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Living Environment Design for Reconciling Social Loneliness in Old Age

Architecture & Dwelling

Designing for Care – towards an Inclusive Living Environment

Mentor: Birgit Jurgenhake

Lex van Deudekom

Frederique van Andel

Jianing Liu

5290236

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Chapter 1. Introduction

Figure 1.1 J.H.A. Huysmans, Bejaardencentrum Aldenhof, Maastricht, 1957.

1.1 Ageing: a global challenge

The population worldwide is ageing rapidly. Every country is experiencing much faster growth in the size of the world's population over 60 years old, which will nearly double from 12% to 22% between 2015 and 2050, while the number of people aged 80 and older is expected to triple to reach 426 million. [1] In addition, considerable evidence confirms the worrying disproportion between the number of children and elderly, especially in the European region: today, people aged 60 and older outnumber children under 5.[2]

This unprecedented challenge of our demographics requires global actions to meet the changing needs of an ageing population, to provide the opportunity for older people to live a long and healthy life. Ageing brings a higher risk of social loneliness, and limited access to an affordable and high-quality living environment. Since living environments including their homes and neighborhoods, are essential variations that can directly affect older people's physical and mental capacity, it is important to consider environmental and design approaches that ameliorate the losses associated with older age to improve their life quality.

1.2 Fieldwork

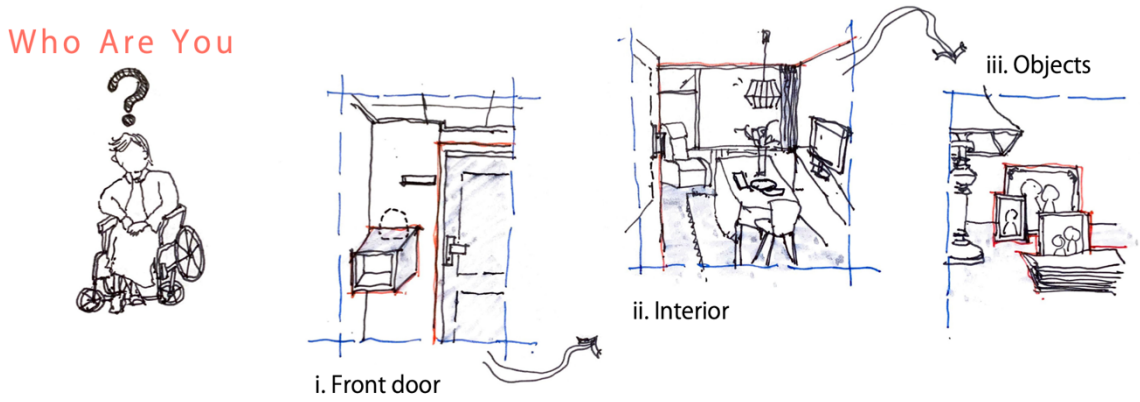

Figure 1.2 Detailed sketches of the spaces and objects from elderly's apartments in Loenen.

As part of the studio 'Designing for Care – towards an Inclusive Living Environment', which focused on the topics of architectural designs for the elderly, this study specifically aimed at

[1] "Health topics: Ageing", World Health Organization, accessed October 4, 2021, https://www.who.int/health-topics/ageing#tab=tab_1.
[2] Ibid.

building an open and intimate neighborhood through connections in answer to the elderly's urgent problems from aged-related social losses.

In order to design *with* the elderly by deeply understanding them as unique individuals, the research is based on one-week fieldwork in *'t Nieuwe Kampje*, an elderly home in the rural area of Loenen where the inhabitants are mixed of independently living elderly, people in need of care and relatively young tenants. The 5-days stay provides a direct human-centred investigation into the elderly and relevant groups to gather firsthand information, through methods including general questionnaires, deep interviews, observation in communal spaces, mappings for immediate surroundings, sequential photography and drawing (Figure 1.2). The results of the fieldwork are important raw materials in an early stage of the research that could be sorted into categories as followed:

1) A series of *personal diaries*: 10 detailed records of each interviewee in words and sketches, including thorough unit layouts of interior space, detailing of personal possessions, timelines of personal daily routine and social relationships with others, etc.

2) Spatial characters and activities in communal spaces, both indoors and outdoors.

3) The opinion and role of other supportive groups: caregivers, hosts, nurses and housekeepers etc.

4) Preliminary summary: positive and negative feedback from all relevant aspects.

1.3 Striking experience

From the analysis of the fieldwork in 't Nieuwe Kampje, intriguing facts specifically concerning the preferences of private and social spaces highlight the question that this study is intended to look into:

1) Connection with people matters more.

It is shown that more spacious space or private time is not so attractive as simply being more with people. On the contrary, almost half of the interviewees voluntarily moved here because their partners died, and they couldn't bear living alone in their former big yet empty houses anymore. The social relationship with neighbors affects the elderly's feelings about this new home more than anything else (Figure 1.3).

2) Communal space is the center of daily routines.

The architectural element that inhabitants care about most is the communal space for gathering, including all the activities that took place there. Attending those social events, such as painting

and coloring, knitting, baking, movie and games etc., and even the preparations for attending those seemly ordinary activities are considered as essential rituals by the elderly.

3) Everyone makes one's own interior arrangement.

Inhabitants would change available space in such an unpredictable and different way that in the end, identical living units would present distinguishing features and interior decorative styles related to their owners' identities, no matter what the original design was. It suggests that the architectural interventions inside private space that fits the architect's perspective are not the elderly's major concern.

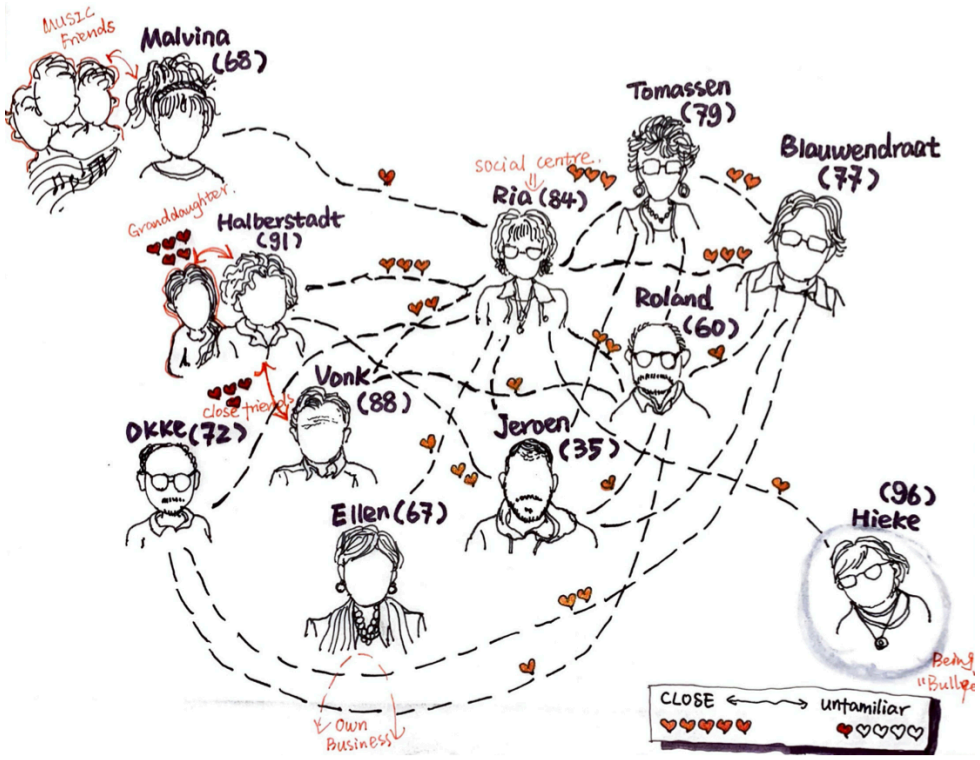

Figure 1.3 The social network of interviewees in Loenen.

The findings above are coherent with Loenen's diverse atmosphere of inhabitants from mixed groups, where relationships between *people and people* are widely-perceived as more important than those between *people and place*. Rather than being alone focusing on their private rooms, the strong desire of interacting with people outside living units on daily basis has been emphasized by the interviewees. This common feedback shows that for those who are vulnerable to age-related loneliness, the design of the living unit itself according to the architect's own decisions is overvalued, while encouraging the closer connection with neighbors and further access to communal spaces should be focused on.

Chapter 2. Problem statement

Figure 2.1 Herman Hertzberger, De Drie Hoven, Amsterdam, 1974.

2.1 From loneliness to *social loneliness*

Loneliness, is "the painful subjective feeling-or 'social pain'-that results from a discrepancy between desired and actual social connections."[3] Loneliness has been considered as a major problem of ageing. There are many studies and evidence suggesting that the elderly suffering from moderate loneliness have increased over the past years, particularly among people older than 75 and those with movement difficulties[4]: in 2019, nearly 1 in 10 Dutch people aged 75 and over are frequently lonely[5]. What's worse, evidence shows that loneliness can have significant negative effects on both mental and physical health among the elderly[6], lower the quality of life, and further compromise their ability to live independently. It is believed that loneliness is related to the elevated mortality rates in old age[7], for its negative outcomes including heart disease, depression and dementia etc.[8]

Loneliness can be caused differently by social or emotional isolation, which requires different ameliorations[9]. Instead of broadening the research to the general emotional state of feeling lonely, the source and type of loneliness focused in this study is limited to those related to *social connection*. The importance of reducing social loneliness can be marked by recent public agendas in a few countries, such as their own "loneliness ministers" appointed by the Government of the United Kingdom and Japan successively in 2018 and 2021.[10] Social relationships are central to the quality of life in old age[11], which also could be typically demonstrated during the observation in 't Nieuwe Kampje in Loenen. For example, many inhabitants are accustomed to keeping their front doors wide open through different ways even

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[3] Prohaska T, Burholt V, Burns A, Golden J, Hawkley L, Lawlor B, Leavey G, et al, "Consensus Statement: Loneliness in Older Adults, the 21st Century Social Determinant of Health?" *Bmj Open* 10, no. 8 (2020): 034967.
[4] Keming Yang and Christina Victor, "Age and Loneliness in 25 European Nations," *Ageing and Society* 31, no. 8 (2011): 1368–88.
[5] "Social cohesion & well-being," a 2019 survey conducted by Statistics Netherlands (CBS), accessed March 27, 2020.
[6] Pearl Dykstra, "Older Adult Loneliness: Myths and Realities," *European Journal of Ageing: Social, Behavioural and Health Perspective* 6, no. 2 (2009): 91–100.
[7] Julianne Holt-Lunstad, Timothy B. Smith and J. Bradley Layton, "Social Relationships and Mortality Risk: A Meta-Analytic Review," 7, no. 7 (2010): 1000316.
[8] Luanaigh Conor Ó and Brian A. Lawlor, "Loneliness and the Health of Older People," *International Journal of Geriatric Psychiatry* 23, no. 12 (2008): 1213–21.
[9] Weiss, R. S. and J Bowlby, *Loneliness, the Experience of Emotional and Social Isolation* (Cambridge, Mass: MIT Press, 1973).
[10] "Seeking shelter from social isolation and loneliness under the tree of friendship", Etienne Krug, accessed July 29, 2021,
https://www.who.int/news-room/commentaries/detail/seeking-shelter-from-social-isolation-and-loneliness-under-the-tree-of-friendship
[11] Ann Bowling, *Ageing Well: Quality of Life in Old Age* (Maidenhead: Open University Press, 2005).

during the midnight, as an obviously welcoming gesture (Figure 2.2); and when asked about dissatisfactions of the current home, interviewees' answers referring to more spacious private space or other architectural improvements inside living units are seldom popped up. On the contrary, being in a relationship or coexisting with people in a more frequent and comfortable way is what they care about most. If have to choose, they don't even mind densifying their internal living space in exchange for close neighbors.

Figure 2.2 The doors being kept open during the day in Loenen.

2.2 From social loneliness to *communal space*

Social loneliness resulting from deficits in the broader circle of social contacts, is explicitly emphasized in this study, for it could be addressed by broadening the social network, especially through architectural designs. Studies show that access to *communal spaces*, in general, implies the direct involvement with others which would benefit all residents[12]: the expected increase of the quantity of social interactions within those spaces is supposed to exert a positive effect on social loneliness[13]. In the literature, communal space has been traditionally defined as "an inclusive, equitable and accessible space that theoretically belongs to everyone".[14] As an essential tool and contact space, providing communal space as the heart for connection[15] is considered to be an important design intervention in this study. For instance, communal space

[12] Elizabeth Burton and Lynne Mitchell, *Inclusive Urban Design: Streets For Life* (Oxford: Taylor & Francis, 2006).
[13] James S. House, "Social Support and Social Structure," *Sociological Forum* 2, no. 1 (1987): 135–46.
[14] Aelbrecht, Patricia, and Quentin Stevens, eds, *Public Space Design and Social Cohesion : An International Comparison* (New York: Routledge, Taylor and Francis Group, 2019), 2-7.
[15] Dick van Gameren, Hans Ibelings, D'Laine Camp and Peter Mason, *Revisions of Space: An Architectural Manual* (Rotterdam: Nai, 2005), 32.

has been required as a multi-functional asset and necessity for freeing the elderly from the confines of the enclosed bedroom or cramped and dull corridors within the building. In addition, considering communal spaces as important open space and junctions spreading out their local neighborhoods, which develops social mobility of getting about outdoors for the elderly, can also be a vital stimulation of both spontaneous encounters and organized meetings to further promote social connection[16].

The need for those social centers is coherent with the results from fieldwork. For example, according to the interviewees from ‘t Nieuwe Kampje, the most common complaint is about the central hall that used to be their largest communal space (Figure 2.3). Since it has been changed into a rented-only area, inhabitants feel disappointed in losing an irreplaceable social center, which reflects the importance of vibrant communal spaces to the elderly.

Figure 2.3 Various events and activities before the renovation of central hall.

[16] Sheila Peace, Caroline Holland and Leonie Kellaher, *Growing Older: Environment and Identity in Later Life* (Maidenhead: Open University Press, 2005).

Chapter 3. Research question

Figure 3.1 Herman Hertzberger, Bejaardemhuis De Overloop, Almere, 1984.

3.1 Main question

What are the design strategies in the living environment for reconciling social loneliness in old age?

When loneliness from the shrinking social relationships becomes the urgent concern behind each older inhabitant's closed door, this study is aimed at finding architectural interventions that could help to develop close social connection and a vibrant living environment.

3.2 Sub-question

The construct of this well-connected elderly neighborhood could be further decomposed into two sub-questions as followed:

1. *How to build intimate social connection in-between private spaces in the living environment for the elderly?*
2. *How to create communal space for supporting social connection in the living environment for the elderly?*

3.3 Definition for key terms

Design strategies, practical principles and solutions of architectural placemaking relating to programme and space. This study pays particular attention to the ideas of spatial links and the design of movements through the space, for improving the quality and function of space in and around buildings.

Living environment, immediate living spaces that are essential to the elderly's daily life. The term refers to private homes and spaces inside buildings, and outdoor environments that they can frequently use within their local neighborhoods, including streets or other open places that are regarded as familiar spaces for their everyday existence, wellbeing and enjoyment of life (Elizabeth *et al*., 2006).

For this study, the broader domain of urban planning is not discussed, but focuses on a closer environment within walking distance of home, since older people typically experience mobility problems. Physical decline, incapacity to either drive or to use public transport on their own, limit their independent trips only to places around the local neighborhood. For example, people

in their mid-70s will generally take 10-20 min to walk 400m to 500m and cannot walk further than 10 min without a rest.[17]

Old age/the elderly, the adults aged 75 years and older. This particular group represents the age span of those experiencing the worrying trend of social loneliness in the survey described in the problem statement.

Connection, the spatial instrument providing a range of mobility options in the human dimension that stimulates small and casual social movements both inside and outside buildings. This starts at the door of one's private space for the smallest journeys, which enables living units that are occupied and used in very different ways to coexist, e.g. routes of circulation, including the corridor, hallway, gallery etc.; and extends out onto residential streets integrated with the outdoor environment within the local neighborhood.

Communal space, common area and shared facilities that are accessible to all inhabitants, functioning as the heart with welcoming atmosphere for chatting, gaming, sharing, and encouraging unplanned and spontaneous encounters within buildings. At neighborhood level, they present as open squares, community parks, and social amenities etc., which can host regular, voluntary, informal gatherings, and therefore facilitate and foster broader social connection (Patricia *et al*., 2019).

[17] AIA (American Institute of Architects), *Design for Aging: An Architect's Guide* (Washington, DC: AIA Press, 1985).

Chapter 4. Methodology

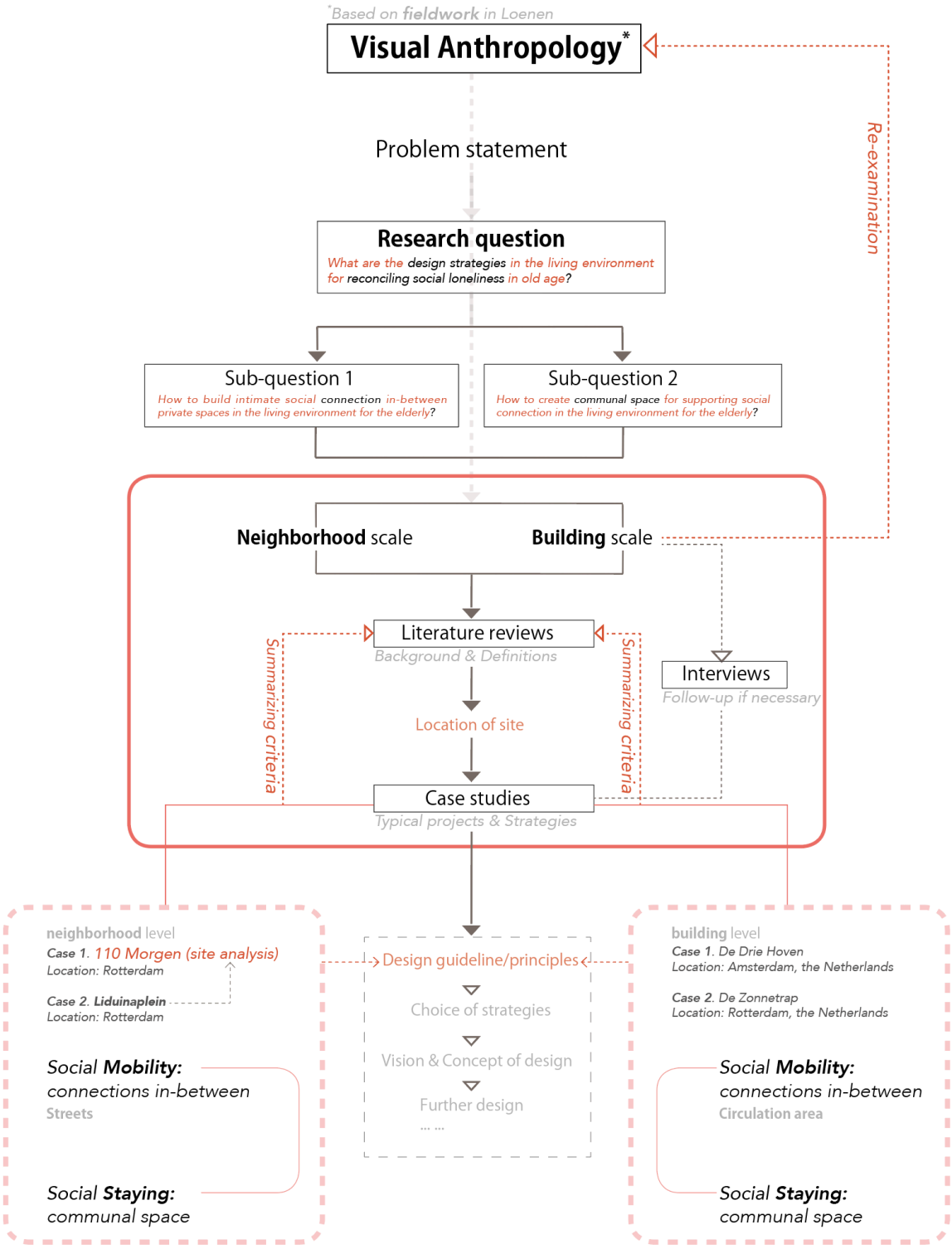


Figure 4.1 Structure and overview of the research.

The main goal of this study is to consider the possibilities that our living environment could go beyond the adaptation to its own structures, to explore effective design practice for the elderly among whom social loneliness is widespread. The research questions are focused on design principles and strategies which are suited to specific needs from different scales, including outdoor environment at the neighborhood level, and smaller-scale within the building (elderly homes). The preliminary conclusion consisting of innovative concepts and skills would be integrated as an encouragement for the elderly to get out of their private space for better social connection.

Visual anthropology

The study starts based on visual anthropology and direct contact with the target group, and will go further under this domain from more architectural perspectives. The particular methods include deeper and methodical on-site analysis of the results from the fieldwork, more purposeful observation of the elderly's daily life outside enclosed living units, and visualizing the outcome into place-centred maps and photography series recording behavior patterns in certain spaces. The anthropological research makes up the main body of the study, and re-examination of the fieldwork according to the research question contributes to solid argument and insight into the subject.

Literature reviews

To tackle social loneliness in the living environment through design strategies, the study seeks to gain a more comprehensive understanding with literature search and review as well. A sufficient bibliography consisting of international publications would clarify the background and definitions related to the subject.

Aside from those, the purpose of further literature reviews is to summarize fundamental criteria and design principles as the reference for following case studies.

Case studies

Case studies are also necessary by taking a detailed look at typical projects. It is important for living environment design and delivery of ameliorative interventions, for a variety of case selection helps to demonstrate the general design solutions and specific architectural strategies including the different types or settings of communal spaces, the logical layouts of floor plans and arrangements of private units, etc. Particularly for the neighborhood scale, the site analysis of the design location in this graduation studio will be used as case studies.

Interviews

The study requires detailed knowledge about the daily habits, activities, routes, rituals and feelings of the elderly and their supporters outside the private space. Especially from the scale of building design, if responses collected through the previous fieldwork is not focused enough, follow-up interviews with relevant groups are necessary to include.

Chapter 5. Hypothesis

Figure 5.1 The elderly walking in 110 Morgen, Rotterdam.

"The design and development of buildings and the built environment have the capacity to facilitate or to hinder people's movement and mobility, and particular designs... are infused with powers of demarcation and exclusion."[18] Especially for the elderly who often live alone and are more vulnerable to social loneliness, they require not only private homes meet their needs, but also options of 'journeys' from inside to outside, to get out and about – spaces for casual stays with neighbors, meeting up with friends, getting fresh air, everyday exercise, or walking the dog within the neighborhood.

Based on previous fieldwork, visual anthropology research and preliminary literature reviews, the study looked at projects and at what makes them satisfying neighborhoods or buildings in general for the elderly to enjoy closer social connections. It suggests that social loneliness could be ameliorated through design strategies encouraging *social mobility* and *social staying*.

5.1 Social Mobility: connections in-between

"Walkability can make for sociability."[19] Walking through corridors, or crossing the outside streets, all of those insignificant movements are necessities of daily life and opportunities for social connection, as invitations for the elderly to interact with other people.

From neighborhood level, taking the project *Little Village Neighborhood* in Chicago as an example, an inspiring solution would be creating a 'walkable neighborhood' which provides access for elderly individuals to comfortable and secure streets and sidewalks, and to places that draw them out of homes and into the public. When it comes to building scale, other design strategies could be learnt from *De Drie Hoven* by Herman Hertzberger: well-designed detailings within corridor spaces, such as the half-opened front doors allowing informal contacts among neighbors. Social mobility could broaden the maximum scope for social relations.

[18] Hall, P., and R. Imrie, "Architectural Practices and Disabling Design in the Built Environment," *Environment and Planning B: Planning and Design*, vol. 26, 3 (1999): 424.
[19] David Sim and Jan Gehl, *Soft City: Building Density for Everyday Life* (Washington, DC: Island Press, 2019), 97.

5.2 Social Staying: communal/collective/public space

A living environment with pleasurable communal spaces to stay in could offer the elderly as many opportunities as possible for social contact. Further, Ray Oldenburg, an urban sociologist, also demonstrates why and how gathering places including collective and public spaces are essential to neighborhood vitality. These spaces for social staying could cover means and facilities for relaxation and leisure like beer gardens, pubs, cafes, coffeehouses, and post offices etc.[20]

For example, *The East Rock Neighborhood* in New Haven, Connecticut, presents strategies as Oldenburg's advocated concept of 'third places'- creating a series of *informal* gathering places within walking distance of many residents' homes, so that people can easily integrate them into their everyday routines. From building scale, taking project *Sonjatun Omsorgssenter* in Norway as an example, spacious and centrally located communal spaces are essential. And most of the residents could have eye contact with one of the common rooms as soon as they leave their own private doors.

[20] Ray Oldenburg, *The Great Good Place: Cafés, Coffee Shops, Bookstores, Bars, Hair Salons, and Other Hangouts at the Heart of a Community* (New York: Marlowe, 1999).

Chapter 6. Growing Life outside Doors

From this chapter, the following discussion would be focused on how to facilitate the elderly's informal social connections in and out buildings (private dwellings) through architectural designs more thoroughly, as the key proposal in this study for reconciling social loneliness. By defining active 'outdoor' activities, structure and spatial quality of the living environment, the research focus on how *spaces* play an important role in the everyday lives of older people. Finally, consideration is given to how more detailed principles and strategies enable the elderly to feel about themselves and others positively. The discussion utilizes findings from literature reviews undertaken by the author.

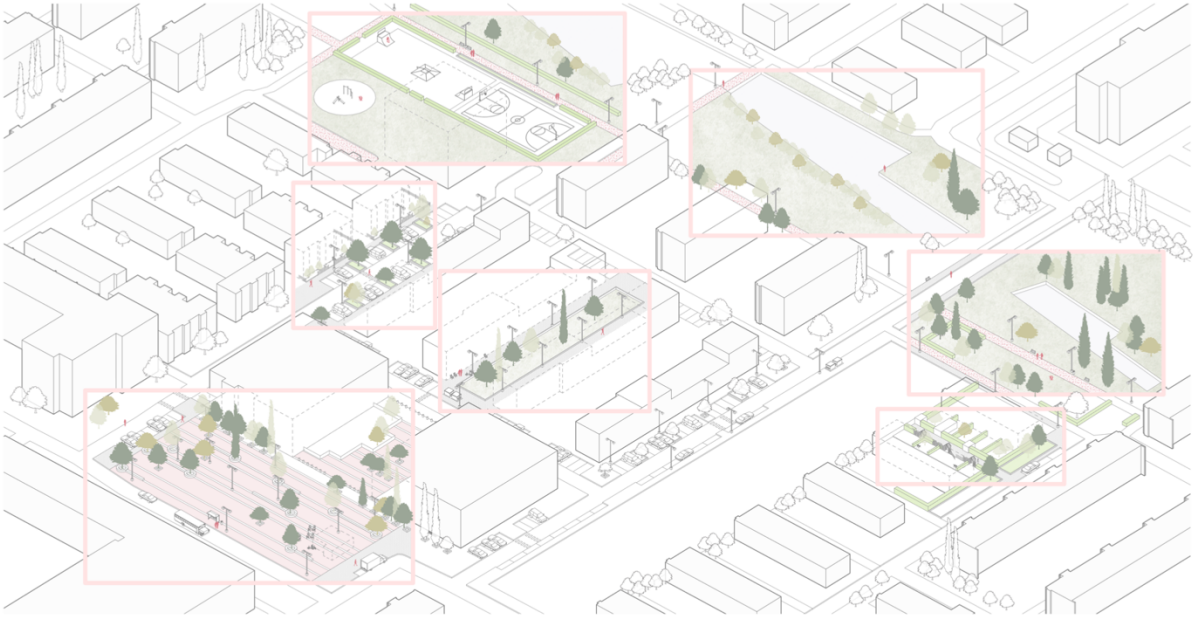


Figure 6.1 Diagram showing the site analysis of the neighborhood – 110 Morgen.

6.1 What could be going on outside doors - types of activities

According to the previous hypothesis, the mix of active outdoor 'journeys' is emphasized as a promising way of densifying social networks for the elderly to face loneliness. Influenced by a variety of factors, their outdoor activities can be presented and closely correlated to the living environment in different ways. Life happening outside private front doors could be categorized into three types: *necessary activities*, *optional activities*, and *social activities*, each of which asks different requirements for the living environment (Gehl, 2011).

1) Necessary activities: *under all conditions*

Everyday tasks and pastimes, including grocery shopping, waiting for a bus/a person, running errands outdoors in the neighborhood, and mail pick-up or doing laundry inside elder housing. These activities are more or less related to walking, and compulsorily take place without being influenced by the living environment.

2) Optional activities: *only under favorable conditions*

Activities take place only when spaces invite people to stop, sit and stay longer, instead of hurrying through. These activities are closely related to the quality of the living environment: when optimal conditions are provided, a broader spectrum of recreational behaviors occur outside, like taking a walk for relaxing, sitting and enjoying the sunshine.

3) Social activities: *spontaneous results of necessary and optional activities*

'Resultant' activities, depending on the presence of others in public spaces, including greetings, casual conversations, and other communal activities.

According to the nature of different activities, life outside doors is especially sensitive to the quality of the living environment. And the link between them could be simplified as follows (Figure 6.2):

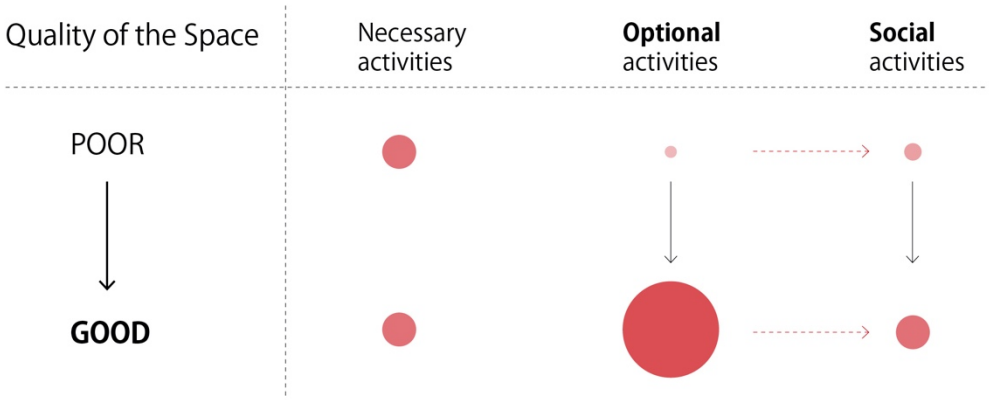


Figure 6.2 Diagram of the relationship between the quality of spaces and the rate of occurrence of activities (Gehl, 2011).

It suggests that optional and social activities are especially conditioned by the spatial settings, therefore as the subject that this study aims to stimulate; reversely, the frequency of these contacts could be considered as a barometer of the quality of spaces.

6.2 Spatial structure - according to accessibility and activity

In order to support those essential outdoor activities, spatial conditions and qualities of the living environment need to be examined for the elderly. Spaces for growing social relationships can be differentiated in terms of different levels, which differ according to access and activity they accommodate: *public zone*, *semi-public zone*, s*emi-private zone,* and *private zone*.[21] The hierarchical system of spaces could be established consistent with social structure in the living environment, showing varying scales and transitions between private and public (Figure 6.3).

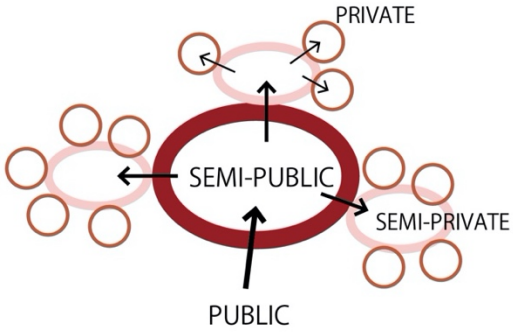


Figure 6.3 Diagram showing a hierarchically organized housing area with public, semi-public, semi-private, and private zones (Newman, 1973).

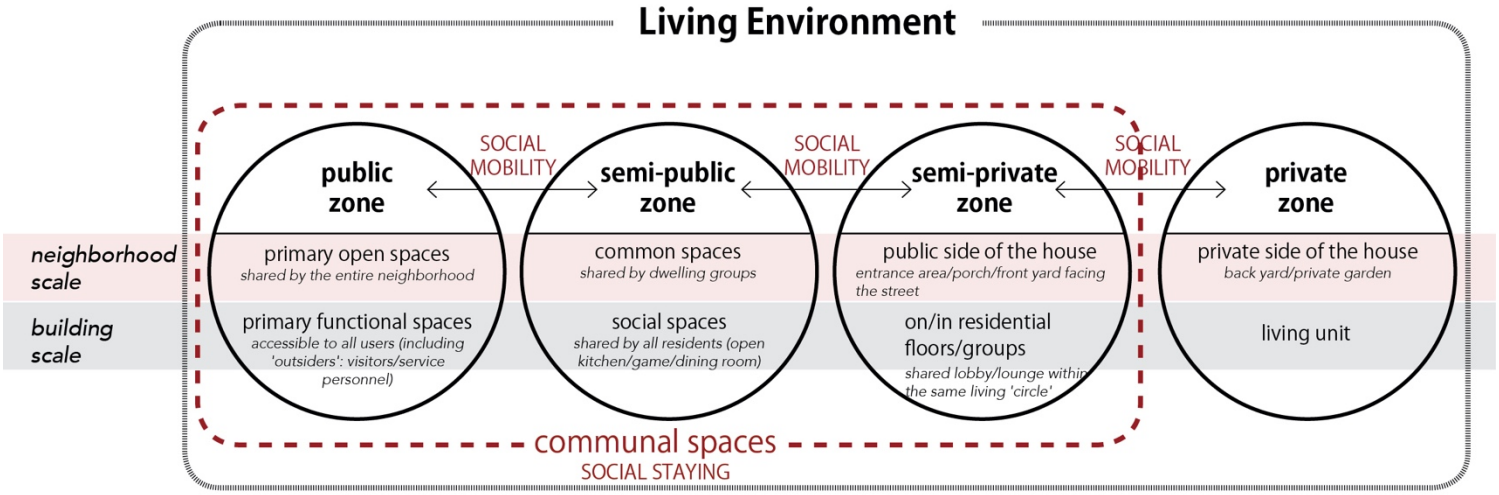


Figure 6.4 Diagram of the spatial typology in the living environment.

[21] Oscar Newman, *Defensible Space* (New York: Macmillan, 1973).

Those under the domain of *communal spaces* for *social staying* outside private doors will be the zones this study mainly focused on, especially when they contribute more to opportunities for optional and social activities. However, these four zones should not be used as rigid divisions between spaces. And the chance as *social mobility*, the connection and access for coming and going in-between is also a major part of the study, which allows fluid and dynamic activities flowing in and out different spaces (Figure 6.4). [22]

6.3 What is a '*good*' living environment - quality of space

"The design and development of buildings and the built environment have the capacity to facilitate or to hinder people's movement and mobility, and particular designs… are infused with powers of demarcation and exclusion."[23] Based on literature reviews, a comprehensive set of living environment characteristics that are closely linked to the health and well-being of older people is underlined (Table 6.1 & 6.2).[24]

Table 6.1 Neighborhood Characteristics Related to Health and Wellbeing of Older People.

External environment and community characteristics	Linked Impact	
1. Safe neighborhood *(e.g. low crime, anti-social behavior and vandalism, adequate street lighting)*	Physical health *(prevent from injuries)*; Mental health *(support social connectivity)*	
2. Environmental conditions *(e.g. air quality and traffic/street noise)*	Physical health *(prevent from illnesses and injuries);* Mental health	
3. Cleanliness and aesthetics *(attractive and well-kept areas, lack of littering)*	Physical health *(facilitate physical activity)*; Mental health *(support social connectivity)*	
4. Walkability and pedestrian infrastructure *(e.g. pedestrian-oriented design, continuous obstacle free pavements, signal-controlled crossings, mobility-scooter pathways)*	Physical health *(facilitate physical activity)*; Mental health *(prevent social isolation)*	SOCIAL MOBILITY (streets)
5. Access to public transport options within walking distance *(e.g. buses, trains)*	Physical health *(facilitate physical activity)*; Mental health *(prevent social isolation)*	
6. Accessibility to local amenities *(e.g. retail and food shops, post office, cash points)*	Physical health *(facilitate physical activity)*; Mental health *(prevent social isolation)*	SOCIAL STAYING (communal spaces)
7. Accessibility to health care center or health services	Physical health; Mental health	
8. Accessibility to green space, parks, recreational facilities	Physical health *(facilitate physical activity)*; Mental health *(prevent social isolation)*	
9. Access to indoor leisure opportunities *(e.g. leisure centers, pools, gyms)*	Physical health *(facilitate physical activity)*	
10. Availability of public toilets and rest areas	Physical health *(facilitate physical activity)*	SOCIAL MOBILITY (streets)
11. Features for social interaction *(e.g. playground, seating areas)*	Physical health *(facilitate physical activity)*; Mental health *(prevent social isolation)*	SOCIAL STAYING (communal spaces)
12. Social and community engagement opportunities *(e.g. community hubs, venues to interact with others, volunteer)*	Mental health *(prevent social isolation)*	

[22] Sandra C. Howell, *Designing for Aging: Patterns of Use* (Cambridge, Mass.: MIT Press, 1980).
[23] Hall, P., and R. Imrie, "Architectural Practices and Disabling Design in the Built Environment," *Journal of Planning Literature* 14, no. 2 (1999): 424.
[24] Mulliner, Emma, Mike Riley, and Vida Maliene, "Older People's Preferences for Housing and Environment Characteristics," *Sustainability* 12, no. 14 (2020): 5723.

Table 6.2 Housing Characteristics Related to Health and Wellbeing of Older People.

Housing characteristics	Linked Impact	
Home size: 1. Larger home with extra space *(e.g. for family, visitors, career)* 2. Smaller easy-to-manage home	Physical health; Mental health	
3. Room on one floor *(without stairs)*	Physical health *(prevent indoor accidents)*	SOCIAL MOBILITY (circulation area)
4. Temperature and thermal comfort *(warm, dry, ability to control temperature)*	Physical health; Mental health *(subjective satisfaction)*	SOCIAL STAYING (communal spaces)
5. Energy efficient home *(wall insulated, efficient heating system)*	Physical health	
6. Passive (natural) ventilation system	Physical health	
7. Intensity of natural and artificial light	Physical health; Mental health *(subjective satisfaction)*	
8. Flooring with anti-slip material, even surfaces, impediment free	Physical health *(prevent home accidents/injuries)*	SOCIAL MOBILITY (circulation area)
9. Adaptable design to facilitate ageing in place *(e.g. wider corridors and doors, handrails, stair lift, accessible light switches)*	Physical health *(comfort; prevent home accidents/injuries)*; Mental health *(psychological satisfaction)*	
10. Color and contrast of walls, floors, doors *(e.g. for wayfinding or calming)*	Mental health *(psychological satisfaction)*	
11. Views out to nature/green	Mental health	
12. Private garden or outside space	Physical health; Mental health	SOCIAL STAYING (communal spaces)
13. Storage space for wheelchair or scooter	Physical health *(physical activity)*; Mental health *(mobility satisfaction)*	
14. Ability to extend the property *(e.g. self-contained annex)*	Physical health *(physical activity)*; Mental health *(psychological satisfaction)*	

For the elderly, these factors particularly affect both their physical and mental health, and furthermore, their subjective satisfaction with spatial qualities and social connections. A brief summary of those necessities is laid as the basis of design principles and detailed strategies in this study.

As the above tables show, a specific range of living environment characters have been identified as exerting a significant impact on both physical and sensory needs of the elderly. For building scale, the quality of the space itself affects their private living experience, and the level of independent physical ability in many ways[25]: well-heated, adequately-insulated, dry and good quality homes have been proved to be effective in reducing the risk of injuries, illness and depression. In addition to those basic needs of a safe and comfortable building, other characteristics including housing size and adaptability, interior environment, and garden or other forms or views of outdoor greenery are essential as well. More importantly, with reasonable design outside private zones that adapts to older people's changing needs and circumstances, social mobility and social staying could be improved to further strengthen social connections, and reduce the sense of social loneliness.

[25] Sixsmith, J., Sixsmith, A., and Dahlin-Ivano, S., "Influence of occupation and home environment on the wellbeing of European elders," *Int. J. Ther. Rehabil.* 12 (2005): 505–509.

Aside from buildings, the perspective of neighborhood scale is critical to healthily 'ageing in place', especially as studies show that the elderly tend to spend more time in their immediate living environment within neighborhood due to physical decline[26]. Safety, cleanliness, and environmental quality of pedestrian infrastructure, accessibility to local facilities and basic services, accessibility to greenery/parks/recreational facilities, are of higher importance to the elderly[27]. Those should be considered as key factors to be included in the further design, which potentially promote older people's mobility and provide greater opportunities for social interaction (Figure 6.5).

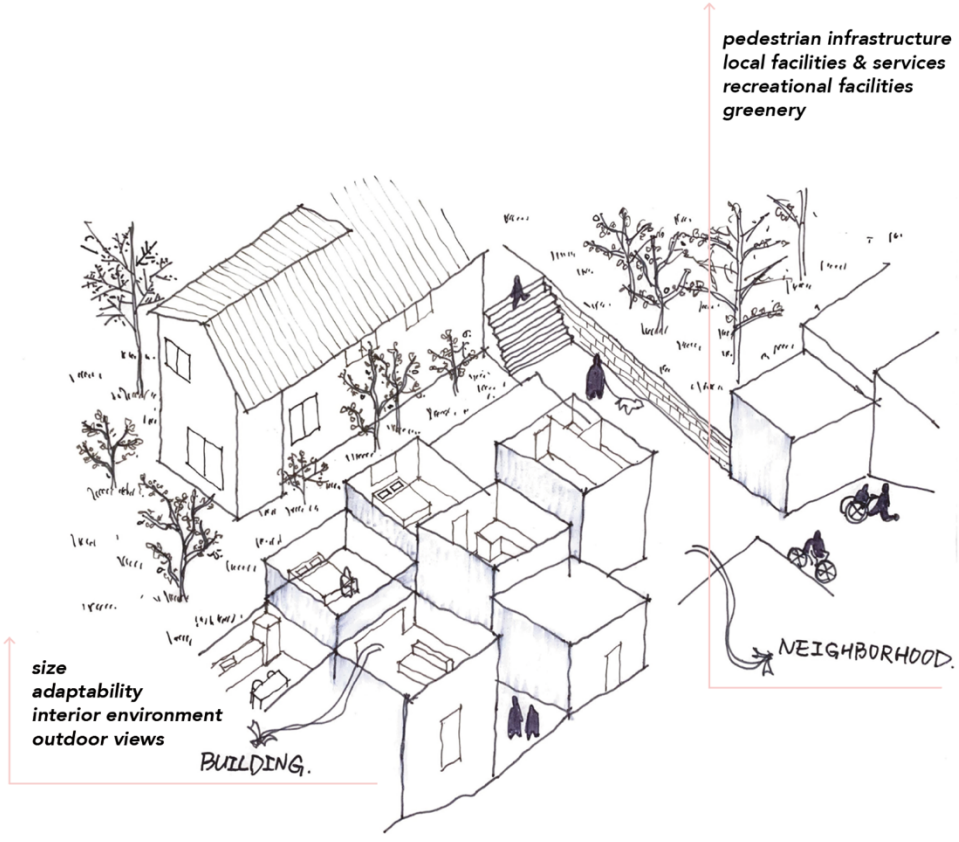


Figure 6.5 Diagram showing key qualities of the living environment for older people.

[26] Garin, N., Olaya, B., Miret, M., Ayuso-Mateos, J.L., Power, M., Bucciarelli, P., and Haro, J.M., "Built environment and elderly population health: A comprehensive literature review," *Clin. Pract. Epidemiol. Ment. Health* 10 (2014): 103–115.
[27] Duncan Boldy, Linda Grenade, Gill Lewin, Elizabeth Karol, and Elissa Burton, "Older People's Decisions Regarding 'Ageing in Place': A Western Australian Case Study," *Australasian Journal on Ageing* 30, no. 3 (2011):135-142.

6.4 Connecting in *neighborhood* scale - site planning between buildings

For the elderly, "age does not obviate the desire or necessity to go shopping, see the doctor, visit friends, and undertake other everyday activities - but it may alter the method and frequency with which they are done."[28] This part aims to identify the preferred characteristics and design strategies within neighborhood scale that are particularly key to fostering the elderly's energetic social life outside of dwelling units. Via a body of research investigating associated topics, spatial qualities of social mobility and social staying are summarized respectively as common design principles (Figure 6.6).

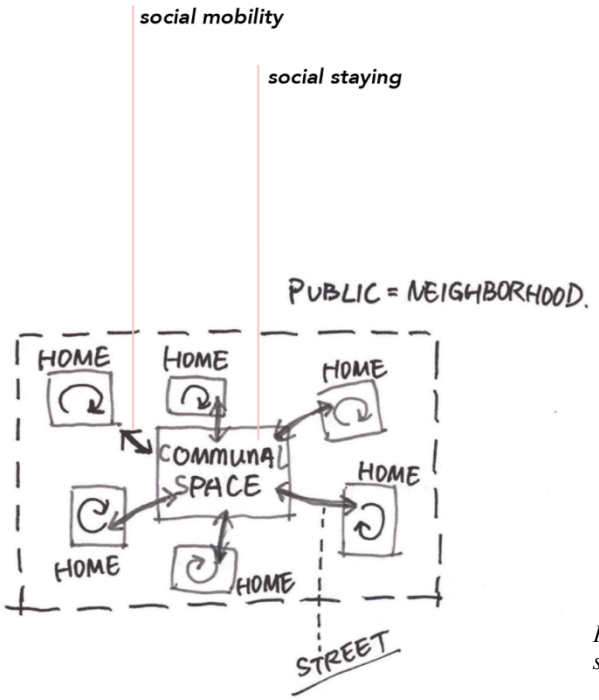


Figure 6.6 Diagram showing the social mobility and social staying within a neighborhood scale.

6.4.1 Social mobility - streets

To promote older people's capability of getting out and about on regular basis, the effective design of neighborhood streets is stressed as an influential solution. Recently, there has been more specific focus and guidance on inclusive mobility, for enabling older people to remain active around their neighborhood streets. Based on previous findings, a structured set of features and strategies is formed in this part and used as general criteria for good streets.[29] As Table 6.3 shown, the most relevant characteristics to older people include a safe, comfortable

[28] Greenberg, L.,"The implication of an ageing population for land-use planning," *Geographical Perspectives on the Elderly,* A. Warnes, ed. (1982):401–425.
[29] Newton, R.; Ormerod, M.; Burton, E.; Mitchell, L.; Ward-Thompson, C, "Increasing independence for older people through good street design," *J. Integr. Care* 2010, 18, 24–29.

and walkable environment with well-designed footways, pedestrian crossings and navigation, and pleasant seating and greenery.

Table 6.3 Detailed design criteria of the street for the elderly.

Key Design Factor		Key Design Strategy
Footways	Dimension	wide enough for 'wheeled traffic'
	Surface	well-maintained/firm/flat
	Pedestrian and traffic segregation	separated from road/no shared path with cyclists
	Changes in level	ramp on inclines/short flight of steps/color contrast on the edge
Pedestrian crossings	Signal	traffic light/provision of both visual and audible signals
	Curb	plain dropped curb with/without tactile paving
	Distance	short crossing distance
Navigation	Obstacle	no parking on pavements
	Temporary barrier	scaffolding poles etc.
Seating	Adequacy	frequent resting points *(at regular intervals, e.g. every 100m²)*
	Material	warm
	Maintenance	well-maintained and safe
	Informal seating	garden walls/bus shelters etc.
Street greenery	Grass strip	separate from cars/bikes
	Planter and flower bed	trees - providing shade and shelter for rainfall

1) Footways

Studies suggest that going outdoors on a daily basis is crucial to the elderly, and walking is considered by them as major means of transport. Therefore, at the scale of detailed design in the street, smooth, well-maintained and wide enough footway is highly preferred. Pavements less than 2m wide that are not suitable for wheelchair users should be avoided, as well as those uneven or damaged surfaces (Figure 6.7), for it could make elderly residents feel unsteady, vulnerable and easily tripped.

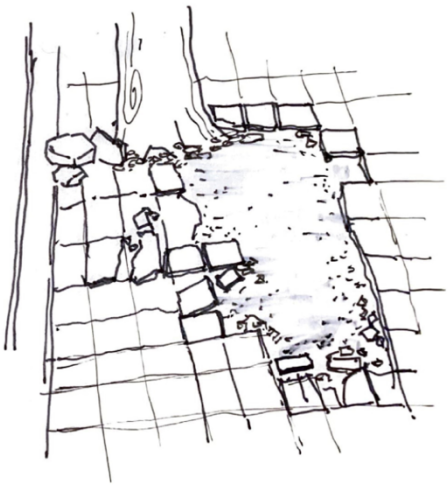


Figure 6.7 Sketch showing the uneven or broken paving is considered particularly dangerous to the elderly.

Besides, a proper separation between pedestrians and heavy traffic is necessary when walking around local neighborhoods (Figure 6.8). Because a common fear among the elderly is being knocked over by cars, cyclists, scooters, or skateboarders. Generally, quiet side roads free from motorized traffic or shared paths with cyclists make them feel safer. And the change

in level should be minimized: when it cannot be avoided, a gentle slope or ramp on inclines or a short flight of steps, and obvious color contrast on the edge are optimal strategies.

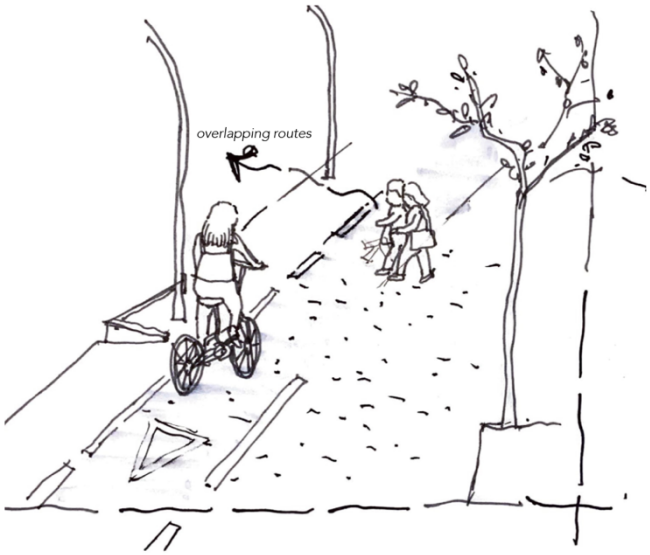


Figure 6.8 Sketch showing bicycles on footways are a common safety concern for the elderly.

2) Pedestrian crossings

Difficulties of crossing roads is the elderly's main concern, especially with speedy or heavy traffic. Essential designs that contribute to a safe crossing require a relatively short crossing distance (or a traffic island in the middle for rest), a controlled traffic light, and a combination of visual and audible signals for crossing (Figure 6.9). And the most preferred form of curb is a marked, plain dropped one, with tactile paving for impaired vision if needed.

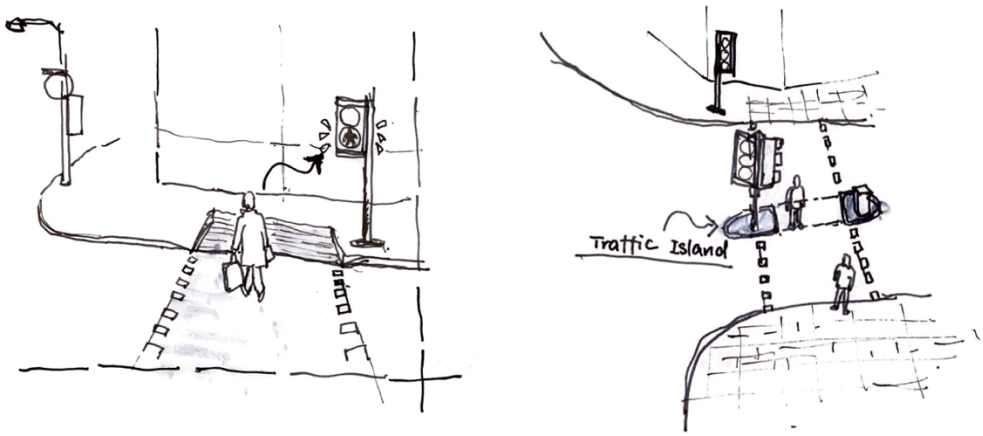


Figure 6.9 Sketches showing the designs of crossing that makes older people feel safer.

3) Navigation

To reduce the fear of falling over from mobility decline, obstructions especially the temporary obstacles on the street should be excluded, such as parking on pavements (Figure

6.10). Because they are considered as annoying and dangerous particularly to the elderly when trying to walk around them with extra effort.

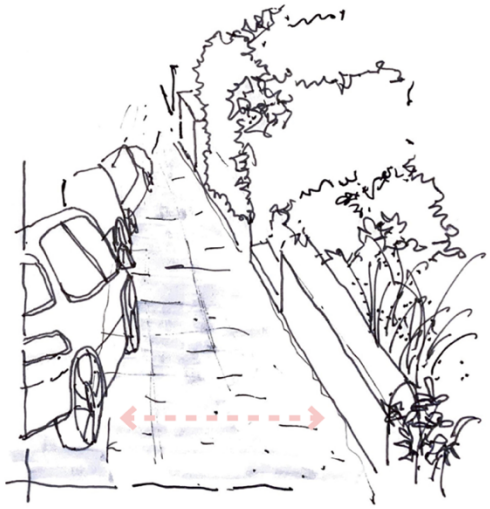


Figure 6.10 Sketch showing cars parked half on footways are dangerous and obstructive.

4) Seating

One of the important problems that lead to uncomfortable walking is that there is not enough public seating for occasional stops en route, since most of the elderly are not able to walk longer than 10 minutes without resting. Adequate seats should be provided as a basic need, and at an ideal interval of every 100m to 125m between home and local facilities, otherwise, it appears to be a particular reason for some elderly choosing not to go out as often as they want or avoid certain places.

The favorable style and materials among the elderly are well-maintained, wooden seats with both back and arm supports. When well-positioned at right angles to each other, safe, comfortable and welcoming seating could develop more points of unplanned chat. Besides, informal seating in the form of stairways, steps, pedestals, low garden walls, boxes etc. are necessary at times, serving as good lookout points as well (Figure 6.11).

Figure 6.11 Sketch showing facade details could provide a range of sitting opportunities.

5) Street greenery

Aside from physical safety and comfort, enjoyment is also important for walking on the streets. Different forms of street greenery could positively improve older people's feeling and walking experience (Figure 6.12), including grass strips separating footways from cars or cyclists, trees providing necessary shade and shelters for rainfall, and planters, flower beds, hanging baskets or any other forms for aesthetic needs.

Figure 6.12 Sketch showing the elderly particularly enjoys seeing greenery and trees along walking paths.

6.4.2 Social staying - communal spaces

The efficient design of the communal space is extremely important in supporting the elderly with a range of gathering places to get out and about. According to Oldenburg's famous argument of our lifestyles being “increasingly privatized and competitive, residential areas are increasingly devoid of gathering places”. Especially for the elderly, instead of trapped inside, they need not only local streets that meet their needs to walk through, but also outdoor communal spaces that they can stay longer, use and enjoy.

It is noted that efforts should be made to develop dynamic communal spaces within local neighborhoods, since “neglect of the informal public life can make a jungle of what had been a garden while, at the same time, diminishing the ability of people to cultivate it” (Oldenburg, 1999). Therefore, the following detailed design principles of neighborhood gathering places that support older people's outdoor staying is used in this study, as well as general criteria for good communal spaces (Table 6.4). Previous research suggests that, at the scale of detailed design for communal spaces, accessibility, comfort and safety, distinctiveness, and soft edge and landscaping as a transition from private to public, are key aspects to consider (Burton & Mitchell, 2006).

Table 6.4 Design principles of communal spaces for the elderly.

Key Design Factor		Key Design Principle
Accessibility	Reaching of local facilities and services	primary facilities within 500m of older people's housing; secondary ones within 800m
	Unimpeded movement	obvious and easy entrances/slight and marked level changes (where unavoidable)
	Understandable places	clear cues to their identity/well-defined function
Comfort and Safety	Familiarity	blending in with local character and existing built form
	Feeling welcome	more 'human', open nature, and small enough for psychologically undaunting environment
	Enjoying peace and quiet	easy, comfortably positioned public seating/acoustic buffers
	Meeting physical needs	flat, smooth, non-slip and non-reflective paving; adequate lighting/shelter
Distinctiveness	Feeling of a sense of belonging	smaller, more informal or 'natural' green open spaces
	Offering 'something to do'	lively, mixed use places of interest, stimulation and activity
	Maintaining concentration	varied architectural forms (buildings differ in local styles/sizes/shapes/materials/colors)
	Landmarks and aesthetic features	reference points and distinctive wayfinding cues
Soft edges and landscaping	Linking indoors and outdoors	detailing connections for events to flow in and out
	Places for stationary activity next to buildings	convenient outdoor stays directly in front of houses

1) Accessibility

Reaching, entering and using places they need regardless of any physical or sensory difficulties is essential for the elderly. Accessibility of primary facilities including a general food store, post office, bank, general practitioner's surgery or health center matters more because according to studies, older people seem to shop more often or regularly go to medical facilities. It is highly recommended that the elderly's housing is no further than 500m from these essential services (Burton & Mitchell, 2006), and within the distance of fewer than 800m from secondary leisure facilities such as café, library and other social clubs (Figure 6.13).

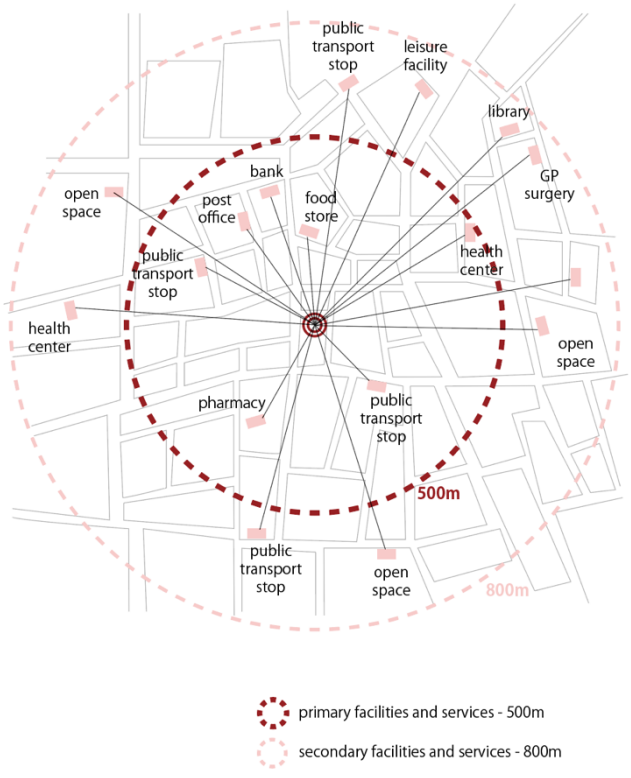


Figure 6.13 Diagram showing the maximum distance between primary/secondary services and the elderly's home.

These communal spaces should be understandable enough for the elderly by presented with clear clues to their identities and well-defined functions,

instead of causing misunderstanding or confusion. And to make sure they enjoy an unimpeded reaching towards destinations, useful strategies like obvious and easy entrances from the street, slighter and marked level changes when is unavoidable, should be considered.

2) Comfort and safety

Comfort and safety are the most common qualities that the elderly expect for good communal spaces in their local neighborhood. Related research emphasizes the significance of a familiar outdoor environment and features in providing hospitable settings and reducing confusion, frustration and anxiety, especially for those suffering from short-term memory problems. Generally, it is recommended to make these spaces more inclusive to older people by blending in with local materials, characters and existing built forms. Compared to formal urban squares which always enjoy relatively spacious, empty grounds surrounded by huge and imposing buildings, the elderly prefer psychologically undaunting environments with more 'human', open nature and small enough settings.

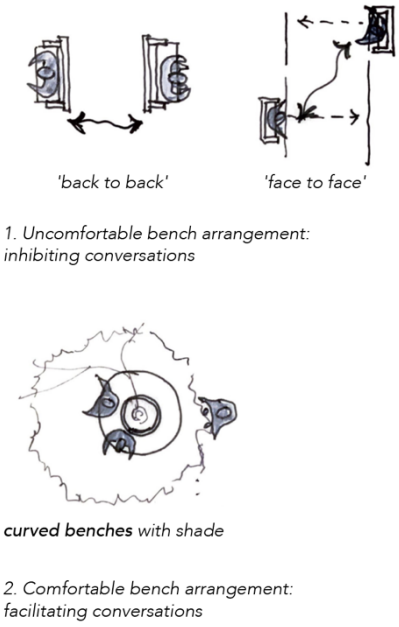


Figure 6.14 Sketch showing different arrangement of benches.

Staying in a lively communal space does not mean that the elderly have to put up with noisy or crowded surroundings. On the contrary, "the best public spaces often have nodes of activity (with pavement cafes or markets, for example), complemented by quiet zones for rest and people-watching".[30] For example, easy and comfortably-positioned public seating, together with necessary acoustic buffers can enable them to sit and observe quietly within those spaces (Figure 6.14). In addition, other important factors of their special physical needs should be provided to make communal spaces easier to use by the elderly, including flat, smooth, non-slippery and non-reflective paving, and adequate lighting or shelters (Figure 6.15).

[30] Llewelyn-Davies, *Urban Design Compendium* (London: Llewelyn-Davis, 2000).

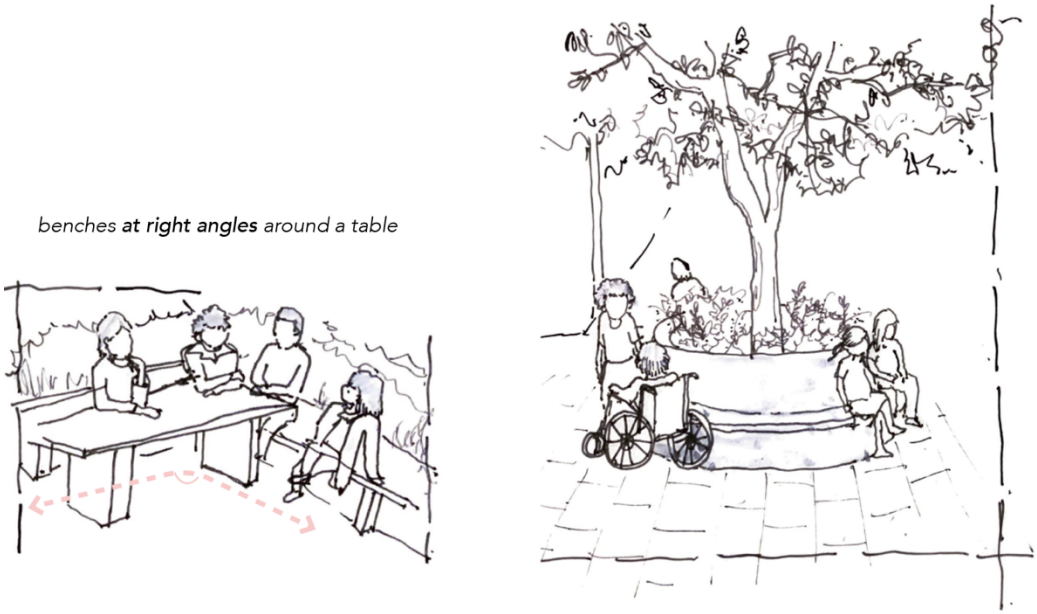


Figure 6.15 Sketches showing the 'conversation landscape': design of places for sitting.

3) Distinctiveness

Similar to people of other ages, the elderly are also sensitive to how 'interesting' or 'dull' each place is, especially when they need distinctive features (landmarks/aesthetic elements), varied building forms (styles/sizes/shapes/materials/colors), more vibrant and mixed-use spaces providing necessary interest and stimulation to maintain concentration or locate their ways. Good communal spaces that are attractive to the elderly have to be psychologically 'safe' by offering a sense of belonging, such as smaller, more informal or 'natural' green open spaces. And spaces are supposed to offer lots of things to do as the reason for the elderly to stay once they arrive (Figure 6.16).

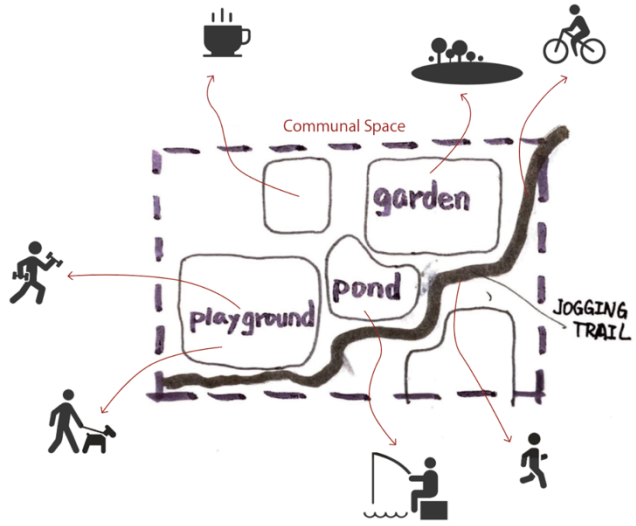


Figure 6.16 Diagram showing the smaller 'informal' spaces co-existing with diverse functions.

4) Soft edges and landscaping

Other than basic requirements of comfort and safety, the elderly particularly notice and appreciate nature and aesthetic features in their neighborhood, such as trees, gardens and exterior furnishing. Therefore, soft-edged linking between indoors and outdoors is another efficient strategy to enable life 'flow' in and out. Typical design strategies include a variety of detailing connections for fostering events among neighbors, and places for convenient outdoor stays directly in front of the housing (Figure 6.17).

Figure 6.17 Diagram showing the soft-edged transition between indoors and outdoors.

6.4.3 Case study 1- site analysis for *110 Morgen*

According to this set of design principles and detailed strategies from the above discussion, now a specific analysis of *110 Morgen*, the design site of this graduation studio, is processed closely associated with the research questions in this chapter as one of the case studies instead of the general investigation.

As a neighborhood with a majority of social housing and a lot of green spaces, 110 Morgen is a quiet yet isolated residential area, and nowhere reflects the image of Rotterdam as a large city. Targeting this neighborhood with potential and a lot of dedicated people who desperately want to 'ageing in place', the analysis aims at finding problems and opportunities for older people to improve their life quality through environmental and design approaches.

From the overview information (Figure 6.18), although with a considerable distance from the city center, it appears that basic facilities are included within the neighborhood now. For example, there are bus and tram stops where residential buildings with commercial on the ground floor are right across the road; spacious park and lake is accessible; necessary local grocery stores and healthcare are within the radius of 600m as well.

Figure 6.18 Overview of the key facilities in 110 Morgen.

However, the living experience for the elderly there is limited when examined deeper. And in order to analyze the spatial quality of 110 Morgen according to the criteria summarized in previous research, streets and communal spaces within this neighborhood will be studied through the following process: firstly, a hierarchy of streets or spaces will be established for a comprehensive overview; then typical examples for each different level will be chosen to showcase how the ongoing social mobility and social staying may be influenced by.

Figure 6.19 Structure of streets in 110 Morgen.

1) Social mobility – streets

From the spatial structure of social mobility (Figure 6.19), all the streets in 110 Morgen are logically categorized into four different levels based on dimension and function, including: *main street* (*Lv.1*) and *secondary street* (*Lv.2*), which are motorized roads accessible for both automobile and pedestrian; and *walking road* (*Lv.3*), and *inner path* (*Lv.4*), which are only for pedestrian.

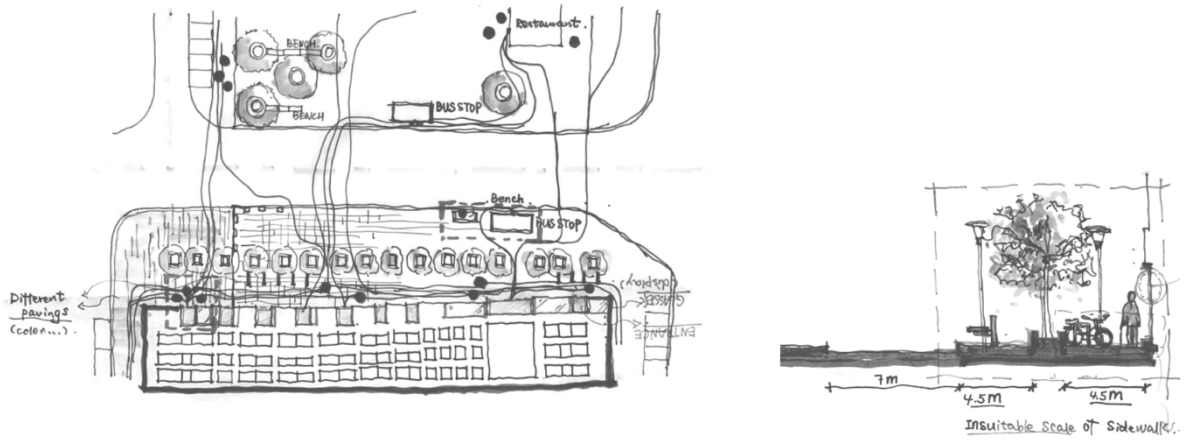


Figure 6.20 The plan and section of Lv.1 streets.

Taking the Minervalaan as an example for *Lv.1* street, its spatial characteristics can be regarded as desolate and empty where merely a few people passing by on foot yet barely stationary activities happen on daily basis. The dimension of this street is wide enough for most of the traffic (Figure 6.20), containing 7m for vehicles and almost 9m for footways (especially with a line of trees dividing in the middle as two-way lanes to make it not too wide). With stone and brick tiles, the flat surface is mostly acceptable for the elderly, yet with a few obstacles such as bike lockers and posts. However, the encounter offered by outdoor spaces, particularly on the ground floor level is reduced along this street. For instance, there are only three wooden benches in the whole area and no informal seating or trees that can provide comfortable shades or shelters; and the façades are too hard-edged (Figure 6.21), lacking interesting details (niches, holes, gateways, stairs, etc.), which means they are only suitable for brief comings and goings yet difficult for residents to find

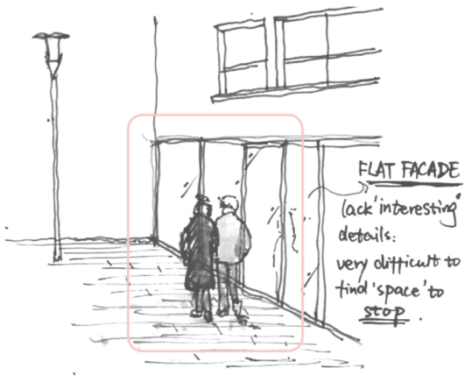


Figure 6.21 The flat facades with no outdoor spaces.

places to stop. To conclude, the elderly are unwilling to stay here because of the limited opportunity for events 'flowing' in and out.

Similarly, the spatial quality of *Lv.2* street is too hard-edged as well. Taking the Ajaxstraat as an example, it is also a wide street well-separated among cars, bikes and pedestrians, and with fences in-between as soft divisions for the dwelling's front yard and sidewalks (Figure 6.22).

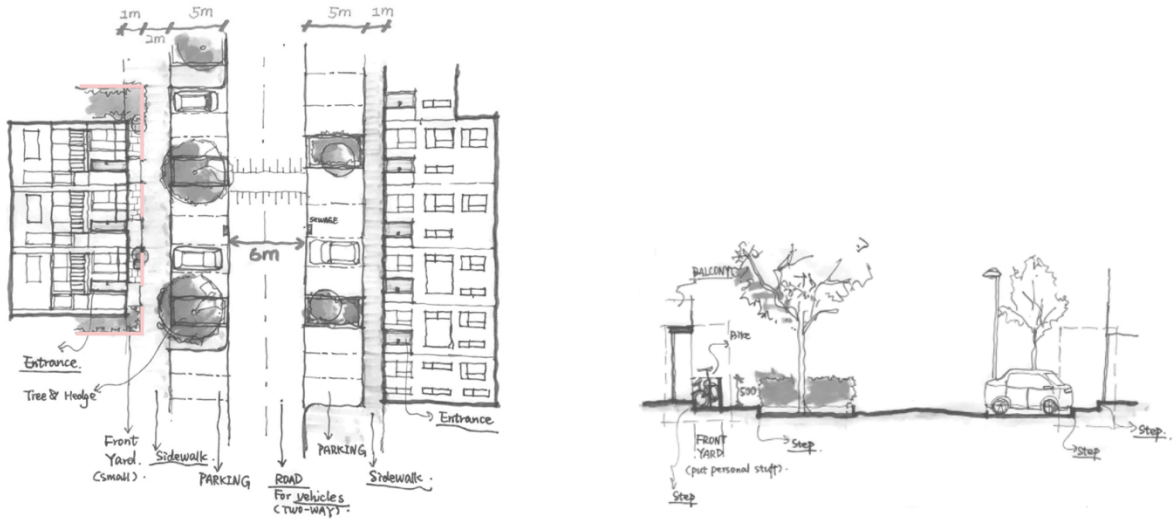


Figure 6.22 The plan and section of Lv.2 streets.

However, the social engagement for many elderly along the street is reduced: poor detailing, weak semi-private spaces, and too many cars parked right up to the entrance of dwellings discourages people to stay on the sidewalk for any forms of social contact (Figure 6.23).

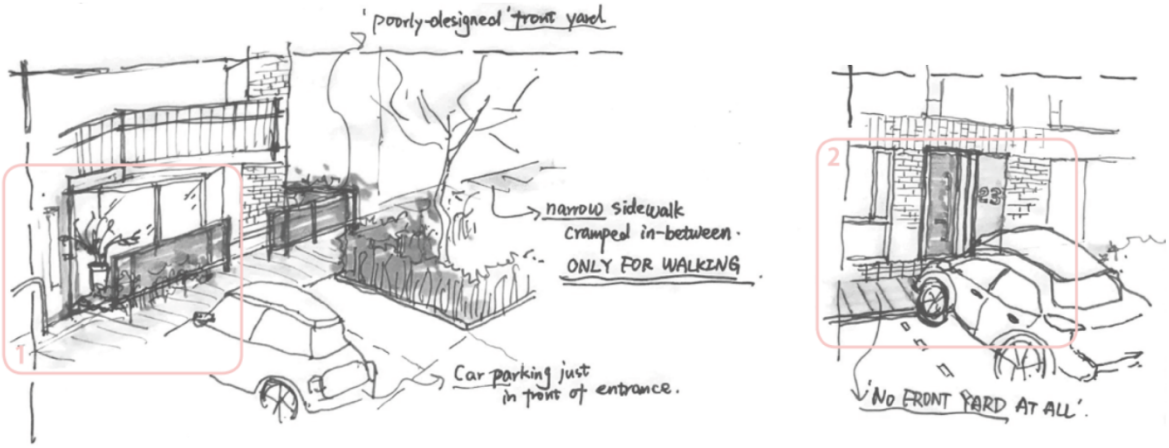


Figure 6.23 The limited opportunity of social contact along Lv.2 streets.

The *Lv.3* streets can be considered too straightforward according to the design criteria. Compared to the previous two higher levels, footways within the community park for example are only 2-2.5m in width and made of asphalt or gravel (Figure 6.24). Those paths are inaccessible for vehicles, yet shared with bikes which are inconvenient for the elderly. Although street greenery such as scattered trees or lines of hedges is provided, the footway still lacks interesting views and comfortable settings (Figure 6.25): instead of being positioned carefully, the wooden benches are just next to garbage bins or street lights at random intervals; and most importantly, the footway is too long and straight, without any winding routes or changes.

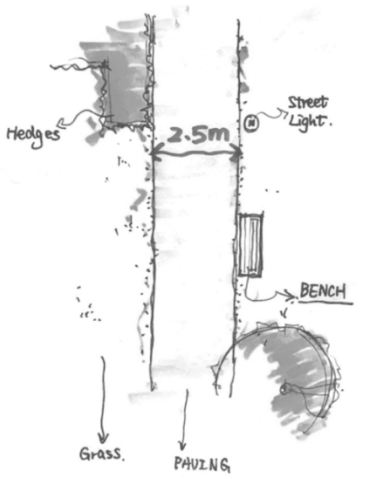


Figure 6.24 The plan of Lv.3 streets.

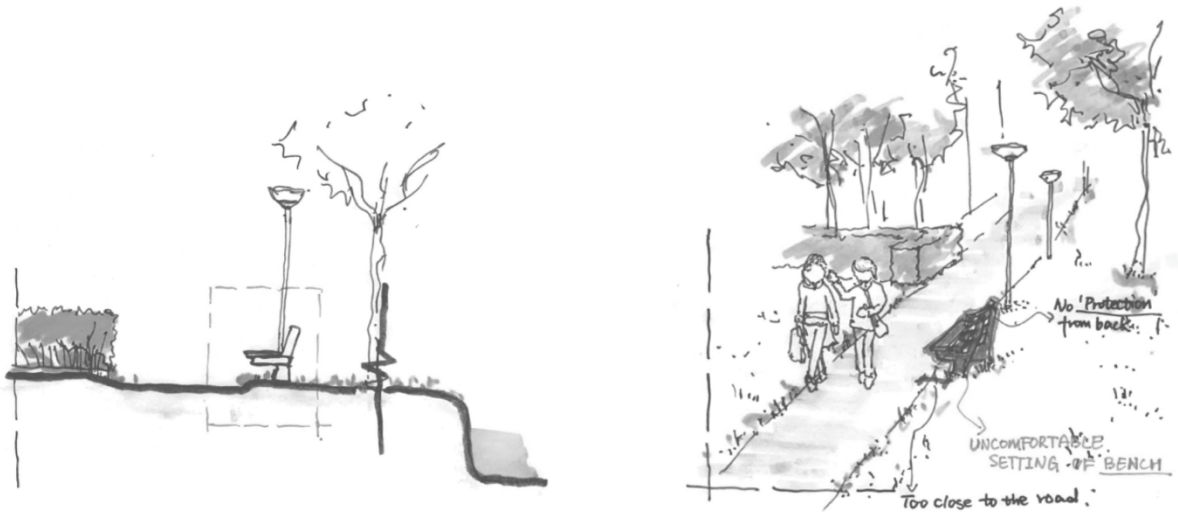


Figure 6.25 Uncomfortable settings along Lv.3 streets.

When it comes to the Lv.4 streets, they appear to be even worse as narrow and too blocked. For example, those footways between private yards are only 1.6m in width and slightly bumpy due to brick tiles (Figure 6.26). With higher hedges as hard boundaries in-between, an

uninviting atmosphere is created while most of the views are blocked (Figure 6.27). As a result, fewer chances of social contact can take place.

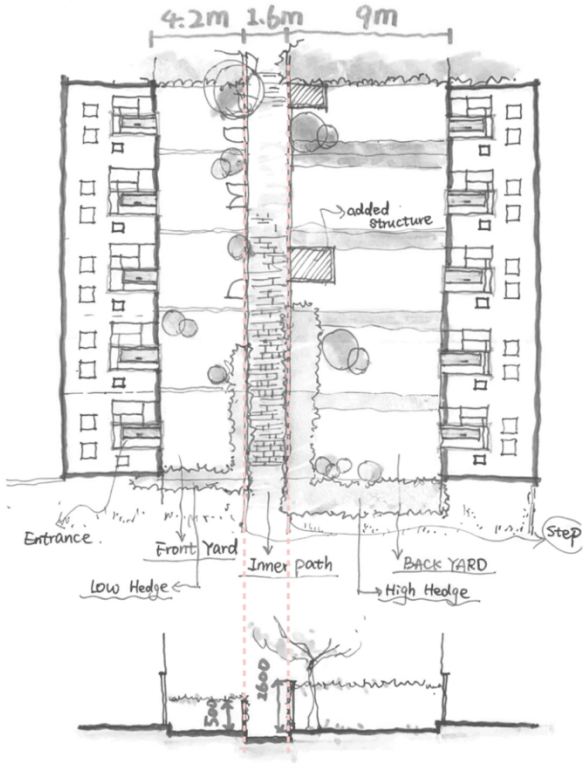


Figure 6.26 The plan and section of Lv.4 streets.

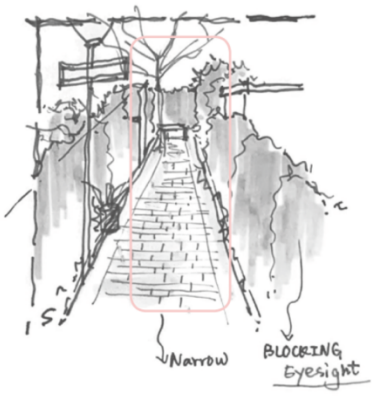


Figure 6.27 The blocked-views of Lv.4 streets.

In conclusion (Table 6.5), the spatial design and quality of social mobility in 110 Morgen can be seen as *tiring* in general.

110 Morgen

	Lv.1	Lv.2	Lv.3	Lv.4
Footways				
dimension	4.5m	2m	2-2.5m	1.6m
surface	generally no slippery/hilly/uneven paving			
pedestrian and traffic segregation	separated from traffic		shared path with cyclists	
changes in level	ramp/one step (no color contrast on the edge)			
Pedestrian crossings				
signal	only visual signs			
curb	plain dropped curb with tactile paving			
distance	<10m			
Navigation				
obstacle	NO			
temporary barrier	NO			
Seating				
adequacy	3	0	4	0
material	wood	-	wood	-
maintenance	one back	-	one back	-
informal seating	0	0	0	0
Street greenery				
grass strip	grass/dirt strip		no grass/dirt strip	
planter and flower bed	No proper trees as shade or shelter			

good poor

For the many elderly who, due to unsatisfying environmental settings especially those poorly-designed public seating and greenery, are unable to go outdoors more often to enjoy public life without any improvement of the streets.

Table 6.5 The summary of spatial quality for social mobility in 110 Morgen.

2) Social staying – communal spaces

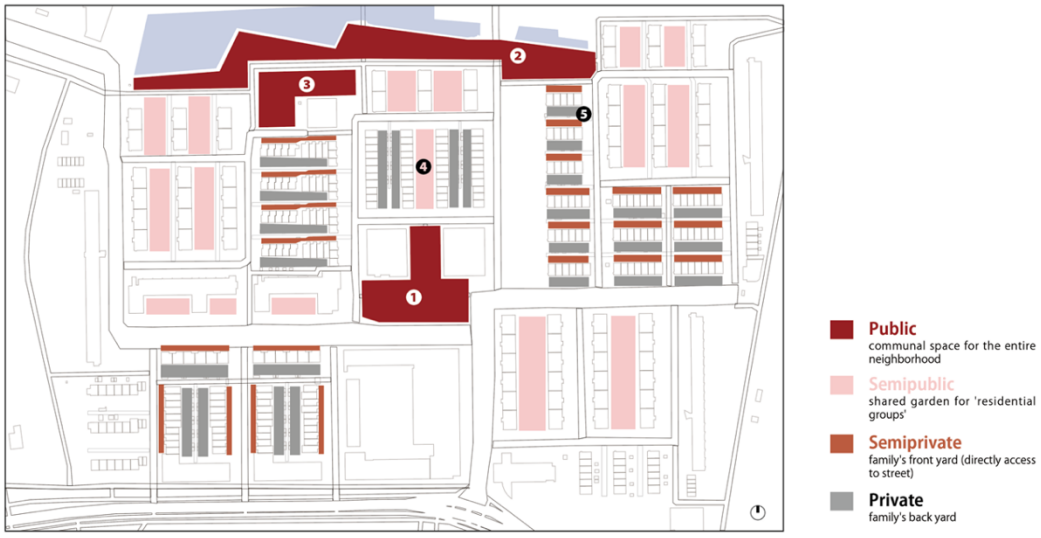


Figure 6.28 Structure of communal spaces in 110 Morgen.

From the spatial structure of social staying (Figure 6.28), all the communal spaces in 110 Morgen are classified into four different levels based on differentiation of privacy, including: *public* (*open spaces for the entire neighborhood*), *semi-public* (*shared gardens for residential groups*), *semi-private* (*dwelling's front yard with direct access to streets*), and *private* (*dwelling's back yard*).

Taking the public square – the Minervaplein as an example for the *public* level, its spatial character can be regarded as too spacious and empty where options of outdoor activities are unexpectedly limited for such a huge, wide-open square with a total area of 3000 m^2 (Figure 6.29). Located in the center of the neighborhood, it is within an easy reach of 200m from residential blocks. However, reduced social staying there is not limited to the physical accessibility: surrounded by two newly-built, imposing apartment buildings, the square is not properly separated from the main road and traffic; the only public benches now are poorly designed, without any back or armrests, shade or shelter. In this way, any elderly who has ever tried to relax

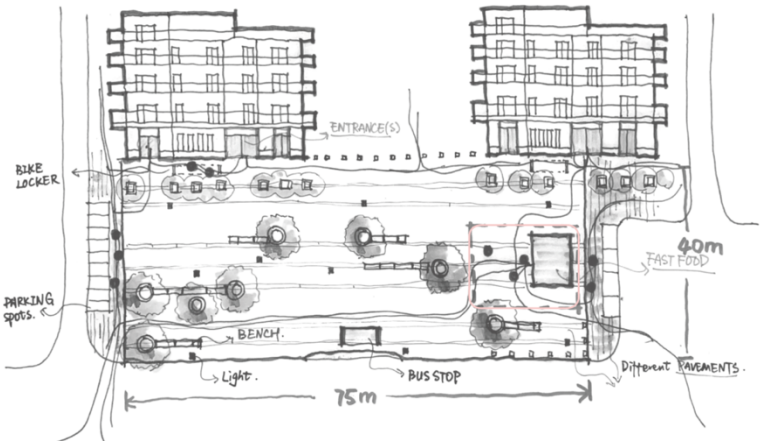


Figure 6.29 The plan of Minervaplein.

in the square would know how uncomfortable it imposes. On the other hand, its lacking of distinctiveness is another hindrance. The too formal, 'unnatural' setting (uniform paving/no aesthetic features or exterior area for dining) that makes the elderly feel intimidating and forbidding, prevents them to partake in the possible liveliness of this communal space (Figure 6.30).

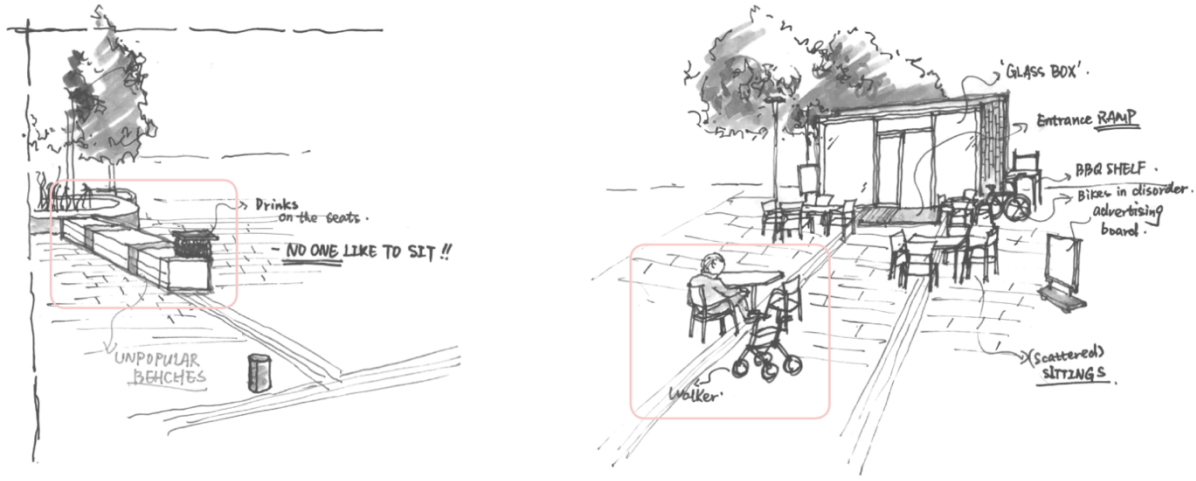


Figure 6.30 The empty square, with uncomfortable seats and limited options of outdoor activities.

Other examples for the *public* level have similar problems. The local park and lakes near the northern outskirt provide huge, green open spaces (Figure 6.31), yet tedious paths, uniform landscaping, inadequate public seating and lighting, and unclear accesses. Without lively, informal activities and functions, such as children's play areas, boating or fishing ponds etc., only limited possibilities can be found for spontaneous contact with others in those areas (Figure 6.32). Although there are playgrounds next to the park as well, they are blocked by tall apartment buildings without obvious routes as 'entrance' (Figure 6.33). Separated

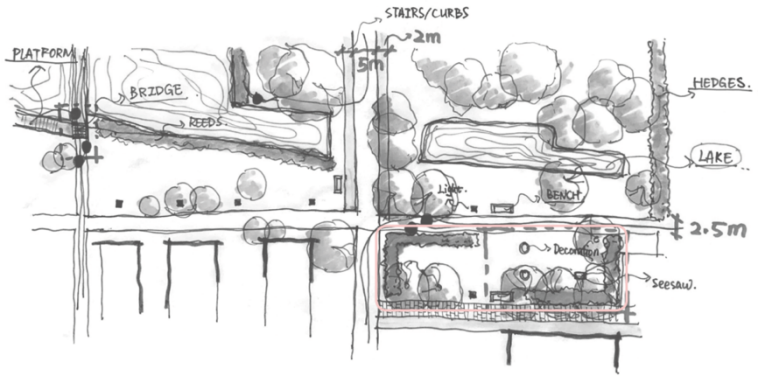


Figure 6.31 The plan of park and lakes.

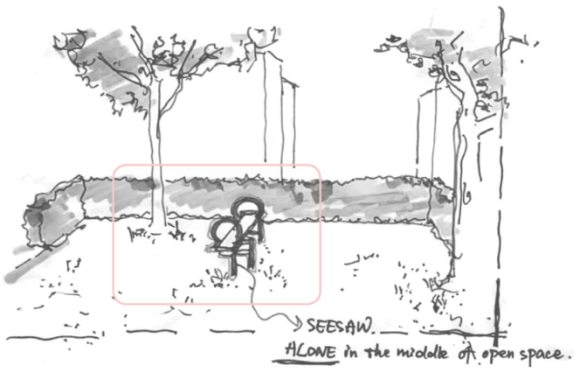


Figure 6.32 The lacking of lively activities and facilities.

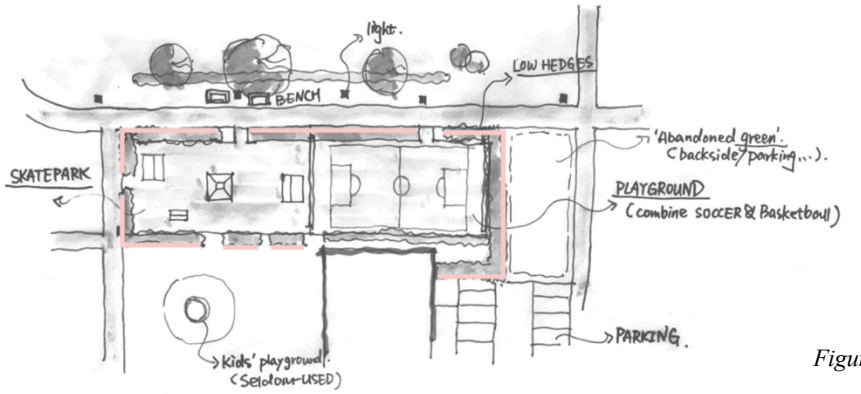


Figure 6.33 The plan of playgrounds.

by hedges and grass strips as hard boundaries from the surroundings, those playgrounds are underused because of unsafe paving (asphalt) and limited fitness equipment (Figure 6.34).

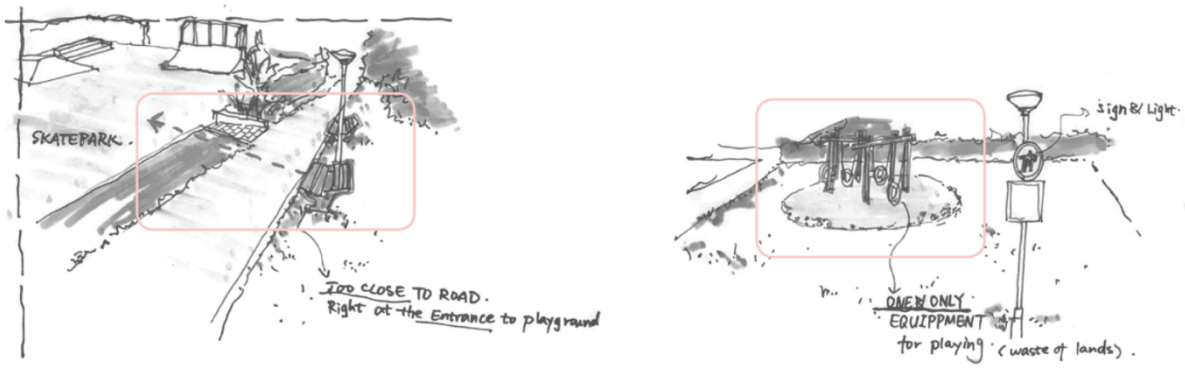


Figure 6.34 The under-used playground, without safe and various equipment.

The *semi-public* level can be concluded as under-designed in general according to the design criteria. Taking a shared garden directly located in-between dwellings as an example, it has an open and spacious area of greenery (more than 600 m^2), yet partially inaccessible because of several fencing and hedges (Figure 6.35). This square-like, deserted atmosphere does not allow necessary interests or stimulation for people to stay outdoors longer; and is unable to provide a spatial transition to the surrounding houses (Figure 6.36).

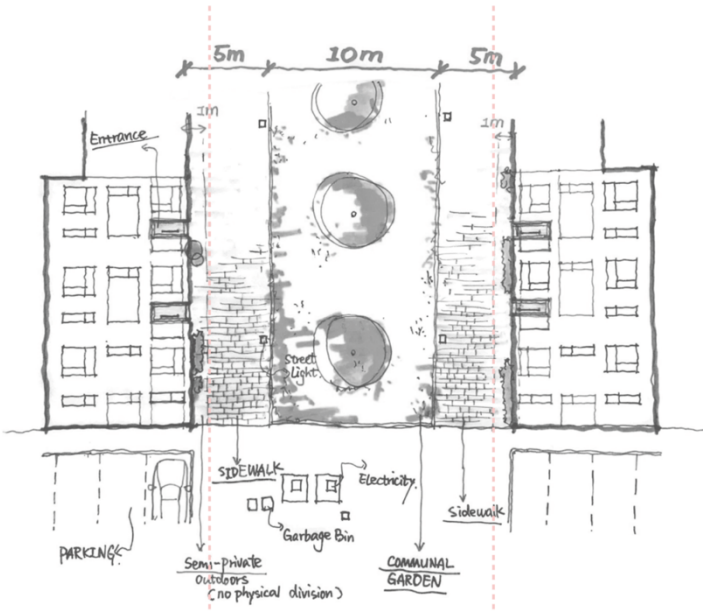


Figure 6.35 The plan of shared gardens.

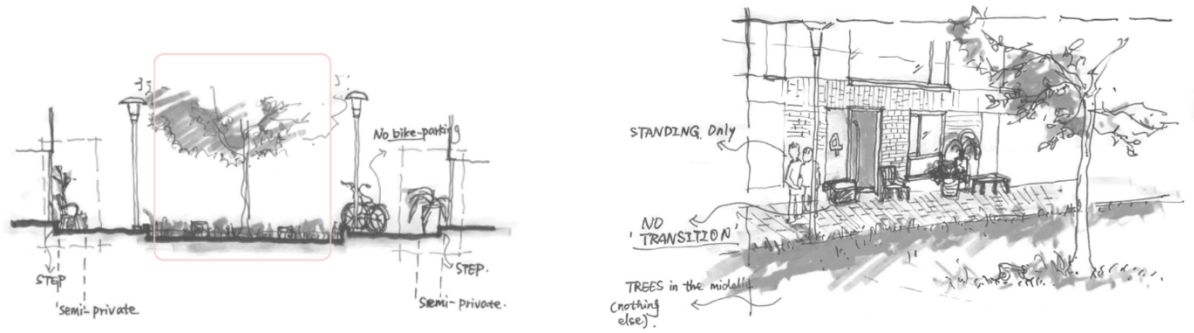


Figure 6.36 The under-designed spaces, without proper transitional areas.

However, the *semi-private* level shows the potential of transitional spaces, which are used for someone to subtly and gradually invite others or be invited: the front yard of private housing is presented as a more intimate and partially open area with softer divisions, using lower fences as the blurry delineation from private to public zones (Figure 6.37); and more self-decorated porches, terraces or smaller gardens are allowed as well. By those spatial instruments, opportunities for more stationary activities and social interactions are provided: at first one might appear through sound, smell and glance over the fence (Figure 6.38), then perhaps one "gradually comes in gaze, greeting or conversation, depending on the form of the day and the appetite for adventure"[31].

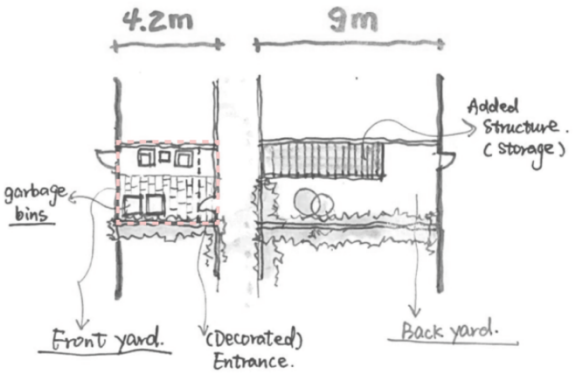


Figure 6.37 The plan of front yards.

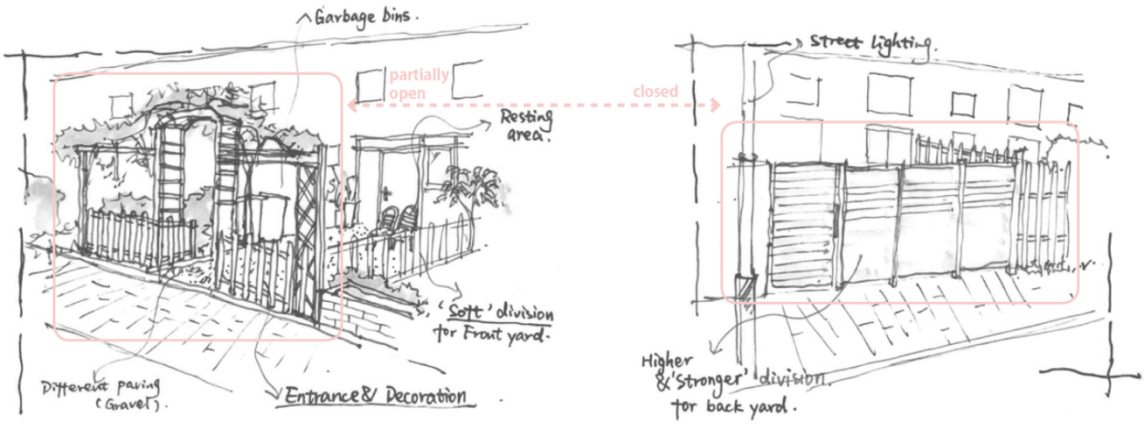


Figure 6.38 The potential of transitions from private to public.

[31] Hauderowicz, Dominique, and Kristian Ly Serena, eds, *Age-Inclusive Public Space* (Berlin: Hatje Cantz, 2020).

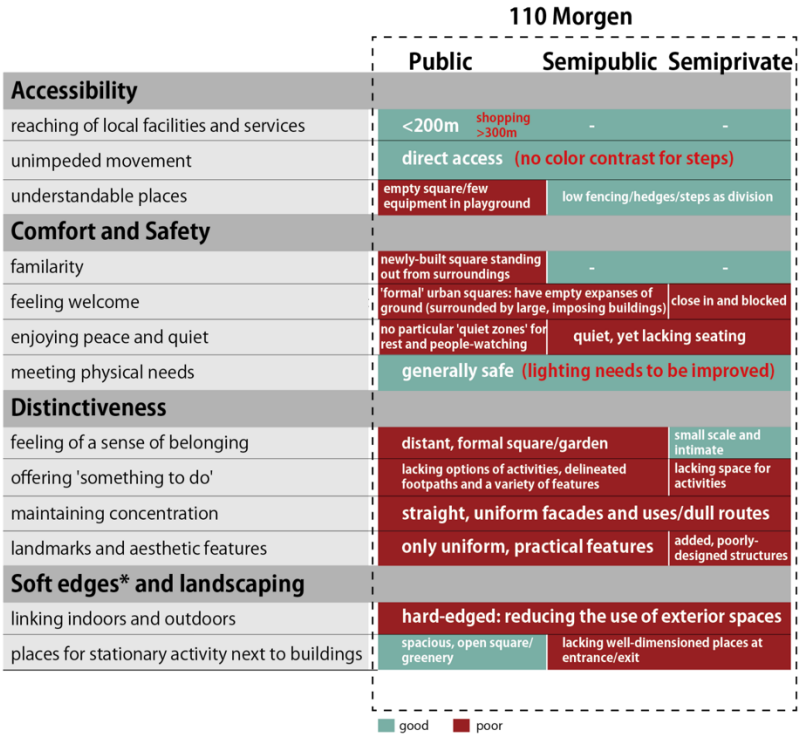


Table 6.6 The summary of spatial quality for social staying in 110 Morgen.

In conclusion (Table 6.6), the spatial design and quality of social staying in 110 Morgen can be seen as *closed* in general. Neglecting proper designs for comfort, distinctiveness and soft edges, social staying can render communal spaces difficult, inhospitable, or impossible for older people to use.

6.4.4 Case study 2- site analysis for *Liduinaplein*

Aside from 110 Morgen itself, another case study – *Liduinaplein*, is processed following similar steps. To understand social mobility and social staying from neighborhood scale, it is essential to comprehend how different spatial qualities within the same district influence older people's movement and daily life according to design principles.

As one of the nearest neighborhoods to 110 Morgen, however, the elderly residents in Liduinaplein are ageing with completely different settings and challenges (Figure 6.39). Generally, the typology of dwelling is simple and uniform, including detached housing, three galleries of four floors, and only one 8-storey apartment as a nursing home for the elderly. Compared to 110 Morgen, Liduinaplein has a more ideal proximity of primary facilities, such as local shops, public transportation and pocket parks, and more lively communal spaces, yet

more difficult streets. Research for this neighborhood would further show how design can make outdoor spaces more amenable to people as they age, or make them less enabling.

Figure 6.39 The site plan of Liduinaplein.

1) Social mobility – streets

From the fieldwork in the neighborhood, many outdoor streets may be distressing or even dangerous for older people because they are difficult to navigate in many ways. For example, the poorly-maintained paving appears to be a serious problem (Figure 6.40): uneven and broken brick tiles can be found everywhere, which annoyingly disrupts pedestrian routes.

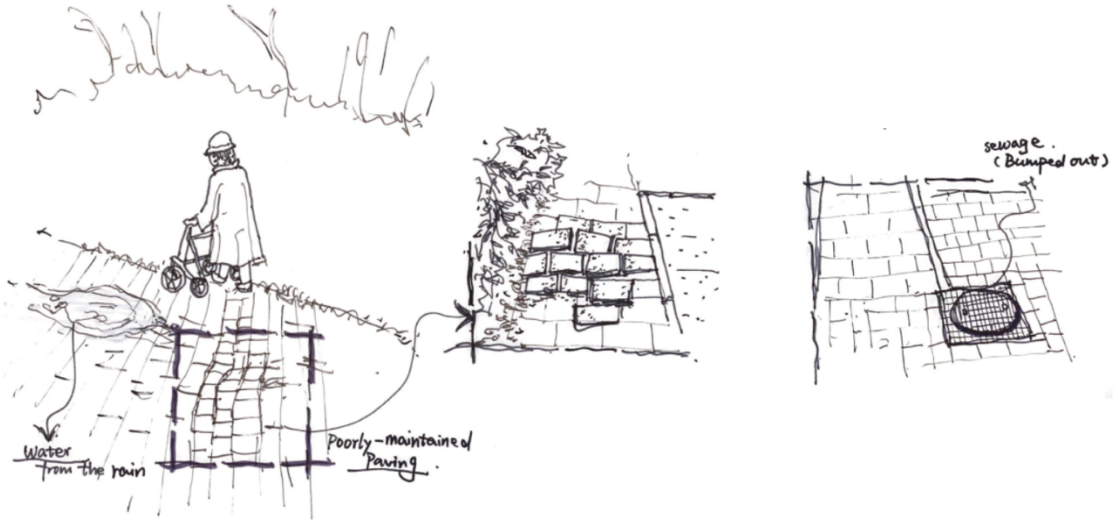


Figure 6.40 The dangerous pavement within the neighborhood.

The main motorized road is also inhospitable for older people: without proper sound buffers, the noisy drone of heavy traffic affects their quality of living on a daily basis; and the crossing turns to be threatening because there is an only ambiguous traffic island, yet no obvious visual or signal guide (Figure 6.41).

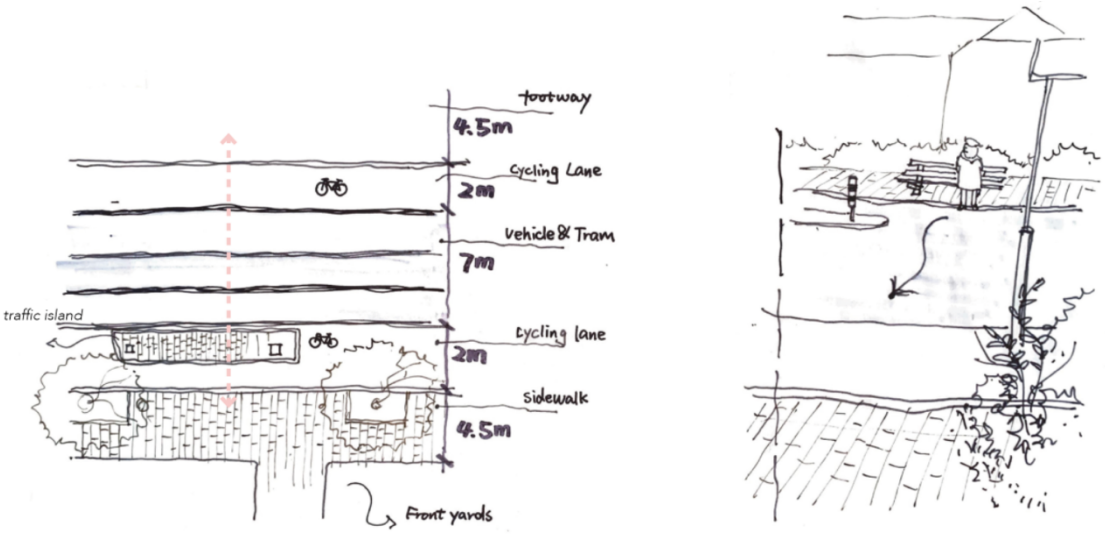


Figure 6.41 The dangerous road crossings.

What's worse, messy parking spaces contribute to the obstacle for pedestrians, especially older ones: the common scene of cars parked right on the sidewalks during the day makes it inaccessible for wheelchairs (Figure 6.42).

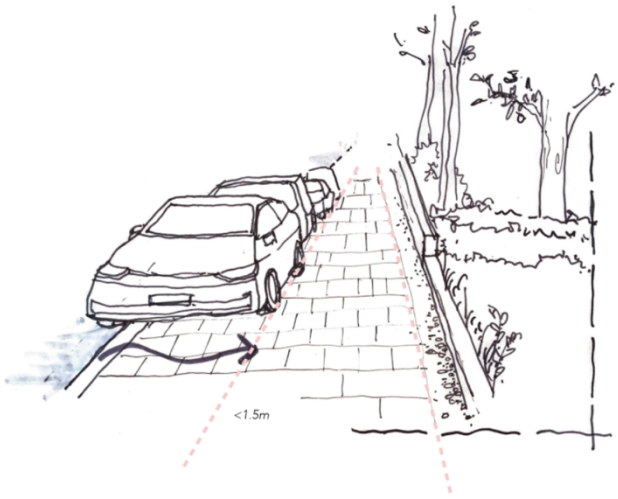


Figure 6.42 The obstacle on the sidewalks.

In conclusion (Table 6.7), the spatial design and quality of social mobility in Liduinaplein can be seen as *difficult* in general. The lacking of obvious elements, including footways that is safe and walkable in all weather, accessible pedestrian crossings, comfortable seating at intervals, leads to the elderly's fear and feelings of vulnerability. As a result, older people are more likely to avoid going out, especially after dark and during the winter months.

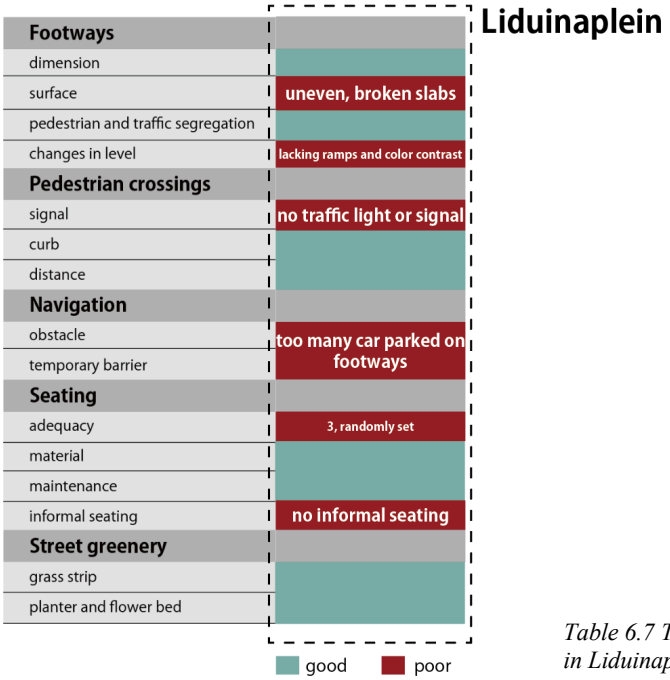


Table 6.7 The summary of spatial quality for social mobility in Liduinaplein.

2) Social staying – communal spaces

Compared to 110 Morgen, social staying in the neighborhood seems promising in many aspects thanks to a better consistency to design principles. For example, moving through the shops on the ground floor along sidewalks near the southern edge, people are also experiencing pleasant social interactions: the needs and preferences of the elderly are taken into account with soft-edged facades (Figure 6.43), including overhangs for sheltering, comfortable public seating, and plenty of flowerpots in-between; in order to improve the aesthetic experience of those daily errands, as well as serve practical purposes such as aid for orientation, there are changes in textures, varied forms of entrances and decorations provided.

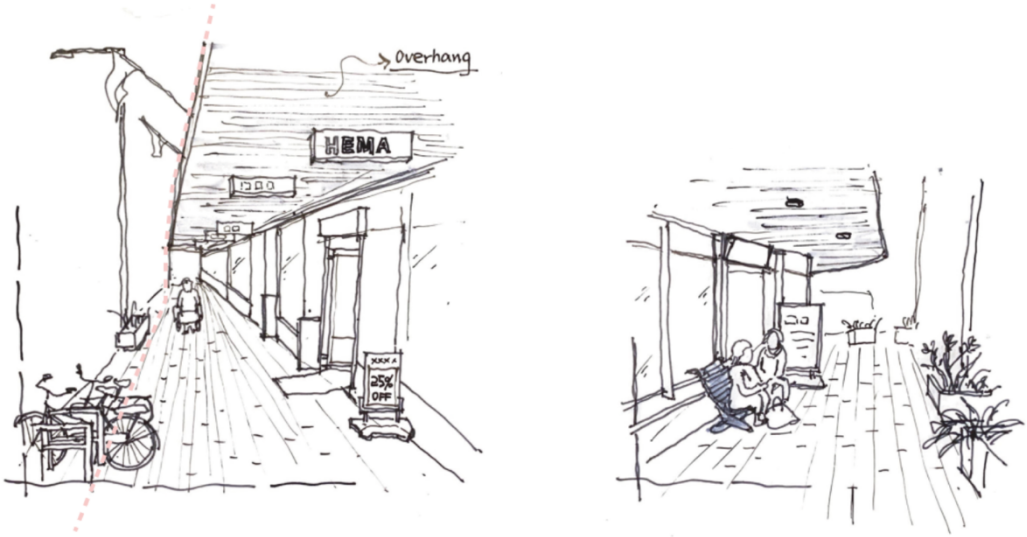


Figure 6.43 The soft edge of public facilities.

On the other hand, the softer edge between neighbors offers easier accommodations for the kind of casual acquaintanceships, chance meetings and shared uses (Figure 6.44): visual connections over fences, self-decorated front gardens, people resting in the strip of shade under the awning, can all become the trigger for conversations and further social contacts.

Figure 6.44 The soft edge between private dwellings.

In conclusion (Table 6.8), the spatial characters of social staying in Liduinaplein can be seen as *lively*. Generally, spaces for social staying are designed with awareness of how older people can be included. Those near-home communal spaces form a bridge between the private dwelling place and the wider community, offering the elderly extra atmospheric qualities and stimuli to go out and greet others.

	Liduinaplein
Accessibility	
reaching of local facilities and services	<5min
unimpeded movement	unmarkd level changes
understandable places	
Comfort and Safety	
familarity	bench facing flower pots organised bike parking
feeling welcome	
enjoying peace and quiet	
meeting physical needs	poorly-maintained paving
Distinctiveness	
feeling of a sense of belonging	overhang for a sense of closure
offering 'something to do'	lively, mixed use places
maintaining concentration	niches of facade for staying
landmarks and aesthetic features	huge display windows/logos/ads
Soft edges* and landscaping	
linking indoors and outdoors	frontyards with inviting porches lower hedges for visual connection spacious area for chatting
places for stationary activity next to buildings	

good poor

Table 6.8 The summary of spatial quality for social staying in Liduinaplein.

6.5 Connecting in *building* scale - detail design within buildings

Previous research suggests that the extent to which a closer social connection develops within a building is related to spatial qualities of social mobility and social staying. And this chapter aims to define strategies of improvements for the 'outdoor' environment other than private realms inside a building (Figure 6.45). Those design principles and variables identified to have the most significant impact on the elderly's well-being and social behavior are discussed respectively in the following parts, as a general design guideline for directing to a better match to the users, and exploring alternative solutions (Sandra, 1980).

The guideline based on literature review is used as performance criteria of critical variables involved in the design of elderly homes, and efficient design strategies or suggestions for more usable spaces within the building. To be more specific, the guideline provides the barometer primarily fitting to medium elderly homes in urban settings.

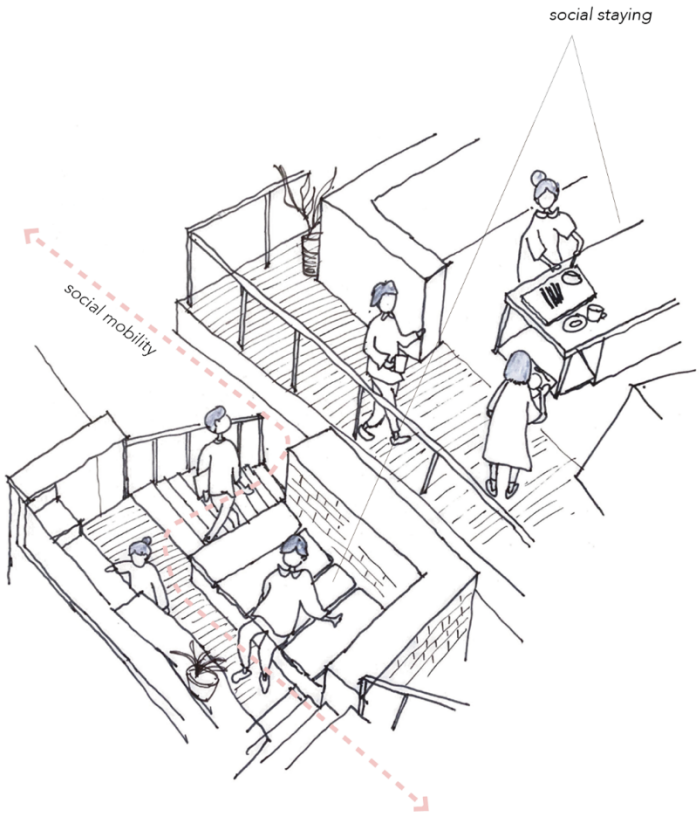


Figure 6.45 Diagram showing the social mobility and social staying within a building scale.

6.5.1 Social mobility - circulation area

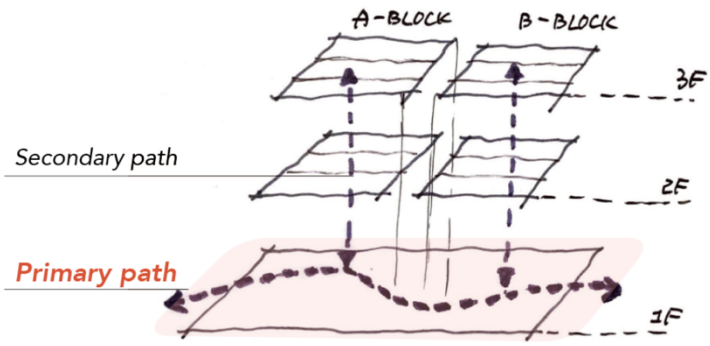


Figure 6.46 Diagram showing the definition of circulation area.

Similarly, the interior spaces within the building can be analyzed in terms of social mobility and social staying. Under building scale, spaces of walkability are defined as the circulation area, which could be more specifically classified into the *primary path* and *secondary path* (Figure 6.46). As Table 6.9 shown, a series of crucial design strategies pointed out from literature reviews can be used in this study (Howell, 1980).

Table 6.9 Detailed design guidelines of the circulation area for the elderly home.

Key Design Factor		Key Design Strategy
Primary path	Dimension	a main route at the length of 9m-24m, from the main entrance to elevators
		long, and wide enough to accommodate daily traffic
	Mail area	located near the main route
		extra (small) area off of the main route, separating traffic flow and mail pick-up
	Elevators	within easy, direct access
		not located directly inside the main entrance
	Waiting area	located near the front entrance
		comfortable seating, and a view of arriving vehicles
	Observation area	opportunities for watching activities near the front entrance
		(partial) visual blocks provided
Secondary path	Dimension of corridors/hallways	length - less than 30m, avoiding long walking distance
		width - wide enough for providing transition between units and the circulation area
	Personalization of doorways	widening corridors or articulating unit entries
		freedom of decoration and furnishings for residents
	Orientation	signs and graphics to identify both floor and unit locations
		natural light *(e.g. windows)* near the elevator and on residential corridors
	Floor lounge area	equally accessible from all corridors on a floor
		visually separated from elevator lobby and private units

The *primary path*, is the main circulation area within the building where most daily coming and going activities occur. It is the routes travelled most by residents as they go in and out of the building, including the circulation path between main entrances to elevators. Aside from traffic of arrival and departure, other typical functions and activities related to this space are

distributing mail and delivery, orienting visitors, waiting for vehicular arrival, and watching others come and go.

1) Dimension

Generally, the primary path should provide enough length and width to accommodate the daily traffic of residents, as well as the possible activities and behaviors related to those comings and goings without creating congested areas, especially for the elderly using wheelchairs or walkers. It is suggested that the main route from the front entrance to elevators should be at a length from 9m to 24m.

2) Mail area

The area for mail and delivery pick-up is better to be located near this main route, which makes it easier for the elderly to check their mailboxes regularly on the way in and out of the building. For better experience and comfort, it is recommended to separate the flow of traffic from mail checking. Simple strategies, such as an extra small area off of the walking route, could allow both activities to happen at the same time.

3) Elevators

The elderly prefer easy and direct access to elevators, especially when returning home with bags after grocery shopping. However, for safety concerns, elevators should not be located directly inside the main entrance. Otherwise, it is likely for some residents to worry that unwanted visitors can easily slip to the residential floors as well. In addition, wall space for information and announcements should be provided along the route to the elevators or be postered right by them, in order to be readily seen by as many residents as possible.

4) Waiting area

Considering the physical decline with advancing age, many older people have to depend on others for driving. And there is a need to be as close as possible to the front entrance when waiting for their rides. With comfortable seating and a direct view toward the outside, this waiting area can be well-designed for a longer stay.

5) Observation area

Research shows that observation of the congregating near the main entrance is considered as an enjoyable routine for many elderly residents. A proper space for watching a variety of people, and coming and going activities near the entrance should be included. However, it is also suggested that (partial) visual blocks should be provided for those who prefer to enter or leave the building without being watched. For instance, plants, columns or walls that keep this sitting area distance from the primary path can be useful to minimize that unnecessary offensive

surveillance. In many cases, the watching area can be shared by those waiting for rides, which could encourage opportunities of informal social interactions among neighbors (Figure 6.47).

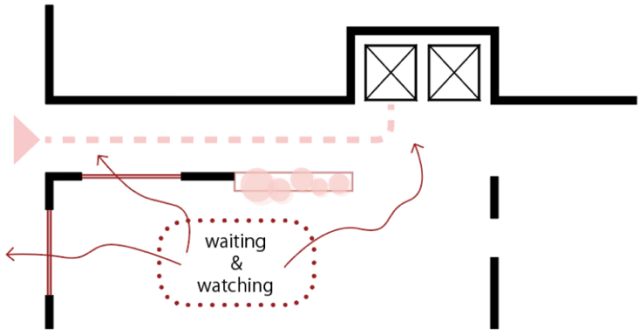


Figure 6.47 Diagram showing a typical option of primary path.

The *secondary path*, refers to these circulation areas used as access to living units, and as informal socializing spaces occasionally. It includes corridors, elevator lobbies and lounges, on each residential floor or within each residential group. Since the secondary path is immediately outside the private door and considered as the beginning of 'home', it is common that the elderly want to personalize it in different ways. Therefore, it makes those areas more intimate, and convenient to trigger more casual contacts with neighbors.

1) Dimension of corridors/hallways

Long corridors are well-perceived as not residential and should be avoided in elderly homes. Based on previous research, residential corridors appear optimal when they are less than 30m in length. The reason includes both physical and psychological concerns: on one hand, many residents have difficulty walking long distances with ageing; on the other hand, the formal, intimidating character of long corridors discourages the elderly to wander about because it often reminds them of hotels or unattractive office buildings. Besides, the unsuitable width of hallways contributes to a gloomy appearance as well: once hallways are not wide enough for transition areas between the circulation and living units, the 'tunnel effect' of depressingly straight, narrow corridors would be aggravated.

2) Personalization of doorways

Rather than circulation only, there appears more personalization of each unit entry when those transition areas are available in-between. Doorways become spaces similar to the front porch inside private homes, where residents often 'self-design' as an indication of personal territory. The freedom of decorating doorways leads to a stronger place-attachment for elderly

residents, when a variety of possible personal furnishings are allowed: coloring, wall lighting or other wall decorations, rugs, plant stands, seating, and furniture for putting bags or packages on when looking for keys (Figure 6.48).

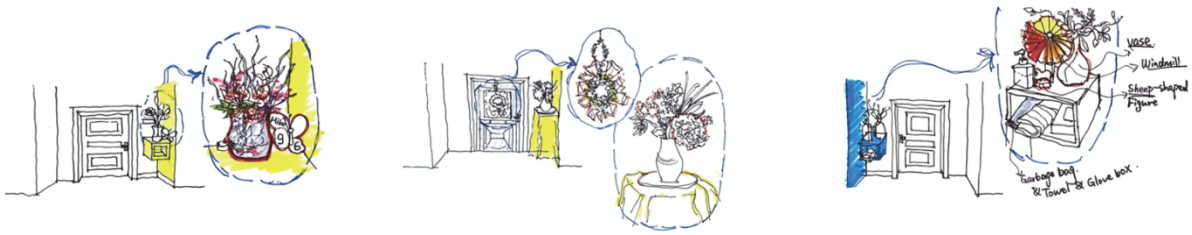


Figure 6.48 Examples of self-decorated doorways in 't Nieuwe Kampje, Loenen.

3) Orientation

The confusion caused by floor numbers and unit location is considered a common yet disturbing issue for elderly residents and visitors, sometimes even caregivers or other supportive staff. For example, in buildings with similar floors, it is often difficult for visitors to identify the right corridor after leaving the elevator; especially for the elderly with loss of short-memory, they are more likely to go to the right unit location yet on the wrong floor and be overwhelming embarrassed by the inability to get in their own homes. Well-designed orientation by means of clear signs, graphics and color coding can alleviate those problems. Other solutions include sources of natural lighting placed near the elevators and inside corridors as the guide, such as windows or skylights, providing visual relief and ventilation at the same time.

4) Floor lounge area

Floor lounge spaces on residential floors or within residential groups are a necessary part of the circulation area, for they can facilitate casual meetings among those who share the same semi-private zone. These lounges are supposed to provide more private spaces that can serve as an alternative for small gatherings, when the elderly want to enjoy company yet choose not to entertain inside their own home or go to more public spaces. Particularly for some of them who want a change of environment from private units, the lounges can be their ideal choice with different and convenient settings

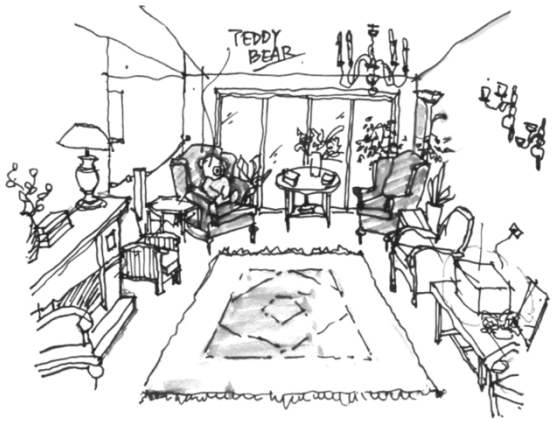


Figure 6.49 Example of lounge areas in 't Nieuwe Kampje, Loenen.

(Figure 6.49). While being equally accessible from all corridors on a floor, lounges should be visually separated from elevator lobbies and private units: visual connections to elevators are supposed to be minimized to protect the privacy of both lounge users and those passing by; similarly, the adjacent location to living units should also be avoided, in order to keep the privacy of 'home'.

6.5.2 Social staying - communal spaces

Compared to the neighborhood scale, communal spaces within the building refer to those social staying zones outside residents' living units, which are designed to accommodate the social and leisure routines of the elderly. According to the spatial typology defined in this study (see Chapter 6.2), typical spaces and rooms include:

- *public zone*, e.g. central meeting hall, open to all visitors;
- *semi-public zone*, e.g. community room, pool room, arts and crafts area, gym, and library etc., shared by all residents;
- *semi-private zone*, e.g. TV lounge, open living room and kitchen etc., shared within the same residential floor or group.

Table 6.10 Detailed design guidelines of communal spaces for the elderly home.

Key Design Factor		Key Design Principle
Location	Centrally-placed within the building	public/semi-public: at ground level
		semi-private: if on upper floors, be close to greatest resident movements
	Minimal distance to the circulation area	located close enough to the primary/secondary path
	'Unforced' relation with the circulation area	a physical distinction in-between
		(where possible) extra optional path for walking by
Differentiation	Space arrangement of various events	clustering primary and secondary functions
		including outdoor extensions for use
	Circulation among communal spaces	easy physical access, encouraging social interaction
		without distractions to activities
	Various settings	different levels of interaction with surrounding areas for varying private needs
Size	Current/anticipated program requirement	more spaces is needed: available to the surrounding neighborhood as meeting points
	Size of the resident population	0.7 m^2 of primary function (formal and structured activities) per resident
		0.5 m^2 of secondary function (informal and smaller group activities) per resident
Visual Connection	Between the circulation area and communal spaces	visual access without requiring residents to enter communal spaces
	Between communal spaces	visual access for being aware of activities in other areas
	Between communal spaces and outdoor activities	location of communal spaces with a view of outdoor activity
	Forms of connection	low enough openings (glazed and unglazed) for seated individuals
		visual buffer from pedestrian activity
	Visual privacy	minimizing offensive surveillance

Based on previous research (Table 6.10), the design guideline for social staying within buildings is further elaborated in terms of these aspects of the space appearing to have the most influence on the elderly's behavior: *location*, *differentiation*, *size* and *visual connection*.

1) Location

The proper location of communal spaces within the building plays a key role in the development of closer social connections, while interactions between residents are encouraged instead of being forced (Figure 6.50).

It is essential for communal spaces to be centrally-placed within the building, especially public zones and semi-public zones being located at ground level. Because in general, many of these activities in communal spaces result from residents stopping by on their way in and out of the building, and location on the ground floor brings the elderly closer to those activities. It also allows them to stay and watch the activities of others both inside and outside the building as an enjoyable pastime, while a communal space isolated on an upper floor is comparably underused. However, if semi-private zones shared on upper residential floors are needed, it is recommended that they are where the greatest resident movement is.

Besides, it would be better to keep those communal spaces within a minimal distance to the circulation area, particularly be close enough to the primary path to increase their frequency of use. Being able to see or hear others when passing by, elderly residents can be easily attracted to the ongoing events without the excessive commitment of time or effort.

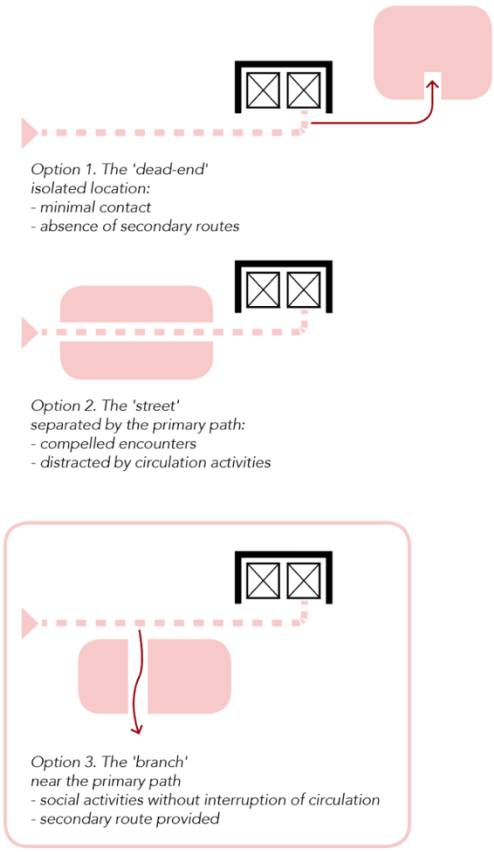


Figure 6.50 Diagram showing options of location.

However, the elderly prefer the available opportunities for social connections, rather than those forced upon them. This 'unforced' relation with the circulation area should be provided by avoiding the primary path being led directly through communal spaces, serving residents the option for circulation with little risk of unwanted encounters. For example, a physical distinction in-between can provide the protection from

interruptions and busy traffic. Where possible, an extra optional route through communal spaces can facilitate drop-in activities, by increasing possibilities of walking by those areas on the way to other destinations.

2) Differentiation

Communal spaces are supposed to be able to spatially support a wide range of events and activities. For example, typical larger group events include meetings, dining and games in which most of the elderly residents are involved; while playing cards, private birthday parties, entertaining family, or just gathering for casual chats and other events, mostly happen among smaller, informal groups. Except for primary rooms spacious enough for 'formal' group activities, communal spaces of secondary functions are necessary as well, to accommodate settings for those smaller groups and intimate gatherings. Therefore, the differentiation of scale, mood, and furnishings according to these various functions is important when designing communal spaces.

Dynamic interactions among communal spaces depend on proper space arrangement, which encourages the flow of activities and people in-between. One of the strategies is clustering different spaces to increase the likelihood of frequent use by providing more options for the elderly. A stronger sense of togetherness can also be generated by clustering: elderly residents are aware of others being close by, engaging in different things, but sharing in the overall sense of community. Besides, an outdoor extension for use of the interior cluster should not be overlooked especially when weather permits, since there is a huge appreciation of nature among older people.

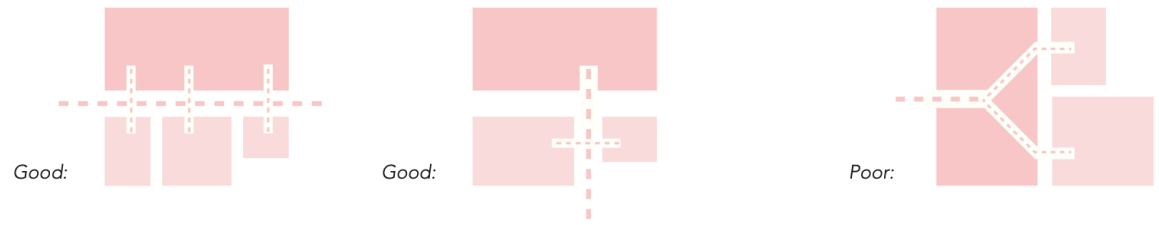


Figure 6.51 Diagram showing circulation between communal spaces.

Easy physical access promoting social interactions among clustered spaces is necessary. However, in order to allow events and activities to take place simultaneously in different spaces without distractions from comings and goings, the circulation between them should be well-defined, especially not requiring route directly through main rooms (Figure 6.51). In terms of the settings of communal spaces, identical or similar areas for smaller group activities should

be avoided since the privacy needs vary from different activities and group sizes. For example, some activities invite and benefit from interaction with other groups and passersby; while others prefer fewer outside distractions. And this differentiation should be consistent with the degree to which communal spaces are open to surrounding areas.

3) Size

The proper sizes of communal spaces differ according to the population of residents and current or anticipated programming requirements. In this study, the guideline is particularly suitable to sites where communal spaces of the elderly home are accessible and shared within local neighborhoods for gatherings and meetings. As a result, relatively more areas are recommended. In general, spaces primarily used for larger, more formal and structured gatherings like meetings, performances, games and parties, should be around $0.7m^2$ per resident. Sufficient spaces for these large-scale activities make the circulation easier and avoid overcrowding that may discourage some residents from active participation. However, even the primary spaces should not be too spacious, or it will lead to misunderstandings that any differentiation of spaces is not permitted within the larger area for small groups. Useful strategies for making primary spaces flexible enough to accommodate gatherings of different scales include: changes in ceiling height or surface materials, column placement, changeable divisions and continuity with adjacent space.

For communal spaces of secondary functions such as sitting area, TV lounge, crafts or reading room for informal, smaller meetings, the optimum area should be around $0.5m^2$ per resident. Sufficient and clear-defined secondary spaces could make sure that certain activities, particular residents' interests, and possible changes over time are all included. Besides, too huge spaces will also decrease the frequency of their use.

4) Visual connection

It is noted that creating visual connections between communal spaces can efficiently facilitate casual interaction among neighbors, by allowing both those passing by and staying to have a clear view of what is happening around them. The visibility within the communal space itself, and those between the space and its immediate circulation areas, is highly-needed. Once the elderly are able to find out the activities in other areas without entering, the chances of them dropping in and joining will increase. And they are more willing to circulate within those spatial clusters. The visual connection between communal spaces and the outdoors is essential as well, allowing the elderly inside to establish passive interactions with those passing by outside. This visual access can be achieved by the location of communal spaces with a nice view of outdoor activities.

Considering the form of visual connections, a variety of glazed and unglazed openings can be used. And it is suggested to keep these openings low enough for seated individuals, and to provide a visual 'buffer' from pedestrian activity as well, like trees, bushes or an overhang (Figure 6.52). However, too many visual connections may cause problems, for some residents feel uncomfortable and nervous with unnecessary eye contact. This requirement of visual privacy should also be taken into account to reduce annoying tensions between residents, and further, underused areas within the building.

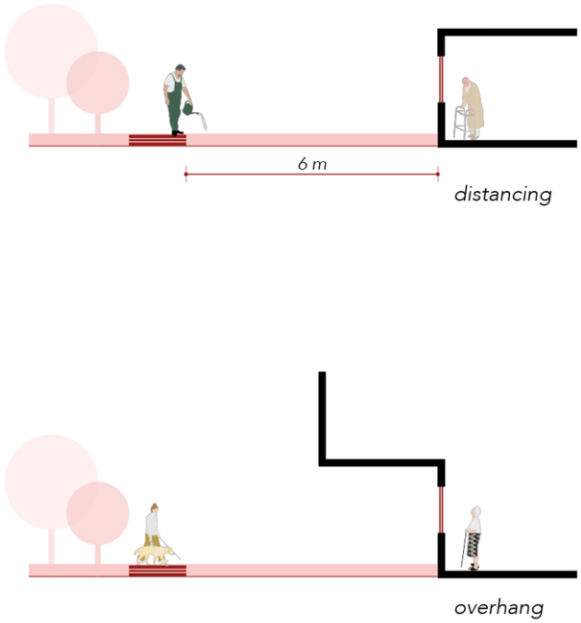


Figure 6.52 Diagram showing optional forms of 'visual buffer'.

6.5.3 Case study 1- *De Drie Hoven*

Based on the notion of important design principles as above shown, two cases - *De Drie Hoven* and *De Zonnetrap*, will be analyzed according to those guidelines for deeper understanding and inspiration in the following discussion.

Figure 6.53 Bird's eye view of the original De Drie Hoven complex: showing the pinwheel configuration of the buildings.

De Drie Hoven, the complex designed by Herman Hertzberger, was built west of central Amsterdam between 1964 and 1974. It is described as a 'center for the elderly', combining functions for independent housing, a nursing home with a lower degree of care provided, and a full-care home for rehabilitation (Figure 6.53).

The original design is consisted of four independent dwelling sections and three courtyards around a central building, with the aim of smoothing the transition from one to another for residents and visitors (Figure 6.54). Since many elderly residents have limited opportunities to go to the city center on regular basis due to their physical or mental problems, the idea is to 'bring the city inside the buildings' to let daily social events flow through. [32] Those

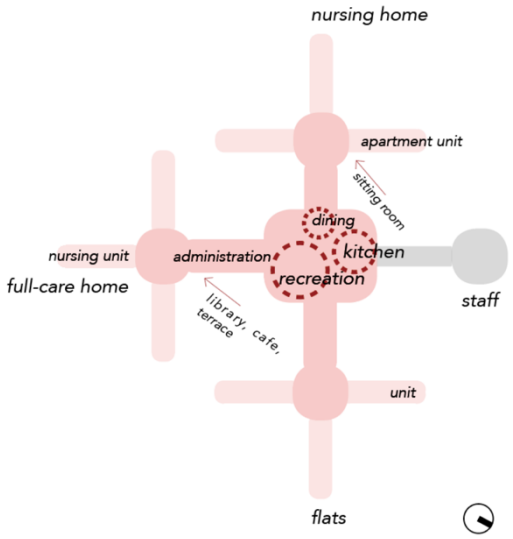


Figure 6.54 Diagram showing the program and functions of the complex.

[32] Peter Buchanan, "Revisit: Herman Hertzberger's architecture and influence," *The Architecture Review*, December 12, 2018.

creative design attempts for this vision are closely related to the topic of fostering social encounters and served as a successful example according to the guideline.

1) Communal spaces

- Hierarchical structure of spaces

Based on this principle of 'maximum social interchangeability', Herman Hertzberger is able to establish a logical hierarchy throughout the buildings for communal spaces, which reflects and supports the structure of sociability. Spaces outside dwelling units are divided into a large community center ('city square'), smaller gathering areas ('group squares') and corridors ('inner streets'), resembling various levels and scales of arenas for social life: *home* > *doorway/gallery* > *dwelling group* > *neighborhood* > *district* > *city* (Figure 6.55). The complex is separated into a series of wings, each of which functioning around its own 'focus' for meeting in the middle; and those different wings are linked together again in the central building. In this way, every service is accessible within a relatively short distance, so that daily unplanned activities and additional communal life can naturally develop from any scale desired by elderly residents.

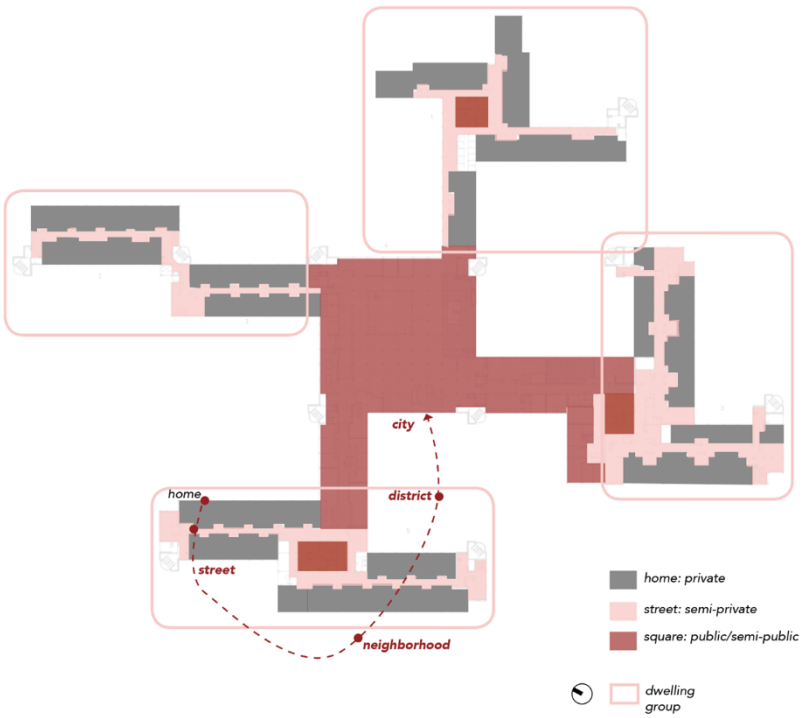


Figure 6.55 Diagram showing the hierarchy of interior spaces.

- The ‘city square’ (Het dorpsplein): *social heart* of the De Drie Hoven residence

As the main entrance, the central building contains major facilities for the entire complex. Located on its main level (the second floor), *Het ‘dorpsplein’* - the city square, is the social heart of the whole complex directly bonding four different wings together. Dominated by a continuous open area with voided atrium in the middle, the square can easily accommodate the largest gatherings such as parties, concerts, dance performances and exhibitions (Figure 6.56). This central recreation area is subtly defined by a series of columns and the change of height (Figure 6.57), which separate it from general circulation but still maintain convenient access from every direction. As a result, the daily comings and goings of residents and visitors do not interfere with ongoing activities.

Figure 6.56 Gathering of the central recreation area.

Figure 6.57 Interior view of the ‘city square’.

Aside from the primary function and more formal setting, there are smaller social spaces ‘branch’ off the central area and are divided by different forms (glass doors/low walls etc.) with different degrees of enclosure and visual connections. Those zones cover shop, café, pool room, hair salon, library, open terrace and other facilities, with a range of specific settings: for example, the pool room and library are large, open spaces that can be entered at multiple points across the hallway; while café with its glazed door that can be closed off offers more group privacy. The clustering contributes to almost a continual use of this square by residents on a casual and informal basis. And very little effort is required to check out activities within the square because of the immediate adjacency to the primary circulation. A great deal of interaction is allowed between activities in different zones because the distance between them is minimal so that the elderly can easily move from one to another (Figure 6.58).

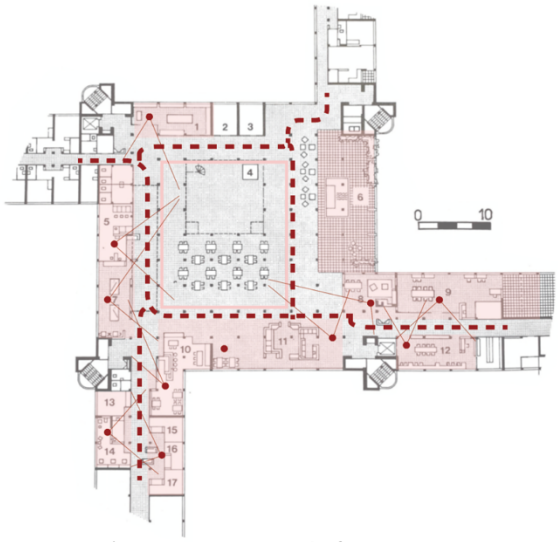


Figure 6.58 Diagram showing space arrangement and visual connections in het 'dorpsplein'.

2) Circulation area - '*inner streets*'

One of the most impressive strategies that could be learnt from the project is the corridors - 'inner streets', which served as active in-between spaces mediating residents' private living and their social life outside. To maximize the scope of social interactions, the elderly can find opportunities for delight encounters in all kinds of corners, openings and even staircases on every scale. By means of various niches, degrees of glazing, and informal sitting areas carved along the path, corridors are elaborated in different and creative ways for each dwelling wing to develop social contacts.

Instead of long, narrow, uninviting 'tunnels' that look alike with no sighs of hominess, these widened, intimate 'streets' are functioning as the extension of dwelling units and the bridge between the private and public realm. Taking the south wing as an example, it is noted that corridors in this nursing home section are opened up as different service spots for short, casual

stays all the way. The coffee corner and pantry area formed at the end of the route, together with small 'common living rooms' cut in-between units, are alternative socializing spaces closer to the elderly's own home for chatting or staying (Figure 6.59).

The detailed design takes resident's comfort into consideration as well: the windows right next to the elevators provide natural lighting, visual relief from the monotony of traffic, and orientation to the outdoors; resident personalization can be more evident in the enlarged, naturally lit corridor space, where the wall surface and caved areas along the hallway invite any personal furnishing outside and doorway decoration (Figure 6.60); front doors, the top half of which can be opened separately, generate visual connection and informal interactions with neighbors (Figure 6.61); patio areas also benefit circulation spaces, accessed through large glazing, that enables the elderly to spend time outside in the summer months and let light flood in during the colder months (Figure 6.62).

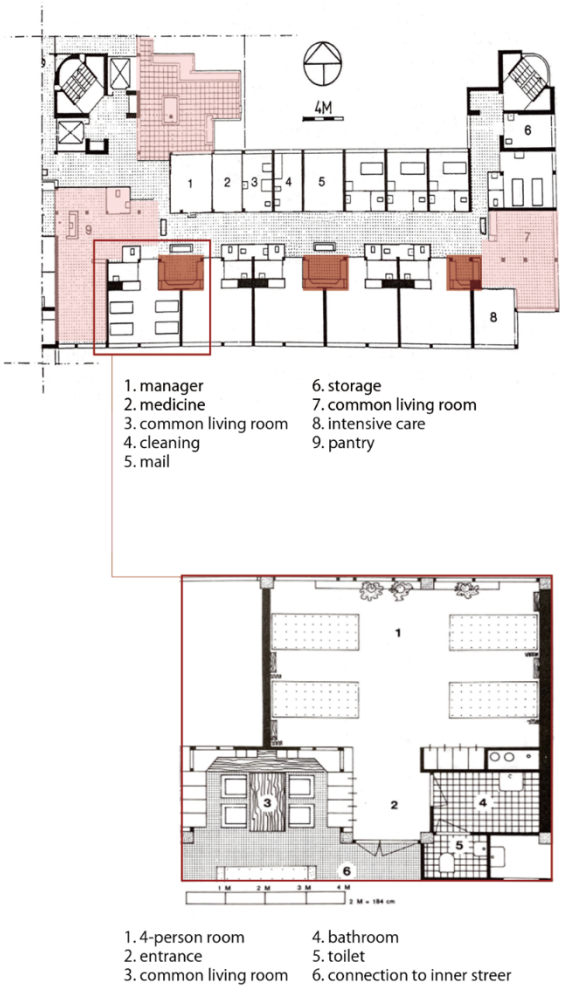


Figure 6.59 The 3rd floor plan & 4-person unit of the full-care home.

Figure 6.60 'Streetscapes' of the corridors.

Figure 6.61 Half-opened front doors.

Figure 6.62 View of the exterior patio.

6.5.4 Case study 2- *De Zonnetrap*

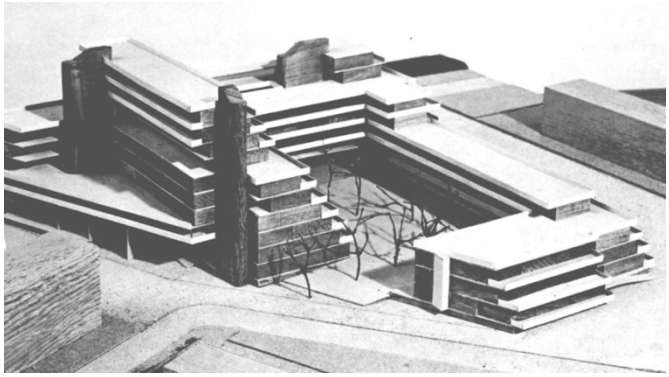


Figure 6.63 Bird's eye view of De Zonnetrap complex.

As a retirement complex in Rotterdam, *De Zonnetrap* is designed by Enrico and Lucia Hartsuyker in 1970. The project is consisted of three blocks of different heights with five, seven and ten floors respectively, providing 179 elderly homes and facilities for the whole neighborhood. The housing units located on the south, west and east side, are arranged in an impressive form of steps (Figure 6.63).

1) Communal spaces – *multifunctional hall*

Behind and below the apartments, a large hall combined with public facilities and workplaces is placed. This central hall is a public area, including offices, studios, workshops, hobby areas, meeting areas, billiard room, shops, bank, café, snack bar and nursery etc. The diversity of users and functions successfully promotes a lively environment like a 'city' (Figure 6.64). This remarkable hall open to residents and local neighborhood, it stretches the spaces of infrastructure and circulation to provide opportunities for random encounters between people. The hall becomes a spatial instrument that allows people to get acquainted with one another during daily routines, while gradually introducing them to a variety of public engagements.

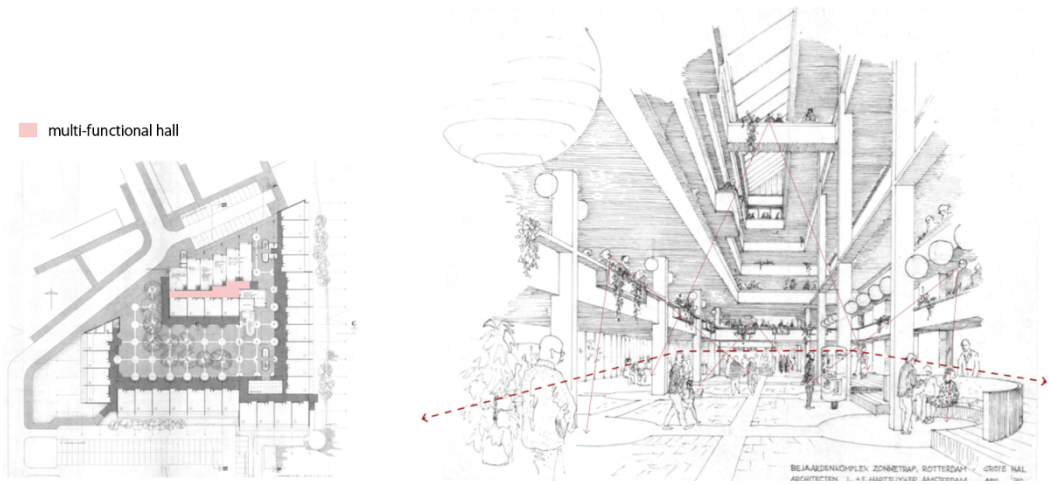


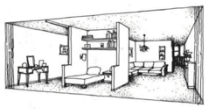
Figure 6.64 The public hall of De Zonnetrap complex.

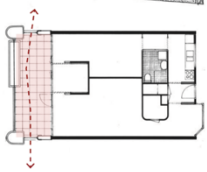
2) Circulation area – *corridor* and *terraced balcony*

Within the building, there are semi-public corridors as walking routes where neighbors could meet (Figure 6.65). Instead of corridors generally designed with maximum efficiency by being reduced to the basic function of the movement itself, those transitional spaces provided by semi-public corridors can encourage someone to gradually invite others or gradually be invited.

Figure 6.65 The interior space of circulation.

One of the most striking design strategies of the project is the terrace. Those spacious terraces have gates through which residents could reach their neighbors, as another close connection within outdoors (Figure 6.66). More importantly, terraces with better outdoor views offer older people 'restorative' opportunities by 'taking in' some of the liveliness that unfolds before their eyes, creating a social space that encompasses their dwelling/sitting rooms and immediate living environment.[33] For the many elderly who, due to reduced competence or environmental hindrances, are unable to go outdoors without assistance, the encounter offered by gazing out might constitute the only access to public life. And this visual contact at a distance is a routine inside the home, that is related to daily life events outside the home.[34]





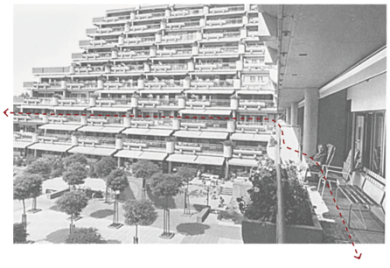


Figure 6.66 The exterior space of circulation.

[33] Kaplan, Rachel, "The Nature of the View from Home: Psychological Benefits," *Environment and Behavior* 33, no. 4 (July 2001): 507–42. https://doi.org/10.1177/00139160121973115.
[34] Lisa Roovers, "The home: A cage or a castle? The significance of home in the lives of two older people ageing in place in Nijmegen, the Netherlands" (Master diss., Radboud University, 2019).

Chapter 7. Conclusion

Figure 7.1 Connecting with the elderly in Loenen, Apeldoorn.

As a prevailing issue across all ages, social loneliness is especially diminishing the life quality of the elderly. Due to reduced social networks caused by the loss of friends or a spouse, sickness, or more or less forced relocation, many elderly people find themselves alone at some point in their old age. This research broadens our understanding of the spatial instruments of reconciling this upsetting ageing issue, by developing closer relationships among neighbors through inviting spaces. It should be emphasized that older people benefit both physically and mentally from being able to get out and about, to be together with neighbors.[35] In Denmark, public health advertisements promoting non-smoking have been replaced by campaigns that now state: "*Say hello to your neighbor – it makes a difference*." Intimate neighbors matter especially for the elderly, who are at higher risk of experiencing a serious decline in physical and mental health resulting from social loneliness.

To answer the elderly's stronger request of *ageing in place* with dense social networks, only making geographical and physical access to 'outside' spaces easier is proved to be not enough; while emotional attachment matters even more by expanding the idea of 'home'. This mental intimacy to 'outside' spaces is referred to the development of the sense of 'home': it "involves an intimate interweaving of persona and location over time that results in a sense of familiarity, comfort, and at-oneness with places that finds expression in many dimensions of a person's being in the world and is closely related to well-being" (Rowles & Bernard, 2013, p.11). Based on previous chapters, it is proved that architectural designs of social mobility and social staying can become ingenious devices to promote this process of attachment, "unless the relationship with their neighborhood is a troubled one, near-home public places form a bridge between the dwelling place and the wider community, providing the person with an attachment to society and interactions with 'the other' beyond the home, which we see as crucial to developing and maintaining well-being" (Peace & Holland, 2005).

7.1 Social mobility

Based on the research for social mobility, it is shown as a reasonable notion of expanding a great variety of social engagements within 'edges' between the public and private spaces. Since *the edge*, which referred to those transitional spaces between the private dwelling and its

[35] Sugiyama, Takemi, Catharine Ward Thompson, and Susana Alves, "Associations Between Neighborhood Open Space Attributes and Quality of Life for Older People in Britain," *Environment and Behavior* 41, no. 1 (2009): 3-21.

immediate living environment, is considered to be where numerous opportunities for more and closer social encounters might be developed, better social mobility through architectural designs allows active movement and staying in this domain.

With this general principle, various forms and examples of how social mobility could be facilitated spatially have been introduced in previous chapters. For neighborhood scale, promoting the elderly themselves to find a place that feels like 'home' through streets is central. The settings of the street can be decisive for the elderly's desire to 'step out' to participate in social relationships. For example, the flow of the pedestrian traffic between the periphery and center of the neighborhood that allows more subtle, informal, and intuitive movements, has the potential for them to easily overcome social boundaries and gradually come in contact with local neighbors; or sometimes delicately manipulates outdoor movements at the expense of the most efficient journey, in order to densify the web of opportunities for casual contact. On the other hand, for building scale, well-designed circulation areas including entrances, corridors and elevators etc., may offer an inviting context that more intimate interactions can be developed between residents. For example, aside from functioning as vertical connections, the staircase can be used as a homely place that allows the elderly to get familiar with one another during serendipitous meetings and other daily routines; the covered seating along corridors is another useful strategy that gives neighbors the possibility to visit each other frequently by visible receptivity, without intruding on their private realms.

7.2 Social staying

For social staying, the communal space is another key device that is openly shared with others, yet loosely connected to the familiarity of home at the same time. According to this study, to foster stronger social bonding among neighbors and other people who frequent the same places, inviting communal space is not limited to typical places such as large squares or parks anymore; it includes various forms of informal, minor sites as well. Potentially, any often-overlooked site of people's everyday lives, no matter its size or ownership, could become a lively gathering place through architectural design.

For example, infrastructural sites, empty corners within the neighborhood or the building, can be adjusted into spaces that facilitate meaningful contact: creating playgrounds combined with infrastructure; or embedding functions in public shortcuts to invite people to watch, linger and

stay. In this way, enjoying casual greetings, conversations, meetings and the comfort of recognition, neighbors, local residents, shop owners or even passersby can experience a stronger sense of belonging. And these daily repeated acquaintances have the potential of growing into more lasting relationships.

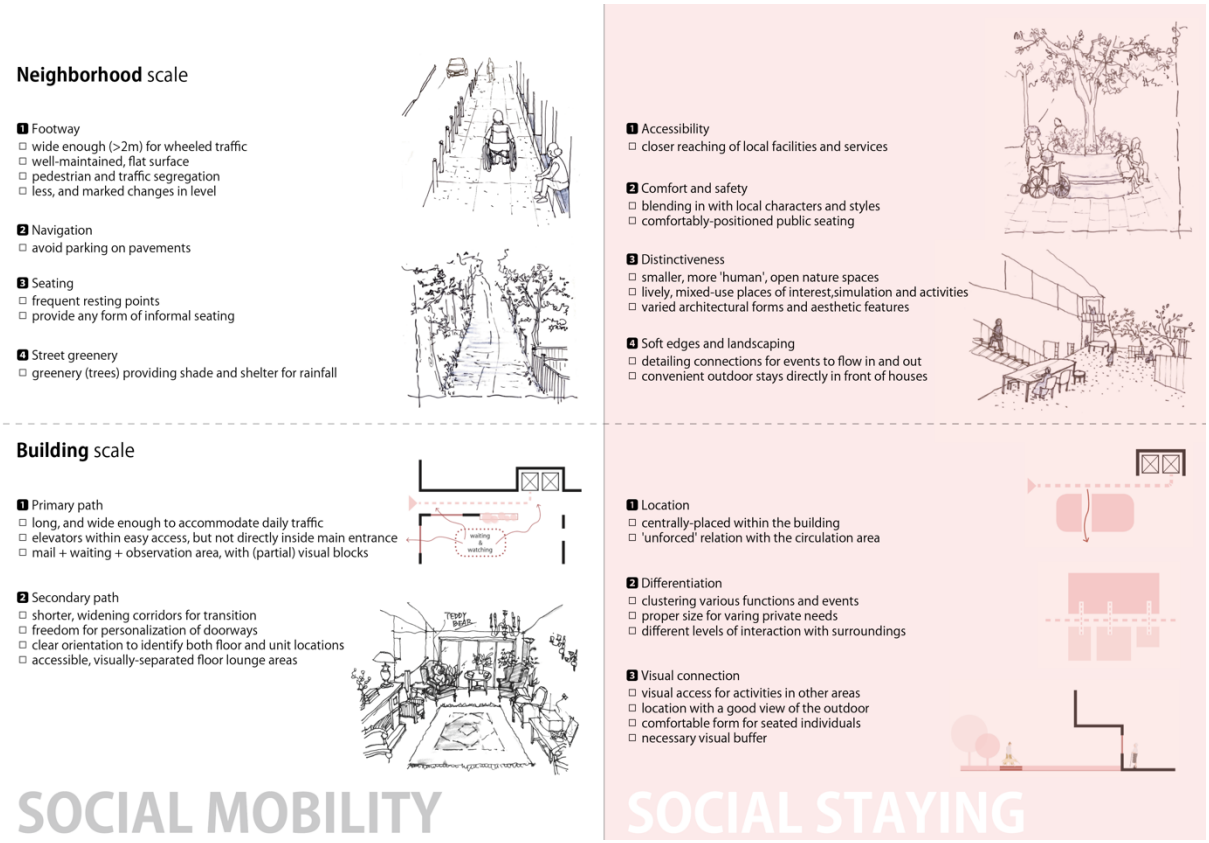


Figure 7.2 The conclusion of design strategies in this study.

The aim of this research is to reconsider elderly residents in the creation of a future living environment. As a handbook and conscious reflections of social loneliness, the conclusions provided in this study could be viewed as a compass to guide further design in the chosen site (Figure 7.2). However, the conclusions, for now, are the most fundamental choices and strategies regarding social mobility and social staying for the elderly, it remains all the possibilities of coming up with more concrete and site-specific solutions.

Image source

Figure 1.1, Figure 2.1, Figure 3.1, photos from

Mens, Noor, and Cor Wagenaar. *De Architectuur Van De Ouderenhuisvesting: Bouw Voor Wonen En Zorg*. Rotterdam: NAi, 2009. p.3, p.7, p.11

Figure 5.1, photo taken by the author, October, 2021. p.17

Figure 6.53, Figure 6.56 - 6.62, photos from

https://housingourmatureelders.wordpress.com/2018/11/09/case-study-de-drie-hoven/

Figure 6.63 - 6.66, photos from

https://www.bonas.nl/archiwijzer/gegevens.php?inr=0346.00004

Figure 7.1, photo taken by the author, September, 2021, p.66

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