

EMPOWERING AGING

enhancing mobility and social
connections for active aging



Research Paper – Mara Popescu – 5840287

Colophon

RESEARCH PAPER

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Designing for Care in an Inclusive
Environment (2024/25 Q1)

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Chapter 1

Introduction

1.1. Problem statement

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Abstract

Architectural and urban design can have an influence on active aging. The concept of active aging plays a role in the quality of life, by supporting a mental, physical, and social active lifestyle. It is not only influenced by healthcare or social services but also by the physical environments of daily lives.

A design focused on active aging can improve safety, facilitate movement, and encourage social interaction to reduce loneliness without excluding vulnerable groups, such as the elderly. Environments that are poorly designed can increase the risk of loneliness, isolation, and physical limitations, especially for vulnerable target groups.



Figure 1 - Tarwewijk (photo taken by the author)

Key words: active aging, aging in place, senior living environment, social infrastructure, mental and physical well-being

1.1 Problem statement

Tarwewijk is a neighborhood located in the Charlois district in the South of Rotterdam, with a population of around 12.000 residents(Wijkprofiel Rotterdam, 2023). The majority of these residents are aged between 27 and 35 years old, followed by a majority age group of 40 to 55 years old. Only a smaller percentage of the population is older than 65 years old. Throughout the years, the elderly population in the neighborhood has decreased significantly, reaching almost half of the population present in 1992 (Dashboard - Bevolking - Charlois, n.d.). While there is no clear reason for the low percentage of elderly, there are some factors present that can play a role, such as life expectancy, housing types and lack of nursing homes and elderly care facilities.

Active Aging

The life expectancy of the people in the neighborhood is lower compared to the average on a national level. In Tarwewijk, women are expected to live until around 80 years old, and men until around 74(Luijt, 2014). Lower education, access to the healthcare system, and unhealthy living conditions also affect life expectancy, as better-

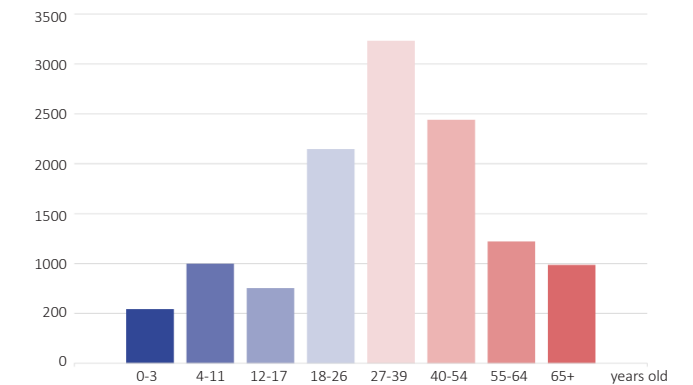


Figure 2 - age of residents (Wijkprofiel Rotterdam)

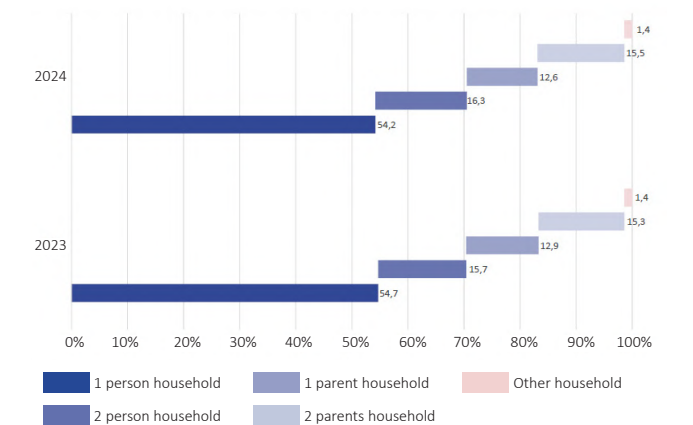


Figure 3 - Household type (Wijkprofiel Rotterdam)

educated people tend to have healthier habits and better access to jobs and healthcare (The Relationship between Education and Adult Mortality in the United States, 2024). Lifestyle factors such as diet, smoking, and lack of exercise and movement can also have

a negative impact on life expectancy. They can lead to heart diseases, cancer, and diabetes and shorten the life duration (ANNEAR et al., 2014). The unhealthy habits that lead to lower life expectancy in the neighborhood of Tarwewijk create an opportunity and a necessity for improvement and redesign focusing on active aging concepts. “Active aging” and “age-friendly” architectural and urban design follow principles based on accessibility, inclusivity, and adaptability, focusing on staying active both physically and mentally, and helping people grow old in a healthier way (ANNEAR et al., 2014).

Mobility limitations

The neighborhood is predominantly residential with low- and medium-rise buildings. Most of the building blocks consist of the portico typology and have three to four levels with no elevator. The portico typology causes accessibility issues, as it presents steep and narrow staircases that are not ideal for the elderly. The lack of elevators combined with the height of the buildings create complications for the elderly to live independently in this neighborhood. Mobility limitations are common among the elderly, as they are present in about 35% of the people aged 65 or older (on behalf of the Council on Environment and Physical Activity (CEPA) – Older Adults working group et al., 2017). The mobility limitations can have different levels of severity and based on that can include climbing the stairs, walking, or performing personal tasks such as cooking or showering. Mobility issues have an impact on the person’s independence, and depending on the severity, a formal or informal caregiver may be

needed for partial or permanent help. The neighborhood lacks a nursing home or elderly home that could provide such help for the elderly. In the Netherlands there is a high demand for nursing homes, causing long waiting lines for the existing ones. Nursing homes are primarily seen as places for your very last years and only for severe cases, such as severe chronic illnesses like dementia, or high-level care needs (Ministerie van Volksgezondheid, 2017). For this reason, getting a spot in such a facility is very difficult. Since nursing homes are suited for the elderly with severe needs, the ones in need of light care rely on formal or informal caregivers. There is big pressure on informal caregivers (Ministerie van Volksgezondheid, 2017).

The lack of elderly facilities in the neighborhood leaves room for implementing caring facilities, focusing on light care, to release pressure from the informal caregivers.

Loneliness

Loneliness is a problem faced by all age groups, including elderly, and can result from emotional, social, and environmental circumstances. Among seniors, the lack of social interaction is a prime cause, often resulting from mobility issues, which make it difficult to go outside the house or meet with friends, living alone, and lack of physical exercise can also contribute to mental health issues (Hawkley & Cacioppo, 2010). One sad case of a woman found dead in her apartment in Rotterdam ten years later shows the real traces of loneliness among people living alone (Redactie, 2013). In the neighborhood of Tarwewijk, 54.2% of the households are one-person

households, which means that more than half the population of the neighborhood lives alone (Buurt Tarwewijk (Gemeente Rotterdam) in Cijfers En Grafieken (Bijgewerkt 2024!), 2016). The neighborhood hosts two community centers which shows that social integration and loneliness are something the neighborhood is dealing with for all age groups and provides spaces for such interaction. One type of living environment where

people can live on their own but still have shared facilities to increase social interaction is co-housing. Research on senior co-housing states that such communities offer emotional and social support for the elderly and help combat loneliness (Bookman, 2008). Co-housing, also called “Living together on one’s own”, provides shared amenities and spaces while maintaining personal space and privacy (Rusinovic et al., 2019).

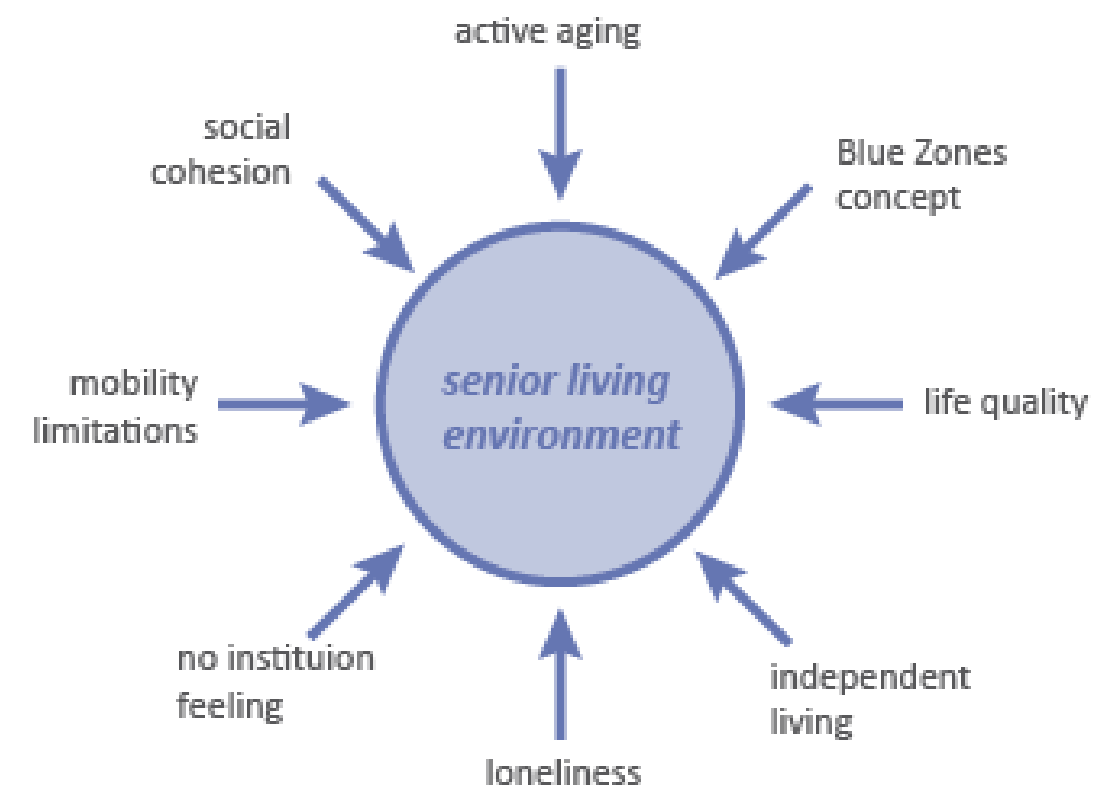


Figure 4 - Factors influencing the design for a senior living environment

This paper aims to investigate how architectural and urban design can influence active aging to combat loneliness and encourage movement and exercise for the elderly. A senior living environment where people can live individually, have common spaces

and activities, be offered assisted living care facilities, and have freedom without feeling in an institution would be a missing addition to the Tarwewijk neighborhood, and maybe to the entire city of Rotterdam.

1.2 Theoretical framework

The theoretical framework of this research is composed of three theories, one for each point highlighted in the problem statement: active aging, mobility limitations and loneliness.

The theoretical framework for active aging is based on the concepts of the book "The Blue Zones" by Dan Buettner. He identifies areas in the world where people have longer and happier lives due to lifestyle, habits and environmental factors (Buettner & Skemp, 2016). This framework will provide insights into how these factors will contribute to an increased lifespan and healthy aging. Further, these concepts will be used in designing aging-friendly living environments and elderly facilities. Buettner explains how the environment and lifestyle have a big impact on your life. He noticed that people from the Blue Zones incorporate natural movements, such as gardening, walking, and manual labor, into their daily routines. This study suggests that living environments that promote natural physical activities are more effective for the well-being of their residents. Other key concepts described by Buettner are the importance of community and diet. In Blue Zones people tend to keep close relationships with community members, friends and family, as it provides a sense of

purpose and reduces loneliness, which further reduces stress and other mental problems linked with it, influencing longevity.¹⁶ He also discovered that residents of the Blue Zones have primarily a plant-based diet rich in antioxidants, essential nutrients, and fiber and tend to stop eating when 80% full, to reduce the risk of obesity (Buettner & Skemp, 2016).

The theories from Buettner's "The Blue Zones" provide an understanding of the factors that contribute to healthy aging and longevity. This framework suggests that strong community feelings, healthy eating, natural movement, stress management, and purposeful living have an impact on life expectancy and should be integrated into urban and architectural design to promote and encourage this lifestyle (Buettner & Skemp, 2016). Although "The Blue Zones" theory promotes some good ideas, there is also critique about other concepts.

The theoretical framework for mobility limitations is based on the concepts from Lawton and Nahemow's "Ecological Model of Aging". Lawton was an American psychologist known for his work in the fields of environmental psychology and gerontology. His work focused on aging, specifically the relationship between the elderly and their physical and social environment (Powell, 2001).

The main concept of the "Ecological model of aging" is "Person-Environment Fit" which connects one's functional abilities to the challenges of their environment. In the case of the elderly with mobility limitations, the degree of person-environment fit is critical in finding out their capacity to stay independent and perform daily tasks. When someone's mobility is decreased, environmental aspects such as stairs, long distances to necessary functions, and uneven surfaces can become problematic obstacles (Lawton & Nahemow, 1973).

The theoretical framework for loneliness is based on the concepts of the "Loneliness and Health Model" by Hawkley and Cacioppo, which offers an understanding of the negative effects of loneliness on mental and physical health. Louise Hawkley is an expert on the topics of loneliness and social isolation and researches their association with health during aging (Louise Hawkley | NORC at the University of Chicago, n.d.). John Cacioppo was a researcher in the field of social neuroscience, who focused on loneliness and his research had an impact on both psychology and neuroscience (Cacioppo, 2002). In this model, it is researched how loneliness has an influence on stress levels, which can lead to weakened immune systems, cardiovascular issues,

and increased inflammation, which can increase the risk of diseases. Loneliness also increases the risk of mental health issues such as anxiety and depression (L. C. Hawkley & Cacioppo, 2003). The concept of loneliness is seen as not only a result of social isolation but a factor that weakens mental and physical health. The text supports that loneliness should not only be addressed by increasing social connections but also by reducing the risks of diseases that can be an effect by it (L. C. Hawkley & Cacioppo, 2003).

Hypothesis:

By designing a living environment for seniors focused on encouraging active aging, combating loneliness, and mobility limitations, Tarwewijk would offer more suitable places for elderly to meet and live and have a healthier lifestyle, from a mental and physical point of view.

1.3 Research questions

Main research question:

How can the architectural and urban design of senior living environments be optimized to reduce loneliness, promote active aging, and support people with mobility limitations?

Sub questions:

1. What architectural elements and design features effectively enhance social interaction among residents in senior living environments?
2. What design strategies can facilitate accessibility and mobility for seniors, thereby promoting active aging and encouraging physical engagement within the community?
3. How can the integration of supportive care facilities within architectural and urban designs enhance the overall well-being and independence of seniors in co-housing settings?

Definitions:

Co-housing: the term “co-housing” refers to a living environment in which people have the facilities to live on their own but have the possibility to share certain amenities, such as garden, common room, common kitchen, sport equipment.

Senior: the term “senior” is considered by the Dutch government as someone aged 75 or older, but this research will refer to people aged 65 or older, as it based on active aging and prevention as well

Elderly: the term “elderly” is considered by the Dutch government as someone aged 75 or older, but this research will refer to people aged 65 or older, as it based on active aging and prevention as well

Living environment: the term refers to the space and context in which someone lives and interacts with other people

Active aging: the term refers to the concept of promoting and encouraging a healthier lifestyle, from a physical, mental and social point of view

Social network: The term “social network” refers to someone’s collection of social interactions and relationships that can be counted on as frequent occurrences.

Social infrastructure: The term “social infrastructure” refers to the collection of spaces and facilities that stimulate and encourage social interactions between people.

This research targets elderly people both in full power, but also with mobility problems or other types of issues that might require partial assisted living. It does not target advanced illnesses such as dementia or other chronic diseases that require intensive care facilities. This research will look into reference projects from different countries, but will in the end take into account factors and regulations specific to the Netherlands, as the project is based in Tarwewijk, Rotterdam.

1.4 Research methods

The methodology of this research paper is divided into three categories that help collect the knowledge needed to understand the target group and the needs for designing for them. These methods are analyzed individually and later the conclusions will be compiled together to produce design guidelines.

Literature

Firstly, literature research is used to deepen the knowledge needed to answer the research question and sub-questions. The articles and books analyzed focus on co-housing for seniors and elderly homes, as well as attributes for a healthy lifestyle. They were found by using the search terms from figure 5 on Google Scholar.

Step 1: Introduce the search terms mentioned in Figure 5 in Google Scholar

Step 2: Skim the texts that appeared to find ones with relevant ideas for the topic

Step 3: Choose texts that relate to the research question and were published closer to the present day.

The main supporting text used is "Living for the Elderly, A Design Manual" by Eckhard Feddersen and Insa Lüdtkke, which provides insights into the relationship between architecture and

the quality of life and independence of the elderly (Feddersen et al., 2018). This text is particularly interesting for the research for discussing and providing practical guidelines for designing accessible, safe, and comfortable environments for elderly people. The first edition of this book was released in 2009, which can seem outdated for the matter at hand. However, a new and revised version was released in 2018, which is the one used for this research, because it is more relevant for current problems. The first author, Eckhard Feddersen is a German architect who worked with the subject of the elderly in different architecture projects and papers. Among other projects, he also designed nursing homes. Insa Lüdtkke is a scientific journalist who contributed to different papers on the subject of the elderly and health.

The text "Senior Co-Housing in the Netherlands: Benefits and Drawbacks for Its Residents" written by by Katja Rusinovic, Marianne van Bochove and Jolien van de Sande will be used as support for analyzing and looking for opportunities in the co-housing environment (Rusinovic et al., 2019). Katja Rusinovic is a research and professor at Urban Development at The Hague University of Applied Sciences



Figure 5 - Search terms

who focuses, among other themes, on housing for seniors (Urban Social Development | The Hague University of Applied Sciences, n.d.).

The text "The Blue Zones" by Dan Buettner offers insights into the lifestyle from the people living in the area considered to have the longest lifespan. As mentioned in the theoretical framework, the text discusses the concepts used for active aging and healthy lifestyle.

Fieldwork

Secondly, this research will be backed up by field research, which is conducted through mapping, observations, interviews and discussions.

Mapping the neighborhood, produced as groupwork, will provide qualitative and quantitative data for understanding Tarwewijk. It includes statistics of the neighborhood, visual representation and analysis of public spaces, residential areas and other characteristics.

Step 1: Collect data from sources like CBS (Statistics Netherlands) about health indicators, age groups, and cultural demographics.

Step 2: Choose characteristics of the neighborhood to analyze, such as building typology, infrastructure, public functions, types of green spaces, and frequency of visiting areas.

Step 3: Produce maps that highlight the spatial characteristics mentioned and use them to analyze the neighborhood and its needs.

Discussions will be held with elderly people from the neighborhood of Tarwewijk to analyze how they experience loneliness, what their ideal housing situation is, and how they feel about senior co-housing.

Step 1: Identify three to six elderly people around the neighborhood.

Step 2: Approach them and start a conversation.

Step 3: Ask about ideal living situations, opinions about living close to other elderly people, experience with loneliness, and what they are missing from the neighborhood.

Interviews would be conducted at elderly facilities, where the answers from personnel and inhabitants would help understand what is needed and what is missing from living in such an environment. Templates for tracking a day in the life of the inhabitants, composing personas, and a set of questions were created as a group and will be used by more students to obtain more results that will later be compared.

Step 1: Identify ten to fifteen elderly people at elderly facilities.

Step 2: Conduct interviews regarding missing amenities, the pros and cons of living in such an environment, and possible improvements.

Step 3: Create personas and spread with the "day in the life of a resident based on the interviews.

The **observation** would bring insight into the interaction between the elderly and their daily activities.

Step 1: Identify spaces in the neighborhood frequently used by the elderly.

Step 2: Conduct observations during different days of the week and at different moments in the day.
Step 3: Observe interaction zones, movement flows, and accessibility.
Step 4: Mark the findings using sketches.

Case studies

Lastly, the research will be backed up with case studies used to find strategies already applied in design. These case studies are chosen to analyze specific topics, such as functionality, design requirements, and measurements, within elderly homes, senior co-housing and community centers for elderly. Floorplans and sections will be used to analyze the already mentioned criteria. The atmosphere and materiality will be analyzed from elevations, renders and images.

Step 1: Search in architectural magazines and on the internet for elderly homes, senior co-housing projects, and elderly communal centers.
Step 2: Scan the found projects and choose the ones that have common themes with the research, such as active aging, loneliness, and mobility limitations.
Step 3: Analyse the chosen projects

based on how they solve the accessibility, functionality, and layout and analyze the atmosphere they create.

1. Liv Inn Hilversum (the Netherlands) – It is an elderly home focused on active aging, that provides common facilities and activities for the residents to create a community feeling. It offers assisted living on demand (Liv Inn Hilversum, n.d.).
2. Vitalitas (Romania): It is an elderly home with different levels of care, from no care to intensive care. It focuses on medical recovery and physiotherapy. It includes a variety of common spaces to increase social interactions (vitalitas1, 2023).
3. Kungsparken Care Home (Kumla, Sweden): It is a residential care facility that offers common spaces while still allowing people to have individuality in their own apartment (Kungsparken Care Home by Marge Arkitekter, 2024).

1.5 Scope of research

The scope of the research is to examine the influence of design on active aging, loneliness, and mobility limitations among the elderly and produce guidelines for architectural and urban design. It includes an analysis of elderly homes and the design location, meaning Tarwewijk, on three levels: the interior of the housing units, the building block, and the neighborhood. The target group of this research is the elderly who choose to live in an elderly

home because of mild health, social, or personal problems. It includes elderly people both healthy and with mobility limitations. It excludes elderly suffering from chronic diseases, like dementia, that require intensive care.

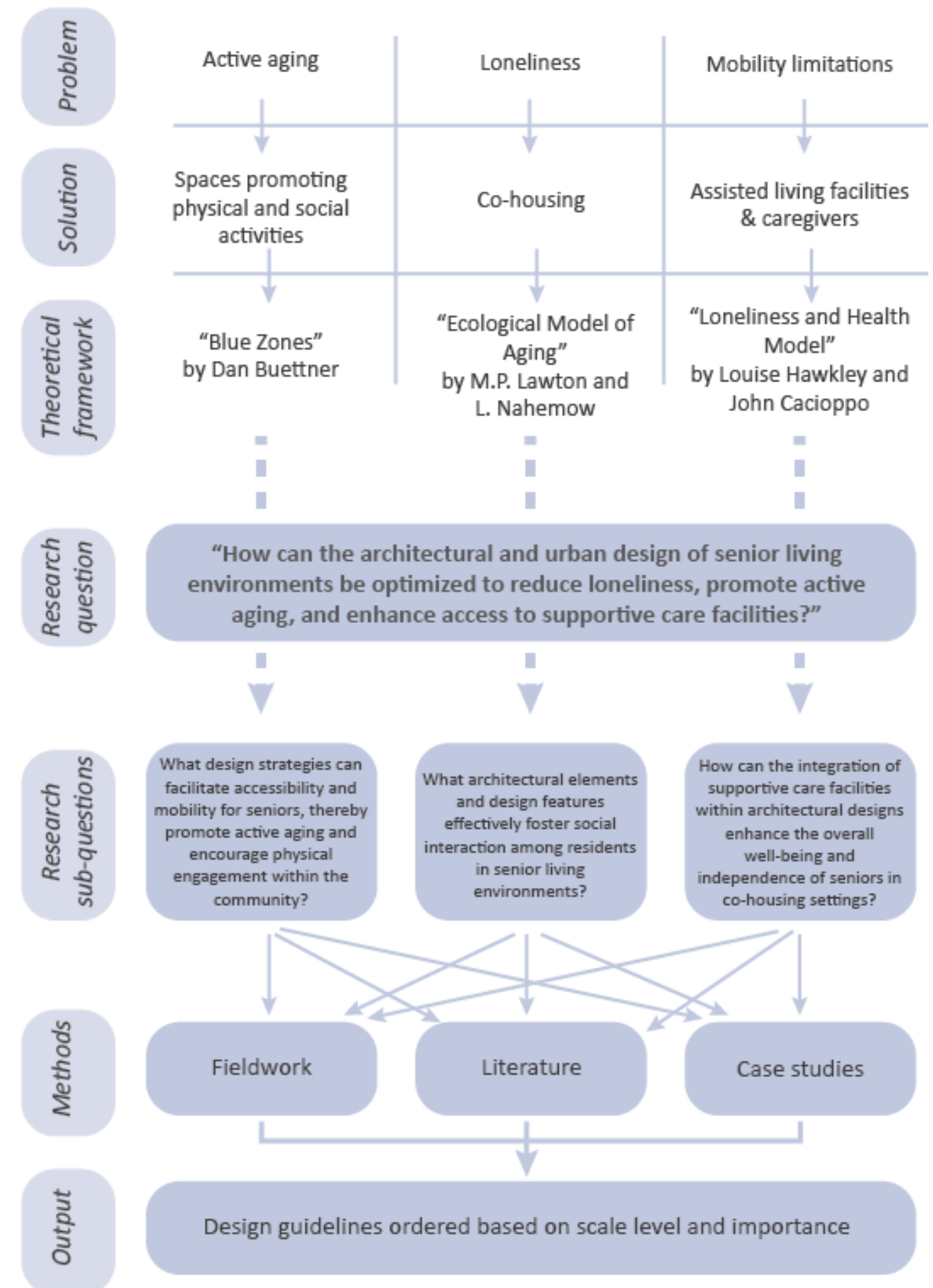
Output research:

The results are used to compose the design guidelines, which are going to be ordered based on their importance.

	Active aging	Loneliness	Mobility limitations
Neighborhood level	Reasons to keep active; spaces to interact	Community feeling; initiatives to bond with neighbors	Obstacles on pedestrian paths
Building level	Activities; spaces to interact	Proximity to common spaces; connection between private and public	Circulation, accessibility
Interior level	Dimensions rooms; space to move around	Possibility to invite people over	Placement furniture; dimensions circulation space

Figure 6 – Scope of study – levels of analysis

RESEARCH OUTLINE



Chapter 2

Research & Fieldwork

2.1. Literature review

2.2. Fieldwork at Liv Inn

2.3. Fieldwork at Vitalitas

2.4. Case studies

**2.5. Observations and Mapping
in Tarwewijk**

2.1 Literature review

2.1.1 Living for the Elderly – A Design Manual

The book “Living for the Elderly – A Design Manual” by Eckhard Feddersen and Insa Lüdtkke discusses opportunities and challenges for designing spaces in accordance with the needs of the elderly. It brings the social, emotional, and physical sides of aging together with the architectural elements to address inclusive solutions prioritizing independence and quality of life for the elderly population. The book is focused on the 21st century’s demographic shifts, where there is a global increase in the aging population (Feddersen et al., 2018).

The authors propose **human-centered design approaches** that include elderly care in communal, residential, and urban spaces instead of following the traditional institutional elderly homes which isolate them from society. These traditional elderly homes were often seen as clinical or institutional spaces that did not succeed in facing the social and psychological needs of the elderly (Lawton, 2000).

The book focuses on **inclusive design** for the elderly, which gives a sense of independence, comfort, and

belonging, and it is not only addressing the functionality side but also the psychological one. The design solutions include features such as intuitive layouts, adequate lighting, barrier-free architecture, and adaptable living spaces, which ensure safety, mobility, and comfort. **Intuitive layouts** guide movement naturally and centralize the important rooms to allow easy access from one another and avoid confusion. **Adequate lighting** is essential for the elderly not only because they may have reduced vision, but also because it increases the comfort level, and quality of life, as lighting can change the way a room is perceived. **Barrier-free architecture** focuses on designing without obstacles, being inclusive for people with mobility limitations. Design elements include step-free entrances, accessible bathrooms and kitchens, wide doorways and corridors, and elevators. **Adaptable living spaces** are meant to be flexible to allow changes in time as the needs of the elderly residents evolve. Such spaces include open-plan design with zoning options, which can host different activities with smooth borders that increase social interaction. Modular room layouts and movable walls offer the possibility for reconfigurations or changes in the division of the apartment, which offers flexibility for

the changing needs of the residents.

The multidisciplinary approach used in the book combines architectural solutions with insights from sociology, gerontology, and healthcare. It supports that there should be a spectrum of needs present in the elderly housing, that would accommodate a range of needs, from active independent living to living with external care. (can mention the adaptable and flexible design strategies)

Improving the quality of life for the elderly requires not only a functional building but also an **integration at the urban level**. It is essential that elderly housing is situated close to healthcare services, public transport, and public places, to ensure the possibility of staying active in society (Feddersen et al., 2018).

The book “Living for the Elderly – A Design Manual” by Eckhard Feddersen and Insa Lüdtkke received critiques on its design strategies due to its focus on the European context. For this research that focuses on designing in Tarwewijk, the Netherlands, the proposed design strategies fit the cultural and special context. Despite the critique received about the location focus, the principles discussed in the book offer a starting

Highlights

-  intuitive layouts
-  adequate lighting
-  adaptable living spaces
-  proximity to amenities
-  communal spaces
-  intergenerational design
-  barrier-free architecture
-  transition areas
-  natural lights and views
-  biophilic design

2.1.2 “The Blue Zones” transition to Orange Zones

“The Blue Zones” by Dan Buettner identifies regions where people tend to live longer and healthier lives and the key elements that lead to it (Buettner & Skemp, 2016). There is a lot of critique around the Blue Zones due to overgeneralization, geographical locations, scalability, and applicability (Bradley & Longino, 2009). Despite these critiques, some of the concepts presented in the Blue Zones form a valid framework for longevity and health. The concepts from the Blue Zones that form one of the theoretical frames for this research have been described in Chapter 1.2. They revolve around movement included in the daily routines, purpose or meaning in life, stress reduction, eighty percent eating rule, belonging to a community, and being close to your family (Buettner & Skemp, 2016).

Critique:

The Blue Zones concepts tend to be seen as a model that can be taken and applied anywhere, without looking into the geographical characteristics, cultural diversity, scalability, and overgeneralization. The focus tends to be on the positive aspects, like exercising and reducing stress, while other important factors such as quality and accessibility to healthcare systems, economic inequality, and sustainability tend to be neglected (Whittle, 2017). The Blue Zones are located in specific regions in the world, like Nicoya in Costa Rica, Sardinia in Italy, and Okinawa in

Japan, where the geographical and cultural characteristics highly influence the success of the Blue Zones concepts and are impossible to be transferred to another place in the world (Buettner & Skemp, 2016). Such characteristics include the climate, the diet, and the cultural traditions. The climate influences the diet and encourages movement naturally throughout the year, which is difficult to achieve in an area with a rainy climate like the Netherlands. The cultural traditions present in the Blue Zones regions rely on multigenerational living and small community-driven areas, which are less present in Western society (Bradley & Longino, 2009). The Blue Zones concepts tend to be generalized and overly used, without keeping into account the factors mentioned above that make a difference in the success rate for longevity and healthy lifestyle. Nevertheless, there are takeaway messages depicted from this framework that can be applied, such as **encouraging movement** through design, creating a **community feeling**, strong **social connections**, encouraging a **healthy diet**, and having a **purpose in life** (Whittle, 2017).

Cartesiusdriehoek project in Utrecht

The Blue Zones concept has been integrated into urban and architectural design projects in the Netherlands as well. Cartesiusdriehoek project, located in Utrecht, has a residential and mixed-use function and aims to promote a healthier lifestyle, a longer life, and a community-driven environment by integrating Buettner’s findings about social and environmental features (De Handtekeningen Zijn Gezet, 2019).

Similar to the Blue Zones where physical activities are integrated into daily routines, the project emphasizes **natural movement** by promoting pedestrian and cycling infrastructure and creating good connections to green spaces. **Social connectivity** is another Blue Zone concept present in the development by implementing several communal areas, spaces for unplanned interactions, and co-housing options. Through mindful urban design and sustainability, the project aims to create a sense of purpose for the residents, following Buettner’s principles (De Handtekeningen Zijn Gezet, 2019).

The Orange Zones: A Liv Inn Model

The Liv Inn project by Habion, which is described more in-depth in the Fieldtrip booklet, follows principles from the Blue Zones and adapts them to the context of the Netherlands, creating the Orange Zones, from the national Dutch colour (“Wat Is Liv Inn?,” n.d.). They take into account and emphasize characteristics of the Netherlands, like the climate, the flat terrain, and urban planning. The infrastructure already prioritizes pedestrians and cyclists, promoting movement and staying active, which are also concepts of the Blue Zones (Buettner & Skemp, 2016). The Orange Zones focus on creating spaces for indoor activities to encourage people to stay active and socialize, due to the rainy and cold Dutch climate, which is not present in the regions of the Blue Zones. The concept of Orange Zones present in Liv Inn aims to bring the feeling of “gezelligheid” (translated from Dutch as togetherness and coziness) among the residents, by designing spaces for social connections and forming a community. Compared

to the Blue Zones which occur largely in rural settings, the Orange Zones need to accommodate a densified country, and they do so by using multi-functional indoor and outdoor spaces, green roofs, and compact living (“Wat Is Liv Inn?,” n.d.).

The Orange Zones are a good translation of the Blue Zones into the context of the Netherlands and are a source of design guidelines for design projects focusing on healthy lifestyles, longevity, and active aging.

Highlights

-  natural movement through design
-  green spaces to encourage staying active
-  social connectivity through communal functions
-  multifunctional spaces to increase social interaction

2.1.3 “Senior Co-Housing in the Netherlands: Benefits and Drawbacks for Its Residents”

The text “Senior Co-Housing in the Netherlands: Benefits and Drawbacks for Its Residents” by Katja Rusinovic, Marianne van Bochove, and Jolien van de Sande provides an analysis with pro and con arguments of senior co-housing as a housing solution for the elderly, in the Netherlands, with the case studies centered around Den Hague. In their research, co-housing is defined as a housing type that combines independent living with shared facilities and communal spaces, creating a sense of community and impacting the resident’s practical and social needs (Rusinovic et al., 2019).

The primary advantage of senior co-housing identified in this research is **combating loneliness** and increasing the social connection for a vulnerable target group. It creates a sense of community and support, as well as opportunities for daily interactions and **informal caregiving**, which are concerns among elderly residents. The shared functions and communal spaces encourage the residents to stay active within the formed community while keeping their independence and autonomy. Due to the feeling of community, there is also an **increase in safety and security**, which are important aspects for the elderly (Rusinovic et al., 2019).

However, the senior co-housings come with disadvantages as well. The biggest drawback presented in this research is the **lack of care facilities** present in

the building. While the residents are willing to help one another with small tasks like grocery shopping, in the case of someone needing help with personal tasks like eating or showering, the neighbors step back and let the family act as informal caregivers. The addition of caring facilities to senior co-housing would free the family from becoming informal caregivers. Other drawbacks presented in the research are surrounding the decision-making process and the task division regarding managing the communal spaces (Rusinovic et al., 2019).

The work of Rusinovic, van Bochove, and van de Sande provides an overview of the advantages and disadvantages of senior co-housings. The research provides a base for designing for the elderly that shows what could be improved to facilitate the living experience of the elderly and their family and what should stay the same. The study is especially relevant for the spatial context of the Netherlands where there is an increase in the aging population and there is a need for elderly housing due to limited caring facilities (Smits et al., 2014).

Highlights

-  possibility for care facilities offered in the complex
-  shared spaces and common function

2.1.4 “Ecological Model of Aging”

“The Ecological Model of Aging” by M. Powell Lawton and Lucille Nahemow offers a framework for environmental gerontology, focusing on the interaction between the elderly and their surrounding environment. This framework is essential for understanding the needs of aging populations and their ability to adapt and function to the changes (Lawton & Nahemow, 1973).

The model uses the “competence-press relationship” as a key concept, which refers to the balance between one’s physical, social, and cognitive abilities and the challenges presented by the social or physical environment. An equilibrium between the two composing factors is essential. If the environmental demands are insufficiently or overly challenging, they lead to functional decline and stress, affecting the recipient mentally and physically. Seniors tend to actively adapt to changes in the environment such as reorganizing living spaces or using assistive technologies to match new needs. The framework highlights the importance of flexible and adaptable spaces to encourage behavioural plasticity and independence. Due to the variety of competencies among the elderly, the environments should accommodate individuals both active and in need of support, by following universal design and including assisted living facilities (Lawton & Nahemow, 1973).

The authors underline that supportive environments that focus on accessible public spaces, barrier-free architecture, and proximity to social facilities can improve well-being and encourage functional independence among the

elderly. Excessive pressure factors in environments, such as poor lighting or steep stairs, can lead to isolation and disabilities, which would further worsen physical and mental health, spiralling into other complications (Lawton & Nahemow, 1973).

This framework strengthens the relationship between environmental conditions and individual capabilities of elderly people, providing an understanding of how to design better for a vulnerable group. However, it is important to note that it mainly focuses on these two factors and oversimplifies other factors influencing aging such as social relationships, cultural perceptions, and psychological resilience. Despite these missing factors, the Ecological Model of Aging focuses on the balance between the environment press and competence and it influences the view on designing for the elderly, encouraging adaptable and active environments that promote well-being and functional autonomy (Golant, 2011).

Highlights

-  assisted living facilities
-  accessibility and proximity to public spaces and social functions
-  barrier-free architecture
-  adaptable and flexible spaces

2.1.5 “Loneliness and Health Model”

“The Loneliness and Health Model” written by Louise C. Hawkley and John T. Cacioppo offers a solid framework that describes the effects of loneliness on mental and physical health, highlighting the psychological, biological, and behavioural pathways. Both writers contributed to the understanding of the relationship between loneliness and health. Cacioppo explored the psychological and physiological effects of social connections and isolation (Cacioppo, 2002). Hawkley focused his work on the impact of social factors on physical health (L. Hawkley & Cacioppo, 2010). They consider loneliness a subjective feeling of social disconnection, and not the objective lack of interactions.

Biologically, loneliness can lead to a weakened immune system and cardiovascular diseases, accelerating aging and increasing the risk of morbidity and mortality. Psychologically, the authors underline that loneliness can produce negative thoughts patterns and cognitive decline, which further lead to deepening the feeling of isolation. Aging population especially have shown a link between cognitive decline and prolonged loneliness. The model also identifies behavioural pathways, which show that loneliness leads to adopting bad habits, such as lack of exercise, poor diet, and disruptive sleeping patterns, which contribute to poor physical condition (L. Hawkley & Cacioppo, 2010).

This framework offers a good understanding of the impact of loneliness and how it can affect individuals of all ages. Vulnerable

groups, such as the elderly, are more at risk, due to their limited mobility and in some cases also due to poorly designed environments that limit movement and not encourage social interactions. Architectural design can play an important role in reducing loneliness, by promoting social interactions through shared spaces and increasing visual connectivity (Gehl, 2011). It can facilitate inclusivity and accessibility by following a universal design and gradients of interactions, which allow for different levels of interactions, based on preferences (Steinfeld & Maisel, 2012). Since loneliness is strongly connected to physical and mental health, an active design that encourages movement is desirable, as well as the use of biophilic features, such as plants and sunlight, which reduce stress and improve mental well-being (L. Hawkley & Cacioppo, 2010).

The Loneliness and Health Model provides a better understanding of the connection between loneliness and physical and mental health, as well as its negative effects on daily life. It shows the relevance of tackling loneliness from different points of view. From the architecture point of view, loneliness can be addressed by designing spaces that encourage social interactions and connections.

Highlights

-  active design to encourage movement
-  shared spaces and common function
-  gradients of interactions for different levels of interaction
-  visual connectivity
-  biophilic design to reduce stress and increase well-being

2.1.6 Design guidelines

Active Aging:

-  **Intuitive layouts:** Design spaces that guide movement naturally and allow easy and clear access from one space to another to avoid confusion.
-  **Adequate lighting:** Ensure sufficient natural and artificial light to help the residents with reduced vision and increase the level of comfort.
-  **Inegration at urban level:** Ensure the proximity to amenities such as healthcare services, public transport and public places to offer the possibility to stay active in society.
-  **Spaces for physical activity:** Incorporate in the design walking paths and sports room to encourage movement.
-  **Green spaces:** Create a good connection to green spaces to encourage staying active.
-  **Natural movement:** Incorporate pedestrian and bicycle paths into the design to encourage natural movement.
-  **Natural light and view:** Maximizes views of nature and natural light to increase the well-being of residents..

Mobility limitations:

-  **Barrier-free architecture:** Design spaces and transitions between spaces without obstacles to facilitate movement.
-  **Assisted living facilities:** Offer partial caring facilities within the building complex to avoid the need of informal caregivers.
-  **Adaptable and flexible spaces:** Design spaces that are flexible and allow changes in layouts and functions in time to accomodate the changing needs for the residents.
-  **Biophilic design:** Integrate plants and natural materials in the interior design to create a calming environment and to avoid the institutional feel.

Loneliness:

-  **Communal spaces:** Design shared areas that ecourage the residents to meet and interact.
-  **Intergenerational design:** Design spaces that can be used by different ages to encourage multigenerational living and interactions.
-  **Gradients of interactions:** Design spaces that can foster different levels of social interactions, to fit different types of social activities.
-  **Visual connectivity:** Ensure visual connectivity towards common spaces to encourage residents to interact.
-  **Multifunctional spaces:** Design multifunctional indoor and outdoor environments which promote social interaction and increase the feeling of "togetherness".

2.2 Fieldwork – Liv Inn

2.2.1 Liv Inn Model

A big part of this research is focused on the field trip experienced at the Liv Inn Hilversum, where five days were spent observing and analyzing the living model and interacting with the residents. The field trip offers essential insights into designing for the elderly based on active aging and aging in place. The entire fieldwork analysis can be found in the separate document “Fieldwork at Liv Inn” (Sen et al., 2024).

For this research, the Liv Inn model offers important guidelines to follow, as it presents an alternative living solution for the elderly to replace the traditional elderly healthcare system. The wish of elderly people was to age in place and to move out of their homes to a place that can adapt to their needs and prevent them from needing to move further from one institution to another. So the Liv Inn model brings the care facilities to the individual, instead of moving the individual to different caring institutions. It is built on three pillars: Apartment Living, Community organization, and Care on demand (“Wat Is Liv Inn?,” n.d.).

Pillar 1: Apartment Living

- Independent living in apartments that come in different sizes and room numbers
- Adaptable and flexible apartments designed for evolving care needs
- Encourages autonomy and independence

Pillar 2: Community Organization

- Weekly activities, events, and shared meals
- Shared spaces and facilities for increased social interaction, reducing loneliness, and creating a community
- Community and activities organized and managed by the residents themselves, offering purpose and autonomy

Pillar 3: Care on demand

- Care available in the building, from minimal care to intensive care
- Care providers adapt to the residents’ needs
- No need to transition to a different caring institution

Liv Inn offers independent living units for elderly people who wish to be part of a community and stay active. It provides a series of communal rooms and spaces that encourage social interactions and that are used most of the day, either by organized activities, other by hanging out in small groups of people. The building offers assisted living facilities for those with mobility limitations to avoid informal caregivers. This model is an example of how the architecture offers support for the formation of a strong community and for combating loneliness, but the actions are still dependent on the individuals. The building offers inviting indoor and outdoor environments that encourage social connections, yet not all residents participate in the activities or are willing to volunteer to add to the community. Some residents are rarely seen and despite having the opportunity to integrate and socialize, prefer not to. From an architectural point of view, Liv Inn offers a good base for active aging, combating loneliness, and living with mobility limitations. However, the lack of volunteers and active elderly creates difficulties in keeping the community in motion.

The Liv Inn, located in Hilversum, lacks cultural diversity, as the majority of people have Dutch nationality. Tarwewijk is culturally diverse, meaning that the solutions possible at Liv Inn could need to be adapted to the habits and costumes that fit a more diverse target group.

During the field trip stay, the communal spaces have been analyzed, as well as the layout of the individual apartments to understand strengths and weaknesses. The residents provided insights using interviews (see Appendix A), discussions, games, and activities, about possible improvements and features that they consider important (Sen et al., 2024).

From the “Fieldwork at Liv Inn” booklet, a series of design guidelines have been extracted, that will be further used for designing an inclusive environment for elderly people. These guidelines are mentioned in chapter 2.2.2.

2.2.2 Design Guidelines

Active Aging:

-  **Stairs:** Design the stairs as a central design element that encourages using them rather than taking the elevator.
-  **Interior atmosphere:** Design the interior of the building using wood, plants and warm colors to create a cozy and homey feeling which is favorable by the elderly.
-  **Promote sports and movement:** The design should include a room dedicated for multipurpose sport activities, that encourages residents to stay active.
-  **Private outdoor space:** Each apartment should have a private outdoor space, like a balcony or loggia, to encourage small outdoor hobbies like planting your own spices.

Mobility limitations:

-  **Physiotherapy:** Extend the physiotherapy area to offer more facilities that would help the residents stay active, recover or prevent injuries.
-  **Care zones:** Create designated areas within the complex for different levels of care needs, to ensure smooth care provision.
-  **Resting spots:** Include seating spots at a regular interval along frequently used routes, to support residents with mobility limitations and create spontaneous meeting places.
-  **Wheelchair-friendly:** The apartments should be designed according to the measurements which facilitate the use of a wheelchair.

Loneliness:

-  **Flexible common spaces:** Design common spaces that can foster diverse functions with smooth transitions between zones, to encourage social interactions.
-  **Circulation spaces:** Avoid poorly illuminated long corridors that remind of hospitals. Instead promote circulation spaces that include natural light and lead to destinations or meeting places.
-  **Cultural inclusivity:** Create spaces that can accommodate culturally diverse activities to promote inclusivity among the residents.

Others specifications:

-  **Diverse unit sizes:** Offer a larger variety of apartment types and sizes to attract a larger range of needs.
-  **Optimized apartment layout:** Re-evaluate the apartment layouts to avoid design conflicts, like hitting doors, and to include more storage and counter space.
-  **Views and natural light:** Maximize natural light and views towards the outdoor communal spaces to make increase the connection between the inside and outside.

2.3 Fieldwork – Vitalitas

2.3.1 Vitalitas Concepts

Vitalitas Care Center is an elderly nursing and care home located in Snagov, Romania, that hosts around 400 units for elderly people and includes shared facilities, common rooms, caring facilities, and a physiotherapy center (Centrul Pentru Seniori Vitalitas | Longevitate de Calitate, n.d.).

This Care Center is aimed at the elderly in any stage of care need. It welcomes both senior people who live independently and people with high caring demands, suffering from dementia or other neurological diseases. Based on the caring demand, the residents are separated into different wings of the building, with more or less restricted access. The residents suffering from neurological illness have restricted access and have their own communal interior and exterior spaces, separated from the rest of the building. The rest of the residents exit the building freely, but depending on their mobility limitations, some do it more often than others. Some residents live there independently



Figure 7 – Reception Vitalitas (photo taken by the author)

and still use the car and drive around the city. The building provides full care facilities, and 24/7 assistance for those in need, it has emergency medical rooms a dentistry practice, and a pharmacy. Although some residents are capable of living independently, the rooms are not equipped with a kitchen, so there is no possibility of cooking for yourself. Instead, there is a big canteen in the buildings, that has different types of



Figure 8 – Hallways Vitalitas (photo taken by the author)

Different than the Liv Inn model, that was giving the residents full independence, not only in their apartments, but also in organizing and managing the building and their activities, at Vitalitas everything is organized and managed by the staff. Even though the residents can freely exit and enter, there is a reception at the entrance of the building, as well as a small nursing room at the beginning of each hallway with rooms for residents.

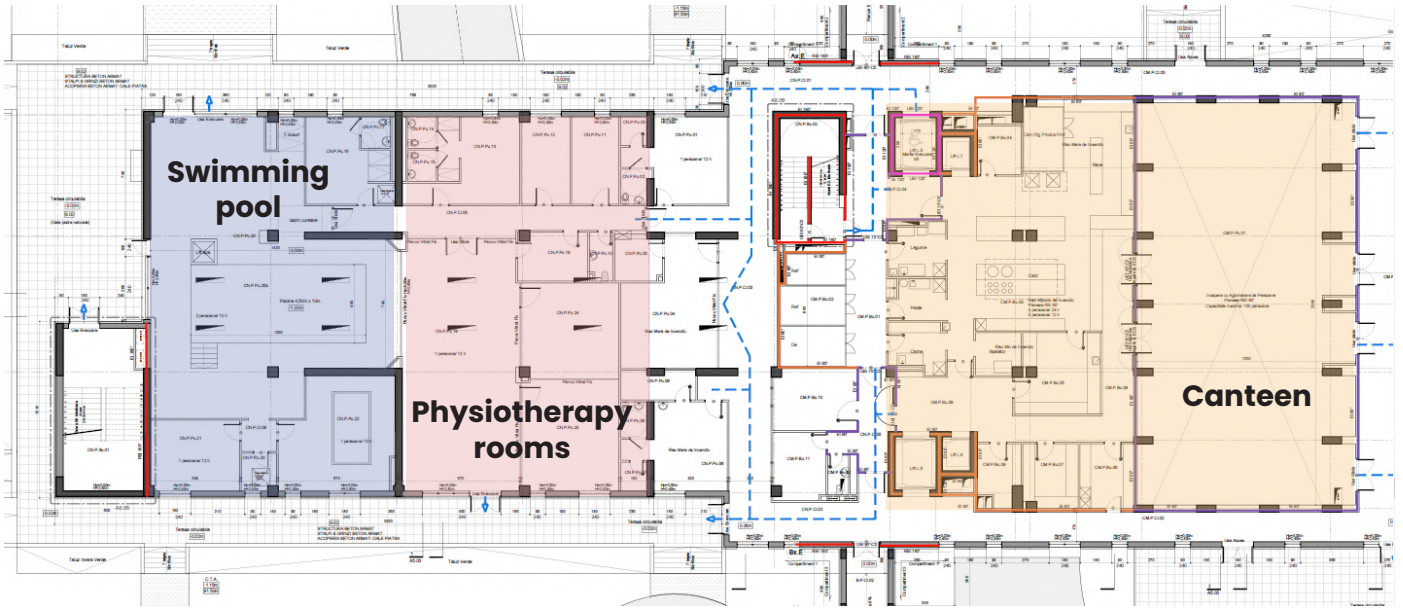


Figure 9 – Plans physiotherapy center and communal canteen



Figure 10 – Communal canteen (photo taken by the author)

2.3.2 Communal spaces and meeting spots

The sense of community and belonging is strengthened by a series of common rooms and activities that the residents can join. Besides the canteen that becomes a meeting place during the meals, there is a cafe (see Figure 11) that has a terrace as well, that is full during summer by the residents and the visiting families. There are meeting



Figure 11 – Coffee corner at Vitalitas (photo taken by the author)

spots resembling small living rooms and libraries, with comfortable seats, TV, bookshelves, and reading spots on every floor of the building (see Figure 12). These spots are located towards the middle of the building, connecting the hallways that lead to the individual rooms.



Figure 12 – Sitting corner at Vitalitas (photo taken by the author)

The hallways have rooms on both sides and resemble hospital corridors (see Figure 8), which was not appreciated by some residents. However, at the end of each hallway, there is a sitting spot that overlooks the common courtyard surrounding the building, which can be seen in Figure 13).



Figure 13 – End of hallway (photo taken by the author)

Three per day there are movie gatherings organized in the small theatre room. From time to time there are also theatre plays, both with exterior actors and acted by the residents themselves. There is a workshop that is currently used by a resident who is a former architect, for continuing his passion for model making. The beautiful models are displayed in one of the common living rooms of the building. During summer, the residents sometimes organize barbeques in the vast courtyard surrounding the building.



Figure 14 – Communal spaces (photo taken by the author)



2.3.3 Physiotherapy center

The Vitalitas Care Center hosts a big physiotherapy center, that focuses on staying active and on medical recovery after surgeries.

The center has doctors and therapists, that work closely with the residents to ensure good results and smooth workouts. It consists of a big gym room with machines adapted for elderly needs, massage rooms, a small heated swimming pool adapted for mobility limitations and aqua gym classes, a sauna, and a salt mineral room for treatment. During the visit, the gym was busy with residents who were training.

Some were training with medical assistance while others were there on their own to stay active. The swimming pool is adapted for mobility limitation access and can be used only during the opening hours and under supervision. These physiotherapy facilities help combat some of the mobility limitations, encourage the elderly to stay active, and prevent muscle atrophy. The physiotherapy center is very used function in the building due to the adapted environment for the need of elderly and wish to keep active. Such a center is beneficial in any elderly environment.

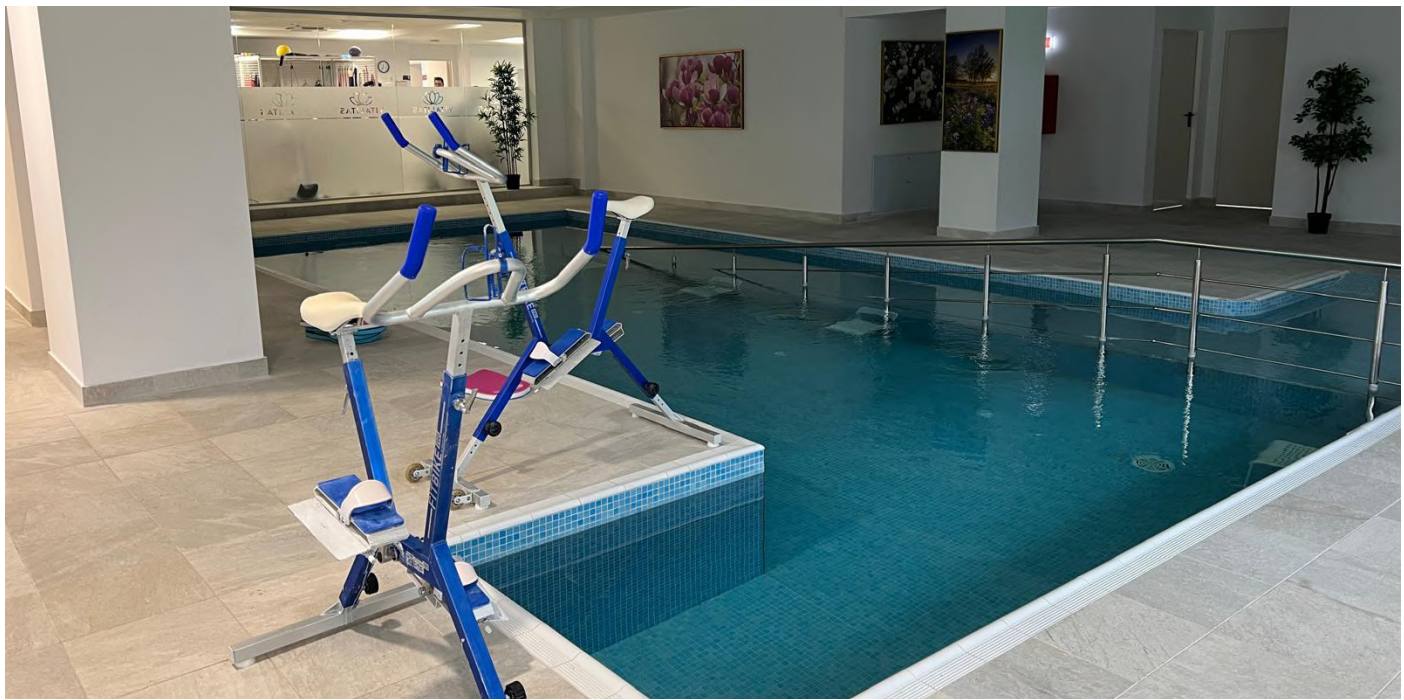
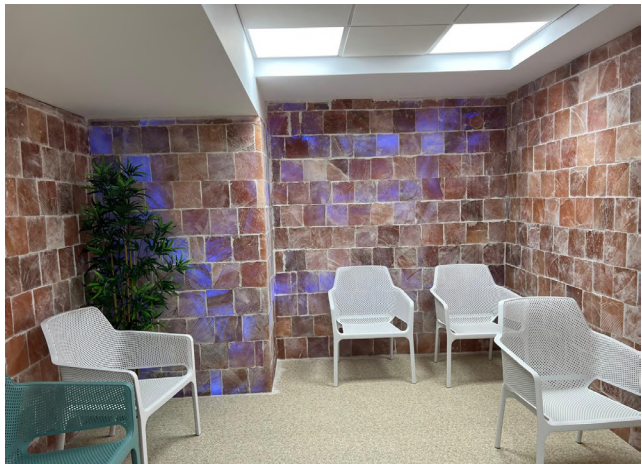


Figure 15 - Physiotherapy spaces (photo taken by the author)

2.3.4 Discussion

Vitalitas Care Center presents an adaptation from a classical elderly care center, integrating elements to combat loneliness and to improve the well-being.

Due to its vast supply of medical rooms and caring facilities, offers the possibility of aging in place. The residents can be transferred from one area of the building to another, depending on the gravity and the caring demand. The advantage is that there is no need for a move to a different location or institution. The building is focused on inclusivity and limited mobility, so it presents an intuitive layout, easy to access, and with clear circulation axes. It is wheelchair-friendly, presenting barrier-free architecture, with no steps or other obstacles in the floorplans. One significant downside of this care

center is that the hospital feeling was not escaped from. The rooms present no kitchen and are already furnished with a single hospital bed, leaving little adjustments possible for the residents to make it feel like home. The long hallways that start with a nursing room transmit the same hospital feeling, which could be avoided through different materiality, layouts, or lighting.

Although Vitalitas proposes a good solution for aging in place, the neighborhood of Tarwewijk, due to its cultural diversity, needs more intergenerational spaces and connections, as well as more diverse living arrangements. Vitalitas provides good guidelines for design elements for elderly care, that can further be used in combination with other requirements from the neighborhood.

2.3.5 Design guidelines

Active aging:

-  **Intuitive layouts:** Design floorplans with clear circulation to avoid confusion and facilitate movement.
-  **Freedom of movement:** Avoid the feeling of living in an institution by having freedom of movement as long as the residents are not in the intensive care area
-  **Room layout:** Offer bigger and varying sizes of living units, with possibility of living fully independent.

Mobility limitations:

-  **Assisted living facilities:** Offer caring facilities in the building complex to avoid the need of informal caregivers.
-  **Care zoning:** Create designated areas within the complex for different levels of care needs, to ensure smooth care provision.
-  **Physiotherapy:** Promote a physiotherapy and kinetotherapy center that help maintain and restore mobility and can deal with medical recovery.
-  **Wheelchair-friendly:** The apartments should be design according to the measurements which facilitate the use of an wheelchair.
-  **Barrier-free architecture:** Design spaces and transitions between spaces without obstacles to facilitate movement.

Loneliness:

-  **Shared functions:** Include shared and common functions in the design to encourage social interactions.
-  **Spontaneous meetings:** Make advantage of dead spaces by creating small meeting points that can foster spontaneous interations.
-  **Circulation spaces:** Avoid poorly illuinated long corridors that remind of hospitals. Instead promote circulation spaces that include natural light and lead to destinations or meeting places.

2.4 Case Studies

2.4.1 The New Sølund

Architects: C.F. Møller Architects and Tredje Natur
Type: Elderly Home and multigenerational living
Location: Copenhagen
Area: 50,000 m²

The New Sølund is a multigenerational project focusing on the connection between elderly home living combined with families and younger people. It hosts 150 homes for younger people (including 20 homes for people facing autism spectrum disorder), 360 nursing home rooms, and 20 homes for senior people. It also provides a daycare center, shops, cafes, workshop spaces, and parking, creating a hub with many facilities, also known as the “House of Generations”.

The project presents three courtyards, with a different atmosphere, providing different semi-public outdoor spaces for the residents to interact and socialize, but also connecting the building with its context. The senior homes are located on the ground floor, each having a private front garden, which is carefully integrated into the urban design of the common outdoor environment.

The project focuses on creating a safe space where multi-generations come together and are encouraged through design to create strong bonds (C.F. Møller Architects and Tredje Natur Win Competition to Design Future Sølund, 2016).

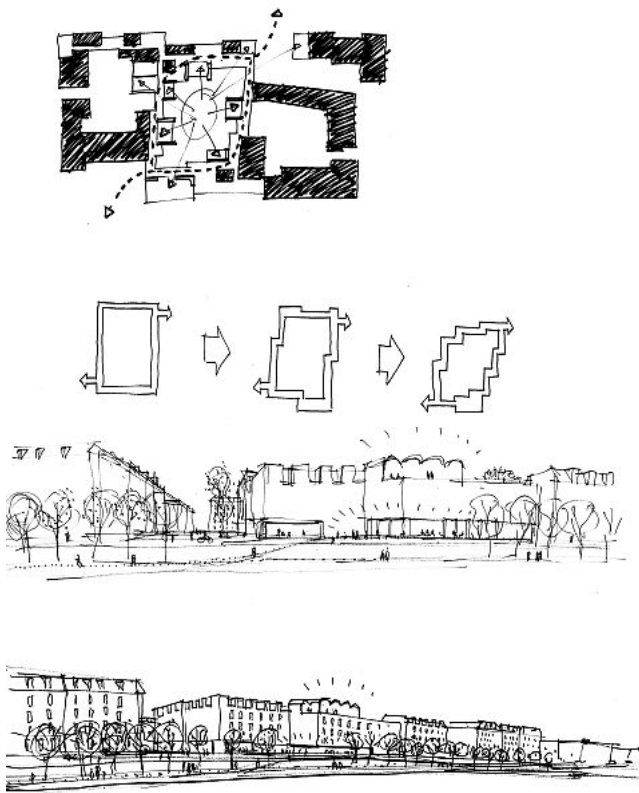


Figure 16 - Concept drawing (ArchDaily)

Highlights

- smooth transition between private and public outdoor spaces
- senior residents on the ground floor
- practical floorplans layout and apartment design
- massing created different types of courtyards
- different generations located in different sides of the building



Figure 17 - Drawings and Atmosphere of The New Sølund (ArchDaily)

2.4.2 The Gardens Care Home

Architects: Marge Arkitekter
Type: Elderly Home
Location: Örebro
Area: 8625 m²

The title comes from the main concept of the design, which surrounds gardens. Contemporary research shows that the well-being of elderly people in care homes is increased by the presence of well-designed outdoor greenspaces and social interactions. A requirement for the project was to create comfortable living spaces for elderly people with an easy connection to private and communal outdoor spaces and shared facilities. The gardens are accessed directly from the ground floor or the roof terrace.

There is a strong connection between inside and outside, achieved by large window sections that allow the residents to have visual contact with the courtyard. This increases the sense of security and the willingness to go outside and interact with others.

The building provides a series of common facilities, visitor centers, and shared spaces, which increase social interaction and strengthen the sense of belonging, essential for combating loneliness (Gardens - Elderly Centre in Örebro by Marge Arkitekter, 2016).

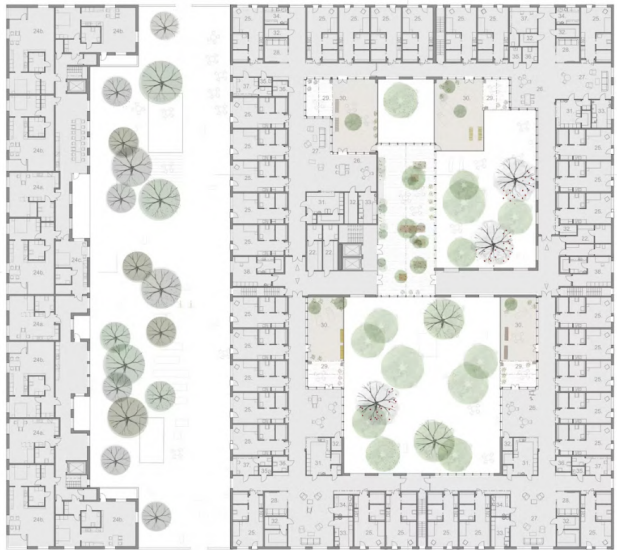


Figure 18 - Floorplan (ArchDaily)



Figure 19 - Resident Gardens Care Home (ArchDaily)

Highlights

-  create different types of private and public outdoor spaces
-  shared functions
-  create a strong visual connection between the inside and the gardens



Figure 21 - Images Gardens Care Home (ArchDaily)



Figure 20 - Section drawing Gardens Care Home (ArchDaily)

2.4.3 Kungsparken Care Home

Type: New-built Care Home
Location: Kumla
Area: 11700 m²
Apartments: 126

The Kungsparken Residential Care Facility consists of a base section that unifies two buildings made of brick. It hosts 126 apartments organized in a clear way, to help the residents orientate better. Such feature is essential when working with elderly, since it facilitate distances and avoids confusion in moving around. The base section hosts the communal functions, such as the assembly hall, the professional kitchen and the stuff rooms. On the Southern side, the two buildings are connected by a courtyard that provides opportunities for a outdoor activities in a safe and accessible environment (Kungsparken Care Home by Marge Arkitekter, 2024).

Highlights

- practical floorplans layout and apartment design
- mass design pushed to create more privacy



Figure 23 - Images Kungsparken Residential Care Facility (Marge Projects)

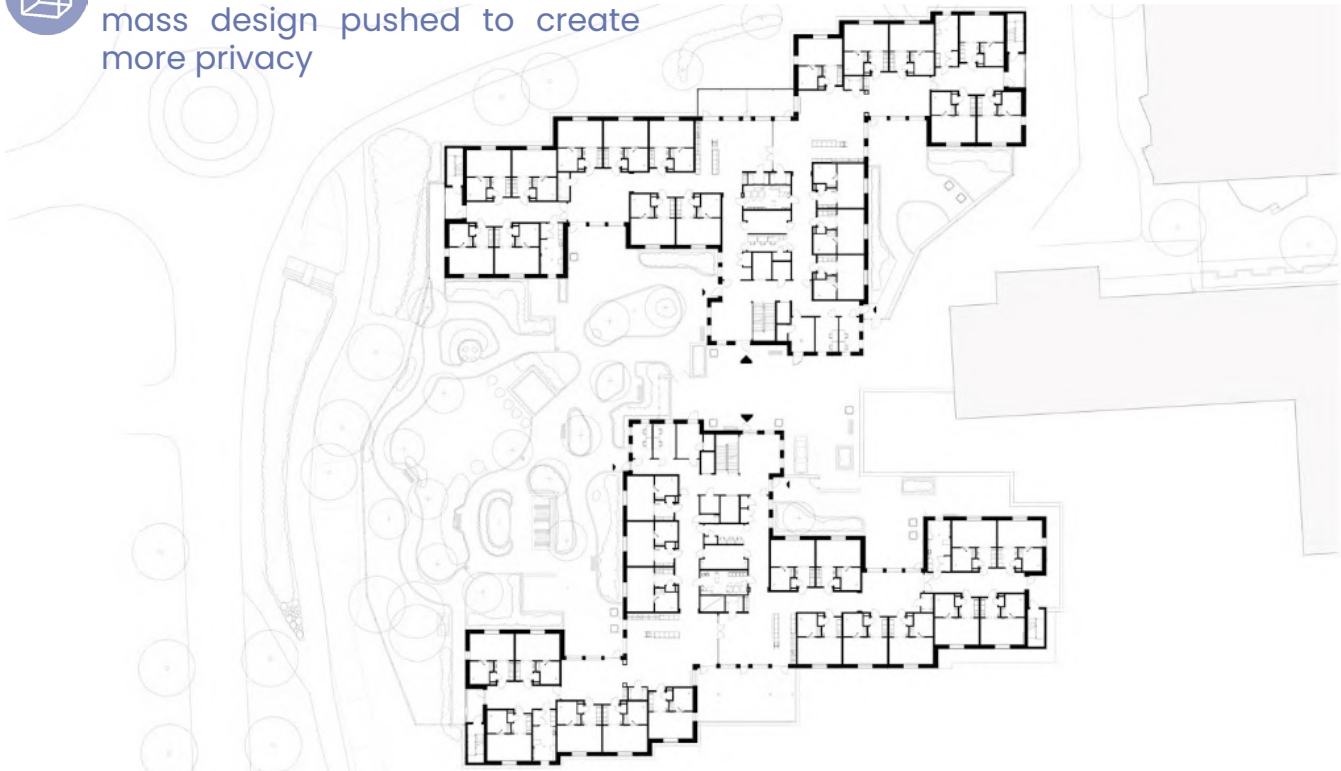


Figure 22 - Floorplan Kungsparken Residential Care Facility (Marge Projects)

2.4.4 Sjælsø Care Center

Architect: C.F. Møller Architects
Type: Care Home
Location: Birkerød, Denmark
Area: 11084 m2

This care center consists of transformation and newly built parts. It is focused on creating a cozy living environment and not an institution. Besides the 140 living units, the building hosts a day care, therapy rooms, a production kitchen, and communal laundry. The fan-shaped layout was used to create privacy between the buildings and strengthen the connection with the landscape, creating beautiful views. It ensures that the dwellings do not have a view perpendicular to the neighbor's house, and are more connected to the landscape. The human scale is visible in the project, as all houses have their own entrances and are grouped in buildings of two-storey height (Sjælsø Care Center, n.d.).

Highlights

- incorporate human scale
- create non-perpendicular views from one apartment to another for more privacy



Figure 24 - Atmosphere Care home (CFMøller)

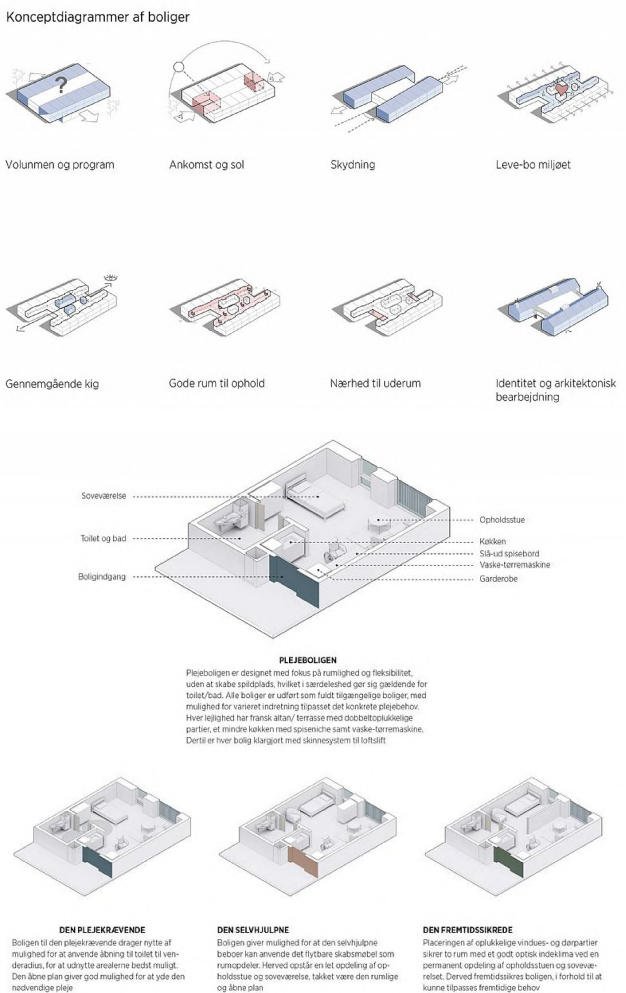


Figure 25 - Concept drawings (CFMøller)

2.4.5 Design Guidelines

Active Aging:

-  **Intuitive layouts:** Design practical floorplans layout and apartment design for clear movement and accessibility.
-  **Mass design:** Create different types of courtyards using the mass design to promote outdoor activities.
-  **Outdoor spaces:** Create different types of outdoor spaces fostering activities to encourage movement and staying active.

Mobility limitations:

-  **Ground floor:** Encourage elderly living on the ground floor to facilitate movement and accesibility.

Loneliness:

-  **Shared and common functions:** Include shared and common functions in the design to encourage social interactions.
-  **Outdoor transitions:** Create smooth transitions between private and common outdoor spaces to encourage the use of the common ones.
-  **Multigenerations:** Locate different generations in different sides of the building but offer spaces where they can all come together.
-  **Visual connectivity:** Create a strong visual connection between the inside spaces and the gardens to enhance social interactions

Other guidelines:

-  **Privacy:** To create more privacy in the apartments, push parts of the mass inwards or create non-perpendicular views.
-  **Human scale:** Incorporate human scale in the design to create a more personal atmosphere and to enhance the feeling of home.

2.5 Observations and Mapping of Tarwewijk



Figure 26 - Images Tarwewijk (photos taken by the author)

2.5.1 Overview Tarwewijk

An in-depth analysis of the neighborhood of Tarwewijk has been performed as groupwork, producing a separate booklet with all the information needed about it. The neighborhood has been analyzed from three perspectives: profile, space and use, and process. The information from this booklet has been used to create design guidelines (Presura et al., 2024).

From the profile point of view, Tarwewijk faces a series of health, socio-economic, and spatial challenges that leave room for redesign and redevelopment. It is a multicultural neighborhood, which causes social fragmentation not only due to communication barriers but also due to limited shared public spaces. This fragmentation reduces interaction and affects community cohesion, leaving opportunities for the design of environments that promote diverse activities. Health is a big issue for the neighborhood, with high rates of obesity, low life expectancy rates, and mental health problems, such as depression, stress, and anxiety. An urban design that promotes

healthy lifestyles, with green spaces and infrastructures that encourage natural movement and physical activities, is needed in the neighborhood (Wijkprofiel Rotterdam, 2024.). There is currently a missing link between design and health, leading to environmental stressors like noise and pollution having an impact on the well-being of the residents. A healthier environment that promotes movement, and green spaces, and encourages social interaction and community activities is needed in the neighborhood to increase the physical and mental well-being of the residents (Presura et al., 2024).

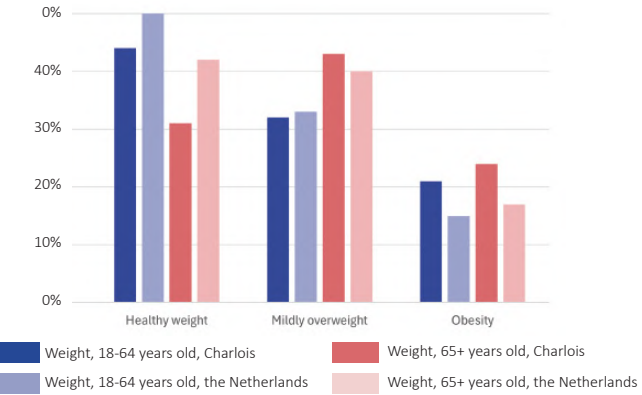


Figure 27 - Weight rates (Wijkprofiel Rotterdam)

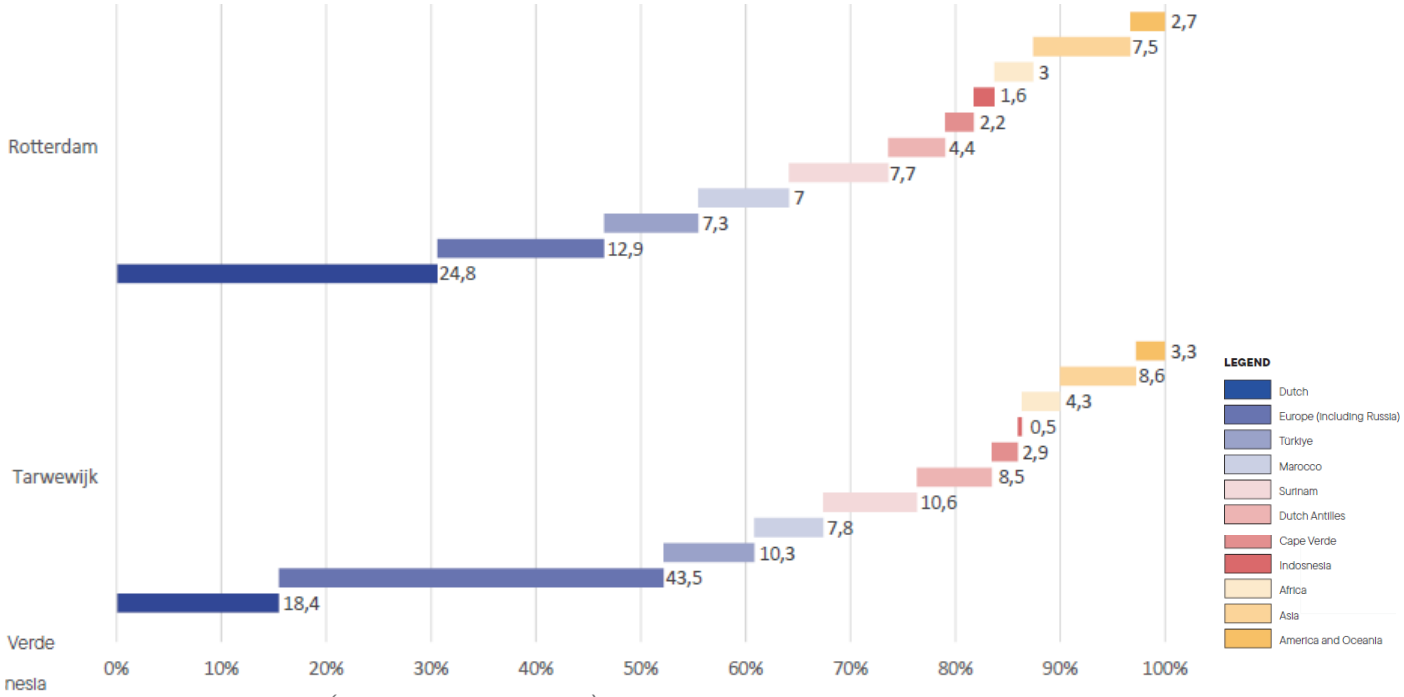


Figure 26 - Ethnicity graph (Wijkprofiel Rotterdam)

From the “space and use” perspective, the neighborhood presents both challenges and opportunities. During a neighborhood visit, it was observed that accessibilities cause issues, especially for disabled people. Height differences in the pavement, lack of ramps, obstacles on the way, and inadequate street lights limit the movement of vulnerable target groups like elderly and disabled people.

A positive development to enhance safety and encourage cycling and walking is the 30 km/h speed limit in the inner streets of the neighborhood. However, the pavement is still cluttered due to insufficient parking spaces, creating difficulties in walking. The outer parts of the Tarwewijk are well connected by public transport, where also most public functions are located. The inner parts of the neighborhood cause problems for vulnerable groups due to the required walk to facilities. This tension between the outer and inner parts of the neighborhood is also felt in the diversity of building heights and housing types. The central inner area is quieter and has low-rise buildings, while the outer area has a higher density and hosts most amenities (Presura et al., 2024). The green spaces are spread around the neighborhood, having different functions to match the needs of different age groups.

By better aligning the public spaces, amenities, and accessibility in the neighborhood, a healthier and more inclusive environment can be created.



Figure 28 - Speed limits (“Health and Care in Tarwewijk” group booklet)



Figure 29 - Bike streets (“Health and Care in Tarwewijk” group booklet)

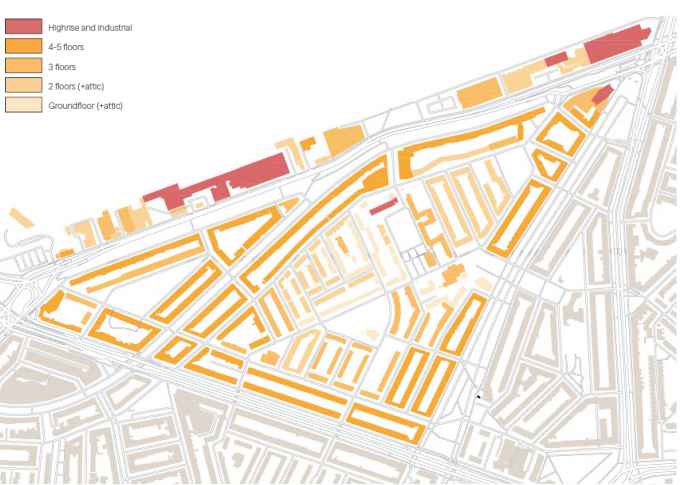


Figure 30 - Building heights (“Health and Care in Tarwewijk” group booklet)



Figure 30 – Public functions (“Health and Care in Tarwewijk” group booklet)



Figure 30 – Public transport (“Health and Care in Tarwewijk” group booklet)

The process perspective shows insights from observation and interviews with residents. A summary of the interviews can also be checked in chapter 2.5.2. Residents complained about the infrastructure of the neighborhood that limits the mobility of impaired people due to uneven sidewalks and poor crossing facilities. The cultural diversity is shown by different community activities being organized through the neighborhood, to combat loneliness and increase social interactions. When asked about these community initiatives, the wish for intergenerational cohesion was present, especially from the elderly who state that interacting with younger people makes them forget about pain. A similar reasoning was given about the desire for elderly homes. While they consider the caring facilities an advantage for those in need, being in an institution with only elderly people did not seem appealing. Due to the cultural diversity, a different approach compared to the traditional elderly home is needed. It is essential to promote multigenerational interaction and to offer housing options for different views on aging, from being surrounded by other elderly to aging with your own family.

Tarwewijk is a culturally diverse neighborhood that offers room for improvement in health, spatial organization, safety and accessibility. The cultural diversity of the neighborhood influences the needs of the residents, as different cultures perceive growing old differently. In the case of Tarwewijk, there should be solutions to accommodate both the elderly who want to grow old among other elderly and the elderly who want to grow old with their family nearby.

By adapting the urban plan, the well-being of the residents would be increased, and the neighborhood would present a healthier and more inclusive living environment. These design opportunities have been translated into design guidelines.

2.5.2 Interviews

Gender: F
Age: 88



Characteristics:



Positive information:

- She loves the proximity to Zuidplein, where different activities take place.
- She likes Milinxstraat due to the neighborhood initiatives, which helped her build a social network with people from the neighborhood.

Negative information:

- She expressed dissatisfaction with the neighborhood because she thinks it is dirty and crowded.
- Waste management is not handled well.
- She is worried about walking to Zuidplein as she ages because there are no benches and resting spots on the way.
- She currently lives in a flat and she feels more isolated. Something obstructs her view towards the outside and she cannot enjoy the looking out.
- She misses the stairs in her previous house because it made her move more.
- The pavement lacks sufficient walking space.

Gender: M
Age: 60



Characteristics:



Positive information:

- He is very active in the Turkish community center.
- He likes the interaction between younger and older generations in the same place; it brings joy, strengthens the community, and makes him forget about health problems.
- He is in charge of organizing activities for the Turkish community.
- When asked about living in an elderly home, he said he likes the caring help you can receive there. He considers still himself young and healthy, but with age, he might need to rely on family for help.

Negative information:

- When asked about living in an elderly home, he said he would not like to do that because it feels like a hospital, and would not like to interact only with older people. The interaction with younger people and children helps him.

Gender: F
Age: 69



Characteristics:



Positive information:

- There is a community of dog owners, which creates a shared bond through the neighborhood as they walk their dogs.
- She lived in the neighborhood for 58 years.
- The new buildings under construction bring positives to the neighborhood since they also include social housing which helps promote social cohesion and provides dwellings for low-income.

Negative information:

- The neighborhood became more crowded over the years and she expressed concerns about the trash, as it is often unmanaged.
- She is concerned about the rise in criminality, so she added extra locks to her door for security.
- She is working in Thuiszorg (home care) which made her aware of the need for care in the area.
- Houses in the area have too many stairs and are not designed for disabled people.
- The neighborhood is too much car-dominated.
- She emphasizes the need for green spaces.

Gender: F
Age: 75



Characteristics:



Positive information:

- She enjoys having shops nearby.
- Getting to know people in the neighborhood has been easy for her, due to local communities and activities.
- She enjoys the diverse mix of cultures and backgrounds.

Negative information:

- She would like more communication with her nearby neighbors.
- She lives by herself and sometimes it gets lonely.
- Her family is far away and it gets difficult to manage things alone when she is sick or not feeling well.
- She likes walking but there are many obstacles and a lot of trash on the street, making walking difficult on the pavement.

2.5.3 Design Guidelines

Active Aging:

-  **Infrastructure:** Promote bicycle and pedestrian infrastructure to encourage natural movement, instead of using the car.
-  **Outdoor spaces:** Design inclusive public green spaces, with different functions, to encourage people to stay active, enhance the well-being and increase social interactions.
-  **Accessibility:** Increase the accessibility to the inner parts of the neighborhood through public transport and bring public functions closer.

Mobility limitations:

-  **Resting spots:** Incorporate frequent benches and resting spots in the urban design to facilitate movement for people with limited mobility
-  **Barrier-free design:** Design environments that meet universal accessibility standards, such as ramps, wide paths and entrances, elevators, to ensure inclusivity in design.

Loneliness:

-  **Community centers:** Design spaces for communities and intergenerational activities to increase social interactions.
-  **Public spaces:** Include public spaces in the urban plan that support culturally diverse activities.

Neighborhood specific:

-  **Eyes on the street:** Include public functions on the ground floor of buildings to increase the feeling of safety when walking on the streets.
-  **Housing variety:** Desing different types of housing options for different views on aging, from living with other elderly to aging with your family.

Chapter 3

Conclusions and Design guidelines

**3.1. Research questions
conclusions**

3.2. Design guidelines

3.3. Reflection

3.1 Research questions conclusions

This research has been conducted to accumulate answers to the research questions formulated in Chapter 1.3. The sub-questions and research questions will be answered using the knowledge described in Chapter 2, using literature research, case studies, and field trips. The design guidelines formed from this analysis are summarised in Chapter 3.2.

1. What architectural elements and design features effectively enhance social interaction among residents in senior living environments?

Architectural design plays an important role in enhancing social connections between residents by providing community interactions. Common spaces serve as social hubs, presenting comfortable environments for casual gatherings and activities. Flexibility in design is also essential. Adaptable spaces with smooth transitions between areas encourage engagement in various activities and social groups. Additionally, such spaces should provide areas for multigenerational activities as they can enrich the lives of the elderly through interaction across age groups. Shared facilities, such as libraries, common kitchens, or sports rooms, complement the common spaces by encouraging interaction through daily activities. Spatial planning plays an important role in promoting social cohesion

by implementing a thoughtful design of hallways and corners that facilitate spontaneous meetings. Chance encounters are encouraged through these gathering points that create a sense of belonging. Visual connection, both between the public and private spaces and between inside and outside spaces, creates the possibility to observe, feel part of a community, engage in outdoor activities, and explore shared gardens. By integrating these design elements, senior living environments can increase social interaction, a sense of community, and mental well-being, creating a sense of belonging.

2. What design strategies can facilitate accessibility and mobility for seniors, thereby promoting active aging and encouraging physical engagement within the community?

At an urban level, integrating pedestrian and bicycle paths in the urban design is essential for active aging, as it encourages elderly to conduct light physical activities in a safe environment. Well designed outdoor spaces, such as gardens, walking trails, and fitness areas, further enhance mobility and movement. They provide opportunities for physical activity while enjoying the benefits of nature. Proximity to facilities, such as healthcare centers and grocery stores, encourages

movement and independence for seniors.

At the building level, a centralized appealing staircase would encourage natural movement rather than using the elevator. Additionally, an intuitive layout encourages movement freely and independently by offering clear navigation.

These design strategies shape environments that support accessibility and empower elderly to stay active, increasing their physical well-being.

3. How can the integration of supportive care facilities within architectural and urban designs enhance the overall well-being and independence of seniors in co-housing settings?

The integration of care facilities in senior co-housing settings can balance the formed community and release the informal caregiver function. In co-housing settings, sometimes neighbors feel obliged to take over the informal caregiver role which leads to tension and uncomfortable situations. The possibility of partial caring facilities strengthens the connection between residents by creating independence about personal tasks and maintaining social interaction for common activities.

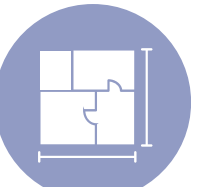
How can the architectural and urban design of senior living environments be optimized to reduce loneliness, promote active aging, and support people with mobility limitations?

The architectural and urban design of living environments can be optimized to reduce loneliness, promote active aging, and support people with mobility limitations by creating spaces that promote and balance physical engagement, social interactions, and accessibility, at the neighborhood,

building, and interior scale. The three topics of loneliness, active aging, and care are closely related to one another, and often a solution to one has a positive impact on another one. Mental and physical well-being are influenced by one another. Combating loneliness improves mental well-being, and encouraging movement improves physical well-being. While the two topics are not always linked, they both have an impact on growing old in a healthier way. There are also linked parts between these topics. Keeping active and taking part in physical activities creates opportunities to meet people and extend the social network. Having a healthy mind also encourages one to keep a healthy body.

Design strategies such as flexible and adaptable communal spaces, visual connectivity between inside and outside, intuitive layouts, well-designed pedestrian and bike paths, and outdoor spaces promote natural movement and increase the feeling of community. Including families in this environment fits the habits of different cultures present in the neighborhood, where people want to grow old with families closeby and be surrounded not only by other elderly, but by younger people as well. The addition of proximity to health and care services facilitates belonging to a community without relying on informal caregivers. By intertwining these urban and architectural design strategies, the senior living environment can be optimized to meet their needs for aging in settings focused on their physical and mental well-being.

3.2 Design guidelines

	Active Aging	Mobility Limitations	Loneliness
Neighborhood Level	 Pedestrian and bicycle paths	 Barrier-free surroundings	 Shared garden
	 Proximity to amenities	 Living on ground floor	 Culturally diverse spaces
	 Eyes on the street	 Frequent benches	 Outdoor transitions private-public
	 Different green spaces		 Intergenerational community functions
	 Accessibility to public transport		
Building Level	 Centralized attractive staircase	 Caring facilities	 Communal functions
	 Intuitive layouts	 Physiotherapy facilities	 Multifunctional spaces
	 Human scale	 Different care zones	 Gradients of interaction
	 Maximize visual connection to nature	 Barrier-free floorplans	
	 Multipurpose sports spaces	 Frequent resting spots	
Interior Level	 Private outdoor spaces	 Wheelchair-friendly apartments	 Spontaneous meeting spots
	 Housing variety	 Adaptable apartments	 Avoid long and dark corridors
	 Natural materials for interior design	 Avoid institutional feeling	 Visual connectivity private-public
	 Sufficient natural and artificial light		

Legend:

- 1st importance
- 2nd importance
- 3rd importance

3.3 Reflection

This research paper provides a series of design guidelines that can help improve the living environments for the elderly. The sublayer of cultural diversity fits the design location, Tarwewijk, Rotterdam, where culture and habits also play a role in how people view aging and growing old. The core of the guidelines is formed by the fieldwork done at the Liv Inn in Hilversum. Their alternative solution for an elderly home provides a great example of how the elderly can co-live while maintaining their independence.

The visit offered time to properly analyze and observe the interactions between residents and the use of the spaces. It was noted that architectural design can only go to an extent in forming communities and social connections. It can provide well-designed social infrastructures that encourage social interactions, but the people themselves still need to take action. A good balance between people who are willing to volunteer, socialize and use common spaces and those who are not, creates opportunities for a successful design.

Chapter 4

Appendix

1. Appendix A: Summary interviews at Liv Inn
2. Appendix B: P4 Reflection

Appendix A: Summary interviews Liv Inn

Name: P
Gender: F
Age: 70
Persona:
Volunteering Group



Characteristics:



Positive information:

- One of the **most active volunteers** in the building, planning activities and coordinating with Habion and the Congress
- She moved here to **age in an active way**
- She **takes the stairs** instead of the elevator to say active and healthy
- She mentioned that Habion is looking for active residents who will stay at Liv Inn all year long
- Her 38 m² apartment is compact but well suited for her needs. He has a **balcony**, which she considers **essential** for an apartment, but not all have one. She has a beautiful **view of the garden** which she enjoys a lot
- She likes to run and ski

Negative information:

- She is annoyed that the **bathroom door collides with the bedroom door**.
- She complains about the **lack of volunteers** in organizing activities
- She would like younger residents in the building to be in power to volunteer, there are currently too many residents around 80 years old
- P believes that intensive care (people with dementia) is not well suited at Liv Inn

Name: E
Gender: F
Age: 75
Persona:
Volunteering Group



Characteristics:



Positive information:

- She is an **active participant** in communal dinners at Liv Inn and cooks once per month Surinamese food
- Her husband R assists with electrical work, lighting and other technical chores within the community. R uses the **workshop** space a lot.
- E enjoys the happy-hour **gatherings**.

Negative information:

- She used to be involved in **gardening** but had to stop due to her **arthritis**, which makes movement difficult. The head of the gardening committee is very stubborn and insists on doing things his way.
- Both E and P commented that Liv Inn might not be the best fit for individuals with **limited mobility** as they may struggle to fully participate and contribute

Name: L
Gender: F
Age: 77
Persona:
Active Group



Characteristics:



Positive information:

- She is an American resident and enjoys **playing pool** in the evenings with other residents
- She thinks the community has ups and downs. She likes to stick with her friend group which **plays pool regularly**
- She has a dog that walks late in the evening and again late in the morning.
- She joins the **communal yoga sessions**.

Negative information:

- She has been living in the Netherlands for around 40 years but she still struggles with the Dutch language sometimes, especially in **formal language contexts**. Therefore she sometimes struggles to fit in the Liv Inn community.
- She lives in a small apartment and she would love to have a **bigger countertop** for cooking.
- Her apartment has **limited storage space** so sometimes she forgets where she puts things around.

Name: F
Gender: F
Age: 77
Persona:
Fancy Group



Characteristics:



Positive information:

- Used to live in Dan Haag and had a lot of **stairs**; in the house it was cold, so she wanted something smaller
- She lives five minutes away from her son

Negative information:

- Even though the apartments have a fully equipped kitchen, many residents order **pre-made meals** to heat up later.
- F likes to **play piano**, but the Liv Inn does not have one
- She likes the aesthetics of the other Liv Inn more (white frame instead of black)
- She would like a **heated swimming pool and sauna**
- She does not participate in activities here because she does not like the organization

Name: T
Gender: F
Age: 87
Persona:
Congress Group



Characteristics:



Positive information:

- She is an **active participant** at the Liv Inn, participating in a lot of **activities at the Congress**, where she aligns the needs of the residents and what architects can do.
- The bathroom is **wheelchair-friendly**, a useful feature for future accessibility needs.
- Each apartment has a board outside of the entrance door that can be personalized. She uses the space to hang up paintings.

Negative information:

- The light switch is placed inconveniently behind the designated coat-hanging space, which she considers a **design flaw**. A light sensor has been installed as a practical solution for this issue.

Name: J
Gender: F
Age: 80
Persona:
Passive Group



Characteristics:



Positive information:

- She believes that **light** can create a **homey environment** in the common spaces at Liv Inn
- She appreciates being able to take walks whenever she wants.
- One student helps her with dinner, groceries and cleaning 3x a week. One other day she eats communal dinner, because she cannot do groceries herself.
- She has everything she needs in the building.
- The Huiskamer is usually used for **birthday parties** with friends and family.
- Likes the size of her room and that she has everything she needs
- She plants spices in **her balcony**
- When she moved in there was a lot of concrete everywhere and now it's **wood** and it's nicer

Negative information:

- The **brickwork** in the corridor towards her room is darker, and she does not like the **long hallways** because it looks like a hospital.
- Physio is painful for her
- There are no sufficient sitting places at the library

Name: D
Gender: F
Age: 56
Persona:
Active Group



Characteristics:



Positive information:

- She has lived at Liv Inn for one year and is one of the **youngest residents**.
- She lived in Hilversum before moving to Liv Inn. Is very active: does **Tai Chi** outside of the Liv Inn, but also gives classes of Tai Chi and **chair yoga** for the residents of Liv Inn, likes to ski (she used to be a ski instructor). She **walks** to be more active (biking would be too easy)
- She sold her house and wanted to rent something small, no big house and garden to take care of alone
- She really likes the **community feeling** at Liv Inn.
- **Plays pool** with 4-5 others almost everynight, and she likes it, sometimes they bring wine and snacks

Negative information:

- Lounges need to be larger and more appealing.
- Corridors should be made livelier; they currently resemble **hospital hallways**, especially those with brick walls.
- **Sound insulation** can be improved, it can be very loud especially if the band is playing.
- Lack of **dedicated fitness areas** at Liv Inn, she needs to use makeshift rooms for yoga or Tai Chi

Name: W
Gender: M
Age: 75
Persona:
Volunteering Group



Characteristics:



Positive information:

- He is responsible for **weekly communal dinner planning**, and cooks once per month for them, often Dutch food
- He **drives regularly**, either to nearby areas, like grocery shopping, or to his family in Brabant.
- He mentioned that once per week the communal areas are cleaned by the cleaning staff. The rooms are cleaned by the residents themselves, but if they want help they can apply for help at the municipality and pay 20€ for 6 hours per week.

Negative information:

- He would not be open to a **shared-car concept**, he wants to have his own car
- He labels his food in the shared fridge so others do not take it by mistake

Appendix B: P4 Reflection

1. What is the relation between your graduation project topic, your master track (Ar, Ur, BT, LA, MBE), and your master programme (MSc AUBS)?

This research and project look into the effects of architectural and urban design on the mental and physical well-being of a vulnerable target group, the elderly. It is connected to the “Health and Care” studio focusing on designing healthier living environments with caring facilities for elderly people. The project engages on the scales of urban, architectural, and interior design to reach its goals. All these levels, followed by structural details, as part of the AUBS master program, come together in a complex design to tackle the problem of health and care among elderly living environments.

2. How did your research influence your design/recommendations and how did the design/recommendations influence your research?

The research and design processes maintained a dynamic relationship throughout the project. Investigation at Liv Inn deepened the understanding by highlighting the significance of fostering communal living environments. The fieldwork there emphasized the benefits of shared amenities and the necessity for housing units that are flexible enough to adapt to evolving care needs. This insight confirmed that the design should not only address physical constraints but also nurture a sense of community and mutual support.

A subsequent field trip to Vitalitas provided essential input for the medical recovery facilities aspect of the project. The observations made during this visit helped define spaces that support healing and medical care, ensuring that these specialized areas were integrated effectively into the overall design.

Early fieldwork in Tarwewijk revealed several critical issues—such as inefficient layouts that disrupted movement, steep stairs that impeded accessibility, and underused public areas that lacked vibrancy. These challenges provided a concrete foundation for preliminary design proposals and even influenced the decision regarding the project’s location.

All of these insights were eventually consolidated into a set of comprehensive guidelines that directed the design development. Early sketches and massing models played an equally important role by challenging initial assumptions and prompting new research questions.

In essence, the continuous dialogue between research and design ensured that every stage of the project was grounded in real-world insights and focused on the users’ needs. This iterative, user-centered approach not only addressed

immediate spatial challenges but also allowed the design to evolve organically, resulting in an outcome that is both innovative and deeply responsive to the context in which it operates.

3. How do you assess the value of your way of working (your approach, your used methods, used methodology)?

The project uses the following methodology:

- Ethnographic research (Liv Inn)
- Spatial mapping (Tarwewijk)
- Interviews and personas
- Literature and Case studies

The methodology created a base and guidelines to be implemented at three scales: urban (neighborhood level), architectural (building level), and interior (apartment level).

At the urban scale, strategies were developed for neighborhood-level planning, focusing on community connectivity, public spaces, and broader contextual considerations. On the architectural scale, the guidelines informed the overall design and structure of buildings, ensuring that the physical form and spatial organization meet both functional and aesthetic requirements. Finally, at the interior scale, these principles were translated into detailed apartment-level strategies that optimize livability and user experience.

The combination of the theoretical research and the practical research (fieldwork) concluded in essential design strategies, that are context-sensitive and deal with differences in income, nationalities, and background. This layer added extra challenges and guidelines and required solutions that combined the approach used in the case studies analyzed and the needs of a culturally diverse area.

The feedback from the teachers was focused on strengthening the concepts on all scales throughout the project and on ensuring awareness of the different cultures in the area. The implementation of the feedback influenced the entire design but was particularly important for the mass design which created a strong base for the whole project. Further, the feedback was translated into using a homogenous language throughout the project and creating an atmosphere that influences physical and mental well-being.

4. How do you assess the academic and societal value, scope, and implication of your graduation project, including ethical aspects?

This research contributes to the field of architectural gerontology by exploring design strategies that promote active aging while addressing mobility limitations. It emphasizes creating environments that enable older adults

to remain independent, active and engaged in their communities. By integrating principles from architecture, urban design, and gerontology, the study offers new perspectives on how built environments can be adapted to support aging populations.

In addition to focusing on the needs of older adults, the research also addresses the growing demand for spaces that accommodate multi-generational and multi-cultural communities. In neighborhoods characterized by aging housing stock and low-income profiles, the study’s design strategies promote inclusivity and social cohesion. It recognizes that modern urban environments must cater to a diverse range of users, ensuring that communal spaces foster interaction, cultural exchange, and mutual support across different age groups and backgrounds.

5. How do you assess the value of the transferability of your project results?

The project provides a set of practical recommendations aimed at enhancing the overall quality of life for all users, with a primary focus on residential environments and the common and public spaces that support them. These recommendations are grounded in extensive research and field observations, ensuring that the proposed interventions are both evidence-based and directly responsive to the needs of everyday users.

A key strength of the project lies in the versatility of its guidelines. While initially made for residential projects—addressing issues like spatial efficiency, accessibility, and community connectivity—the principles established can be adapted to a wide range of projects, from residential to public space and urban projects. Thus, the guidelines can be transferred to other projects and adapted to the type of projects, following the line of mental and physical well-being and encouraging active aging.

Reflection questions:

1. How can architectural design support a flexible design that future-proves the buildings and adapts to the changing needs of the new generations?

Architectural design can support flexible, future-proof buildings by focusing on modular and adaptable layouts. Modular design features spaces that are easily configurable or expanded using prefabricated components and movable walls, so the buildings evolve according to the changing needs. By prioritizing open floor plans and universal structural grids, interior spaces can transition between different functions over time, such as communal spaces, residential, and commercial. Such adaptability is strengthened by using durable and sustainable materials that extend the building’s lifespan and reduce

the costs of renovations, as well as reducing the environmental impact.

These strategies ensure layout changes as well as functional adaptability for the needs of future generations.

2. How can the architectural design for multigenerational spaces promote active aging without segregating the groups?

Architectural design spaces can promote active aging by fostering intergenerational, inclusive interactions while accommodating diverse social and physical needs. Rather than segregating different age groups, design should encourage shared spaces focusing on mobility, comfort, and social interaction for everyone. This should include walkable layouts with gradients of interaction, seating areas to encourage conversations, and accessible amenities. Including flexible and open communal areas, such as gardens, kitchens, and game rooms, without strict division walls encourages social mixing and offers different generations spaces to connect. Visual connections allow for passive interaction and create a sense of belonging, while accentuating the gradients of interactions.

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Fieldwork at Liv Inn Hilversum

Fieldwork Report
AR3AD110 Dwelling Graduation Studio:
Designing for Care in an Inclusive
Environment (2024/25 Q2)

TU Delft // Faculty of Architecture and
the Built Environment // Department of Architecture
Chair of Architecture and Dwelling

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01 Traditional Care vs. Liv Inn Model

Insights into the comparison between traditional care models and the Liv Inn model are derived from an interview with Peter Boerenfijn, the director of the Dutch housing cooperative Habion. The traditional approach to elderly care is characterized by a phased progression, beginning with individuals aging in their own homes. This is followed by relocation to a centralized institutional care facility, often transitioning through stages such as elderly care homes, specialized care facilities, and ultimately, hospice care.

Independent Living at Home:

- Independent living with minimal or no care needs
- Care is brought in as needed but often leads to isolation due to a lack of community support.

Elderly Care Home:

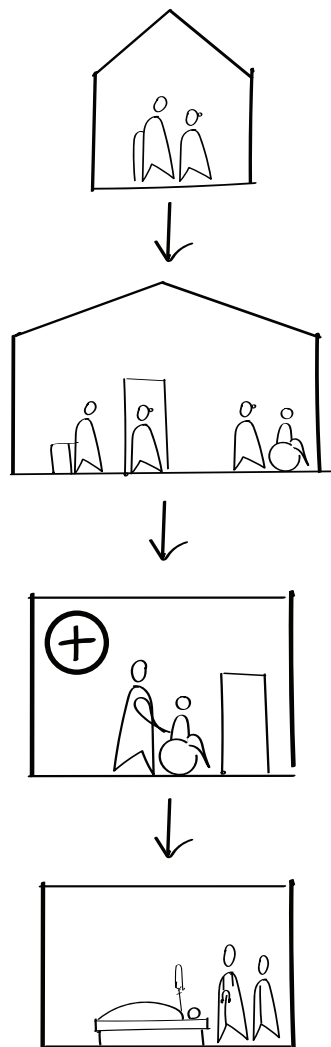
- When living alone becomes difficult, people move to an elderly home.
- Basic care and assistance are provided, but the transition can feel disruptive and disempowering for many.

Specialized Care Facility:

- Individuals requiring intensive medical or dementia care move to highly specialized facilities.
- Social connections and personal environments are often left behind.
- Long waiting lists and shortage of staff makes it not scalable for the future

Hospice:

- In the final stages of life, individuals are moved to a hospice for end-of-life care.
- This can mean another significant transition for the individual and their family.



The Liv Inn model brings care to residents through three pillars: Apartment Living, with adaptable, independent apartments designed for aging in place; Community Spaces, fostering social interaction and active ageing, and a resident-driven community; and Care on Demand, offering seamless, comprehensive care within the same community, ensuring continuity, dignity, and stability without relocations.

Pillar 1: Apartment Living

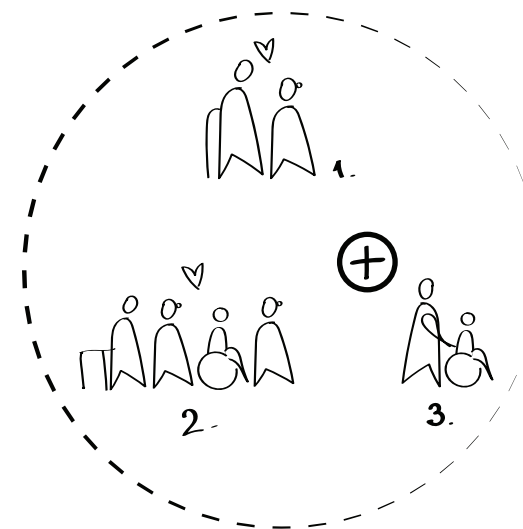
- Residents at the complex live independently in apartments designed for aging in place.
- Apartments are adaptable to evolving care needs, eliminating the need for relocation.
- Encourages ownership, autonomy, and personalization of living spaces.

Pillar 2: Community/Communal Spaces

- Shared spaces foster social interaction, reducing isolation and building a sense of belonging.
- Activities, events, and shared meals create a vibrant, active community.
- Residents actively shape the community, contributing to its development and purpose.

Pillar 3: Care on Demand

- A full spectrum of care is available, from minimal support to specialized end-of-life care, all within the same building.
- Care providers work seamlessly within the community, supporting residents' independence and dignity.
- No disruptive moves between facilities, ensuring continuity and emotional stability.



02

Integration & Interview Process

Liv Inn Hilversum was created through the residents' ideas on how they wanted to age, according to the developer that created the Liv Inn in Hilversum. Moreover, over a hundred future-oriented social housing units are realized with interactive communal living spaces, where elderly can receive care if necessary and where residents are both central and in charge over how you (actively) age.

Entering the Liv Inn

The policy for all Liv Inn locations is that residents have to be motivated to live there. Yet, it differs per location how people can apply for a room. Sometimes they can do it directly and other times it has to be done through "WoningNet", a room application website. Everyone must meet income requirements for rental housing set by the government per room type or Van Der Linden. Additionally, a check is done for their age. If they meet all of these requirements, they are invited to preliminary talks, are interviewed and get a tour through the Liv Inn. Although the Liv Inn has "care rooms", it is an important part of the interview and the contract that they sign where the elderly state that they are allowed to live at the Liv Inn as long as they are not a threat to themselves or to others, hinting that the Liv Inn accommodates a limited level of (professional) care. For the students that are allowed to live in the studio's in the building, the agreement is that they have to study something related to the topic of elderly people.

Becoming a Member of the Liv Inn Association

The association is set up by and for the residents of the Liv Inn. Through this, residents are able to exercise their hobbies, participate in many social events (e.g. communal dinner, happy hour at the communal bar) or writing in the Reuring magazine of the building. Residents are able to become members of various groups that actively organize activities within the Liv Inn and their always able to communicate and propose their own initiatives or ideas that they have for the community (e.g. creative club, finance commission and cooking team). The membership is €20 per year and €40 for residents that do not live in the Liv Inn itself.

03

Interaction Between Age Groups



Research of student living in the Liv Inn Hilversum

The research of the student explores the dynamics of multigenerational interaction within a communal living environment, focusing on its impact on resident well-being, inclusion, and the effectiveness of communal spaces. The findings highlight both positive outcomes and significant challenges, offering valuable insights into how these spaces can foster relationships across age groups. The research is motivated by an interest in understanding how shared living environments like Liv Inn can reduce isolation and promote meaningful connections. Its problem statement emphasizes the difficulty of designing communal spaces that meet diverse needs while fostering supportive, intergenerational relationships.

Positives

Interactions between age groups at Liv Inn contribute significantly to building a sense of community and mutual support. Many residents reported reduced feelings of isolation due to opportunities for interaction created by the presence of other older individuals and (occasionally) younger residents, such as students. These intergenerational exchanges often include assistance with daily tasks, participation in activities, and shared learning experiences, fostering a sense of purpose and belonging. Communal spaces are essential in facilitating these connections. Areas such as the "binnentuin", lounges, and kitchen-dining rooms serve as meeting points for informal interactions and structured activities, including communal meals and celebrations. These spaces allow for spontaneous exchanges and provide a framework for organized events, enhancing the overall social fabric of the community. Residents who actively participate in these activities often report an improved quality of life, as the interactions provide emotional support and meaningful engagement.

Negatives

Despite the strengths of Liv Inn's multigenerational setup, several challenges remain. Social dynamics within the community sometimes lead to exclusion, particularly for newcomers or quieter residents. Tight-knit groups among long-term residents occasionally create barriers to inclusion, leaving some individuals

feeling disconnected. Additionally, gossip and cliques can exacerbate feelings of exclusion, discouraging participation in activities and reducing the effectiveness of communal spaces in fostering inclusion.

The lack of volunteers to support community events limits opportunities for interaction. This challenge is particularly evident among residents with limited mobility, who may find it difficult to access or fully utilize communal spaces. Design shortcomings, such as inadequate seating or unwelcoming corridors, further restrict engagement for less active individuals. While many residents benefit from the communal setup, those unable to participate due to physical or social barriers often experience continued isolation. Additionally, in an interview with the student it became evident that there is limited interaction between the students and the elderly due to varying schedules and interests. The student further explains that most activities are focused on the elderly, which makes it less appealing for the younger audience to join. Besides that, constant negative comments about their attendance and lack in support by the elderly further demotivate them to participate in the communal activities. Even piloted activities initiated by a studentbased commision struggled to launch after having minimal elderly attendees.

Behavioral issues during social gatherings, such as excessive alcohol consumption during the “happy hour” at the communal bar, have disrupted community harmony on occasion (e.g. fight and medical incidents that required police and/or medical interventions). Such incidents detract from the sense of comfort and inclusivity that these spaces are designed to promote.

Recommendations to use in Tarwewijk

- **Boost Volunteer Participation:** Actively engage more residents, especially younger and mid-aged individuals, to support and organize activities, reducing reliance on a few individuals
- **Promote Inclusion:** Develop programs and small-group activities to ensure quieter or less mobile residents feel involved and valued within the community.
- **Improve Accessibility:** Adjust communal spaces to accommodate mobility limitations, ensuring they are welcoming and usable for all residents.
- **Establish Behavioral Guidelines:** Introduce clear rulesto address issues like gossip, exclusion, and disruptive behaviors, fostering a more inclusive and respectful environment. The student mentioned in an interview that this might be outsourced so the role does not fall on the residents

04 Buddy System



The buddy system was introduced to the residents of the Liv Inn as a way to provide mutual support between the elderly and the students. The idea is that each student (e.g. a newcomer) is assigned to several elderly people and helps them with their daily tasks, such as doing the groceries, or digital hurdles, and participation in the social activities. In an interview with an elderly resident, she explained that a student helps with the cooking and cleaning three times a week and doing the groceries, which helps her a lot since she has limited mobility due to ageing. Another interview with a student highlighted that the students are “stand-by 24/7” and ready to call for help in case the elderly need medical attention, if they fall for example.

“Spread too thin”

Although the buddy system seems like a fitting concept to promote social interaction and mutual support between the two age groups, the student-interviewee says the system is not convenient at the moment. This is mainly due to the elderly who are becoming more dependent on the few students (11 in total) that in the Liv Inn. She mentions that it can be very unfamiliar for newcomers (students)

05

Situation in Neighborhood

that are assigned to some elderly that need more informal care such as help with the cleaning, cooking or groceries. It results in a lot of pressure for the students as they already have a busy schedule. A proposed solution is to change the ratio between students and elderly, so students can cover for each other when one is sick or not available at that moment to help the elderly for example. Additionally it can also increase the number of people the elderly resident meets and foster more meaningful relationships between the two age groups.

Neighbours as buddies

The students live mainly in the “corners” of the buildings, as this is where the studio-apartments are located. At least two students live in every corner. The student-interviewee mentions that this helps the neighbouring elderly to spontaneously meet and interact with the younger age group. Furthermore, she mentions that she prefers these spontaneous meetings in the hallway or at an elderly resident’s room more than meeting new people at the communal activities, as it is more organic. Lastly, she finds it interesting to further research how a mix student-elderly clusters in the hallways (instead of only the corners), might affect the stimulation of building meaningful relationships.



Source: Habion; Vragen, antwoorden & plattegronden Liv inn Hilversum

The Liv Inn buildings in Hilversum is designed around a central core or “heart” that organizes the surrounding space. The ensemble consists of three individual buildings set within a park-like environment. Access points are strategically placed along major streets such as Vondellaan, Vaartweg, and Boomborglaan, emphasizing its orientation towards easy navigation and fostering community interaction with the neighborhood.

06

Interviews at Liv Inn Hilversum



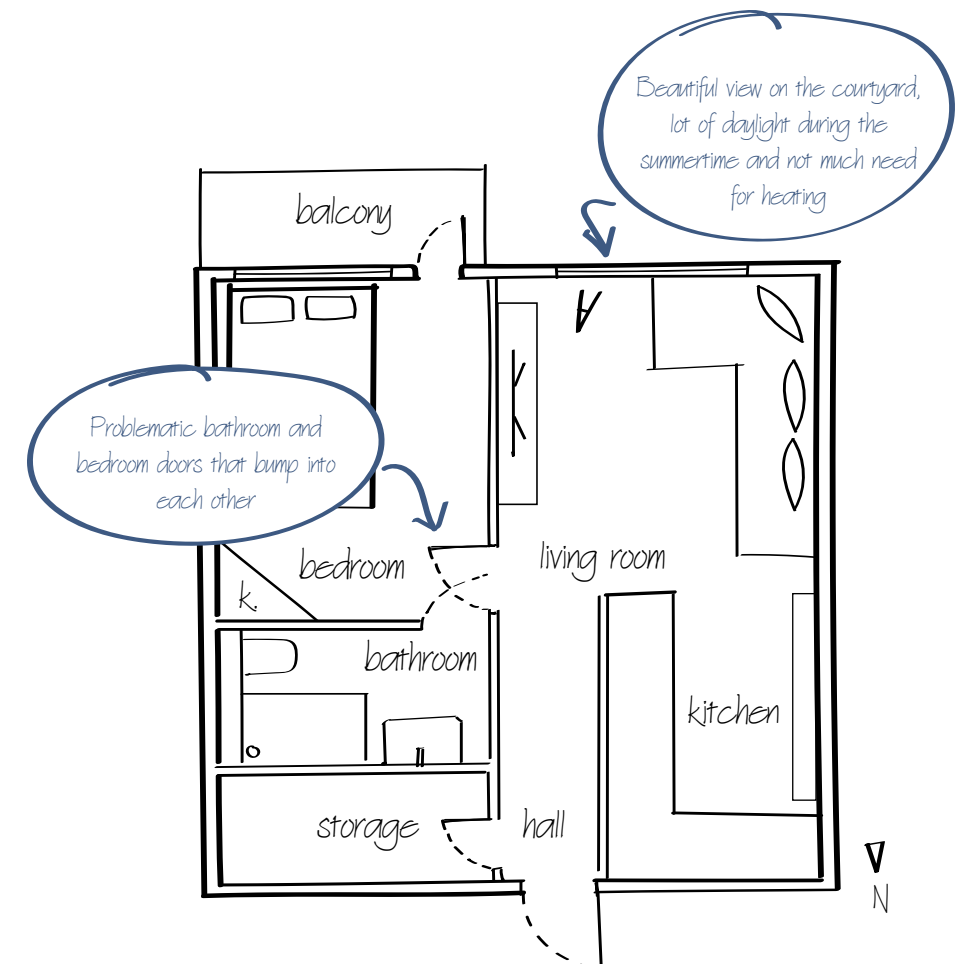
Name: P
Gender: F
Age: 70
Persona: The Volunteering Group



- P is responsible for finances, contracts, and planning activities at the Liv Inn.
- She moved to Hilversum 2-3 years ago to age in a more active way. She is one of the most **active volunteers** at the Liv Inn in planning activities and also coordinating with Habion and the Congress.
- She prefers to **take the stairs** instead of the elevator to stay active and healthy.
- She is frustrated by the lack of volunteers who are willing to help organize events and activities. There is a lack of younger, active adults (aged 50-60) who are more mobile. In her opinion, the group predominantly consists of people aged 80-90, many of whom stay in their apartments and do not interact much. Communal dinners are planned in the shared kitchen, but only about 20 people (or fewer) attend, partly due to the **lack of volunteers and willingness to participate**.
- P believes that more intensive care facilities are not well-suited for the Liv Inn and suggests that residents who need more support may need different housing arrangements. She has ongoing discussions with Habion about how to handle residents who may pose a danger to themselves or others (referring to people with dementia), as they need intensive care and are not suited to participate at Liv Inn.
- Prefers more residents from Hilversum, as most residents are from other parts of the Netherlands.
- Her apartment is 38 m² and, while compact, it is well suited for her needs. She has a beautiful **view of the central garden**. She is frustrated with the way the **bathroom door collides with the bedroom door**, says that the room must have been "designed by a man" and didn't take into account her needs
- She is dissatisfied that she does not have a say in how the garden is managed (interior policies amongst the residents as to who is in charge).
- Likes to watch tv in her free time
- She plans to travel to Spain for four months during the winter. Habion (management) does not accept new residents who plan to be away for extended periods, as they want **active participants**.
- Pauline mentions that Habion's interview process ensures that candidates are available to stay at the Liv Inn most of the year and don't spend too much time away in the summer or winter. She enjoys walking, but here not so much because there aren't walking trails/routes. She likes to run and ski.
- She is trying to smoke less



View of the central courtyard from P's room



P's apartment, located in the older part of the Liv Inn Hilversum building



Name: E
Gender: F
Age: 75
Persona: The Volunteering Group



- E is an **active participant** in **communal dinners** at the Liv Inn, where she cooks once a month.
- She enjoys cooking Surinamese food with spices and finds it relaxing.
- She used to be heavily involved in **gardening** but stepped back due to internal disputes and her **arthritis**, which makes movement difficult. The head of the gardening committee is very stubborn and insists on doing things his way.
- Her husband R assists with electrical work, lighting and other technical chores within the community. R is very active at the workshop space by the entrance, he is there most of the day.
- Both E and P commented that the Liv Inn might not be the best fit for individuals with limited mobility, as they may struggle to fully participate and contribute.
- Enjoys the happy-hour **gatherings**



Name: E
Gender: F
Age: 77
Persona: The Active Group



- L, an American resident, enjoys **playing pool** with her friend circle in the evenings.
- She has been living in the Netherlands for around 40 years due to her husband's work, and her grasp of Dutch remains limited, especially in formal **language contexts**. She therefore also struggles to fit in at the Liv Inn community at times.
- She mentions that she worked at Schiphol for a long time for multiple airlines, and that she had to wake up early, so now she tends to sleep in.
- L's apartment is small, which she likes, but she misses some of her old furniture, which she had to leave behind in her old house which was bigger and had stairs. She would like to have a bigger countertop for **cooking**.
- Sometimes, she **forgets** where she put things around her apartment due to the limited storage space.
- When asked if she likes the community, she said it has both ups and downs. She likes to stick with her friend group which periodically plays pool together.
- She mentions **walking her dog** Max in the evening, so she can wait until the late morning before walking him again.
- She also joined in the **communal yoga session**



Name: G
Gender: M
Age: 87
Persona: -



- G has been a resident at the Liv Inn for three years.
- A few years ago, a close friend of his, who was in critical health, also moved into the Liv Inn. G and his friends provided care and support during his friend's final years, highlighting the value of informal care networks and the ability to spend the last stages of life in a communal living environment rather than relying solely on a specialized care facility or hospice.
- Additionally, professional care services are available through Amaris, located on the building's second floor.



Name: M
Gender: F
Age: 75
Persona: The Volunteering Group



- M noted the lack of volunteers for cooking activities at the Liv Inn.
- She makes lunch once a month for the **communal dinner**
- She is concerned about what will happen if "X," another resident, is unable to continue volunteering because she always cleans the coffee machine. This shows that each resident is important within the community and some have specific roles
- M lives in a spacious apartment with beautiful **views on the garden**. Also a spacious balcony that is connected to the living room and the bedroom.
- She mentions that she used to live in a more expensive apartment, and her children advised her to move to the Liv Inn where she now pays a third of the **rent**



Name: B
Gender: M
Age: 70
Persona: The Volunteering Group



- B is considered the “lighting expert” of the Liv Inn. He bought a lamp as a housewarming gift and is in charge of setting up Christmas lights.
- He ensured that we knew where the light switches above the sofas we were studying at and fixed the TV. He makes rounds late at night to make sure there are no issues.
- Highly **autonomous**, he interacts well with younger people and engages with students.
- Showed us pictures of students who were here last year. Although most apartments are equipped with kitchens, many residents order **pre-packed meals** from the chef to heat up later.
- He also dines out **with students** and is invited to have dinner with them at their homes.
- He likes to go out to concerts and theaters given his fondness for **music**



B's apartment, located in the newer extension of the Liv Inn Hilversum building



Name: W
Gender: M
Age: 75
Persona: The Volunteering Group



- W is responsible for weekly **communal dinner planning** and is often seen shopping for groceries, ensuring that meals are well-prepared for the group. He cooks once a month for the communal dinner, often cooking Dutch food that the other elderly people are familiar with (e.g. Hutspot)
- He drives regularly, often times in the nearby area in his lease car, sometimes to family in Brabant (longer distance), or to do the groceries. When asked if W would be open to a shared-car concept (deelauto's) for the Liv Inn (with other elderly or students) he replied with a no. He does not want to share his “own” car with others, he assumes that others would not keep it clean.
- He labels his food in the fridge to make sure that others don't take it by mistake.
- He mentioned that once per week the communal areas are cleaned by the cleaning staff. The rooms are cleaned by the residents themselves. If the residents want help cleaning assistance you can apply for help at the municipality, and you pay 20€ for 6h per week



W's apartment, located in the newer extension of the Liv Inn Hilversum building



Name: B
Gender: F
Age: 76
Persona: The Active Group



- B is an **active participant** at Liv Inn. She has been very busy recently, participating in a variety of activities at the Congress. At the Congress she aligns the needs of the residents and what architects can do.
- She shows us her apartment and what she likes/doesn't like. The light switch is inconveniently located behind the designated coat-hanging space, which is considered a design flaw. **A light sensor** has been installed as a practical solution to this issue.
- The bathroom is **wheelchair-friendly**, a convenient feature for future accessibility needs, even though it is not currently required for her.
- The area just outside the entrance to her apartment provides a versatile space that can be personalized and utilized as desired. She pins up her **paintings** on the magnet board.



Magnet/corkboards at the entrance to the individual apartments provides opportunity for personalization



Name: N
Gender: F
Age: 77
Persona: -



add here diagram of N's route with scoot-mobile (Mara)

- Believes that **light** can enhance the feeling of coziness and create a homey environment in the common spaces at Liv Inn. Likes lower lighting, which she feels adds ambiance to her home.
- Appreciates being able to take **walks** whenever she wants, if she's able to. She likes to go for a stroll in the evening for 20-30 min, as it is pleasant.
- She explains that the brickwork in the **corridor** to her room is darker, and that she doesn't like the long hallways because it looks like a hospital.
- Physio is painful for her
- Sometimes likes to watch people come and go from a bench near her room. There are no sufficient **sitting places** at the library, which causes her to take the books to her room, instead of being able to read it in the heart of the building.
- It's nice for her that the Liv Inn has organized lunches and dinners, which means that she does not need to do groceries herself, which is quite difficult for her.
- Although she explains that the students usually don't connect with the elderly, she does explain that there is one student who helps her with dinner, groceries and cleaning 3x a week. One other day she eats **communal dinner**, because she can't do groceries herself. She has a friend who lives on another floor, whom she met through the communal activities.
- She does have a **scoot mobile**, but mentions that it's scary to cross the streets and at intersections.
- Explains that it doesn't necessarily bother her that she can't go outside, because otherwise she has everything she needs in the building.
- There are discussions regarding residents with **dementia**, with varying opinions on how best to integrate them into communal life. Although people with dementia are not allowed to live here due to the special care they need and them being a danger to themselves and others, it's hard to legally kick them out when their health has deteriorated to the point that they've become dement.
- Explains that the Huiskamer is usually used for birthday parties, which allows family members and friends who are visiting to celebrate it with the elderly.
- Likes the size of her room and that she has everything she needs
- When she moved in there was a lot of concrete everywhere and now it's **wood** and it's nicer
- She is a bit **deaf** and doesn't like to sit in loud cafes
- They can pick which spices to plant in the garden, but she has her own balcony and she plants there as well



Name: E
Gender: F
Age: 58
Persona: The Active Group



- Romanian, but moved to NL when she was 18
- Has lived at Liv Inn for one year and is one of the **youngest residents**.
- Chose this place because it is close to where she does **Tai Chi**. Lived in Hilversum before moving at Liv Inn. Is very active: does Tai Chi outside of the Liv Inn, but also gives classes of Tai Chi and chair yoga for the residents of Liv Inn, likes to ski (she used to be a ski instructor). She walks to be more active (biking would be too easy)
- Lack of **dedicated fitness areas** at Liv Inn, need to use makeshift rooms for yoga or Tai Chi
- She sold her house and wanted to rent something small, no big house and garden to take care of alone
- She really likes the **community feeling** at Liv Inn.
- Plays **pool** with 4-5 others almost every night, and she really likes it, sometimes they bring wine and snacks
- The pool group is going to celebrate Sinterklaas together with poems and little gifts
- Lounges need to be **larger and more appealing**.
- **Corridors** should be made livelier; they currently resemble hospital hallways, especially those with brick walls.
- Sound insulation can be improved, it can be very **loud** especially if the band is playing.
- There are biweekly dinners, yoga sessions, Tai Chi classes, and a Christmas lighting ceremony for the central tree, which are well-attended by residents.



Name: F
Gender: F
Age: 77
Persona: The Elite Group



- F likes to play piano, but Liv Inn doesn't have one
- She likes the aesthetics of the other Liv inn more (white frame instead of black)
- Would like a heated swimming pool and sauna
- Used to live in Dan Haag and had a lot of stairs; in the house it was cold, so she wanted something smaller
- She lives 5 mins away from her son
- She doesn't participate in activities here because she doesn't like the organization

07

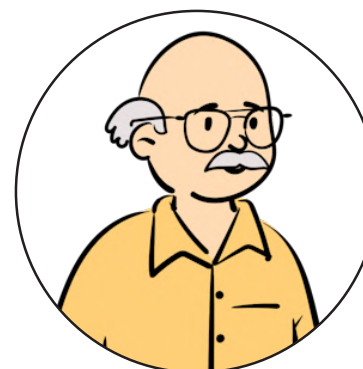
Personas at Liv Inn



Personas are research-based representations of target group users. In most cases, they make an abstraction of individual people and describe a group formed of three or four people who share similar characteristics or personalities. There are also exceptions to the rule, in the case of individuals possessing character traits that stand out.

The personas were formed based on a combination of quantitative and qualitative research methods, such as interviews and observation conducted at the Liv Inn and it concluded in eight personas:

- the active group
- the elite group
- the lighting man
- the congress group
- the grumpy group
- the volunteering group
- the passive group
- the student group



The use of personas creates a clear distinction of who the user is and what the needs of the user are. It reduces the risk of designing for a general user with non-specific characteristics and ensures that the design solution resonates with the real user.

In the case of the personas formed after the Liv Inn fieldwork, the physical and social activities were of great importance for the target groups, as the main focus of this community is staying active, both mentally and physically. Understanding the different ways in which the personas stay active creates better-defined guidelines for designing. Another aspect of the created personas is the negatives and positives of living at Liv Inn, which offer an in-depth understanding of the things that work well and the things that could be improved, from a user's point of view.



“The elite group”

AGE: 75
GENDER: Female
PREVIOUS OCCUPATION: -
LIVING SITUATION: living alone

Physical Activities



Piano

She enjoys playing piano, and would like to have a real one in the building, but it was not allowed.



Walking

She enjoys walks around the building and neighborhood.



Drinks & snacks

A small group of people gather at a specific table from the interior garden for drinks and snacks, creating an exclusive environment.



Coffee gathering

She joins the gathering for coffee in the morning.

Frustrations

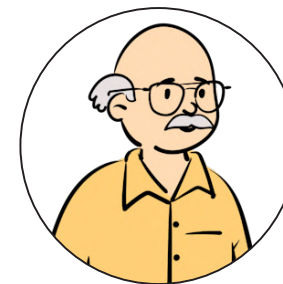
- She would like a real piano, but it was not allowed. She would also like a heated swimming pool and a sauna.

- She does not like the aesthetics of black frames of the Liv Inn, and prefers the aspect of the newer building that has them white.

Positives

- She lives five minutes away from her son.

- She can easily interact with other people her age.



“The lighting man”

AGE: 85
GENDER: male
PREVIOUS OCCUPATION: -
LIVING SITUATION: living alone

Physical Activities



Christmas tree lights

He is in charge with setting up the Christmas tree lights and ensuring proper functionality.



Music DJ

He takes over the DJ role because he enjoys to play music and creates playlists for gatherings and parties.



Walking

She enjoys walks around the building and neighborhood.



Bond with students

He has a close relation with the students living in the building, and have dinner or go out for drinks together sometimes.



Common dinner

He participates in the weekly common dinners organized in the shared kitchen.



Coffee gathering

She joins the gathering for coffee that happens every morning.

Frustrations

- -

- -

Positives

- He enjoys the interaction with the students living in the building, and has a close relationship with them.

- He likes that he has full control over costumizing his room and adapting it to his wishes.



“The congress group”

AGE: 87
GENDER: female
PREVIOUS OCCUPATION: -
LIVING SITUATION: living alone

Physical Activities



Painting

She enjoys painting, even though she is too busy to do it at the moment.



Walking

She enjoys walks around the building and neighborhood.

Social Activities



Coffee gathering

She joins the coffee gatherings almost every morning to socialize with the fellow residents.



Congress

She is enaging in multiple activities at the Congress.



Feedback on floorplans

Works with architects on providing feedback on floorplans for elderly housing.

Frustrations

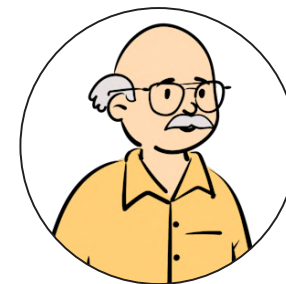
- The light switch on the hallway is hard to access behind the space appointed for hanging coats.

- The kitchen couter is too small, and there is not enough space for cooking.

Positives

- The bathroom is wheelchair friendly, even if she does not applicable to her at the moment.

- She enjoys being able to personalize the panel outside of her room.



“The grumpy group”

AGE: 80
GENDER: male
PREVIOUS OCCUPATION: -
LIVING SITUATION: living alone

Physical Activities



Walking

He enjoys walks around the building and neighborhood.



Physiotherapy

Once per week there is a gym class organized by the physiotherapy center located in the buiding.



Dog walking

Several times per day he walks around the building with the dog.

Social Activities



Coffee gatherings

He joins the coffee gatherings almost every morning to socialize with the fellow residents.



Happy hour

Once per week, the happy hour takes place and reidents meet to socialize over a drink.



Common dinner

He participates in the weekly common dinners organized in the shared kitchen.

Frustrations

- Not all activities are according to his liking.

- He does not want to volunteer to organize activities.

Positives

- He lives close to his children who live in Hilversum.

- He likes that he can be as independent as he wants, without needing permission to get put of the building.



“The volunteering group”

AGE: 70
GENDER: female
PREVIOUS OCCUPATION: -
LIVING SITUATION: living alone; part time living in Spain

Physical Activities

**Walking**
She enjoys walking, but she would prefer to have walking trails/routes in the proximity of the building.

**Cooking**
She prepares dinner once per month for the common meals.

**Ski**
She enjoys skiing when she has the chance.

Social Activities

**Coffee gathering**
She joins the coffee gatherings almost every morning to socialize with the fellow residents.

**Congress**
She is enaging in multiple activities at the Congress and is responsible with finance, contracts and planning activities at Liv Inn.

**Finance and activities**
She is in charge of the finance of the building and of organizing activities, so she collaborates often with other residents.

Frustrations

- She would like more residents of the Liv Inn to come from Hilversum and not other parts of the country.
- Not enough people are young and fit to volunteer for activities.

Positives

- She is content with her apartment even though it is small.
- She enjoys being part of a community and staying active.



“The passive group”

AGE: 88
GENDER: female
PREVIOUS OCCUPATION: -
LIVING SITUATION: Living alone

Physical Activities

**Walking**
She enjoys walking twice a day for approximately half an hour, around the building.

**Motorized scooter rides**
Due to limited mobility, she uses the scooter for longer distances in the neighborhood.

**Gardening**
She likes to plant spieces on her own balcony.

Social Activities

**Coffee gathering**
She joins the coffee gatherings almost every morning to socialize with the fellow residents.

**Common dinner**
She participates in the weekly common dinners organized in the shared kitchen.

**Help from students**
She has a strong bond with the students. She receives cooked meals three times per week from a student and help with cleaning once per week.

Frustrations

- The brickwork in the hallway where she lives makes the atmosphere too dark and it reminds her of a hospital.
- She thinks there are mixed opinions among residents, making it hard to reach a consensus on various issues, sometimes leading to disagreements.

Positives

- She appreciates that she can go out of the building whenever she wants, without restrictions.
- She feels like she has everything she needs in the buildin, so she does not mind that she cannot go outside that often due to her mobility limitations



“The active group”

AGE: 65
GENDER: Female
PREVIOUS OCCUPATION: IT developer
LIVING SITUATION: living alone

Physical Activities



Pool games

Every evening, a small group of people meet and play pool before dinner time, combining physical activity with socializing



Chair Yoga

Once a week, the chair yoga class is held, that encourages the residents to stretch, move and relax.



Tai Chi

A group of around eight people participates in the Tai Chi classes that are held once per week.



Drinks & snacks

While playing pool, the group sometimes enjoys drinks and snacks. They also organize other activities together, such as celebrating Sinterklaas.



Tea time

After the yoga class, the participating group gathers to socialize over a cup of tea.



Tai Chi

She joins a Tai Chi studio from the neighborhood, which acts both as physical and socializing activity for her.

Frustrations

- In the need of a proper sports room, big enough for the Tai Chi and Yoga classes to take place freely.

- The sounds insulation in the building is not so good, and you can hear your neighbors through the ceiling.

Positives

- She liked the community feeling which helps with not feeling alone.

- She liked that the building encourages sports and movement.



“The student group”

AGE: 20
GENDER: female
PREVIOUS OCCUPATION: -
LIVING SITUATION: living alone

Physical Activities



Going to the gym

She goes to the gym at least once per week.



Biking

She often uses the bike to move around the city



Helping the elderly

She sometimes helps the elderly with chores or volunteer for activities.



Meeting with friends

She likes to hang out with her friends in their free time.



Study

She socializes with many classmates during her studies.



Work

Through her work, she socializes with her colleagues.

Frustrations

- Sometimes the elderly complain that the students do not spend time with them.

- It can become too much to help all the elderly with their chores, so she needs to have clear boundaries.

Positives

- It is a beautiful building with many amenities.

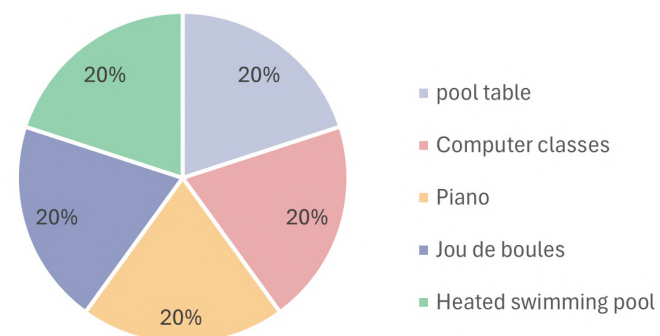
- She does not feel alone because it is a big community.

08 Quiz

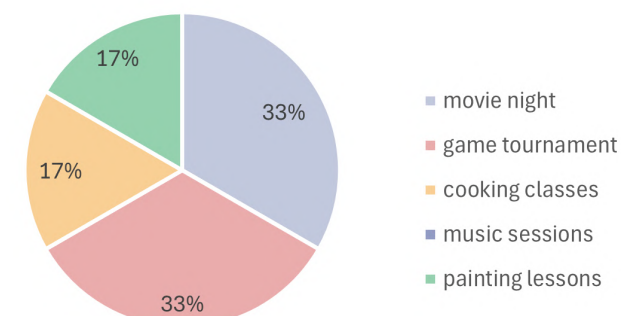
To get to know the residents better informally, a quiz was created that they could fill in. The quiz was composed of questions regarding ideal improvements from the residents' point of view, preferred outdoor and indoor activities, suggestions for room additions, and more. A few questions had an open answer, while most had multiple choice answers, with the possibility of adding another answer as well.

Valuable information was obtained by interacting with the elderly in a fun way. This information will be used as feedback from the residents of the building and will possibly be translated into further guidelines for designing for elderly. The questions will be stated below, with graphs including the answers.

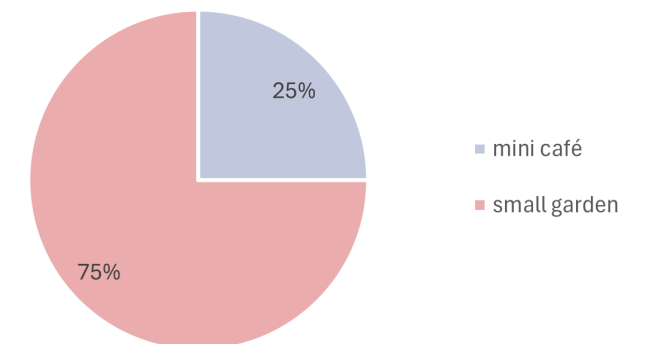
If you had won €5000, what would you want to buy for the Liv Inn?



Suppose you could create one new weekly activity. What would that be?

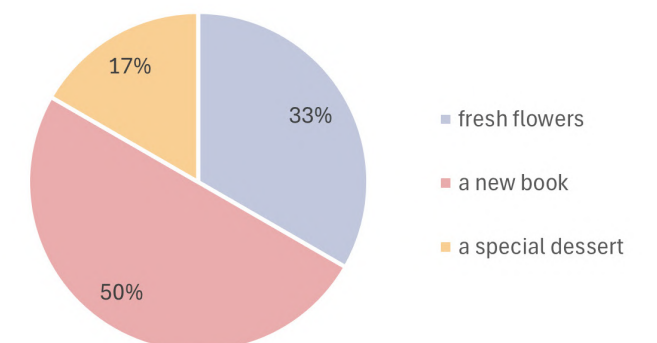


Would you rather have a mini cafe to relax in or a small garden to help maintain?

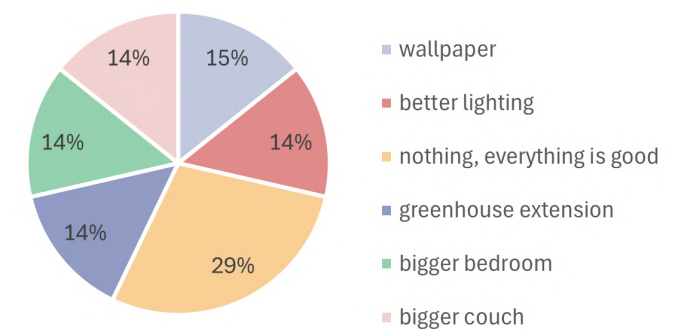


Among the residents choosing the small garden, it was mentioned that the garden should be in the sun, and a cafe would be too busy for them. Among the residents choosing the cafe, it was specified that the cafe should be open daily.

Suppose that every week you could get a personal delivery. What would you choose?



What would you change to make your apartment cozier?

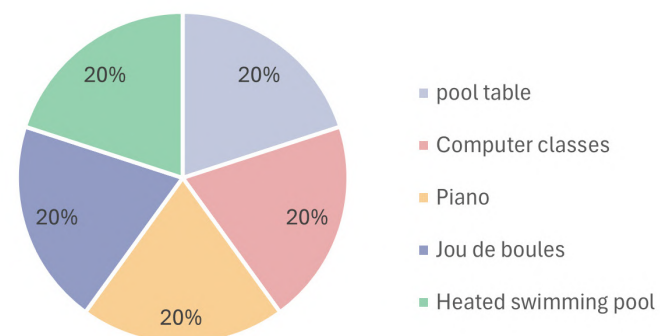


08 Quiz

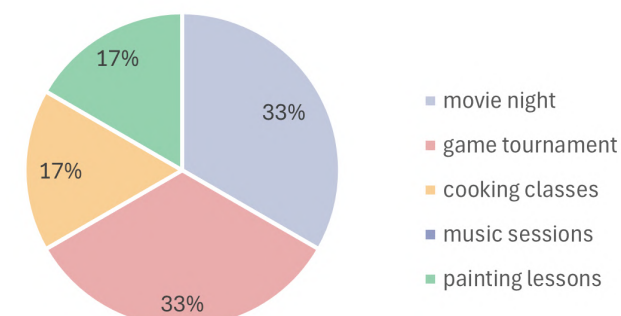
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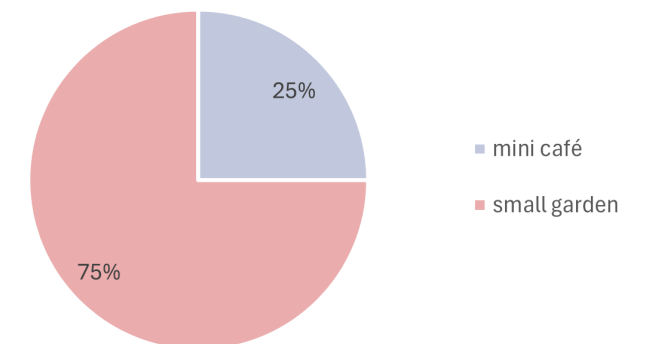
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Suppose you could create one new weekly activity. What would that be?

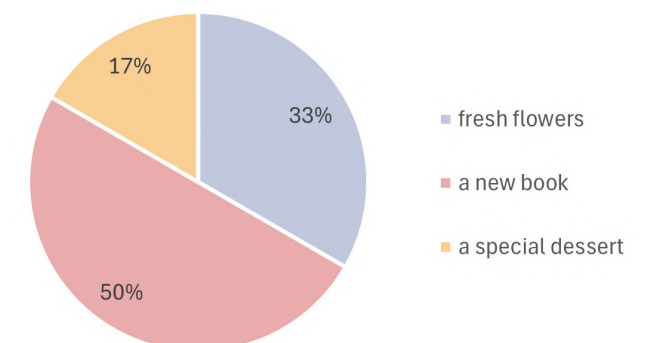


Would you rather have a mini cafe to relax in or a small garden to help maintain?

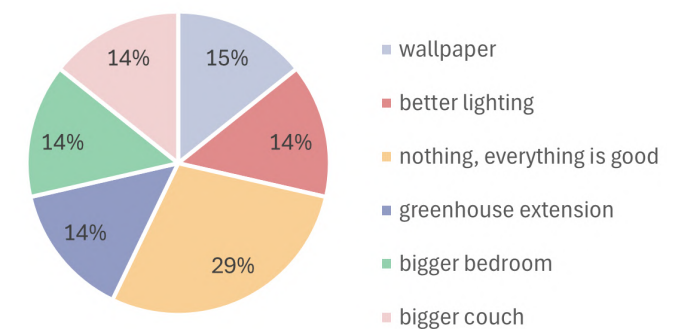


Among the residents choosing the small garden, it was mentioned that the garden should be in the sun, and a cafe would be too busy for them. Among the residents choosing the cafe, it was specified that the cafe should be open daily.

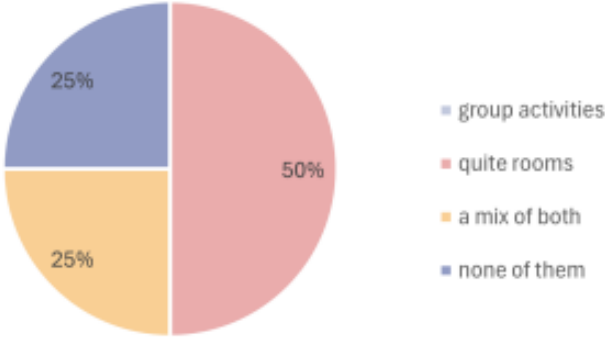
Suppose that every week you could get a personal delivery. What would you choose?



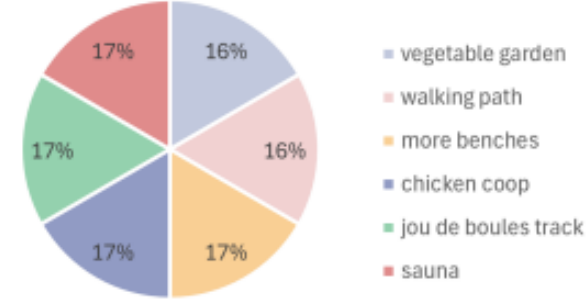
What would you change to make your apartment cozier?



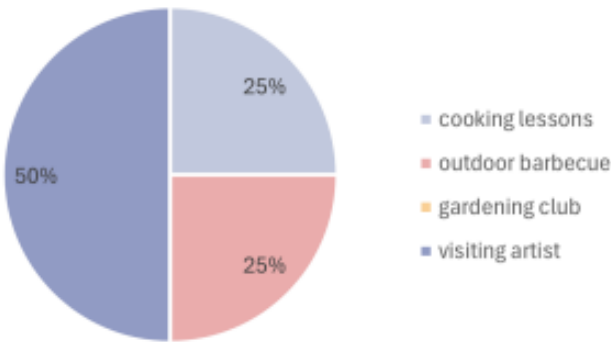
Would you rather have more group activities, more quite and relaxing rooms or a mix of both?



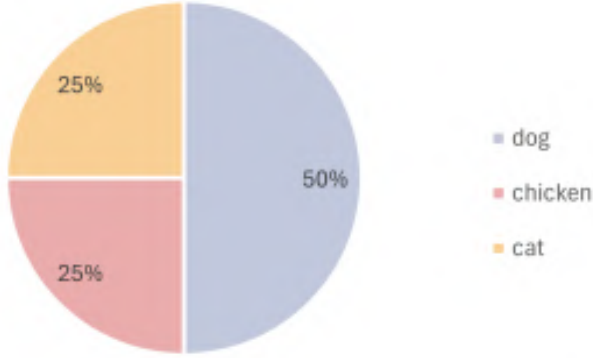
If you could have one new outdoor facility, which one would you rather have?



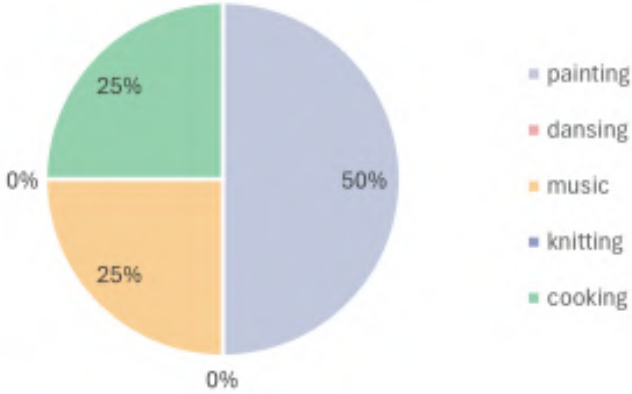
If you could organize one special monthly activity, what would that be?



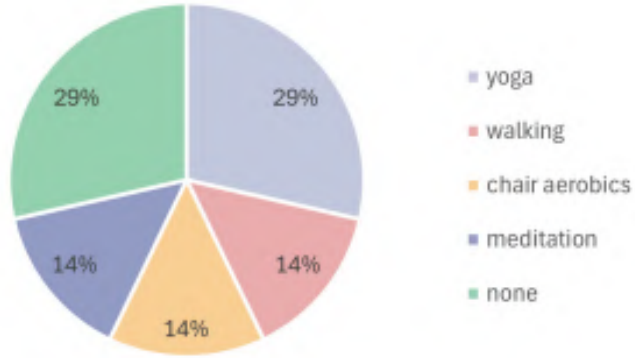
If you could have a small pet at Liv Inn (e.g. a fish, a bird, etc.), what would that be?



If you could invite a hobby instructor, what would you like to learn?



What type of exercises of wellness activities do you find nice?



09

Day in the life

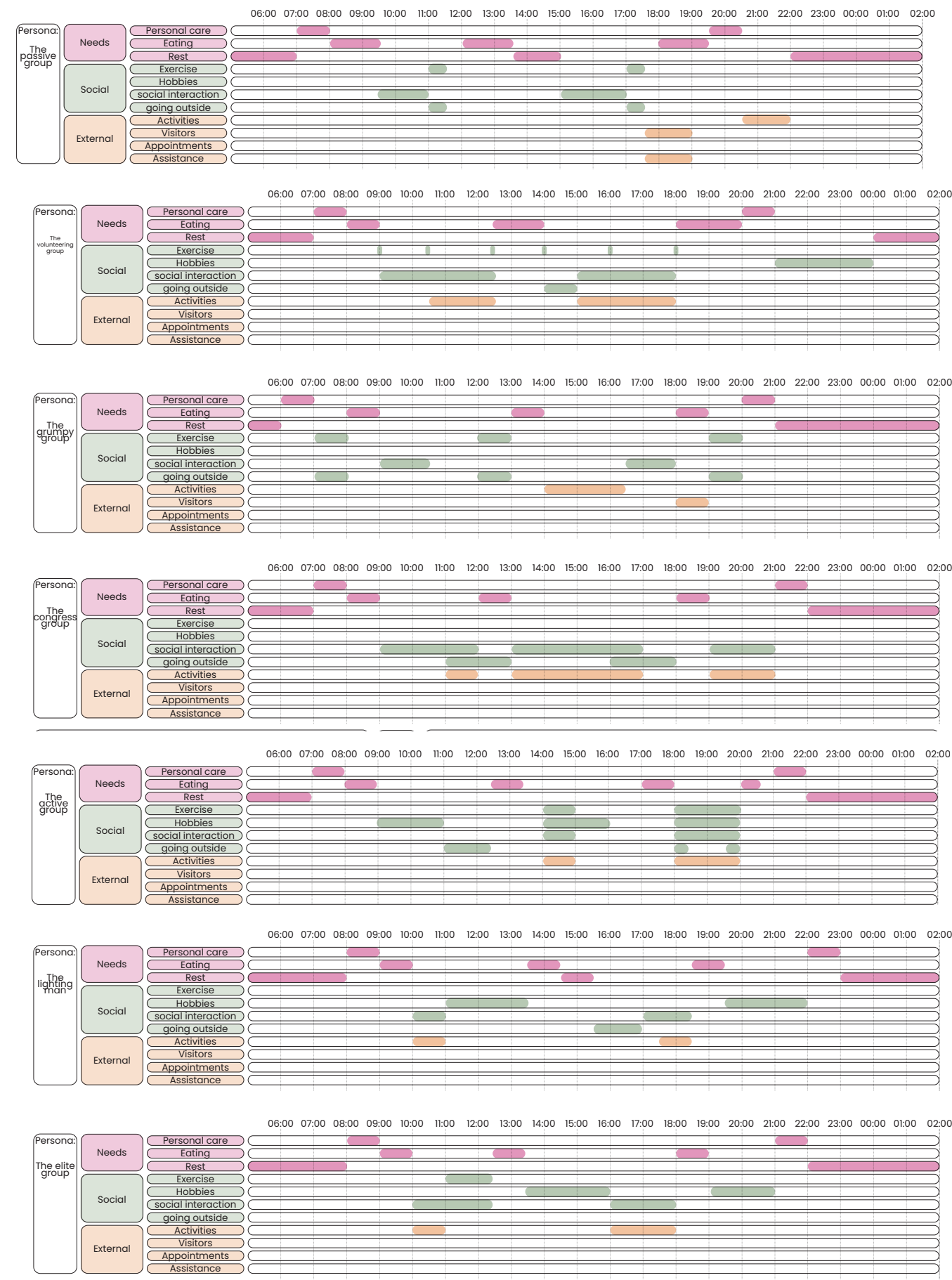
The “day in the life” timelines were created based on the personas defined in the previous chapter, but the schedule belongs to only one individual out of the persona group.

The timeline is divided into three categories: needs, social, and external. These categories are also split further into smaller actions that can be tracked and compared. Some of these actions can happen simultaneously, and overlap, for example needing external help while eating.

On one hand, this timeline has the purpose of understanding when the schedules of different groups of people overlap and when they differ from one another. The overlapping of schedules leads further to examining the activity and peak hours in the common rooms and how the flow of people moves from one area to another. The peak activity in the common rooms is further described in a later chapter.

On the other hand, this timeline looks into the different habits of the residents during a common day in their life. These habits give an insight into how much they socialize, exercise, go outside and receive help in their daily routines. This information is valuable for better understanding the target group as well as designing based on their needs and customs.

The results have been collected using interviews, discussions, and observation and have been mapped out to determine whether there are gaps in daily schedules that are challenging or face unmet needs.



10

Spatial Organization: Peak Hours & Traffic Flows

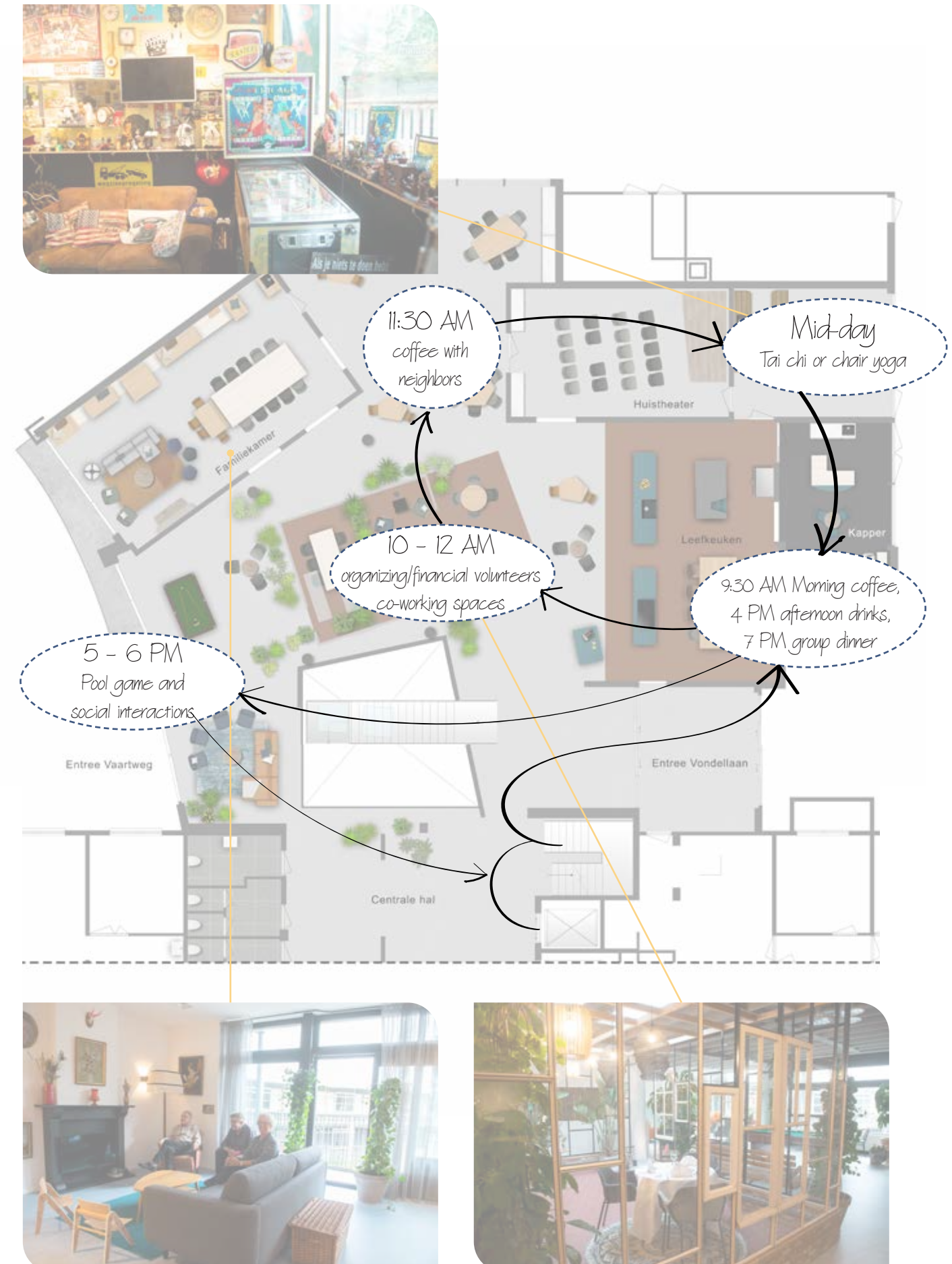
The communal areas at Liv Inn are designed as a central hub, fostering interaction through fluid, adaptable spaces. Soft separations between areas like the communal kitchen ("leefkeuken"), family room, theater, and internal courtyard ("binnentuin") are achieved using wooden frames, varying materials and lighting, curtains, and plants. This approach encourages seamless transitions and social engagement.

Throughout the week, the flow of residents and visitors across these communal spaces reveals distinct patterns of activity. The day typically begins around 9:30 AM with a coffee session in the communal kitchen, which accommodates up to 10 people. If attendance exceeds this, smaller nearby tables are utilized. By 10:30 AM, residents disperse for scheduled activities, personal errands, walks, or grocery shopping, creating a quieter period between 10:30 AM and 12:00 PM. During this time, organizing and financial volunteers often gather at tables near the binnentuin, while the hairdressing and nail art rooms see a steady flow of visitors. Around 11:00 AM, external members frequently rent tables in the binnentuin for co-working purposes.

Organized activities like Tai Chi or chair yoga take place in the theater room, an adaptable space as the building lacks a larger dedicated area for physical activities. Lunchtime varies: on days with organized lunches, the communal kitchen becomes a lively hub around 12:00 PM; otherwise, the space is quieter as residents eat privately in their apartments.

Activity picks up again around 4:00 PM, with residents gathering for drinks at the kitchen table. Between 5:00 PM and 6:00 PM, traffic shifts to the opposite end of the communal spaces near the windows, where a pool game and casual seating create a lively and vibrant atmosphere. If there is a group dinner, residents congregate in the kitchen area once more.

On Sundays, the bar opens from 4:00 PM to 8:00 PM, drawing many residents for an extended social evening, often lasting later than usual.



11 Occupancy of Communal Spaces

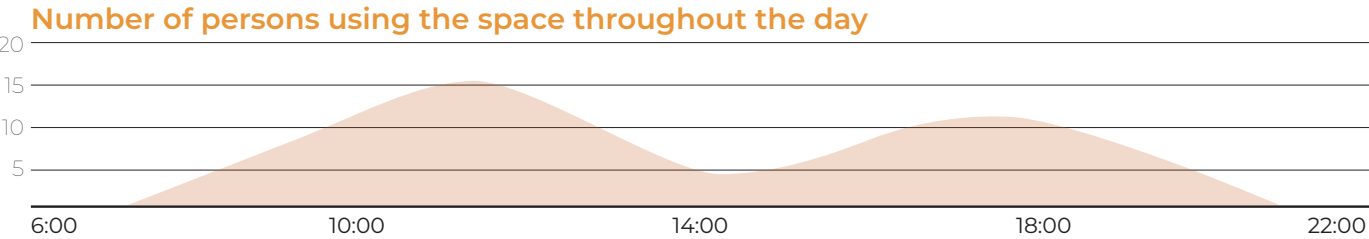
Communal Kitchen

Space Use

One of the most frequently used spaces by the elderly residents is the large open kitchen. The daily coffee break at 10:00 AM serves as the peak moment of the day in this space, with a group of around 20 elderly individuals gathering each morning to start their day together. After about an hour to an hour and a half, the group disperses, and the kitchen becomes quieter. However, there are always a few residents who remain in the kitchen, as they prefer not to be alone in their rooms and enjoy being among others. On Tuesdays, a lunch is organized by one of the residents, and on Wednesdays, a communal dinner takes place. These events also attract many people to the shared kitchen space. Overall, it is evident that the communal kitchen is a highly valued place for the residents, who consider it a pleasant space to spend time in. However, the kitchen is located quite deep within the building, which results in limited natural daylight and a lack of views to the outside.

Applying to Tawrwewijk

The Tarwewijk area primarily consists of family homes, many of which come equipped with their own kitchens. Therefore, an additional shared kitchen for the elderly would likely be redundant for most Tarwewijk residents. However, if people are interested in communal dining experiences, the regular lunches and dinners could serve as an opportunity to invite local residents to join and participate, thus fostering a sense of community and making them aware that they are welcome to share a meal together.



Evaluation

Daylight / view	● ● ○ ○ ○	Used by Elderly	● ● ● ● ●
Location in the building	● ● ● ● ○	Combine with Children	● ● ● ● ●
Atmosphere	● ● ● ● ●	Add to Neighbourhood	● ● ● ○ ○
Design score	● ● ● ● ○	Add to Design in Tarwewijk	● ● ● ● ●

Pool Table

Space Use

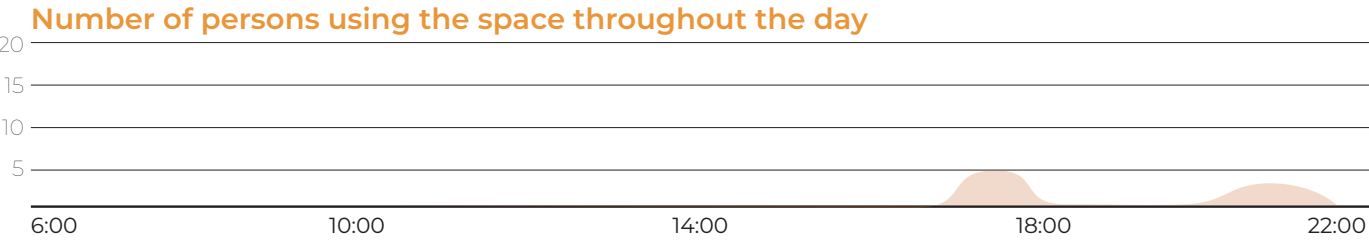
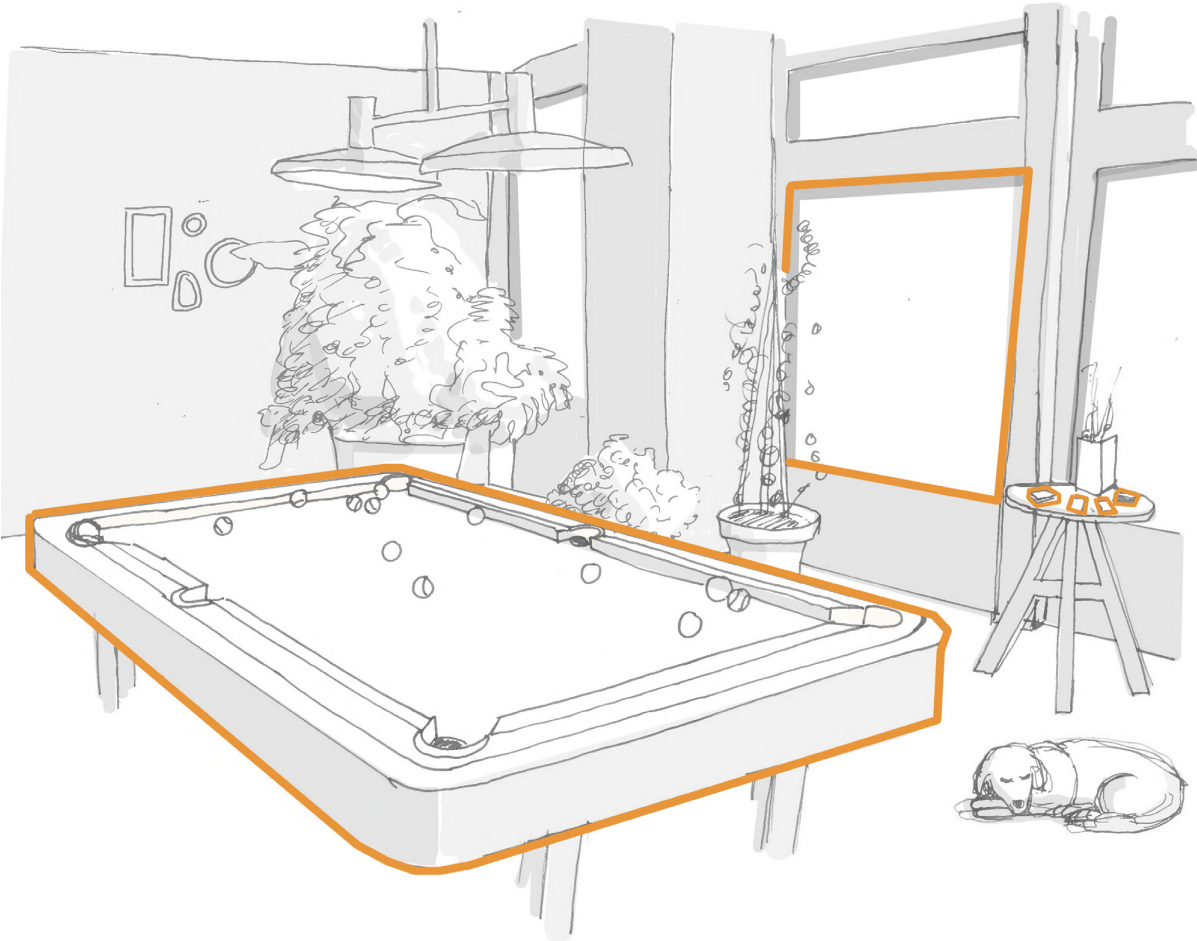
At the heart of the 'Liv Inn,' the pool table serves as a central point for social interaction, especially for the older residents. After dinner, a regular group of elderly individuals often gathers for a game of pool. It is clear that the pool table is an important space where residents can relax and simultaneously engage with one another. However, after 8:00 PM, the use of the pool table shifts to the students in the complex.

Some of the elderly residents have expressed a desire for a billiard table, indicating a need for more variety in available game options, which could make the space more appealing to the older residents. While the game cabinet offers some variety, allowing other games to be played, the desire for more options still exists.

The space around the pool table is located centrally in the building, making it an ideal spot for people who are already present in the heart of the complex to meet. The area has a cozy, homely atmosphere, with benches and chairs around it, where residents can either play other games or watch. The space is filled with greenery, and large windows provide a view of the entrance to the 'Liv Inn.' Overall, it is a pleasant place to spend time.

Applying to Tawrwewijk

The pool table could become a connecting feature for the neighborhood. However, the current space is not large enough to accommodate more people than the group of elderly residents and students already using it. Adding more pool tables would likely compromise the intimate, homely character of the space as it is now. wider community.



Evaluation

Daylight / view	● ● ● ● ●	Used by Elderly	● ● ● ● ●
Location in the building	● ● ● ● ○	Combine with Children	● ● ● ● ○
Atmosphere	● ● ● ● ○	Add to Neighbourhood	● ● ○ ○ ○
Design score	● ● ● ● ○	Add to Design in Tarwewijk	● ● ● ● ○

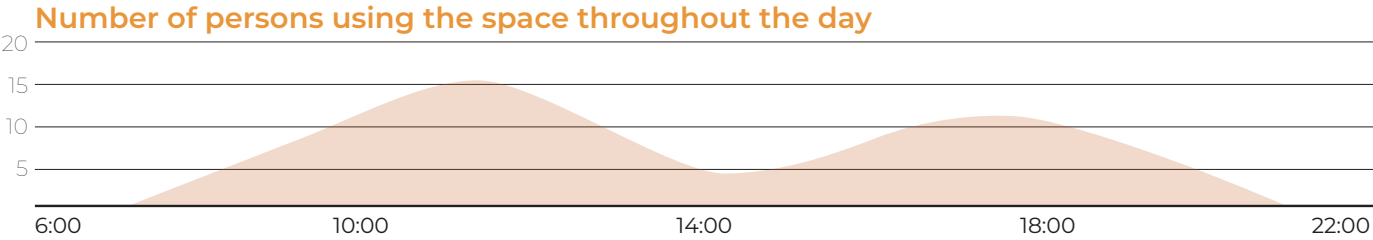
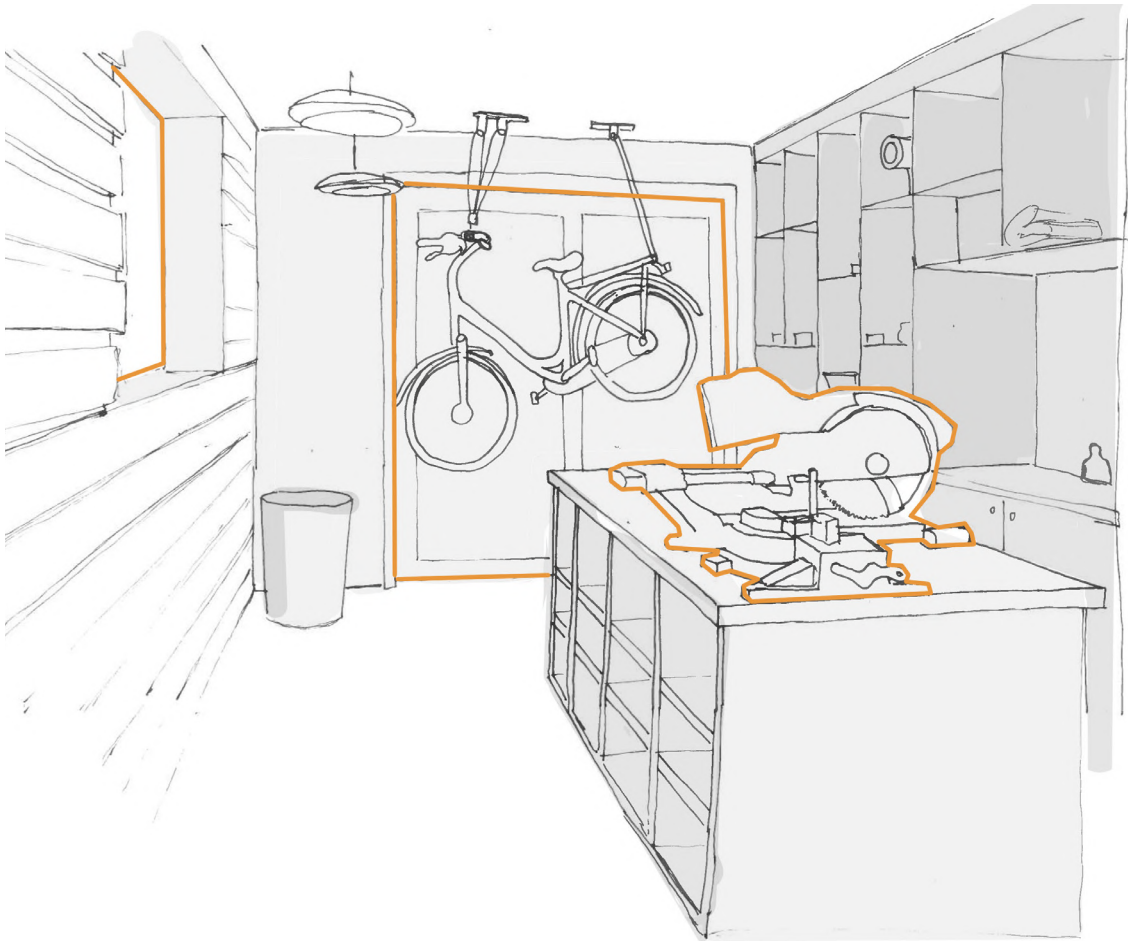
Workshop

Space Use

Observations of the workshop space reveal that it is primarily used by one man, who is often found working there. Residents approach him when things need repairing, whether it's broken lamps, kitchen utensils, or even bicycles. This makes the space a focal point for interaction across the entire community, as it brings together both the elderly and younger residents. The workshop is located next to the building's side entrance, with both an external door and a window that allows passersby, whether inside or outside, to view the space. However, observations suggest that the side entrance is not frequently used, which means few people walk past the workshop. The space itself is large enough to accommodate these repair tasks and has a distinct workshop atmosphere, with the use of raw materials like wood and metal, making it a comfortable environment to work in.

Applying to Tawrwewijk

A workshop space for the neighborhood would be a valuable addition. While the current space is sufficiently large for one person to work and to occasionally accommodate repairs for the 177 residents, if it were to be used as a workshop for the entire neighborhood, both the size of the space and the number of volunteers would need to increase. Expanding these aspects would ensure the workshop could better serve the needs of the wider community.



Evaluation

Daylight / view	● ● ● ● ●	Used by Elderly	● ● ● ○ ○
Location in the building	● ● ○ ○ ○	Combine with Children	● ● ● ● ○
Atmosphere	● ● ● ● ○	Add to Neighbourhood	● ● ● ● ●
Design score	● ● ● ○ ○	Add to Design in Tarwewijk	● ● ● ● ○

The Theater

Space Use

The theater is primarily used when an activity is organized, such as the chair yoga session on Wednesday afternoons or the Tai Chi lessons on Thursday mornings. During these activities, all tables and equipment are moved to the side to create space. The theater also has the capability to screen films on a large projector. Overall, the space is very multifunctional and can be used for various purposes. The theater is located next to the heart of the building, with large windows offering a view of this central area. However, this can sometimes be considered disruptive by participants in the activities, as noise from the heart of the building can cause sound disturbances.

Applying to Tawrwewijk

The theater already hosts regular community gatherings, such as performances and workshops by local musicians and artists. The space accommodates around 30 people, but for larger groups, the open area in the heart of the building is used. The stage in the theater is not suitable for large-scale performances where multiple people need to use the stage simultaneously.



Evaluation

Daylight / view	● ● ● ● ●
Location in the building	● ● ● ● ○
Atmosphere	● ● ● ● ○
Design score	● ● ● ● ○

Used by Elderly	● ● ● ● ●
Combine with Children	● ● ● ● ○
Add to Neighbourhood	● ● ○ ○ ○
Add to Design in Tarwewijk	● ● ● ● ○

Bar

Space Use

The bar is not regularly used by the residents. The dishwasher for the kitchen is located here, so occasionally, people pass through the bar. However, on Sunday evenings, the bar becomes quite popular during happy hour, where residents can enjoy drinks using their punch cards. Typically, between 10 and 15 people gather during this time, and it often remains a lively, social space late into the evening. The space is designed to resemble an authentic pub, with great attention to detail that contributes to a warm and cozy atmosphere. The jukebox and pinball machine are unique additions that enhance the ambiance and provide extra entertainment for visitors. These elements make the bar not only a place to enjoy a drink but also an inviting space for people to socialize and have fun together.

Applying to Tawrwewijk

A bar could be a pleasant addition to the neighborhood, offering a social space for residents. If research shows that there is a demand from the local community, it could be a valuable addition to the Tarwewijk. Since the elderly residents do not use the bar daily, it would be necessary to find a way to separate the bar from the rest of the building to ensure it doesn't disturb other areas when not in use.



Evaluation

Daylight / view	● ● ● ● ○
Location in the building	● ● ○ ○ ○
Atmosphere	● ● ● ● ○
Design score	● ● ● ○ ○

Used by Elderly	● ● ● ○ ○
Combine with Children	● ○ ○ ○ ○
Add to Neighbourhood	● ● ● ● ○
Add to Design in Tarwewijk	● ● ● ○ ○

Family Room

Space Use

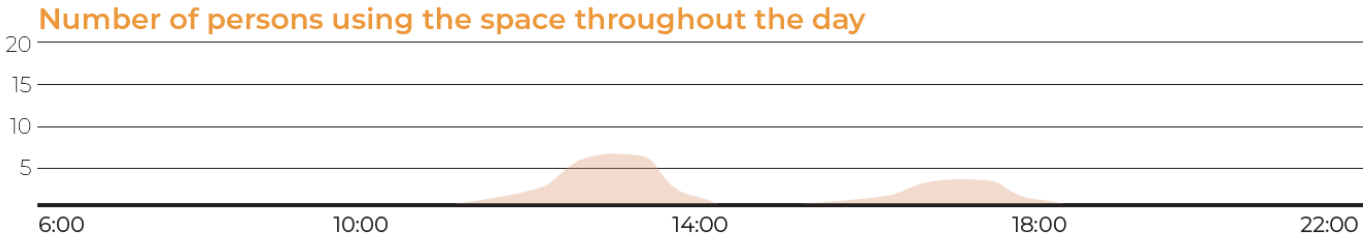
The family room is primarily used by neighborhood residents and visitors, playing a vital role when large groups of family or friends gather and cannot fit in a personal room. This space offers a warm, homely atmosphere with a large living room setup, a spacious dining table, and ample toys for children, making it an accessible and versatile location.

In addition to informal gatherings, the family room is also rented out for various activities. For example, the neighborhood team uses the space weekly for meetings, and discussions with residents and experts are frequently held here. When the room is rented, residents often provide coffee, tea, and snacks in exchange for a small fee, giving the space a personal and welcoming touch.

One notable drawback is that the room is relatively deep within the building, making it feel slightly dark around the dining table. Additionally, the family room is adjacent to the central heart of the building, which, during events in the heart, can result in noise disturbances, potentially hindering the peaceful use of the space.

Applying to Tawrwewijk

The family room is already a valuable addition to any neighborhood. Particularly in Hilversum, where a traditional community center is absent, this space fulfills a similar role. It provides a venue where local residents can come together for social activities, discussions, or simply to connect with one another. In this way, the family room contributes to strengthening the sense of community and fostering relationships among neighborhood residents.



Evaluation

Daylight / view	● ● ● ○ ○	Used by Elderly	● ● ○ ○ ○
Location in the building	● ● ● ○ ○	Combine with Children	● ● ● ○ ○
Atmosphere	● ● ● ○ ○	Add to Neighbourhood	● ● ● ● ●
Design score	● ● ● ○ ○	Add to Design in Tarwewijk	● ● ● ○ ○

12

Role of Lighting in Creating Atmosphere

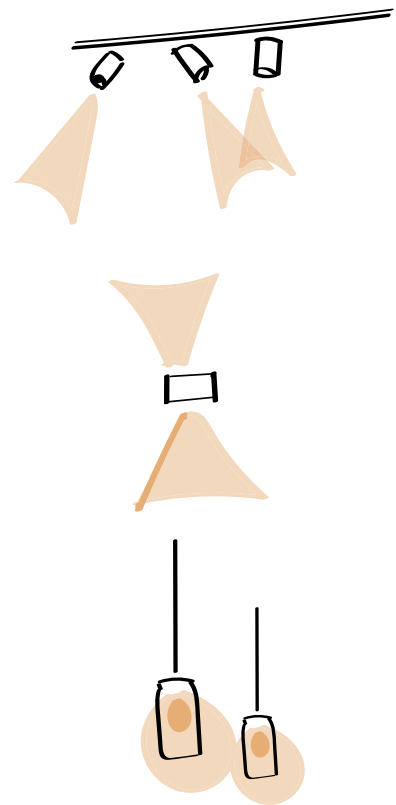
Lighting is a crucial element in interior design, serving not only functional needs but also contributing significantly to the aesthetic and emotional ambiance of a space. At Liv-Inn, the emphasis is on diffused lighting, which helps create a warm and inviting environment, fostering a sense of coziness and comfort. The selection of various lighting fixtures demonstrates how thoughtful design can enhance the atmosphere.

By integrating fixtures of diverse textures, shapes, and materials, the lighting design ensures a harmonious interplay between form and function. These materials allow light to filter through in a manner that is soft and pleasant, avoiding harshness. According to an interviewee, it contributes to the coziness of the spaces and she associated the hanging lights and lanterns with the common spaces. The hanging lights, for example, provide focused yet gentle illumination, striking a balance between practicality and mood enhancement.

The arrangement of lighting in common areas, such as dining or seating spaces, reflects a careful consideration of how light interacts with furniture, decor, and the spatial layout. The combination of natural and artificial light ensures a dynamic yet consistent feel, adapting to different times of the day and the activities within the space.

Through this meticulous approach, lighting not only serves as an aesthetic feature but also becomes an active participant in shaping the experience of those inhabiting the Liv-Inn.

Designing communal spaces requires a thoughtful integration of light, sound, and environmental elements to create an atmosphere that supports well-being and influences behavior. The use of warmer lighting during dinner and softer tones afterward aligns with natural circadian rhythms, fostering comfort and relaxation. Blue-light adjustments, along with the introduction of daylight and outdoor-inspired materials such as tiles, help blur the boundaries between indoor and outdoor spaces, creating a harmonious and inviting environment. Ventilation systems that manage CO2 levels, combined with the careful manipulation of sound and reflection, enhance both comfort and health. These sensory elements, paired with intuitive wayfinding, work together seamlessly to create dynamic, engaging spaces that feel natural and effortless to navigate.



1. Common kitchen area
2. Binnentuin with rentable office spaces

13

Sensory Analysis of Communal Spaces

To decypher the physical qualities of the interior space and its relation to creating spaces of belonging, comfort, home and social wellbeing a sensory analysis is made based on the framework of Khyeun Lee (2022).

According to architect Gwendoline Schaff in *Home in Later Life* by sensorial factors directly impact emotional and social wellbeing. By balancing sensory stimuli like light, material texture, and sound, spaces can encourage both privacy and interaction. Alternatively, Keunhye Lee (2022) advocates that multi-sensory engagement (e.g., through light, shadow, texture, and smell) creates emotional connections to space, enhances social well-being and establishes identity. Such design enriches spatial experiences by fostering personal and shared cultural memories, which can mitigate loneliness and promote social interaction.

Moreover, analysing sensory design elements in the design can help generate specific acoustic parameters for the people with hearing difficulties and adequate lighting compositions for the visually-impaired (e.g. Qualidom, 2018). For example, residents of the Liv Inn also mention that focusing on making the lighting more diffused and addign measures for communal spaces, which are too loud for those with hearing disabilities at the momemnt, are important factors for the comfort, coziness or user satisfaction the communal spaces.

Analysis

The analysis focuses solely on the sensory factors of the interior communal spaces, i.e. texture, light, shadow, color, sound and smell. Temperature is left out in this scenario, as it is hard to identify and fairly similar in each room (personal opinion). The orange dot indicates that the sensory element works “good”. And the green dot indicates that the element works “very well”.

	Morphological Factor						Sensual Factor						Influential Factor		The Body			
	Volume	Scale	Rhythm	Order	Proportion	Contrast	Texture	Light	Shadow	Color	Temperature	Sound	Smell	Culture	Local	Senses	Movements	
TH							●	●	●	●		●						
B							●	●	●	●			●					
IG							●	●		●				●				
CK							●	●	●	●								
...																		
...																		
...																		
Theater (TH), Bar (B), Inner Garden (IG), Communal Kitchen (CK), ...																		

Sensory framework for analyzing interior spaces by Keunhye Lee (2022)

Sensory Analysis: The Theater

Sound

To absorb the sound emitted from the speakers or instruments in the theater, wooden panels on the side of the walls help reduce unwanted noise or distortion, contributing to the acoustic quality of the room. Additionally, the floor is carpeted which can contribute to the absorption of soundwaves due to its physical qualities and soft surface.

Light

Throughout the communal spaces of the Liv Inn, (movable) spotlights are used (see figure to the right). These spotlights, "accent lighting", emphasize important areas in the theater, such as the stage or area with the tables and chairs or the piano area. Alternatively, wall-mounted armatures are used as decorative lighting, which helps to set the mood or positively contribute to the atmosphere of the building.

Shadows

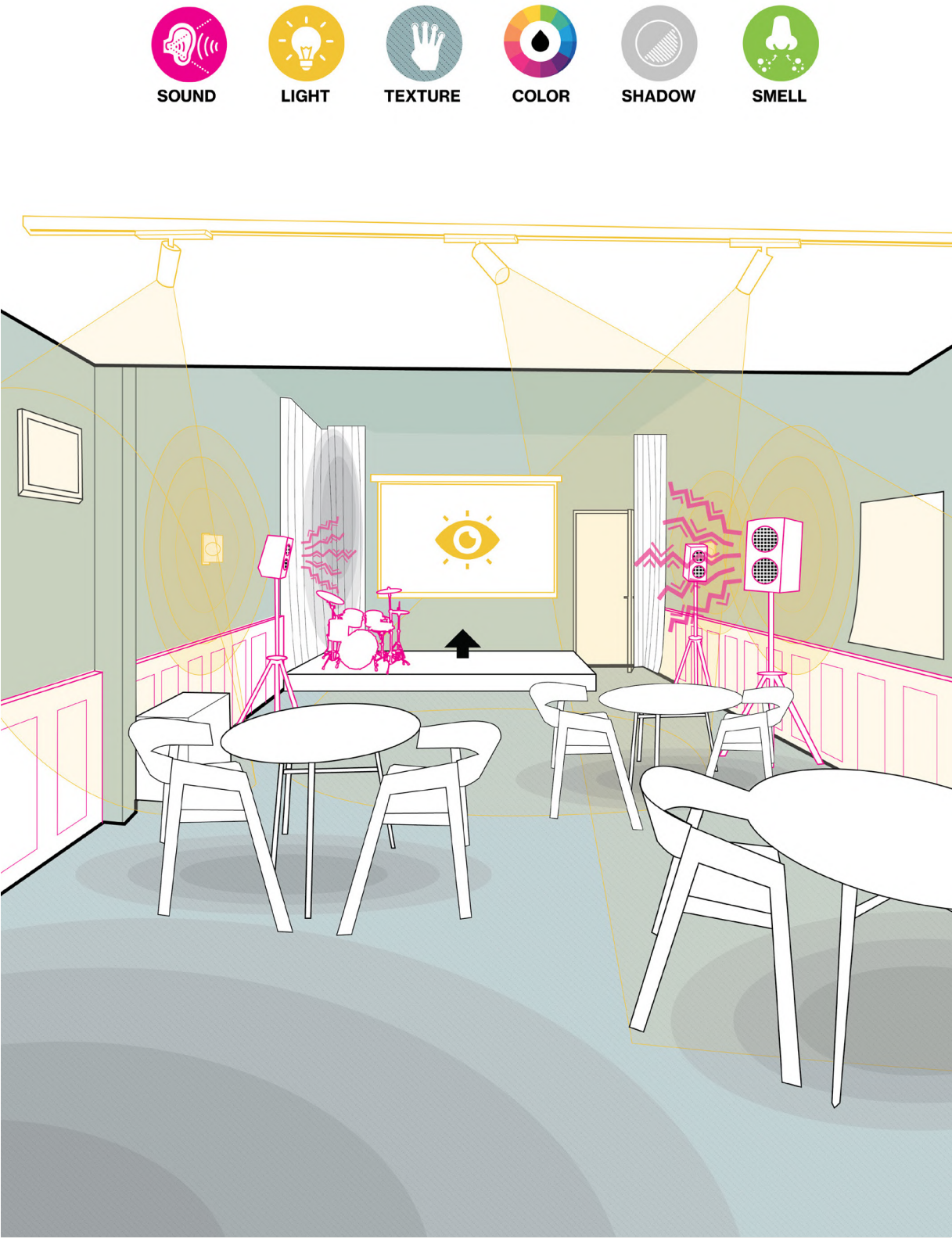
With little to no windows openings, the theater is naturally dark, which is ideal for this specific funtion. The shadows create a dramatic and contrasting play with the lighting, as the accent lighting focuses more on the stage, tables, paino area, and wall-armitures more on decorating the walls. This leaves room for the shadows dramatize shadows in the corner (located at the hanging curtains) and on the floors, especially near its entrance.

Texture

Wooden panels, the carpeted floor and plastered (colored) walls mainly make up for the play with texture in this room. Carpeted floor also increase the feel of comfort, coziness and home, next to their acoustic properties.

Color

Vibrant colors contribute to the atmosphere of the theater, as the blue curtains, carpet, walls are inviting, lively and complimentary to the wooden objects in the room (e.g. color of the tables, chairs, wooden panels).



The Theater

Sensory Analysis: The Bar

Sound

To absorb the sound emitted from the speakers or instruments in the bar, wooden panels on the side of the walls also help reduce unwanted noise or distortion, contributing to the acoustic quality of the room. Similarly, the floor is carpeted which can contribute to the absorption of soundwaves due to its physical qualities and soft surface.

Light

The bar uses decorative lighting that helps to set the mood and positively contribute to the atmosphere or look-and-feel of the space. Similar to the theater, accent lighting is used in this space, but now to emphasize the decorative posters, flyers, old vinyl covers on the wall, and “nostalgic” furniture of the elderly (e.g. cigarette dispenser or traditional wall cabinet).

Shadows

With the decorative lighting as the main lighting for the bar, shadows are a little less prominent in this space. On the other hand, the lighting makes the room less illuminated which in turn causes for a cozy and homy feel.

Texture

Similar to the theater wooden panels, the carpeted floor and plastered (colored) walls mainly make up for the play with texture in this room. Again, the carpeted floor can contribute to the acoustic performance of the room. Alternatively, various (almost random) object hanging from the walls or ceiling add a 3D texture to the space, which acts as a “Wunderkammer”, where every object you focus on is totally random but still has its own story and (nostalgic) value.

Color

Apart from the vibrant yellow color of the wall, and blue carpet, the bar also becomes interesting through the old vinyl record collection of an acquaintance of the Liv Inn residents that were used by the interior designer. The various colors of the covers and center of the vinyls make the room colorful and compliments well with the vibrant colors of the walls and floors.



The Bar

Sensory Analysis: The Kitchen

Light

The communal kitchen is also seen as the heart of the building. The kitchen uses decorative lighting above the dinner table which contributes to the atmosphere at the table when eating or drinking. Additionally, accent lighting in the form of spotlights are used to emphasize and illuminate the kitchen islands (where the cooking and the washing of dishes happens), and the shelves (to the left in the drawing) where the glasses and other kitchen equipment is stored.

Shadows

Although the presence of shadows is minimal, the play of accent lighting and the decorative lighting above the dinner table causes the shadows to separate three main areas in the communal kitchen: the shelvers or cabinets (left), dinner table (middle) and kitchen islands (right).

Texture

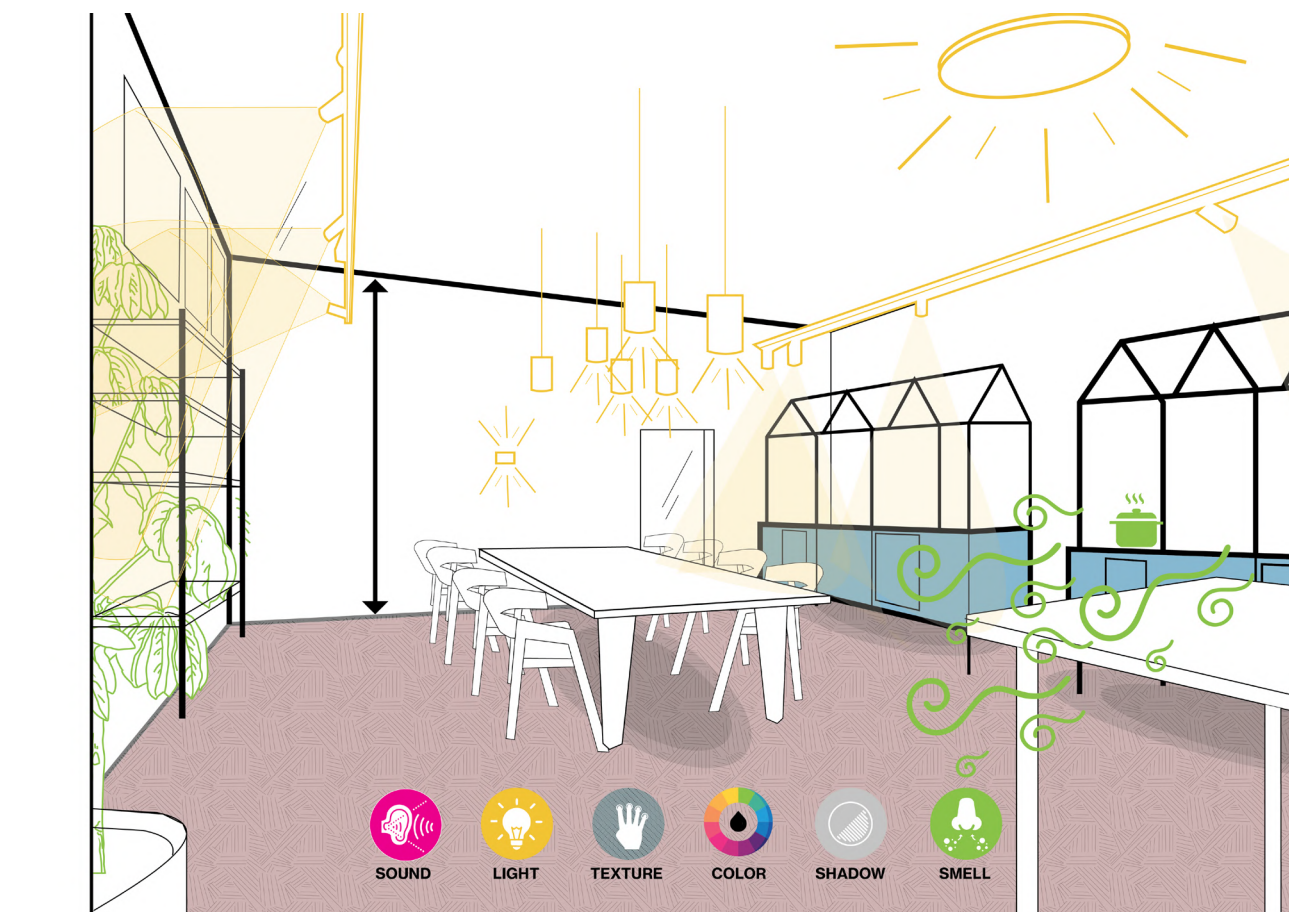
Similar to the inner garden, red hexagonal ceramic tiles are used to border the communal kitchen from the surrounding walkways and interior spaces. Other than that, the walls are white plastered.

Color

The vibrant blue color used in the theater is repeated to highlight the cabinets of the kitchen islands. This makes them both noticeable and act as borders in the open space. For example, the tiles in combination with the kitchen islands that lie in one line indicate when a person either enters or leaves the communal spaces. Decorative greenery also adds to the atmosphere and coziness of the kitchen.

Smell

Almost logically, the large kitchen is designed where the smell of cooking from the oven or induction plates, or the smell of coffee from the coffee machine can be experienced.



The Common Kitchen

Sensory Analysis: The Theater

Light

The inner garden mainly uses decorative lighting that helps to set the mood and positively contribute to the atmosphere or look-and-feel of the space. Besides that, the inner garden is adjacent to large window openings on the first floor in the Liv Inn, which allows a lot of natural daylight to come through.

Texture

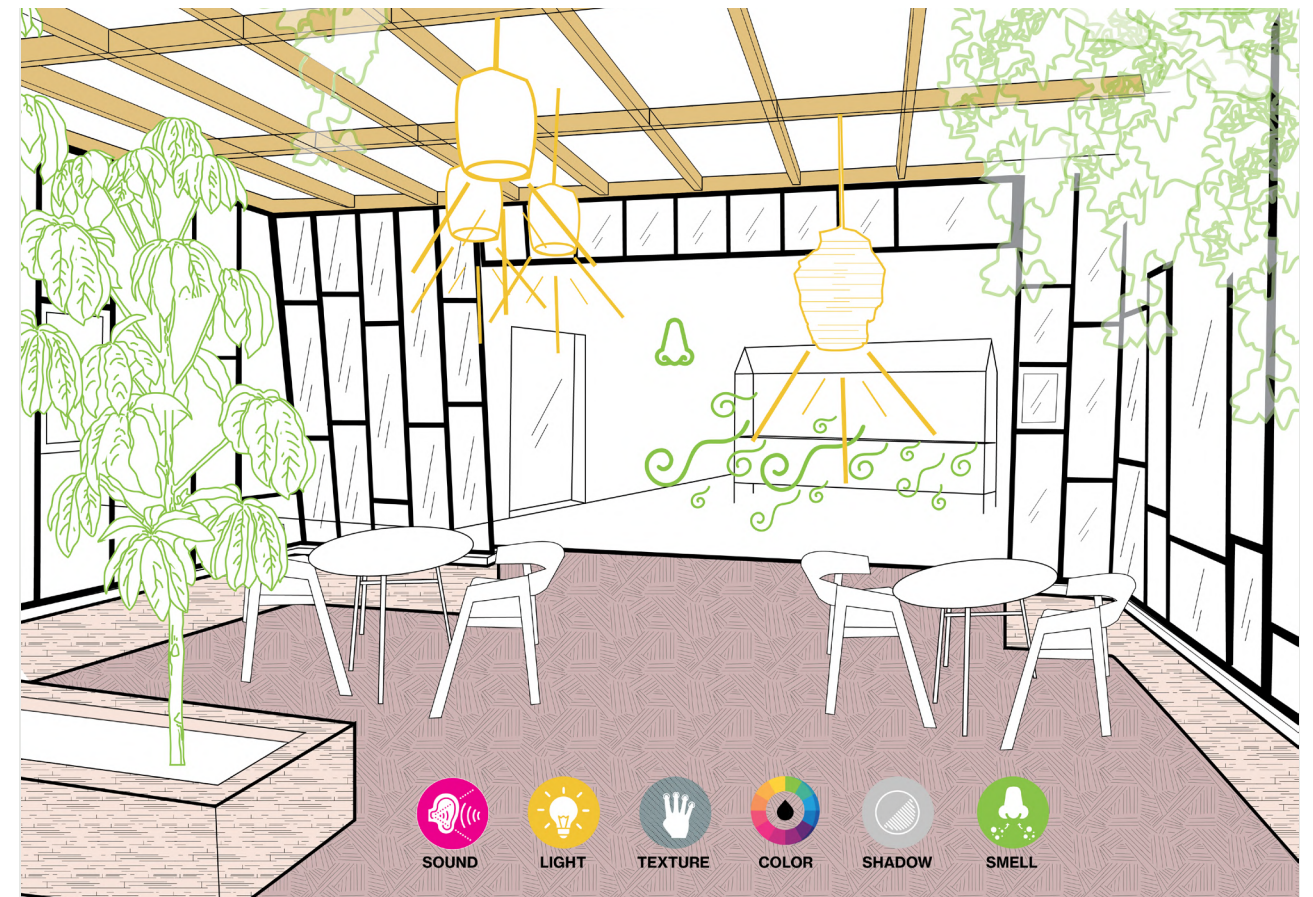
The inner garden, as the name suggests, focuses on creating a garden-like environment in the interior of the Liv Inn. By drastically bordering the floor surface texture with red hexagonal tiles of the inner garden in comparison to the walkways or other functions with a polished concrete look, a contrast and zoning of the inner garden becomes evident. Apart from that the glass partition cause for a semi-transparent wall around the space. An open wooden ceiling and refurbished wooden elements in the glass wall add to the warmth of the space. To further border the inner garden in the open, yet central interior space it finds itself in, the architect's use a plinth made of red brickwork, which also adds the the warmth and interplay of textures within the space.

Color

By using warmer colors such as wood, red brickwork, red hexagonal ceramic tiles and greenery around the ceiling and in planting beds which are integrated in the brick plinth, the inner garden certainly feels comfortable, cozy and invites lingering and provides an atmosphere that is suitable for study or work. The latter is concluded based on talks with staff, a student and elderly who confirm this success of the inner garden.

Smell

Although the garden is drastically bordered or partitioned from the surrounding interior spaces, it still has an open design. This allows for the smell from cooking or coffee from the communal kitchen to enter the space. This can residents to possibly move from the inner garden to the communal kitchen, which is often occupied by residents during certain peak hours for either drinking coffee, a drink, cooking or eating.





RELATION TO LONELY PEOPLE (IN TARWEWIJK)



LIGHT

Layered Lighting: Integrate layered lighting types such as combining accent lighting and decorative lighting to create an inviting atmosphere

Natural Light: Maximize natural daylight with large windows in communal spaces, as it enhances mood and fosters connection with the outside environment

Poor lighting prevents one's ability to "read" the space, making it feel unsafe or comfort, hinders their mobility and sense of orientation, decrease in social connectedness (Petermans, 2019)



SHADOW

Dynamic Play of Shadows: Employ lighting that produces soft, dramatic contrasts. Use shadows to evoke depth and intimacy while maintaining visibility

Soft Transitions: Prioritize diffuse and low-intensity lighting to minimize harsh shadows, creating a cozy and homelike feel

Poor contrast to the lighting (with shadows) can have the same effects as the ones stated above.



TEXTURE

Tactile Diversity: Use varied materials to provide tactile richness and visual contrast, making spaces feel warm and recognizable

Functional Textures: Use distinct textures to define zones, which can visually guide users to navigate

Poor lighting prevents one's ability to "read" the space, making it feel unsafe or comfort, hinders their mobility and sense of orientation, decrease in social connectedness.



COLOR

Warm and Vibrant Tones: Utilize warm and vibrant colors like red brick or vibrant accents to foster appeal, comfort or recognizability

Personal and Nostalgic Touches: Include personalized or nostalgic coloured elements such as vinyl records or curated artifacts to evoke emotional connections and stimulate conversation

Studies show that even simple changes in colour combined with strategic placement of certain social activiteit can drastically increase social connectedness (Petermans, 2019)

Despite being in a new environments, the sense of wellbeing among elderly can be traced back to the (nostalgic) things that recall meanings of home, which are often tied to objects of home from their past (Petermans, 2019)



SMELL

Aromatic Flow: Design open connections between areas to allow pleasant or identifiable smells, to permeate and encourage movement and socialization

Natural Scents: Incorporate natural greenery and plants into spaces like inner gardens to provide a refreshing sensory experience and enhance calmness

The smell of food or coffee might be an invitation (or rather an excuse to some) to go and socialize with others (e.g. coffee time at lunch or joining communal dinners)

Smell is directly linked to the spatial perception of people. It is a design factor that influences how people (partially) evaluate spatial cues and in turn, how they might experience social relations with others within that space (Petermans, 2019)



SOUND

Acoustic Treatment: Use sound-absorbing materials to minimize noise and echo

Purposeful Noise Control: Design spaces with clear acoustic zoning to ensure sound is contained where needed and reduced in adjacent areas to foster pleasant conversations

People with hearing impairments, that might use hearing aids, might avoid (communal) spaces that become too noisy when crowded, resulting in them potentially further isolating themselves. Designing acoustically-sound spaces might encourage these individuals to participate in social activities

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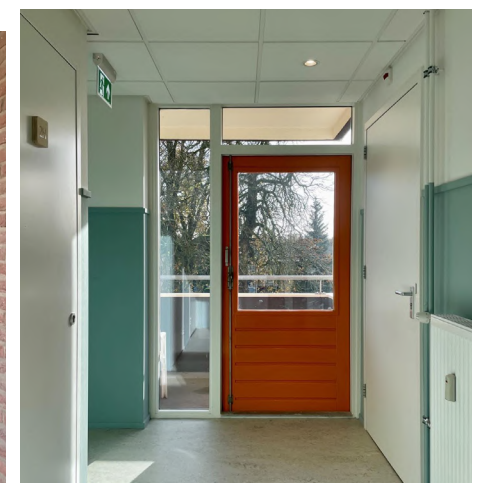
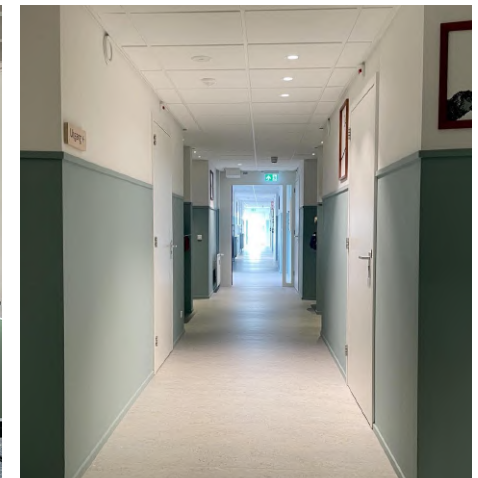
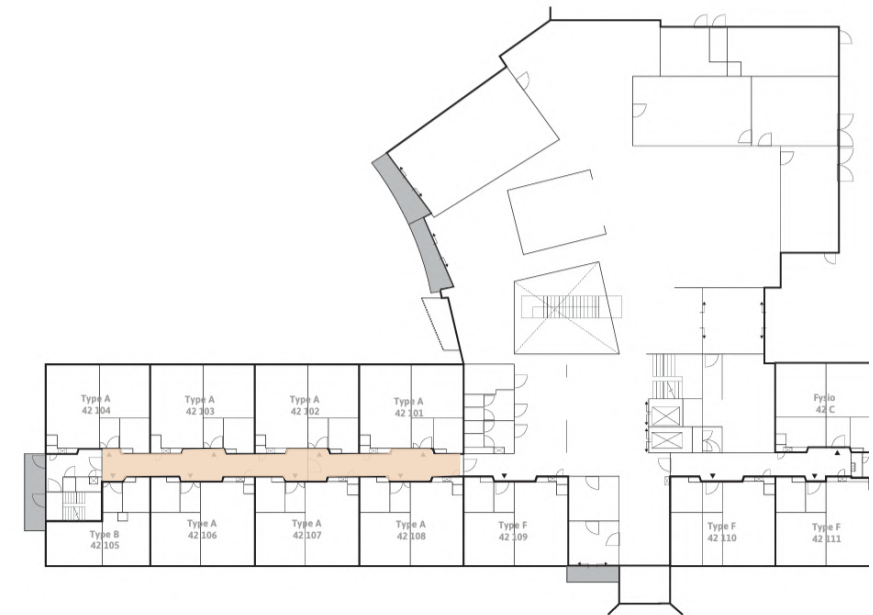
Deserted Corridors: A Study in Spatial Perception

Among the spaces we observed, the long corridors in the building stood out as the most deserted areas throughout the day. Their configuration—long, linear pathways—evoked hospital-like imagery for one of our interviewees, reinforcing a sense of sterility and disconnection. Despite their functional purpose as transitional spaces, these corridors fail to invite pause or engagement, lacking the warmth or visual interest that might encourage lingering.

The stark difference in wall materials further amplified the divergence in perception. In the newer half of the building, plastered walls, with their bright and reflective surfaces, created a sense of openness and light. By contrast, the older section featured dark, exposed brick walls, which felt heavier and less welcoming according to another interviewee. This juxtaposition of materials offered a striking commentary on how architectural finishes alone can shift the emotional tenor of a space.

The gym on the second floor presented another layer of complexity. The design of this space mimicked the elongated, corridor-like typology of the adjacent spaces: a long, curved room with daylight penetrating only through high, narrow windows. Over the course of our week-long stay, we noted that the gym remained entirely unused. Interviews and observations suggested several possible reasons: its placement in the corner of the building, on an upper floor, creates a sense of inaccessibility. The lack of inviting daylight—restricted to the upper reaches of the walls—renders the room dim and uninviting, despite its potential utility.

Additionally, the gym's elongated configuration reflects a spatial typology associated more with movement through space (like corridors) than with activities requiring presence and engagement. This subtle architectural cue might subconsciously discourage users from spending time there. The lack of direct visual or physical connection to other active spaces in the building further isolates the gym from the rhythms of daily use.

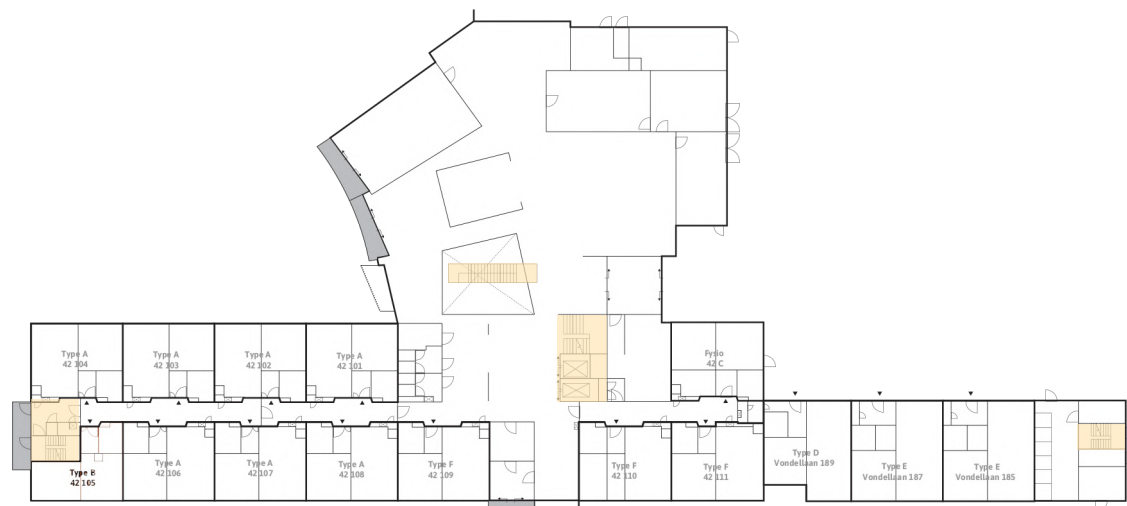


1. Gym on the second floor
2. Corridor along the first floor (newer extension)
3. Corridor along the third floor (old building)
4. Door to balcony at the end of first floor corridor (newer extension)

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Encouraging Movement through the Built Environment

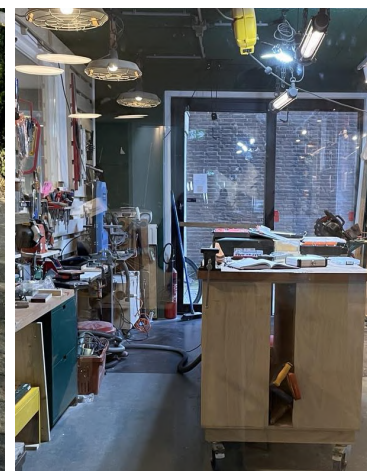
The stairwells are thoughtfully designed to promote walking and physical activity. Interviews with younger, mobile residents reveal a strong preference for taking the stairs over the elevator. The spacious, well-lit main staircase, which connects directly to the communal space, sees frequent use, while the elevator is used less often.



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Fostering a Sense of Ownership in Collective Living

Spaces at Liv Inn are thoughtfully designed to encourage personal expression and active engagement. Bulletin boards and magnet strips outside individual rooms allow residents to showcase their identities and personalize their spaces. Activities like tending plants, cleaning, and maintaining the communal kitchen and facilities not only foster a sense of responsibility but also keep residents mentally and physically active. The communal garden provides a shared outdoor area for relaxation and interaction, while workshop spaces equipped with tools and equipment for rent offer opportunities for creativity and hands-on projects.



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Limitations and Discussion Fieldwork at Liv Inn Hilversum

Declining Volunteer Pool

According to our interviews, the Liv Inn is experiencing a shrinking demographic of active, younger elderly residents (aged 55–65), who are traditionally more mobile and capable of taking on volunteer roles to organize events and foster community spirit. This demographic shift leaves the community dominated by residents aged 80–90, many of whom are less mobile and prefer to stay in their apartments rather than participate in shared activities. This lack of active participation not only reduces social engagement but also places additional pressure on the few available volunteers, leading to frustration and fatigue among those willing to help.

Communal dinners in the shared kitchen, while planned, suffer from low attendance (fewer than 20 people) due to both a lack of volunteers and resident willingness to participate. The minimal turnout suggests deeper issues in the community, such as social isolation, health limitations, or a lack of appealing programming to draw residents out of their apartments.

Residents Requiring Intensive Care

The presence of residents with advanced dementia or other conditions requiring intensive care presents unique challenges. While Liv Inn fosters a communal living model, accommodating such residents can strain resources and disrupt the atmosphere. Potentially rethinking the balance between independence and care within the Liv Inn model.

Challenges in Inter-generational Engagement

While residents wish for students to play a more active and engaging role within the Liv Inn community, there is a misalignment between the schedules of elderly residents and students. The elderly are most active midday, whereas students are generally away studying during the day and socialize more in the evenings or nighttime, leaving little overlap for meaningful interaction.

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Relevance Fieldwork for Tarwewijk

Addressing lack of neighborhood volunteers

The issue of a shrinking volunteer pool is a significant challenge, as seen in areas like Tarwewijk. For instance, the lack of volunteers to manage sports fields and parks often results in closed gates, discouraging community activity and engagement. This highlights that providing physical infrastructure alone is insufficient; the issue is deeply rooted in social dynamics, such as the absence of active, younger residents willing to take initiative. There is a pressing need to coordinate efforts and implement strategies that encourage volunteerism, particularly among younger demographics.

Future of informal care in networks

Promoting ageing in place presents several challenges, especially as elderly residents may reach more critical stages of care or advanced dementia. This underscores the importance of building an inclusive safety net that supports ageing in place while fostering informal networks of care. Strengthening these networks will require community engagement, awareness campaigns, and collaboration among families, neighbors, and local organizations to ensure comprehensive support.

Monofunctional spaces prevent inter-generational interaction

Monofunctional spaces, such as parks designed exclusively as play areas for children, limit opportunities for intergenerational interaction in neighborhoods like Tarwewijk. The lack of shared, multi-use spaces hinders meaningful engagement between residents of different age groups. Addressing this issue will require rethinking urban design to create versatile spaces that encourage social integration and interactions across generations.