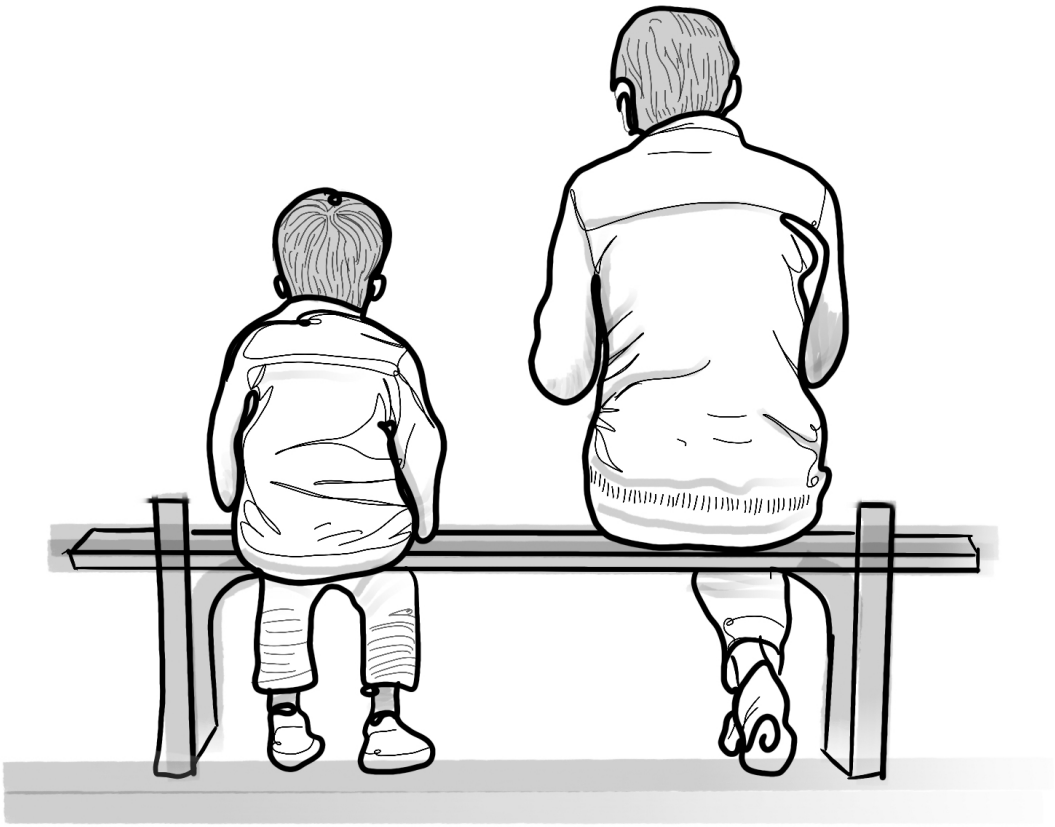

BUILDING BELONGING

Balancing privacy, connection, and design in addressing loneliness in the Built Environment

Lisa Vermeer
5944279
TU Delft
Faculty of Architecture and the Built Environment
Designing for Health and Care in an Inclusive Environment

Delft University of Technology
Master Architecture, Urbanism and Building Sciences

Dwelling Graduation Studio_AR3AD110
Designing for Health and Care in an Inclusive Environment

Lisa Vermeer
5944279

Tutors
Kobe Macco
Birgit Jurgenhake

Research
Leo Oorschot
Birgitte Hansen

Building technology
Paddy Tomesen

2024-2025

Abstract

Loneliness is a pervasive and complex issue influenced by numerous factors, including the design of the spaces we inhabit. This study explores how the spatial layout and architectural features of residential homes can be tailored to encourage social interaction and inclusivity across generations, addressing loneliness within the home environment. Drawing on literature, fieldwork and case studies, the research highlights key architectural principles, such as spatial layout, stability, housing density, natural light, and personalization, that can foster social connectivity.

The findings emphasize that smaller, poorly designed homes lacking clear separations between functional areas often exacerbate loneliness, while flexible communal spaces and opportunities for personalization can enhance a sense of belonging. Stability and permanence in housing are also critical, as they encourage residents to invest in social relationships. The study includes a case analysis of the Diakonissestiftelsen project in Copenhagen, which demonstrates how thoughtful architectural design—through mixed-use housing, communal spaces, and transitional zones—can promote inclusivity and reduce isolation.

The research underscores the need for interdisciplinary collaboration among architects, sociologists, caregivers, and residents to address loneliness effectively. While architectural design alone cannot eliminate loneliness, it can significantly contribute to creating environments that support social well-being. This study advocates for extended, in-depth research to identify specific design elements that positively influence social interaction, ultimately leading to more inclusive and connected communities.

Keywords

Loneliness – Social connectivity – Architectural design – Social isolation – Belonging

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CHAPTER 1

INTRODUCTION

This research was conducted in conjunction with a week of on-site fieldwork at ‘t Kampje, a residential building for the elderly in Loenen aan de Vecht. The fieldwork report forms an integral part of this study.

PROBLEM STATEMENT

Loneliness is a hidden but persistent issue in modern society, and we live in a time when individuals rarely look out for each other. Many news reports have tragically reported instances when persons were discovered deceased in their residences many years after their deaths. For instance, the case of Bep de Bruin gained national prominence in the Netherlands, where, as reported by Hakkenberg (2016), she had been deceased in her home for a decade before being discovered.

While loneliness is frequently associated with the elderly, research shows that young people are increasingly affected. According to De Staat van Volksgezondheid en Zorg (2023), 49.4% of those aged 18 to 34 report feeling lonely, a higher percentage than among people aged 35 to 49 and those aged 50 to 64 (both 47%).

A variety of factors contribute to this growing problem. Economic pressures, such as soaring housing prices, force many young adults to stay at home longer or live alone in spaces that may feel isolating. The fast-paced nature of modern life can also be overwhelming, with constant demands for productivity and success leaving little room for meaningful social interaction. Additionally, mental health challenges are on the rise, making it harder for some individuals to maintain or develop social connections.

Living alone has a particularly strong connection to loneliness. In the Netherlands, approximately 39% (3.3 million) of all 8.4 million households consist of just one person (Volksgezondheid en Zorg, 2024). Many of these individuals reside in homes that are too large for one person, contributing to a lack of social cohesion and integration within their communities. Social isolation can become a vicious cycle, where those feeling lonely find it increasingly difficult to break out of their isolation.

This issue of social separation affects people of all ages, causing mental health issues, decreased well-being, and, in extreme situations, terrible outcomes in which people die unnoticed for long periods of time. Addressing loneliness is vital for developing a more inclusive and supportive society, where individuals of all ages can live in circumstances that foster meaningful interactions and community engagement.

Addressing loneliness demands more than simply social initiatives; it requires a reassessment of how we build living spaces. Architecture has a significant impact on social interaction and community building. Isolation can be decreased by developing environments that encourage connection, such as co-housing communities or multigenerational living arrangements. Housing that has been thoughtfully constructed can help people create meaningful relationships by bridging the gap between their private and public lives. In this sense, architecture becomes an effective tool for reducing loneliness and building a more connected, supportive society.

GOAL

The aim of this research is to establish a foundation for the design that will follow as part of the Master's thesis in Architecture for the graduation studio Designing for Health and Care in an Inclusive Environment. The focus is on reducing loneliness within the built environment. This will be achieved by developing and visualizing design guidelines based on the research, applied across three different scales: the urban neighbourhood scale, the building scale, and the housing scale.

The goal of this research is to gather an overview of design guidelines that either contribute to or should be avoided in relation to loneliness and social isolation. These guidelines will be categorized based on different scales:

1. Interior Scale This pertains to the home itself, which is the private domain of the resident. Design elements at this scale should promote comfort and facilitate social interactions among household members and visitors.

2. Building Scale This scale refers to the location where private and public spaces often intersect. Design guidelines here should focus on creating environments that encourage social engagement and interaction among residents, such as communal areas or shared facilities.

3. Surrounding Environment Scale This encompasses the often public spaces outside the building, which should also be designed with the intention of reducing loneliness and social isolation. Effective public space design can foster community interaction and provide opportunities for socializing.

Once these general guidelines are organized according to their importance and scale, they can be integrated with an analysis of the Tarwewijk location. This combination will lead to the development of a cohesive design strategy aimed at enhancing social connectivity and reducing feelings of isolation within the community.

Ultimately, these design guidelines will be prioritized and organized by their importance and impact on the subsequent design of a mixed-use residential building for Tarwewijk. By addressing loneliness and fostering social interactions at multiple scales, the research aims to create a comprehensive framework that informs the design of inclusive and socially connected environments.

THEORETICAL FRAMEWORK

Loneliness, a multidimensional phenomenon, has been studied by sociologists, psychologists, anthropologists, and urban designers alike. According to anthropologists Franklin and Tranter (2021), one of the defining aspects of loneliness is a perceived absence of belonging. Belonging is inherently social, grounded in culture, beliefs, and personal preferences, but also shaped by place, generation, and residential arrangements. However, loneliness is primarily a subjective experience that varies from person to person, making it challenging to define and quantify.

Different individuals have varied social needs; some may find contentment in a single deep bond, while others may require multiple relationships to feel socially fulfilled. Mellor et al. (2008), a professor of Psychology, underscore the importance of considering variables such as personality and psychotropic factors when addressing loneliness, cautioning that not all cultures associate the need for belonging with close social relationships.

Furthermore, urban design and architecture have been recognized as key contributors to the rise of loneliness, for example, following the modernization and restructuring in of cities in the 1950s and 1960s. Franklin and Tranter (2021) note that industrial villages, which once fostered close-knit communities, gave way to high-rise buildings and urban landscapes designed around individualism. The works of architects such as Alison and Peter Smithson further reflect this trend, as they famously argued that the concept of a balanced, self-contained community was "both theoretically untenable and practically wasteful" (Bauman, 1992). According to their vision, the untethered individual, rather than the community, became the new social unit, and little attention was given to the creation of public spaces that might nurture communal relationships.

This concept, once relevant but now outdated, has been relied upon for too long, leading to the prevalence of anonymous concrete buildings commonly seen in cities across the Netherlands. This historical shift in urban design continues to have ramifications in modern cities like those in the Netherlands, where the demand for housing is rising and high-rise buildings are increasingly prevalent. While high-density urban living might meet the logistical need for more housing, it often fails to address social needs.

Urban planners and designers have recognized the potential to mitigate loneliness by creating spaces that promote social interaction. The book Restorative Cities by Jenny Roe, a Professor and Director of the Center for Design & Health at the University of Virginia, and Dr. Layla McCay, Director of Policy at the NHS Confederation, offers valuable insights into how urban design can promote health and well-being. Roe and McCay emphasize the importance of creating restorative environments that foster a sense of connection while balancing privacy and inclusivity. Their work aligns with the recognition that urban spaces should support not only physical health but also mental and emotional well-being, particularly in the face of rising loneliness.

However, as noted by two scholars, a psychologist and social scientist and an architect and urban planner, Cassis Heu & Brennecke (2023), not all experiences of loneliness can be solved through the creation of semi-public spaces for interaction. People do not always think in the same way that the design was conceived; it is impossible to create a design that everyone will follow in the same manner. This is especially true for the Dutch, who tend to resist anything that feels forced upon them, and rightly so. Privacy remains crucial for many individuals, and it is clear that loneliness cannot simply be "designed away."

Thus, loneliness can be approached from multiple perspectives, each addressing different aspects of the issue. While it is rooted in sociological and anthropological factors, urban designers and architects must also consider the growing numbers of people experiencing loneliness and create spaces that balance the need for privacy with opportunities for connection. In sum, the solution to loneliness is not straightforward, requiring an interdisciplinary approach that accounts for both the emotional and environmental dimensions of belonging.

RESEARCH QUESTIONS

Loneliness and social isolation are increasingly recognized as pressing societal challenges, with profound implications for mental and physical health. These issues are particularly pronounced in urban areas like Tarwewijk in Rotterdam, where high population density and diverse demographics coexist with fragmented social networks. As urbanization continues to shape our living environments, understanding how the built environment can influence social connectivity becomes critical.

The research questions posed in this study aim to explore how the design and configuration of residential spaces, shared environments, and transitional zones can mitigate loneliness while fostering meaningful social interactions. By focusing on Tarwewijk, a neighbourhood with unique social and spatial characteristics, this research seeks to uncover actionable insights that can inform urban planning and architectural practices.

The main research question:

How can the living environment reduce loneliness and social isolation while enhancing social connectivity across all age groups in the built environment, for example in the Tarwewijk in Rotterdam?

Enhancing Social Well-being: A well-designed living environment has the potential to reduce feelings of loneliness by facilitating opportunities for interaction and connection among residents.

Promoting Intergenerational Inclusivity: The spatial layout and design of homes and shared spaces can encourage relationships across different age groups, creating a more inclusive and supportive community.

Sustainable Urban Living: Thoughtful integration of green and shared spaces not only supports social interaction but also contributes to environmental and psychological well-being, aligning with broader sustainability goals.

The sub-questions delve deeper into specific design elements and configurations that influence social behaviour:

1. Green Shared Spaces: Exploring how the layout and use of green, communal areas can bring residents together and reduce social isolation.

How can the layout and configuration of (green) shared spaces around, for example Tarwewijk's residential buildings, be crafted to enhance social interaction and mitigate social isolation?

2. Mixed-Use Residential Buildings: Investigating how the design of buildings and their transition zones between private and communal spaces can support spontaneous and intentional interactions.

How can the design of mixed-use residential buildings and their transition zones between private and communal areas support social connectivity

3. Homes for All Generations: Examining

How architectural features and spatial layouts can foster inclusivity and interaction across age groups.

How can the spatial layout and architectural features of homes be tailored to encourage social interaction and inclusivity across generations?

By addressing these questions, this research contributes to the growing body of knowledge on how urban environments can be designed to combat loneliness, improve quality of life, and strengthen community bonds.

DEFINITIONS

Social isolation and Loneliness
According to Holt-Lunstad (2020) Social isolation and loneliness both refer to aspects of social disconnection but differ in meaning. Social isolation is an objective condition characterized by having few or infrequent social interactions. In contrast, loneliness is a subjective, distressing experience that arises from a perceived gap between the social connections one has and those one desires.

Public spaces and private spaces
As defined by Jackson (2001) Public space is "a place accessible to all citizens, for their use and enjoyment". In contrast, a private place is open to those permitted by law or custom.

Social connectivity
Social connection refers to, as stated by the U.S. Centers for Disease Control and Prevention (2024), the size and diversity of a person's social network, its roles, the functions these relationships serve, and their positive or negative qualities. On the other hand, social connectedness reflects the extent to which one's social needs are met. It involves having the desired number, quality, and variety of relationships, and feeling a sense of belonging, support, and care from those connections.

Architectural features
According to Law Insider (2024), architectural features are prominent or characteristic elements that are part of a building and define the design. These elements can be a window or columns. In this study, architectural features and design elements will be used interchangeably to refer to the same concept.

Intergenerational interaction
As defined by Peters et al. (2021), intergenerational interaction is the process of individuals from different generations coming together in a purposeful and mutually beneficial way, fostering meaningful connections between age groups, from children to the elderly. This interaction encourages the exchange of knowledge, experiences, and support across generations, strengthening social bonds and promoting a greater sense of community.

Belonging
Belonging is, according to (Cambridge Dictionary, 2025) a feeling of being happy or comfortable as part of a particular group and having a good relationship with the other members of the group. This could be between neighbours or friends.

SCOPE

This research examines how architectural design can reduce loneliness and enhance social connectivity across all age groups. It focuses on how the built environment can foster meaningful interactions through features such as shared spaces, flexible layouts, and proximity to community resources like parks and public plazas.

The study will assess both public and private spaces, looking at how they impact social isolation in children, adults, and the elderly. It will explore how architecture can evolve to meet changing social needs over a lifetime, incorporating successful case studies and sustainable design principles.

Excluded from this research are non-architectural solutions like psychological interventions, specialized environments (e.g., prisons, hospitals), and a deep focus on smart home technology or economic policy. The aim is to concentrate on physical design elements and their direct influence on reducing loneliness and promoting social cohesion.

METHODS

Using a mixed method, this study will investigate how the living environment in de Tarwewijk, Rotterdam, can be designed to reduce loneliness and enhance social connectivity among different age groups within a housing complex.

Data Collection Methods

Literature review

Objective
To explore existing research on loneliness, social isolation, and architectural design in order to build a strong theoretical foundation. This will highlight effective design strategies and their influence on fostering social connectivity.

Approach:
Begin by using databases like Google Scholar and JSTOR to locate relevant studies and articles. Organize the findings by categorizing them based on themes such as relevance, peer-reviewed status, scale of the research, and level of importance. Summarize key findings and insights, using diagrams where applicable, to highlight design elements that impact social isolation and loneliness. Finally, identify gaps in the existing literature or define the scope of research to reveal areas where further investigation or innovation is needed.

Qualitative Data

Interviews

Objective
To gather personal insights from the target group on their social interactions and the role of their living environment in these interactions.

Approach
Create open-ended questions to explore how residents engage with their neighbours and the impact of building design on social interaction. Recruit a diverse group of participants through flyers, community boards, or housing associations. Conduct interviews in person or online, recording conversations (with permission) and taking notes. Afterward, analyze the responses to identify common themes, such as communal space use or mobility issues, and categorize insights on loneliness and social connectivity.

Quantitative Data

Observational studies

Objective
To observe how people use spaces in their homes and communal areas to assess patterns of social interaction and places for improvement.

Approach
The goal is to observe how residents use spaces in their homes and communal areas to identify social interaction patterns and potential areas for improvement. Begin by determining specific behaviors to observe, such as gathering spots and how different age groups use spaces. Select key areas within the housing complex for observation, like entrances or communal gardens, and

visit these spots at different times. Record how residents use these spaces and how long they stay. Finally, analyze the data to identify trends, using charts or graphs to highlight areas of high or low activity.

Site Analysis and Mapping

Objective
To assess the spatial layout of Tarwewijk's housing complex and its potential for promoting social interaction.

Approach
Begin by obtaining maps of the area, including building plans and public spaces, from local sources or online. Visit the site to observe how communal and private spaces are used, particularly parks, benches, and courtyards. Create your own map marking key areas, such as private, public, and semi-public spaces, and assess how accessible these areas are, especially for the elderly or those with mobility issues. Evaluate opportunities for improvement, like adding seating or better lighting, to enhance social interaction in these areas.

Case Study Analysis

Objective
To learn from successful examples of how design can reduce loneliness and promote social connections.

Approach
Identify housing projects from other cities or countries that focus on reducing loneliness, such as cohousing communities or age-friendly neighbourhoods. Gather information from articles, reports, or websites about these projects, focusing on design features like shared spaces and their impact on residents' social lives. Reflect on how the lessons learned from these examples can be applied or adapted to Tarwewijk to foster social connectivity in the housing complex.

Anthropological Research

Objective
To understand how residents' social habits and interactions are shaped by their built environment.

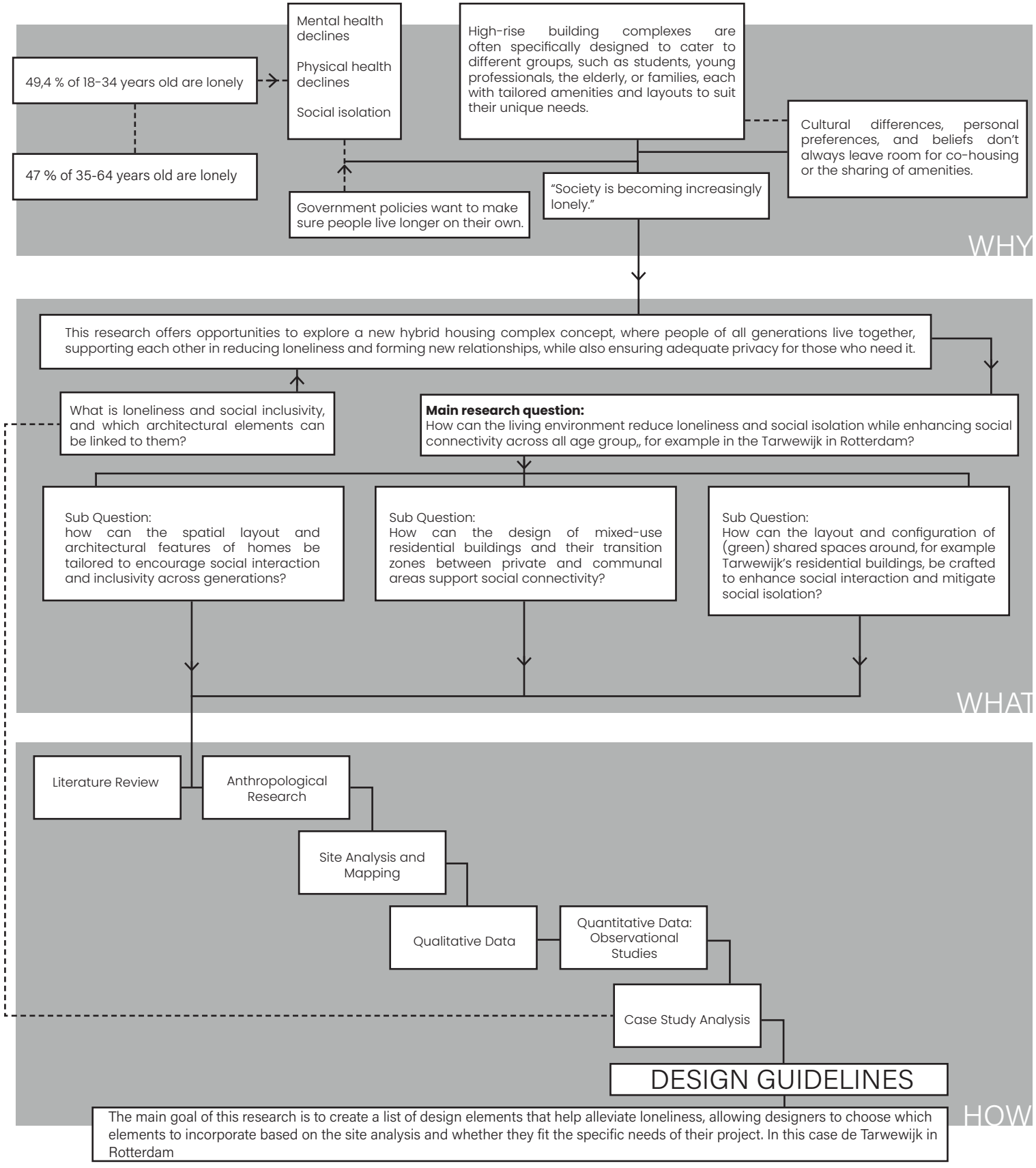
Approach
Review anthropological studies on urban spaces and community behavior, especially those that focus on how space affects social connectivity. Use insights from these studies to interpret how residents in Tarwewijk might interact with their environment, considering factors like proximity to shared spaces and cultural attitudes toward privacy and community. Apply these insights to propose design recommendations that cater to social habits, such as creating smaller, more intimate gathering areas for elderly residents to foster interaction.

Ethical Considerations
The study will obtain informed consent from all participants, ensuring they understand the research purpose and their rights. Confidentiality will be maintained throughout the study, and ethical approval will be sought from the relevant institutional review board.

Limitations

Potential limitations of this study include the sample size, response bias, and the challenges associated with generalizing findings beyond the Tarwewijk context. Additionally, external factors affecting social dynamics may influence residents' experiences of loneliness and connectivity.

RESEARCH DIAGRAM



CHAPTER 2

DE TARWEWIJK

As researched by Presură et al. (2024), Tarwewijk, a neighbourhood located in the southern part of Rotterdam, the Netherlands, exemplifies both the complex challenges and the promising potential of contemporary urban living. Known for its rich cultural diversity and dynamic population, Tarwewijk is home to a diverse mix of ethnic groups, age demographics, and housing typologies.

This diversity offers promising ground for community vibrancy and innovation, but it also presents structural and social challenges that hinder social cohesion and quality of life.

Socio-Economic Landscape

Tarwewijk is primarily composed of rental housing, 78% according to Presură et al. (2024) , which contributes to high rates of tenant turnover. This constant change undermines the development of stable social networks and long-term community bonds. Residents often lack the time or incentive to invest in local relationships, and informal support systems, which are critical in lower-income areas, are weakened as a result.

Economically, the neighbourhood faces considerable adversity. In January 2022, 12.3% of Tarwewijk residents lived below the

Fig 1: impression of de Tarwewijk (Presură, et al., 2024)

national poverty line, compared to 8.7% in Rotterdam as a whole and just 4.4% across the Netherlands (Presură et al., 2024, p. 16). Unemployment further compounds these struggles: 37% of residents are unemployed, a striking contrast to the 26% national average. These figures reflect deeply rooted economic disparities that influence everything from housing stability to access to education, healthcare, and opportunities for upward mobility.

Cultural Diversity and Social Cohesion

Cultural diversity is one of Tarwewijk's defining characteristics. The population comprises individuals from a broad spectrum of ethnic backgrounds, including Dutch, Cape Verdean, Turkish, Moroccan, Surinamese, Indonesian, African, Asian, European (including Russian), American, and Oceanian communities (see fig. 2). Each group brings distinct cultural norms, preferences for housing, and differing household compositions.

While this diversity can foster vibrant cultural exchange and mutual enrichment, it can also lead to fragmentation and social tension, especially in the absence of shared public spaces and inclusive community engagement initiatives. Language barriers, differing social customs, and unequal access to resources can further alienate certain groups, reducing the likelihood of sustained interaction or collaboration between communities.

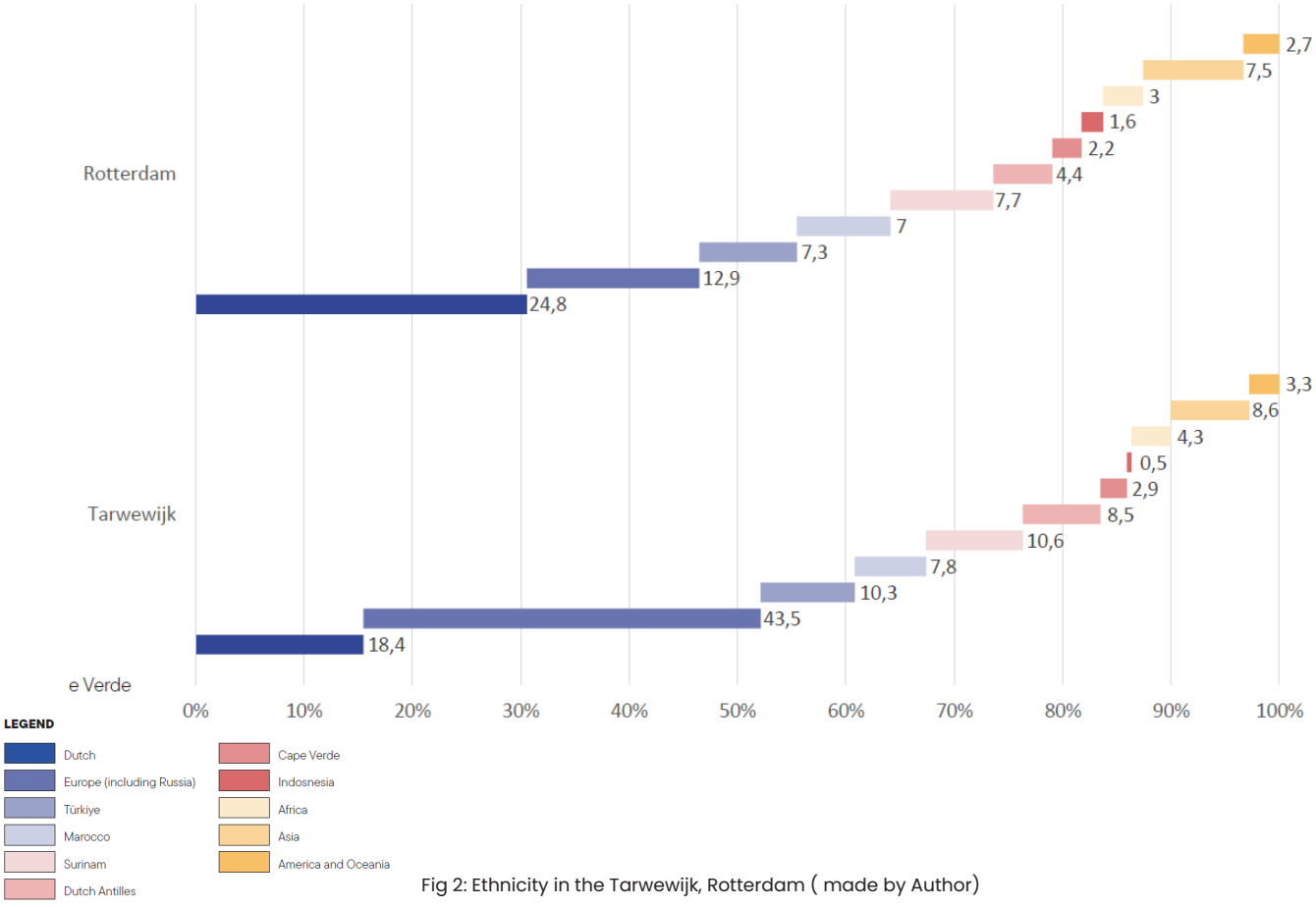


Fig 2: Ethnicity in the Tarwewijk, Rotterdam (made by Author)

Community initiatives in Tarwewijk reveal local resilience and a desire for improvement, but participation in these efforts has been waning. Stronger, more inclusive strategies are needed to revitalize social engagement and build a collective sense of purpose.

Spatial and Environmental Constraints
Tarwewijk features a relatively generous amount of green space; however, the distribution and design of these areas limit their effectiveness. Many green areas are small, scattered, and fenced off, primarily designed as playgrounds for children. As a result, they fail to serve broader demographic needs, particularly those of elderly residents, people with disabilities, or others with limited mobility.

Accessibility is a major concern throughout the neighbourhood. Several green spaces are situated on lower levels, without proper ramps or alternative access for wheelchair users. Additionally, essential services are not evenly distributed: the only supermarket in the area is located in the northern section of the neighbourhood and is accessible solely via a steep incline. For residents with mobility challenges—such as seniors or those using walking aids, this presents a significant barrier to accessing basic necessities.

The physical environment of Tarwewijk also contributes to a diminished sense of place and pride. Poor maintenance, litter, and visible signs of neglect reinforce negative perceptions of the neighbourhood. Unclean public spaces not only affect aesthetic appeal but also erode the psychological well-being of residents, fostering a sense of abandonment and disengagement.

From Challenges to Opportunities
Despite its socio-economic and spatial challenges, Tarwewijk holds considerable potential for meaningful transformation. The area's cultural richness, existing community spirit, and structural diversity offer a strong foundation for a more inclusive and resilient urban future.

Addressing Tarwewijk's layered issues requires a multi-scale approach that combines physical infrastructure improvements with strategies that strengthen social networks and promote civic participation. Key areas of focus should include:

- Improving accessibility to public spaces and services for all residents, including those with limited mobility.

- Enhancing the usability and inclusivity of green spaces to serve a wider demographic.

- Supporting socio-economic development through local job creation, skills training, and small business support.

- Fostering intercultural dialogue and engagement, ensuring that the voices of all communities are heard in planning and design processes.

- Prioritizing cleanliness and maintenance to rebuild pride in the local

environment and shift perceptions of neglect.

By aligning urban design with inclusive, community-driven planning, Tarwewijk can evolve into a neighbourhood that not only reflects the vibrancy of its population but also actively supports their well-being. With targeted investment, thoughtful design, and collaborative governance, Tarwewijk can become a model for equitable and connected urban living.

Fig 3: De Tarwewijk, Rotterdam (map by Author)

CHAPTER 3

BUILDING BELONGING

As stated by Bower et al. (2023), loneliness is inherently an individual condition. Its diagnosis is based on personal perceptions, with treatment focused on specific symptoms. However, like many contemporary public health issues, it is possible to identify connections between the built environment and loneliness, and how these factors can influence each other.

This is not always a straightforward process. We cannot claim that a well-designed space will directly reduce feelings of loneliness, but architecture can contribute to social interactions, social cohesion, and opportunities for encounters, which in turn can positively impact loneliness over time.

One example frequently discussed is the presence of green spaces. Research, such as that by Astell-Burt et al. (2022), shows that greater exposure to or experience with green spaces is associated with reduced loneliness. However, studies often remain somewhat superficial regarding the amount of green space and which specific elements contribute to or detract from reducing loneliness.

The sense of belonging—the feeling that one is part of something—plays a significant role in alleviating loneliness. As mentioned earlier, belonging is inherently social, rooted in culture, beliefs, and personal preferences, but it is also shaped by place, generation, and residential arrangements.

Belonging is also closely tied to social cohesion. The more a resident identifies with their building and home, and the greater the sense of individualism and freedom they experience, the more open they are to forming new connections. This is often the first step in reducing loneliness.

This research will explore belonging within the context of the built environment and architecture. If we do not narrow this focus, the concept of belonging would be too broad for this study, making it difficult to draw clear conclusions. Therefore, we will focus specifically on how the design of the built environment can foster a sense of belonging and social connections, which can ultimately contribute to reducing loneliness.

CHAPTER 4

DESIGNING GREEN SHARED SPACES TO MITIGATE LONELINESS AND FOSTER COMMUNITY

Green shared spaces are vital in fostering social interaction and mitigating loneliness, particularly in urban settings Like de Tarwewijk in Rotterdam. Research underscores the multifaceted benefits of such spaces, ranging from mental health improvements to enhanced community engagement, in this chapter we will cluster key design principles and evidence-based design strategies to optimise these spaces for social interaction and attempt to answer the following research question: How can the layout and configuration of (green) shared spaces around, for example Tarwewijk's residential buildings, be crafted to enhance social interaction and mitigate social isolation?

Bower et al. (2023) highlight that individuals with greater access to natural spaces report lower levels of loneliness. Similarly, their research shows that residents living within 1–3 kilometres of green spaces experience reduced feelings of isolation. One example is allotment gardening, which, even when not primarily pursued for social interaction, significantly decreases loneliness. The change of scenery and the experience of being in nature, rather than in an urban environment, can foster a positive mental state.

Natural Settings such as areas with trees and grass, provide shade, privacy, and sound buffering while promoting restorative effects (Maas, van Dillen, Verheij, & Groenewegen, 2009). These spaces encourage outdoor activities and facilitate neighbourly interactions fostering a sense of community, these natural spaces however, do need to be able to facilitate activities and community gathering.

Another important element of shared green spaces, according to Roe & McCay (2021), is the inclusion of water features such as fountains. These features help reduce noise pollution, alleviate heat stress, and enhance biodiversity, providing therapeutic and multisensory experiences. Visual contact with water is widely regarded as pleasant, a sentiment echoed in fieldwork conducted at T' Kampje. Residents expressed great appreciation for the large pond surrounding part of the building, highlighting its positive impact on their well-being. (Vermeer & Verlaan, 2024) The pond can be seen in figure 4 with it's 2 geese residents.

Key design Elements

4.1 Accessibility and proximity

Green spaces should be easily accessible, ideally within a 5–10 minute walk or approximately 300 meters (Roe & McCay, 2021). To ensure accessibility and safety, the surrounding streets should be pedestrian-friendly, with a width of around 4 meters to allow for easy flow and encourage informal neighbourly interactions (Gehl, 2011). While being able to see greenery is beneficial, even if it is not directly accessible (Roe & McCay, 2021, p. 31), it is crucial to design green spaces that can be actively used. Neglecting

usability can lead to unsafe areas where people may loiter, undermining the positive impact of these spaces.

A more concrete design element for urban spaces are benches. According to Gehl (2011), they should be placed every 100 meters and designed to encourage a variety of uses. Curved or angled benches, for example, promote interaction by positioning people to face each other, making conversations and lingering more natural. Unlike traditional straight benches, incorporating features like a table enhances social engagement and creates a more inviting atmosphere. This is also supported by Roe & McCay (2021), who emphasize the importance of providing plenty of well-maintained seating opportunities and toilets to ensure accessibility and comfort in public spaces. These seating areas should provide intimacy, security and favourable micro-climates. Popular spots are often at the edges of open spaces, where people's backs are protected and views are unobstructed. As shown in figure 5, the benches in the plaza are designed with curved, high-backed seating to create a sense of protection and comfort. Designed by Arcadia Landscape Architecture, this plaza has become a vibrant destination where people linger over coffee, pick up groceries, walk their dogs, or watch children enjoy the urban play area and engage in active recreation at the outdoor gym.

Fig 4: pond at 't Kampje (photo by author)

Fig 5: Friedlander Place (Arcadia Landscape Architecture, 2021)

4.2 Activity zones

As mentioned earlier, natural spaces should facilitate and accommodate a variety of activities, such as jogging, walking, playing, and community events (Roe & McCay, 2021). Placing gardens and parks in visible areas allows residents to combine gardening with recreational and social activities. More importantly, it enables them to observe others and decide freely whether to join in, fostering a sense of autonomy and inclusivity. These spaces should be designed with flexibility in mind, accommodating a balance between busyness, noise, and daily activity while also offering quiet, private areas for retreat (Morgan et al., 2019). This approach ensures that everyone can feel at home, fostering a sense of connection and inclusivity.

Parents of young children in large multiple-dwelling units often cope with the paucity of nearby play spaces by keeping children inside their apartments. Such restrictions heighten intrafamilial conflict, minimize play opportunities with others, and remove a primary avenue for parents to get to know their neighbours. (Evans, 2003). Thus a playground or safe area where children can play should be provided in close proximity to the house.

4.3 Safety and lighting

Another straightforward yet essential element is good lighting, which fosters a sense of safety, encourages the use of outdoor spaces, and reduces perceived risks (Roe & McCay, 2021). Streets with high activity levels and natural surveillance from windows further enhance safety and promote social interaction. This is also evident in T' Kampje, where residents with views of the entrance reported feeling more engaged and secure compared to those with a "street" view, as they themself described it. (Vermeer & Verlaan, 2024)

4.4 Integration of water features

A more practical design element to consider is the incorporation of a "designed" rain garden or stormwater drainage system. These mini waterways not only create visually appealing features, as shown in figure 6 and figure 7, but also foster social interaction. Such systems can be maintained as part of a communal effort, encouraging residents to work together to care for the plants and keep the area clean. Adding benches around these gardens would further enhance the design, inviting people to linger and providing more opportunities for social engagement.

4.5 Connectivity and inclusivity

A less easily influenced but equally important factor is the strong connection between residential areas and public transport, coupled with high walkability. These elements are crucial for creating accessible and sustainable urban environments (Morgan et al., 2019).

4.6 Enhancing the experience

Alternating street spaces with small squares can make walking distances seem shorter, enhancing the overall experience (Gehl, 2011).

Furthermore, being able to see and observe activities in public spaces can serve as an invitation for participation. And lastly, climate considerations can transform a route from merely functional to a place where people linger (Duivenvoorden & Mantingh, 2021)

The primary goal of establishing a public space near or within the building, in this case for de Tarwewijk, is to create an environment where people can come together and foster a sense of community. As Maas, van Dillen, Verheij, & Groenewegen (2009)perfectly describe, this space aims to help residents of the building and the surrounding neighbourhood feel at home, build relationships with one another, or have opportunities to form these connections, ultimately cultivating a strong sense of belonging and connection to the place.

4.7 conclusion

The layout and configuration of green shared spaces can significantly enhance social interaction and mitigate social isolation by integrating design principles that prioritize accessibility, flexibility, safety, and inclusivity. These spaces should be thoughtfully designed to encourage diverse activities, foster a sense of community, and provide opportunities for both social engagement and quiet retreat. Evidence suggests that proximity to green spaces, visibility of activities, and features such as water elements and well-placed seating contribute to creating vibrant, socially engaging environments.

Fig 6: Waterway in Mittelfart, Denmark, Schulze + Grassov

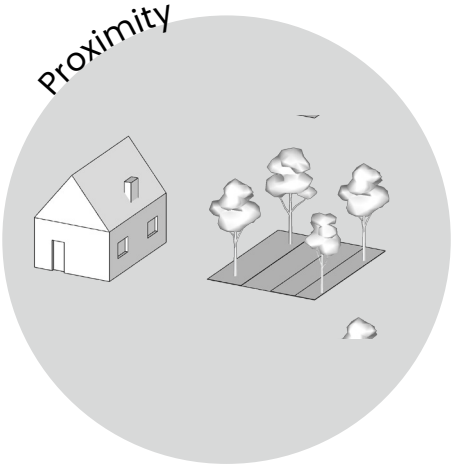
Fig 7: (Bass, (2022)

DESIGN GUIDELINES - NEIGBOURHOOD SCALE

Accessibility

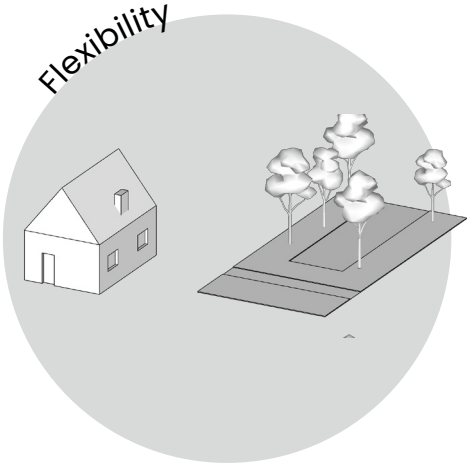
Green spaces within a 5-10 minute walk or 300 meters.

Proximity



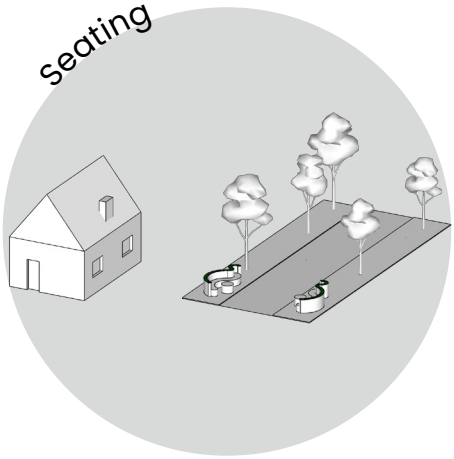
Pedestrian-friendly streets, 4 meters wide, to encourage flow and informal interactions.

Flexibility



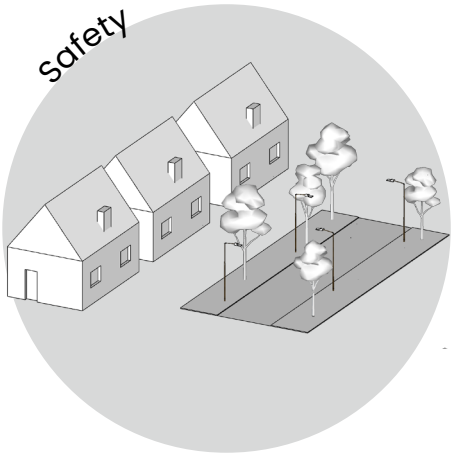
Space accomodating activities such as jogging, walking, playing and community events, flexible in use.

seating



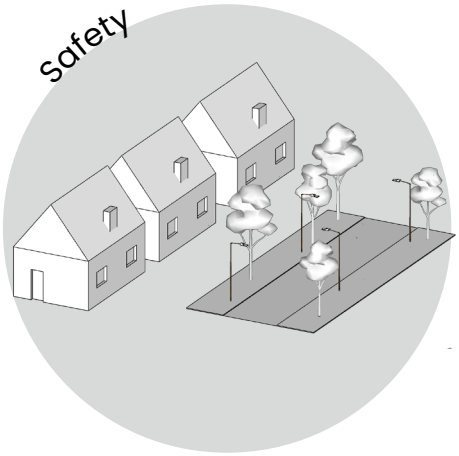
Benches every 100 meters, curved or angled for natural conversations.

safety



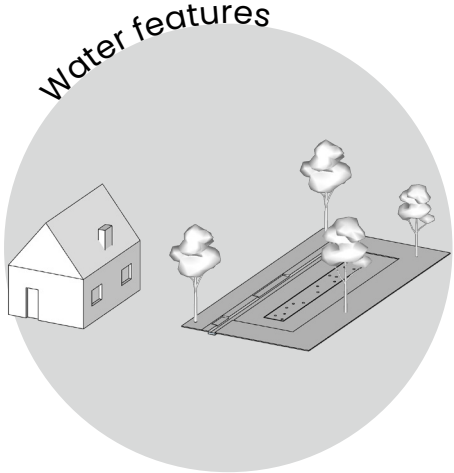
Natural surveillance with window facing activity zones and no high traffic streets

safety



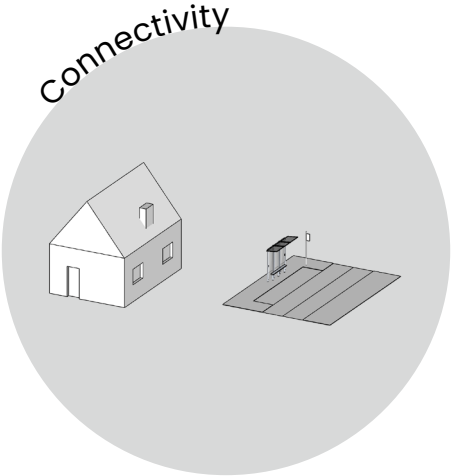
Lighting, well lit areas to reduce risks and encourage outdoor use all year round.

Water features



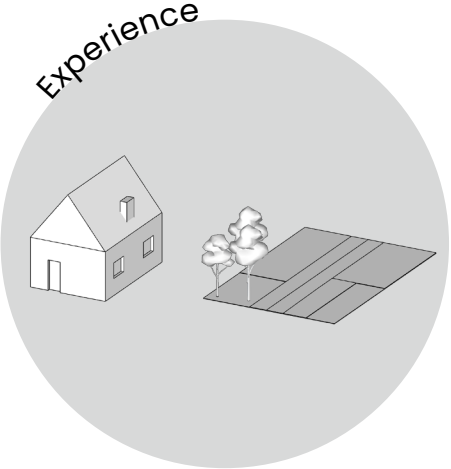
Fountains or rain gardens to reduce noise, alleciate heat, and enhance biodiversity for people to look at.

Connectivity



Strong links to public transport and walkable routes.

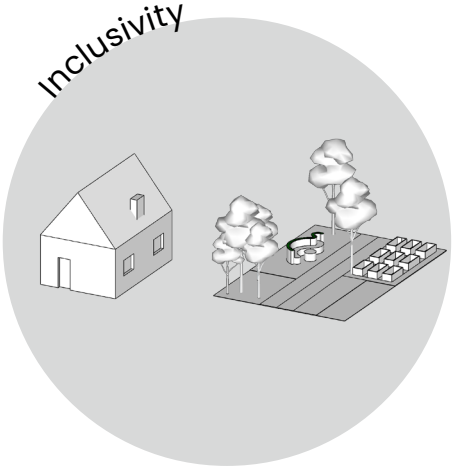
Experience



Alternating street spaces with squares and climate sensistive designs to enhance usability.

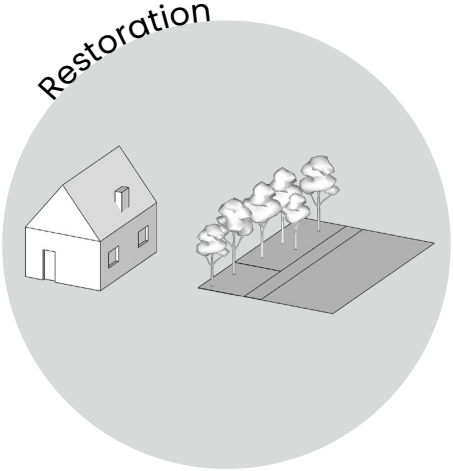
DESIGN GUIDELINES - NEIGBOURHOOD SCALE

Inclusivity



Visible green spaces to combine gardening with recreational and social activities.

Restoration



Trees and grass for shade, privacy, and sound buffering.

CHAPTER 5

DESIGNING SPACES TO ALLEVIATE LONELINESS: GUIDELINES FOR THE SCALE OF BUILDINGS

As individuals age, the desire to live independently grows, alongside challenges in finding suitable housing. Addressing loneliness through spatial design requires a nuanced understanding of how building density, typology, and the interplay between private and communal spaces impact social connectivity. This chapter explores the research question: How can the design of mixed-use residential buildings and their transition zones between private and communal areas support social connectivity?

5.1 Building Density, hight and Loneliness

The impact of housing density on loneliness varies. Research suggests that Macro-level urban characteristics like higher housing and building densities can negatively affect loneliness among individuals over 60 years old. (Bower et al., 2023). According to Gehl (2011), meaningful interaction with ground-level activities is primarily achievable from the first few floors of a multistory building. A noticeable decline in the ability to connect with ground-level events occurs between the third and fourth floors, with a significant threshold observed between the fifth and sixth floors. Beyond the fifth floor, individuals are effectively detached from the sights and sounds of ground-level activities. When one can no longer clearly see or hear what is happening at ground level, it creates a sense of disconnection from the surrounding environment and its activities. This is confirmed by Bower et al,. (2023) who concluded that mothers who moved to high- rise apartments had trouble remaining connected to previous friendships networks and forming new networks. Low buildings along a street are in harmony with the way in which people move about and the way in which the senses function, as opposed to tall buildings, which are not. In multi-story buildings, multi-racial and multi-generational environments can help reduce loneliness among ethnic minority residents, as noted by Bower et al. (2023).

This effect is closely tied to fostering a sense of belonging and the feeling of being acknowledged and included within a community. However, it is important to recognize that low-density urban environments often coincide with higher housing costs and income levels, making it challenging to distinguish the specific impact of density from broader socioeconomic factors.

5.2 Use

An essential aspect of designing buildings to combat loneliness is considering their purpose and usage. When a building is solely dedicated to residential living, it naturally limits the flow of people to its premises. In such cases, only the residents and their specifically invited guests interact within the building, which reduces opportunities for spontaneous social connections and interactions. This isolation can unintentionally reinforce feelings of loneliness among its inhabitants.

In contrast, incorporating mixed-use functions into a building can transform it into a vibrant community hub. For instance, combining housing with facilities such as a gym, library, café, or postal office introduces a dynamic element that attracts not only the residents but also neighbours and even people from further afield. These visitors bring energy, diversity, and opportunities for interaction that can break down social barriers and foster a sense of belonging.

To maximize the building's potential for combating loneliness, it's important to include functions that encourage people to linger and engage. Spaces such as cozy seating areas, community kitchens, or coworking spaces invite prolonged use and casual interaction. For example, a library with comfortable reading nooks or a gym with a café attached creates natural opportunities for people to spend more time in the building and interact with others.

On the other hand, functions that don't support full-day use or lack versatility are less effective in achieving this goal. For example, a space that serves a single, narrow purpose for a limited time—like a small meeting room used only for occasional events—does little to promote continuous engagement or foster connections.

By thoughtfully integrating diverse and multifunctional spaces, buildings can serve as catalysts for community building, enabling residents and visitors alike to form meaningful connections and combat loneliness effectively.

5.3 Privacy and Community Balance

Fostering a sense of community on the building scale is essential to combat loneliness. While encouraging social interaction is important, residents must have the option to retreat to private spaces when needed. Shared spaces should provide opportunities for activities while maintaining clear boundaries between private and communal areas. No one wants to feel compelled to engage in social interaction, as each individual has their own unique threshold for social contact. For some, speaking to neighbours once or twice a week may be sufficient, while others may require daily interactions or at least five instances of contact to feel socially fulfilled. Recognizing and accommodating these differences is essential in creating environments that support diverse social needs.

5.4 Transitional Spaces and Front Yards

Semi-private spaces, such as front yards, offer a balance between privacy and social interaction. Front yards, ideally 3.25 meters deep (Gehl, 2011), allow residents to engage with passersby while maintaining a degree of separation. Homes should be set back 3-4 meters from the sidewalk to provide privacy while enabling casual social interactions (Roe & McCay, 2021). Small outdoor areas placed directly in front of houses can have far greater and substantially more faceted use than larger recreational areas that are more difficult to reach. This does not mean that areas for sports, green lawns, and city parks are in any way superfluous, but it means that in all cases there should be areas and resources set aside to provide "immediate" recreational areas. (Gehl J. , 2011).

5.5 Circulation Spaces and Accessibility

Designing circulation spaces, in the building

itself, that promote encounters can foster community. For instance, pathways leading past communal areas can encourage interaction. Sightlines can be created to stimulate visual contact and interaction. This can be achieved by strategically placing voids, staircases, open sections in the floor, glass walls, or other transparent elements that connect spaces. The design of new high-rise buildings, with narrow and dark staircases and elevators, is highlighted as a deterrent to expanding social networks (Pojani & Buka, 2015). These design choices not only encourage social interaction but also contribute to an open and spacious experience within a building .

However, accessibility must be prioritized to ensure inclusivity for individuals with limited mobility. Attractive and functional design elements, such as bridges, staircases, and sightlines, can enhance connectivity while maintaining privacy (Roe & McCay, 2021). Circulation spaces should serve small groups of dwellings to build micro-communities (Sim, 2019) and semi-private front yards with seating, play areas, and flower beds can further encourage interaction (Gehl, 2011). Gehl, (2011) also explains that when the zone is too small, it does not support the usage of the space. While too large transition zones create too much privacy and harden the line between private and public (Duivenvoorden & Mantingh, 2021). Popular zones for staying are found along the facades or in the transitional zone between one space and the next, where it is possible to view both spaces at the same time. An example of how this can be achieved is found in the Tarwewijk itself. In the design of the newly built rowhouses, concrete benches have been integrated into the façade, creating a seamless connection between the building and public space as can be seen in figure 8.

5.6 Safety and Social Cohesion

Safety significantly influences social cohesion and reduces loneliness. Clear, well-lit routes and the absence of dark or unused corners in the building create a sense of security, encouraging the use of shared spaces (Duivenvoorden & Mantingh, 2021). Familiar, safe environments promote spontaneous encounters and community building.

5.7 Identity and Connection

Creating a sense of identity within residential buildings plays a crucial role in enhancing social cohesion and fostering a strong community spirit. Thoughtfully designed facades, unique architectural details, and recognizable features not only give each building a distinct character but also help residents develop a sense of pride and emotional connection to their living environment. These elements act as visual anchors, making it easier for residents to identify their homes and feel a part of a larger, cohesive neighbourhood. Recognizable architectural features, such as strong horizontal or vertical lines and varied materials, enhance a building’s identity and functionality.

Horizontal and Vertical Lines:

Horizontal lines create a sense of stability and openness, while vertical lines add height and prominence. These can highlight entrances or break up large façades for visual interest.

Material Differentiation:

Using different materials, like brick for residential areas and glass for public spaces, distinguishes sections of the building and clarifies their purpose. These features make buildings more visually engaging, intuitive, and welcoming.

When residents feel connected to their homes and surroundings, it fosters a sense of belonging that extends beyond the physical space to the social fabric of the community. This connection encourages informal interactions, neighbourly relationships, and collective responsibility for shared spaces, further strengthening social ties. Over time, this sense of belonging can significantly reduce feelings of loneliness and isolation, contributing to improved mental well-being and overall quality of life. Additionally, a strong identity within residential areas can attract a more diverse and engaged population, creating a vibrant and inclusive community.

5.8 Communal Spaces

Properly designed communal spaces facilitate social interactions. Poorly designed or inaccessible communal areas hinder social connections (Morris et al., 2021). Effective design includes central locations with good visibility, a hierarchy of sub-spaces for flexible use, greenery, seating, and aesthetic appeal (Kleeman et al., 2023). Communal areas should cater to diverse activities and user groups, ensuring inclusivity and accessibility (Devnmini Bandara et al., 2020). This observation aligns with the

Fig 8: Residential building Tarwewijk, Rotterdam, 2024(photo by author)

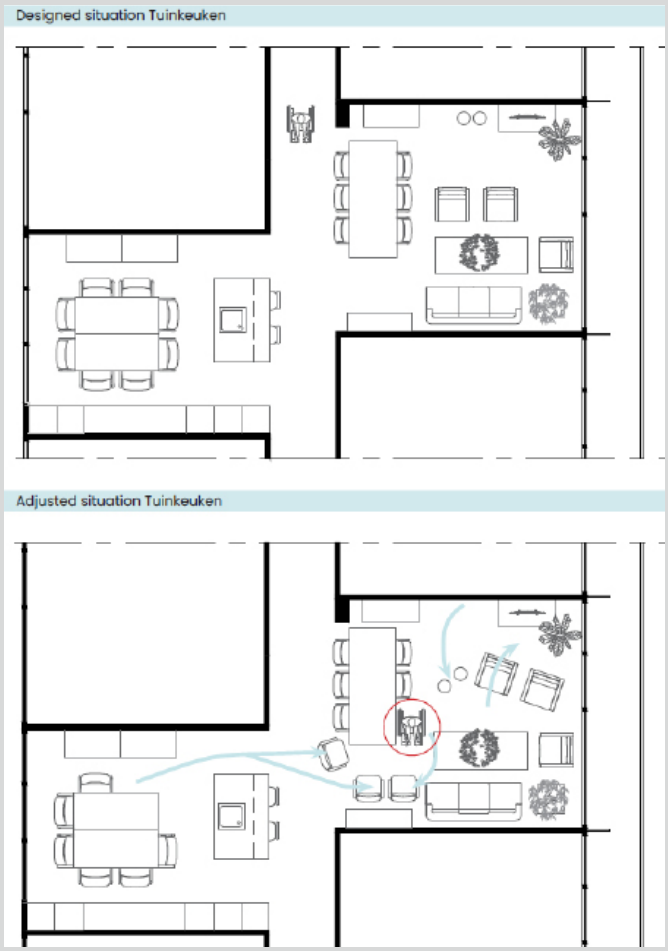


Fig 9: communal space 't Kampje (made by author)

findings of Vermeer and Verlaan (2024) during their fieldwork at 't Kampje. Despite the presence of more than five communal spaces distributed throughout the building, only one was consistently used during the week. As can be seen in figure 9. The utilization of these spaces was influenced by several factors, including the proximity to residents' rooms, the absence of attached kitchens in some communal areas, the quality of the view from the rooms, and the scheduling of activities or meetings in other communal spaces. These findings highlight the importance of thoughtful design and programming to ensure communal spaces meet residents' needs and encourage regular use.

5.9 Challenges in High-Density Housing

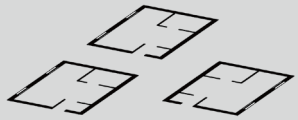
High-density housing poses challenges, such as limited access to communal areas, unattractive aesthetics, and a lack of green spaces. Poor lighting and visibility in shared areas can deter sociability and compromise safety (Kleeman et al., 2023). While some residents may feel uncomfortable in highly visible communal spaces, natural surveillance can enhance security for others.

5.10 Conclusion

To address loneliness through spatial design, residential buildings must balance privacy and community while integrating transitional spaces that promote interaction. Prioritizing safety, fostering a sense of identity, and creating accessible, adaptable communal areas are key to meeting the diverse social needs of individuals across all stages of life. Thoughtfully designed spaces, including clear circulation pathways and semi-private zones, can enhance opportunities for connection while respecting personal boundaries. By addressing these factors, spatial design has the potential to reduce loneliness and build vibrant, inclusive, and connected communities.

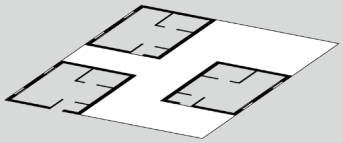
DESIGN GUIDELINES - BUILDING SCALE

Privacy and Community



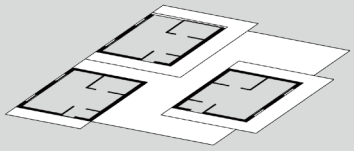
Provide shared spaces for interaction while ensuring residents have private areas to retreat.

Boundaries



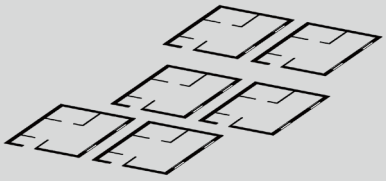
Design clear boundaries between private and communal areas to maintain comfort and autonomy.

Transitional spaces



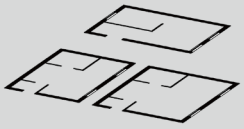
Incorporate semi-private zones such as front yards or balconies to encourage casual interactions.

Density



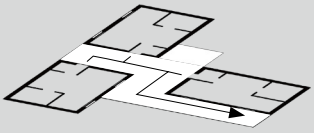
Consider the social implications of housing density, balancing the benefits of community interaction with the potential drawbacks of overcrowding.

Diversity



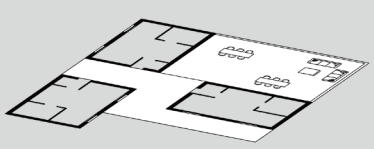
Design multi-generational and diverse housing typologies to foster inclusivity and reduce loneliness.

Circulation



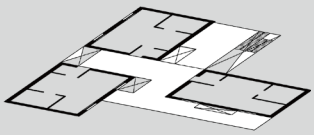
Create circulation paths that pass through or near communal areas to encourage spontaneous encounters.

Communal spaces



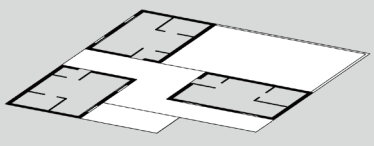
Design central, visible, and easily accessible communal areas with greenery, seating, and aesthetic appeal.

Transparent elements



Use transparent elements such as glass walls or open staircases to enhance sightlines and connectivity.

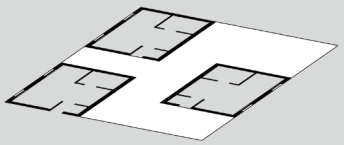
Hierarchy



Include a hierarchy of sub-spaces to accommodate diverse activities and user groups.

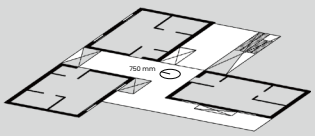
DESIGN GUIDELINES - BUILDING SCALE

scale



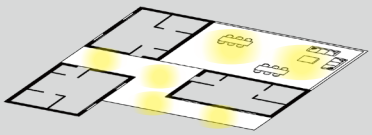
Ensure transitional spaces are appropriately scaled—neither too small to discourage use nor too large to isolate users.

Accessibility



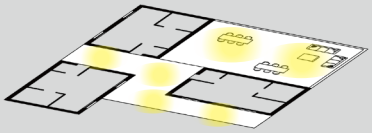
Ensure circulation spaces are accessible for individuals with limited mobility. Wheelchair, walker and other mobility aids.

Lighting



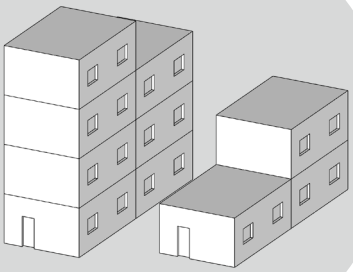
Design clear, well-lit routes with good visibility to enhance safety and encourage the use of shared spaces.

safety



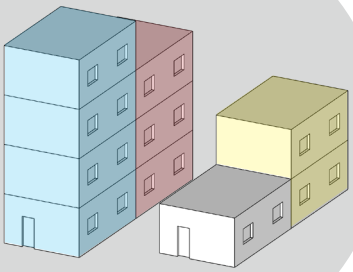
Prioritize safety through well-lit and open designs that discourage the formation of unused or unsafe zones.

Height



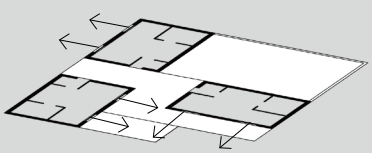
No higher than 4 stories.

Identity



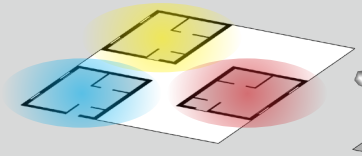
Use distinct architectural features and facades to create a sense of identity and pride for residents.

Natural surveillance



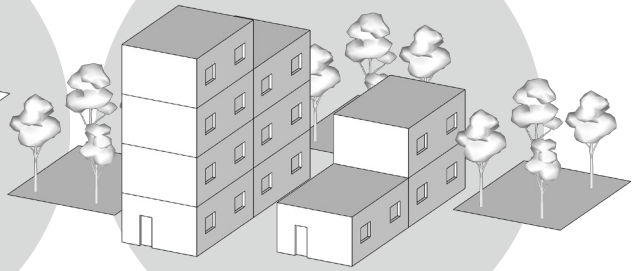
Integrate natural surveillance through strategic placement of windows and communal areas.

Connectivity



Foster emotional connections to the living environment by incorporating elements that reflect the community's character.

Green space



Include small, easily accessible outdoor spaces near homes for immediate recreational use. Complement these with larger parks and green areas for sports and leisure activities.

CHAPTER 6

ARCHITECTURAL DESIGN TO REDUCE SOCIAL ISOLATION AND FOSTER INCLUSIVITY ACROSS GENERATIONS

Loneliness is a complex issue influenced by numerous factors, including the design of the spaces we inhabit. While no architectural solution can completely resolve social isolation, thoughtful design choices within residential homes can significantly impact how individuals connect and interact. This chapter examines the following sub- research question: how can the spatial layout and architectural features of homes be tailored to encourage social interaction and inclusivity across generations? addressing the critical question of how design can mitigate loneliness within the home environment.

The Role of the Built Environment in Addressing Loneliness

Humans spend approximately 90% of their lives indoors, according to Evans (2003). While this statistic may be somewhat outdated due to increased attention to mental health following the pandemic, it underscores the importance of the built environment in influencing social connectivity. Despite a wealth of research on outdoor environmental conditions and their impact on health and loneliness, there is comparatively less focus on the relationship between health and the built environment itself. This paucity of research highlights the need for greater attention to how architectural design can mitigate loneliness.

Loneliness does not arise solely from the built environment, but the environment can significantly influence how residents experience it. For example, questions such as whether people feel lonelier in apartment complexes compared to ground-level homes, or whether smaller homes exacerbate loneliness more than larger ones, underline the importance of design choices. Research shows that architectural features can either minimize or amplify feelings of loneliness, making thoughtful design a critical consideration.

Key Architectural Features to Combat Loneliness

6.1 Spatial Layout and Size

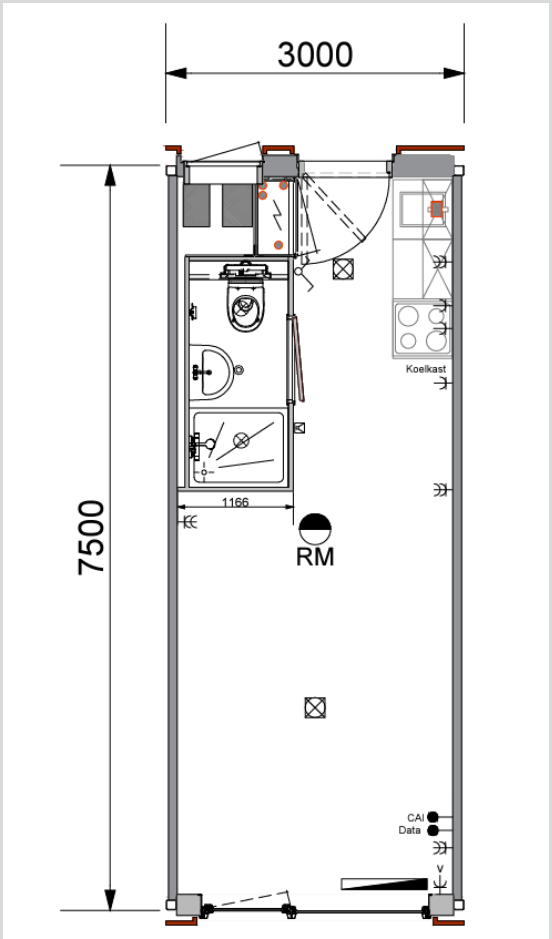
Research has consistently demonstrated that the size and layout of a dwelling significantly impact feelings of loneliness. Smaller apartments, particularly those lacking a hallway separating the living room, bedroom, and bathroom, are associated with an increased risk of loneliness. Interviews cited by Bower et al. (2023) reveal that elderly individuals living with their children often hesitate to invite friends over due to concerns about privacy. Visitors frequently need to pass through the bedroom to access the bathroom, creating discomfort and limiting social interaction. Furthermore, residents report that a lack of energy for hosting, the burden of cleaning, and perceived insufficient space hinder their ability to foster social connections. An example of housing where loneliness can be a concern is the newly built social housing complex in Alphen aan den Rijn, The Netherlands. The complex

consists of modular blocks featuring studios, two-room apartments, and three-room apartments, with a primary focus on the studios where the floorplan can be seen in figure 10. These rectangular units lack outdoor space, and the complex is located in an industrial zone, far from amenities and public transport, which can contribute to social isolation. However, the main issue lies in the lack of separate spaces designed to foster social connections. There is no designated area to sit and eat, leaving only the bed and perhaps a chair as the only seating options, limiting opportunities for residents to engage in social activities.

To address these issues, designing even the smallest homes with a separate bedroom and living room is essential. This separation allows residents to regulate social interactions more effectively. Additionally, furniture arrangement plays a crucial role. For instance, tables with chairs facing each other create opportunities for conversation and encourage lingering interactions. However, sufficient space must be allocated to accommodate these features.

6.2 Stability and Permanence

Chen and Gong (2022) highlight that individuals living in self-built, commercial,



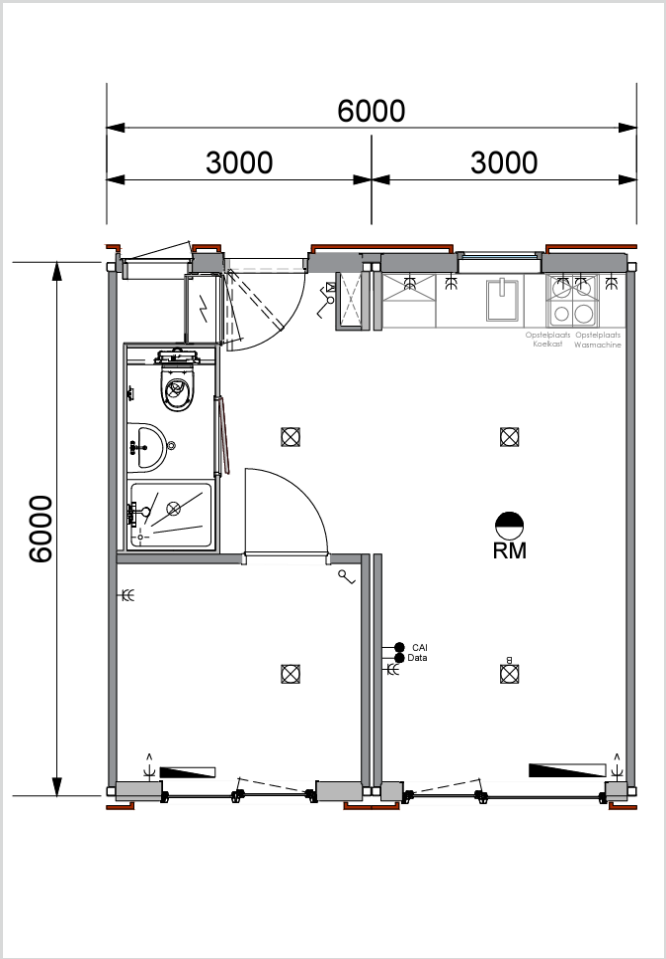


Fig 10: Floorplans de Zaagmolen (Woonforte, 2024)

or public housing generally experience lower levels of loneliness compared to those in temporary housing. This difference is attributed to feelings of safety and a sense of belonging. When residents know they won't have to relocate in the near future, they are more likely to invest in building social relationships and fostering connections within their community. While stability and permanence are largely influenced by socioeconomic factors and policy decisions, architectural design can support these goals by creating environments that encourage long-term residency and community building.

6.3 Housing Density and Social Interaction

Housing density also correlates with loneliness. According to Bower et al. (2023), apartment dwellers were initially found to be lonelier than residents of other dwelling types. However, this difference diminished after accounting for sociodemographic and age. This finding suggests that loneliness is not inherently tied to apartments but rather to factors such as the building's relationship to its surroundings, the placement of individual units, and the social dynamics among residents. Therefore, thoughtful placement of communal spaces, such as shared gardens or lounges, can foster interaction and reduce isolation.

6.4 Access to Natural Light

Natural light is another critical aspect of reducing loneliness. The ability to see outside from the bedroom, living room and maybe even the bathroom, the ability to determine the time of day, and establish a visual connection with the world can foster social connectivity. Key design elements include balconies and sufficient windows, which not only provide light but also create opportunities for interaction with the external environment.

6.5 Personalisation and Sense of Belonging

The ability to personalise one's living space significantly impacts feelings of belonging. Kalina (2021) notes that restricted personalisation can lead to detachment and a lack of connection to the building. Fieldwork conducted at 't Kampje revealed that residents placed personal items next to their doors to identify their homes and make them feel more like their previous residences. While 't Kampje attempted to differentiate homes through variations in wall cabinet colours and printed door images, these efforts were insufficient (Vermeer & Verlaan, 2024). Allowing residents to personalise their spaces more freely can enhance their sense of belonging and reduce loneliness.

6.6 Implementing Design Principles in Spatial Floor Plans

To foster inclusivity and reduce loneliness, residential floor plans should incorporate the following principles:

1. Separate Functional Areas: Ensure even small apartments have distinct spaces for sleeping, living, and dining to allow residents to regulate social interactions.
2. Flexible Communal Spaces: Design shared areas that encourage interaction, such as lounges, community kitchens, or gardens, while maintaining privacy.
3. Ample Natural Light: Include large windows and balconies to provide access to natural light and visual connections with the outside world.
4. Opportunities for Personalisation:

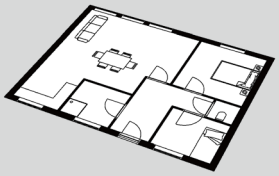
Allow residents to personalise both their private and shared spaces, fostering a sense of ownership and belonging.
5. Accessible and Inclusive Design: Create spaces that accommodate residents of all ages and abilities, promoting intergenerational interaction and inclusivity.

6.7 Conclusion

While loneliness is influenced by numerous factors beyond the built environment, thoughtful architectural design can play a crucial role in reducing social isolation and fostering inclusivity across generations. By addressing spatial layout, stability, natural light, and opportunities for personalisation, architects can create residential buildings that support social connectivity and enhance the well-being of their residents. These principles, when implemented in spatial floor plans, can contribute to more inclusive and connected communities.

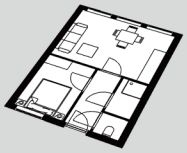
DESIGN GUIDELINES - HOUSING SCALE

separate funtional areas



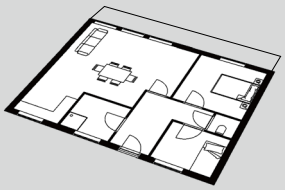
Ensure even small apartments have distinct spaces for sleeping, living, and dining to allow residents to regulate social interactions.

seperate funtional areas



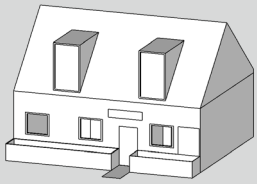
Ensure even small apartments have distinct spaces for sleeping, living, and dining to allow residents to regulate social interactions.

Natural light



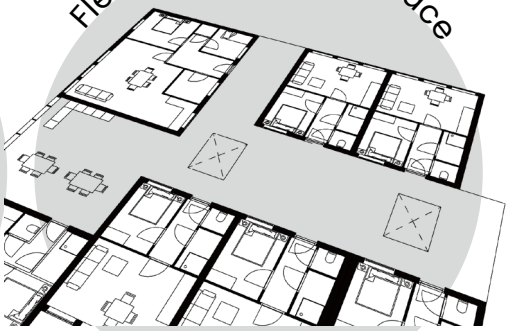
Ample Natural Light: Include large windows and balconies to provide access to natural light and visual connections with the outside world.

Personification



Allow residents to personalise both their private and shared spaces, fostering a sense of ownership and belonging.

Flexible communal space

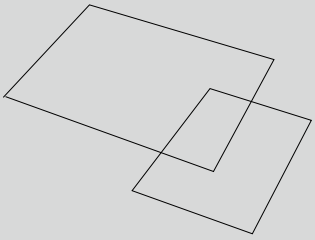


Design shared areas that encourage interaction, such as lounges, community kitchens, or gardens, while maintaining privacy.

Inclusivity

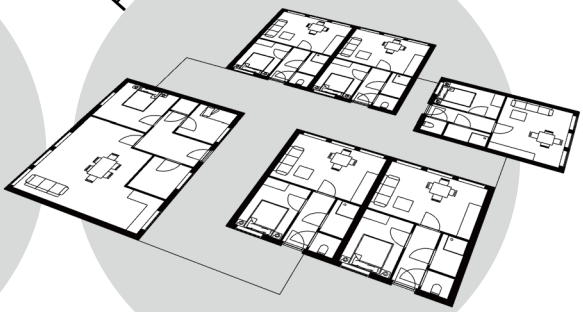
Create spaces that accommodate residents of all ages and abilities, promoting intergenerational interaction and inclusivity.

Functional



Prioritize functional forms and efficient layouts to maximize flexibility in space usage.

Funtionality



Minimize unnecessary corners and irregular shapes to avoid creating dead spaces

Use provided floor plans as inspiration and reference points, ensuring they serve as examples rather than templates for direct replication.

CHAPTER 7

MODERN LIVING IN DIAKONISSESTIFTELSEN

This chapter sheds light on a case study from Denmark that shares the same objectives as the proposed design for the Tarwewijk. The masterplan includes 72 care units, 110 senior housing units, shared housing, guest accommodations, student housing, educational facilities, and a care and health institution. While the scale is larger than the proposed program for the Tarwewijk, the combination of housing types, residents, and overarching goals aligns closely.

According to Vandkunsten Architects, (2012-2018) the primary aim was to transform the area into a more diverse living environment rooted in a shared cultural and religious foundation. To distinguish between guests and residents, the design incorporates gradients transitioning from private to semi-private to common outdoor spaces, reflecting the three spatial scales central to this research.

The community within each housing cluster is informal, supported by generous shared spaces near entrances and staircases. These spaces naturally encourage residents to interact with their neighbours, fostering a sense of safety and social cohesion (Vandkunsten Architects, 2012-2018)
The design comprises dwelling clusters and singular blocks of 3-4 floors. Flat roofs are utilized for recreational purposes, featuring raised green beds, greenhouses, and other amenities integrated with the architecture. These shared roof terraces provide spaces for residents to cultivate social bonds and community at their own comfort level. The terraces are set back from the roof edges, ensuring privacy for residents while allowing greenery to be visible from the street, enhancing the overall urban experience.

On the following pages, you can observe the sightlines created within the staircases and galleries (figure 11 and figure 13), as well as the clustering of the new buildings adjacent to the historic Diakonissestiftelsen (figure 12) (literally, “the Deaconess Foundation”). Located in the Frederiksberg district of Copenhagen, Denmark, this large site is owned by the Danish Deaconess Community and served various social and healthcare-related functions, including an elderly care home and a nursing training facility. (Wikipedia, 2024)

Project name
Diakonissestiftelsen- Masterplan and housing for seniors
Category
Co-Housing, Housing, Planning, Wood
Client: Diakonissestiftelsen
Location
Frederiksberg, Copenhagen, Denmark
Gross area: ca. 57.000 m²
Date: 2012 - 2018
Status: Finished

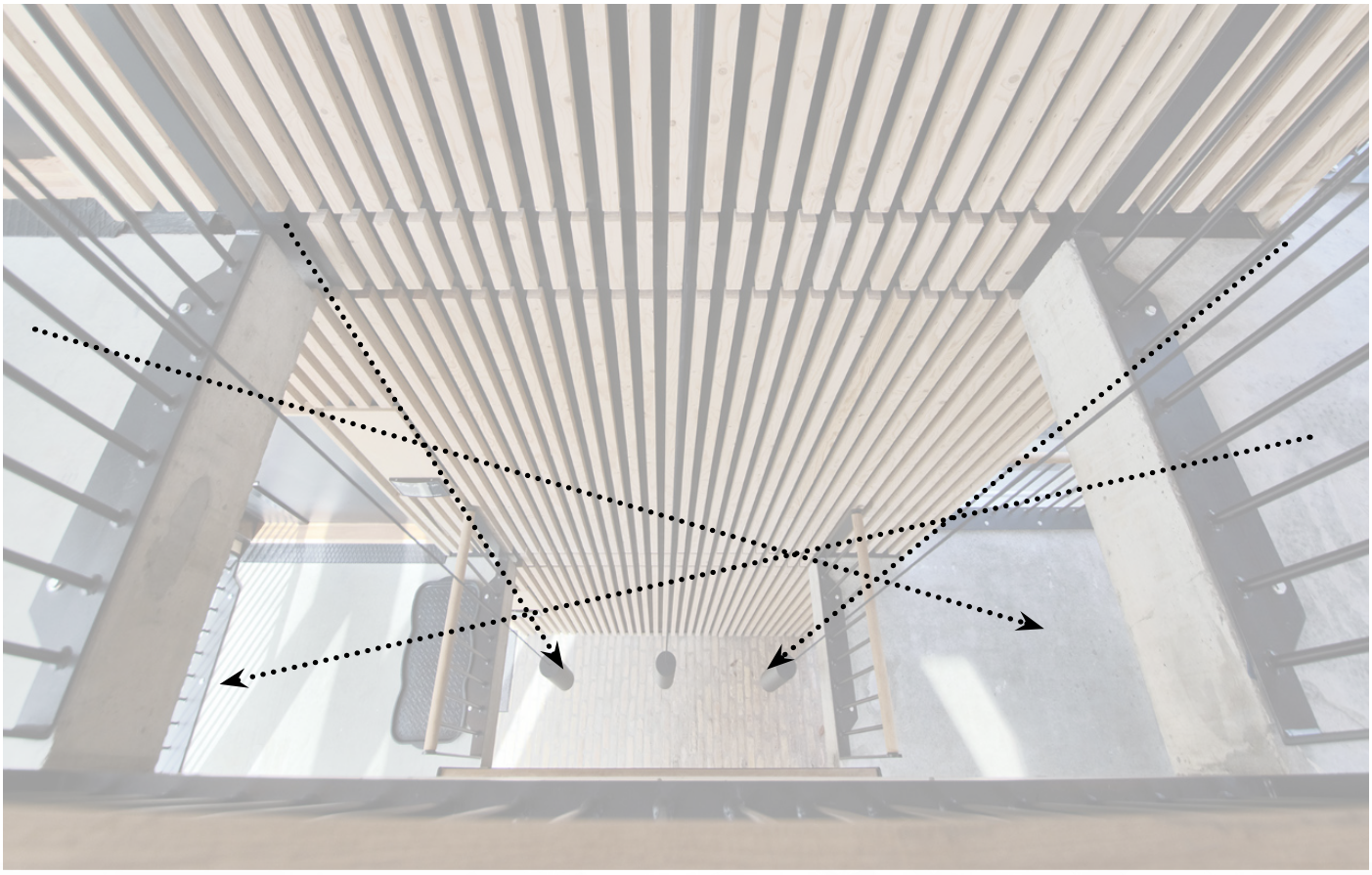


Fig 11: Diakonissestiftelsen(Vandkunsten Architects, (2012-2018)

Sightlines

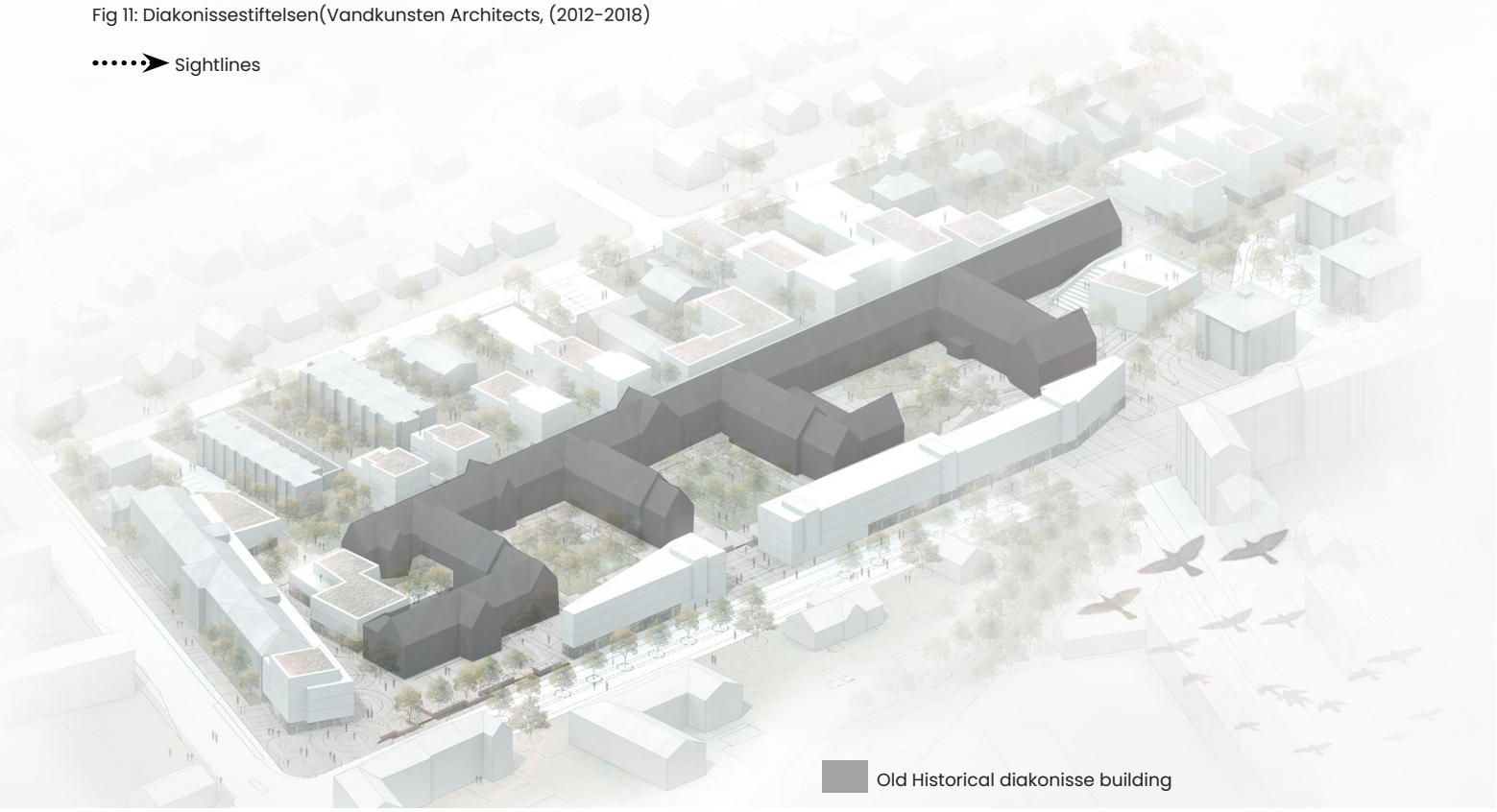


Fig 12 Diakonissestiftelsen(Vandkunsten Architects, (2012-2018)

Fig 13: Diakonissestiftelsen(Vandkunsten Architects, (2012-2018)

CHAPTER 8

CONCLUSIONS

Addressing loneliness and social isolation through architectural design requires a comprehensive approach that thoughtfully balances privacy, community, and inclusivity. While no single design solution can eliminate loneliness entirely, architectural strategies can significantly enhance social connectivity and improve quality of life across all age groups. Critical design principles include optimizing density and building height for human-scale interactions, integrating shared and semi-private spaces, and fostering a sense of belonging through culturally responsive and inclusive design elements.

Access to natural light, walkability, safety, and opportunities for spontaneous interaction are essential for creating vibrant, intergenerational communities. However, because loneliness is inherently subjective, its reduction cannot rely on spatial interventions alone. Long-term success demands collaboration with urban planners, policymakers, and community organizations.

Sub-Questions and Their Conclusions

Green Shared Spaces
How can the layout and configuration of (green) shared spaces around, for example Tarwewijk's residential buildings, be crafted to enhance social interaction and mitigate social isolation?

Green, communal spaces play a vital role in fostering social interaction and reducing isolation. When thoughtfully placed and easily accessible, these spaces can serve as informal gathering spots for diverse groups. Design strategies include clear visibility from surrounding homes, seating arrangements that encourage conversation, and programming that invites intergenerational use—such as gardens, playgrounds, and walking paths. A successful layout blends openness with subtle boundaries to create comfort and encourage spontaneous social contact.

Mixed-Use Residential Buildings
How can the design of mixed-use residential buildings and their transition zones between private and communal areas support social connectivity?

Mixed-use buildings offer valuable opportunities for social interaction, especially when the transition between private and shared spaces is well-considered. Semi-private areas such as stoops, porches, shared hallways, and courtyards act as buffers that allow for casual encounters without infringing on personal space. These zones help normalize social contact and create rhythms of daily interaction, especially when complemented by ground-floor community services like cafés, small shops, or activity spaces. A layered approach to privacy supports both spontaneous and intentional social moments.

Homes for All Generations
How can the spatial layout and architectural features of homes be tailored to encourage social interaction and inclusivity across generations?

Inclusive home design should accommodate varying mobility levels, routines, and lifestyles across age groups. Features such as flexible room layouts, accessible entrances, shared kitchens or common lounges, and adjacent units for multigenerational families can strengthen intergenerational ties. Architecture that respects both independence and proximity enables meaningful connections while preserving autonomy. Personalization options and culturally resonant design elements can further foster a sense of ownership and pride within a diverse community.

Main Research Question and Conclusion

How can the living environment reduce loneliness and social isolation while enhancing social connectivity across all age groups in the built environment, for example in the Tarwewijk in Rotterdam?

The built environment can meaningfully contribute to reducing loneliness and enhancing social connectivity by integrating spatial elements that support safety, interaction, inclusivity, and a sense of belonging. In the context of Tarwewijk—a dense and diverse urban neighbourhood—successful design requires a multi-scale approach, from building façades and interior layouts to the configuration of public spaces. Key guidelines include:

Safety and Privacy: Design for secure and private living while allowing for controlled and comfortable interactions.

Social Connection: Embed communal spaces that naturally facilitate interaction across ages and cultures.

Belonging: Use architectural cues, personalization, and cultural expression to build pride and identity.

Scale and Accessibility: Maintain human-scale environments, walkability, and access to public transit for mobility and casual encounters.

Inclusivity: Design for physical, generational, and cultural diversity, supporting both active and passive forms of engagement.

Ultimately, while architecture alone cannot solve the complex issue of loneliness, it can lay the foundation for environments where social bonds are more likely to flourish. With integrated design strategies and cross-disciplinary collaboration, neighbourhoods like Tarwewijk can become more connected, inclusive, and resilient.

CHAPTER 9

DISCUSSION

Research reveals that loneliness, social belonging, and connection remain complex and multifaceted topics, particularly when examined in conjunction with architecture. The challenge lies in the fact that loneliness is deeply rooted in socio-cultural contexts, which often limits the depth of existing literature on the subject. Recommendations and conclusions tend to remain superficial, overlooking the significant role architecture can play in mitigating loneliness. Given that individuals spend a substantial portion of their lives at home, the influence of architectural design on fostering social interaction and reducing isolation should not be underestimated.

This study underscores the importance of the academic studio involved in commissioning this research. The findings highlight the necessity of addressing loneliness from multiple perspectives, involving not only architects but also sociologists, caregivers, and the individuals directly affected. Currently, approaches to tackling loneliness are often siloed, with each stakeholder—be it citizens, sociologists, architects, or caregivers—attempting to address the issue in isolation. This study suggests that a more interdisciplinary approach is essential to develop concrete strategies and actionable plans for combating loneliness effectively.

Furthermore, the research emphasizes the need for extended and in-depth studies to identify specific architectural elements that can positively influence social connection and reduce loneliness. These elements might include spatial configurations, communal areas, and environmental factors that encourage interaction and a sense of belonging. By integrating insights from diverse disciplines, future research can provide a more holistic understanding of how architecture can contribute to alleviating loneliness, ultimately leading to more impactful and sustainable design solutions.

An important element that should not be overlooked is the financial aspect. Design guidelines aimed at reducing loneliness are not always 100% necessary for the functional operation of a building. Since loneliness is not universally prioritized, these considerations are often omitted to cut costs. This financial reality can hinder the implementation of architectural solutions designed to foster social interaction and inclusivity. Recognizing the economic constraints and finding cost-effective ways to integrate these principles is essential to ensuring that such designs are feasible and widely adopted.

CHAPTER 10

CLASSIFICATION DESIGN GUIDELINES

The design guidelines all influence feelings of belonging and loneliness, but they can be distinguished based on their primary focus. Some guidelines are more closely tied to the specific location of Tarwewijk, while others prioritize social cohesion or have a stronger impact on privacy elements and cultural aspects that foster a sense of belonging.
To avoid ranking the guidelines all together and instead present a clear overview, an icon-based system has been developed to differentiate between these categories. This system is outlined on the following page.

Tarwewijk

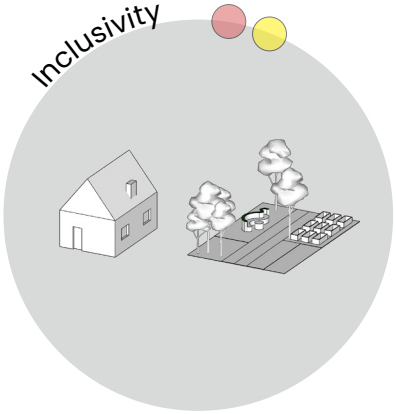
Social interaction

Privacy/Safety

Belonging

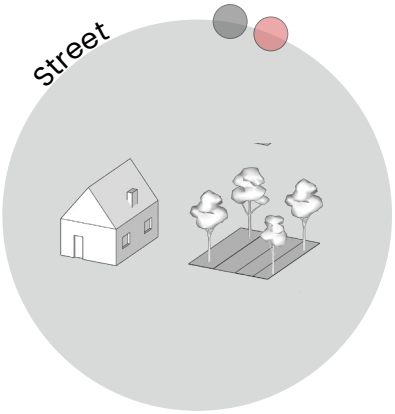
DESIGN GUIDELINES - NEIGBOURHOOD SCALE

Inclusivity



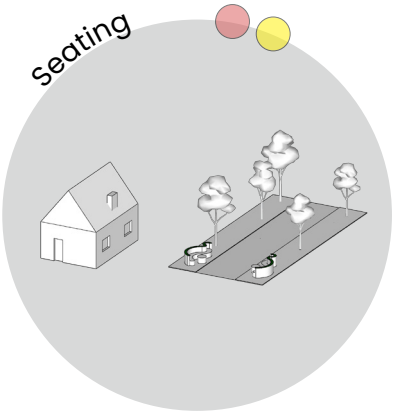
Visible green spaces to combine gardening with recreational and social activities.

Street



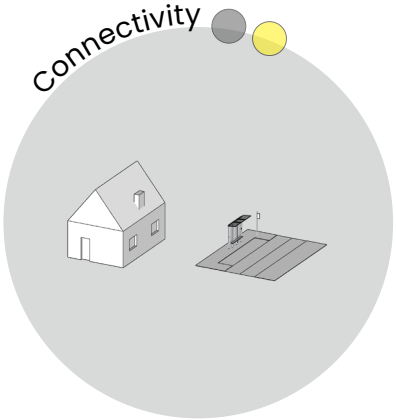
Pedestrian-friendly streets, 4 meters wide, to encourage flow and informal interactions.

Seating



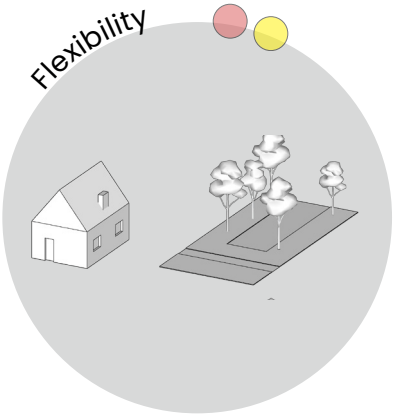
Benches every 100 meters, curved or angled for natural conversations.

Connectivity



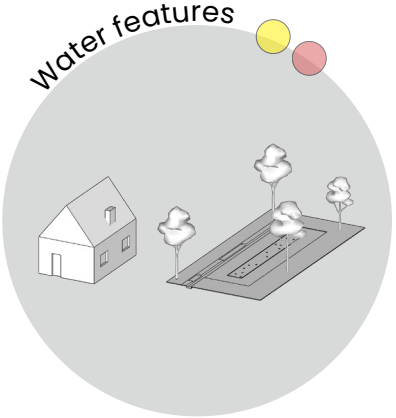
Strong links to public transport and walkable routes.

Flexibility



Space accomodating activities such as jogging, walking, playing and community events, flexible in use.

Water features

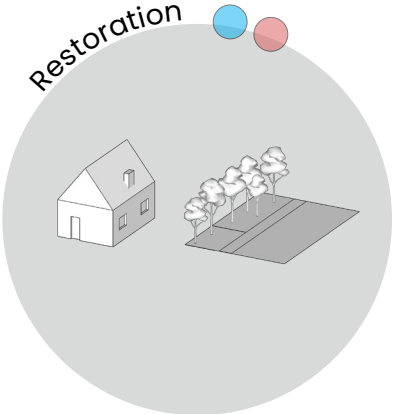


Fountains or rain gardens to reduce noise, alleciate heat, and enhance biodiversity for people to look at.

Safety

Natural surveillance with window facing activity zones and no high traffic streets

Restoration

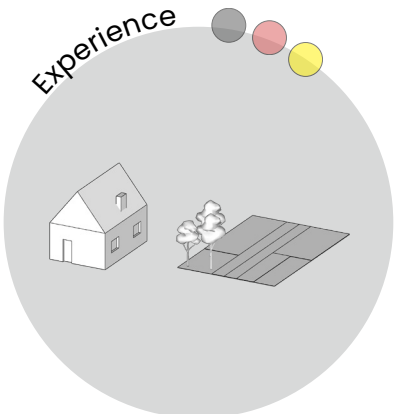


Trees and grass for shade, privacy, and sound buffering.

Safety

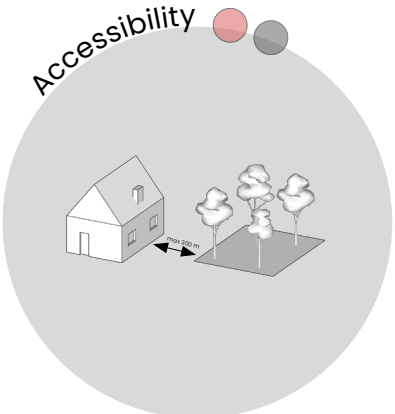
Lighting, well lit areas to reduce risks and encourage outdoor use all year round.

Experience



Alternating street spaces with squares and climate sensistive designs to enhance usability.

Accessibility

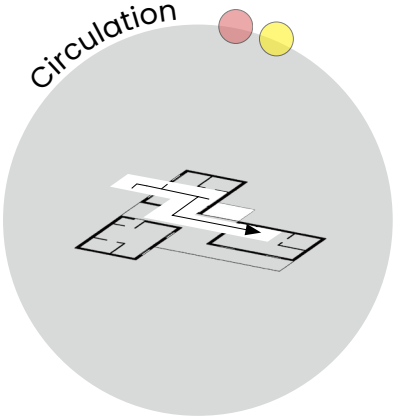


Green spaces within a 5-10 minute walk or 300 meters.

- Tarwewijk
- Social interaction
- Privacy/safety
- Belonging

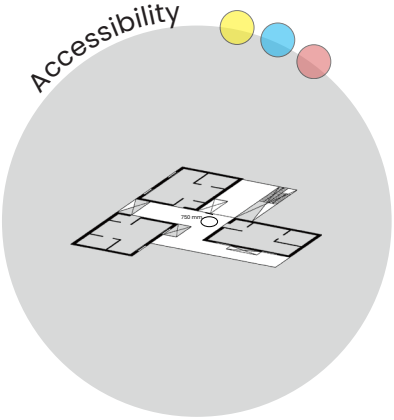
DESIGN GUIDELINES – BUILDING SCALE

Circulation



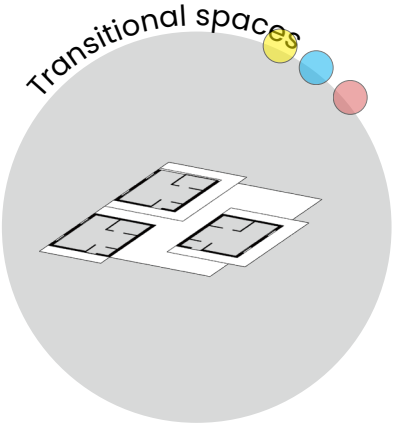
Create circulation paths that pass through or near communal areas to encourage spontaneous encounters.

Accessibility



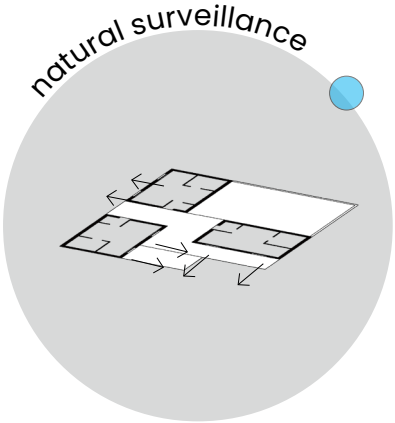
Ensure circulation spaces are accessible for individuals with limited mobility. Wheelchair, walker and other mobility aids.

Transitional spaces



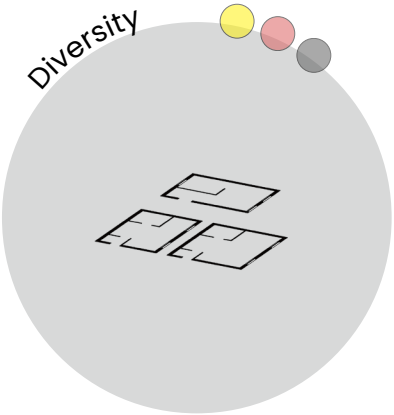
Incorporate semi-private zones such as front yards or balconies to encourage casual interactions.

natural surveillance



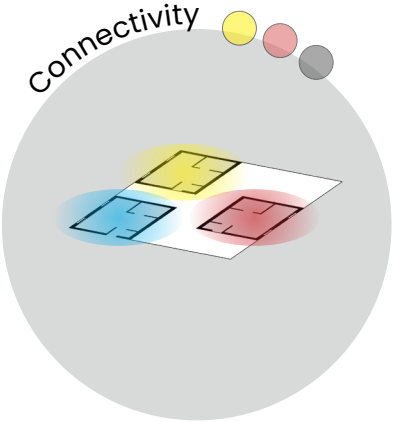
Integrate natural surveillance through strategic placement of windows and communal areas.

Diversity



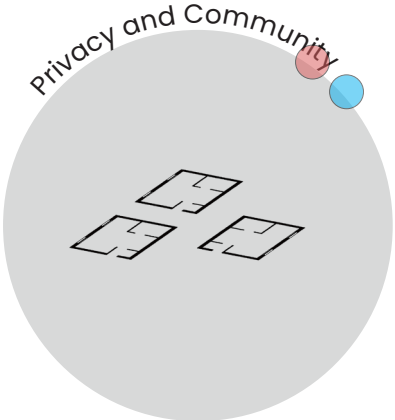
Design multi-generational and diverse housing typologies to foster inclusivity and reduce loneliness.

Connectivity



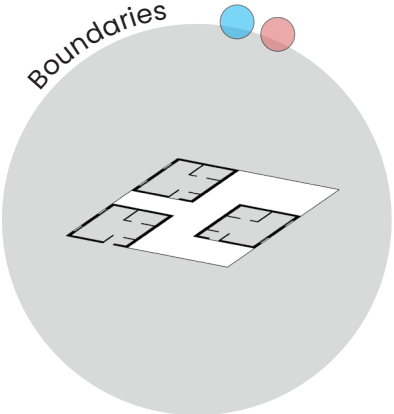
Foster emotional connections to the living environment by incorporating elements that reflect the community's character.

Privacy and Community



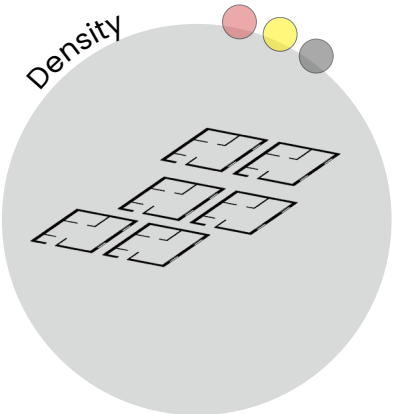
Provide shared spaces for interaction while ensuring residents have private areas to retreat.

Boundaries



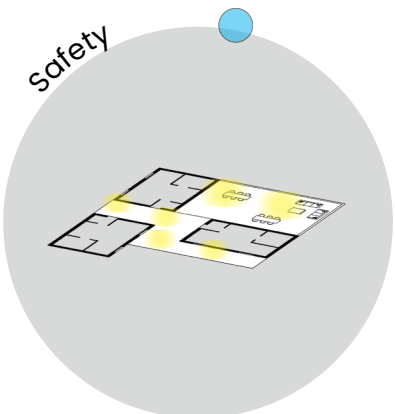
Design clear boundaries between private and communal areas to maintain comfort and autonomy.

Density



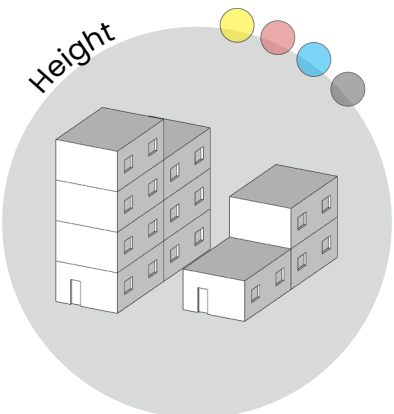
Consider the social implications of housing density, balancing the benefits of community interaction with the potential drawbacks of overcrowding.

safety



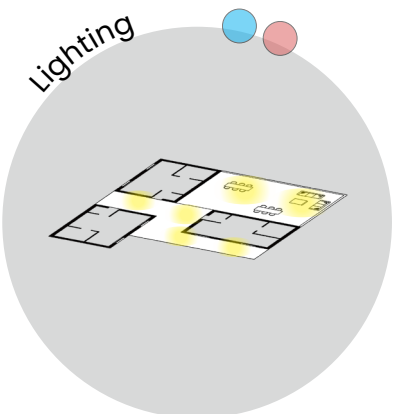
Prioritize safety through well-lit and open designs that discourage the formation of unused or unsafe zones.

Height



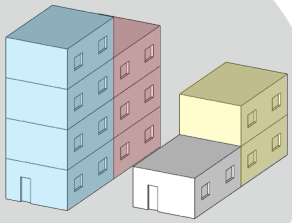
No higher than 4 stories.

Lighting



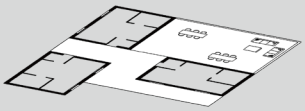
Design clear, well-lit routes with good visibility to enhance safety and encourage the use of shared spaces.

Identity



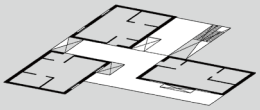
Use distinct architectural features and facades to create a sense of identity and pride for residents

Communal spaces



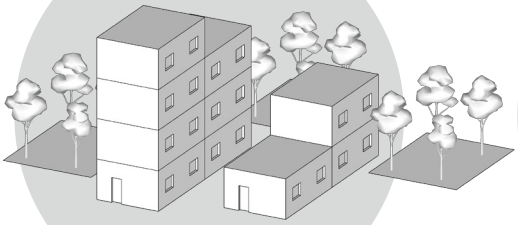
Design central, visible, and easily accessible communal areas with greenery, seating, and aesthetic appeal.

Transparent elements



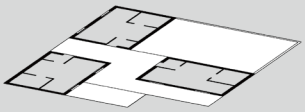
Use transparent elements such as glass walls or open staircases to enhance sightlines and connectivity.

Green space



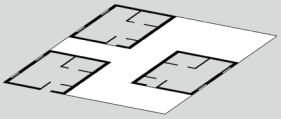
Include small, easily accessible outdoor spaces near homes for immediate recreational use. Complement these with larger parks and green areas for sports and leisure activities

Hierarchy



Include a hierarchy of sub-spaces to accommodate diverse activities and user groups.

scale



Ensure transitional spaces are appropriately scaled—neither too small to discourage use nor too large to isolate users.

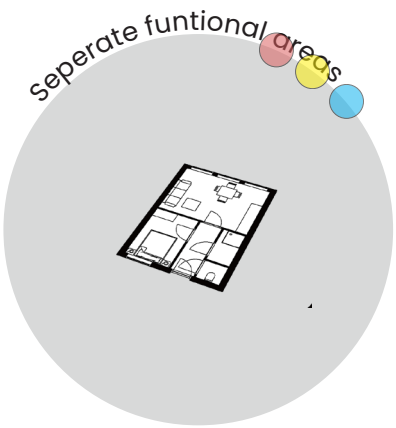
Tarwewijk

Social interaction

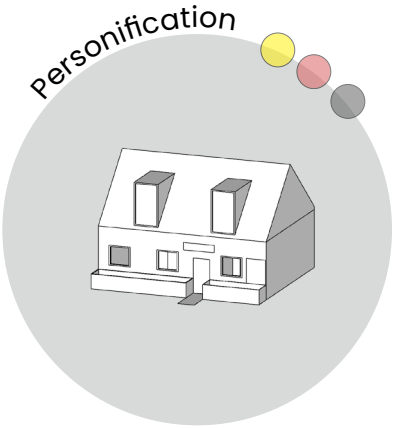
Privacy/safety

Belonging

DESIGN GUIDELINES – HOUSING SCALE

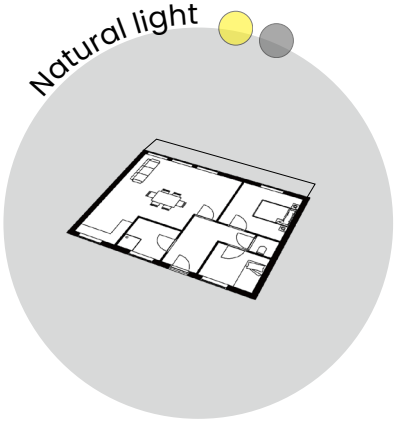


Ensure even small apartments have distinct spaces for sleeping, living, and dining to allow residents to regulate social interactions.

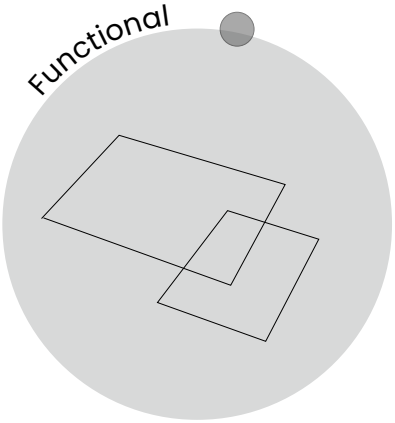


Allow residents to personalise both their private and shared spaces, fostering a sense of ownership and belonging.

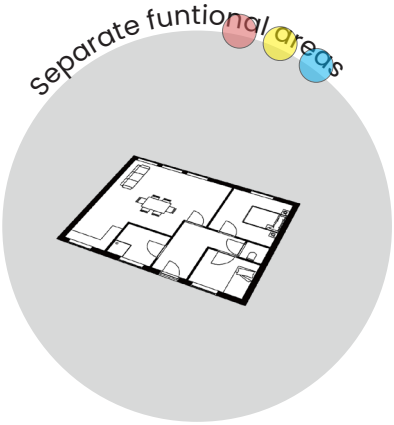
Design shared areas that encourage interaction, such as lounges, community kitchens, or gardens, while maintaining privacy.



Ample Natural Light: Include large windows and balconies to provide access to natural light and visual connections with the outside world.



Prioritize functional forms and efficient layouts to maximize flexibility in space usage.



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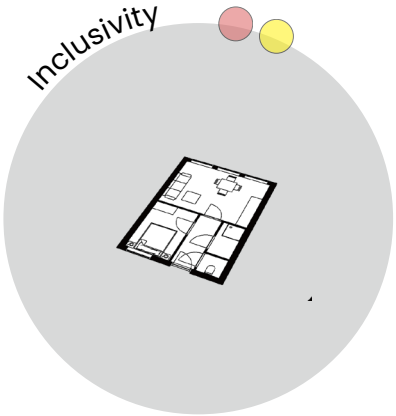
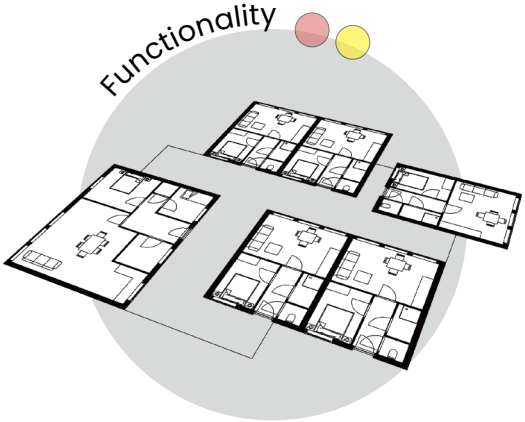


Create spaces that accommodate residents of all ages and abilities, promoting intergenerational interaction and inclusivity.



Minimize unnecessary corners and irregular shapes to avoid creating dead spaces

CHAPTER 10

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