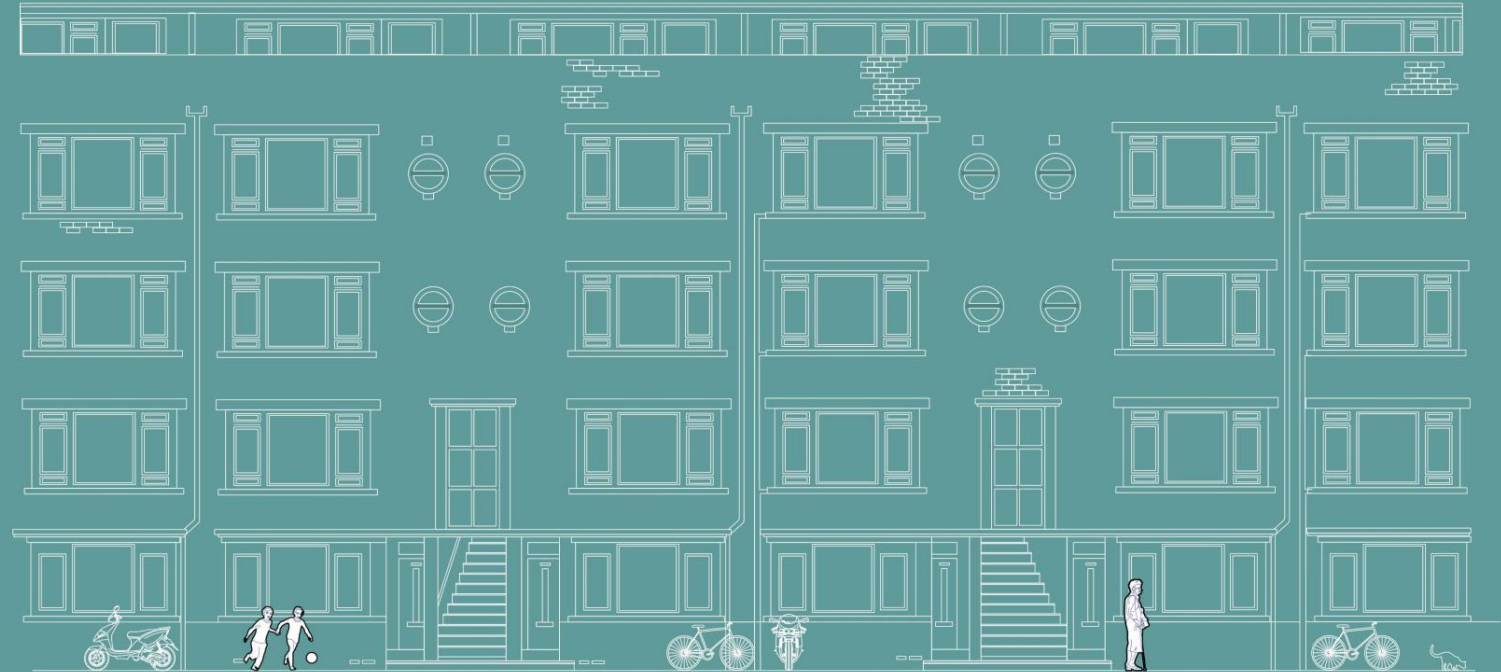


Active Ageing in Tarwewijk

Enhancing mobility, accessibility and
safety within everyday living spaces

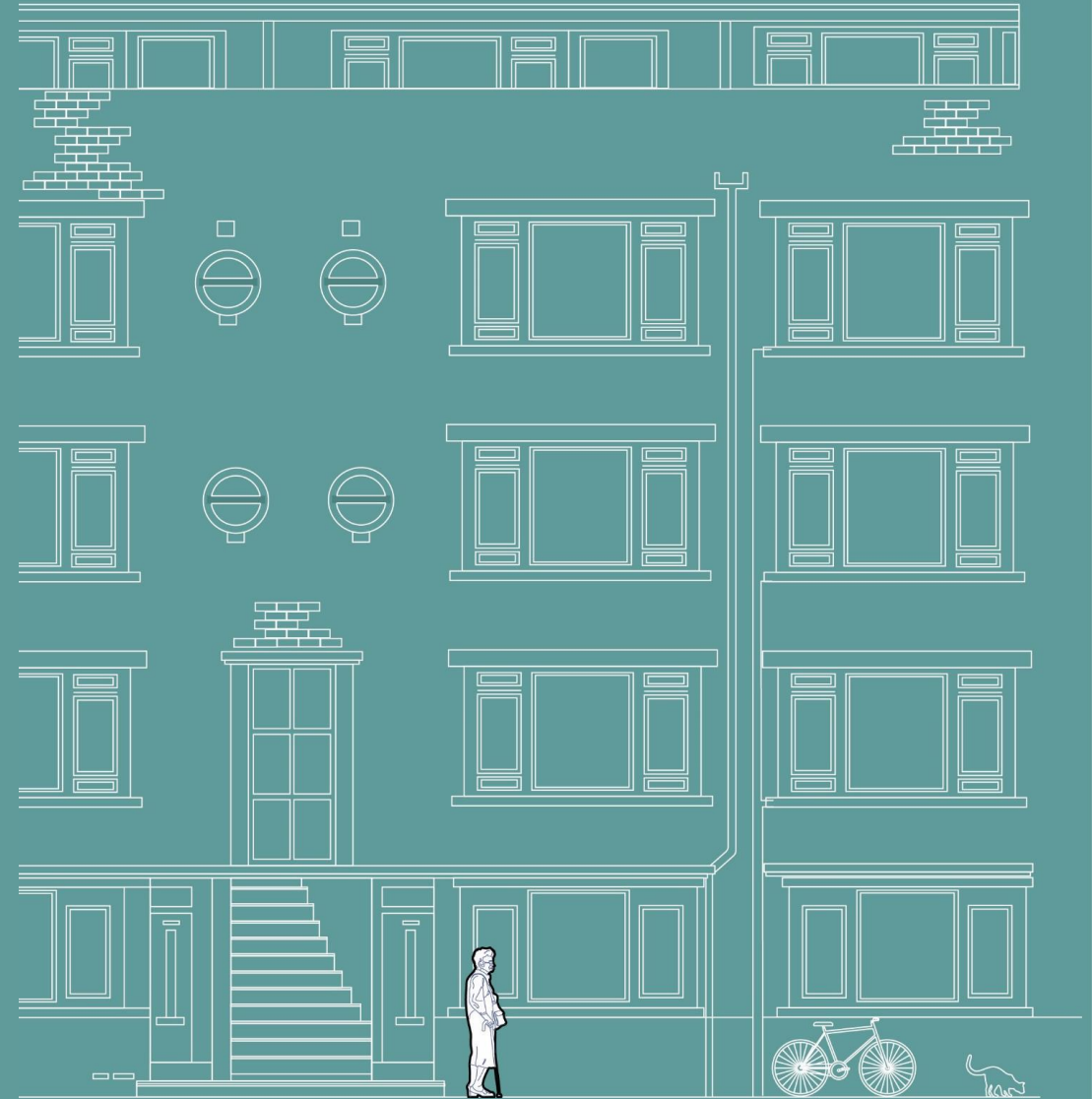
Shreya Sen – 5224721
P5 Examination



Contents

01	Research & Methods
02	Design Guidelines
03	Site Analysis
04	Design Concept
05	Urban Level
06	Residential Level
07	Prototype for Transformation
08	Extension for Care & Community
09	Conclusions

01
17
18
25
32
33
39
58
76



Tarwewijk



Key Research Conclusions



Health & Chronic Conditions

55%

of adults in Tarwewijk are overweight, with obesity and moderate psychological problems disproportionately affecting women and lower-income groups.

Source: Jive - Volwassen - Charlois (2022)

Key Research Conclusions



Safety & Security

982

were reported in Tarwewijk in 2023, including 65 assaults, contributing to safety concerns that significantly deter outdoor physical activities, especially in nighttime.

Source: Onderzoek010, 2024

Key Research Conclusions



Residential Turnover

33%

of Tarwewijk residents relocate within or outside Rotterdam, hindering long-term active aging programs and limited community ties.

Source: Allecijfers.nl, 2024

Key Research Conclusions



Housing Stock

78%

of homes in Tarwewijk are rentals, with much of the housing stock dating back to 1920–1945, highlighting a lack of diverse housing options.



The trash problem is concerning.
Garbage sits out for days, and
people don't dispose of it properly.
Also I don't need a car anymore
now that I'm retired, but the whole
area feels overrun with cars.

Laura, Age: 88





Most houses here aren't built for people with disabilities—too many stairs! I'm fine now, but it might be an issue later. Plus, many homes are old and damp, which can be a problem.

Tom, Age: 57



My neighbor on Dortselaan recently experienced a break-in, which left the community shaken. I've added another lock to my door for extra security. I feel unsafe at night.

Anna, Age: 69





Car-dominated,
cluttered streets
hinder **mobility**



Ageing housing
stock limits
accessibility

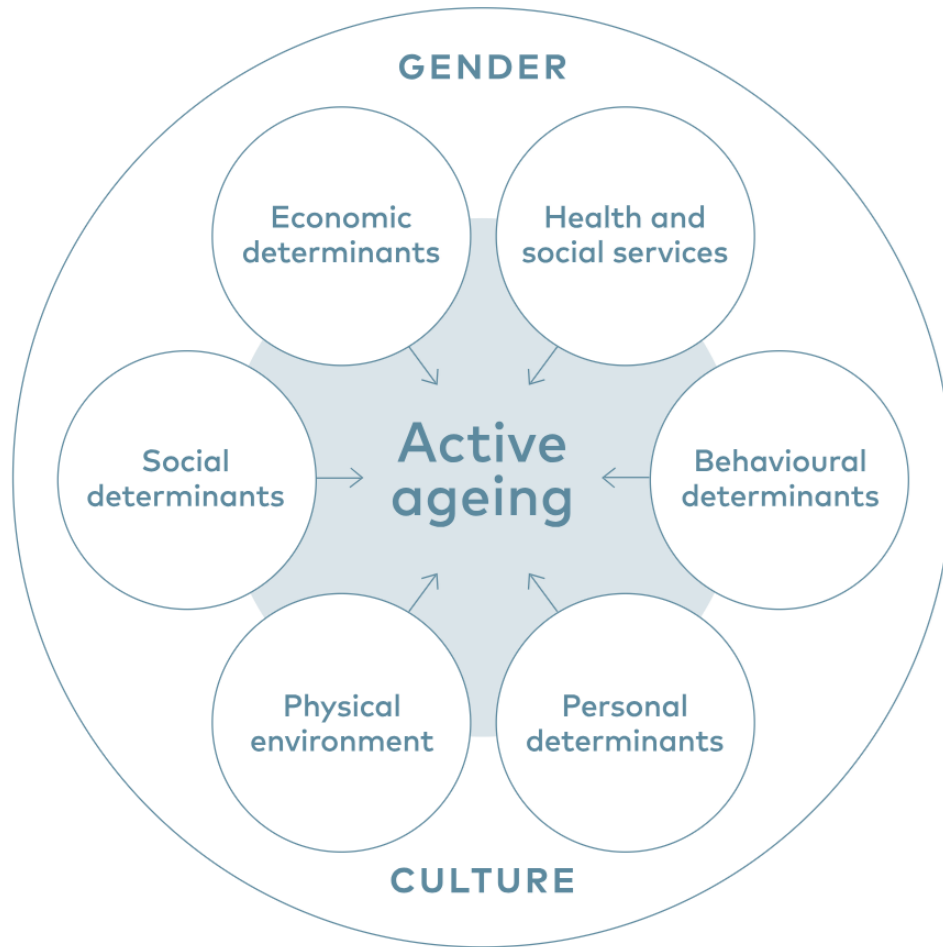


Monofunctional
spaces and neglect
compromise **safety**

Problem Statement

Architectural and urban design that does not prioritize **mobility**, **accessibility**, and **safety** can result in environments that are difficult to navigate and socially isolating for vulnerable populations, particularly for the elderly.





The main determinants of Active Ageing
(Source: WHO, 2002)

Design Hypothesis

By adapting both housing and public infrastructure to prioritize mobility, accessibility, and safety, Tarwewijk can foster an environment where older adults can **actively age**, remain autonomous, and engage fully in their community.

Fieldwork

Quantitative Research

Interviews

Observations

Mapping & Spatial Analysis

Ethnographic
Research

Case Studies

Transformation Projects to
Enable Ageing in Place

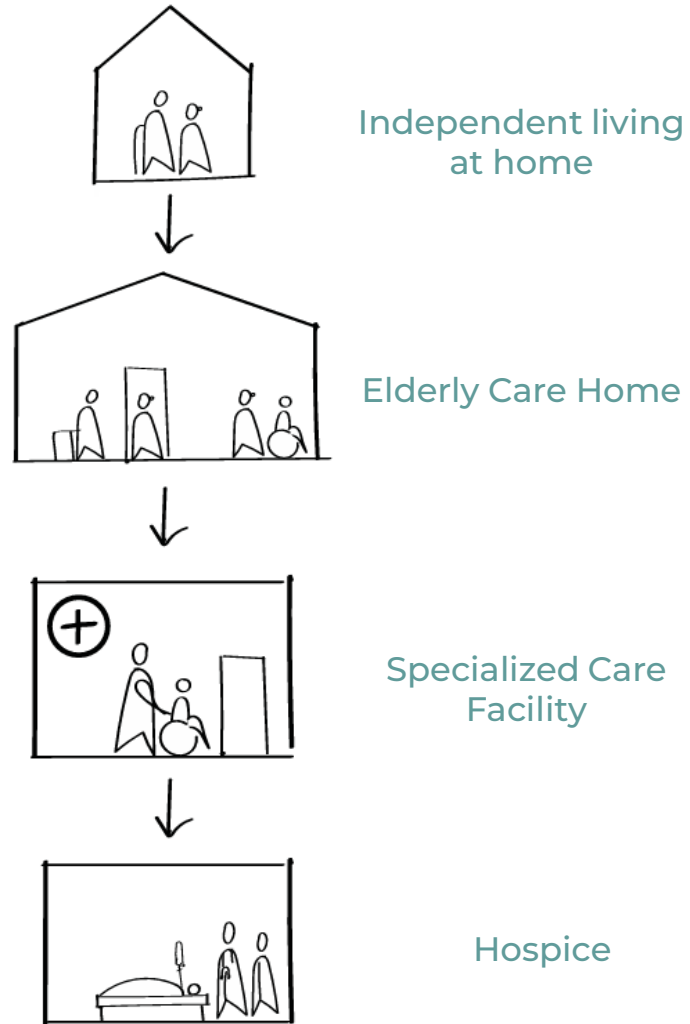
Hybrid Living Concepts for
Community Living

Fieldwork at Liv Inn Hilversum

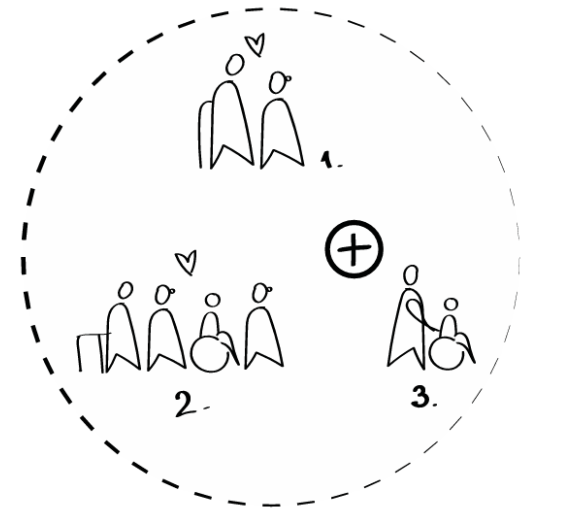
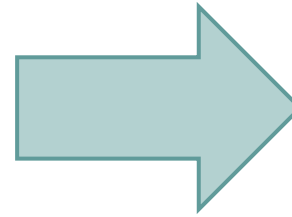
Fieldwork at Liv Inn Hilversum involved experiencing and understanding the daily lives of elderly residents in hybrid living arrangements.



Liv inn
Betekenisvol oud(er) worden



Traditional Care



Active Ageing & Ageing in Place

Liv Inn Model

Case Studies



Source: Pintos (2024)

Transformation of 530 Dwellings
Bordeaux, FR
Christophe Hutin architecture,
Frédéric Druot, Lacaton & Vassal



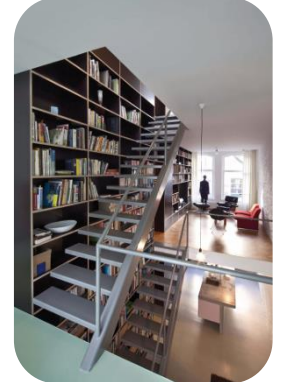
Source: Sagredo (2024)

Kalkbreite Complex
Zürich, Switzerland
Müller Sigrist Architekten



Source: Klijn (2018)

Klussen aan de Klarenstraat
Amsterdam, NL
Vanschagen Architecten



Source: Klijn (2018)

Een Blok Stad
Rotterdam, NL
Architect: various

Design Guidelines

Design Guidelines

02



Neighborhood

Mobility



Shared Streets

Accessibility



Rest Nodes

Safety



Active Street Edges



Residential



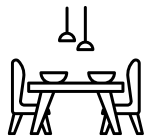
Elevators &
Garden Galleries



Avoid Long
Hallways



Vital Frictions via
Common Spaces & Balconies



Interior



Culturally Responsive
Layouts

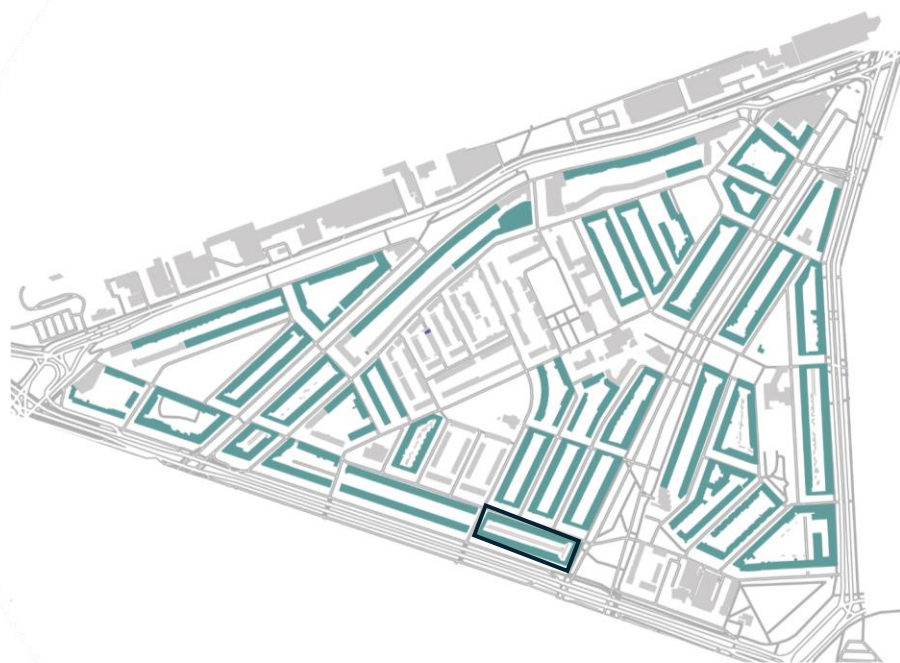


Indoor-Outdoor
Connectivity



Thresholds
Private & Public

Challenges of Ageing in Place in Tarwewijk: An Ageing Housing Stock



Inventory of Haagse-portiek
typology in Tarwewijk



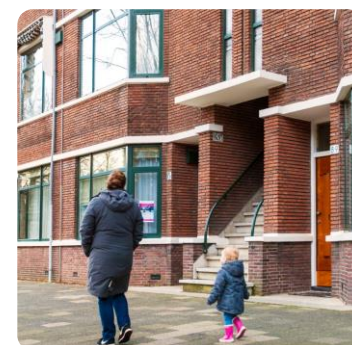
0 100 500 1000

In Den Haag

107,253 portico-buildings, ca. **42.4%** of its total housing stock

In Rotterdam

104,014 portico-buildings, making up **33.4%** of the city's housing inventory





Site Analysis

Q3

Chosen site

Chosen Site

Site Analysis

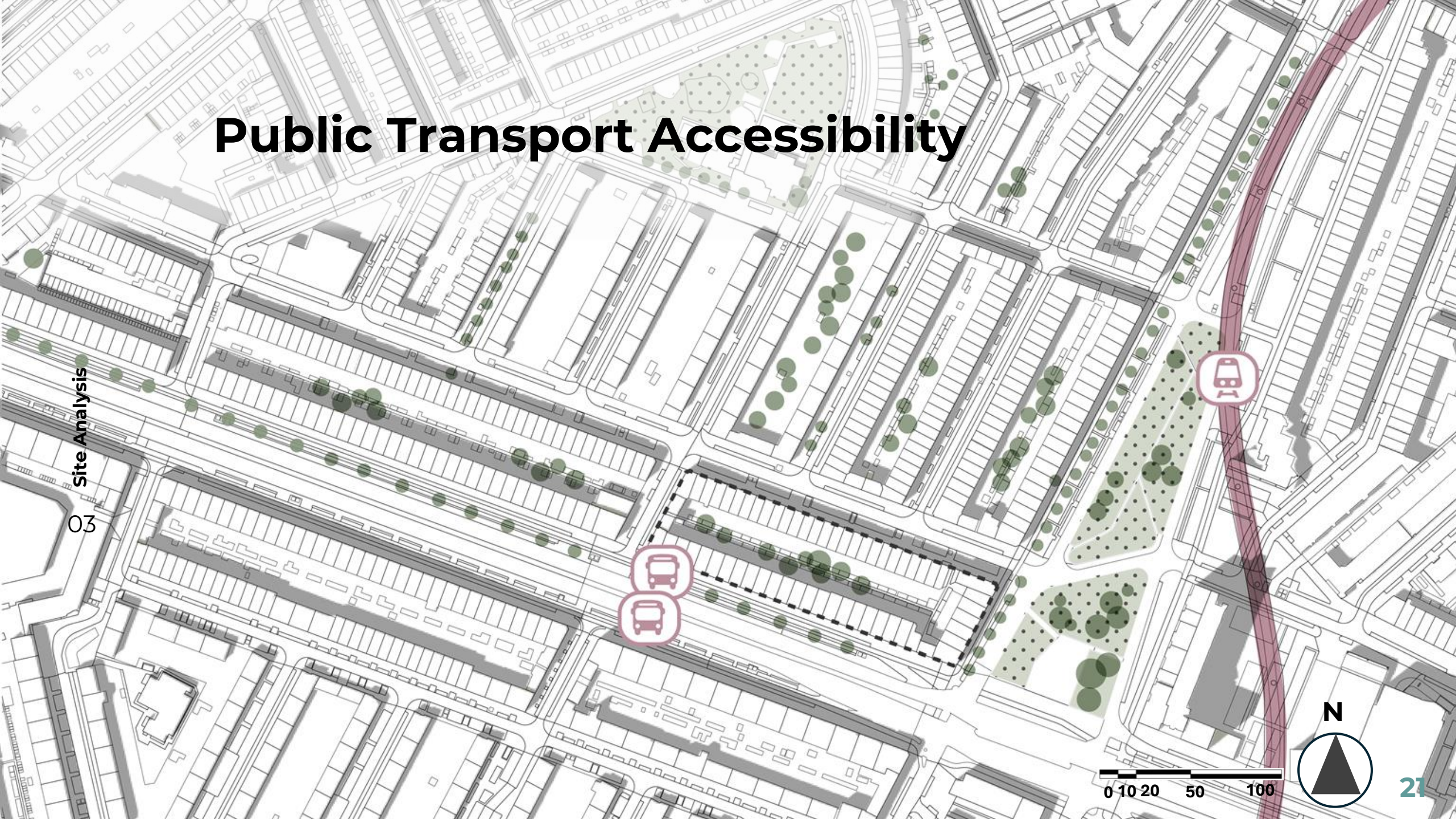
03

0 10 20 50 100



20

Public Transport Accessibility



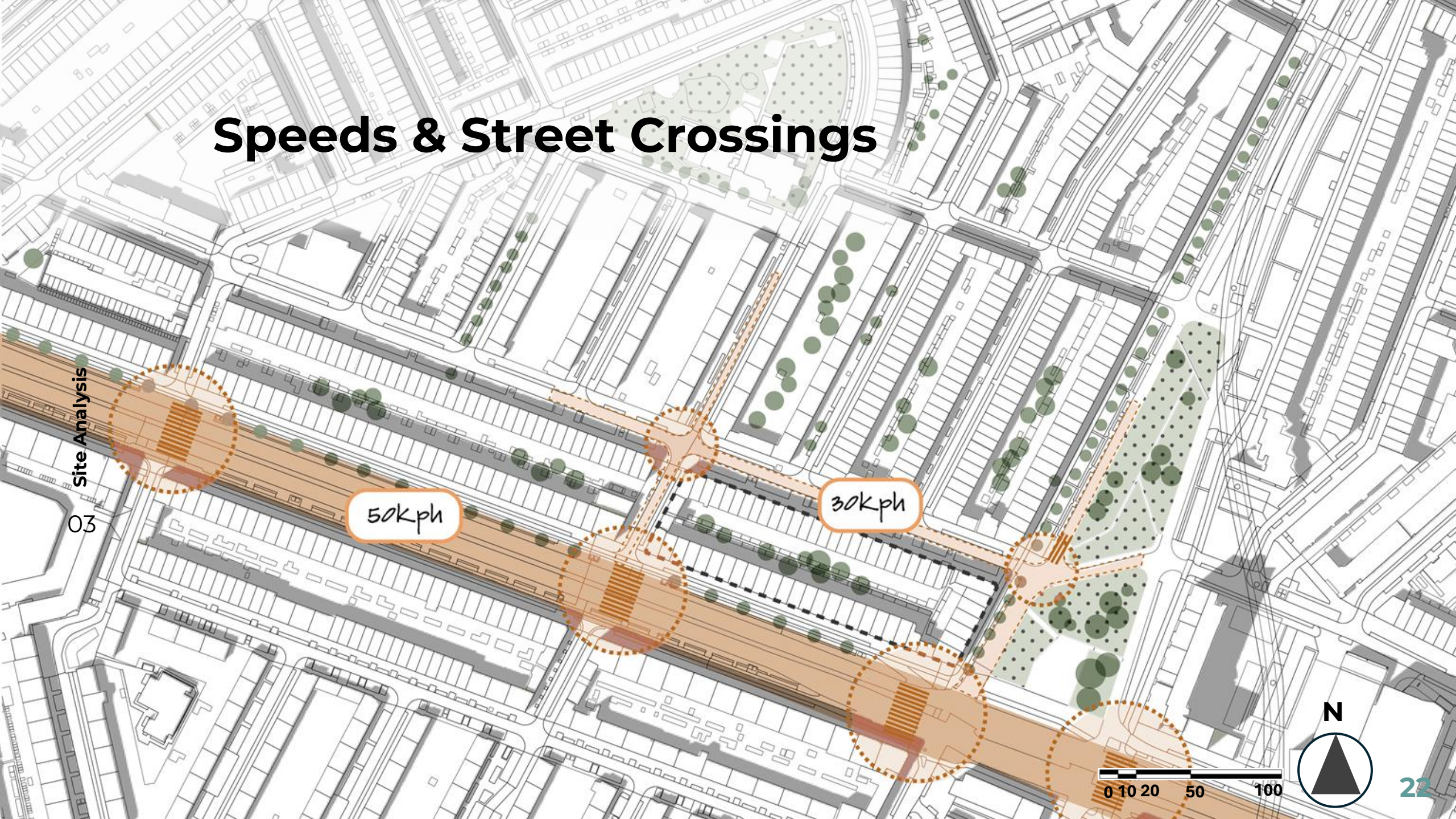
Site Analysis

03

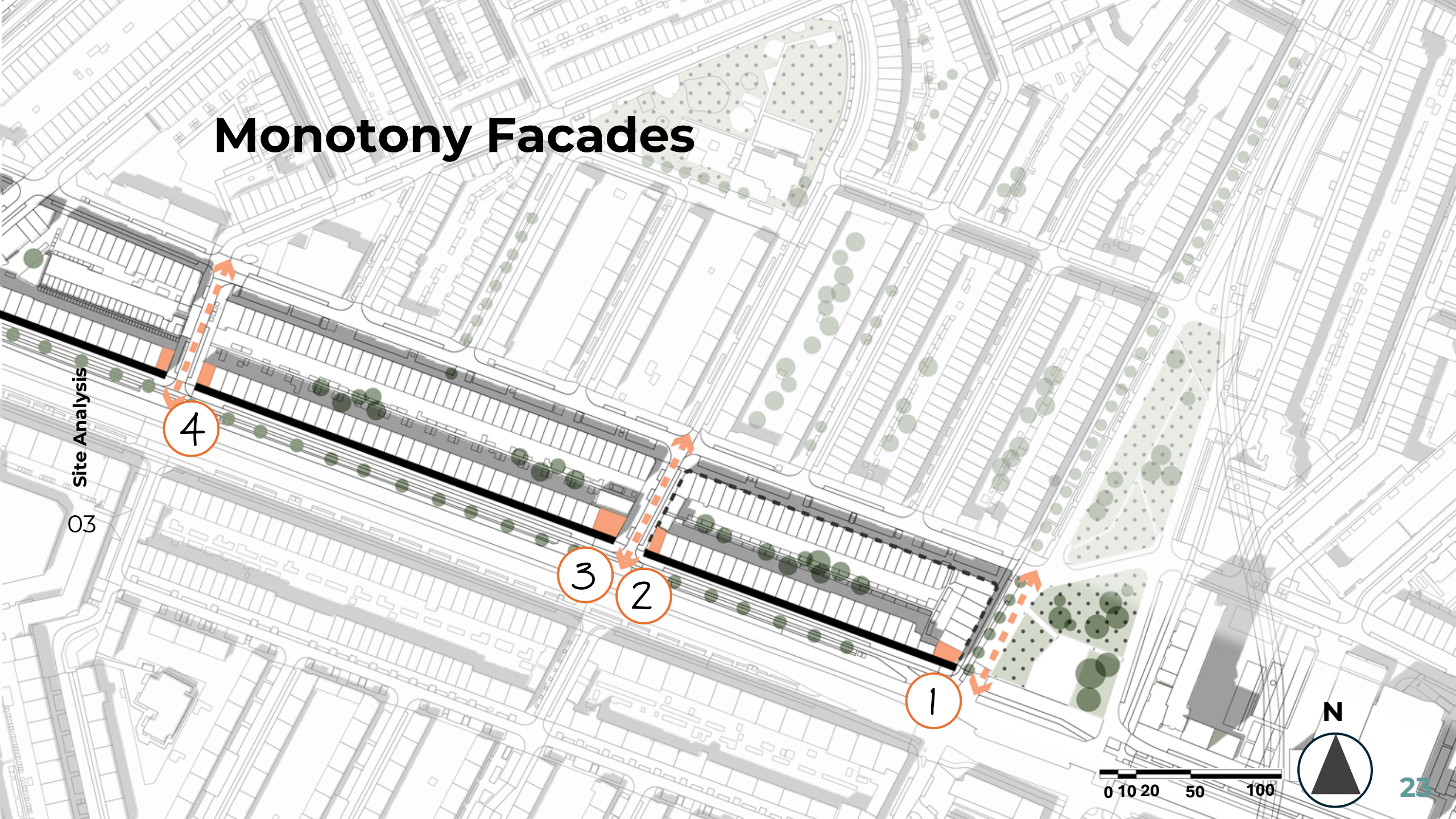
0 10 20 50 100



Speeds & Street Crossings



Monotony Facades



Site Analysis

03

0 10 20 50 100



Monotony Facades

Site Analysis

03



4



3



2



1

0 10 20 50 100



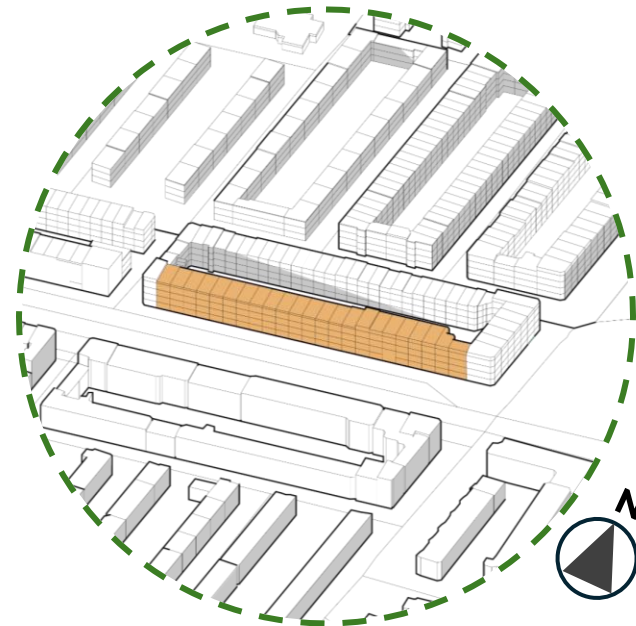
Design Concept:

Partially Transforming & Partially Demolishing a Haagse Portiek Typology Block

This proposal combines 40% transformation and 60% demolition to address these challenges and create a future-proof, inclusive living environment that enables active ageing:

Transformation (40%):

- Retrofit for accessibility (e.g., lifts)
- Improve daylight, energy efficiency, circulation and apartment layouts
- Enable *ageing in place* with health and care concepts, supporting independence and well-being



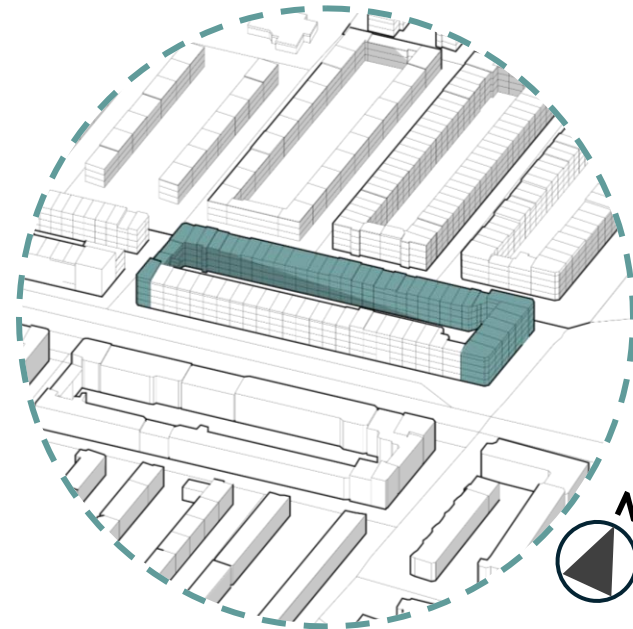
Design Concept:

Partially Transforming & Partially Demolishing a Haagse Portiek Typology Block

This proposal combines 40% transformation and 60% demolition to address these challenges and create a future-proof, inclusive living environment that enables active ageing:

Demolition & Extension (60%):

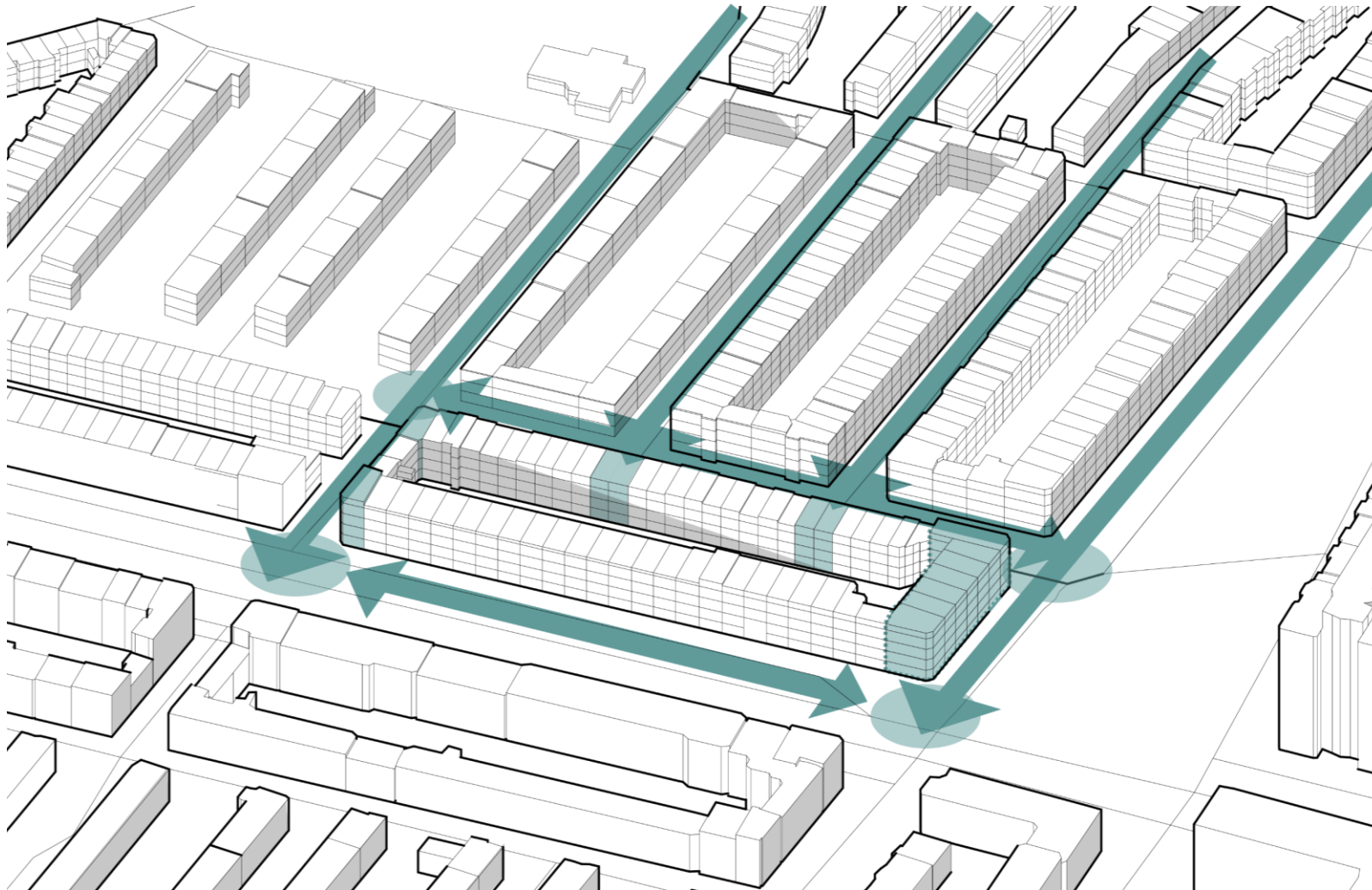
- Break the block's monotony and enable hybrid living models.
- Add care facilities, communal spaces, and green areas for improved quality of life.
- Integrate shared mobility and semi-underground parking solutions.



Essential Axes

Design Concept

04



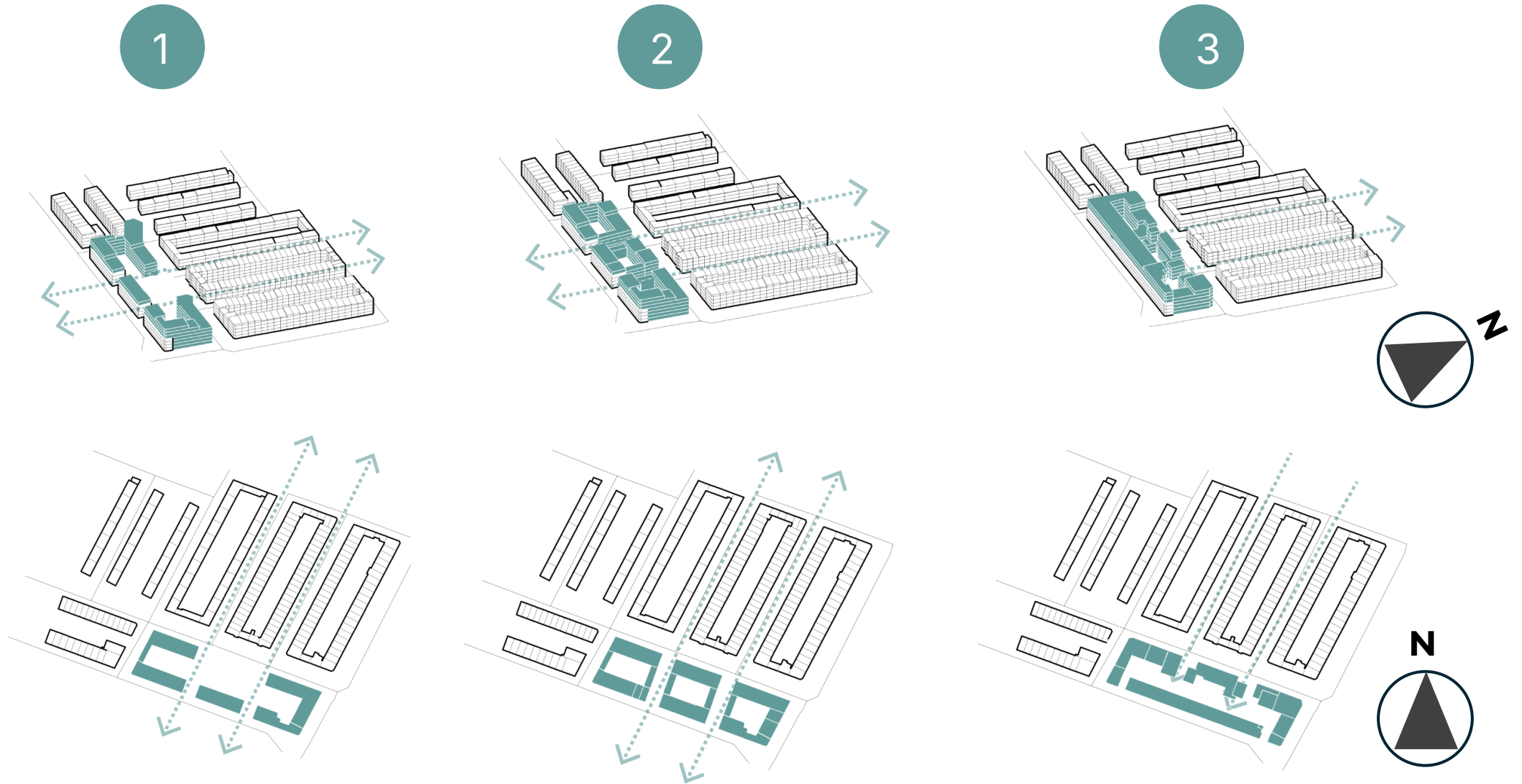
↔ essential axes



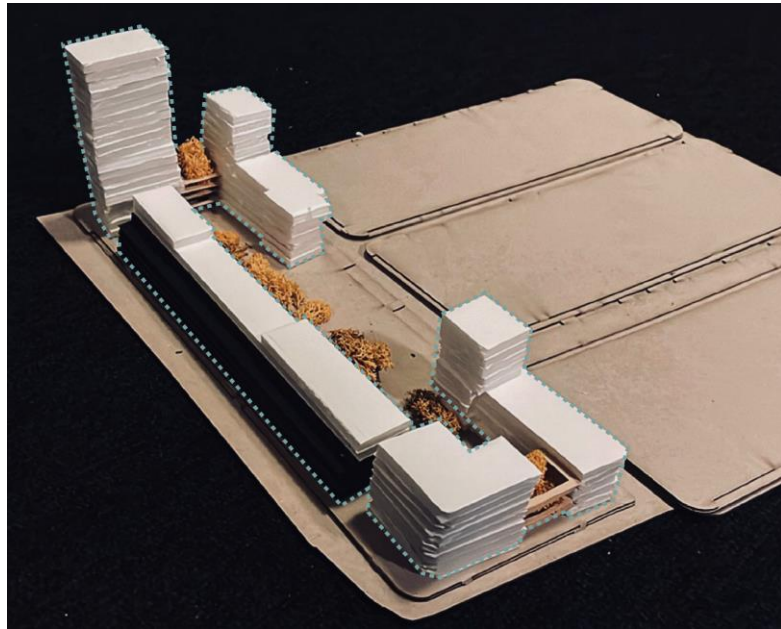
Massing Concepts

Design Concept

04



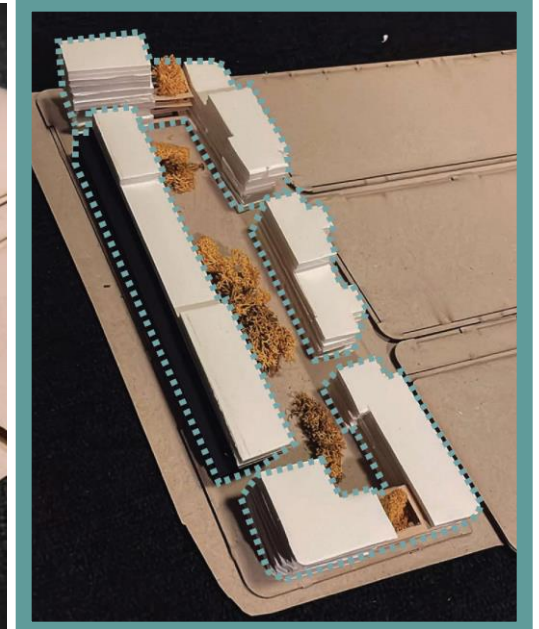
1



2



3



■ transformed □ extention

Urban Masterplan

Urban Level

05

0 10 20 50 100



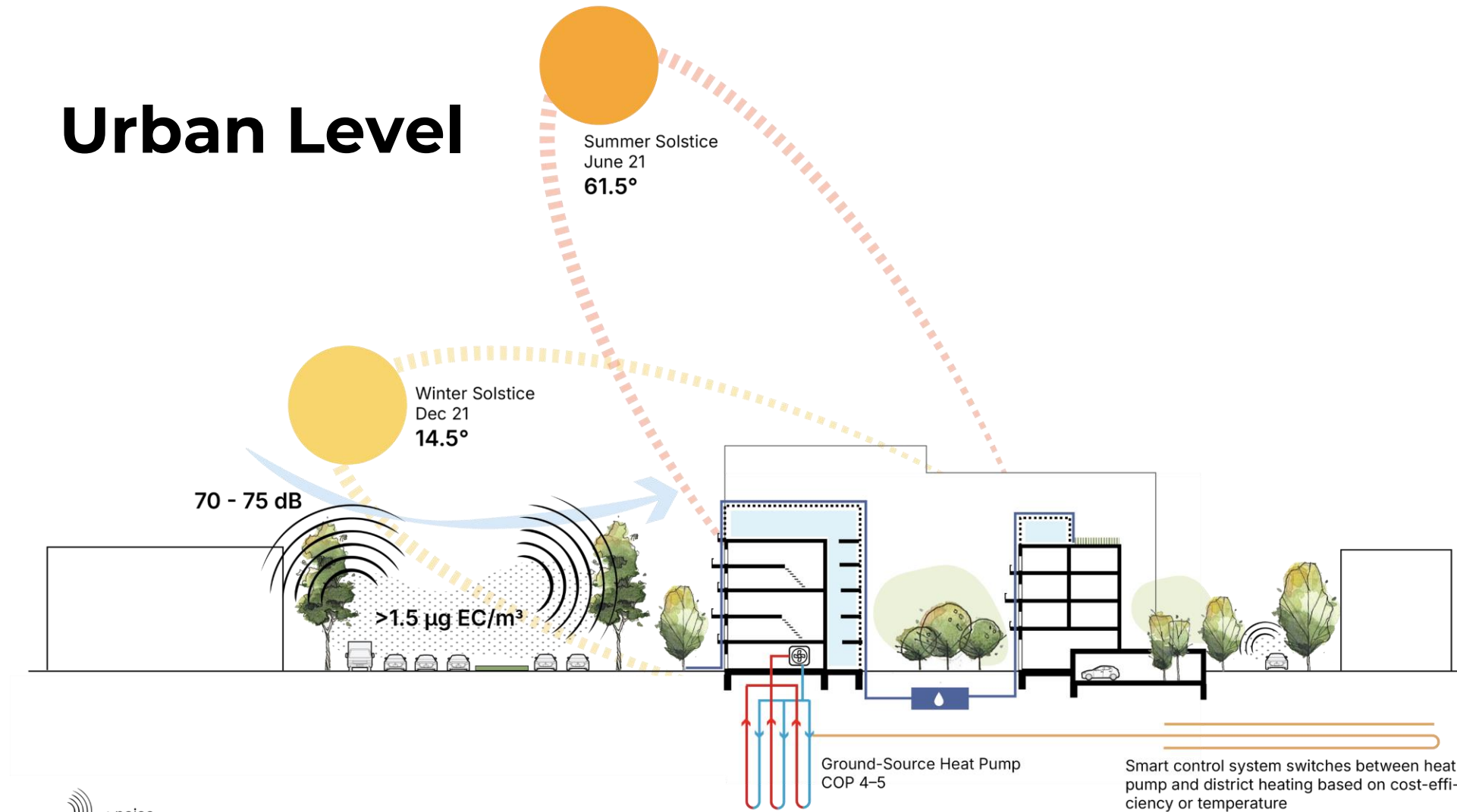
30



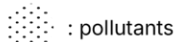
Urban Level
05

Urban Level

Urban Level
05



: noise



: pollutants

Air Quality & Noise Reduction

Vegetation and large trees help block traffic-related noise and pollutants from nearby roads, improving air quality near the building.

Prevailing Wind

Prevailing winds carry pollutants toward the building façade. Strategically placed vegetation acts as a natural barrier, reducing their impact.

Solar Access and Shading

South-facing balconies are staggered to maximize solar exposure for each floor, enabling effective passive heating in winter.



Rainwater Harvesting

The building incorporates rainwater harvesting to reduce potable water use and enhance sustainability.

Micro-climates

Courtyard vegetation improves the microclimate by lowering summer temperatures that can reach 29°C.

3 GOOD HEALTH
AND WELL-BEING



6 CLEAN WATER
AND SANITATION



7 AFFORDABLE AND
CLEAN ENERGY



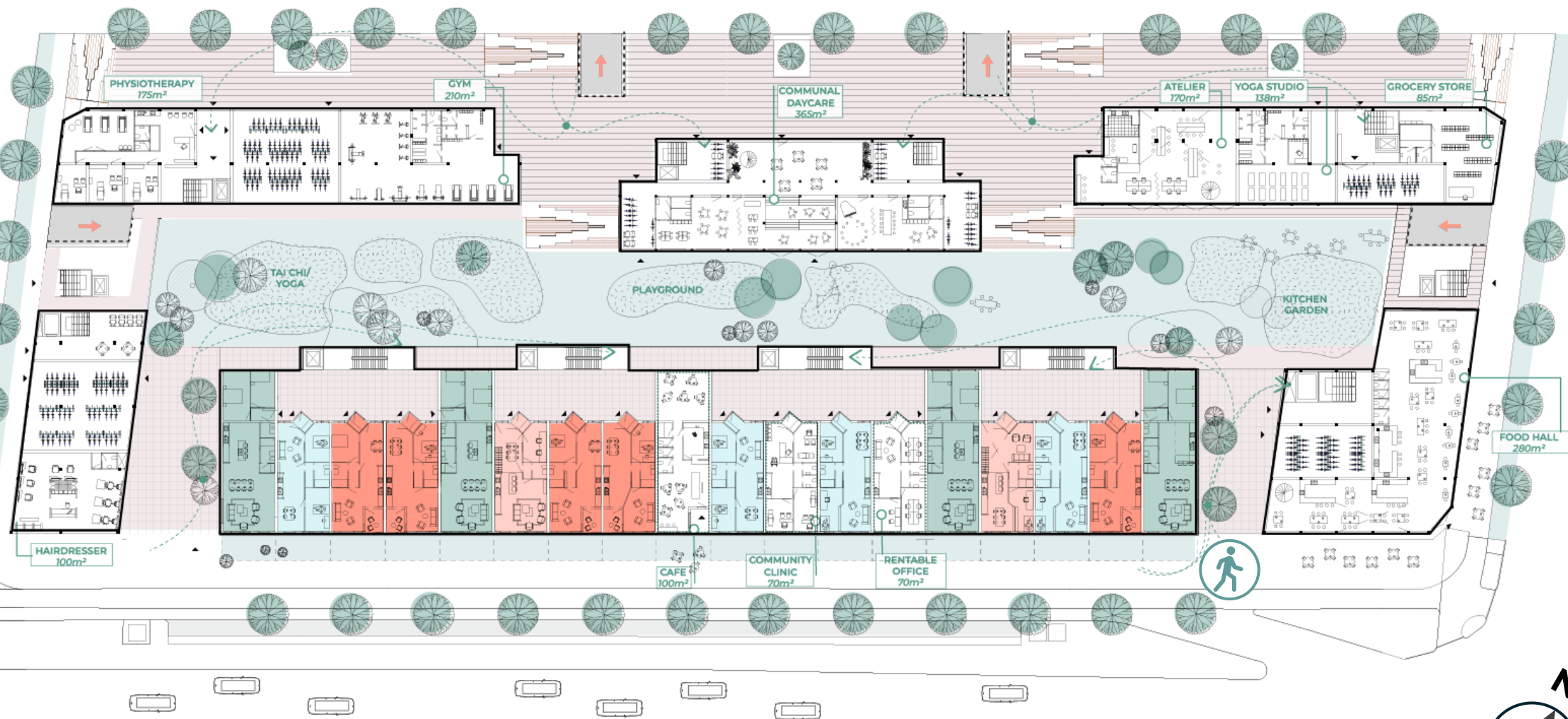
13 CLIMATE
ACTION



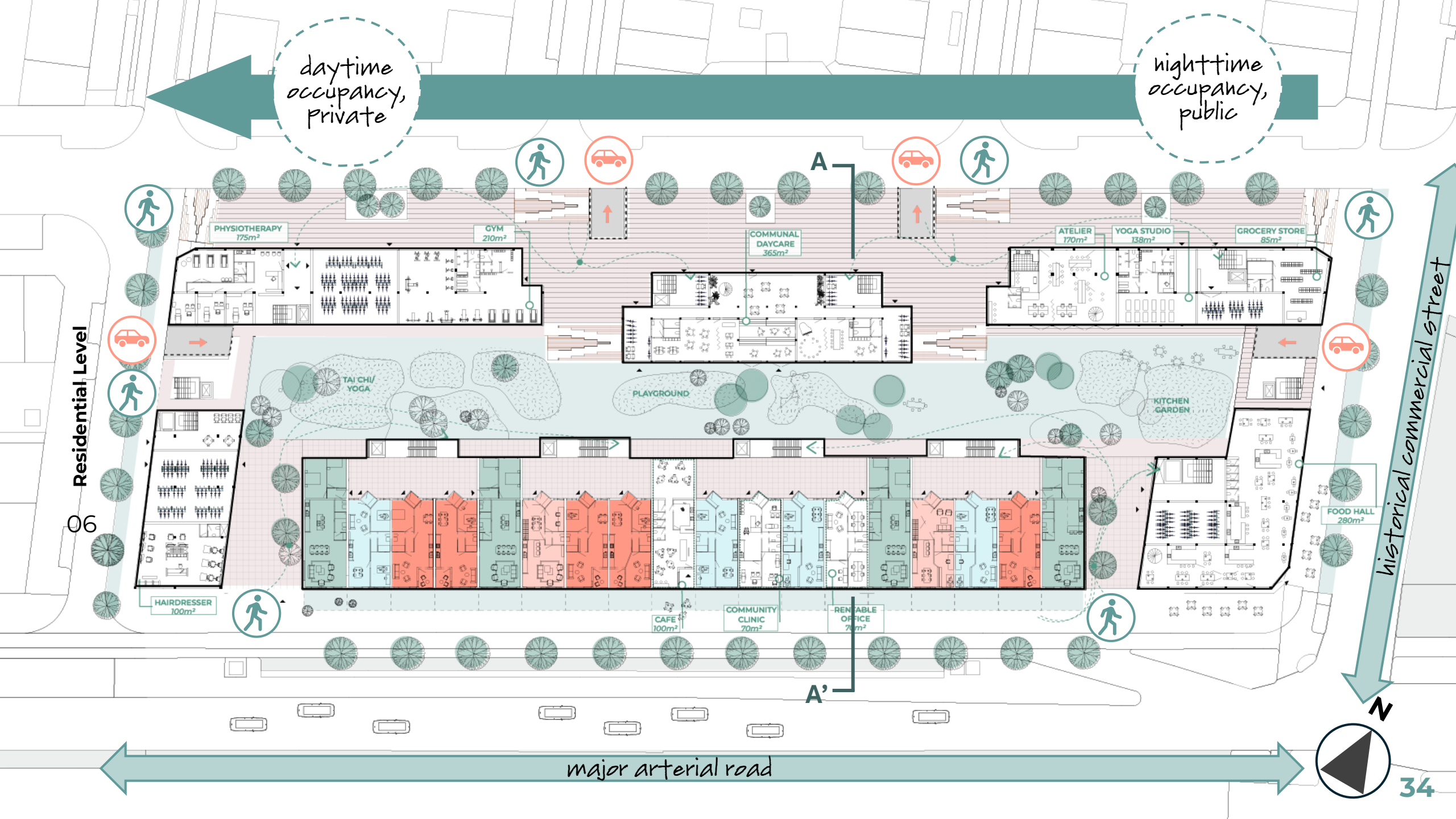
Ground Floor Plan

Residential Level

06

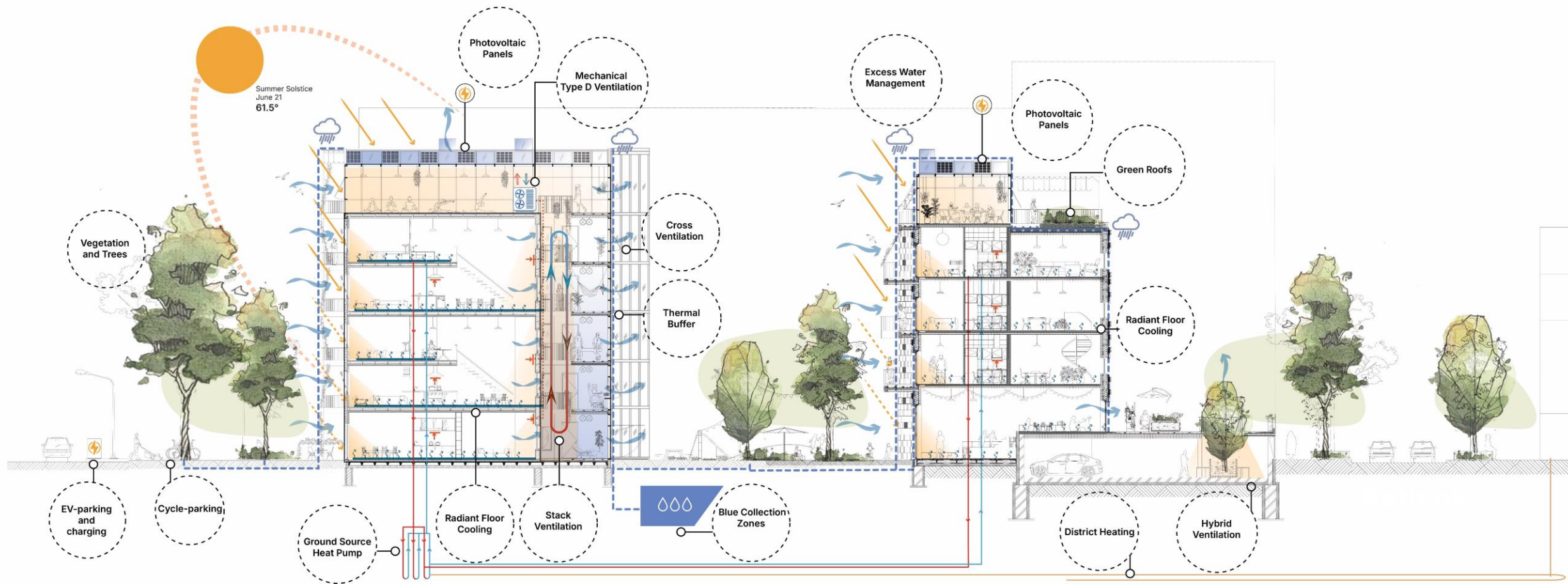


33



Section





Summer

Summer Solstice
June 21
61.5°

Photovoltaic Panels
Rooftop PV panels generate renewable electricity; excess energy can be stored or used for EV charging

Mechanical Type D Ventilation
Type D ventilation system supplies and extracts air mechanically with a heat recovery unit, reducing energy demand for heating and cooling

Vegetation and Trees
Reduce surrounding temperature through evapotranspiration and provide seasonal shading.

Cross Ventilation
Operable windows on both façades allow fresh air to pass through the building.

Thermal Buffer
Greenhouse extension buffers against temperature swings, acting as a passive solar zone in winter and ventilated layer in summer.

EV-parking and charging

Cycle-parking

Ground Source Heat Pump
COP 4-5

Radiant Floor Cooling
Integrated water pipes in floor slabs provide passive cooling during summer

Stack Ventilation
Warm air rises and exits through vents at the top, drawing cooler air in from below.

Blue Collection Zones
Roof and site drainage guide rainwater to underground storage for reuse



Reuse

Reusing existing load-bearing structure of the portiek block, preserving embodied energy and extending building life.



Repair

Improving dampness, accessibility, and energy inefficiency in circulation and building envelope upgrades.



Rethink

Introducing elevators and ramps in older housing stock to enhance access for all residents.

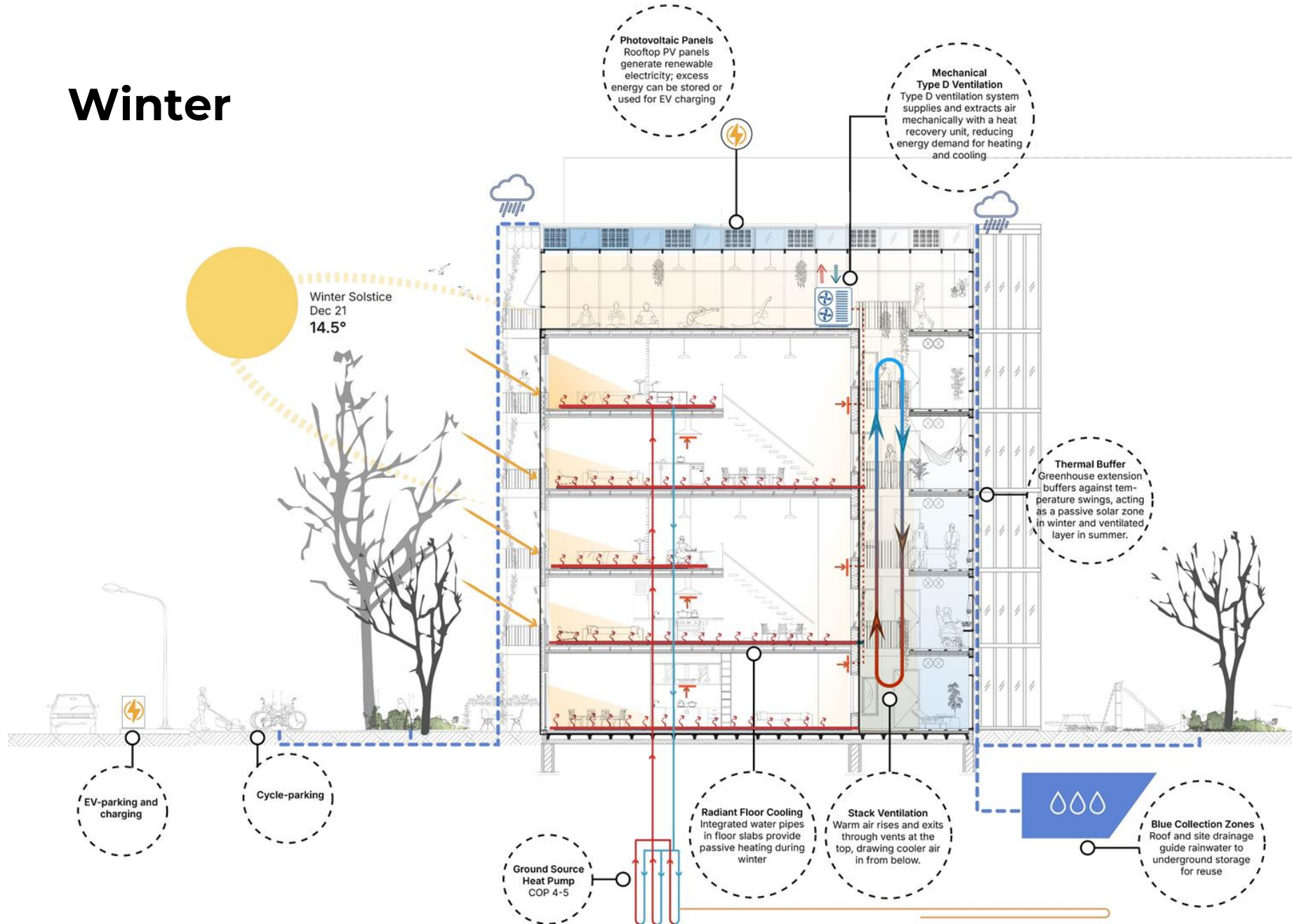
Residential Level

06

Winter

Residential Level

06



Reuse

Reusing existing load-bearing structure of the portiek block, preserving embodied energy and extending building life.



Repair

Improving dampness, accessibility, and energy inefficiency in circulation and building envelope upgrades.



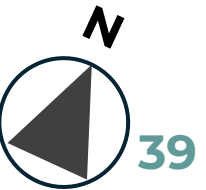
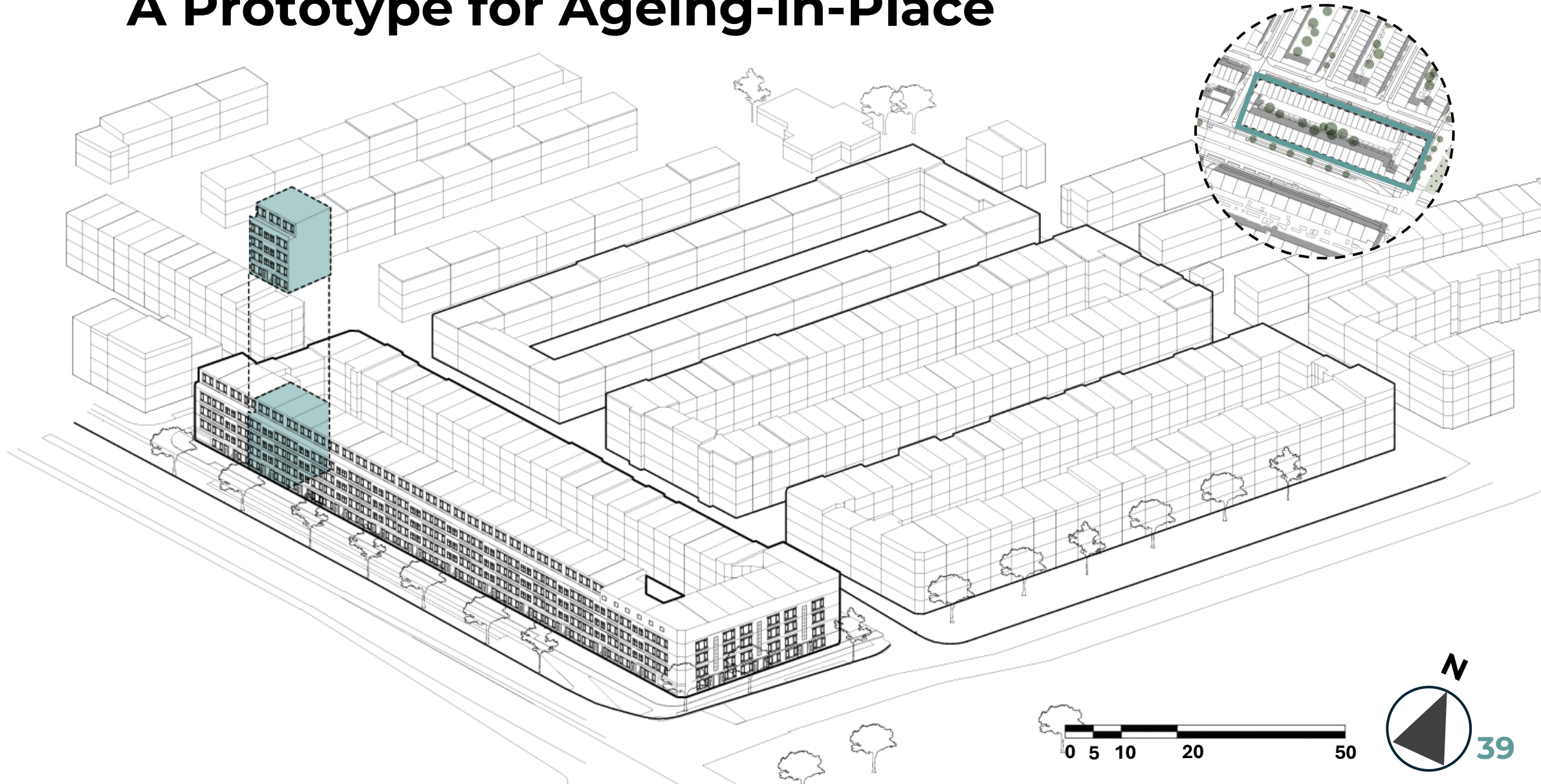
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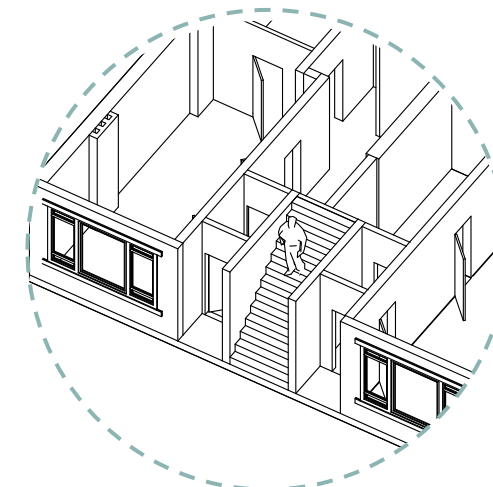
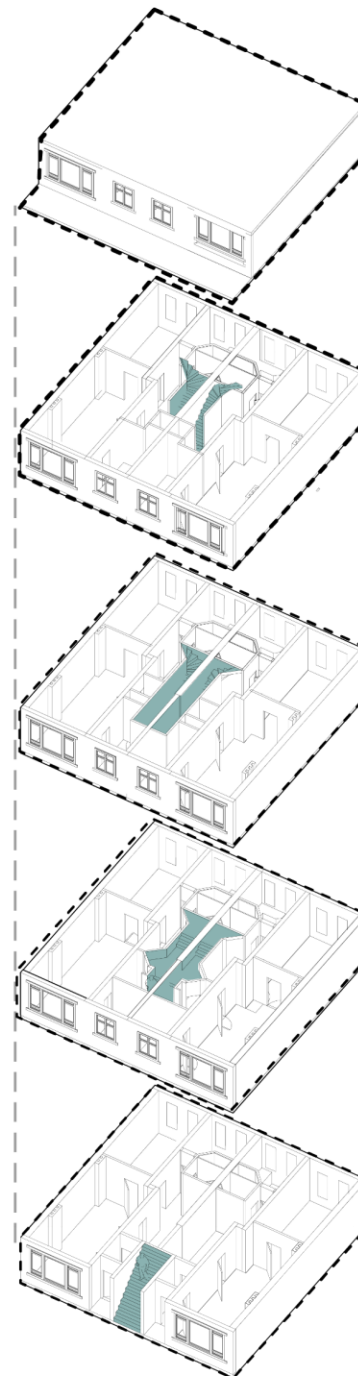
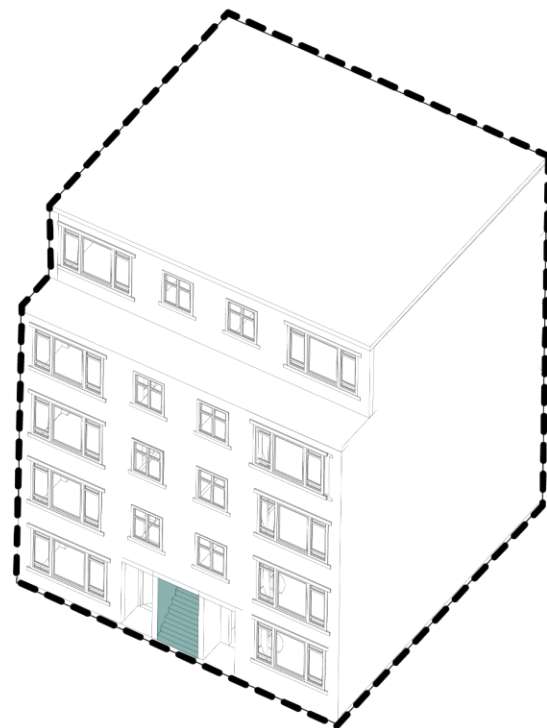
A Prototype for Ageing-in-Place

Prototype for Transformation

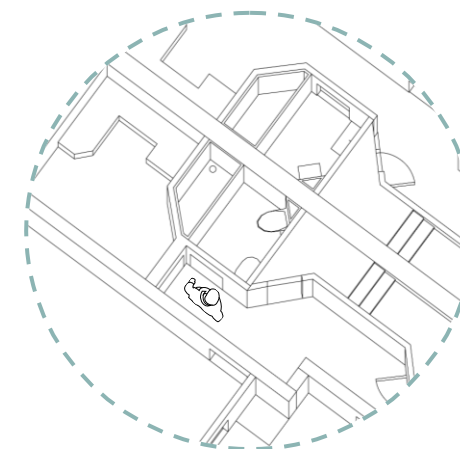
07



One Size Doesn't Fit All

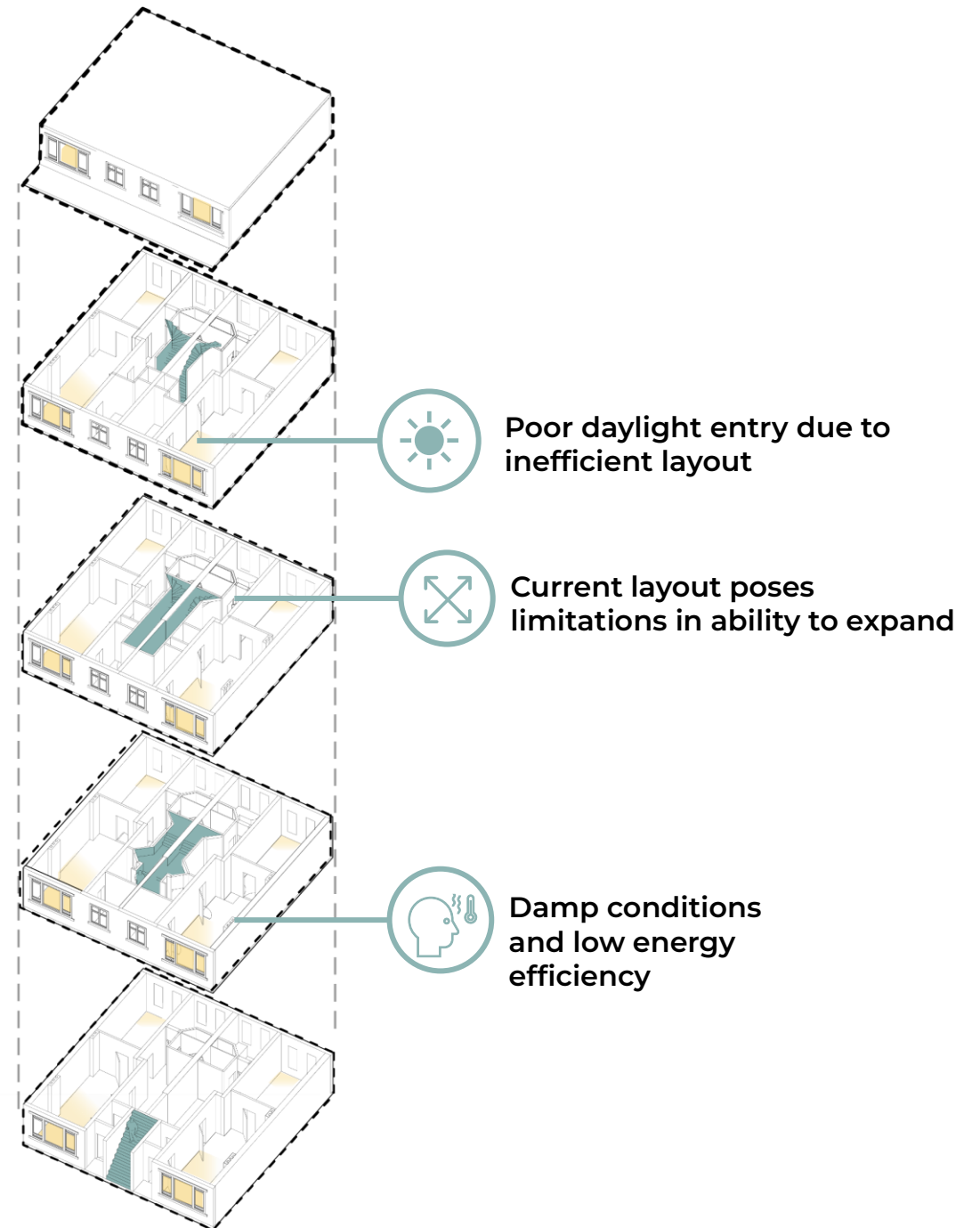
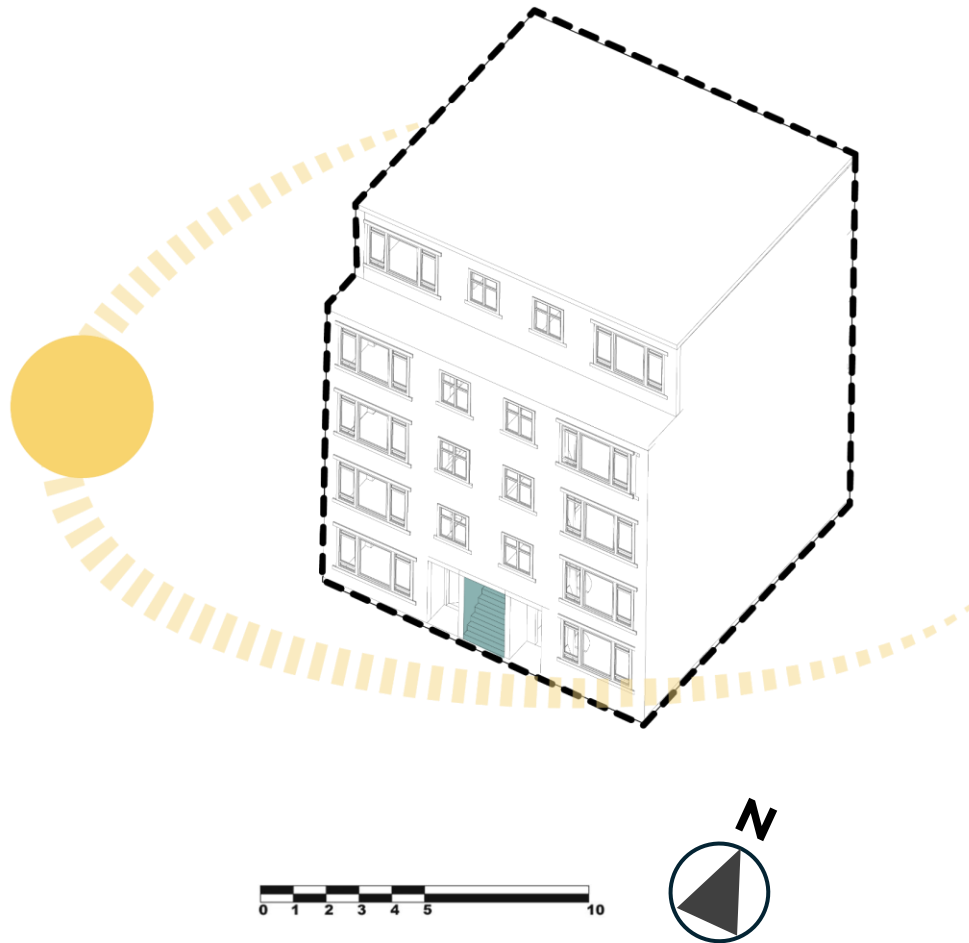


**Steep stairs & small
inaccessible apartments that
force elderly residents to move**

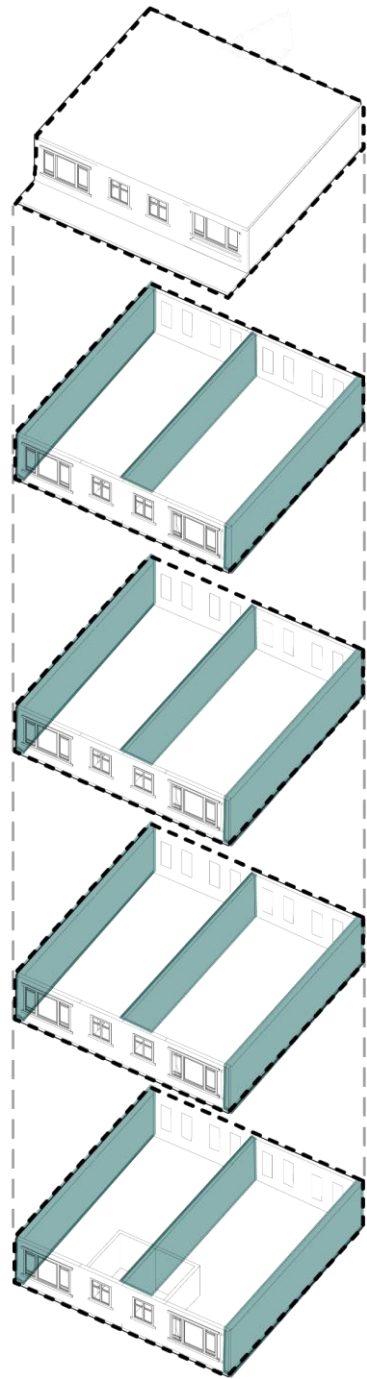
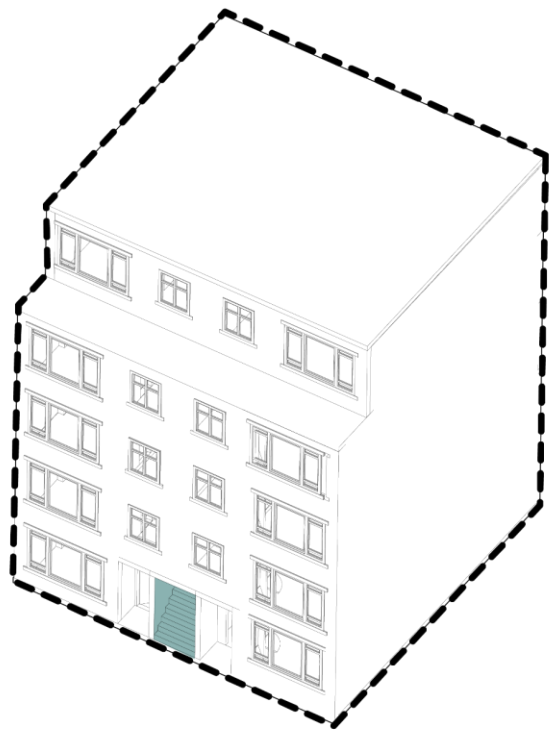


**Inaccessible, small
kitchens and bathrooms**

One Size Doesn't Fit All



One Size Doesn't Fit All



Two apartment share a single stair-core



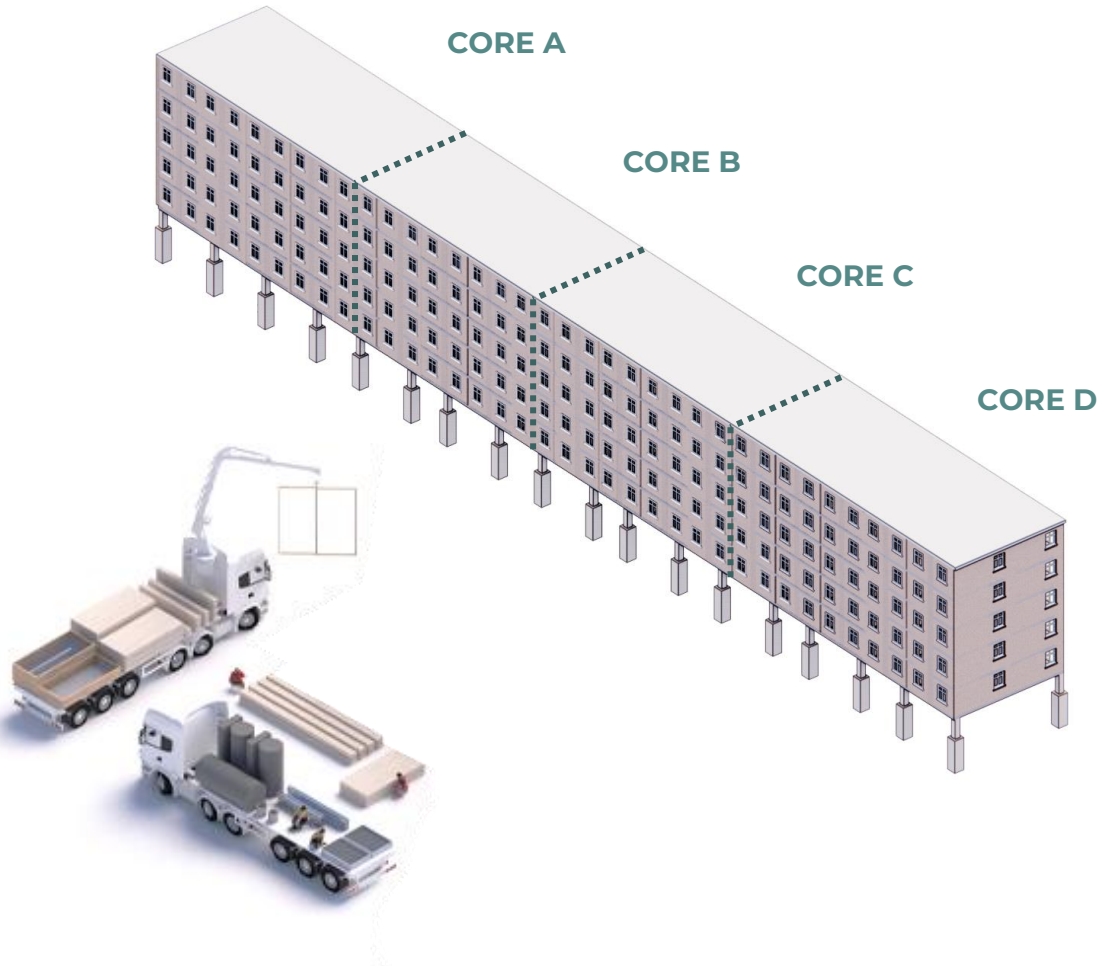
Every 4-5 apartments share a common gallery, stair and elevator core



Phasing Transformation

Prototype for Transformation

08



Phase 0



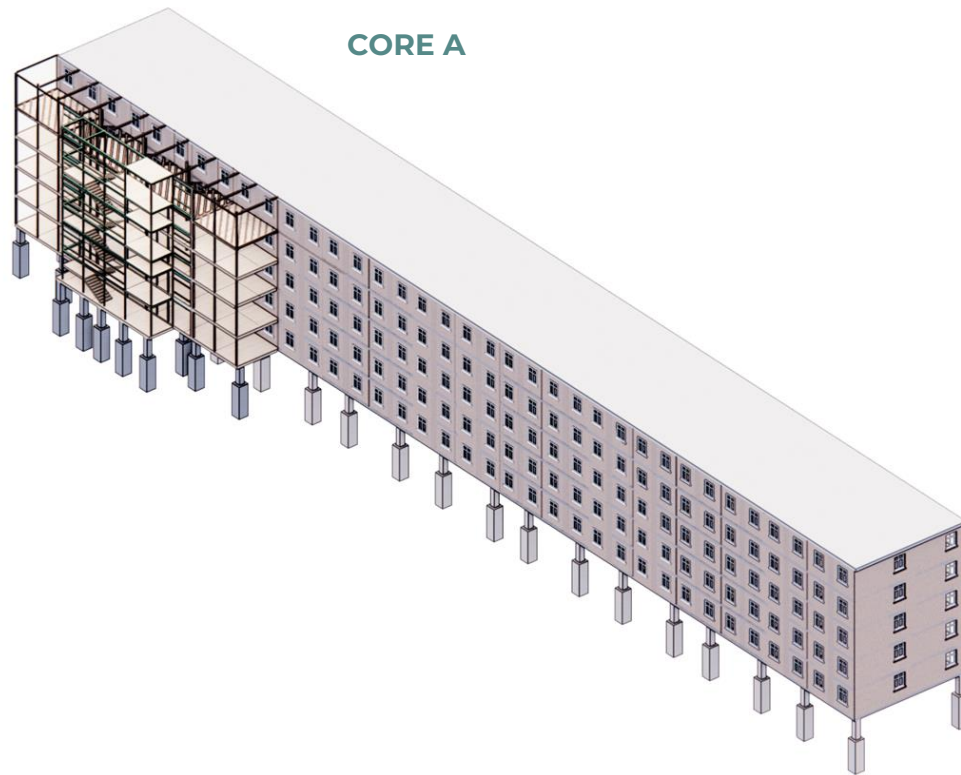
Prefabrication & Preparation

Scope:

- Resident communication and participation
- Technical survey of existing structure
- Identify temporary relocation options
- Prefab of modular timber units, stair cores, and balconies off-site

No relocation required yet

Phasing Transformation



Phase 1



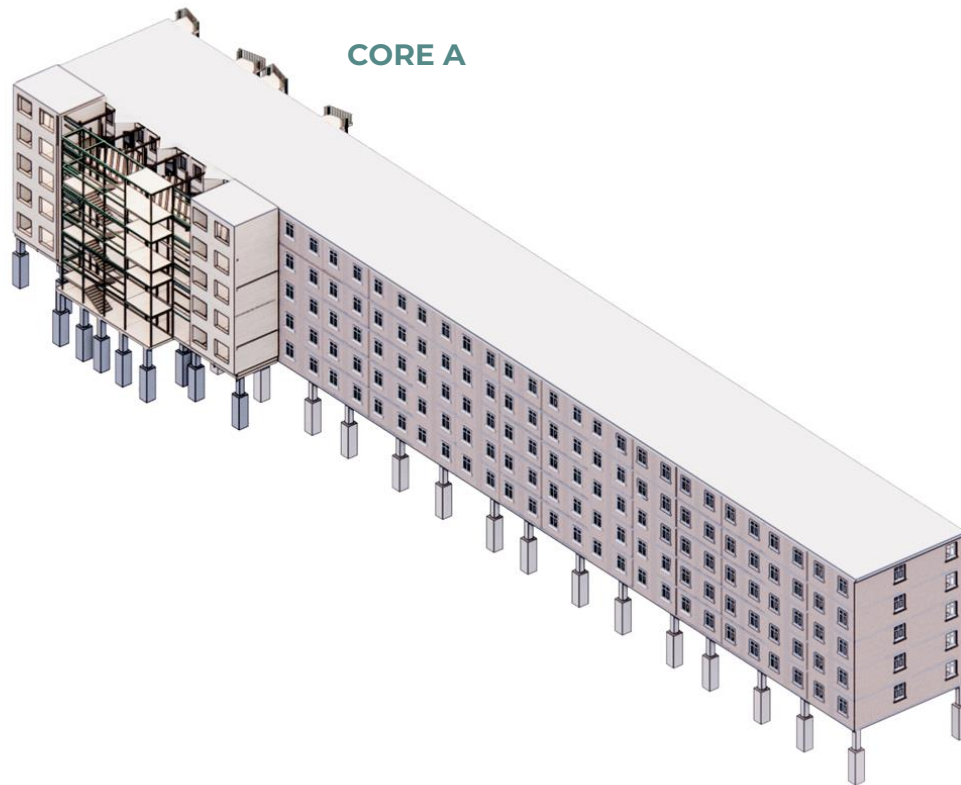
Addition Stair/Lift Core (Garden Side)

Scope:

- Construct new self-supporting stair/lift core behind Core A
- Keep original stairs still in use during construction
- Test circulation, fire egress, and access systems

Relocation: Not required yet – residents still use exiting stairs

Phasing Transformation



Phase 2



Execute One Vertical Stack

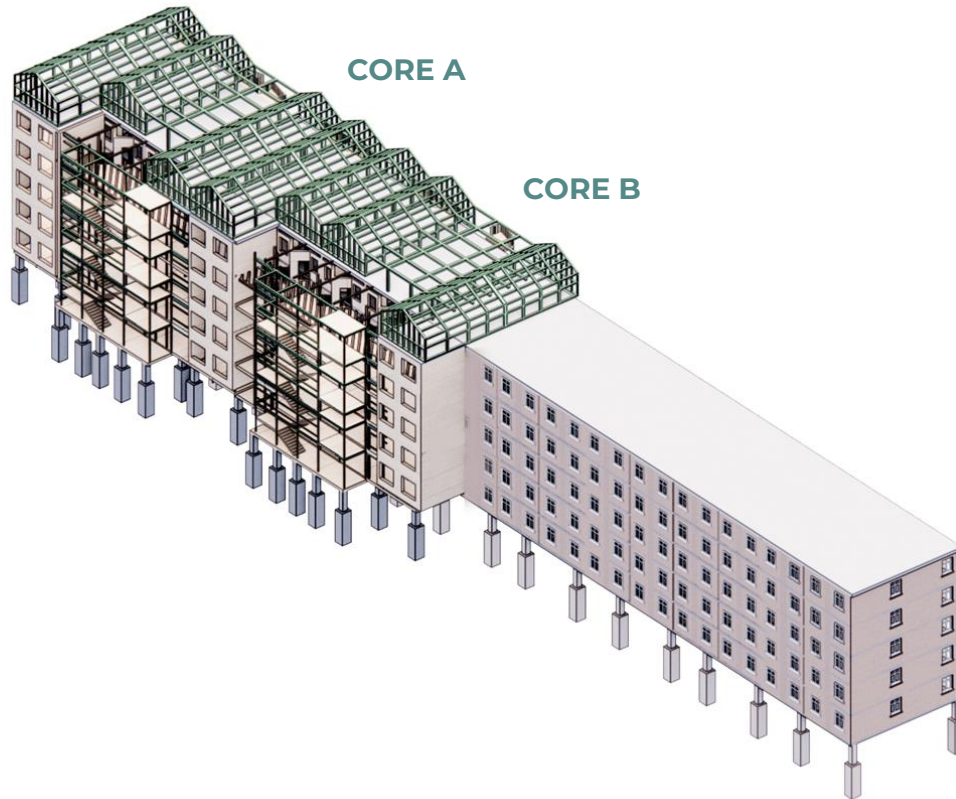
Scope:

- Remove existing portiek stairs of Core A
- Add rear timber apartment extensions
- Add balconies on south side
- Complete façade upgrades in this zone

Relocation: Temporary decanting of 6 units

- Vacant units elsewhere in the block
- Partnered relocation within housing corporation's portfolio
- Short-term modular housing if required

Phasing Transformation



Phase 3

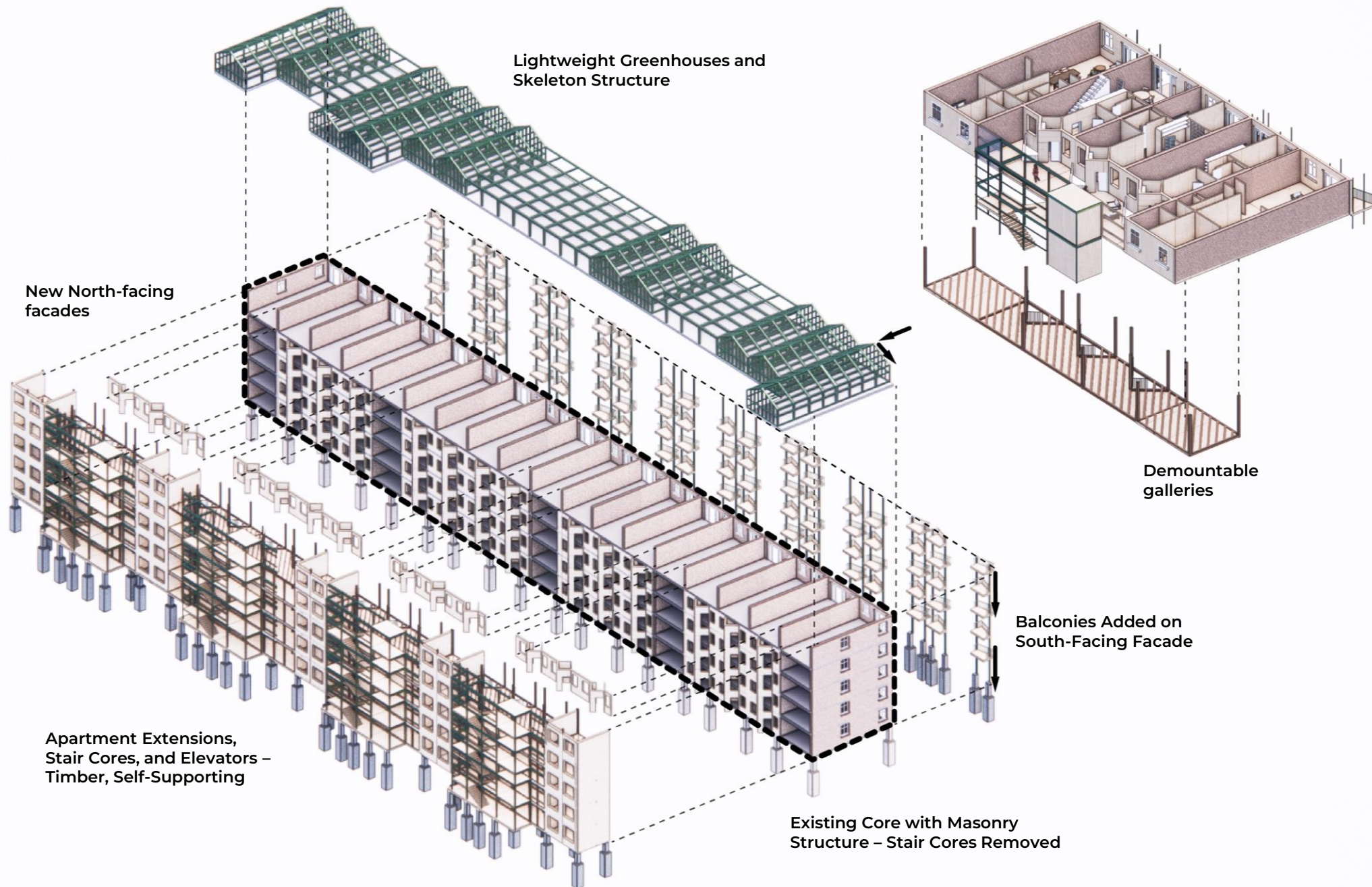


Stack-by-Stack Expansion + Rooftop Greenhouses

Scope:

- Begin Core B, repeating full Phase 2 process
- Add galleries and balconies sequentially along the block
- Install lightweight rooftop frames + greenhouses once multiple cores are complete (ensures structural stability and access)

Relocation: Use completed Core A to temporarily house Core B residents if needed



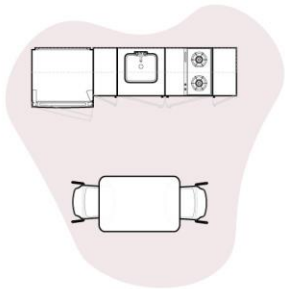
Culturally-Responsive Layouts

Public Realm

Private Realm

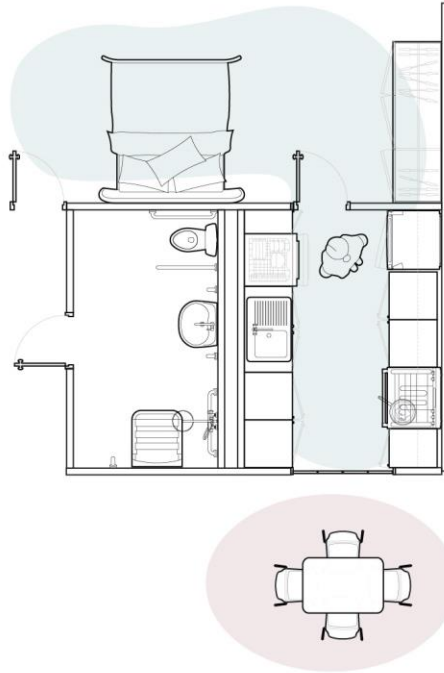
Prototype for Transformation

07



Compact Open Kitchen

Kitchen and dining blend seamlessly – ideal for **Dutch/Surinamese households** valuing shared domestic life.



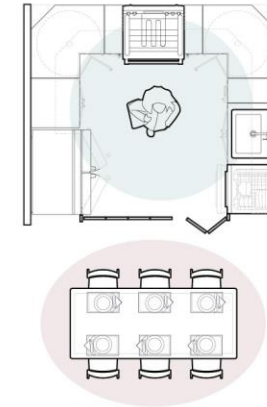
Linear with Soft Buffer

Creates modest privacy—ideal for **elders, caregivers, or women in gendered households** who need retreat without exposure.



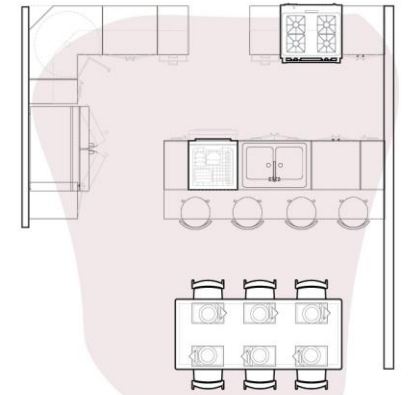
Semi-Enclosed Niche

Allows interaction while preserving workspace – supports households with flexible **gender norms**.



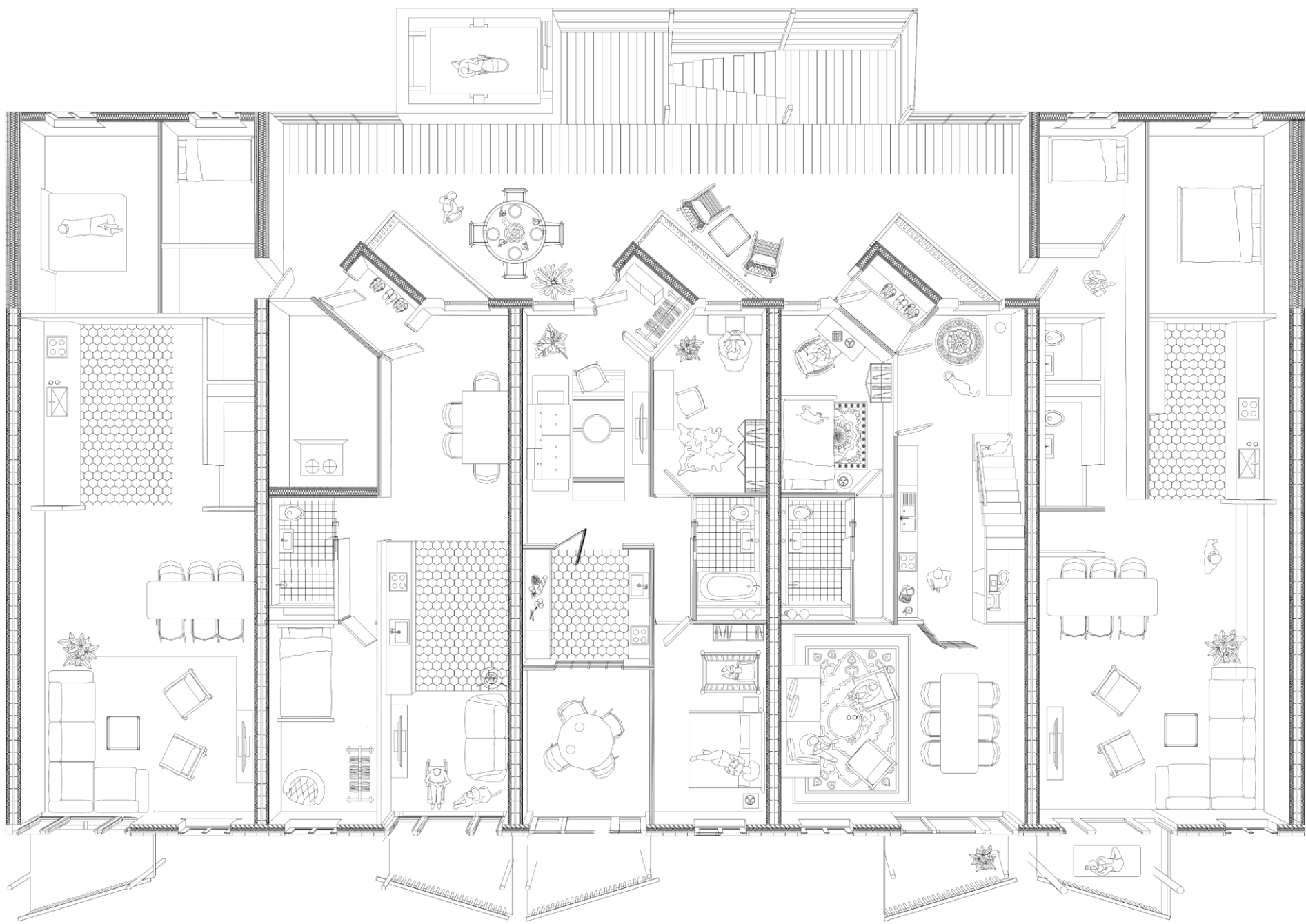
Enclosed U-Shape

Strong separation aligns with **Moroccan/Turkish traditions** of gendered privacy and intensive cooking.



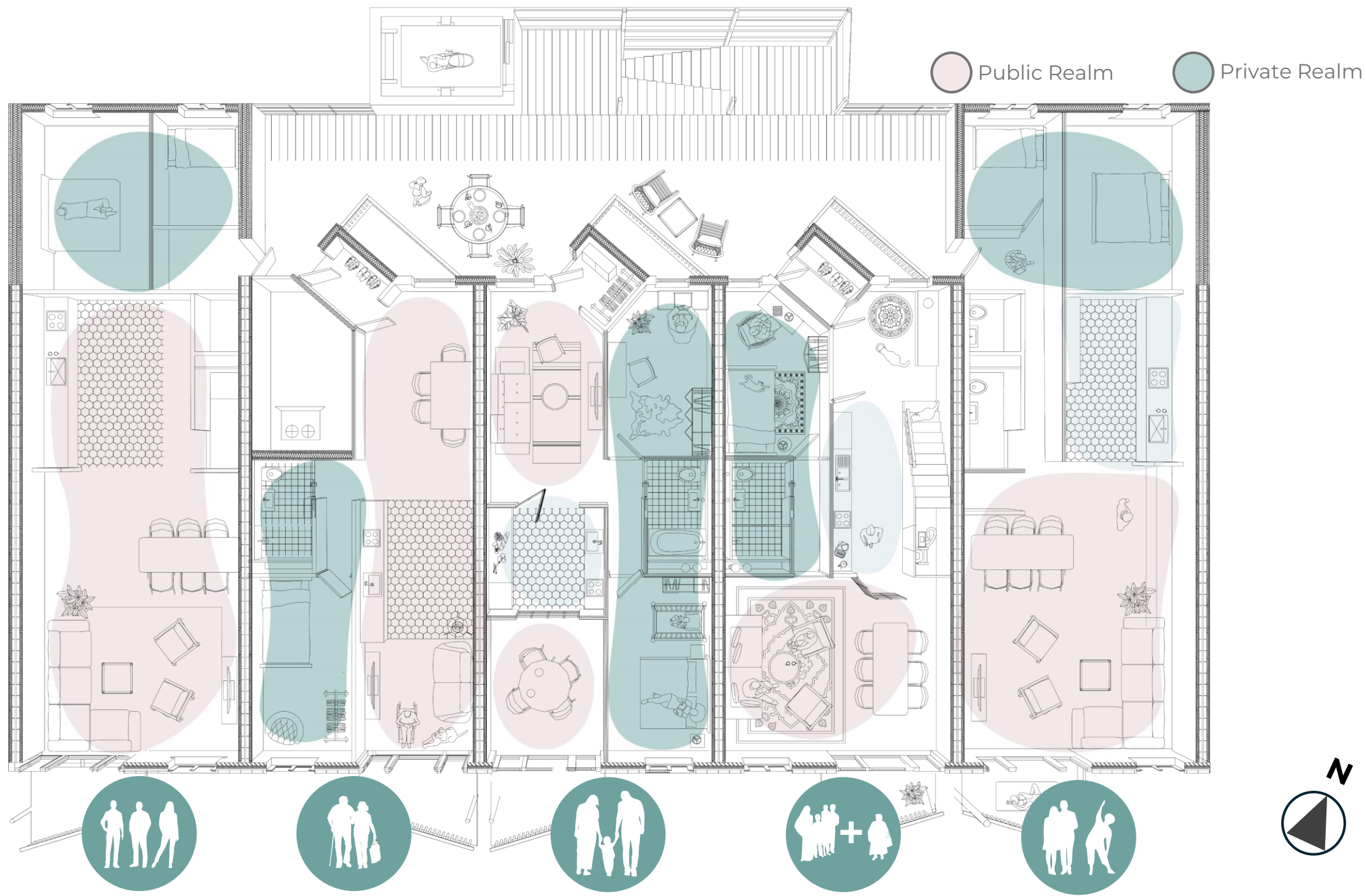
Integrated Island Kitchen

Highly integrated and social – ideal for **large families** engaging in communal cooking and caregiving.





07 Prototype for Transformation

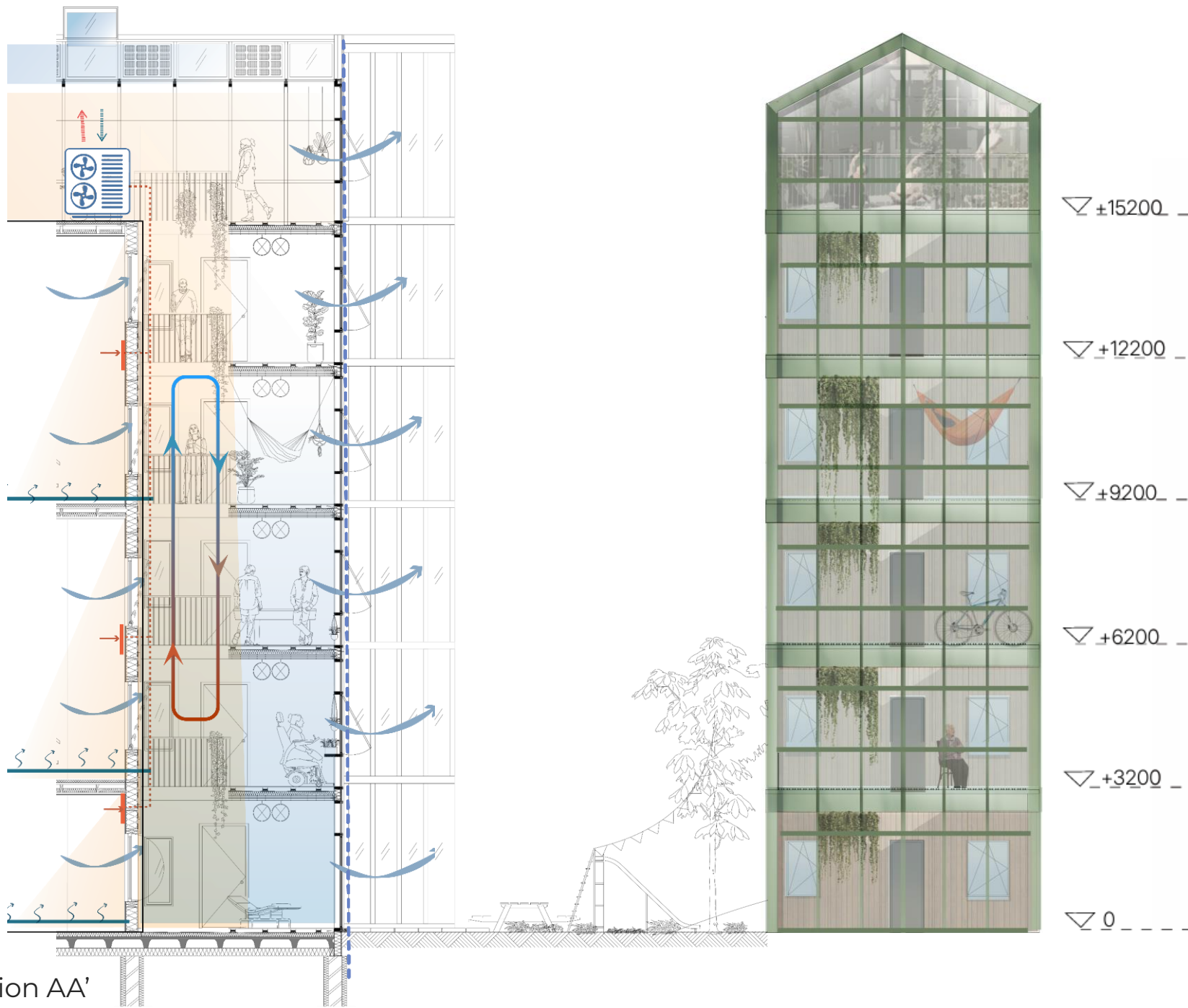


07 Prototype for Transformation



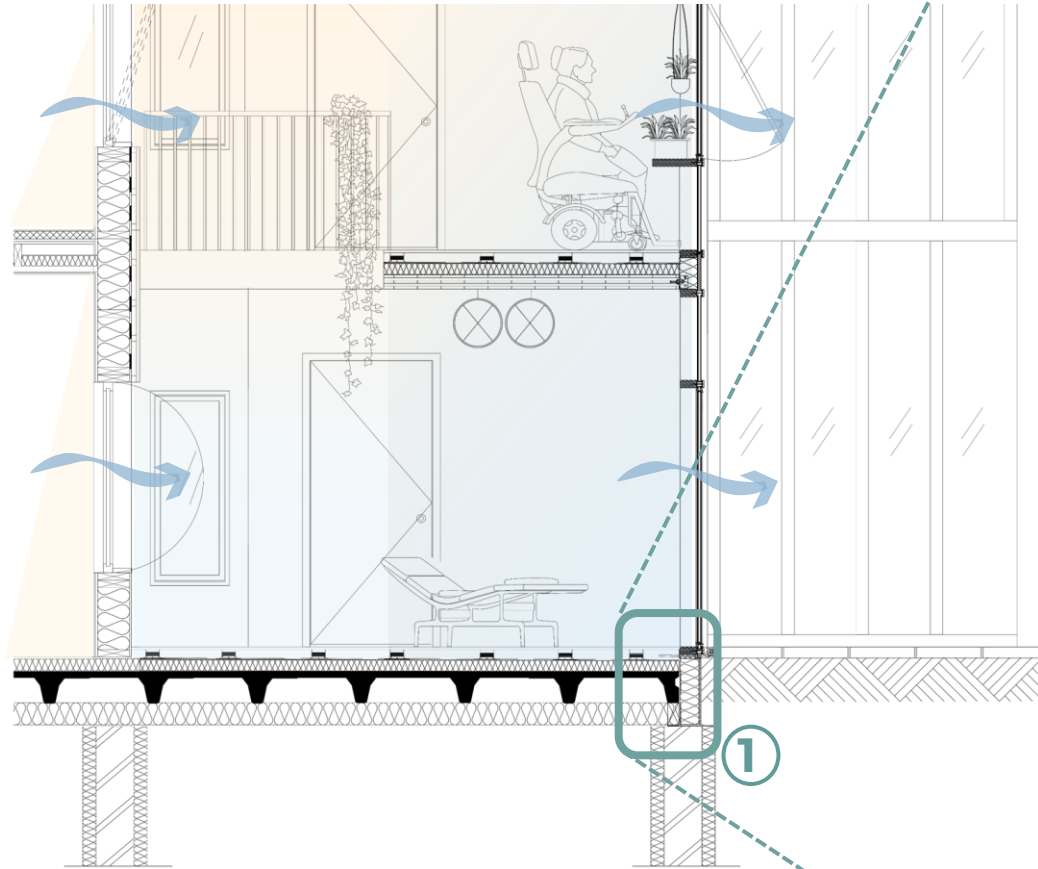


Section AA'



Foundation Detail

07 Prototype for Transformation

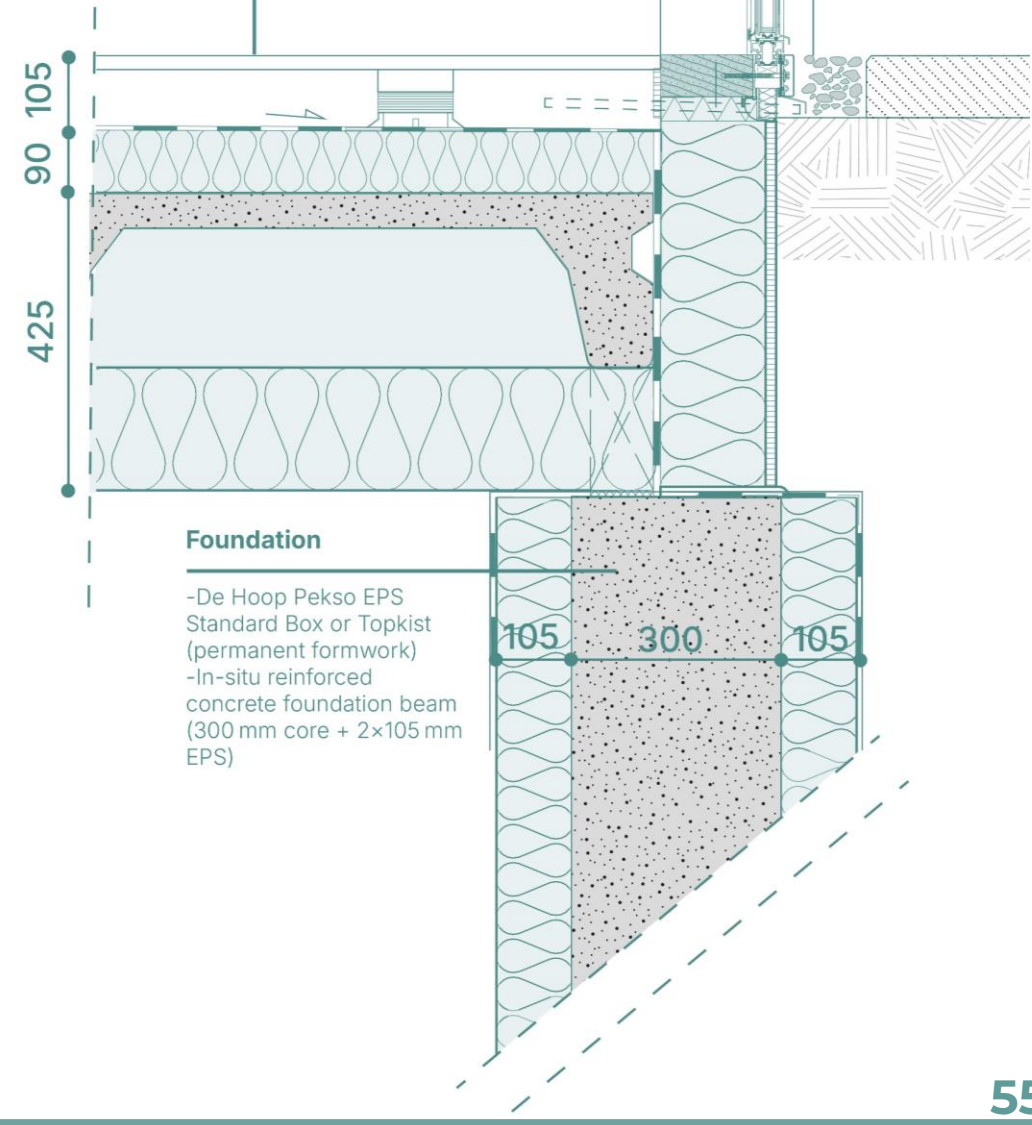


Gallery Floor Assembly

- Timber decking boards fixed to treated softwood battens (25mm)
- Waterproof membrane on rigid insulation with 1:60 falls
- Foamglas® Tapered 90mm
- Precast De Hoop Pekso ribbed concrete slab

Curtain Wall Assembly

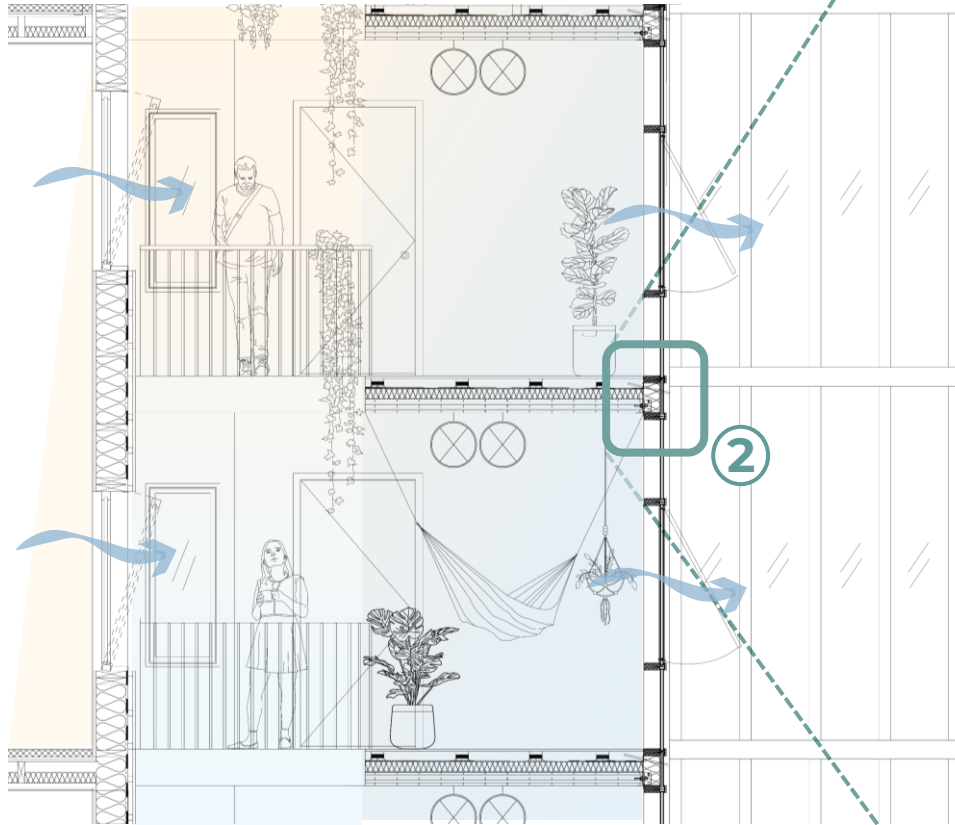
- HR++ glass
- Stabalux-H timber curtain wall system with structural timber mullions and transoms, aluminium pressure profiles, and EPDM gaskets



Foundation

- De Hoop Pekso EPS Standard Box or Topkist (permanent formwork)
- In-situ reinforced concrete foundation beam (300 mm core + 2x105 mm EPS)

Curtain Wall Detail



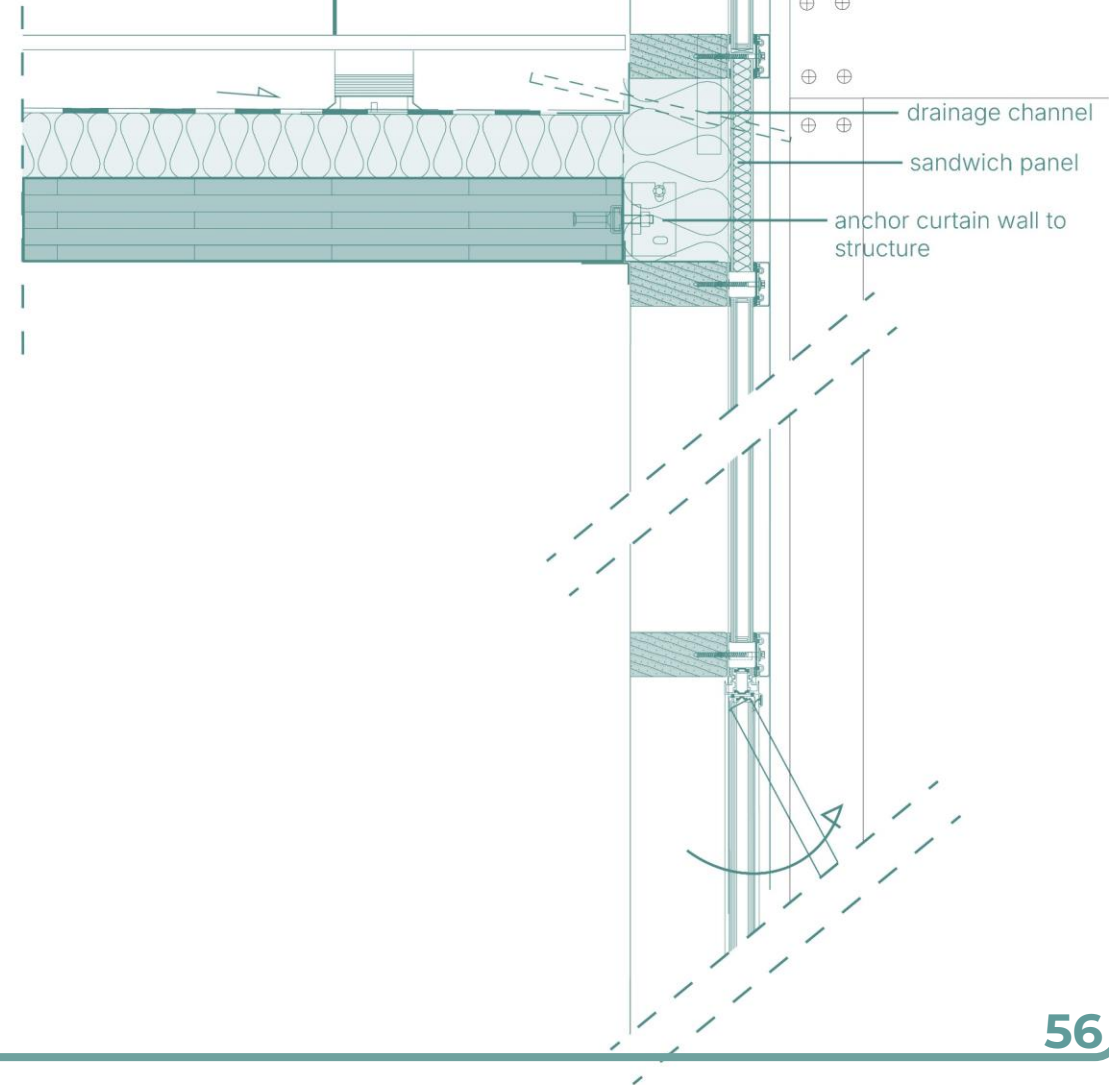
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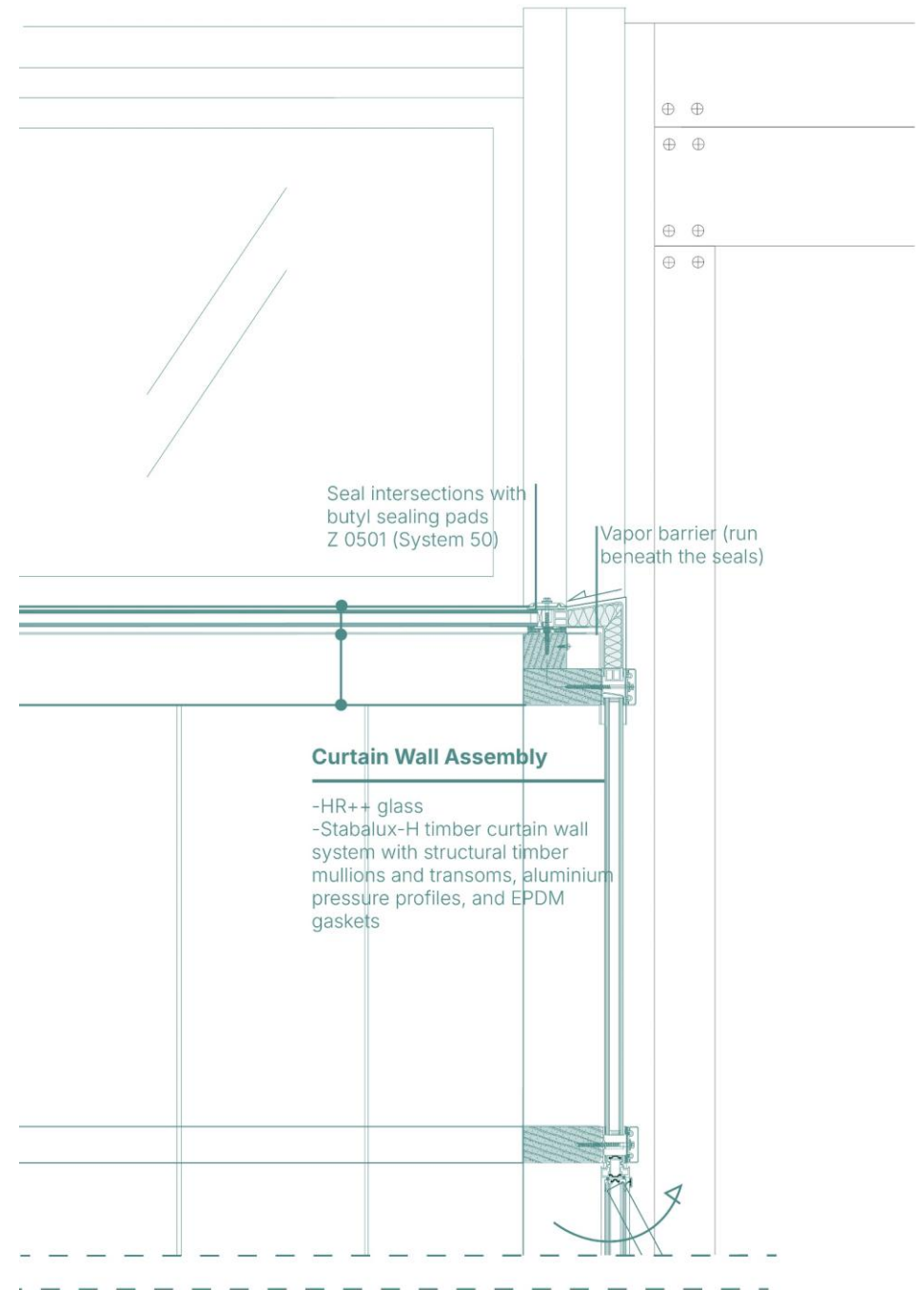
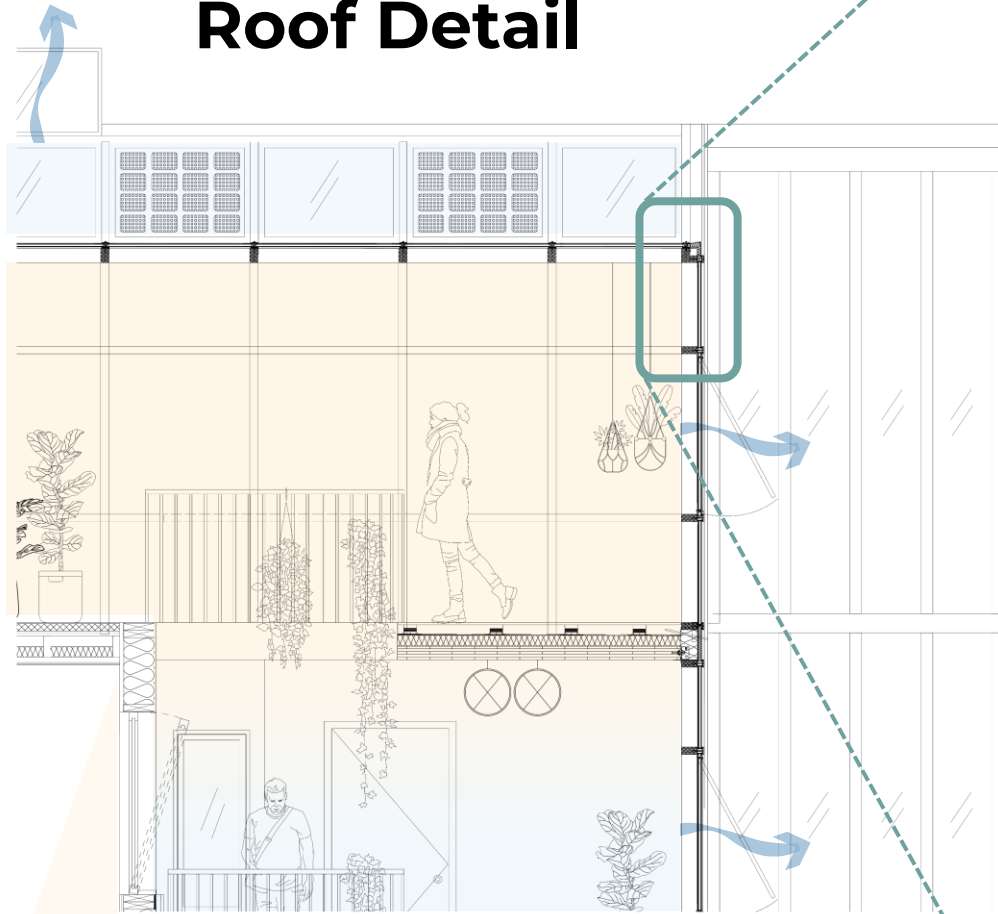
Curtain Wall Assembly

- HR++ glass
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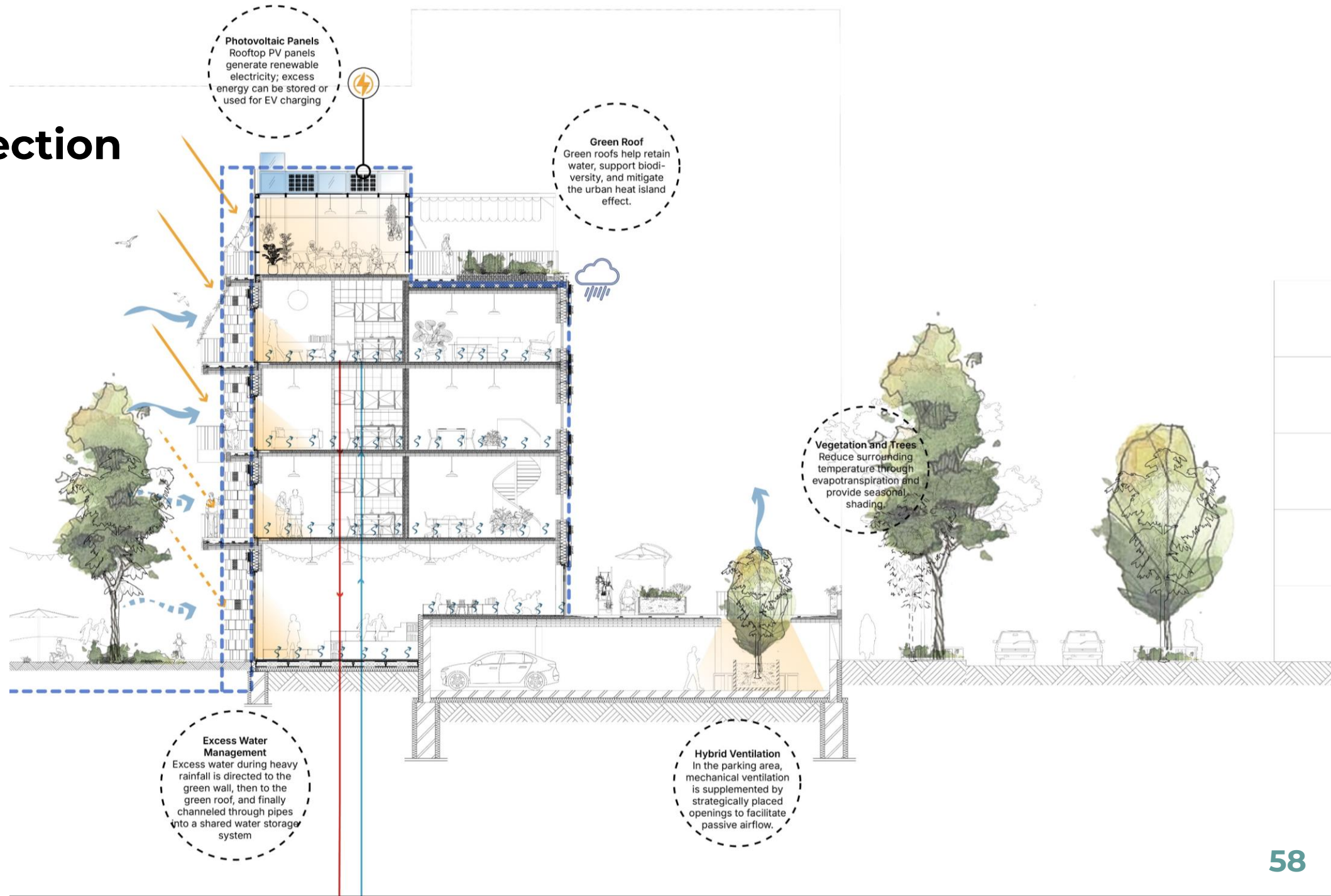
115 90 105



Roof Detail



Section



Current Situation: Material Palette



Monotony and Lack of Visual Variety



Poor Contribution to Biodiversity



Does not respond dynamically to changing climate conditions

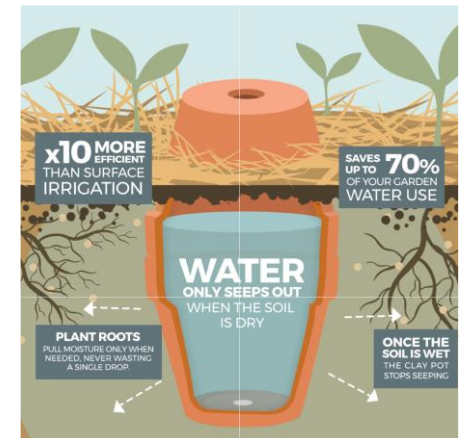
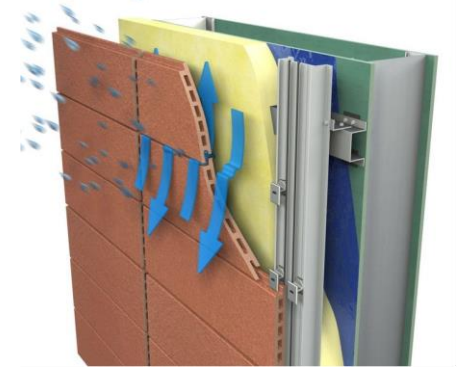
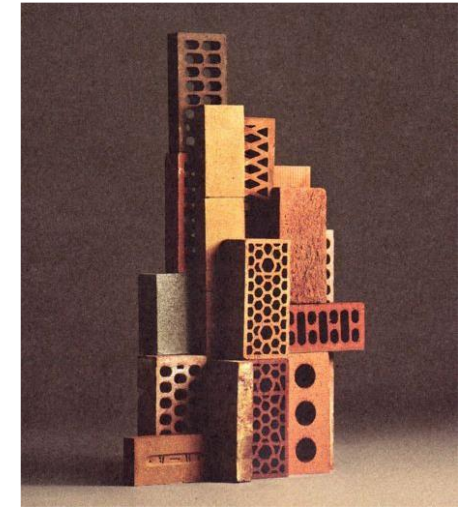
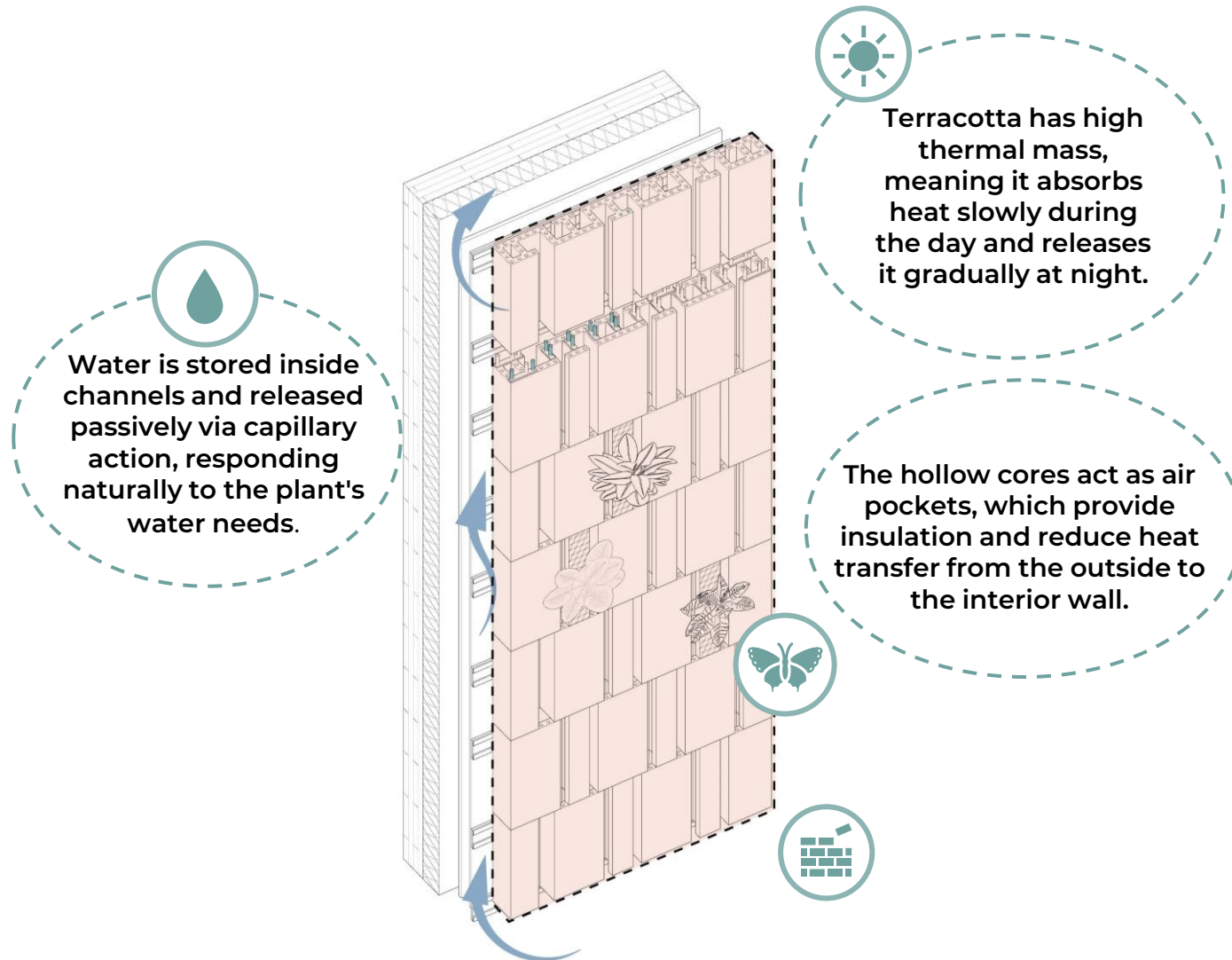


No Demountability Strategy

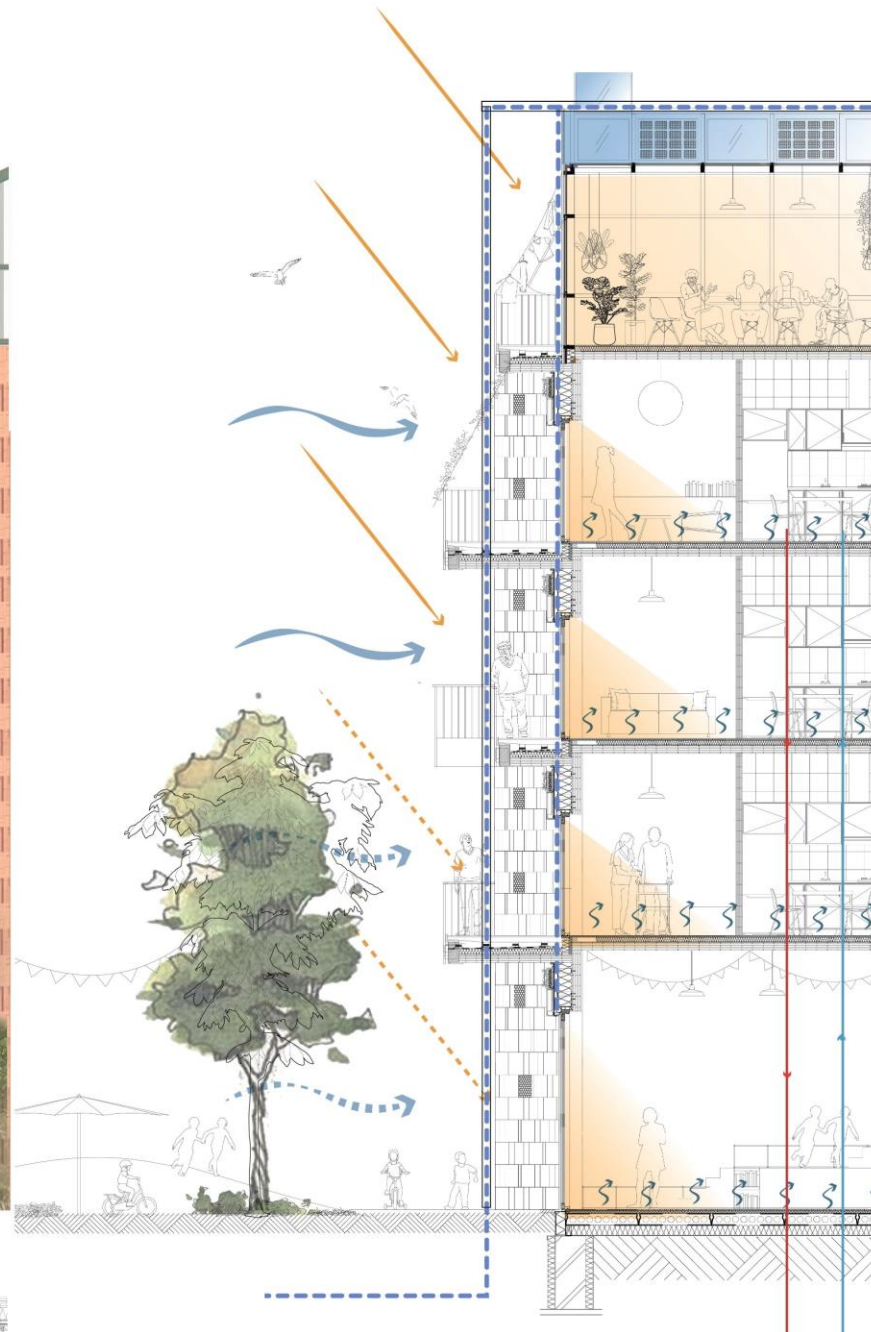
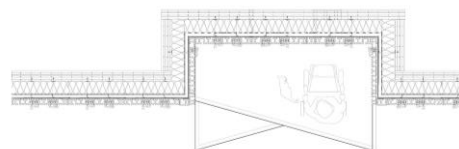


Water Management Neglected

Proposed System: Living Walls



Facade



Active Street Edges

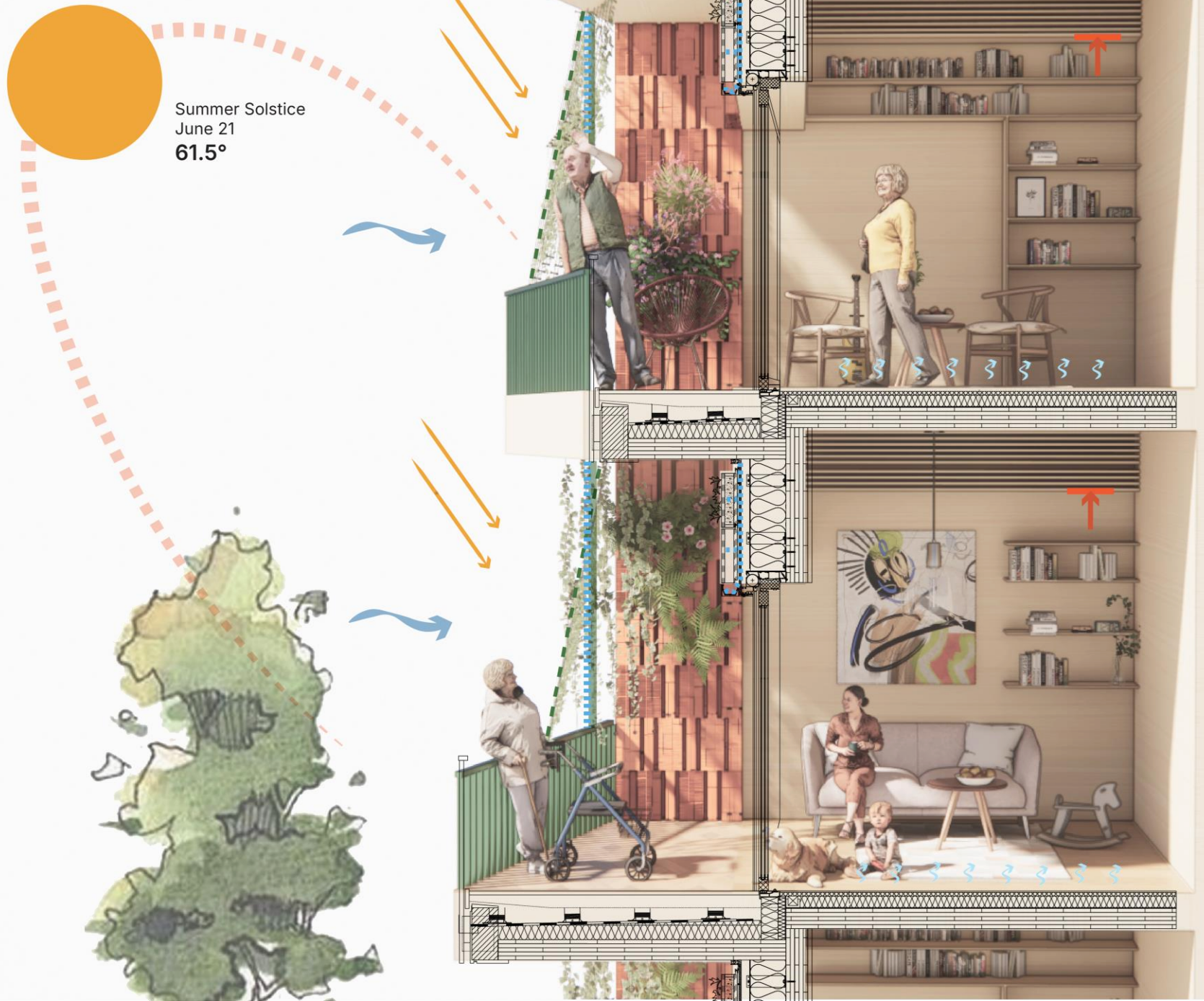


Vital Frictions via
Common Spaces &
Balconies



Indoor-Outdoor
Connectivity





Active Street
Edges



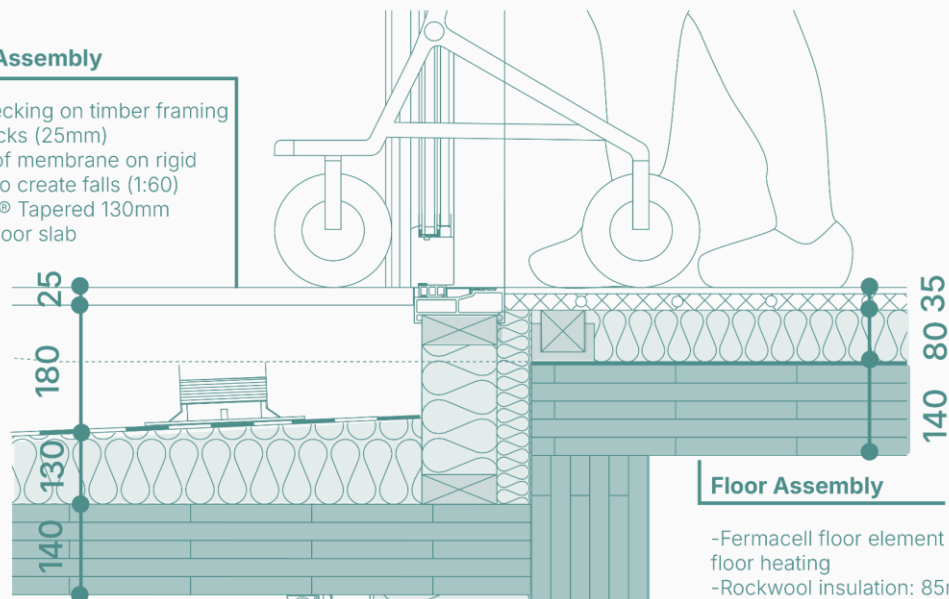
Vital Frictions via
Common Spaces &
Balconies



Indoor-Outdoor
Connectivity

Balcony Assembly

- Timber decking on timber framing on deck jacks (25mm)
- Waterproof membrane on rigid insulation to create falls (1:60)
- Foamglas® Tapered 130mm
- 140 CLT floor slab

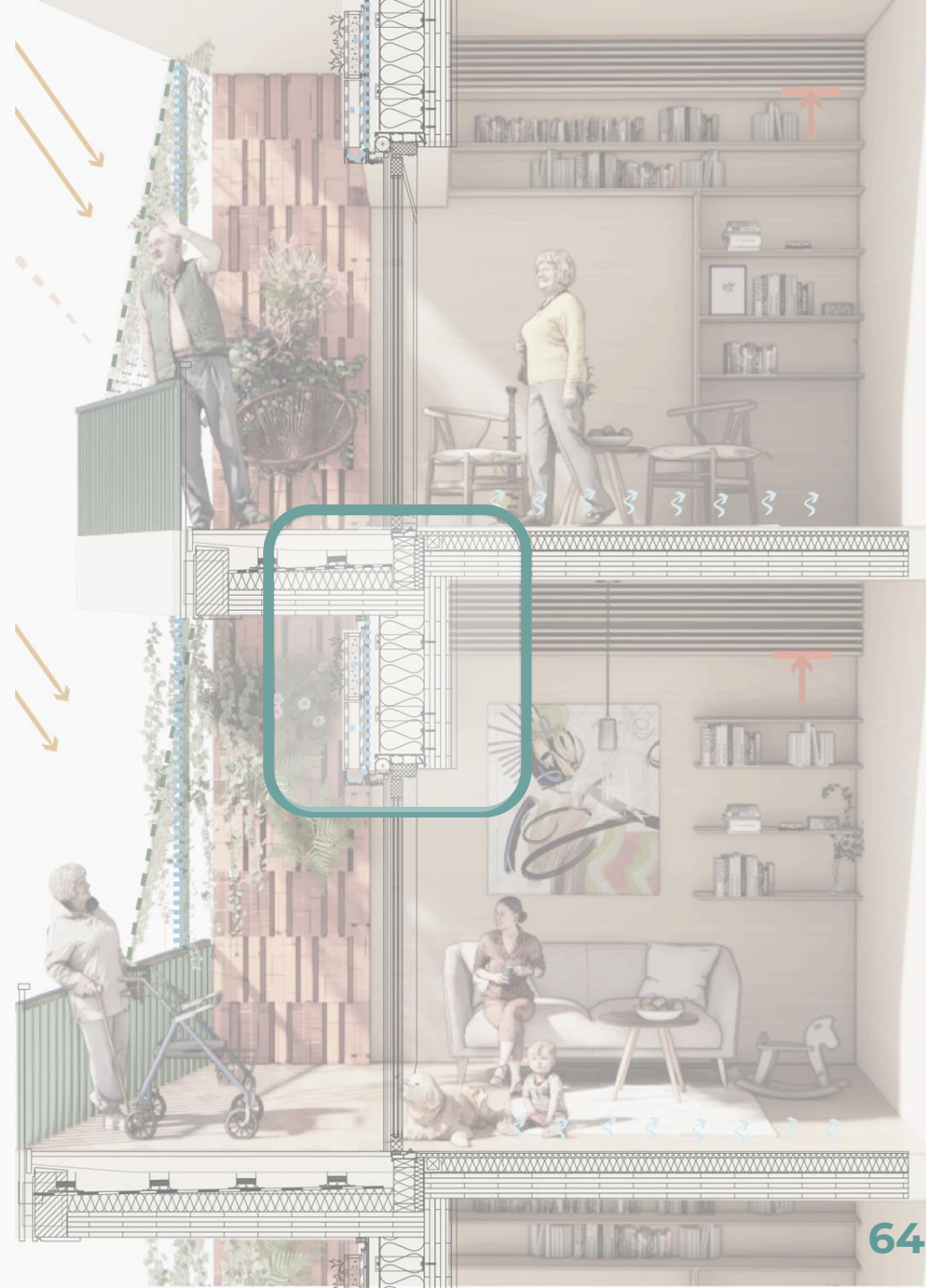
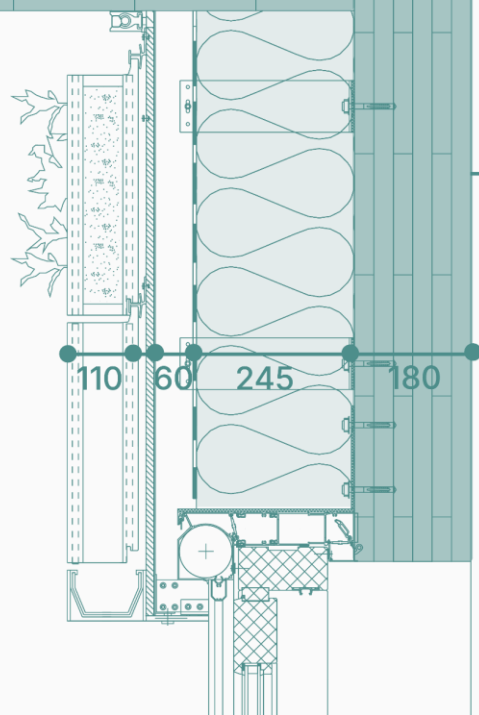


Floor Assembly

- Fermacell floor element with inbuilt floor heating
- Rockwool insulation: 85mm
- Protective layer (Rockwool FloorRock)
- CLT 140mm (Lignotrend – Ligno® Akustik Classic)

Wall Assembly

- 180 CLT wall
- Rockwool insulation: 245mm
- Waterproof backing board (12mm Versaanel Ecosheet)
- Rear drainage layer (4,5mm geotextile drainage layer)
- Thermally broken fasteners
- Aluminium rail carrier system (60mm) and dripline (18mm pressure compensated dripline)
- Terracotta elements (hollow or with growing medium for plants)



Elevations



South-West



North-East



South-East



North-West



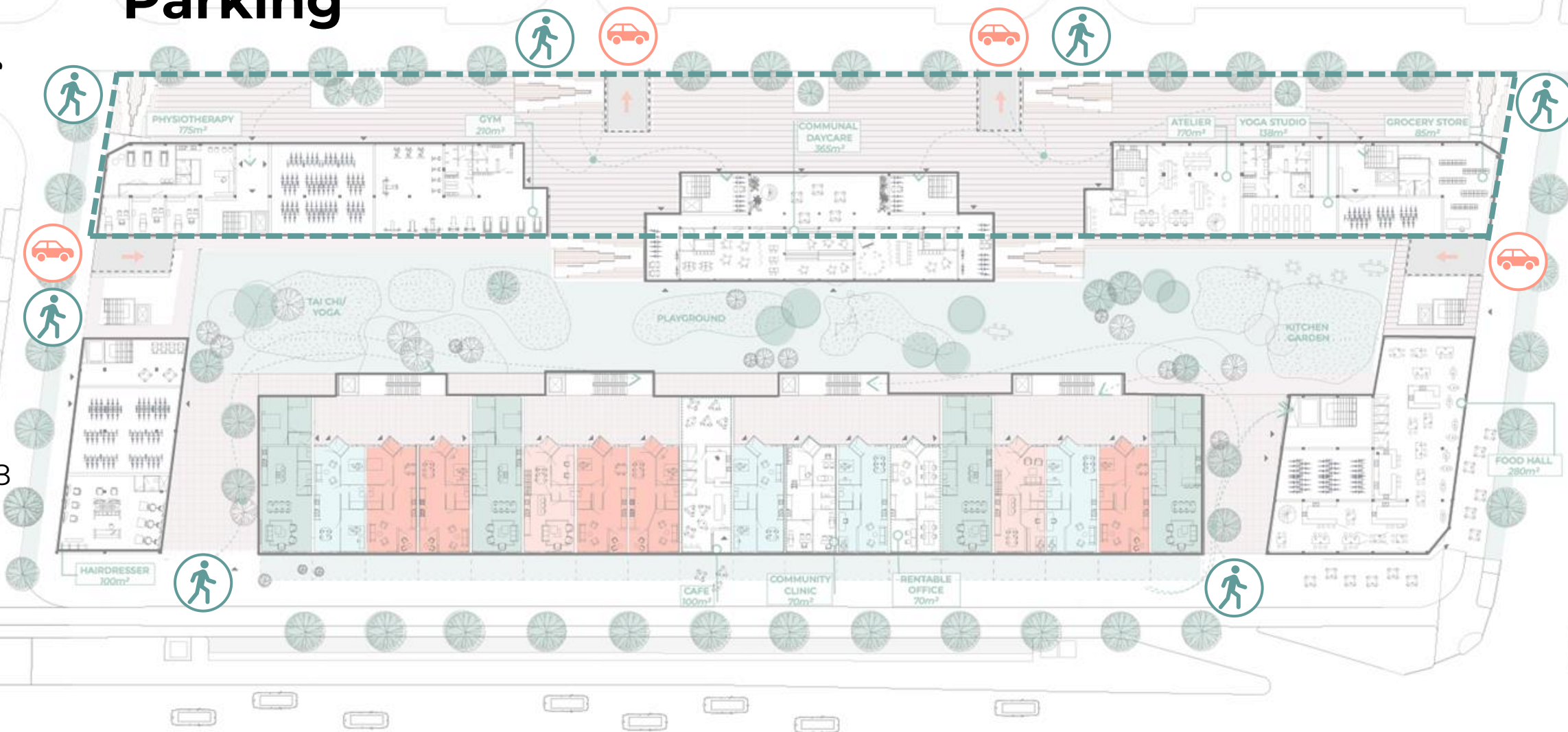
08 Extension for Care & Community



Parking

Extension for Care & Community

08



Parking

Extension for Care & Community

08



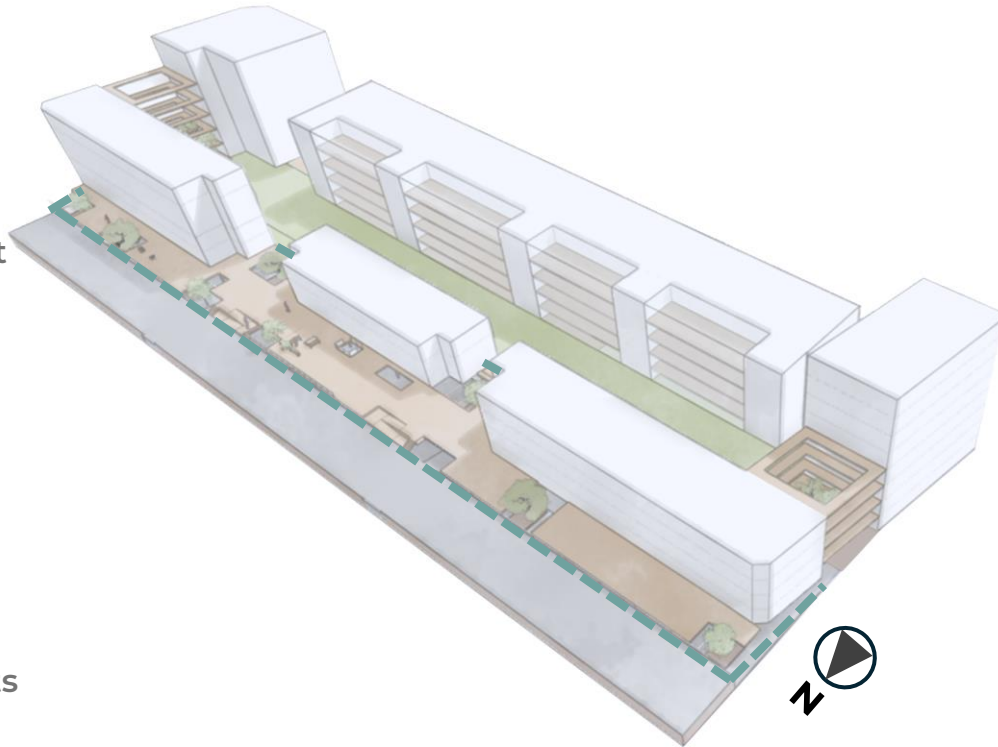
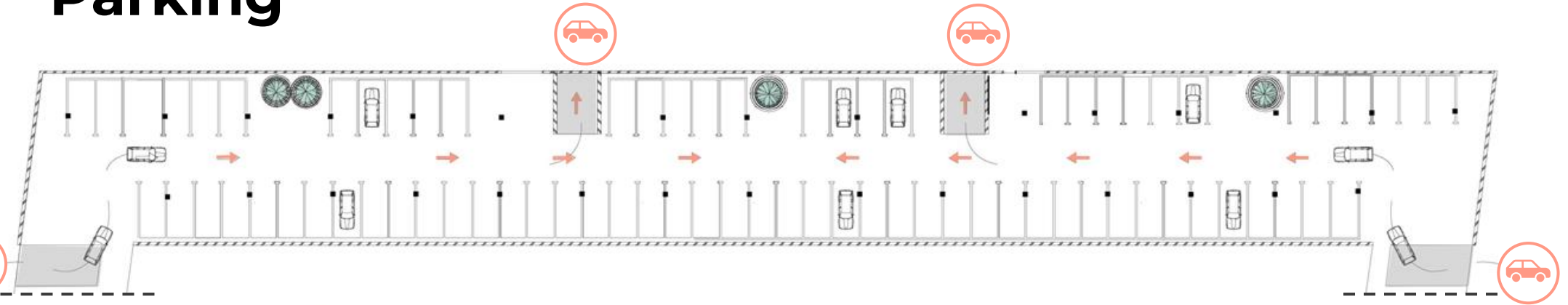
Active Street Edges



Rest Nodes



Shared Streets



Extension for Care & Community

FOODHALL



70

- 95-110m² (3BHK)
- 70-85m² (2BHK)
- 40-60m² (1-2BHK)
- 25-30m² (studio)
- circulation space

CARE SPACES

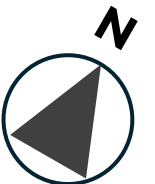
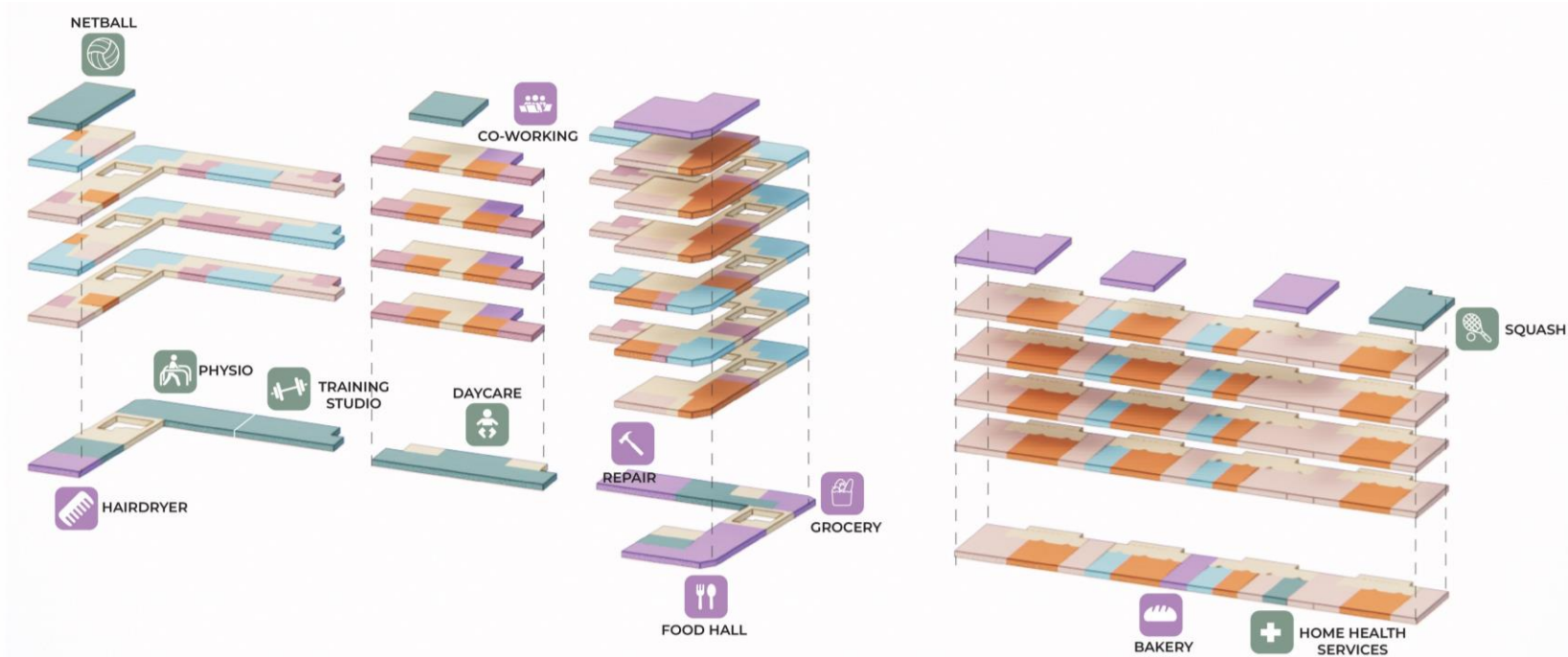
physiotherapy
training studio and
gym
dental care
family medical
practice
pharmacy

COMMUNAL SPACES

guests
common kitchen
fitness
salon
kids space
storage
laundry
sports
joker spaces

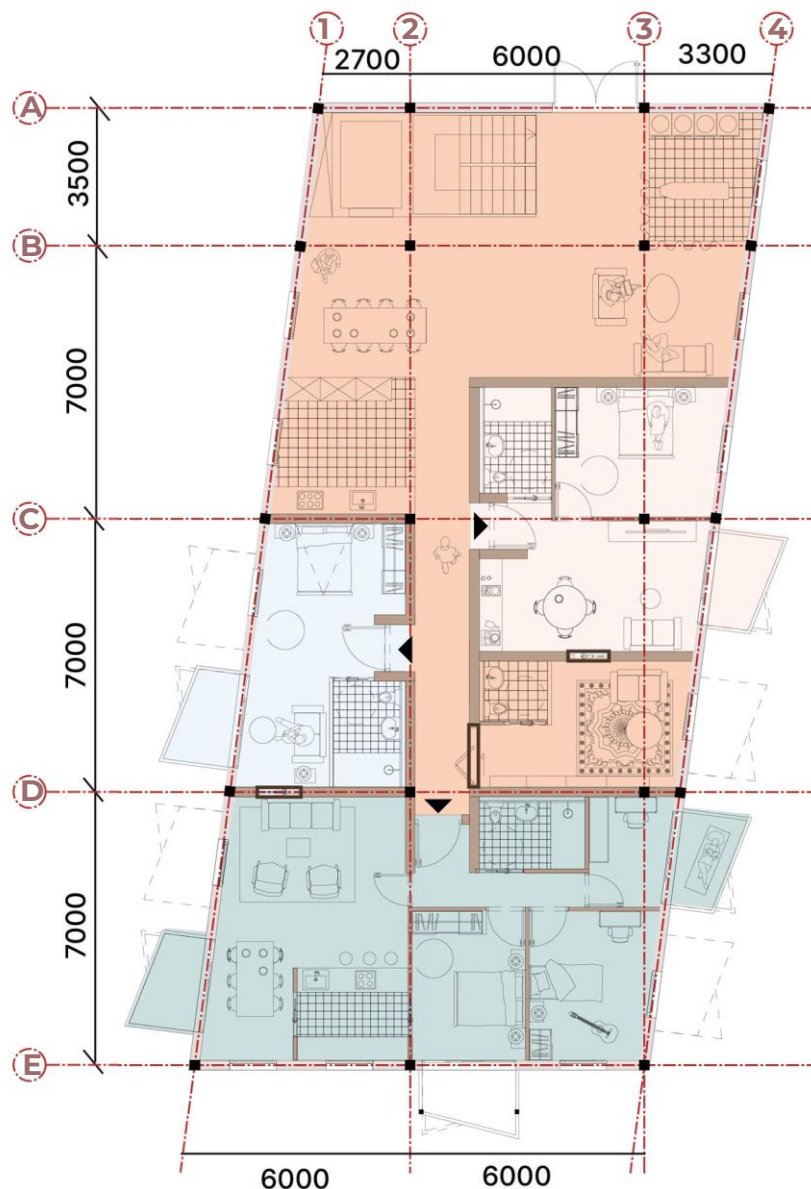
COMMERCIAL UNITS

rentable co-working spaces
atelier
maker's space
grocery store
cinema
food hall/market



25m²

A quiet, compact home for a widower seeking independence.

Common Facilities



40m²

A modest space for a couple rooted in routine and care.



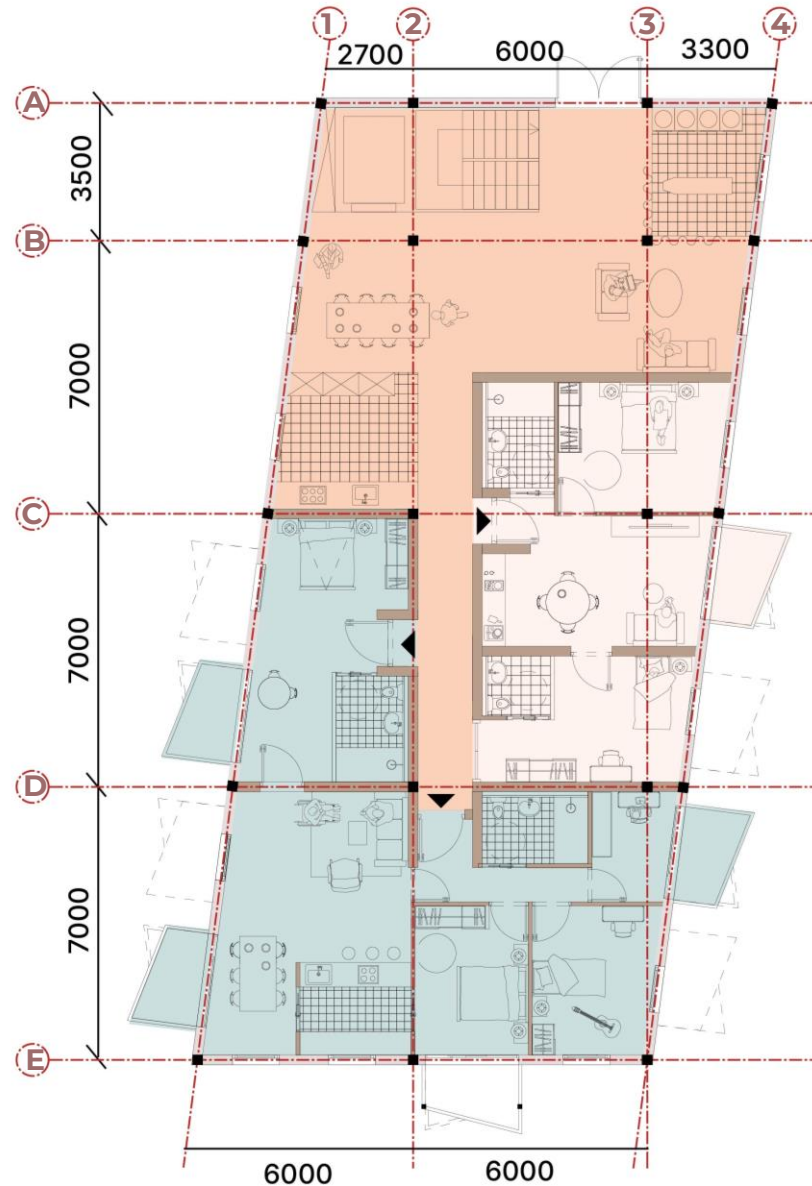
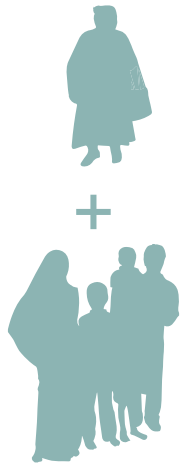
75m²

A flexible home for shared living across generations.

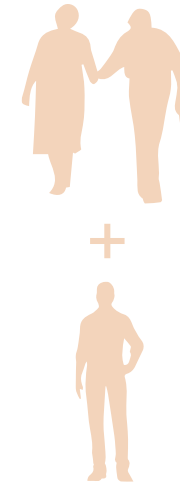



100m²

A flexible household adapts as the grandmother joins, creating space for shared care across generations.

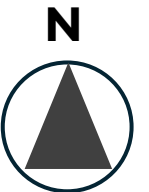


Common Facilities



56m²

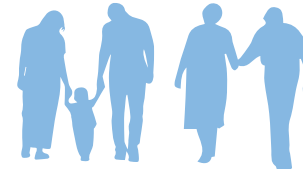
A modest home expands as their adult son moves in to offer daily care and support.





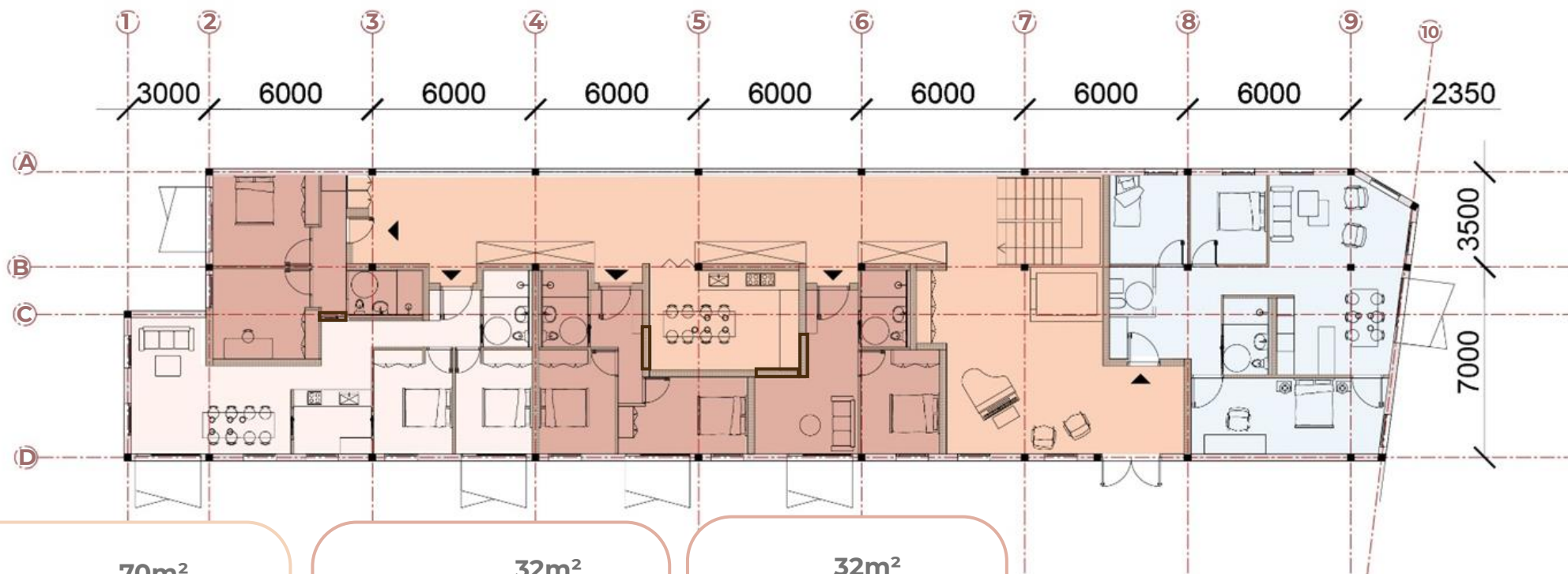
32m²

A compact, independent space for someone aging alone with comfort and autonomy.



95m²

A multi-aged household where grandparents raise a young grandchild in a calm, secure setting.



70m²

A home for a growing family balancing privacy and shared routines.



32m²

A shared starter flat for a couple and their friend; social, and close-knit.



32m²

A self-contained unit for a young professional

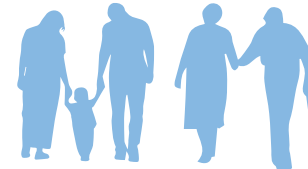
Common Facilities





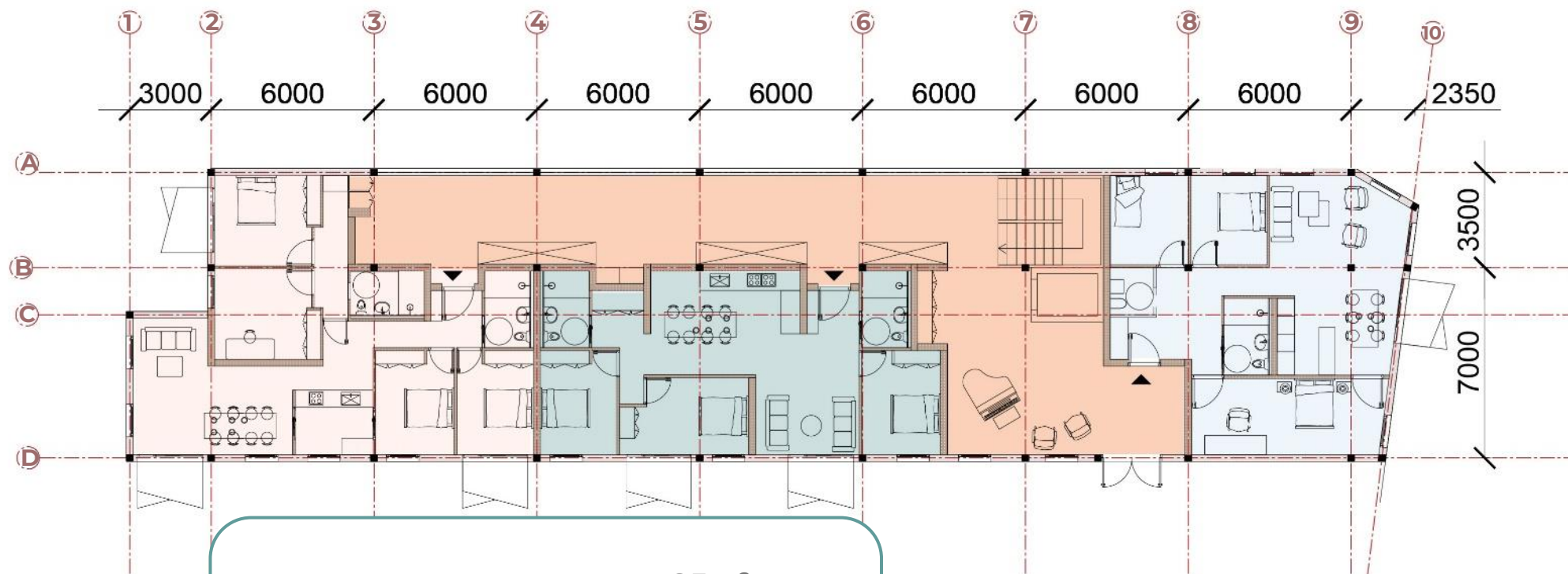
110m²

A family expands across generations, caring for elders under one roof with shared routines and traditions.



95m²

A multi-aged household where grandparents raise a young grandchild in a calm, secure setting.



95m²

A shared home for friends aging together, blending independence, mutual care, and daily activity.

Common Facilities







Neighborhood



Residential



Interior

Mobility



Shared Streets

Accessibility



Rest Nodes

Safety



Active Street Edges



Elevators &
Garden Galleries



Avoid Long
Hallways



Vital Frictions via
Common Spaces & Balconies



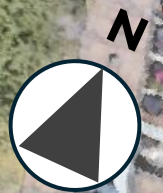
Culturally Responsive
Layouts



Indoor-Outdoor
Connectivity



Thresholds
Private & Public



Thank you!



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Active Ageing in Tarwewijk

Fostering active aging by enhancing mobility,
accessibility and safety within everyday living spaces

Table of Contents

I. Introduction

II. Research and Fieldwork

1.0 Target Group

2.0 Fieldwork at Liv Inn Hilversum

3.0 Literature Review

4.0 Haagse-Portiek Typology Assessment

5.0 Case Studies

6.0 Observations and Fieldwork at Tarwewijk

III. Conclusion, Discussion and Design Guidelines

Research 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

Author:
Shreya Sen

Tutor Architecture:
Kobe Macco

Tutor Research:
Leo Oorschot

I. Introduction

1.0 Problem Definition

Abstract

Architectural and urban design that does not prioritize active aging, accessibility, and safety can result in environments that are difficult to navigate and socially isolating for vulnerable populations, particularly the elderly. When housing typologies and public spaces fail to consider these principles, residents experience restricted interaction with their surroundings, which limits their social engagement and autonomy as they age. The Active Ageing framework, defined by the World Health Organization (2002), encourages older adults to remain physically, socially, and mentally active, plays a critical role in preserving quality of life. By fostering opportunities for active aging, communities can support older adults' physical health, reduce social isolation, and improve mental well-being, while also decreasing healthcare costs associated with age-related conditions.

Tarwewijk, a neighborhood in Rotterdam's Charlois district, is shaped by urban design that prioritizes cars over pedestrians, resulting in an environment that is not only inaccessible but also socially isolating for vulnerable groups like the elderly. Public spaces, poorly maintained and cluttered with unmanaged trash, lack essential amenities like benches, making them difficult to navigate. The neglect of these spaces not only generates physical barriers but also reinforces a sense of insecurity, as illustrated by the broken windows theory. This theory, supported by research from the city districts of Rotterdam, suggests that visible neglect is closely linked to higher crime rates (Meinen, 2014), such as the 29.85 theft-related crimes per 1,000 residents recorded in Tarwewijk in 2023 (AlleCijfers.nl, 2023).

Tarwewijk's aging housing stock further intensifies the difficulties faced by elderly residents, as it is not well-suited to meet their needs.. Combined with the insecurity fostered by poorly maintained public spaces, this creates an environment where elderly and vulnerable



A cluttered sidewalk in Tarwewijk where parked bicycles, and nearby cars obstruct pedestrian access, highlighting a conflict of functions that compromises mobility and accessibility (own image)

residents are less likely to remain active or engaged with their surroundings, leading to increased social isolation and a decreased quality of life.

Public Spaces, Crime, and Social Isolation

Historically, Tarwewijk has faced various crime waves, particularly after the closure of Perron Nul in 1994, which led to an influx of drug-related activity into Rotterdam-Zuid, including the Millinxbuurt (Fassen, 2023). Crime rates in the area peaked in the late 1990s, prompting large-scale police interventions and subsequent urban renewal efforts. From 1998 to 2003, the renovation of Millinxbuurt demonstrated the effectiveness of public space improvements in reducing crime and fostering community cohesion (Fassen, 2023).

Research supports the notion that well-designed public areas—such as parks, playgrounds, and other communal spaces—can help mitigate the social isolation caused by neglected environments, thereby reducing crime rates (Meinen, 2014). This is evident in earlier initiatives like the establishment of the Millinx playground and the Tarwewijk Playground Association, which historically played essential roles in fostering community engagement, particularly among children (Fassen, 2023). However, as maintenance of these spaces declined, so did their ability to serve as safe, communal environments. By improving the design and upkeep of public spaces, their original purpose can be restored, fostering social interaction and enhancing safety.



"Haagse portiek" typical of Tarwewijk's aging building stock (own image)

The Aging Housing Stock

Tarwewijk's aging housing stock, particularly the "Haagse portiek" style homes, presents significant challenges for elderly residents. These buildings, with their steep staircases and lack of elevators, severely limit accessibility for individuals with mobility issues, making it difficult for them to stay active and independent. As a result, many elderly residents are confined to their homes, which reduces their autonomy and heightens social isolation. A report from the City of Rotterdam notes that over 110,000 homes were built before 1945, many located in areas like Tarwewijk (Gemeente Rotterdam, 2019). Research by RIGO Research en Advies (2017) highlights how these outdated housing designs create substantial accessibility barriers, discouraging active aging and contributing to both physical and social isolation.

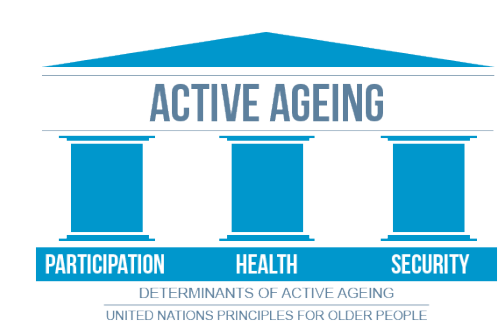
The absence of modern accessibility features, such as elevators or ground-floor living options, prevents elderly residents from maintaining their independence and engaging with their community. This outdated housing stock fails to accommodate the essential needs for mobility, safety, and independence, all crucial for active aging, leading to a lower quality of life for elderly residents (CBS, 2020). Without intervention, these issues will persist, further isolating vulnerable populations.

Broader Implications for Health and Care

illnesses, such as cardiovascular disease and mental health disorders, which are common among isolated elderly populations (CBS, 2020). Fostering active aging can reduce healthcare costs, as it encourages elderly residents to remain physically active and engaged within their communities. Without interventions like housing retrofitting to respond to the needs of the inhabitants or the creation of mixed-use ground-floor residences, such challenges will persist, leaving vulnerable residents further isolated and increasing their risk for health-related complications (CBS, 2020).

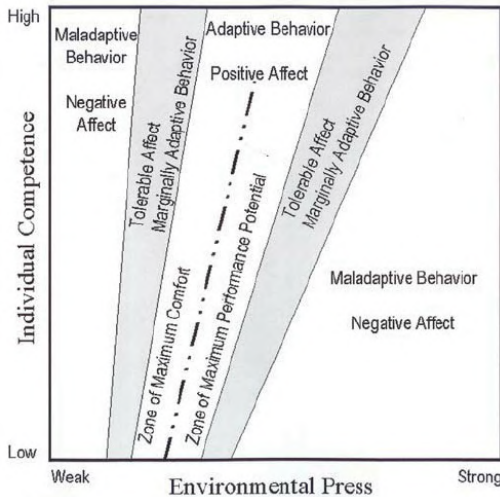
The challenges faced by Tarwewijk stem from both urban neglect and aging infrastructure, which limit mobility, accessibility, and safety for vulnerable populations. By addressing these issues through comprehensive architectural interventions and urban planning that prioritizes accessibility, safety, and community engagement, Tarwewijk can become a more inclusive neighborhood that promotes active aging, social cohesion, and improved health outcomes.

1.1 Theoretical Frameworks



Three pillars of the Active Ageing Framework (World Health Organization, 2002)

World Health Organization's Active Ageing Framework
According to the World Health Organization's Active Ageing Framework (2002), active aging is the process of enhancing health, participation, and security to improve the quality of life for older adults. This framework stresses the importance of environments that encourage physical activity, social engagement, mental stimulation, and security to help ageing adults maintain autonomy and societal involvement. As people age, their relationship with the built environment becomes increasingly influential in determining their quality of life, highlighting the impact of well-designed urban spaces and housing on active aging.



Ecological Model of Ageing (Lawton and Nahemow, 1973)

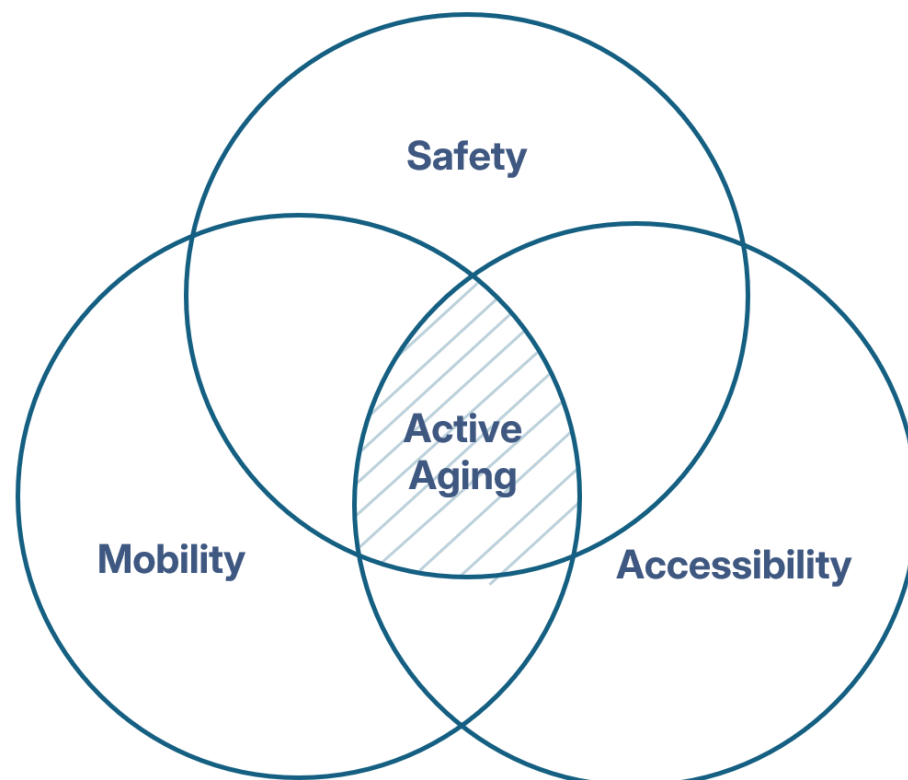
Ecological Model of Ageing
Lawton and Nahemow's Ecological Theory of Ageing (1973) explores how interactions between individuals and their environments affect aging, focusing on balancing an individual's abilities with environmental demands. As physical and cognitive abilities decline naturally with age, inadequately designed environments, for instance such as those with steep stairs or narrow pathways, can reduce autonomy and mobility. When environments do not adapt to the changing needs of older adults, it can result in decreased ability to carry out daily tasks, increased social isolation, and a decline in overall quality of life.

Mobility Justice Framework
Developed by sociologist Mimi Sheller, the Mobility Justice framework expands the conversation around mobility beyond the simple ability to move from place to place. It critiques traditional approaches to transport and urban planning that fail to account for the social and political dimensions of mobility, particularly how access to mobility is distributed unequally across different social groups based on gender, socioeconomic status, and geography (Sheller, 2018). The framework situates mobility justice within broader global crises, such as urbanization, climate change, and automobility. Sheller identifies how rapid urban growth, car dependency, and resource exploitation exacerbate systemic dysfunctions, including environmental degradation, social exclusion, and uneven accessibility. Her approach calls for rethinking urban planning and infrastructure to prioritize inclusivity, sustainability, and equity. This includes advocating for accessible public spaces, universal design, and alternative mobility practices that challenge car dependency and promote collective, sustainable transportation.

1.2 Design Hypothesis

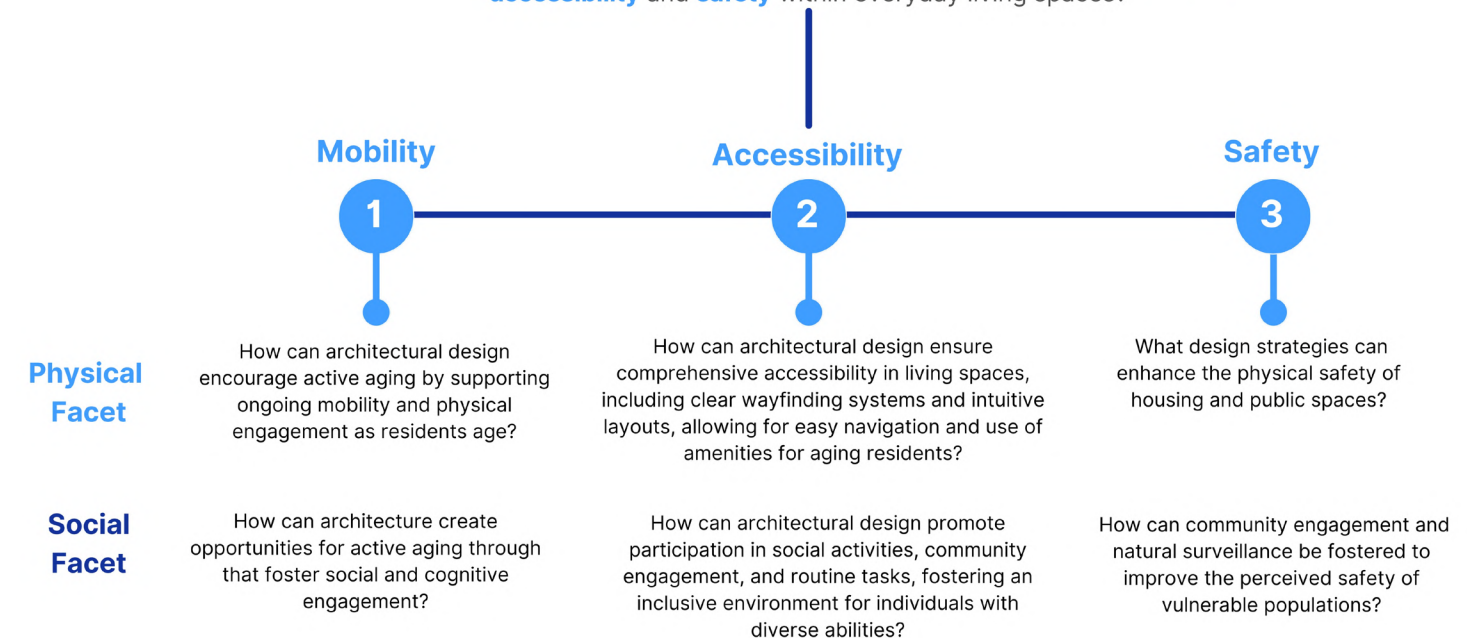
The built environment in Tarwewijk, including housing and public areas, is currently insufficient in addressing the needs of its ageing population. The aging housing stock severely limits the mobility and independence of elderly residents. Poorly maintained public spaces further contribute to social isolation and restricted movement, creating an environment that discourages engagement with the community.

By adapting both housing and public infrastructure to prioritize mobility, accessibility, and safety the urban fabric of Tarwewijk can foster an environment where older adults can actively age, remain autonomous, and engage fully in their community.



1.3 Problem Definition

How can architectural design foster **active aging** by enhancing **mobility**, **accessibility** and **safety** within everyday living spaces?



The main research question addresses how architectural design can foster active aging by enhancing mobility, accessibility, and safety within everyday living spaces. This question explores how environments can be designed to support older adults in maintaining independence, participation, and well-being as they age.

Key Definitions:

Active Aging: The process of optimizing opportunities for health, participation, and security to enhance the quality of life as people age, allowing them to stay physically, socially, and cognitively engaged.

Accessibility: The definition of accessibility is not limited to barrier-free design or compliance standards, rather, it includes the extent to which spaces can be used, adapted, and made accessible to individual and cultural needs. For instance, with layouts responsive to the target group, spatial flexibility, and the ability to age in place through adaptable housing typologies.

Safety: Safety is approached holistically as a combination of physical, psychological, and cultural security. It involves lighting, visibility, and

secure entrances, but also includes the ability to control privacy, avoid social exposure, and feel emotionally comfortable within shared or public space. Perceived safety is as critical as physical safety, especially for older residents in multicultural neighborhoods.

Mobility: Mobility includes physical infrastructure (e.g. walkways, elevators), but also factors like visibility, rest points, and social navigation. Drawing on Sheller’s (2020) concept of mobility justice, mobility here includes the right to move safely, meaningfully, and without fear through one’s neighborhood.

Physical Facet: Physical facet concerns the body’s interaction with the environment, with an emphasis on mobility, ergonomics, and the ease of navigating spaces.

Social Facet: Social facet refers to design focused on fostering interpersonal interactions, community participation, and social inclusion, ensuring that spaces support emotional and cognitive engagement.

Target Group: The primary focus will be on vulnerable groups, specifically the elderly (age group: 65+). These groups often experience the most significant challenges related to mobility, accessibility, and safety in car-dominated or poorly maintained spaces.

1.4 Research Methodology

This research will employ a comprehensive qualitative research methodology to investigate how architectural design fosters active aging by enhancing mobility, autonomy, and social interaction in everyday living spaces. This is structured around three core components: fieldwork, case studies, and literature research, with additional focus on mapping and spatial analysis to assess the current state of the built environment in Tarwewijk.

Fieldwork
Fieldwork will focus on in-depth, qualitative observations of how elderly residents engage with the built environment in Tarwewijk. This will involve several key activities:



1/ Quantitative Research

- Step 1:**
Collect existing data on age, health and safety indicators, and household types from public sources such as CBS (Statistics Netherlands), and housing reports.
- Step 2:**
Analyze above data to identify key patterns in relation to aging, mobility limitations, and socio-cultural aspects in Tarwewijk.
- Step 3:**
Use this analysis to inform site selection, highlight relevant user groups, and ground subsequent qualitative and mapping research in a data-driven understanding of site conditions.

2/ Interviews

- Step 1:**
Identify key resident groups in Tarwewijk based on demographics, with a focus on older adults above the age of 65.
- Step 2:**
Prepare a semi-structured interview addressing themes such as daily routines, walking routes, mobility challenges, housing satisfaction, cultural spatial needs, and informal care networks.
- Step 3:**
Carry out interviews in urban spaces or near participants’ homes to ground their responses in spatial experience. Supplement interviews with walking observations to better understand mobility barriers and neighborhood use.
- Step 4:**
Record (with consent), take notes, and transcribe key insights. Organize findings thematically for integration with spatial analysis.

3/ Observations

- Step 1:**
Identify 5–7 public spaces in Tarwewijk frequently occupied by older adults.
- Step 2:**
Develop a standardized checklist for observation (e.g., movement flow, areas of frequent interaction, seating, obstacles etc.).
- Step 3:**
Conduct observations during peak and off-peak hours over several weekdays and weekends.

- Step 4:**
Record findings using annotated sketches and field notes.
- Step 5:**
Analyze how design elements affect elderly users’ independence, safety, and comfort.

3. Mapping and Spatial Analysis

- Step 1:**
Identify accessibility, safety, and social interaction as the main spatial factors affecting active aging in Tarwewijk.
- Step 2:**
Visit the neighborhood to document conditions through photos, sketch maps, and notes—focusing on walkability, safety cues, and how public spaces are used by older residents.
- Step 3:**
Use insights from interviews and publicly available data (e.g. crime stats) to map perceptions of safety, mobility barriers, and underused spaces.
- Step 4:**
Compare observations and feedback to identify gaps and opportunities (cluttered walkways, too many cars, inactive public spaces, or missing connections) and use these to inform design priorities.

4. Ethnographic Research

- Step 1:**
Choose a residential complex targetted towards elderly (Liv Inn in this case, for its relevance as a co-living model centered around active aging and community living).
- Step 2:**
Spend time in communal areas to observe everyday routines of elderly residents. Visit with permission the apartments of residents to observe spatial use.
- Step 3:**
Join residents in casual contexts like weekly meals, craft sessions, and garden work. Use informal conversations to understand how residents perceive autonomy, care, and community.
- Step 4:**
Capture observations through field notes, sketching, and photography. Pay special attention to how space enables or limits movement, privacy, and communal participation.

Case Studies

The case studies consulted include “Een Blok Stad,” “Klussen aan de Klarenstraat,” and “Transformation of 530 Dwellings.” They all focus on the transformation of various housing typologies to meet contemporary needs. While these projects do not specifically address Haagse-portiek dwellings, they offer essential insights into design strategies that improve accessibility, adaptability, and community integration. These examples highlight approaches for reconfiguring older housing stock to better serve modern needs and promote active ageing.

The Kalkbreite Complex in Zürich adds another perspective by showcasing hybrid functions and campus-style living, integrating multi-use spaces.

Literature Review

This study will consult several sources of literature to explore how architectural design can promote active aging.

First, the World Health Organization’s Active Ageing Policy (2002) will be used to examine how environments can optimize opportunities for health, participation, and security for older adults.

Additionally, Lawton and Nahemow’s Ecological Theory of Ageing (1973) will be referenced to understand how the interaction between individuals and their environments influences their aging process, with an emphasis on the need to adapt spaces to meet changing physical and cognitive abilities.

Finally, the study will draw on Mimi Sheller’s work on Mobility Justice (2018), which critiques traditional transport planning by addressing the unequal distribution of mobility resources across different social groups. This literature will be used to explore how access to mobility, particularly for older adults, can be made more equitable by addressing social, economic, and physical barriers through design.

Key Words

1. Ageing and Wellbeing:

Active Ageing, Ageing in Place, Vital Frictions, Social Isolation, Autonomy, Informal Care Networks, Health and Wellbeing, Psychological Safety

2. Design and Architecture

Culturally Responsive Design, Universal Design, Inclusive Housing, Flexible Floorplans, Layered Privacy, Adaptable Interiors, Barrier-Free Design, Dual-Zone Living Spaces, Personalizable Thresholds, Transition Zones, Shared Courtyards

3. Spatial and Social Infrastructure

Built Social Infrastructure, Social Networks of People, Shared Spaces, Communal, Eyes on the Street, Community Cohesion

4. Mobility and Accessibility

Mobility Justice, Accessible Pathways, Circulation Spaces, Wayfinding, Vertical Accessibility (Elevators, Stairwells), Resting Spots, Sidewalk Obstructions, Visual and Physical Connectivity

5. Cultural Context and Ethnography

Gendered Spatial Norms, Enclosed vs Open Kitchens, Diaspora Housing Preferences, Multi-Ethnic Households, Cultural Adaptability

6. Policy and Frameworks

WHO Active Ageing Framework, Lawton’s Ecological Model of Aging, Mobility Justice (Sheller, 2020), Campus Model for Continuum of Care, Design for Social Inclusion

1.5

Scope of Study & Ethical Considerations

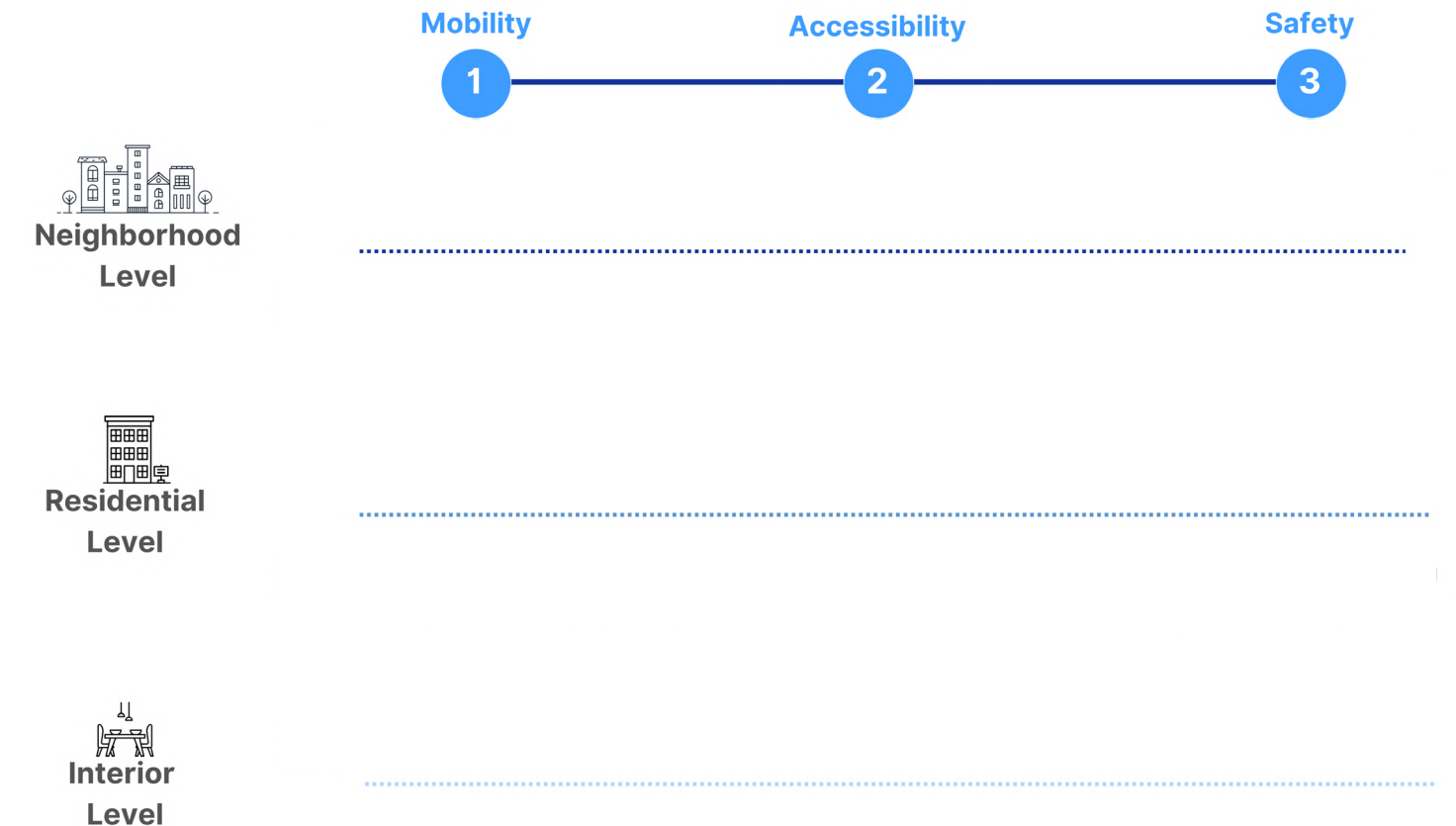
This study will adopt a multi-scalar approach to assess mobility, accessibility, and safety within the built environment, focusing on the needs of aging adults (65+) and their extended care networks (formal/informal). This segment including both healthy and less-mobile individuals. This study recognizes the diverse physical capabilities and domestic needs, and how built environments can support active lifestyles across a spectrum of health conditions and cultural needs. Key areas of investigation will include the interiors of housing units within the “Haagse-portiek” typology - analyzing the opportunities and limitations, organization of residential blocks, and broader neighborhood contexts, with particular attention to transitions between spaces, such as movement from housing to street level.

The output of this research will take the form of comprehensive **design guidelines** for developing spaces that enable active-ageing. These guidelines will be organized according to different scales of the built environment, at the interior, building, and neighborhood levels, and will prioritize design elements that support accessibility and promote active aging.

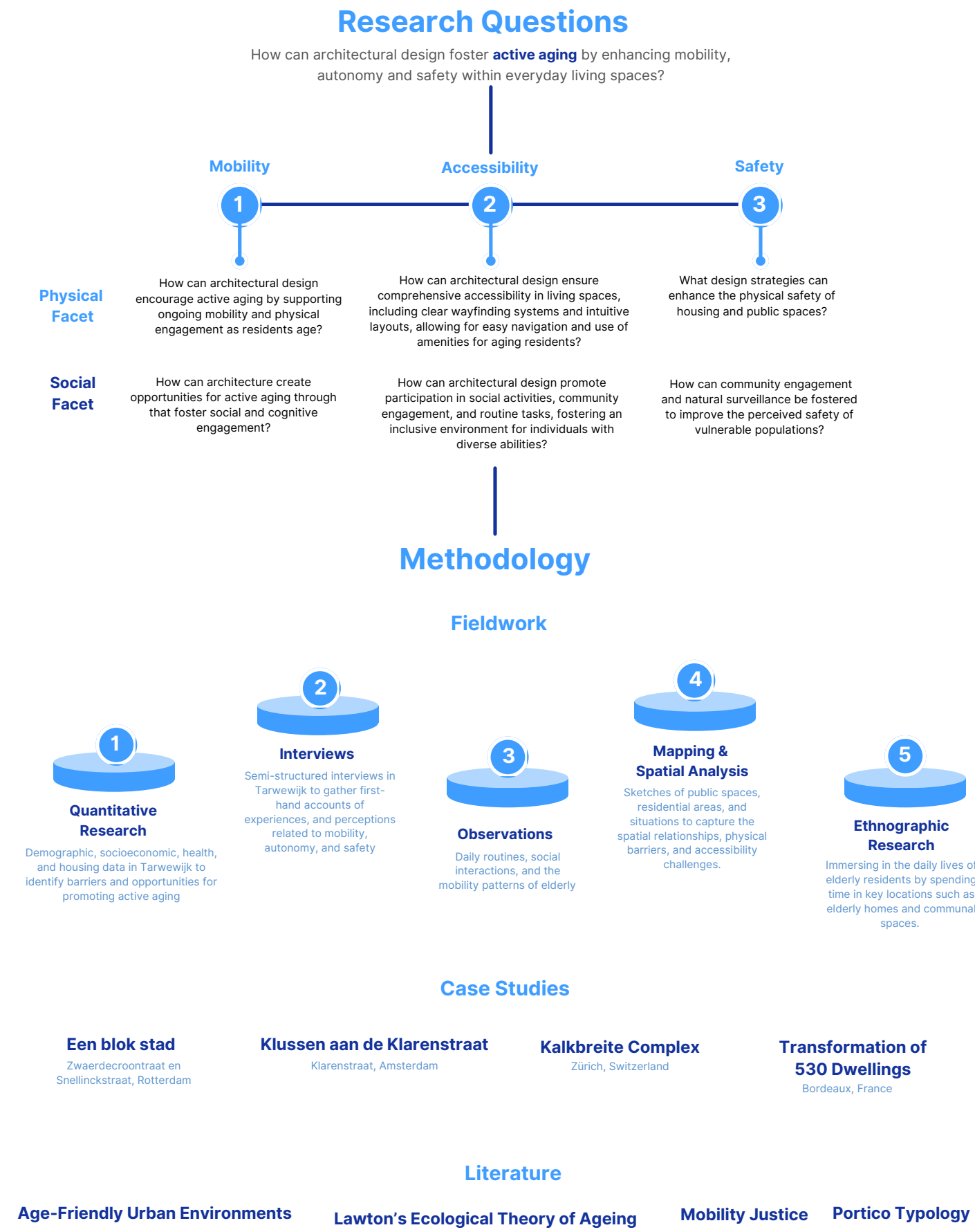
Ethical considerations will play a central role in this study, particularly due to the involvement of vulnerable groups like older adults. Fieldwork, including ethnographic research and interviews, will adhere to strict ethical guidelines to ensure the privacy of participants. The subjective nature of qualitative research requires careful consideration of informed consent, and steps will be taken to ensure anonymization of personal data to protect participants’ identities.

By focusing on the unique challenges older adults face such as physical limitations and social vulnerabilities the research outcomes will aim to prioritize well-being and amplify the voices of aging adults, ensuring that the resulting guidelines reflect their diverse needs and preferences.

Preliminary Structure for Design Guidelines



Research Scheme



II. Research & Fieldwork

1.0 Target Group

1.0 Demographic Trends in Tarwewijk

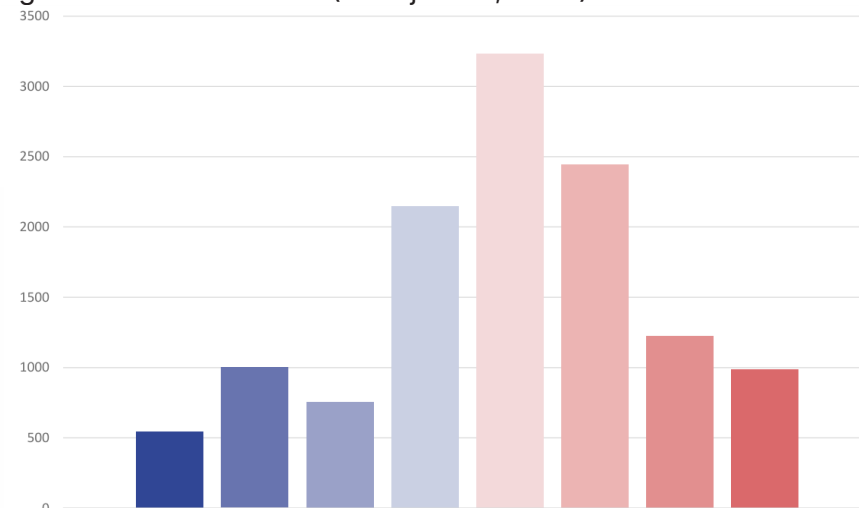
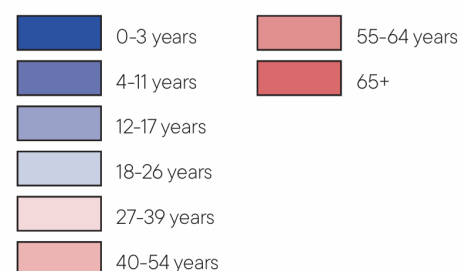
Active ageing in Tarwewijk requires a deeper understanding of the neighborhood's demographic trends. With a predominantly young, ethnically diverse population, many residents have a migrant worker background and often lack a strong connection to the area -- reducing the likelihood of ageing in place. The lack of diverse housing options contributes to social disconnect and a high turnover of residents. Women and individuals from lower-income households are disproportionately affected by inactivity as they age, compounded by limited activities and opportunities within the built environment. By addressing these current gaps and fostering active ageing among the elderly, the neighborhood can be better prepared for a future when its demographics shift toward an older population.

Age

As of 2024, residents aged 65 and above currently constitute **8%** of Tarwewijk's population, with only 986 individuals in this age group (Allecijfers.nl, 2024). Despite their relatively small numbers, this demographic is a critical focus group for public health interventions due to the benefits of physical activity in managing chronic conditions and maintaining quality of life. Tarwewijk's population skews younger, with a significant proportion (**43% of residents**) aged between 18 and 39 (Allecijfers.nl, 2024).

AR3AD110 Dwelling Graduation Studio. (2024). Age distribution in Tarwewijk in 2024. Adapted from AlleCijfers.nl, Buurt Tarwewijk, 2024.

LEGEND



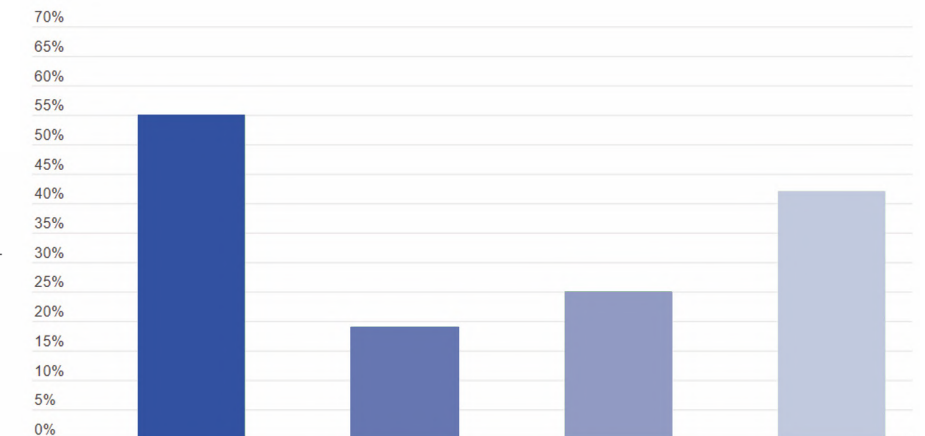
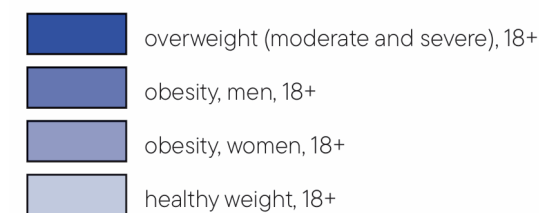
intergenerational activities, where younger residents can support and This offers opportunities for community-led programs to promote motivate older adults to stay active.

Health and Chronic Conditions

The neighborhood data highlight a high prevalence of obesity and moderate psychological problems (Jive, 2022). Physical inactivity in older adults is closely linked to social inequalities, particularly among women, those with lower educational qualifications, and individuals from low-income households. Women in Tarwewijk are more affected by obesity than men. Nearly a third of the population experiences moderate psychological challenges, underlining the importance of social and physical activities for mental health benefits.

AR3AD110 Dwelling Graduation Studio. (2024). Obesity Compared Across Gender in Tarwewijk in 2024. Adapted from Jive - Volwassen - Charlois (2022).

LEGEND



Economic and Social Barriers to Physical Activity

The socioeconomic characteristics of Tarwewijk suggest barriers to physical activity that align with broader trends. With 78% of housing rented and only 22% owner-occupied, the transient nature of rental populations (Allecijfers.nl, 2024) - a primary segment composed of migrant workers- may impact the establishment of long-term community-based fitness and volunteer programs promoting social and physical activity. Additionally, the average disposable income in Tarwewijk is €30,000 per year, significantly lower than the Rotterdam average of €42,800 (Allecijfers.nl, 2024). Lower incomes are associated with reduced access to recreational facilities and sports programs, further compounding inactivity among older adults.

Tarwewijk also experiences a higher prevalence of poverty, with 12.3% of households below the poverty line, compared to 8.7% in Rotterdam (Onderzoek010, 2024). This economic disparity may limit participation in paid or membership-based physical activities.

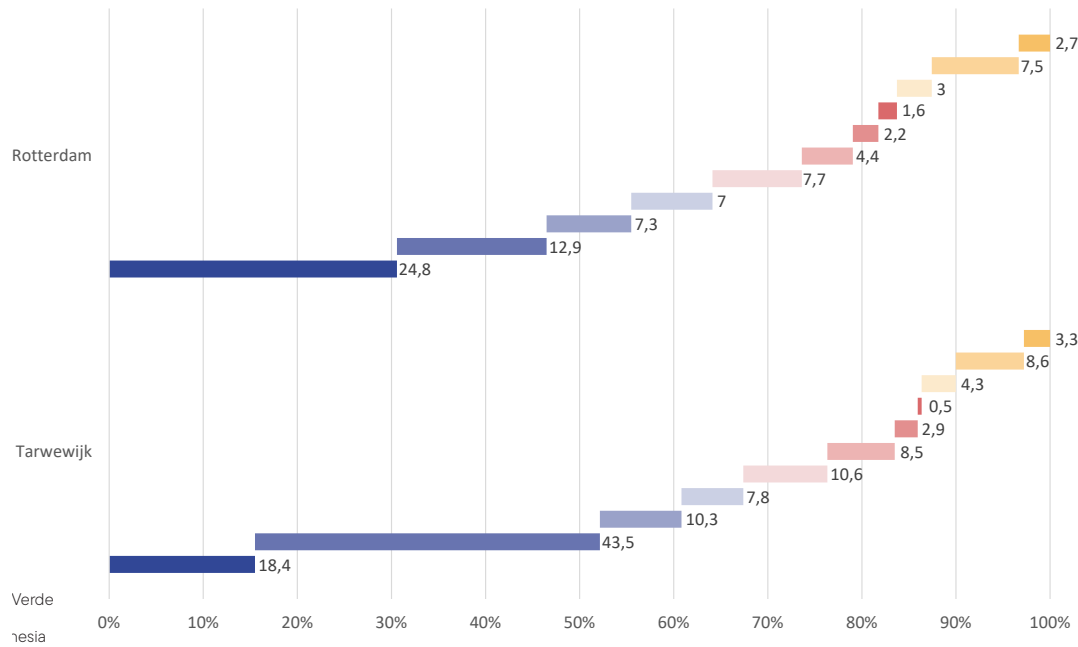
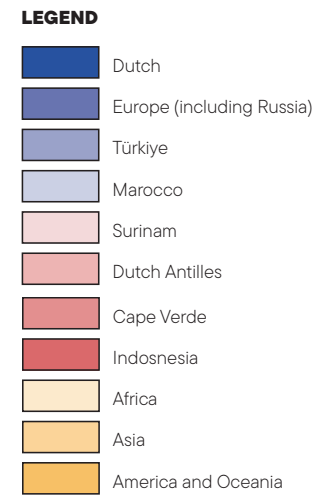
Safety Concerns and Criminality

Concerns about public safety, including theft, vandalism, and road-related incidents, can significantly deter outdoor physical activities, especially among vulnerable older adults (Onderzoek010, 2024). Tackling these safety challenges is crucial to fostering an environment that supports walking, cycling, and other forms of physical exercise.

Cultural and Ethnic Considerations

In Tarwewijk, a significant portion of the population consists of families who may choose to relocate to a new residential development within the neighborhood. Between 2004 and 2015, the number of registered Central and Eastern European (CEE) nationals in Rotterdam increased from 1,450 to 12,300, with nearly 50% originating from Poland, alongside substantial populations from Romania, Bulgaria, and Hungary. This trend is reflected in Tarwewijk, where residents from these countries are well-represented, drawn by factors such as affordable housing and well-established migrant networks. As a result, CEE nationals constitute approximately 43.5% of the local population.

Beyond this group, Tarwewijk is home to a diverse ethnic composition, including Dutch (18.4%), Turkish (10.3%), Moroccan (7.8%), Surinamese (10.6%), and Dutch Antillean (8.5%) communities. Additionally, African (4.3%) and Asian (2.9%) populations contribute to the neighborhood’s multicultural fabric. This diversity underscores the importance of designing inclusive, adaptable housing solutions that cater to varied cultural and family structures while fostering a vibrant community.



AR3AD110 Dwelling Graduation Studio. (2024). Ethnic Diversity in Tarwewijk. Adapted from Buurt Tarwewijk- Gemeente Rotterdam, 2024)

Housing Challenges

Tarwewijk faces a lack of diverse housing options, characterized by an ageing housing stock. The majority of homes date back to the early 20th century and consist largely of pre- and interwar portiek flats. Many newcomers, often with limited financial resources, settle here, leading to social disconnection and high resident turnover. This segment lacks strong ties to the neighborhood, emphasizing the need for placemaking initiatives.

As of 2024, Tarwewijk has 5,841 homes, with a housing market

dominated by rentals. Of these rentals, 34% are owned by housing associations, and 44% fall under ‘other rentals,’ including properties owned by companies, private landlords, and investors (Allecijfers. nl, 2024). The low rate of homeownership and the predominance of rental properties reflect a mix of social housing and private rentals. This underscores the importance of offering a broader range of housing options to cater to different economic groups.

Target Group and Scope

Given that the design intervention involves both transformation and selective demolition, the primary target group includes not only the existing residents within the selected project site in Pleinweg, Tarwewijk, but also anticipates the needs of future elderly populations, with a focus on residents aged 65 and above. Crucially, this group must be understood in relation to their informal care networks, including family members, adult children, and intergenerational households. Older adults in Tarwewijk are rarely isolated. They are embedded within multicultural family structures that play a central role in informal caregiving, social cohesion, and ageing in place. Recognizing the interdependence between older residents and their familial and cultural contexts is essential for designing inclusive, future-proof housing and public spaces.

The current residents of Tarwewijk are highly diverse, with substantial communities from Central and Eastern Europe, Morocco, Turkey, Suriname, and the Dutch Antilles, among others. Any strategy aimed at promoting active ageing must therefore also account for the cultural dimensions of domestic life. These shape preferences around housing layout, privacy, gender roles, and multigenerational living — all of which influence how people engage with their homes and their communities as they age.

Section 1.1 will explore how standard Dutch housing typologies, especially the prevalent open-plan kitchen layouts, often clash with the cultural expectations of Tarwewijk’s multi-ethnic households. Understanding these spatial preferences is essential to ensure that future housing solutions are inclusive, adaptable, and conducive to long-term residence and care within the community, supporting both the older adults and their extended family networks.

1.1 Implications for Housing Design in Diaspora Contexts

Dutch housing layouts are shaped by Western spatial norms that typically emphasize openness and efficiency (Cieraad, 2002). However, post-2000 ethnographic and housing research highlights significant cultural divergence: while open-plan kitchens align with Dutch and Surinamese domestic patterns, they often conflict with Moroccan and Turkish preferences for enclosed layouts and gendered privacy (Dibbits, 2009; Snene, 2023). These findings underscore the need for culturally responsive approaches in accomodating multi-ethnic housing design.

In the Netherlands, open-plan kitchens integrated with living areas are a common feature, shaped by 20th-century modernist ideals aimed at promoting spatial openness and dissolving the isolation of domestic labor (Cieraad, 2002). However, many migrant households, particularly those of Moroccan and Turkish origin, express a preference for enclosed kitchens due to both cultural and practical considerations. Ethnographic research by Gram-Hanssen and Bech-Danielsen in highlights that migrants from Turkish, Somali, and Iraqi backgrounds often reject open kitchens, citing issues such as inadequate odor containment and lack of spatial privacy (Gram-Hanssen & Bech-Danielsen, 2011). While architects typically favor open layouts for their perceived efficiency and sociability, these configurations often conflict with cultural expectations in which kitchen activities, especially those performed by women, are considered private and not to be visible during social visits (Gram-Hanssen & Bech-Danielsen, 2011).

By contrast, Dutch and Surinamese households generally prefer open kitchens and shared living spaces. In the Netherlands, the move toward open-plan kitchen design in the post-1960s period was driven by a desire to integrate cooking into the broader domestic sphere, fostering greater interaction among household members and reducing the spatial separation of domestic labor (Cieraad, 2002). Surinamese-Dutch families, many of whom identify as Christian Creole or Hindu, have similarly embraced open layouts, particularly as their culinary and social practices such as family-style meals and informal gatherings, align with broader Dutch norms (Oostendorp & Sieswerda, 2014). Nonetheless, Surinamese migrants living in Amsterdam's Bijlmer district have noted that standard

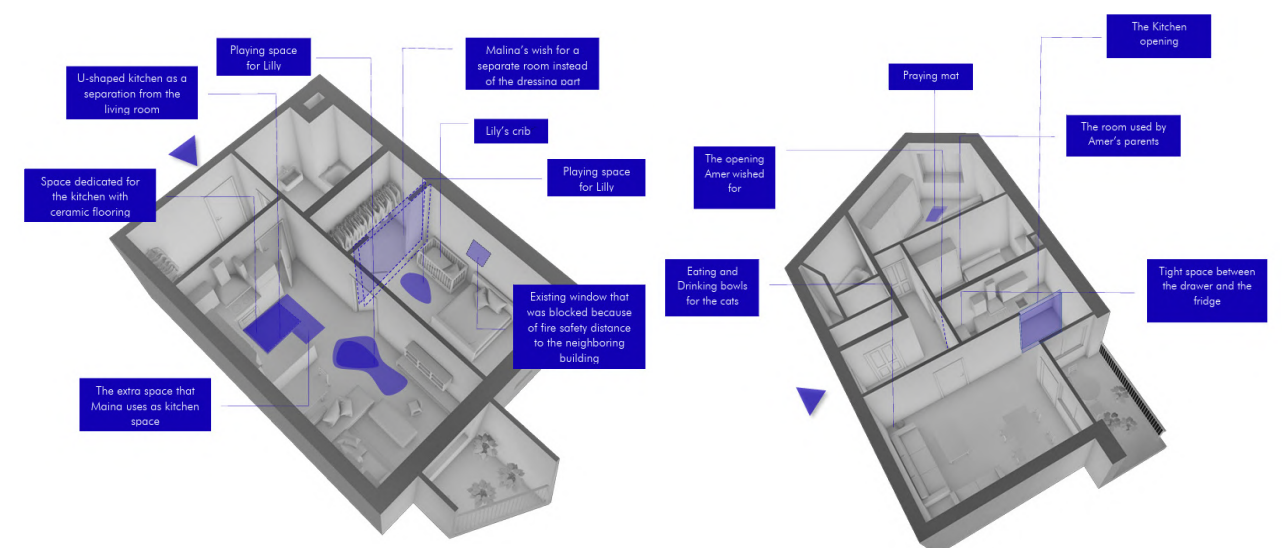
Dutch apartments often lack the spatial and infrastructural capacity to support their style of cooking and entertaining (Oostendorp & Sieswerda, 2014). The intensive food preparation and large indoor gatherings common in Surinamese households place demands on ventilation, layout, and insulation that conventional housing does not adequately meet. In response, some families modified their units, combining or restructuring spaces, to better accommodate extended social functions and communal activities within the home (Oostendorp & Sieswerda, 2014).



The living room in the house of Hafida, Amsterdam, 2007 which depicts the two sitting areas for guests and family (Photo Source: Marijke van den Berg). Image taken from "Designing the Social" (Snene, 2023)

Many of the spatial preferences discussed above are closely tied to gender norms and privacy expectations. In traditional Moroccan and Turkish households, the kitchen and family salon are considered female spaces, while men—particularly unrelated male guests—are typically restricted to formal reception areas. As noted by Dibbits (2009), Moroccan homes often include two sitting rooms: one furnished in a European style for receiving guests, sometimes with gender separation, and another used by the family for everyday activities. This spatial logic persists in diaspora settings, where the kitchen is seen as a private, gendered domain that should remain visually and physically separate from guest areas.

These cultural differences carry significant implications for housing policy and design. Standard Dutch apartments such as those in Tarwewijk, often default to open kitchen layouts, which may overlook the diverse spatial expectations and practices of the area's multi-ethnic communities. In the study "Designing the Social" (Snene, 2023), the author notes that residents in new-build flats in Amsterdam and Brussels—primarily of Moroccan or Turkish backgrounds—were unable to modify open kitchen layouts despite expressing a preference for enclosed designs. Tenants sometimes resorted to informal adaptations such as installing U-shaped counters or extra cabinetry to simulate separation (see figures below), though such modifications were often discouraged by housing authorities (Snene, 2023).



In Designing the Social (Snene, 2023), the author demonstrates how Turkish and Moroccan residents express a clear preference for modifying standard apartment layouts to better align with their cultural and spatial needs, as illustrated in the figures above (Image sources: Snene, 2023)

These spatial interventions by residents reveal the deeper cultural and relational dynamics rooted in domestic spaces.

To understand these dynamics, it is essential to consider the role of social networks of people. This includes the familial connections, friendships, and neighborly ties that shape daily life and care practices within and across these households (Snene, 2023). These networks are deeply linked to belonging, understood here as the affective and spatial sense of being “at home” within a community, both socially and architecturally. In culturally diverse neighborhoods like Tarwewijk, belonging is not only established through interpersonal relationships but also supported or hindered by spatial arrangements.

This also brings into focus the importance of built social infrastructure: the physical and architectural features of the home and neighborhood that support social interaction, caregiving, and mutual support. Elements such as semi-private thresholds, shared living areas, or flexible kitchen layouts can act as enablers of community life when they align with residents’ social practices. For example, Moroccan and Turkish families often depend on extended family structures, and the home must accommodate recurring visits, informal caregiving, and gender-based spatial divisions. Here, transition zones between public and private spaces (for e.g. hallways, kitchen thresholds, or screened-off seating areas) play a critical role in mediating these interactions, providing both hospitality and protection of household privacy (Snene, 2023).

In Tarwewijk, these dynamics differ across cultural groups. Moroccan and Turkish households may prioritize privacy and gender segregation in ways that shape kitchen use and guest interaction, while Surinamese families might emphasize communal gatherings and open social exchange. Housing design must thus respond to the specific social infrastructures and spatial preferences of each community, enabling residents not only to dwell in space, but to shape it according to their social lives, cultural values, and sense of belonging.

Design Guidelines

Accessibility



Improving Accessibility to Communal Facilities: Redesign communal facilities and green spaces to encourage diverse participation across genders.



Placemaking for Connection: Combat the transient nature of rental populations and social disconnection by investing in placemaking initiatives. These initiatives should build stronger ties to the neighborhood, enhance community identity, and encourage residents to grow old in Tarwewijk.



Housing Diversification: Address the lack of diverse housing options by encouraging the development of more owner-occupied homes and mixed-income housing to stabilize the community and attract long-term residents.

(Cultural) Accessibility



Respect for Gendered Spatial Norms: Incorporate flexible kitchen and living arrangements that allow for separation of public and private spaces, supporting cultural practices around gender, modesty, and privacy.



Dual-Zone Living Spaces: Design layouts with the possibility of two living areas—one for guests and one for family use—accommodating traditions that require differentiated hosting spaces.



Personalizable Thresholds: Enable residents to adapt the entrance or transition zones of their homes to reflect cultural expressions and control visibility.



Culturally Adaptable Floorplans: Provide layouts that can be easily modified over time (e.g. adding partitions or reconfiguring circulation paths) to suit changing family compositions and caregiving roles.

(Spatial) Accessibility



Layered Privacy Gradients
Design clear transitions from public to semi-private to private zones (e.g. vestibules, interior corridors) to allow residents to control access and interaction in culturally appropriate ways.



Visual Openness with Privacy Control
Use design elements like internal windows, sliding partitions, or frosted glass to provide visual connection while preserving autonomy and discretion.

(Social) Accessibility



Support for Informal Care Networks: Include spatial features that accommodate intergenerational living and informal caregiving, such as adjacent units, adaptable rooms, or extra storage.



Community-Embedded Shared Spaces: Provide semi-public or communal areas (e.g. courtyards, shared kitchens, multipurpose rooms) to encourage neighborly support and spontaneous interaction.

Safety



Improving safety: Improve public safety and ensure recreational spaces are inclusive and accessible, particularly for women and the elderly.

Mobility



Health and Wellness Focus: Address the high prevalence of obesity and moderate psychological challenges through targeted interventions that promote accessible physical and social activities, particularly for women and individuals from lower-income households, who are disproportionately affected.



Economic Accessibility: Develop free or low-cost fitness and social programs to overcome economic barriers linked to lower disposable incomes, ensuring equitable access for all residents.

2.0 Fieldwork at Liv Inn Hilversum

Design Guidelines

***Note:** The following design guidelines are developed on the basis of fieldwork conducted at Liv Inn Hilversum as part of a group project. Detailed information about the fieldwork can be found in the Fieldwork Booklet - Liv Inn Hilversum.

Accessibility

-  Resting Spots: Install benches or seating along frequently used pedestrian routes. These should be spaced at regular intervals to support elderly residents and those with limited mobility.
-  Circulation spaces: Avoid long, uninterrupted corridors, incorporate design elements like alcoves, seating niches, or visual breaks to invite pause, interaction, and a sense of warmth.
-  Flexible Communal Kitchens: Design larger, more flexible communal kitchen spaces to accommodate more participants in shared dinners and events, fostering a sense of community.
-  Optimized Apartment Layouts: Reassess apartment layouts to eliminate design conflicts, such as the bathroom door colliding with the bedroom door. Introduce sliding or pocket doors to save space and improve functionality.
-  Diverse Unit Sizes: Offer apartments with varied layouts and sizes to attract a broader range of ages (e.g., younger, more mobile retirees aged 50–60) while maintaining accessibility standards.
-  Views and Natural Light: Maximize views of communal gardens and ensure adequate natural light to make apartments feel more open and connected to the outdoors.
-  Personalization Features: Allow residents more input in the interior finishes and layout of their apartments, fostering a sense of ownership and satisfaction
-  Zoning for Care Needs: Create designated areas within the complex for residents requiring higher levels of care or establish partnerships with nearby care facilities for seamless transitions.

Safety

-  Street Crossings: Restructuring intersections and street crossings so that it is more accessible and safe for crossing for people with limited mobility.
-  Safety Enhancements: Integrate safety features, such as discreet monitoring systems, to address potential dangers posed by residents with conditions like dementia.

-  Lighting: Importance of well-lit passages and hallways for safety and accessibility across apartment, building and neighborhood scales.
-  Prioritize the placement and size of windows to bring in abundant natural light at eye level. Avoid high, narrow windows that limit daylight access and create dim or uninviting conditions.

Mobility

-  Stair Accessibility: Design stairs to be more prominent and inviting, with natural lighting, wide treads, and resting spaces to encourage their use over elevators.
-  Situate spaces like gyms or shared activity areas in locations with strong visual and physical connections to other active parts of the building. This fosters accessibility and integrates them into the daily flow of movement.

3.0 Literature Review

3.1 World Health Organization's Active Ageing Framework

Active aging, as defined by the World Health Organization (WHO) in 2002, is the process of enhancing opportunities for health, participation, and security to improve the quality of life for individuals as they grow older. This concept, which gained prominence in the 1990s, highlights the interconnectedness of health, engagement, aging, and maintaining independence.

Key Aspects of Active Ageing

According to the WHO document on active ageing, the key aspects of active ageing are (Paúl et al., 2012):

(1) autonomy refers to an individual's perceived ability to make decisions about their daily life based on their personal preferences and values, maintaining a sense of control and agency.

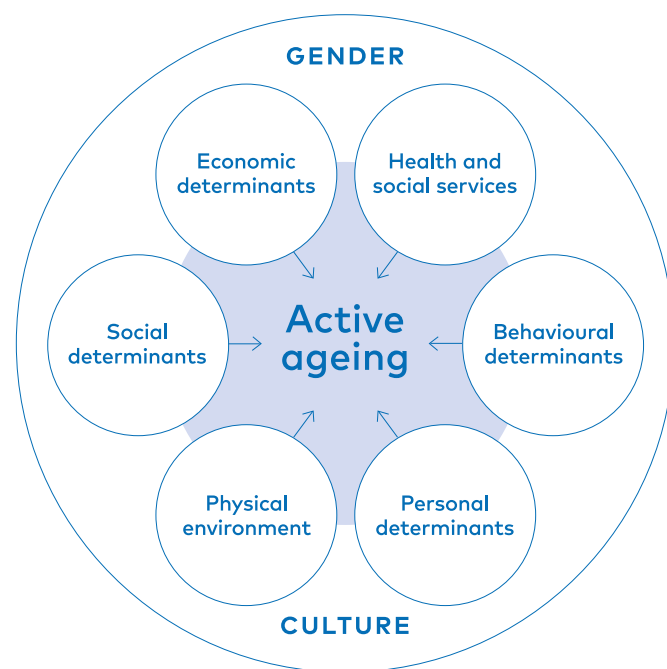
(2) independence refers to the ability to carry out daily activities and live within the community with little or no assistance from others.

(3) quality of life refers to an individual's personal evaluation of their place in life, shaped by their cultural background, values, goals, expectations, and concerns. It is affected by factors such as physical health, mental well-being, level of independence, social relationships, personal beliefs, sense of belonging, and interactions with the environment. For older adults, maintaining autonomy and independence is especially important to their overall sense of quality of life.

(4) healthy life expectancy is linked to the duration in which an individual can live without significant disabilities, focusing on maintaining functionality and well-being throughout the aging process.

Foundational Pillars and Key Determinants

The concept of active aging is built on three foundational pillars: **participation, health, and security**. These pillars form the basis of a proposed model that identifies six groups of key determinants, each covering various aspects:



*The main determinants of Active Ageing
(adapted from WHO, 2002).*

Health and Social Services: This includes initiatives to promote health and prevent diseases, access to comprehensive healthcare services, continuous care, and mental health support.

Behavioral Determinants: This includes factors like smoking behavior, levels of physical activity, diet, oral hygiene, alcohol use, and medications.

Personal Determinants: These involve biological and genetic influences, as well as psychological factors affecting individuals.

Physical Environment: This determinant emphasizes creating age-friendly environments, ensuring safety in housing, preventing falls, and minimizing exposure to pollution.

Social Determinants: This includes social support networks, protection from violence and abuse, and access to education.

Economic Determinants: Factors such as wages, social security, and opportunities for work are included under this category.

Critical Evaluation of Framework

The article "Active Ageing: An Empirical Approach to the WHO Model" provides a critical evaluation of the WHO active aging framework. (Paúl et al., 2012) It identifies health and functionality as core elements, with psychological factors such as optimism and resilience being crucial for coping with aging challenges. Cognition is shown to be closely tied to income, education, and physical health, while adaptability is influenced by social networks and personality. Biological factors, shaped by age and gender, also play an independent role (Paúl et al., 2012). The six-factor model expands beyond traditional "successful aging," recognizing diverse profiles of older adults and emphasizing tailored interventions to enhance quality of life. Psychological resilience and self-efficacy are crucial for maintaining engagement, overcoming challenges, and promoting active aging.

The article "Productive Engagement of Older Adults: Elements of a Cross-Cultural Research Agenda" builds on the WHO's Active Aging Framework by adapting and expanding its core principles to focus specifically on productive engagement in later life. The WHO framework, which emphasizes optimizing opportunities for health, participation, and security to improve quality of life as people age, serves as

a foundation for understanding how older adults can remain active contributors to society. However, the research agenda outlined in the article extends this by refining the focus on economic and social contributions, such as paid work, volunteering, and caregiving, as measurable and actionable outcomes (Morrow-Howell & Wang, 2012).

The research agenda integrates the determinants outlined by WHO into a cross-cultural model, recognizing the interplay between individual capacity and institutional support. By specifying productive behaviors as intermediate outcomes, such as employment, caregiving, and volunteering, the agenda provides a more concrete structure for studying how these determinants translate into meaningful engagement (Morrow-Howell & Wang, 2012).

This work also addresses limitations in the WHO framework by emphasizing the sociocultural context, which influences how determinants manifest in different populations. For instance, the agenda explores how cultural norms around family structures, community roles, and expectations for older adults shape opportunities for productive engagement. Additionally, it acknowledges that economic conditions and public policies are highly modifiable and can significantly affect engagement levels, making them critical areas for intervention (Morrow-Howell & Wang, 2012).

The paper "From Active Aging to Active Citizenship: The Role of (Age) Friendliness" applies active aging principles locally, enhancing independence and quality of life through improved transportation, housing, and accessibility (Del Barrio et al., n.d.). It empowers older adults to shape their communities, fostering ownership and relevance. However, to ensure inclusivity, AFCC must address diversity and equitable participation. By shifting focus to active citizenship, it promotes intergenerational collaboration and shared community goals.

3.2 Mobility Justice

Mimi Sheller's book, "Mobility Justice" (2020), examines the interconnected themes of mobility, accessibility, and safety, uncovering how systemic inequalities shape movement and proposing pathways for creating equitable and inclusive urban environments.

Mobility

Mobility, as Sheller explains, is neither inherently free nor equal. It is shaped by power relations, governance, surveillance, and societal hierarchies, resulting in uneven access stratified by gender, race, class, age, and ability. These dynamics lead to exclusion and oppression for marginalized groups, making mobility contingent, contested, and performative.

The ongoing "urbanization crisis" amplifies these issues, with rapid urban growth and the rise of automobility, characterized by car dependency and urban sprawl, creating widespread dysfunctions. These include hazardous pollution, traffic congestion, social isolation, and ecological degradation, as cities face growing social inequality, mass evictions, and resource shortages.

Sheller underscores the urgency of rethinking urban planning and infrastructure to mitigate these problems through approaches like ecological urbanism, disaster preparedness, and sustainable transport systems. Innovative solutions such as vehicle sharing, complete streets, Vision Zero policies, and congestion pricing represent efforts to reduce car dependency and promote sustainability. However, Sheller cautions that such initiatives must go beyond technological fixes to address the systemic inequities embedded in urban infrastructure.

Accessibility

Accessibility, Sheller argues, must be reframed as a systemic issue rather than an individual challenge. Critical Disability Studies (CDS) critiques how urban planning and public spaces marginalize

individuals with mobility impairments, dehumanizing them by prioritizing efficiency over inclusivity. Disability advocates emphasize that barriers to access are created by societal structures rather than impairments themselves. Urban designs often favor able-bodied norms, reinforcing inequalities and excluding marginalized groups. Activists have used demonstrations like "wheel-ins" at inaccessible subway stations to challenge these inequities, exposing how public spaces privilege certain bodies while neglecting others. Sheller highlights the importance of creating inclusive environments through concepts like "vital frictions," which foster interaction and engagement among diverse populations, and "mobile commons," where communities reclaim shared spaces for meaningful connections.

Movements like Slow Roll Chicago exemplify how collective mobility practices can rebuild trust and cohesion in neighborhoods. Achieving mobility justice requires reimagining urban planning with universal design principles, prioritizing equity and accessibility over profit-driven models. Inclusive design must dismantle structural barriers and foster spaces where diverse individuals can thrive.

Safety

Sheller emphasizes the need for human-centered approaches to mobility that prioritize safety, equity, and public health. As cities grapple with new transportation technologies such as automated vehicles, Linda Bailey from the National Association of City Transportation Officials (NATCO) advocates for policies that regulate these innovations in ways that benefit the public realm.

This includes redesigning streets and curb spaces to prioritize people over vehicles, ensuring reduced traffic violence, and promoting equitable access. Initiatives like Complete Streets, Livable Cities, and Vision Zero aim to reduce car dependency and make urban spaces safer for all users, regardless of their

mode of transportation. Sheller argues that these efforts must go beyond technological solutions to address deeper societal values, shifting from economic growth and technological efficiency to sustainability and relationality. Reclaiming streets as spaces for people, not just vehicles, is central to creating safer and more inclusive cities.

Achieving Mobility Justice

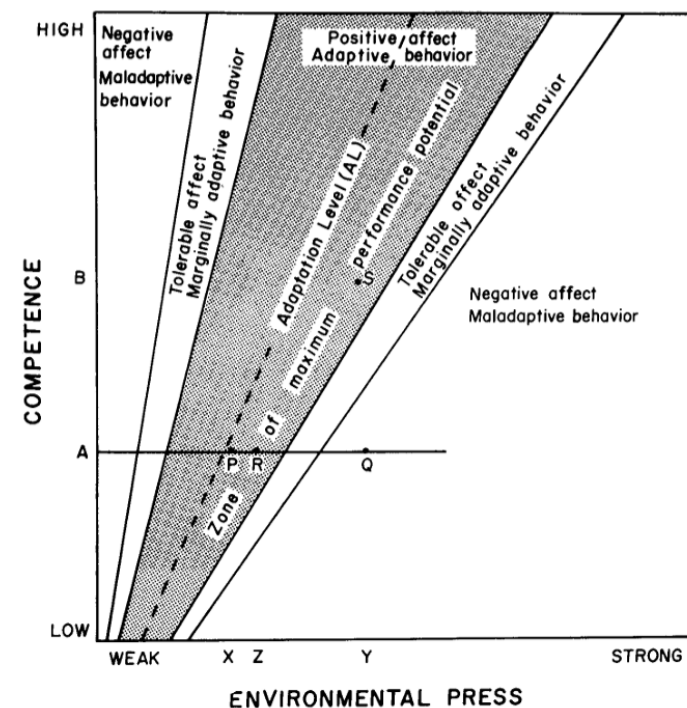
Mimi Sheller argues that achieving mobility justice requires addressing the systemic inequalities embedded in urban infrastructure and societal norms. This involves rethinking urban design to prioritize accessibility, inclusivity, and sustainability. Human-centered planning must dismantle barriers to access, creating equitable environments that serve all individuals regardless of ability, socio-economic status, or identity. By shifting focus from efficiency-driven development to justice-oriented urbanism, cities can foster spaces that empower marginalized populations and promote shared, sustainable futures for all.



Mobility Justice - The Politics of Movement in an Age of Extremes by Mimi Sheller (2020).

3.3 Lawton's Ecological Model of Ageing

Designing for a continuum of care within a campus model offers a scalable, adaptable approach to elderly housing. By anticipating long-term changes in demographics and needs, planners can create environments that seamlessly accommodate transitions from independence to dependence. This strategy not only reduces the physical and emotional toll of relocation but also ensures that the housing remains a supportive, thriving community throughout the residents' aging process.

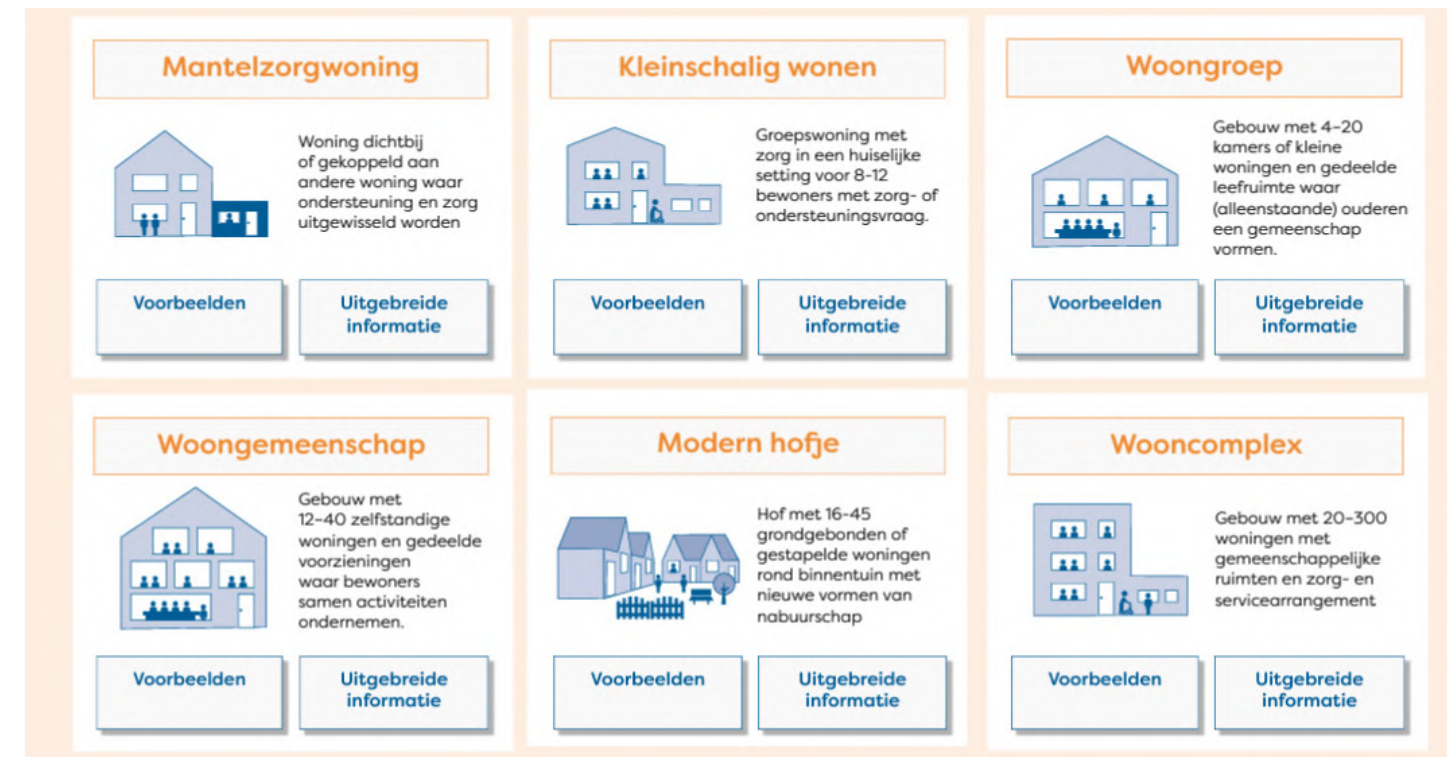


Ecological Model of Ageing (Lawton and Nahemow, 1973)

This approach aligns closely with Lawton's Ecological Model of Aging (1973), which, although developed in the 70s, continues to inform contemporary housing and care practices. The model emphasizes the dynamic interaction between individual competence (including physical and cognitive abilities) and environmental press (the demands placed on individuals by their surroundings). Lawton argues that optimal aging occurs when individuals are situated in environments that challenge them just enough to maintain engagement and autonomy, i.e. the "zone of maximum performance potential", but not so much as to cause stress or failure.

Recent scholarship has revitalized Lawton's model, especially in the context of participatory and relational care (Abma, 2023), where the environment is seen not merely as a backdrop, but as an active component in shaping well-being. This shift supports the development of ecosystem-oriented housing models, such as the campus concept, which organize care as an integrated and adaptive network rather than a linear progression of care institutions.

In practice, the campus model embodies Lawton's principles by offering graduated care settings that adapt to fluctuating competence levels. For highly capable individuals, independent units with minimal environmental press provide autonomy. As abilities decline, residents can transition to more supportive housing types within the same community. This reduces the disorientation often caused by relocation and supports psychological continuity. However, challenges remain: for example, exposure to residents with advanced care needs may cause discomfort or anxiety among more independent residents. Careful spatial planning, programming, and community engagement are therefore essential to maintain a supportive balance between challenge and comfort across the spectrum of needs.



The diagram provides a visual representation of six housing models for elderly residents proposed in the Catalogus Woonvormen voor Senioren (ZorgSaamWonen, 2021)

The Dutch Catalogus Woonvormen voor Senioren provides a detailed inventory of housing typologies that can serve as components within such a campus model. Each typology responds to a different point along Lawton's competence-environment continuum:

Mantelzorgwoningen (Caregiver Housing) support older adults living near or alongside family members, enabling informal care while preserving privacy and autonomy. These models reflect low environmental press and high personal competence, with adaptability as needs increase.

Kleinschalig Wonen (Small-Scale Housing) accommodates 8-12 residents in a home-like setting, offering professional care in an environment that fosters familiarity and interpersonal connection, that is suitable for residents with moderate care needs.

Woongroepen (Living Groups) consist of small individual units with shared common spaces, promoting social engagement among residents who maintain a level of independence but benefit from collective routines and mutual support.

Woongemeenschappen (Living Communities) extend this idea at a larger scale (12-40 units), creating interdependent networks of residents

who share facilities and social activities while living autonomously.

Modern Hofjes (Modern Courtyard Housing) revive a historical Dutch model by clustering homes around a shared garden. These 16-45-unit communities enable informal neighborly contact while maintaining private dwellings that is ideal for moderately independent residents seeking connection.

Wooncomplexen (Housing Complexes) scale up this model with 20-300 units, often incorporating on-site services such as care staff, communal kitchens, or medical support. These are well-suited for aging in place within a partially supported environment.

The strength of the campus model lies in its capacity to link these diverse housing types within one adaptable infrastructure, allowing residents to age in place while maintaining their social networks and spatial familiarity. As demographic shifts place increasing pressure on care systems, integrating flexible, scalable, and culturally responsive housing models becomes not only beneficial but essential.

Lawton's model, especially as revived in relational care theory, serves as a foundational lens for this rethinking. It encourages designers and policymakers

to recalibrate environmental demands to meet evolving capacities, avoiding both premature institutionalization and environments that fail to stimulate. In this context, the campus model offers a practical way to embed adaptability, autonomy, and community into the architecture of aging.

Design Guidelines

Accessibility



Universal Design: Urban infrastructure and transportation should prioritize inclusive designs that accommodate individuals with varying mobility needs. This includes retrofitting sidewalks, public transport stops, and buildings with ramps, elevators, and tactile signage for accessibility.



Vision Zero: Vision Zero: Redesign intersections with raised crosswalks, slower speed limits, and adaptive lighting for enhanced safety.



Integrated Living and Healthcare: Medical services, ranging from routine check-ups to specialized care, can be integrated into the campus to eliminate the need for external appointments, which may be burdensome for less mobile residents.



Social Continuity: Social and community programming fosters relationships that persist even as residents transition between levels of care, promoting a sense of belonging and stability.

Safety



Vital Frictions: Urban spaces designed to encourage slower, convivial interactions among pedestrians (termed “vital frictions”) can promote social inclusion and safety for the elderly by reducing isolation and fostering community ties. For e.g. creating pedestrian zones, community squares with shaded seating, and shared-use paths for slower, safe interaction.

Mobility



Encouraging Micro-mobility: Micro-mobility solutions, such as low-speed e-bikes, mobility scooters, and dedicated lanes for slow-moving modes of transport.



Active Transportation: Promote safe walking routes, expand cycle tracks for tricycles, and install low-impact exercise stations in parks.



Mobility Capabilities: Drawing from theories that highlight differential mobility, strategies must assess and enhance the mobility capabilities of elderly individuals. For e.g. add resting points every 50–100 meters, adjust traffic signals for slower crossing, and provide subsidized mobility devices.

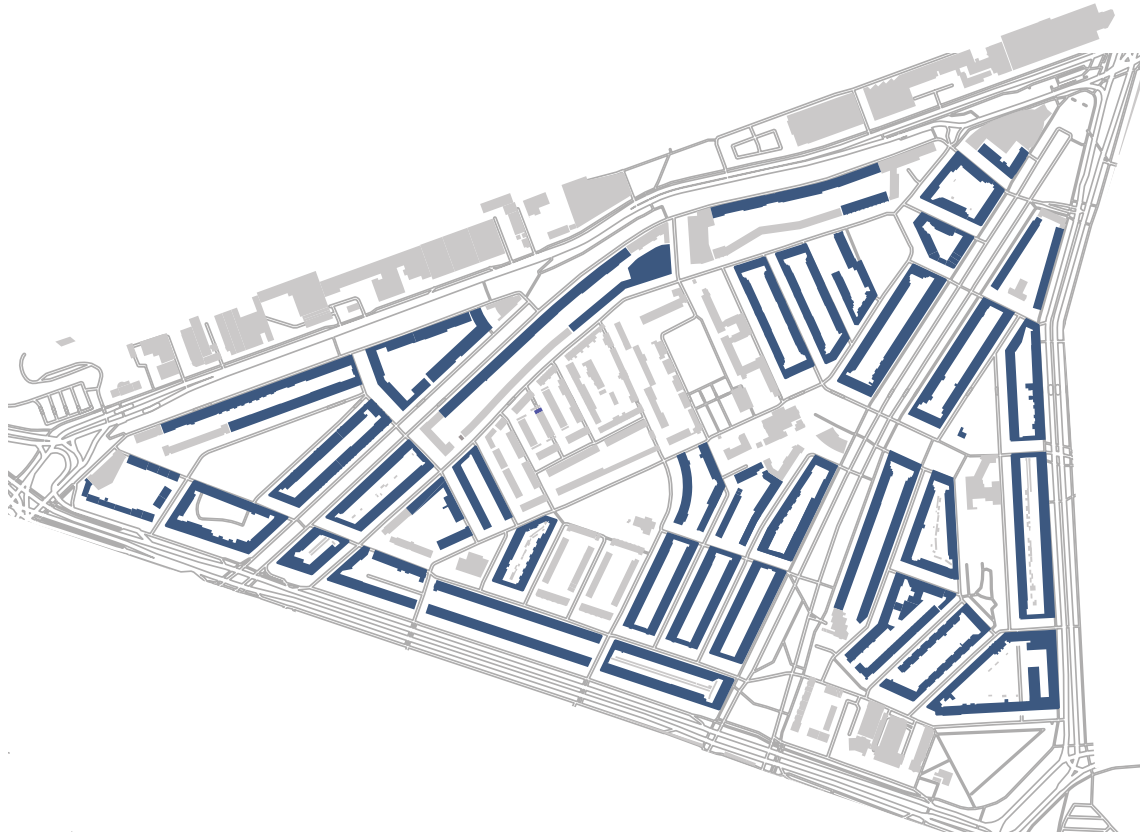


On-Site Services: Facilities can include grocery stores, dining options, and recreational amenities, which support independence for higher-functioning residents while also being accessible to those with mobility challenges.

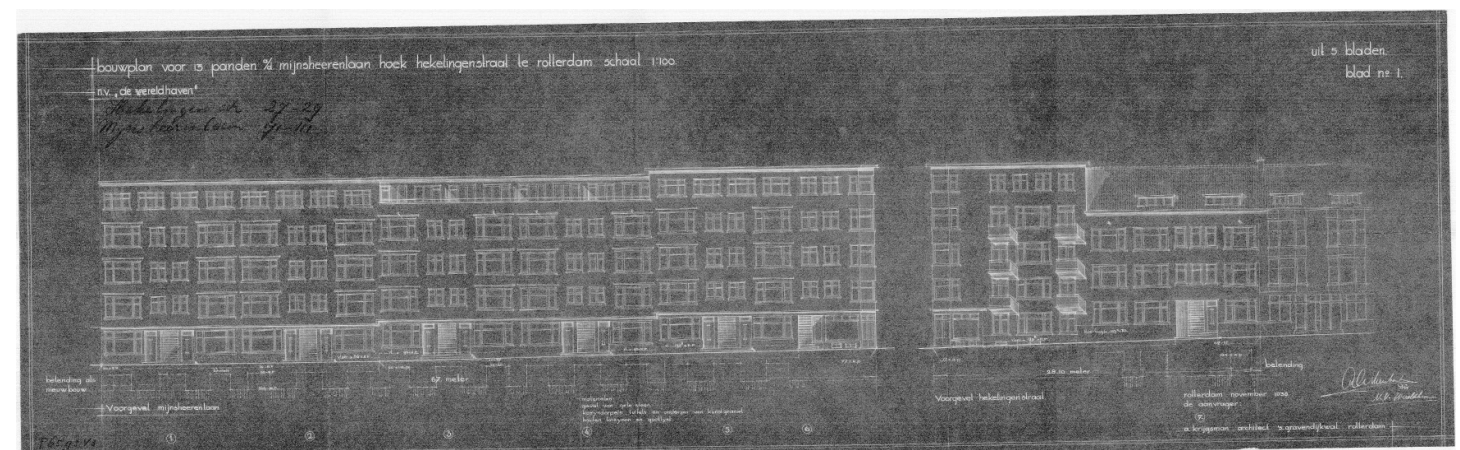
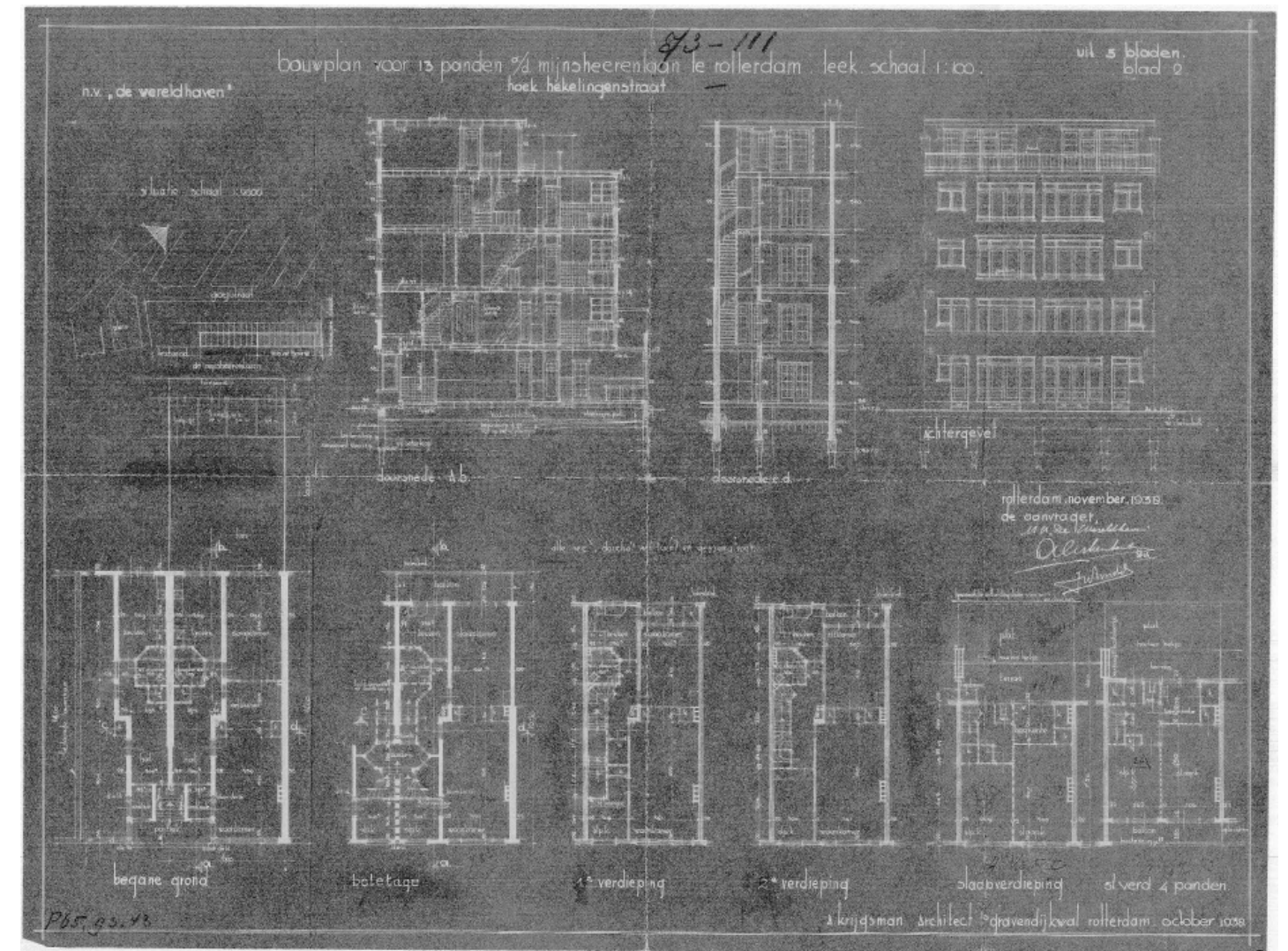
4.0 Haagse-Portiek

Typology Assessment

4.1 Haagse-Portiek Typology in Tarwewijk



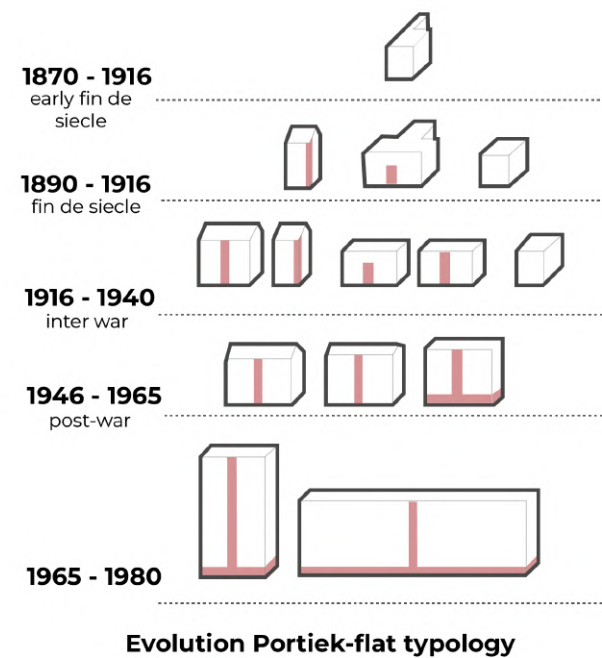
The highlighted buildings on the map represent the Haagse-Portiek Typology in Tarwewijk, characterized by compact portico-stairwell apartments. These apartment blocks are predominantly found on the edges of the neighborhood, offering a denser housing arrangement. Dating back to the inter-war period, these buildings hold significant potential for transformation, making them ideal for strategies that can be replicated not only throughout Tarwewijk but also across Rotterdam. Notably, Rotterdam has 104,014 portiekwoningen, constituting 33.4% of the city's housing inventory, while Den Haag has approximately 107,253 portiekwoningen, representing 42.4% of its total housing stock.



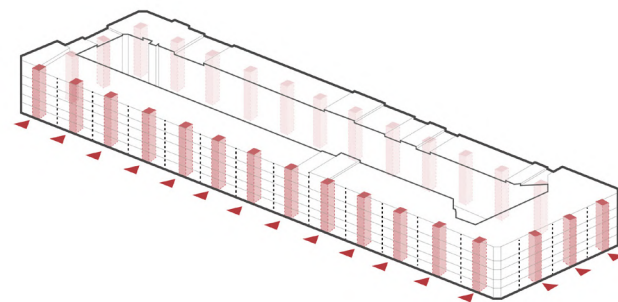
Typical plans and sections of interwar portico flat typologies can be found in the Van Mijnsheerenlaan 83 dossier from 1943, available in the Stadsarchief Rotterdam.



4.2 Transformation Potential of Portiek Typologies



Evolution of portico typology, adapted from Oorschot et al. (2018)



Circulation cores within portico-typology building block

Structural Characteristics of Interwar Buildings

In the interwar years, buildings were structurally supported primarily by masonry walls and façades. However, the limited dimensions of these walls restricted their capacity to bear additional weight, and the brick construction made them vulnerable to damage from traffic vibrations and salt exposure. Floors were commonly made of wood, offering poor fire resistance, inadequate soundproofing between apartments, and insufficient smoke protection (Oorschot et al., 2018).

Renovation Approaches

Renovating interwar buildings typically involves a "box-in-box" method, which requires temporary relocation of residents to carry out foundational and structural repairs. Although this approach incurs high costs due to resident relocation, it allows for comprehensive upgrades to the internal structures, including façade restoration, fire safety enhancements, modernized floorplans, improved soundproofing, replacement of outdated systems, asbestos removal, and updates to kitchens, bathrooms, and toilets (Oorschot et al., 2018).

Unique Features of Rotterdam's Interwar Apartments

Rotterdam's interwar apartments are notable for their depth, often reaching up to 15 meters, and their design, which typically includes individual staircases for direct access and privacy. This layout creates more spacious interiors compared to other cities. Influenced by local regulations and collaboration with architects from various regions, Rotterdam's architecture combines

functionality with rationalist aesthetics. Unlike Den Haag, which often uses open staircases for upper-floor access, Rotterdam's designs emphasize privacy and separation. While street façades are protected as heritage assets, interior and garden façades, often featuring shallow balconies, remain unprotected, offering opportunities for modernization. Renovation efforts in Rotterdam aim to preserve the character of these buildings while improving functionality, balancing heritage conservation with contemporary needs (Oorschot, 2018).

Energy Efficiency and Renewable Energy

To reduce energy demand for heating and cooling, renovations focus on improving insulation and airtightness, achieving energy efficiency labels of B or higher. Measures include low-temperature heating (50°C), improved ventilation systems with natural air inlets, mechanical outlets, and CO2 and moisture sensors. While these updates mitigate street noise, they often reveal noise issues between apartments, addressed by installing floating floors, though this typically requires unoccupied units. Efforts to achieve carbon neutrality by 2050 include integrating renewable energy systems such as photovoltaic panels, solar collectors for hot water, and, where possible, connections to neighborhood heat networks (Oorschot, 2018).

Profitability and Expansion Strategies

Housing associations aim to provide affordable apartments while financing quality upgrades through strategic expansions. Adding floor space, by for instance extending buildings or adapting garden-side balconies into greenhouses, generates additional rental income, enabling

investment in costly renovations. Enlarged apartments not only improve living quality but also create opportunities to integrate service spaces for pipes and ducts. Reimagining storage spaces also plays a role in improving utility and community security. Converting closed storage areas on the ground floor into visually open, secure collective spaces fosters social connection while accommodating electric bicycles and mobility scooters (Oorschot, 2018).

Improving Accessibility and Inclusion

Postwar neighborhoods face a shortage of small, accessible apartments for older adults and individuals with disabilities. A common intervention involves converting first-floor storage spaces into compact residential units for these groups, while repurposing outdoor spaces into collective garden areas with bicycle storage and renewable energy infrastructure. Improving accessibility often includes adding elevators and garden-side galleries while removing existing stairwells to expand floor space. These changes not only enhance accessibility but also generate additional rental income, supporting broader housing association investments.

Design Guidelines

Accessibility

-  Improved Access for Residents: Install elevators and garden-side galleries to enhance access, particularly for older or handicapped individuals.
-  Replace old stairwells with expanded floor space for more functional layouts.
-  Adaptation for Aging and Disabled Residents: Convert existing spaces, such as storage or bedrooms on the first floor, into smaller accessible units tailored for older or handicapped residents.
-  Ensure apartment designs are adaptable to accommodate changing needs, including spaces for mobility aids like wheelchairs and scooters.

Safety

-  Fire Safety and Soundproofing: Upgrade wooden floors to fire-resistant materials to improve fire safety. Enhance soundproofing between apartments to address noise concerns resulting from airtight renovations.
-  Heritage Preservation with Modern Safety Standards: Retain and restore street façades to their original heritage appearance while meeting modern safety and structural codes
-  Transform closed circulation spaces into visually open, secure spaces on the ground floor, fostering social interaction and ensuring safety.

Mobility

-  Extend or adapt garden-side spaces to add floor area, creating more spacious apartments and supporting utility integration for pipes and ducts.

Case Studies

Een blok stad

Name: Een Blok Stad
Location: Zwaerdecroonstraat en
Snellinckstraat, Rotterdam

Project Summary

Original Building	Transformation
Design-completion: 1901-1911	Design-completion: 2007-2011
Architect: various	Architect: various
Client: various	Client: Housing corporation WBR
Building layers: 5	Building layers: 5
Dwelling layers: 4	Dwelling layers: 5
Dwellings: 144	Dwellings: 64
Dwelling types: 33	Dwelling types: 64
Dwelling sizes: 140 m², 70 m²	Dwelling sizes: 120 m², 190 m², 280 m²
Amenities: shared attic space	Amenities: -

(Klijn, 2018)



(Klijn, 2018)



(Klijn, 2018)

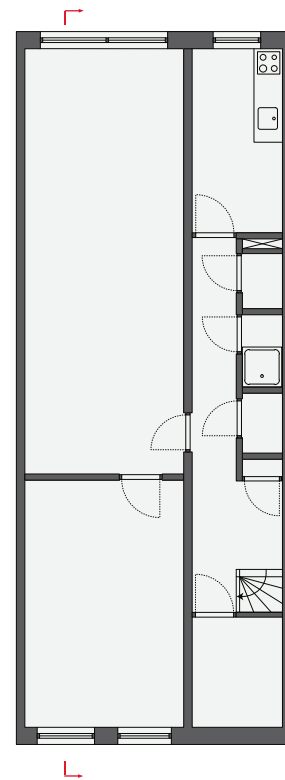
The Een Blok Stad project started ten years ago after residents objected to the proposed demolition of a run-down 19th-century city block, located between Zwaerdecroonstraat and Snellinckstraat, which was owned by the housing association Woonstad Rotterdam. The block, consisting of 48 buildings with 140 units, suffered from severe structural issues, including foundation problems. With low rental income making full renovation unfeasible, Woonstad sold it to ERA Contour (Klijn, 2018).

ERA Contour, aware of residents' appreciation for the original open layout, proposed restoring foundations, façades, roofs, and window frames, while leaving interiors customizable for buyers. This approach offered structural reliability while allowing homeowners to personalize their spaces, using mezzanines, extensions, and other features. The concept attracted significant interest and revitalized the neighborhood by bringing in a new demographic. The project preserved the historical block, enhanced the social fabric of the area, and demonstrated how reusing existing structures can meet modern housing demands for customizable yet community-oriented living spaces (Klijn, 2018).

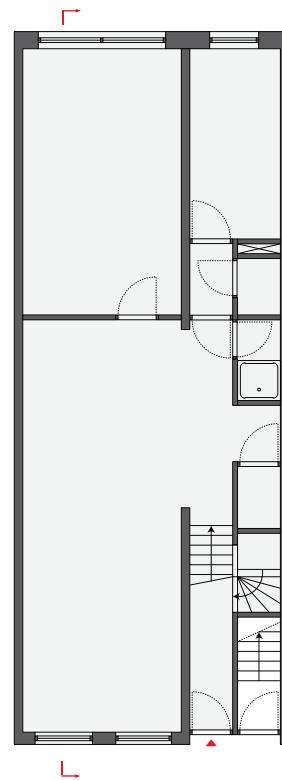
In doing so, the project also reflects the World Health Organization's active ageing framework: it ensures security through structural reinforcement, promotes participation by involving residents in customizing their homes, and supports health by improving living conditions and maintaining social ties. Rather than replacing the block, Een Blok Stad revitalized it, showing how adaptive reuse can meet modern housing needs while fostering inclusive, age- and community-friendly environments (Klijn, 2018).



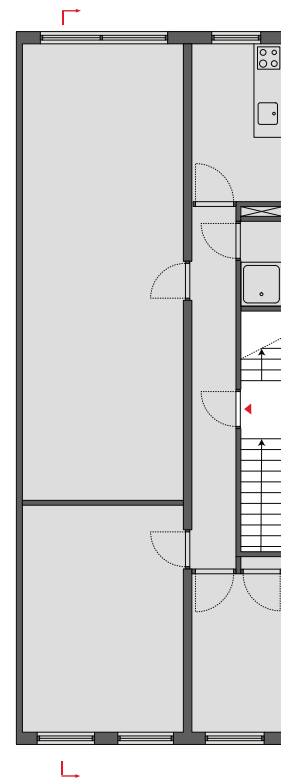
(Klijn, 2018)



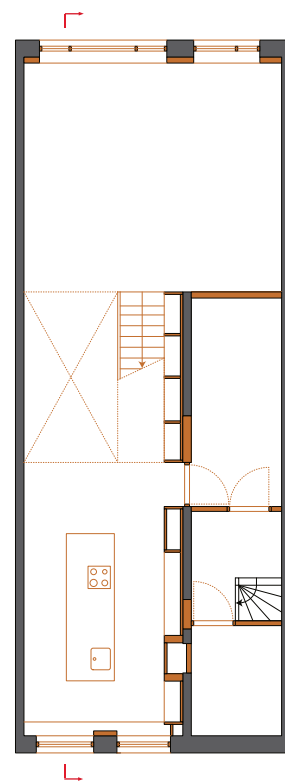
Souterrain
Basement



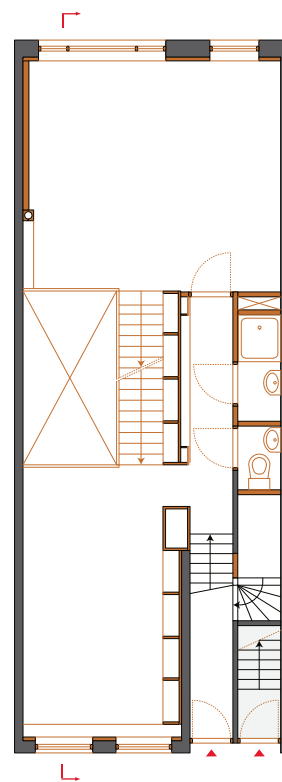
Bel-etage
Entrance level



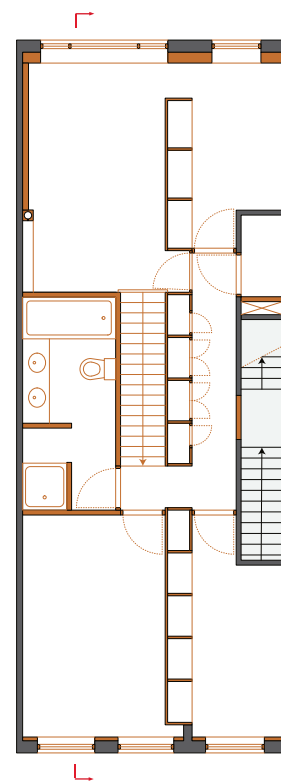
Eerste verdieping
First floor



Souterrain
Basement

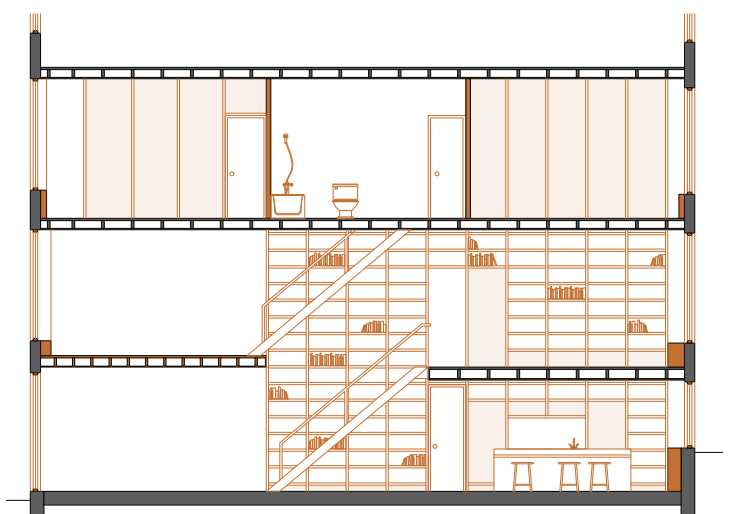
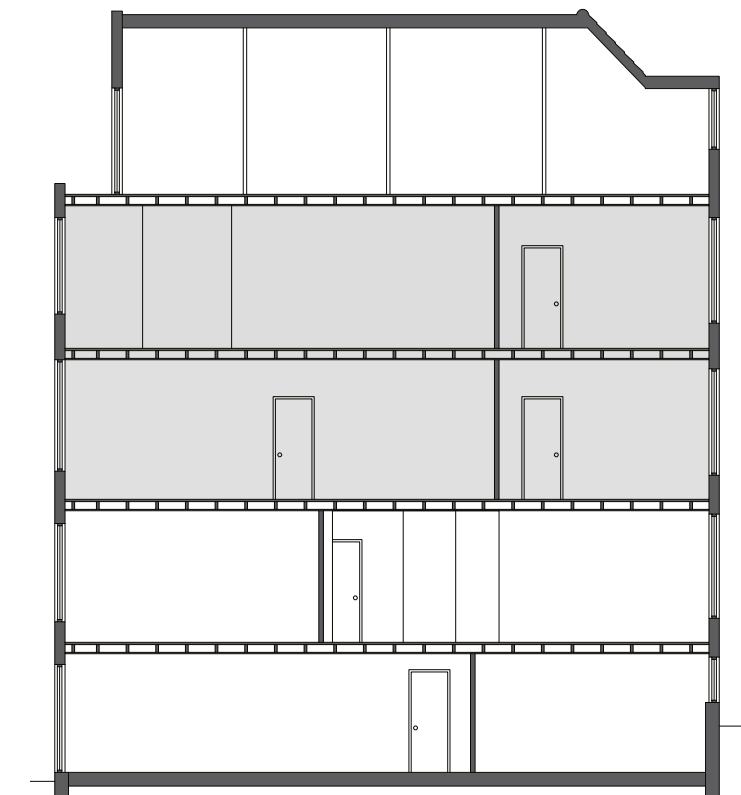


Bel-etage
Entrance level



Eerste verdieping
First floor

(Klijn, 2018)



0 0,5 2,5m

(Klijn, 2018)

Klussen aan de Klarenstraat

Name: Klussen aan de Klarenstraat
Location: Klarenstraat, Amsterdam

Project Summary

Original Building

Design-completion: 1958
Architect: Ernest Groosman
Client:
Building layers: 5
Dwelling layers: 4
Dwellings: 40
Dwelling types: 1
Dwelling sizes: 75 m²
Amenities: garges/storage

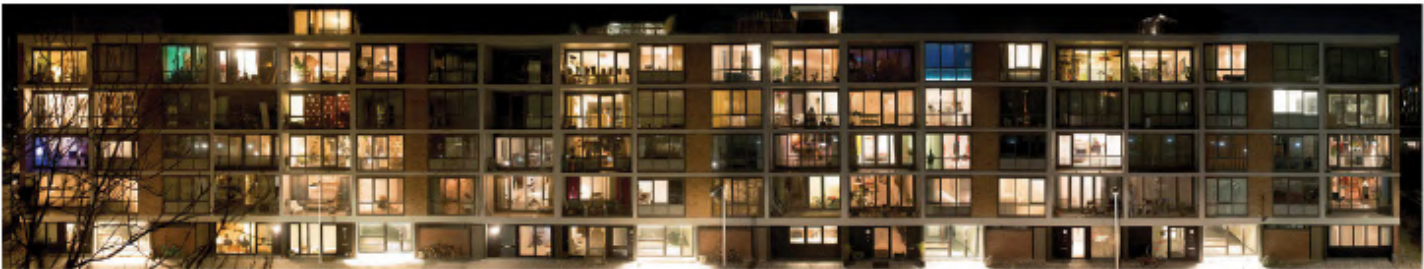
Transformation

Design-completion: 2014
Architect: Vanschagen Architecten
Client: Housing corporation VVO Klussen op Klarenstraat
Building layers: 6
Dwelling layers: 6
Dwellings: 30
Dwelling types: 30
Dwelling sizes: 40 m² - 90 m²
Amenities: storage

(Klijn, 2018)



(Arcam, 2021)



(Arcam, 2021)



(Arcam, 2021)

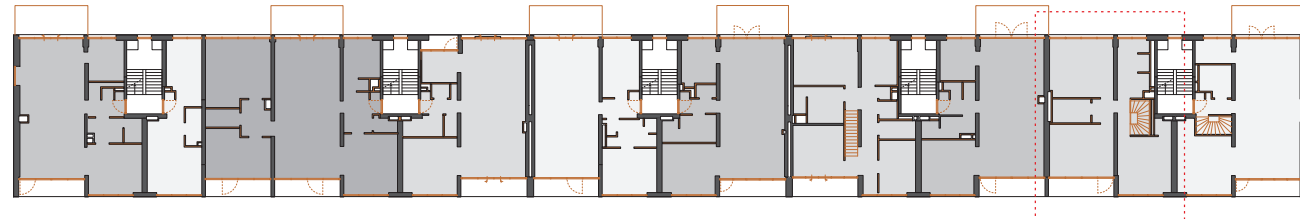
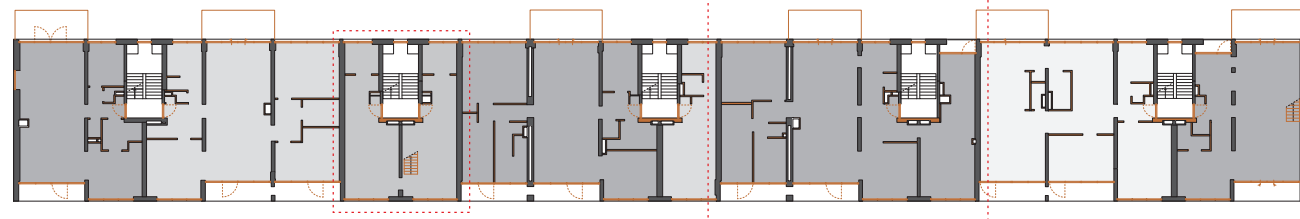
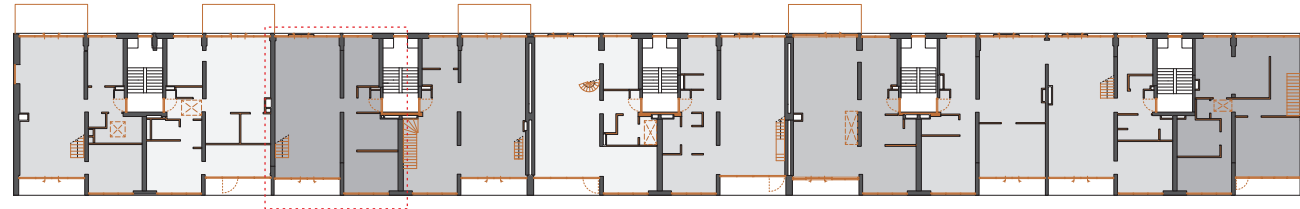
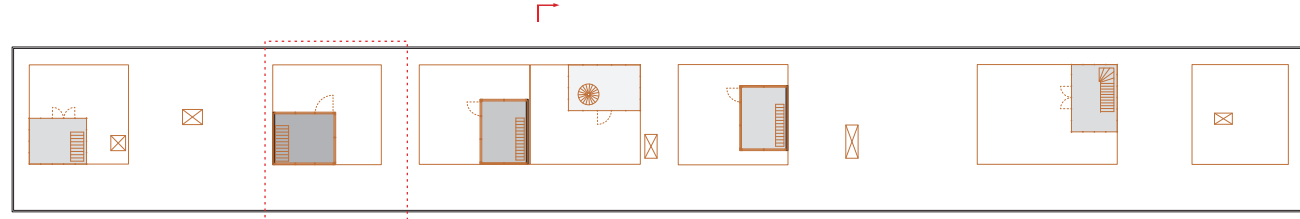
The Dutch housing market presents contradictions: while historic and brand-new homes are prized, mid-century properties are often overlooked, and residents have limited input into home design. The “Klussen aan de Klarenstraat” project in breaks this mold by transforming a 1950s apartment building into desirable urban homes. 30 families together with Van Schagen Architects, reimagined identical flats using a “spatial matrix” that allowed customization in 45-square-meter modules, offering units between 45 and 200 square meters. The shared framework was collectively managed, while residents had significant freedom to design their living spaces (Klijn, 2018).

This innovative approach attracted a diverse group of residents, drawn by affordability, flexibility, and the location, revitalizing the Staalmanplein neighborhood. Celebrated as a model for contemporary housing, it demonstrates how collaboration among residents, architects, and corporations can transform neglected structures into vibrant, livable spaces (Arcam, 2021).

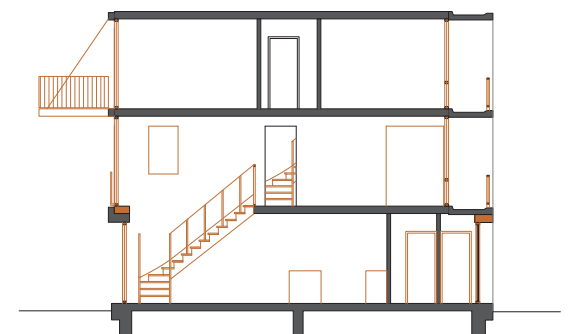
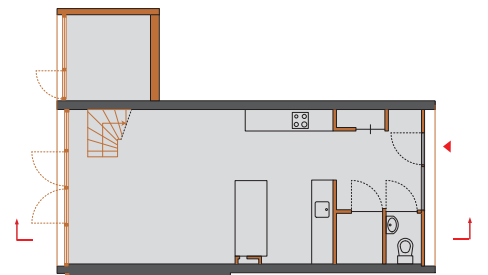
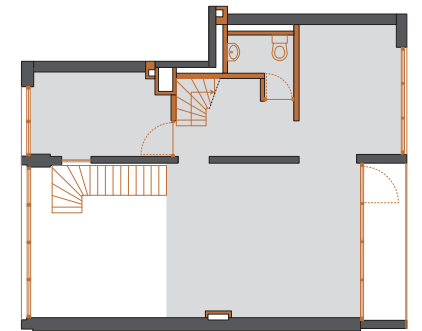
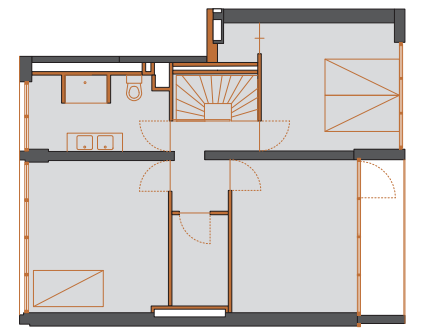
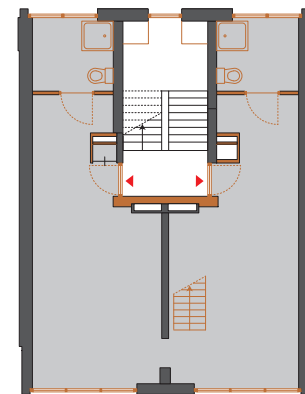
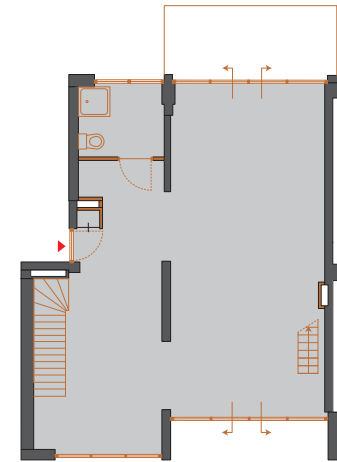
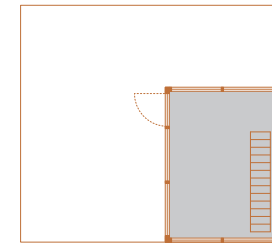
The project reflects the WHO's active ageing pillars: it enhances security by future-proofing post-war housing stock, supports participation through resident-led design, and promotes health by improving living conditions and fostering social cohesion.



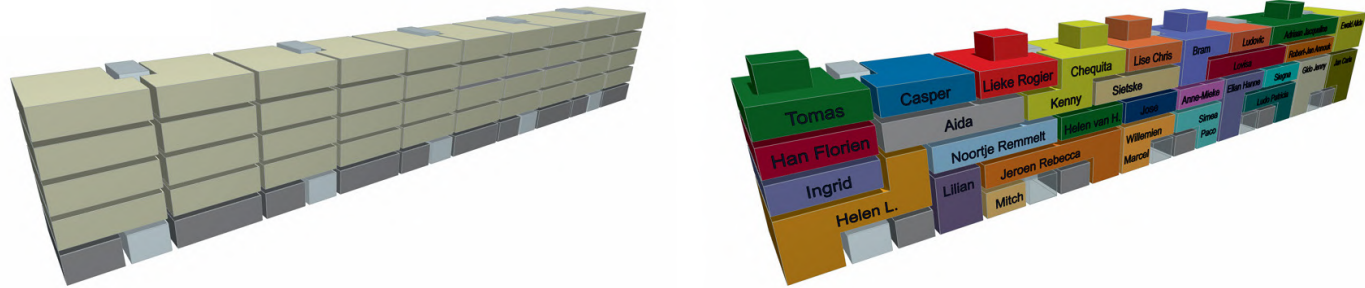
(Klijn, 2018)



(Klijn, 2018)



(Klijn, 2018)



Start renovatie U.J. Klarenstraat, najaar 2013

Start renovatie U.J. Klarenstraat, autumn 2013

De fase van de individuele afbouw, najaar 2014

Individual finishing phase, autumn 2014



(Arcam, 2021)

Kalkbreite Complex

Name: Kalkbreite Complex
Location: Zürich, Switzerland

Project Summary

Design-completion: 2014
Architect: Müller Sigrist Architekten
Client: Housing cooperative Kalkbreite (live-work-complex)
Building layers: (including ground floor+tram)
Dwelling layers: 6
Dwellings: 88
Dwelling types: standard apartments, cluster apartments with shared communal spaces, and large-scale dwellings
Dwelling sizes: 29 m² - 412 m²
Amenities: Retail, commercial, daycare, medical



(Genossenschaft Kalkbreite, 2021)



(Genossenschaft Kalkbreite, 2021)

The Kalkbreite Complex, designed by Müller Sigrist Architekten, is a mixed-use development in Zürich, Switzerland, completed in 2014. Spanning 22,900 m², the project integrates residential, commercial, and cultural spaces within a compact design. Situated at the intersection of two city districts, it also houses a tram depot (Sagredo 2024).

The structure features 88 apartments, including adaptable “joker spaces,” and offers communal areas alongside retail, service, and catering facilities. Supporting 256 residents and 200 jobs, Kalkbreite exemplifies cooperative and flexible urban living. The complex emphasizes sustainability, aligning with the 2000-watt society goals and achieving the Minergie-P-Eco standard. It utilizes a hybrid construction with prefabricated wooden façades and vibrant plaster walls in



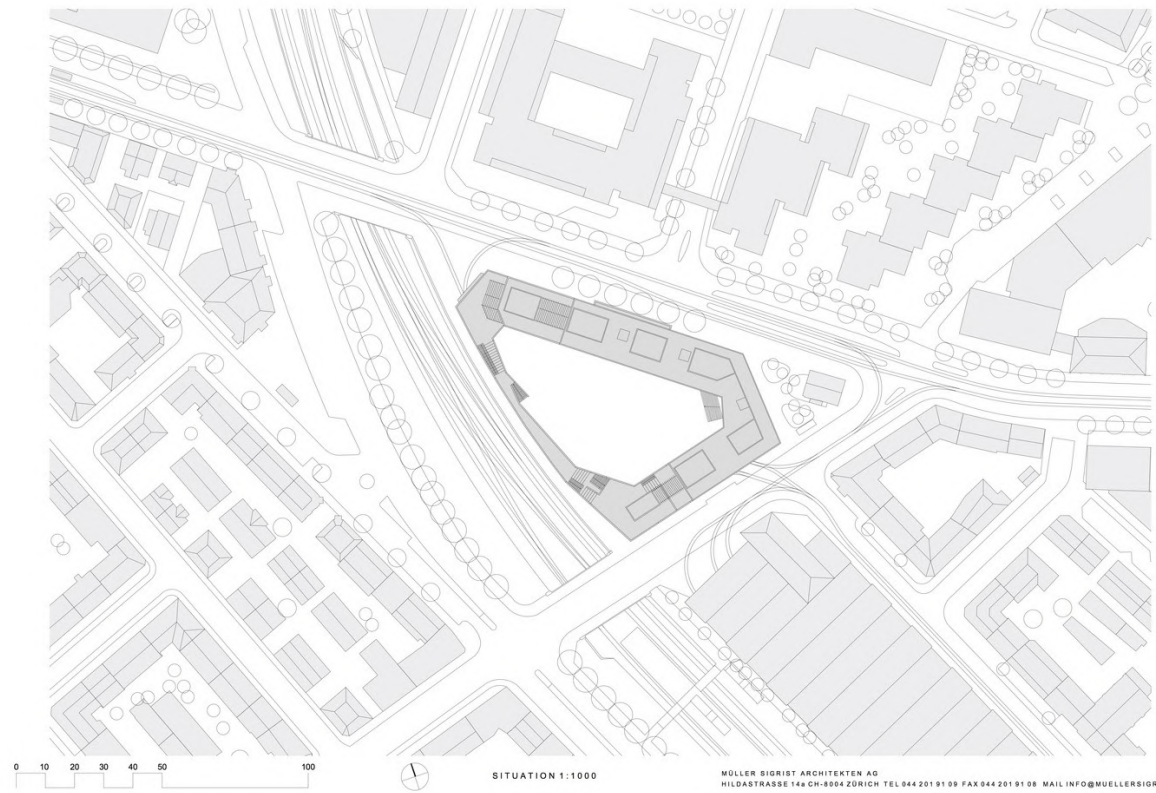
(Drooghmans and Drooghmans, 2021)

shades of orange and turquoise. Walkable roofs, a central courtyard, and integrated indoor-outdoor connections enhance accessibility and community engagement. (Genossenschaft Kalkbreite, 2021)

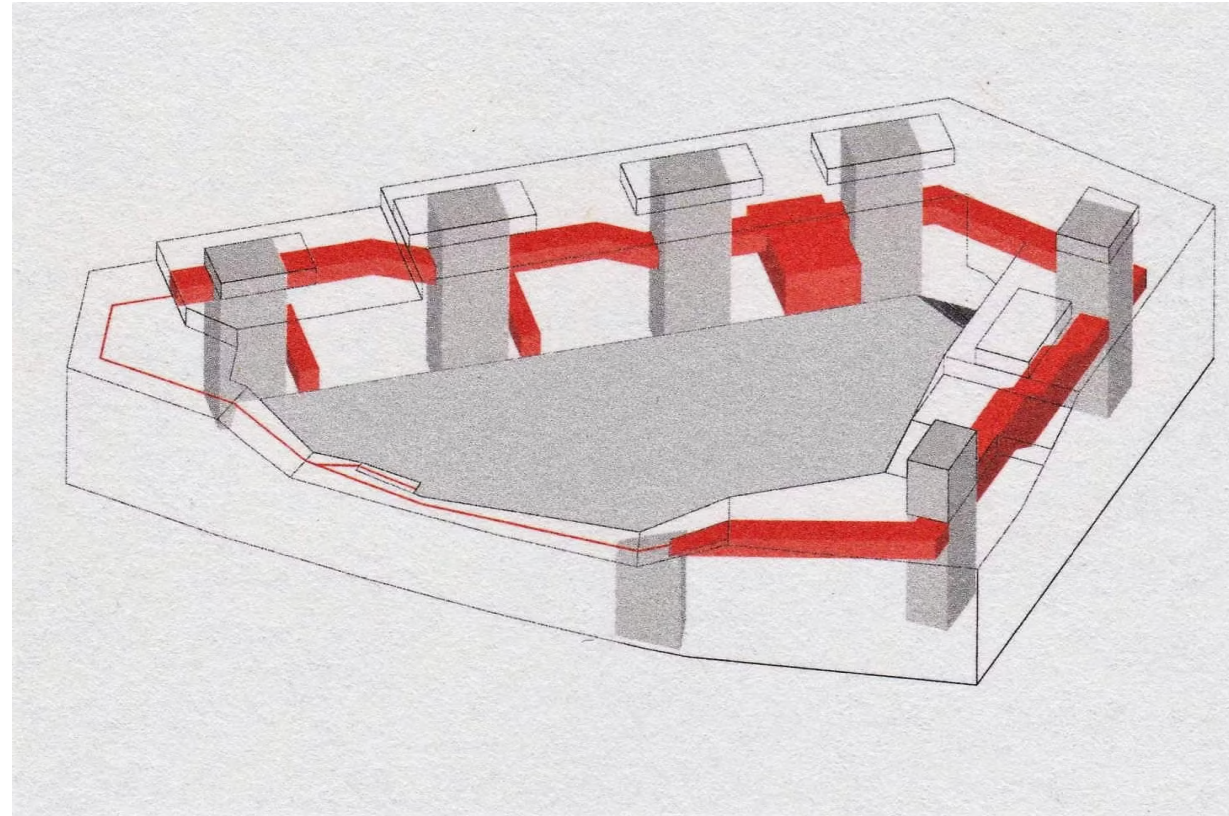
Reflecting the WHO’s active ageing pillars, Kalkbreite fosters participation through cooperative governance and shared amenities, promotes health by encouraging walkability, social interaction, and environmental sustainability, and ensures security through long-term affordability, inclusive design, and architectural quality. Its hybrid structure, walkable rooftops, and accessible public zones create a supportive environment for residents of all ages and abilities. The project stands as a forward-thinking model of age- and community-friendly urban housing.



(Drooghmans and Drooghmans, 2021)



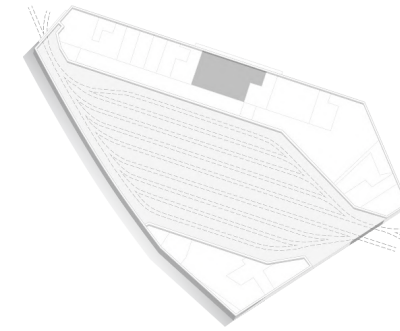
(Sagredo 2024)



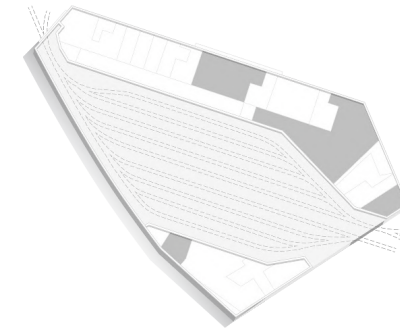
Routing circulations throughout the building, effective use of walkable roof spaces to encourage movement (Sagredo 2024)

Distribution of public functions
in the building block:

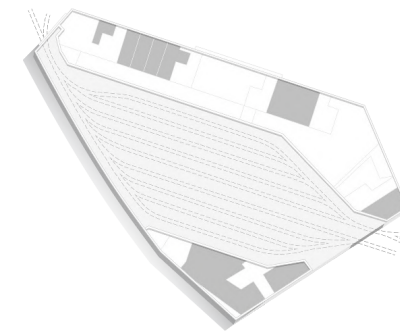
Movie Theater



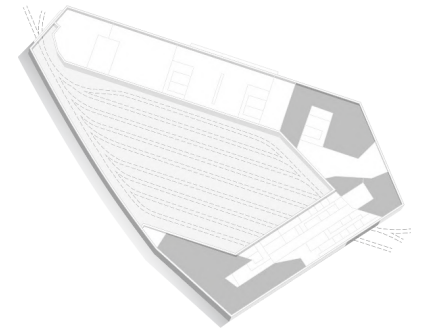
Gastronomy



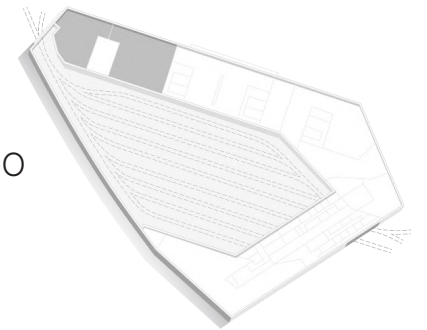
Retail



Services



Health & NGO



Childcare &
Play Spaces



(Sagredo 2024)

Transformation of 530 Dwellings

Name: Transformation of 530 Dwellings
Location: Bordeaux, France

Project Summary

Original Building

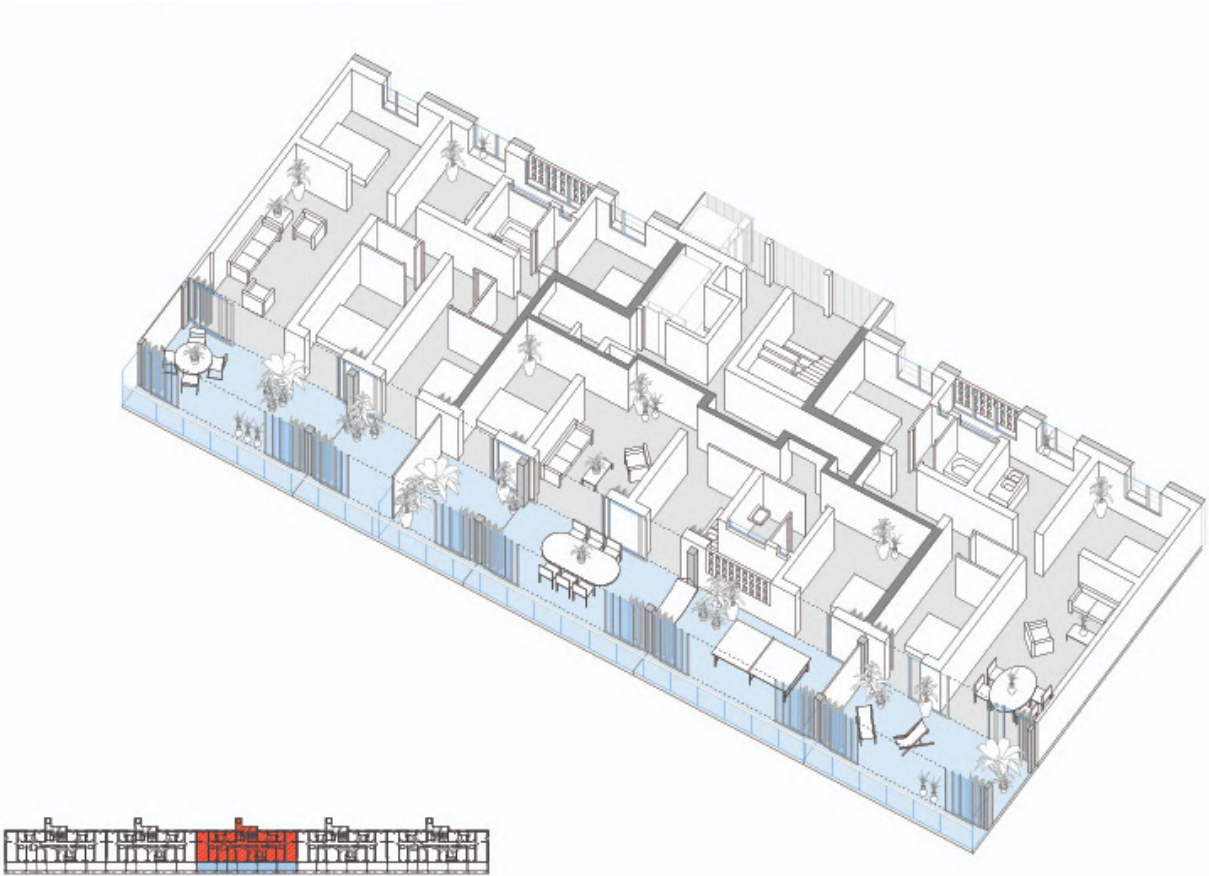
Design-completion: 1960s
Architect: Unknown (commonly attributed to standard mid-20th-century social housing design in France)
Client: Likely the public housing authority or a similar government entity (predecessor to Aquitanis)
Building layers: 10
Dwelling layers: 9
Dwellings: 530
Dwelling types: 1 to 3-bedroom units
Dwelling sizes: 20–70 m²
Amenities: -

Transformation

Design-completion: 2016
Architect: Christophe Hutin architecture, Frédéric Druot, Lacaton & Vassal
Client: Aquitanis (the social housing authority of Bordeaux Métropole)
Building layers: 10
Dwelling layers: 9
Dwellings: 530
Dwelling types: Multiple (ranging from studio apartments to multi-bedroom units)
Dwelling sizes: Varying from 30 m² to over 90 m², total area: 23500m²
Amenities: Extended balconies, winter gardens, new outdoor spaces, improved thermal performance



(Pintos, 2024)

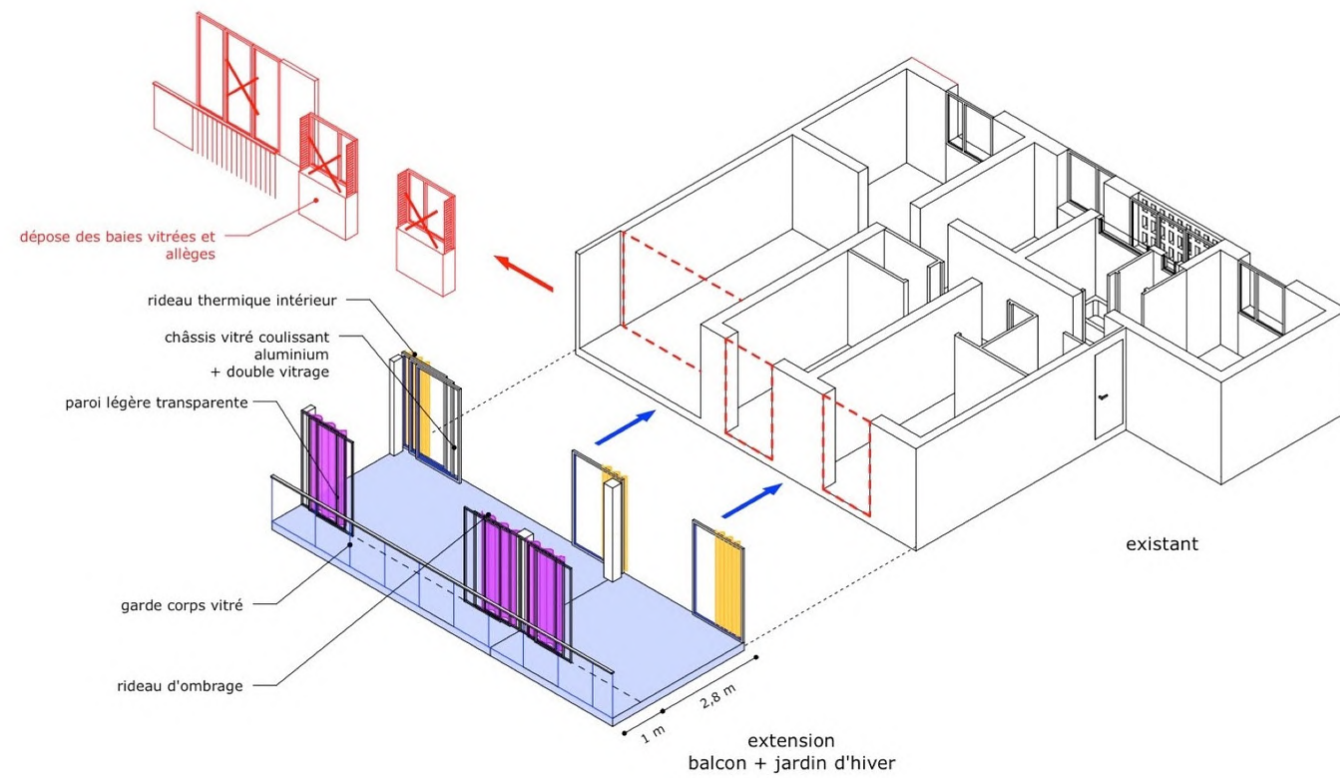


(Pintos, 2024)

The transformation of 530 dwellings in Bordeaux’s “Cité du Grand Parc” by Lacaton & Vassal, Frédéric Druot, and Christophe Hutin reimagines three modernist buildings from the 1960s. By adding winter gardens and balconies, the project enhances space, natural light, and views while preserving the original structure. Renovations include improved vertical circulation with new elevators, upgraded interiors, and energy-efficient features like insulated façades and large sliding glass doors. Ground-floor spaces and gardens were redesigned to improve accessibility and aesthetics. This cost-effective and sustainable approach transforms outdated social housing into attractive, functional, and comfortable dwellings, elevating the perception of urban living (Pintos, 2024). Reflecting the WHO’s active ageing pillars, the project supports health through enhanced comfort and environmental quality, fosters security via durable, affordable design, and encourages participation by enabling residents to remain in familiar, improved environments.



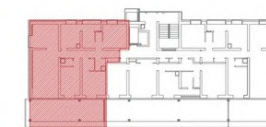
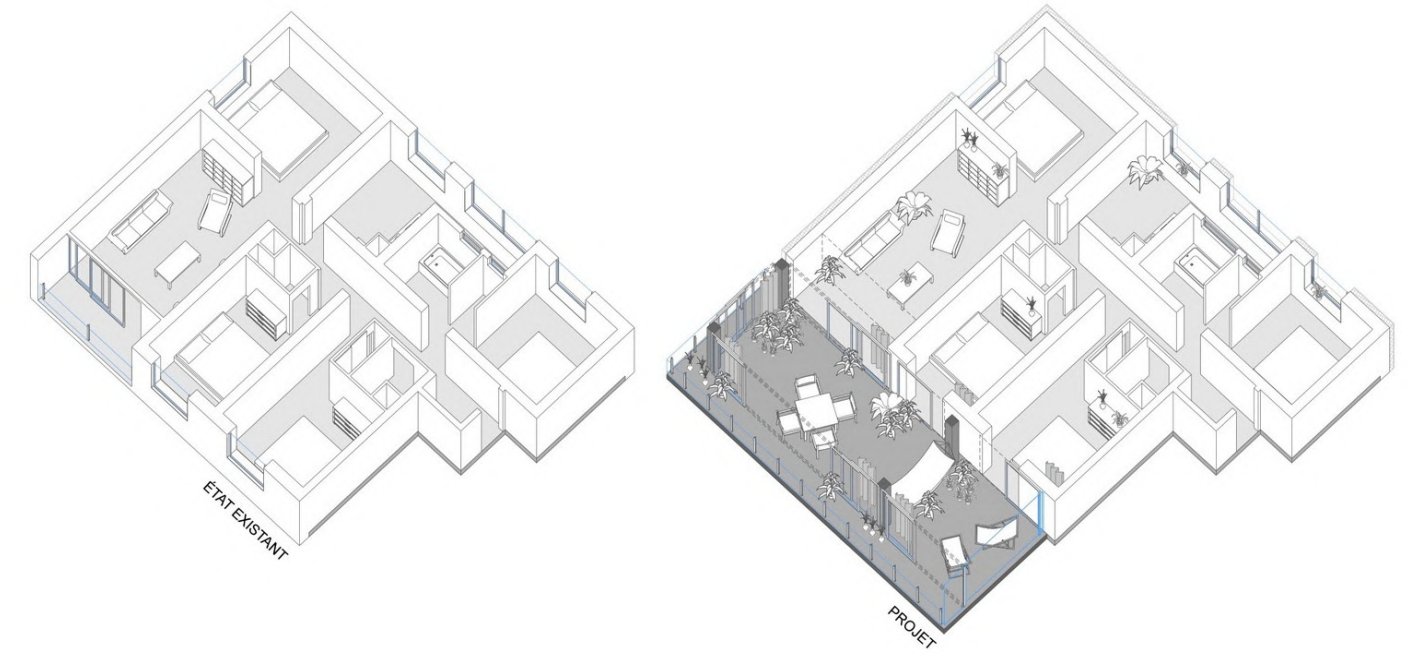
(Pintos, 2024)



(lacaton & vassal, 2017)



(Pintos, 2024)



GRAND PARC Haendel / Ingres - Escalier 1 + 3 + 5 - T5

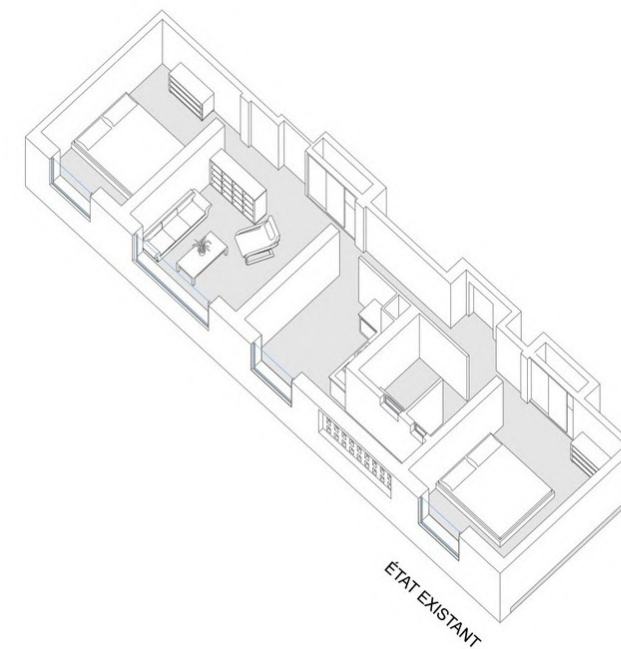
Surface habitable EXISTANT : 87,40 m2

Surface habitable PROJET : 123,40 m2

- Surface jardin d'hiver : 26,00 m2

- Surface balcon : 8,40 m2

(lacaton & vassal, 2017)



GRAND PARC Haendel / Ingres - Escalier 2 + 4 - T3



GRAND PARC Haendel / Ingres - Escalier 2 + 4 - T3

Surface habitable EXISTANT : 58,60 m2

Surface habitable PROJET : 118,90 m2

- Surface jardin d'hiver : 43,80 m2

- Surface balcon : 14,00 m2

(lacaton & vassal, 2017)

Design Guidelines

Accessibility



Inclusive Vertical Circulation: Incorporate new or upgraded elevators in high-rise buildings to improve access for all residents, as seen in the Cité du Grand Parc project.



Flexible and Adaptable Spaces: Design spaces with adaptability in mind, such as the “joker spaces” in the Kalkbreite Complex that accommodate changing resident needs. Allow for modular customization of interiors, enabling residents to create accessible layouts tailored to their mobility requirements, as demonstrated in Klussen aan de Klarenstraat.



Integrated Indoor-Outdoor Connectivity: Add winter gardens, balconies, and walkable roofs to provide accessible private outdoor areas, fostering mental and physical well-being (Cité du Grand Parc and Kalkbreite Complex).



Ground-Level Access: Create open and transparent ground-floor spaces with direct access to public areas, improving safety and convenience (Cité du Grand Parc and Kalkbreite Complex).

Safety



Structural and Foundation Upgrades: Ensure structural integrity by repairing or reinforcing foundations and façades, as seen in Een Blok Stad and Cité du Grand Parc.



Energy-Efficient and Safe Building Envelopes: Improve insulation, replace outdated windows with large, secure glass panels, and integrate fire-safe construction materials to enhance safety and sustainability (Cité du Grand Parc and Kalkbreite Complex).



Crime Prevention Through Design: Employ open, visually connected spaces on the ground floor to reduce opportunities for vandalism or theft while fostering community oversight (Een Blok Stad).



Safe Circulation: Provide wider stairwells, additional elevators, and well-lit common areas to ensure safe movement within the building (Cité du Grand Parc and Kalkbreite Complex).

Mobility



Community-Oriented Outdoor Spaces: Include shared courtyards, green roofs, and recreational areas to enhance mobility and foster social interaction (Kalkbreite Complex and Een Blok Stad).



Mixed-Use Integration: Combine residential, commercial, and cultural spaces within the same complex to reduce the need for long commutes and increase mobility within the community (Kalkbreite Complex).



Customizable Housing Units: Offer flexible housing options, allowing residents to tailor layouts for personal mobility needs, as illustrated in Klussen aan de Klarenstraat and Een Blok Stad.



Sustainable Transport Infrastructure: Incorporate facilities for bicycles, electric scooters, and pedestrian pathways to encourage environmentally friendly mobility (Kalkbreite Complex).

6.0 Observations & Fieldwork at Tarwewijk

6.1 Fieldwork Interviews in Tarwewijk

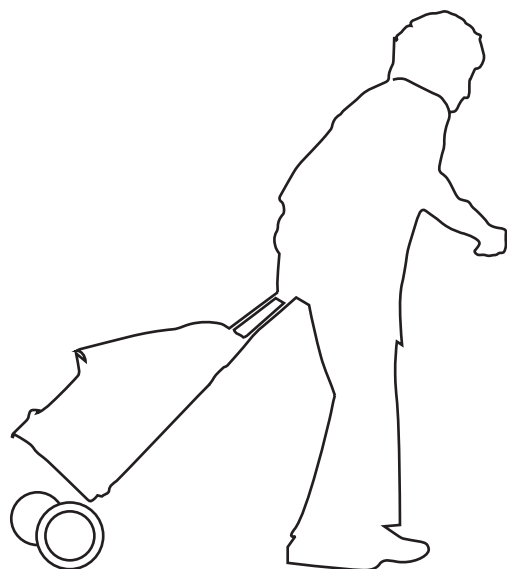


Gender: F
Age: 88

The interview was conducted with an 88-year-old woman who had a hearing impairment. When asked about the atmosphere of her neighbourhood, she expressed dissatisfaction with how things are now. In her opinion, the neighbourhood has become **dirty and overcrowded**. She was particularly concerned about the trash problem, noting that **waste management** isn't handled well. She mentioned that garbage often remains outside for days and people don't make the effort to properly dispose of their rubbish. She agreed that moving the trash bins closer and making them more accessible could help solve the issue.

Despite her concerns, she expressed her love for the proximity of **Zuidplein**. She enjoys having the **theatre and swimming facilities** nearby and mentioned that she was meeting her daughter at the theatre that day. It's only about a 10-minute walk, which she enjoys, but she is worried about being able to continue walking there as she ages. She agreed that **more resting spots, like benches along the way**, would give her the confidence to keep going to Zuidplein on her own.

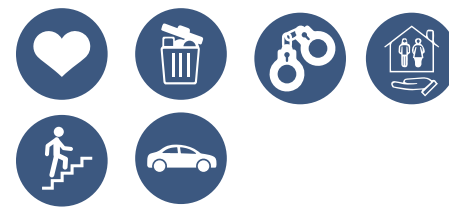
In the past, she lived in a single-family home but has since moved into a flat. She feels more isolated in her current living situation. Something, possibly a verandah or a wall, obstructs **her view**, making it harder for her to enjoy looking outside like she used to. She mentioned missing the **stairs** from her old home, which kept her active. Now that she rarely uses



stairs, she feels this contributes to her stiffness.

She praised Millinxstraat for having a lovely atmosphere, describing it as **"gezellig" due to the neighbourhood's social initiatives**. However, she acknowledged that many people hesitate to participate in these events because it can be intimidating to go alone for the first time. She herself only felt comfortable going to an event because she went with her sister. But by taking that first step, she has now been able to build a nice social network with people from this neighborhood initiative, and she talked about this with enthusiasm. Regarding green spaces in the neighbourhood, she noted that residents are largely responsible for maintaining them themselves.

While we were conducting the interview on the pavement, a hurried lady tried to push past, which startled the elderly woman, who was already disoriented due to her hearing impairment and the unexpected encounter. This incident also highlighted that the **pavement lacks sufficient space**.

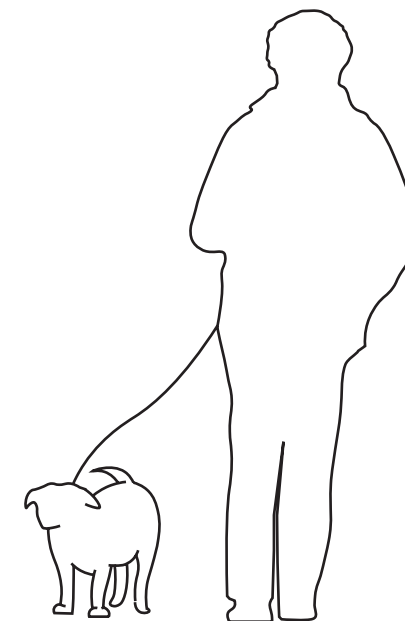


Gender: F
Age: 69

The woman, aged 69, lives near Zwartewaalstraat and was walking her dog in the park during the interview. She mentioned being close with a **community of fellow dog owners**, which gives them a shared bond as they walk through the neighbourhood together. However, she expressed concerns about the current state of the neighbourhood. According to her, during the past years, it has become much more crowded, and there is a significant issue with trash, as **rubbish is often left unmanaged**.

A major concern for her is the rise in **criminality**. She shared that a neighbour on Dordtselaan recently experienced a break-in, which left the community shaken. As a result, she has added another **lock to her door for extra security**, and she is worried about the lack of safety. She emphasized the importance of keeping private properties secure but noted that there is **no visible presence of a wijkagent (neighbourhood police officer) or other forms of security in the area**. In her 58 years of living there, she has never seen such problems. She attributes much of the criminal activity to youth loitering in the streets, and she feels unsafe, particularly at night when the streets are often littered with trash.

Reflecting on the past, she mentioned that Mijnsheerelaan and Dortselaan used to be beautifully designed areas, but they no longer have the same appeal. Having lived in the same house for 58 years,



she feels like one of the oldest residents on her street and has witnessed many changes.

She also commented on the new buildings coming up in the neighbourhood, which she sees as a positive development. These new buildings, including some higher ones designed for **social housing**, are important, in her view, as they help promote social cohesion and provide essential housing for low-income individuals and those on welfare. Her experience working in Thuiszorg (home care) made her aware of the need for care and the challenges of poverty in the area.

She pointed out that many of the houses in the area are not designed for people with disabilities, particularly because **they have too many stairs**. Although she doesn't currently struggle with mobility, she is concerned that this could become an issue in the future. She still owns her own property but remarked that many of the homes are **old and damp**, which can be problematic.

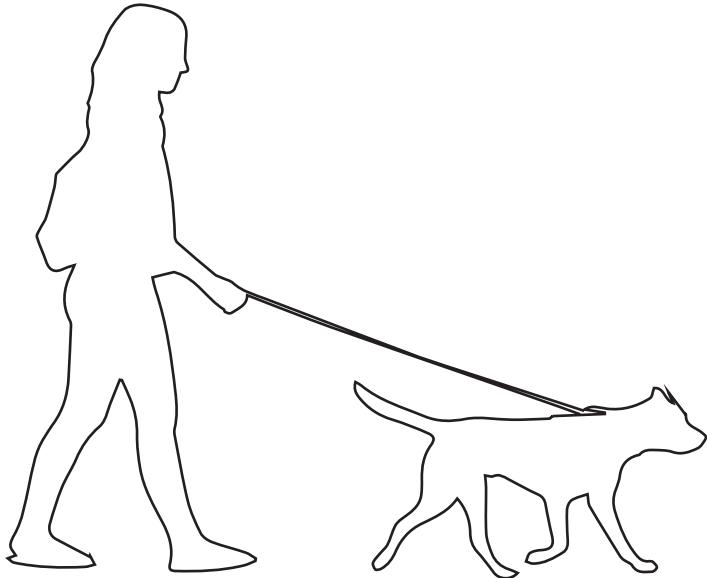
Having worked in Thuiszorg before retiring, she no longer sees the need for a car, though she is overwhelmed by how **car-dominated** the neighbourhood has become. She emphasized the importance of green spaces and appreciates the proximity of Zuiderpark. Although there are neighbourhood initiatives, she chooses not to participate, seeing no reason to get involved.



Gender: F
Age: 36

The woman, in her late 30s, has lived in Tarwewijk for the past two years. This woman clearly has a **migration background**, as she has not yet fully mastered the Dutch language and does not speak English. She mentioned that one of the things she enjoys most about the neighborhood is the convenience of having **shops** nearby. She works at a **daycare** facility and finds the accessibility of the neighborhood a big advantage. It is well-connected by **metro, tram, and train**, and she appreciates its proximity to Zuidplein, making it easy to move around.

She remarked that getting to know people in the neighborhood has been relatively easy for her. She is familiar with the local **church** organization, which organizes food for the homeless and other charitable activities, something she values within the community. She feels quite safe in the neighborhood, both during the day and at night. She attends Dutch classes and enjoys the diverse **mix of cultures and ethnicities** in the area, which she finds interesting and enriching.



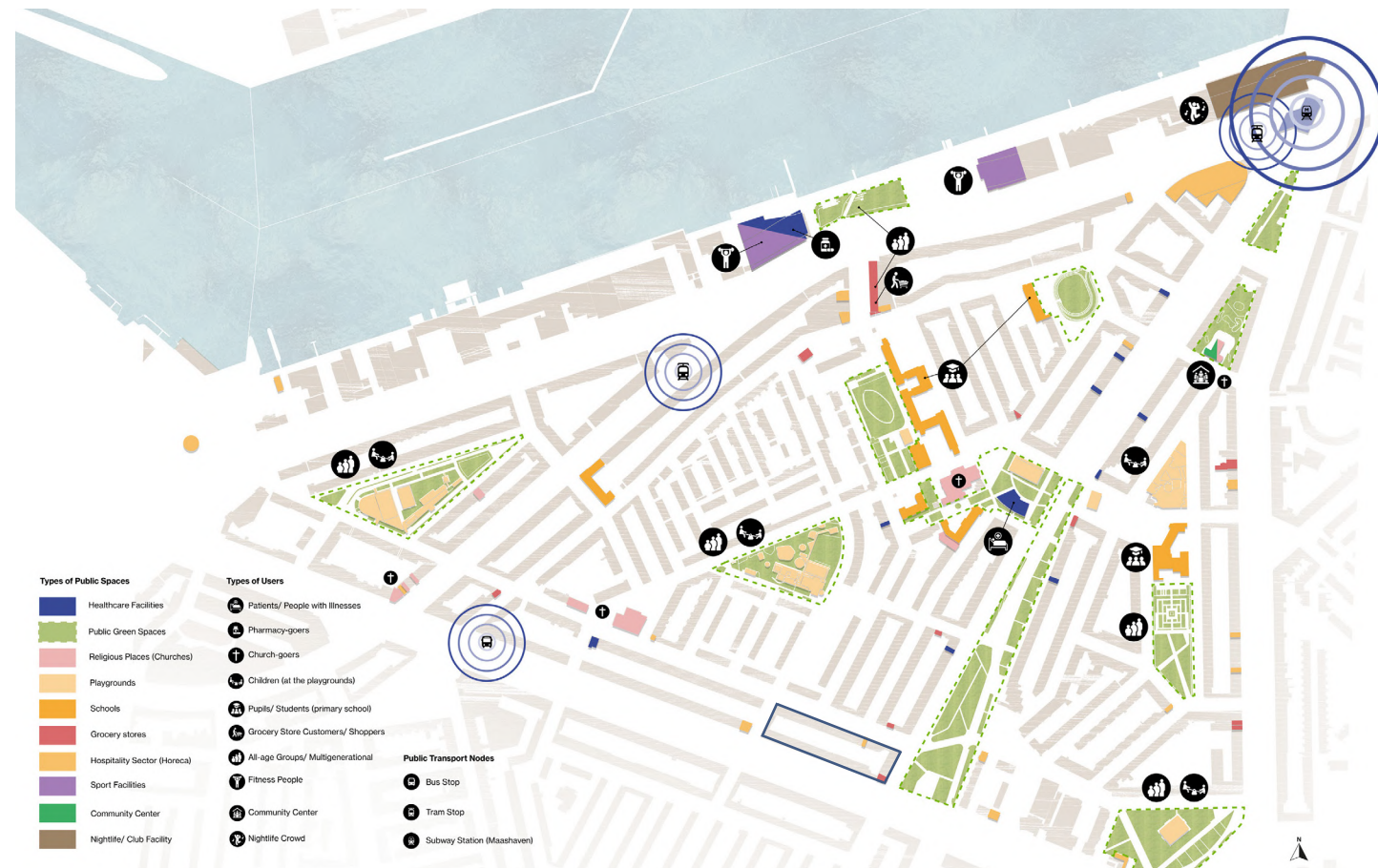
6.2 Spatial Mapping: Cluttered Sidewaks



The cluttered streets shown in the images, taken at various points throughout Tarwewijk, illustrate a pressing issue of improper trash management, which significantly impacts the accessibility and usability of pavements. Overflowing garbage bins, scattered waste, and improperly discarded items encroach on pedestrian walkways, making it difficult for individuals to navigate the area safely, particularly for those with mobility challenges such as older adults, wheelchair users, or parents with strollers. This lack of cleanliness not only creates physical barriers but also contributes to a sense of neglect in the neighborhood, discouraging community engagement and outdoor activities. Effective waste management systems and community-driven initiatives are essential to restore order, improve accessibility, and foster a healthier urban environment.



6.3 Observations: Types of Users & Occupancy Public Spaces



AR3AD110 Dwelling Graduation Studio. (2024). Types of users in public spaces in Tarwewijk.

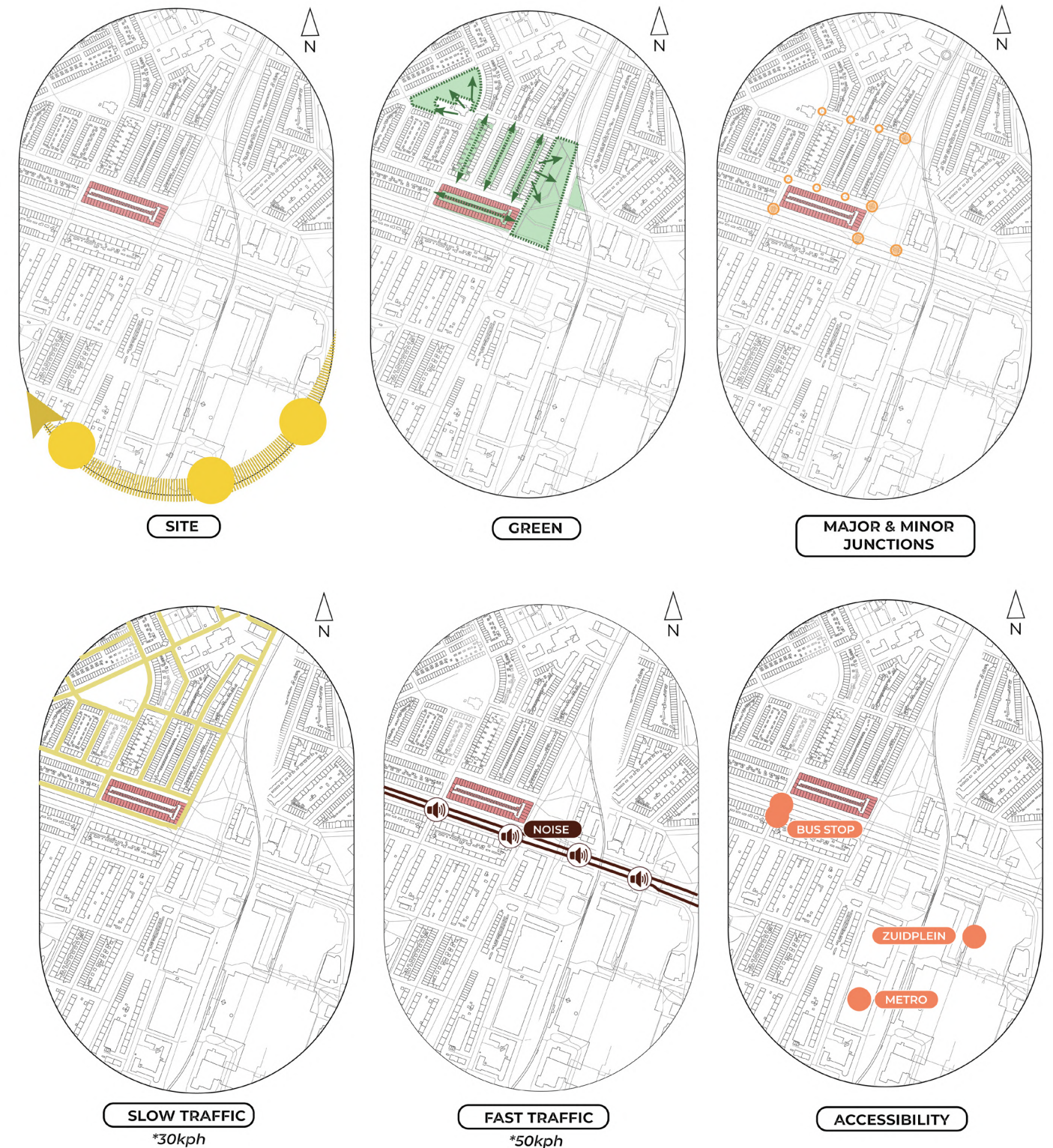
The map above provides an overview of the public spaces in Tarwewijk and identifies the types of users frequenting these areas. The large parks, for instance, are predominantly occupied by middle-aged and older men, particularly during daytime and early afternoon hours. These spaces are often underutilized by other demographic groups, creating a sense of exclusivity that discourages broader community engagement.

Similarly, the green strip under the metro line sees moderate activity during weekday mornings and afternoons but is less frequented in the evenings, likely due to safety concerns and inadequate lighting. Playgrounds, on the other hand, experience cyclical use patterns. They are bustling with children and caregivers during

lunchtime and after-school hours on weekdays, reflecting their importance as family-oriented spaces. However, during weekends, these areas often appear deserted due to the absence of organized activities or volunteers to maintain a sense of community engagement and safety.

This uneven utilization of public spaces underscores the need for more inclusive and diverse programming to cater to different age groups, genders, and time schedules. Improvements such as better lighting, volunteer-led activities, and safety measures could encourage broader usage and foster a more vibrant, community-oriented atmosphere.

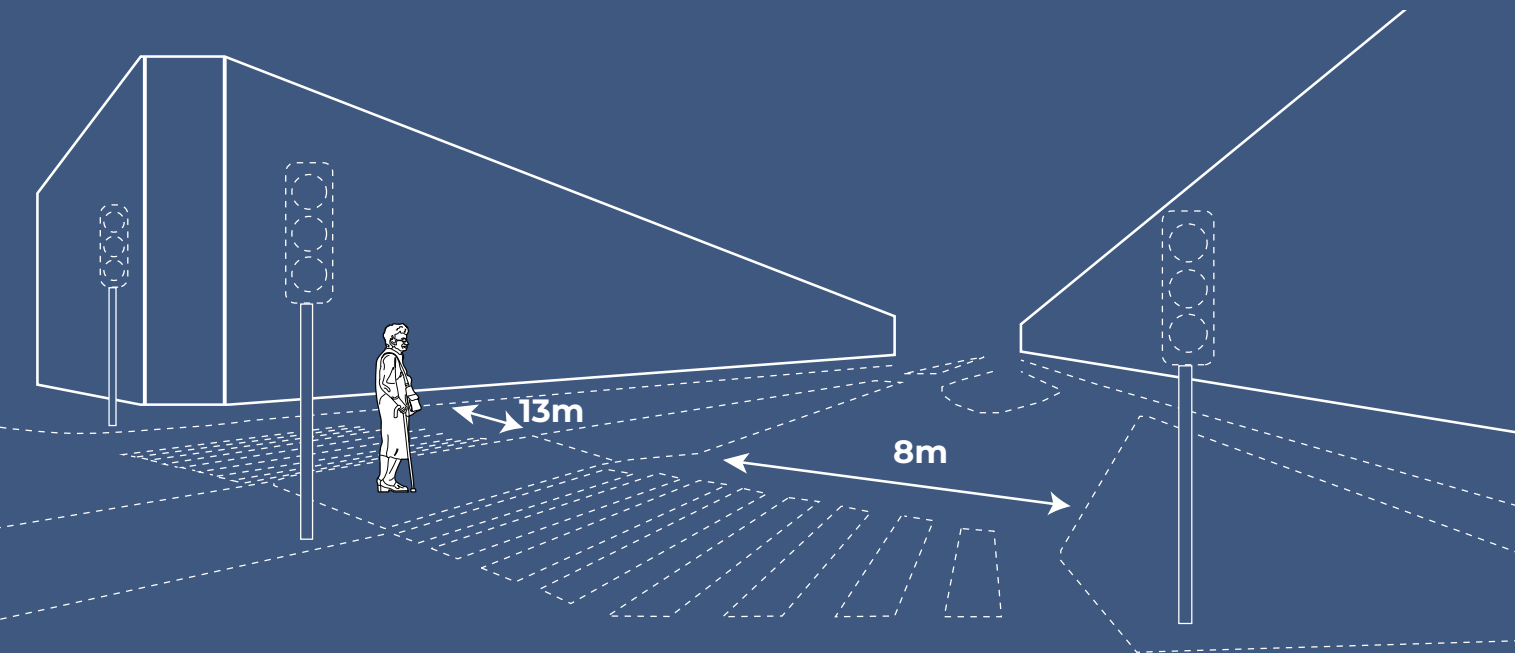
6.4 Site Analysis: Chosen Site



6.5 Observations & Spatial Mapping

The selected site is situated at the edge of Tarwewijk, positioned at a busy corner facing high-traffic roads with speed limits of 50 km/h. The crossing comprises a 13-meter stretch with a median refuge, followed by an additional 8-meter section—a critical connection for pedestrians traveling to Zuidplein. However, during a fieldwork trip simulating limited mobility and vision (using a wheelchair and blindfold), we identified significant challenges: uneven paths made navigation difficult, and the crossing time was too short to safely traverse both sections. Additionally, the absence of resting spots further discourages older adults or those with limited mobility from traveling longer distances.

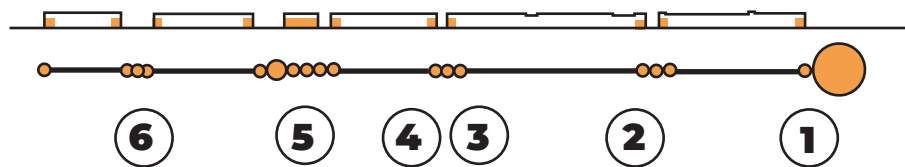
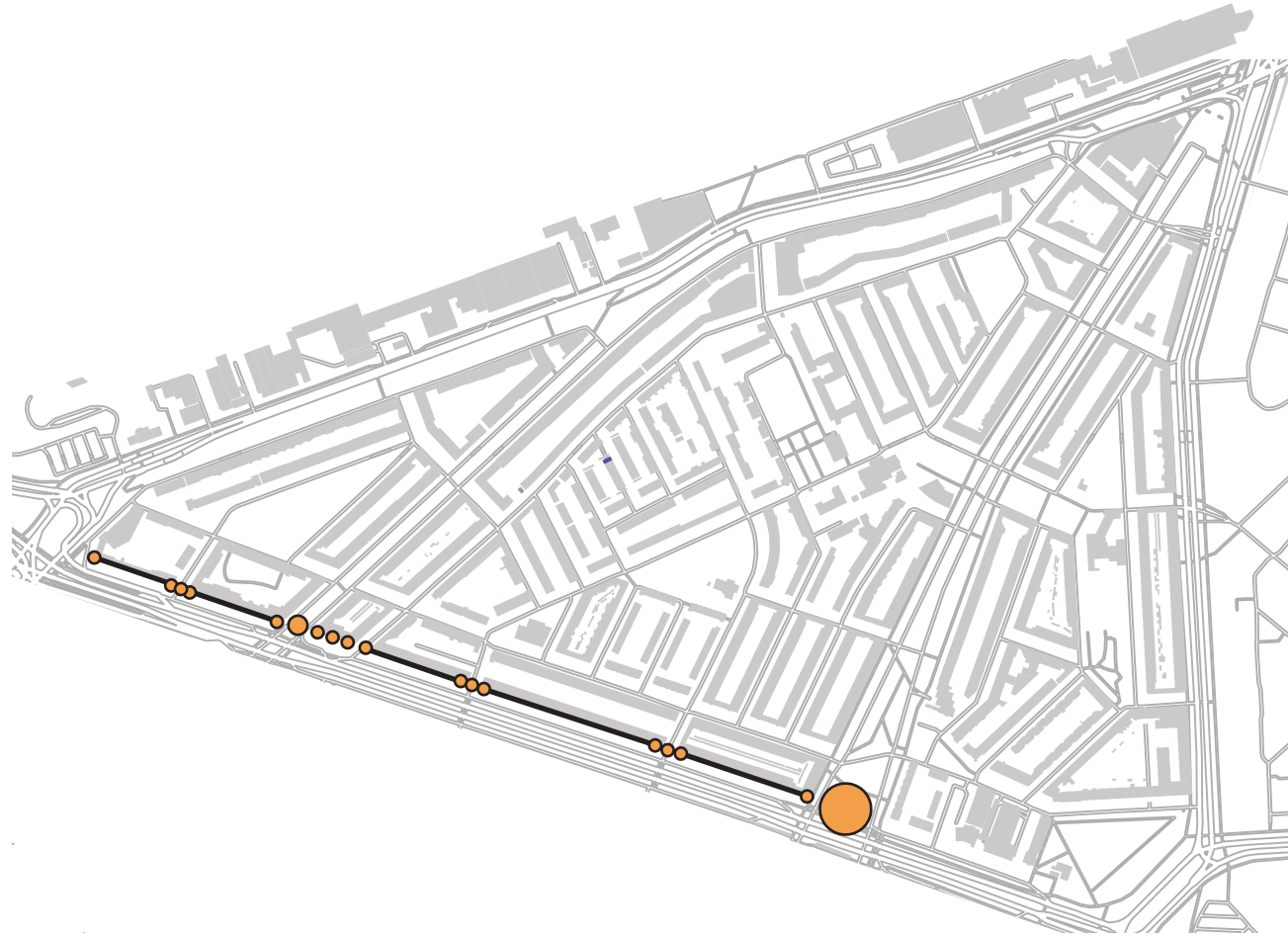
Improvements could include adding resting places at the median or at either end of the crossing to offer breaks for individuals with reduced stamina. Extending the crossing time slightly would also create a safer and more accessible environment for pedestrians, particularly those with limited mobility or vision. These changes would enhance inclusivity and encourage greater use of the area by all age groups.



This section of the site highlights a cluttered street overwhelmed by unmanaged trash, scattered objects, and double rows of parked cars. The crowded environment leaves limited space, discouraging children from playing on the sidewalk. During fieldwork, we observed a deaf woman struggling to navigate the area due to numerous obstacles and the lack of clear, accessible pathways. There is significant potential for improvement by reducing car dominance on the street, reclaiming space for pedestrians, and introducing more greenery. These changes could create a safer, more inclusive, and inviting environment for all users, particularly children and individuals with mobility challenges.



6.5 Observations & Spatial Mapping



The absence of safety in Tarwewijk is exacerbated by long, featureless facades (indicated by black lines), which lack the rhythm and engagement typically provided by shopfronts or open connections to streets and parks (by orange circles).

“eyes on the street,” diminishing natural surveillance and contributing to a sense of insecurity. This mono-functional character of the neighborhood discourages lingering or social interaction, amplifying feelings of unease and detachment in public spaces.

The presence of drawn curtains and blinds on these facades further reduces visual interaction with the street. Despite housing being located on the ground floor, there is a noticeable lack of



Images of street corners and shop-fronts along Pleinweg, Tarwewijk

Design Guidelines

Accessibility



Resting Spots: Install benches or seating along frequently used pedestrian routes, such as the path to Zuidplein. These should be spaced at regular intervals to support elderly residents and those with limited mobility.



Trash Bin Placement: Design waste collection points closer to residential areas and ensure they are accessible, user-friendly, and visually unobtrusive. Provide clear signage and sheltered, enclosed spaces for trash bins to prevent littering.



Barrier-Free Design: Design new buildings and public spaces to meet universal accessibility standards, including ramps, elevators, and wide entrances. Ensure homes have minimal stairs or incorporate alternatives like elevators.

Safety



Visible Security Features: Integrate well-lit streets and alleys, avoiding dark corners. Include visible, approachable wijkagent stations or other neighborhood security presences.



Safe Pavement Design: Widen pavements where possible to accommodate pedestrians, mobility aids, and those with sensory impairments. Use non-slip, level surfaces to- reduce hazards.



Community Surveillance: Incorporate "eyes on the street" concepts by orienting balconies, verandahs, or windows to face public spaces, improving natural surveillance and fostering a sense of safety.

Mobility



Implement shared street designs or restrict car access to reduce double parking and prioritize pedestrians and cyclists.



Introduce designated parking zones away from sidewalks, freeing up space for pedestrians and other activities.

III. Conclusions & Design Guidelines

7.0 Conclusions

Conclusions on Physical Facets:

Accessibility

How can architectural design ensure comprehensive accessibility in living spaces, including clear wayfinding systems and intuitive layouts, allowing for easy navigation and use of amenities for aging residents?

Comprehensive accessibility begins with eliminating physical barriers and ensuring that spaces are designed to be intuitive and inclusive. In the compact and dense portico flats of Tarwewijk, the lack of elevators, narrow entrances, and steep staircases limit accessibility, especially for older adults or individuals with disabilities. Retrofitting these buildings with elevators and garden-side galleries would ensure accessibility to all floors without major structural disruptions. Wider entrances, step-free thresholds, and ramps should also be integrated into both residential and public buildings.

Wayfinding systems play a critical role in accessibility, especially for residents with cognitive impairments. Using contrasting colors, tactile indicators, and clear signage can guide individuals through spaces easily. For instance, pathways with textured surfaces can help individuals with visual impairments navigate safely, while intuitive layouts with clear sightlines and logical zoning reduce confusion. Key communal amenities, such as elevators and mailboxes, should be located centrally and designed for ease of use.

Drawing from the Ecological Model of Aging, these strategies focus on maintaining a balance between individual capabilities and environmental demands. Creating spaces where aging residents can seamlessly transition between independent and assisted living, as seen in Liv Inn Hilversum, ensures long-term usability. Additionally, integrating accessible outdoor areas, such as communal gardens with paved paths and raised planters, allows residents to engage with nature and their community.

Safety

What design strategies can enhance the physical safety of housing and public spaces?

Safety in housing and public spaces can be addressed through a combination of physical interventions and programming. In Tarwewijk, the absence of “eyes on the street” due to long blind façades and mono-functional zoning contributes to feelings of insecurity. Transforming ground-floor housing units or closed shopfronts into active spaces such as cafés, community hubs, or workshops can encourage engagement and natural surveillance. Transparent façades with well-lit interiors help activate streets, making them safer for all users.

Improved lighting in dimly lit pathways and parks, particularly those under the metro line, can enhance visibility and discourage crime. A community-driven approach, such as neighborhood watch programs or resident-led maintenance initiatives, fosters a greater sense of ownership and safety.

Physical safety measures like protective railings at crossings, widened sidewalks, and separated pedestrian zones can reduce risks, particularly for older adults. Inclusive design should consider emergency response accessibility, ensuring wide pathways and clear routes for vehicles like ambulances and fire trucks. Incorporating disaster-resilient designs, such as flood-proof public areas, further enhances safety in the context of climate change.

Mobility

How can architectural design encourage active aging by supporting ongoing mobility and physical engagement as residents age?

Architectural design can facilitate ongoing mobility by creating environments that accommodate a range of physical capabilities while promoting active lifestyles. In Tarwewijk, uneven pavements, cluttered streets, and insufficient crossings impede movement, particularly for older adults and individuals with limited mobility. Introducing smooth, well-maintained pathways with tactile paving, accessible ramps, and ample room for wheelchairs or mobility aids would significantly enhance usability.

Resting spots placed strategically along pathways—such as benches near crossings or shaded seating in green spaces—help older adults navigate longer distances. Crossings at key locations near the site, require wider medians with resting opportunities for individuals with reduced walking speeds.

Inspired by Sheller’s Mobility Justice Framework, which highlights the uneven distribution of mobility access across social and physical demographics, the design should support inclusive and equitable movement. Prioritizing shared-use paths (pedestrians, cyclists, and scooters) can foster mobility for all ages. Designs that encourage active transport, such as bike-sharing stations, integrated parking solutions, shared mobility, and pedestrian-friendly streets, align with global trends in creating age-friendly cities.

Conclusions on Social Facets:

Accessibility

How can architectural design promote participation in social activities, community engagement, and routine tasks, fostering an inclusive environment for individuals with diverse abilities?

Inclusivity in architectural design means accommodating the diverse needs of all community members, from children to older adults, and people with disabilities. In Tarwewijk, creating spaces that blend public, semi-public, and private zones can foster diverse interactions while respecting personal boundaries. For example, transforming the cluttered streets into pedestrian-friendly boulevards with adjacent seating and small kiosks can encourage both spontaneous and planned engagements.

Programming outdoor areas with events like markets, fitness classes, or movie nights ensures consistent usage, which enhances community engagement. Adaptive spaces that can host various activities, such as flexible rooms for book clubs, art workshops, or language classes, accommodate the neighborhood’s cultural and demographic diversity. Accessibility enhancements, such as ramps and tactile paving, ensure that individuals with mobility or sensory impairments are included in these activities.

Inspired by the Liv Inn Hilversum model, communal spaces in residential buildings could include shared kitchens, lounges, or roof terraces. These spaces, paired with participatory governance models, empower residents to take ownership of their environment, fostering a sense of belonging and inclusion.

Safety

How can community engagement and natural surveillance be fostered to improve the perceived safety of vulnerable populations?

Safety in housing and public space must be understood as both physical protection and psychosocial comfort, particularly in multicultural neighborhoods like Tarwewijk, where norms around privacy, gender roles, and visibility shape how residents engage with space. In this context, safety is not just about crime prevention, it is also about control, familiarity, and spatial autonomy.

In Tarwewijk, the lack of “eyes on the street” due to long, inactive façades and mono-functional zoning reduces the perception of safety, especially for elderly residents and women. Transforming ground-floor housing or vacant shopfronts into community-oriented spaces can activate public edges and create natural surveillance. This kind of social programming, combined with transparent façades and well-lit interiors, fosters both visibility and belonging. For many diasporic residents, particularly from Moroccan and Turkish backgrounds, safety is also linked to gendered spatial boundaries. Creating layered transitions between public and private space, such as semi-enclosed porches or curtains at thresholds, allows residents, especially women, to participate in public life without unwanted exposure. Such design moves enhance both cultural safety and spatial agency.

Features such as protective railings, widened sidewalks, and pedestrian-priority crossings reduce fall risks for older adults. Designs should also account for emergency accessibility, ensuring clear, wide pathways for ambulances and fire services. In the face of climate change, flood-resilient infrastructure and raised communal spaces help protect vulnerable populations.

Mobility

How can architecture create opportunities for active aging that foster social and cognitive engagement?

Equally important are spatial strategies that foster social mobility, the opportunity to remain engaged with others through proximity-based interaction. Shared indoor and semi-public spaces, such as galleries, verandahs, continuous balconies, and communal courtyards, offer older residents low-threshold ways to step outside and connect with their surroundings. These transitional zones between private and public space, where one might greet a neighbor, sit for a while, or observe street life, help maintain a sense of rhythm, visibility, and community belonging without requiring formal participation or long travel.

Designing for mobility, then, means not only removing obstacles but actively creating conditions for movement that is social, safe, and intentional. In aging, multi-ethnic communities, these micro-mobilities—stepping out to water plants, walking to a bench, or pausing in a shared stairwell—are what allow people to stay active and connected in place.

Case studies like Kalkbreite Complex highlight the importance of shared spaces in fostering social bonds. The integration of communal dining areas, shared laundry facilities, and group meeting rooms can replicate these successes. Locally, this could be implemented by repurposing underused ground-floor spaces into collective areas that support both routine and creative activities, promoting interaction and reducing isolation.

7.1

Design Guidelines

	Accessibility	Mobility	Safety
Neighborhood Level	 Shared Street Design Implement shared street designs or restrict car access and prioritize pedestrians and cyclists	 Rest Nodes Benches should be placed approximately every 50 meters to allow older people to rest and encourage walkability.	 Active Street Edges Ground-floor units or blind facades can be opened up to introduce more eyes on the street.
Building Level	 Elevators and Garden Galleries Install elevators and garden-side galleries to enhance access, particularly for older or individuals with limited mobility	 Avoid Long Hallways: Minimize long, narrow hallways that restrict mobility, and increase the risk of isolation or confusion for aging residents	 Encouraging Vital Frictions Incorporate balconies, verandahs, and shared spaces to support casual resident encounters, strengthening social inclusion and perceived safety.
Apartment Level	 Culturally Responsive Layouts Provide layouts that can be easily modified over time to suit changing family compositions and caregiving roles.	 Integrated Indoor-Outdoor Connectivity Add winter gardens, balconies, and walkable roofs to provide accessible private outdoor areas, fostering mental and physical well-being	 Privacy-Enhanced Thresholds Design spatial thresholds—between rooms or between public/private—to support privacy, personalization, and cultural norms, enhancing safety and comfort within the home.

7.2

Reflection

This research explored how the design of housing and public space can support active aging. Active Ageing described by the World Health Organization as the process of maximizing opportunities for health, involvement, and safety to improve quality of life in older age. In Tarwewijk, a Rotterdam neighborhood marked by both physical aging and cultural diversity, active aging is challenged not only by architectural barriers, but by spatial assumptions that fail to reflect how older adults actually live, move, and connect.

Aging in Place: More Than Staying Put

For the older residents of Tarwewijk, many of whom are first- or second-generation Moroccan, Turkish, or Surinamese migrants, “aging in place” is about far more than remaining in one’s apartment. It is about maintaining control over one’s environment, navigating familiar streets, maintaining social roles, and accessing care within trusted networks.

Current housing models in the neighborhood, particularly the portico flats (Haagse portieken), offer limited adaptability for changing physical or social needs. Narrow staircases, poor lighting, and rigid internal layouts undermine mobility and accessibility. Moreover, the social and cultural diversity of the area is often flattened by standardized housing that assumes normative lifestyles of typically Dutch, nuclear, and middle-class.

Built Social Infrastructure and Vital Frictions

Active aging also depends on the ability to interact with others casually, safely, and regularly. This means not only maintaining strong personal ties, but being part of public social life. As Sheller (2020) argues, “vital frictions”, i.e. unplanned encounters in doorways, gardens, or shared halls, foster a sense of belonging and reciprocity that formal systems alone cannot provide.

Yet many of Tarwewijk’s physical systems hinder these frictions. Buildings lack communal rooms or transitional spaces; streetscapes lack seating or visibility; thresholds between public and private are often abrupt or absent. Without built social infrastructure, informal care and community life fragment, especially for older residents with limited mobility or language barriers.

The solution lies in rethinking space as a facilitator of care, connection, and cultural expression. Benches at regular intervals, semi-public stoops, or shared balconies are small interventions with significant impact. They allow older residents to see, be seen, and be involved, not merely as recipients of care but as active participants in community life.

Redefining safety, mobility and accessibility

Safety and accessibility are traditionally framed in technical terms, ramps, grab bars, elevators, but in Tarwewijk, they also take on social and cultural dimensions. Residents feel unsafe not just because of stairs or poor lighting, but because of social isolation, cultural mismatch, and fear of surveillance. Safety, in this sense, is relational: it emerges from recognition, familiarity, and spatial legibility.

Mobility, too, must be redefined. It is not just about reaching destinations, but about moving with dignity and confidence through one's environment. This is particularly crucial in a neighborhood like Tarwewijk, where older adults often walk to local shops, mosques, or family homes. Accessible public paths, rest nodes, visual continuity, and clear signage are not just conveniences, they are enablers of autonomy.

Cultural accessibility is equally essential. Kitchens that can be enclosed, thresholds that can be personalized, and living spaces that support extended families are not "special accommodations" rather as expressions of spatial justice. A home that aligns with one's cultural practices supports not only physical ease but psychological well-being and social participation.

Designing with Difference, Not Against It

To design truly age-inclusive housing in neighborhoods like Tarwewijk is to embrace difference as a generative condition, not a constraint. It requires moving beyond generalized models of "older residents" and engaging with the real, situated needs of culturally diverse aging populations. It demands that we see mobility not only as movement, but as participation; safety not only as absence of harm, but presence of care; and accessibility not only as compliance, but as cultural recognition.

In this light, the design guidelines presented are not end points, but tools for ongoing negotiation between built form and lived experience. They support older adults not just to stay in place, but to live well in place, socially, physically, and culturally connected.

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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

Authors:
Dean Simson
Mara Popescu
Jasper Holtus
Shreya Sen

Tutors Research:
Leo Oorschot

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:

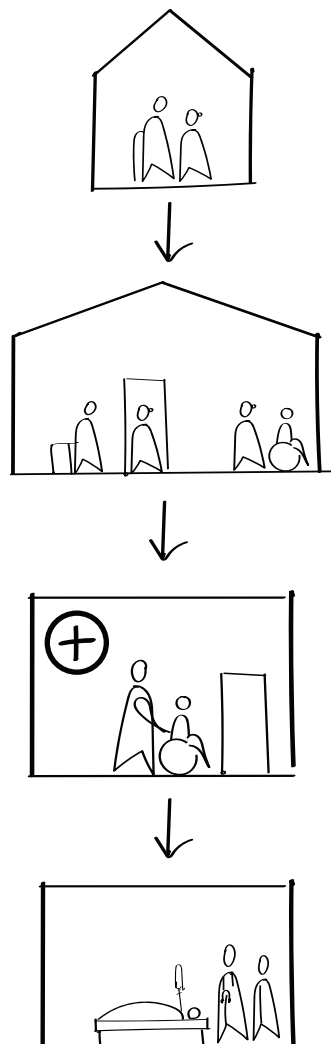
- When living alone becomes difficult, people move to an elderly home.
- Basic care and assistance are provided, but the transition can feel disruptive and disempowering for many.

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

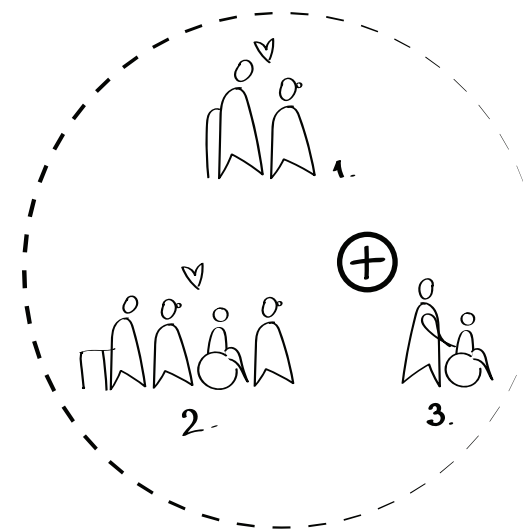
- Residents at the complex live independently in apartments designed for aging in place.
- Apartments are adaptable to evolving care needs, eliminating the need for relocation.
- Encourages ownership, autonomy, and personalization of living spaces.

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



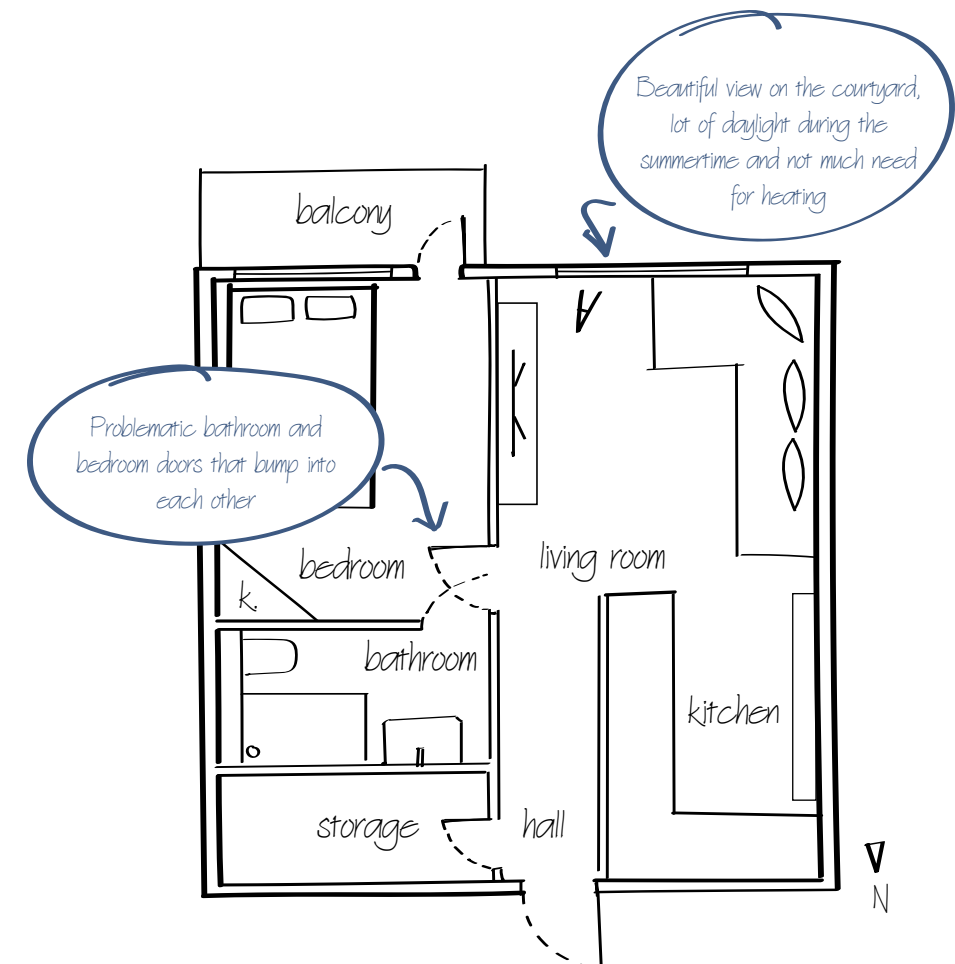
Name: P
Gender: F
Age: 70
Persona: The Volunteering Group



- 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 he 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

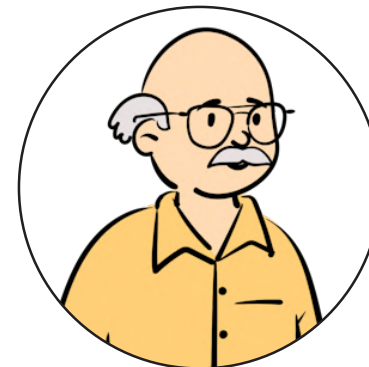
Personas at Liv Inn



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

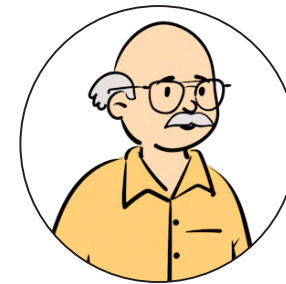
- She would like a real piano, but it was not allowed. She would also like a heated swimming pool and a sauna.

- 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

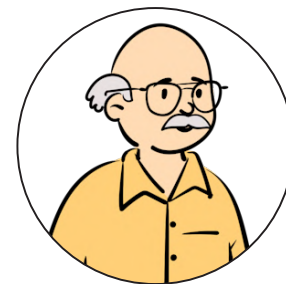
- The light switch on the hallway is hard to access behind the space appointed for hanging coats.

- 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.



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.



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.

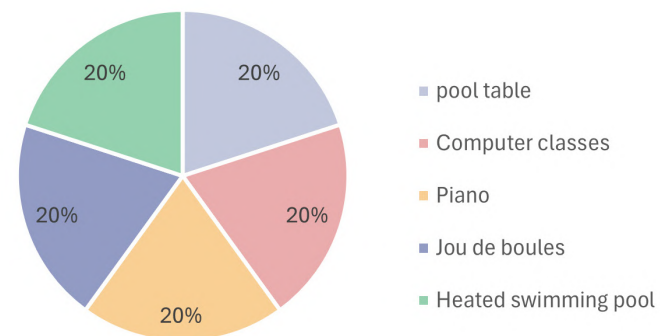
- She does not feel alone because it is a big community.

08 Quiz

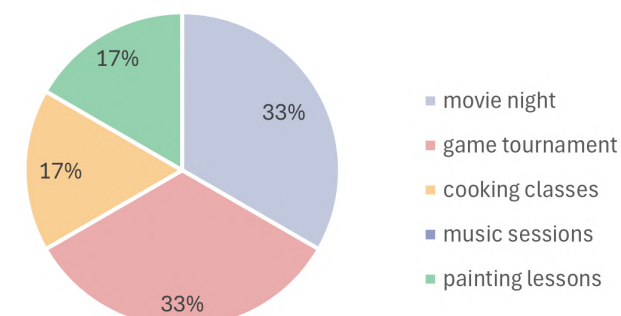
To get to know the residents better informally, a quiz was created that they could fill in. The quiz was composed of questions regarding ideal improvements from the residents' point of view, preferred outdoor and indoor activities, suggestions for room additions, and more. A few questions had an open 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.

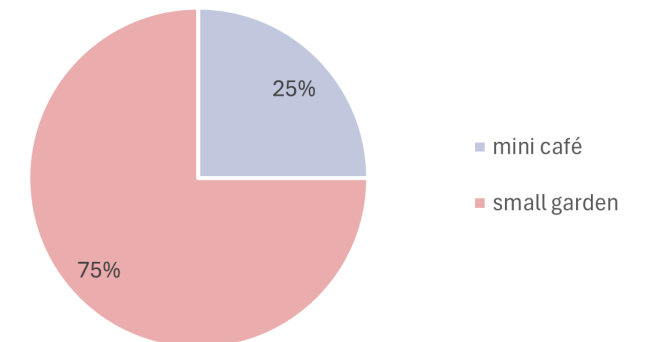
If you had won €5000, what would you want to buy for the Liv Inn?



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

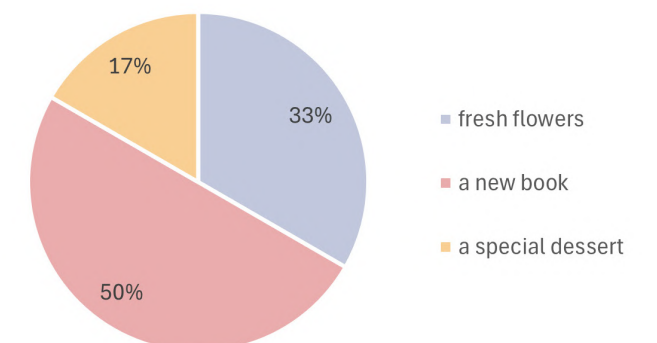


Would you rather have a mini cafe to relax in or a small garden to help maintain?

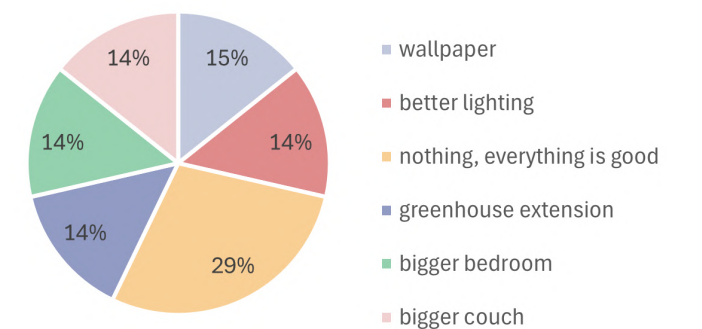


Among the residents choosing the small garden, it was mentioned that the garden should be in the sun, and a cafe would be too busy for them. Among the residents choosing the cafe, it was specified that the cafe should be open daily.

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



What would you change to make your apartment cozier?

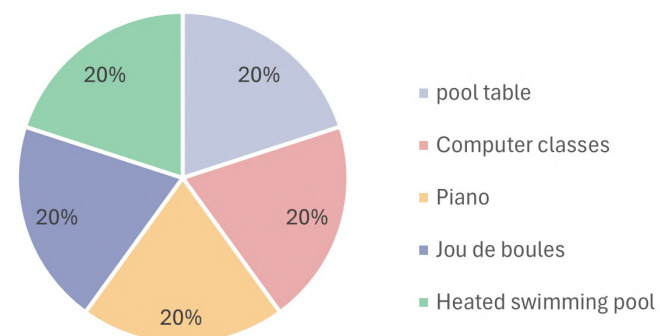


08 Quiz

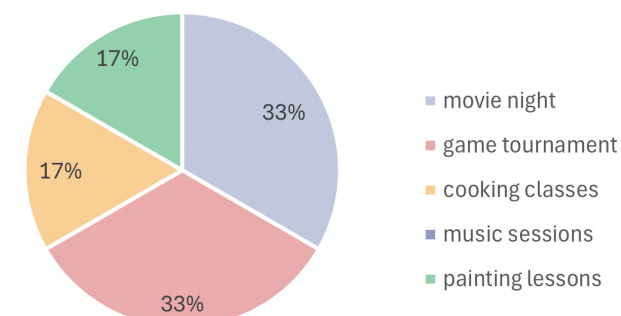
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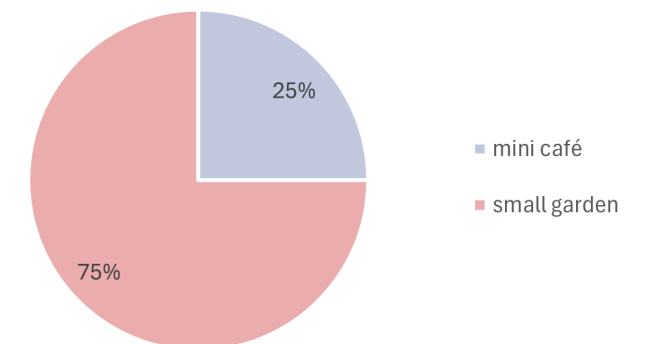
If you had won €5000, what would you want to buy for the Liv Inn?



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

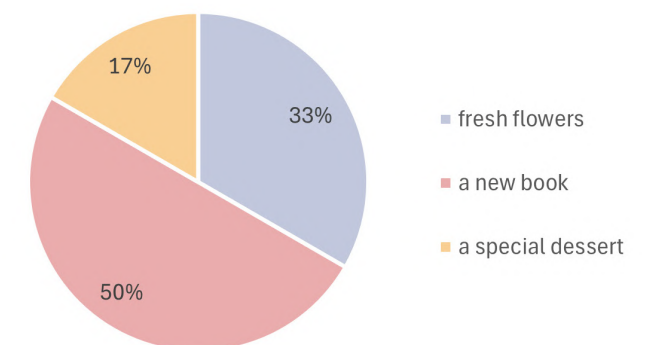


Would you rather have a mini cafe to relax in or a small garden to help maintain?

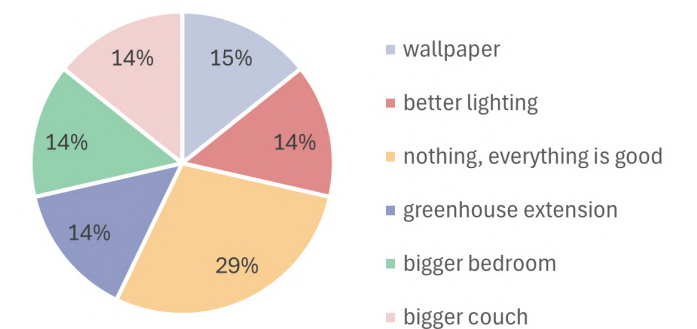


Among the residents choosing the small garden, it was mentioned that the garden should be in the sun, and a cafe would be too busy for them. Among the residents choosing the cafe, it was specified that the cafe should be open daily.

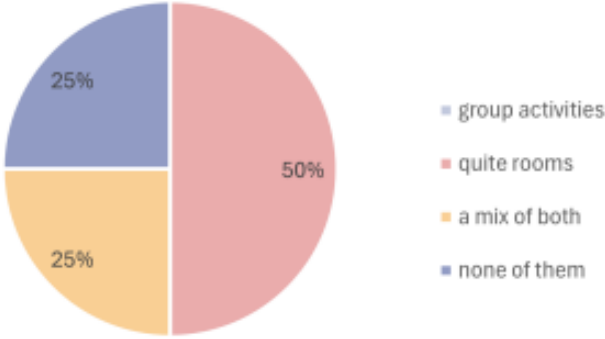
Suppose that every week you could get a personal delivery. What would you choose?



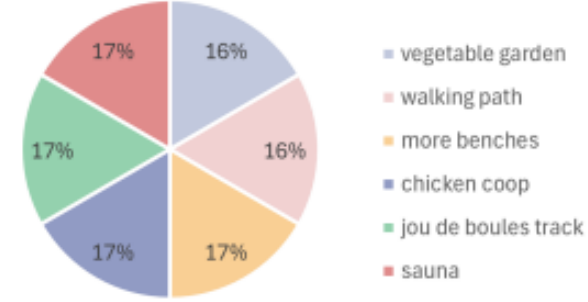
What would you change to make your apartment cozier?



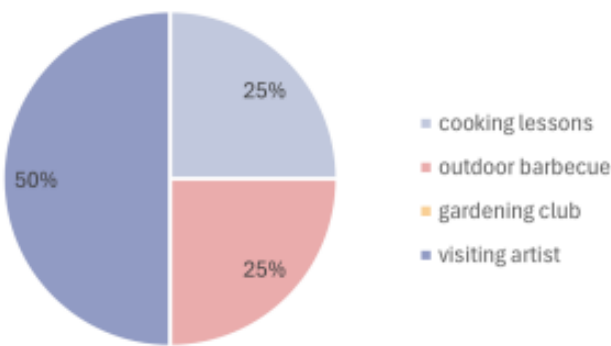
Would you rather have more group activities, more quite and relaxing rooms or a mix of both?



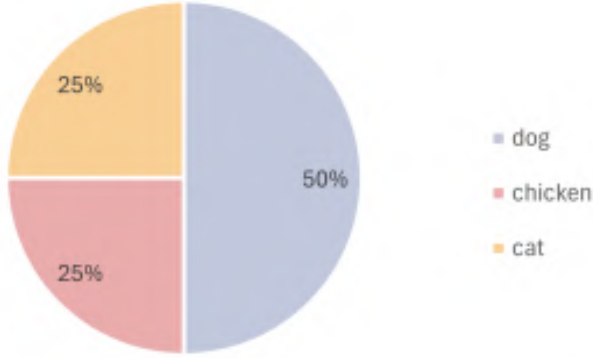
If you could have one new outdoor facility, which one would you rather have?



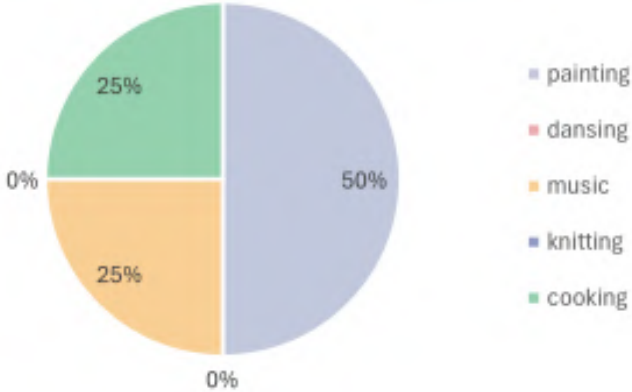
If you could organize one special monthly activity, what would that be?



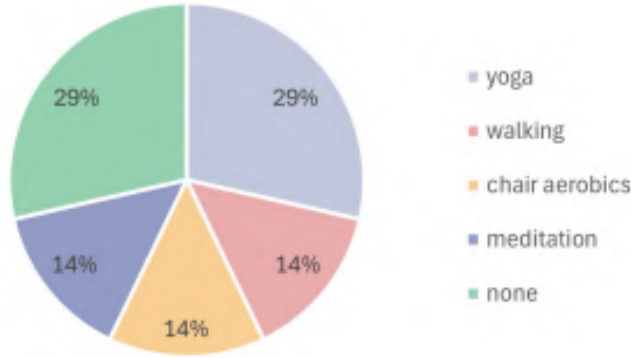
If you could have a small pet at Liv Inn (e.g. a fish, a bird, etc.), what would that be?



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

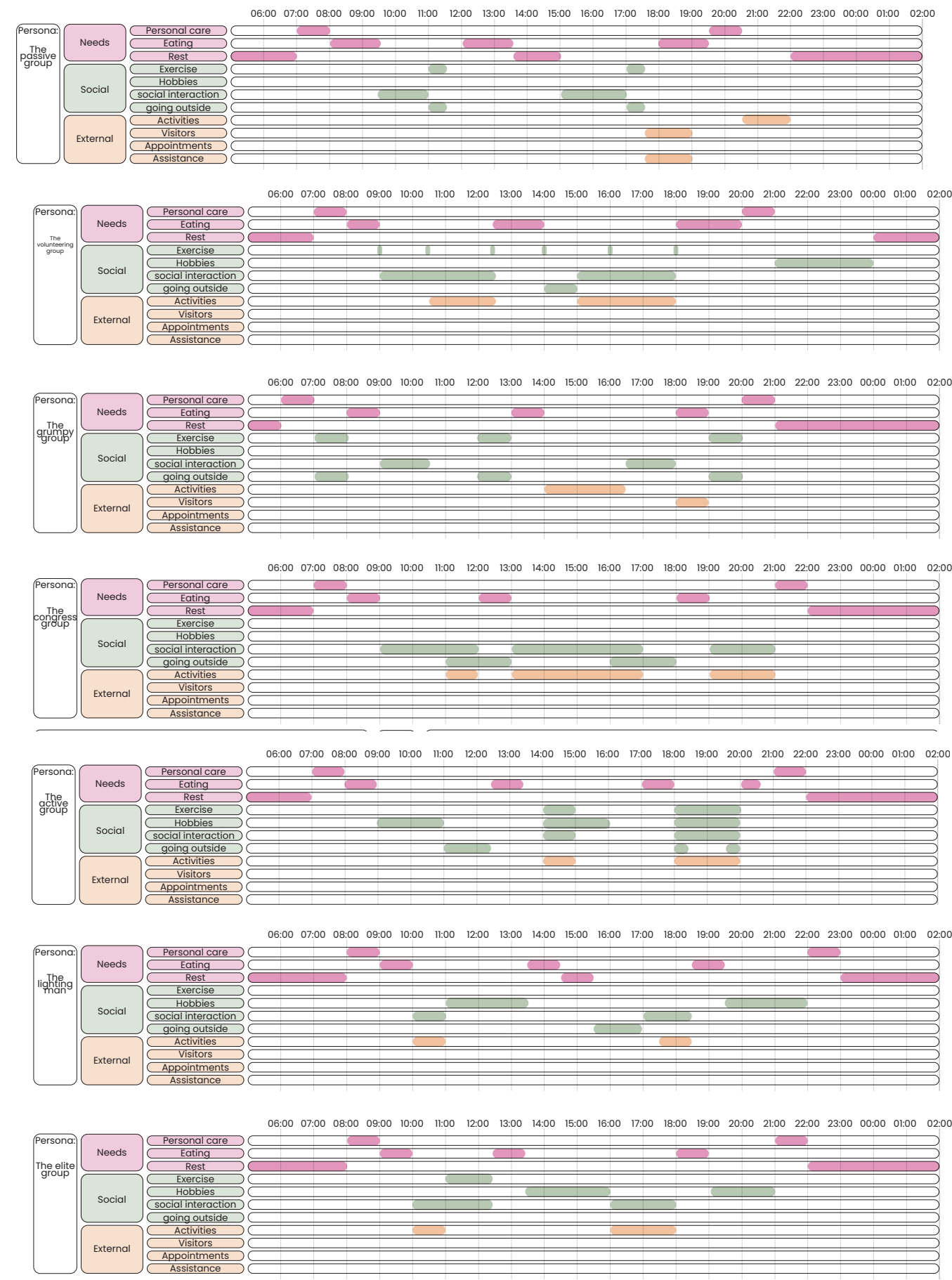
The “day in the life” timelines were created based on the personas defined in the previous chapter, but the schedule belongs to only one individual out of the persona group.

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

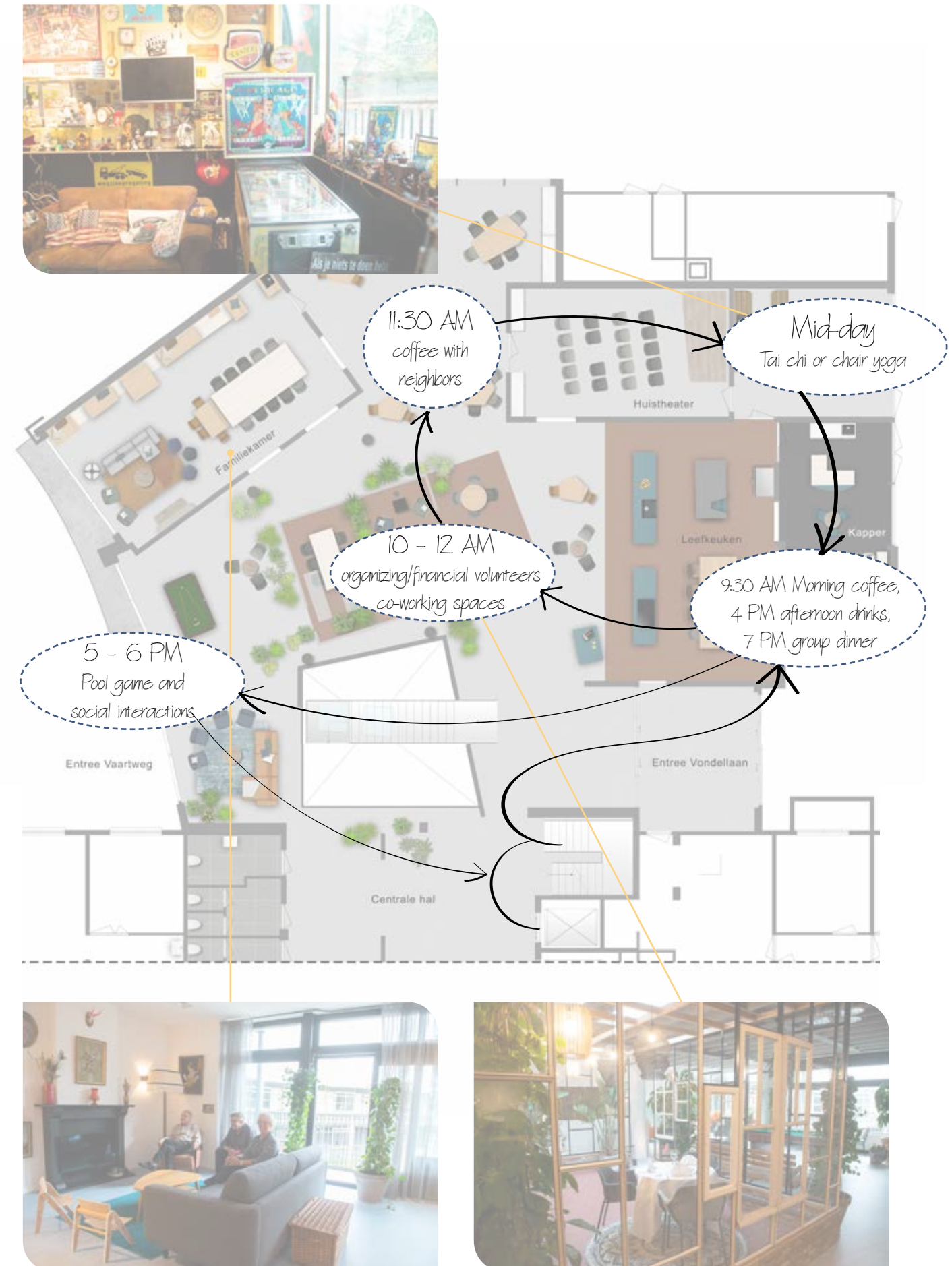
The communal areas at Liv Inn are designed as a central hub, fostering interaction through fluid, adaptable spaces. Soft separations between areas like the communal kitchen ("leefkeuken"), family room, theater, and internal courtyard ("binnentuin") are achieved using wooden frames, varying materials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

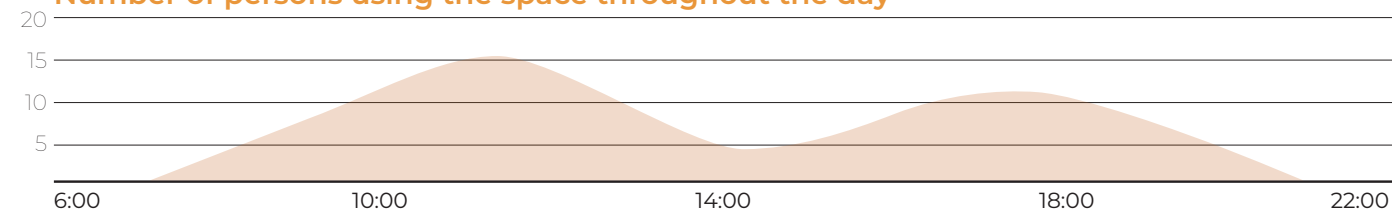
Space Use

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.

Number of persons using the space throughout the day



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

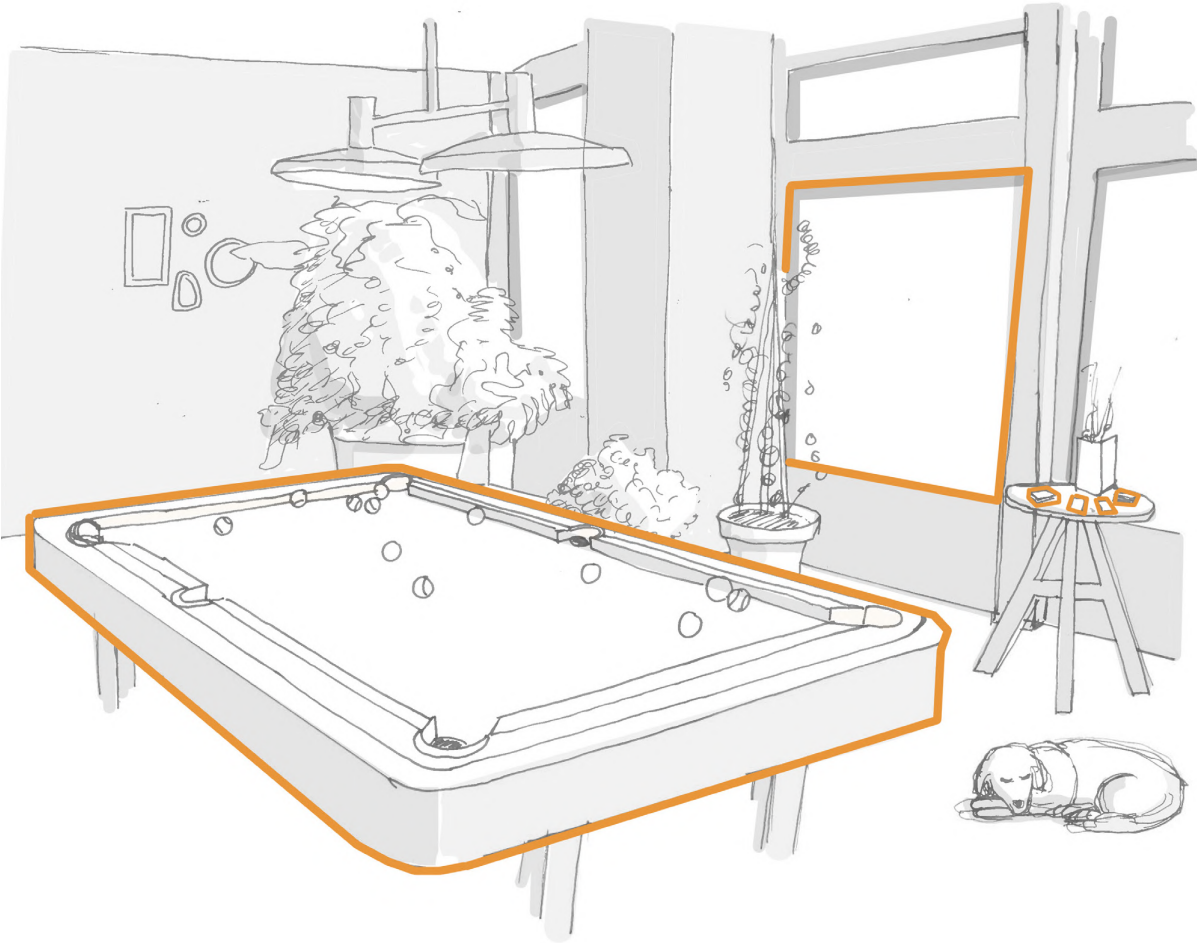
At the heart of the 'Liv Inn,' the pool table serves as a central point for social interaction, especially for the older residents. After dinner, a regular group of elderly individuals often gathers for a game of pool. It is clear that the pool table is an important space where residents can relax and 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	● ● ● ● ○

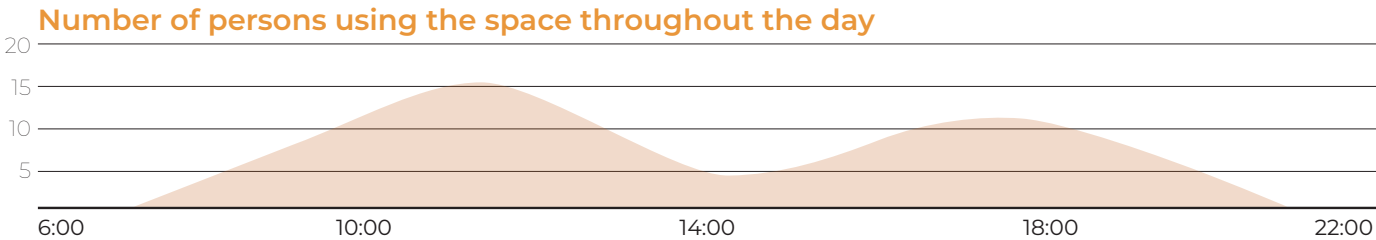
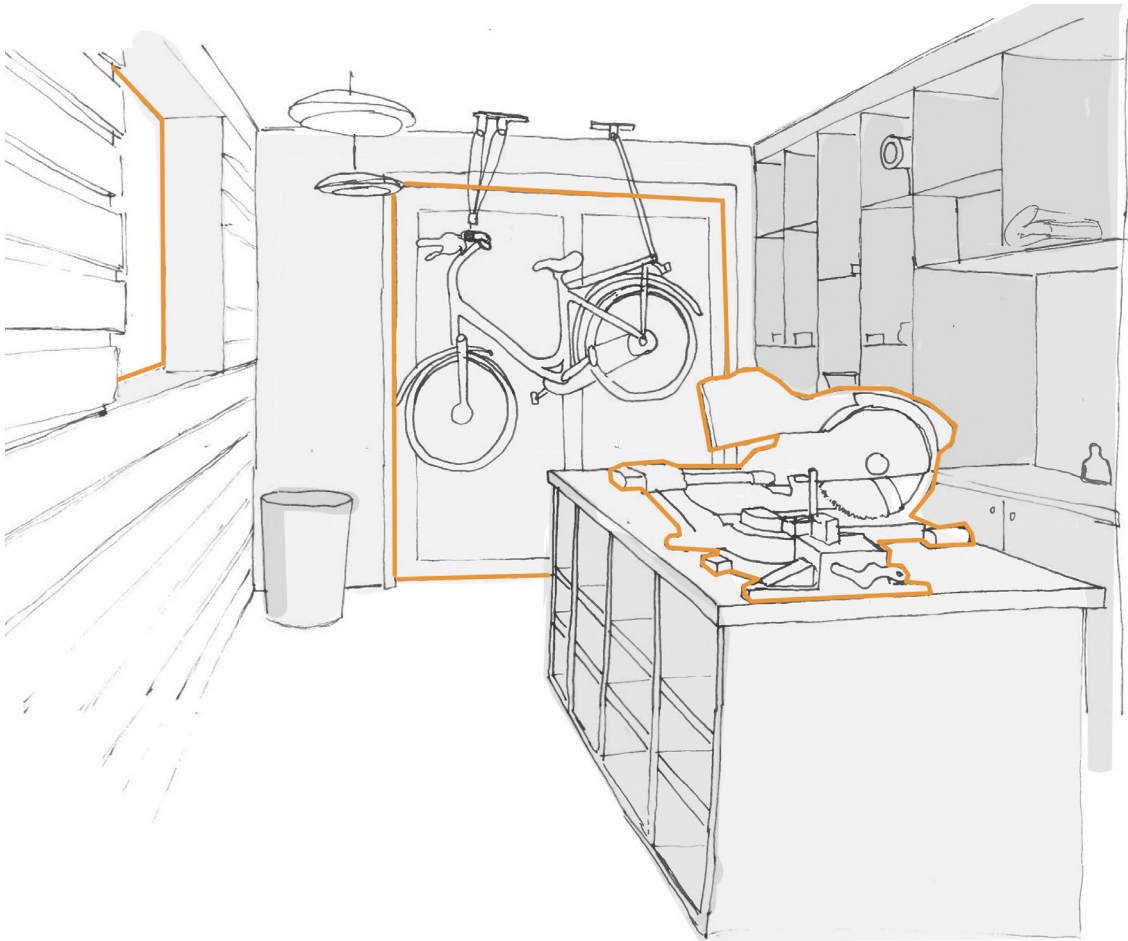
Workshop

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	● ● ● ● ○

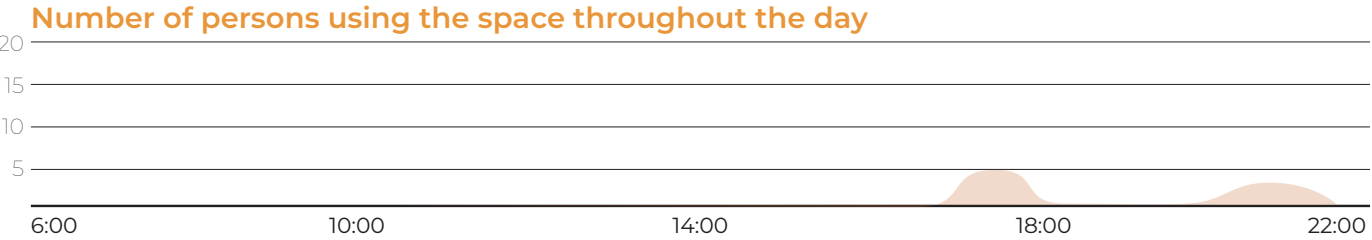
The Theater

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

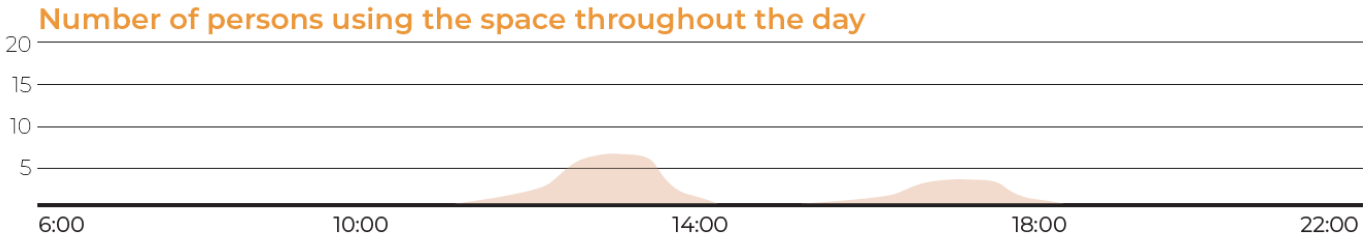
The family room is primarily used by neighborhood residents and visitors, playing a vital role when large groups of family or friends gather and cannot fit in a personal room. This space offers a warm, homely atmosphere with a large living room setup, a spacious dining table, and ample toys for children,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

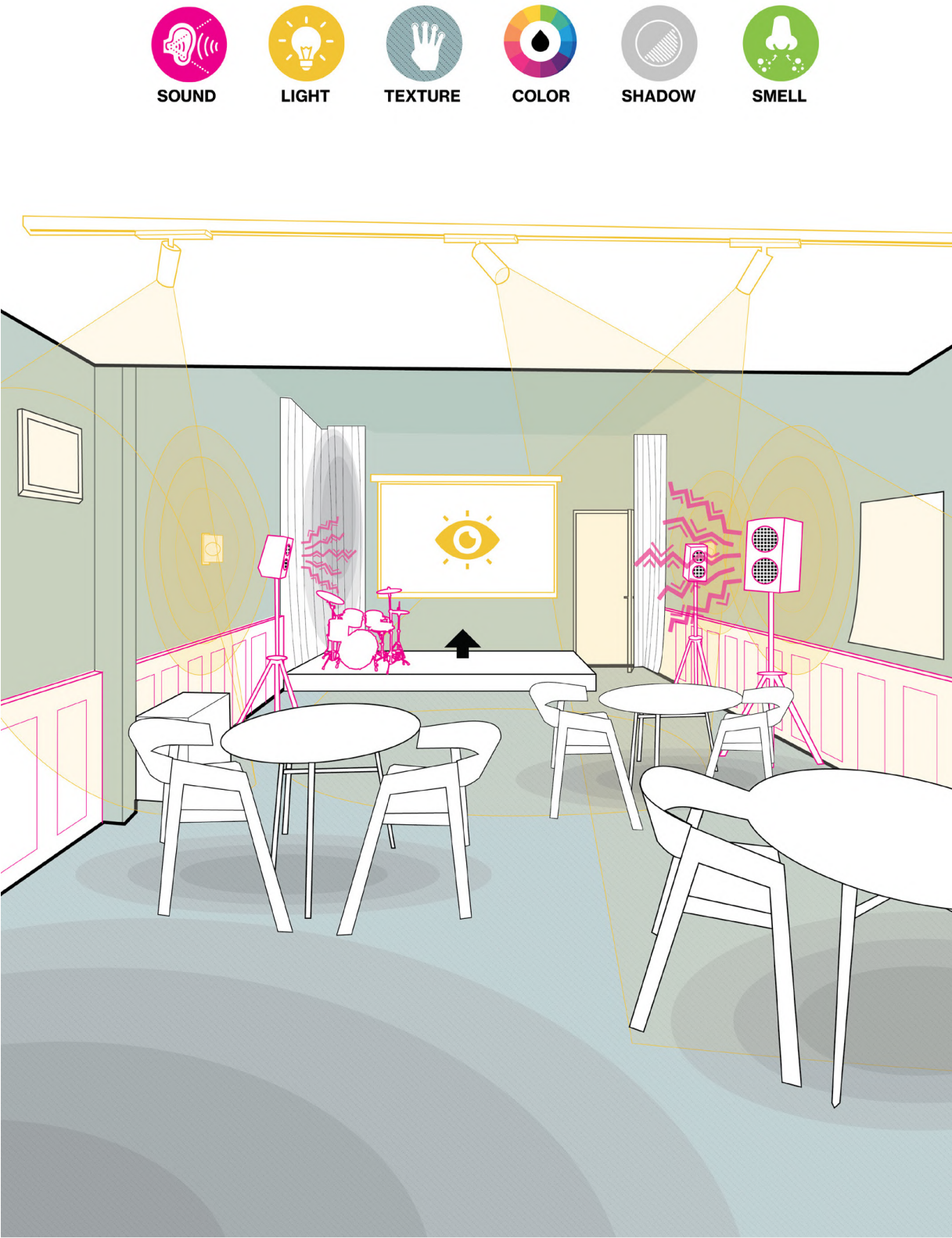
With little to no windows openings, the theater is naturally dark, which is ideal for this specific funtion. The shadows create a dramatic and contrasting play with the lighting, as the accent lighting focuses more on the stage, tables, paino area, and wall-armitures more on decorating the walls. This 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

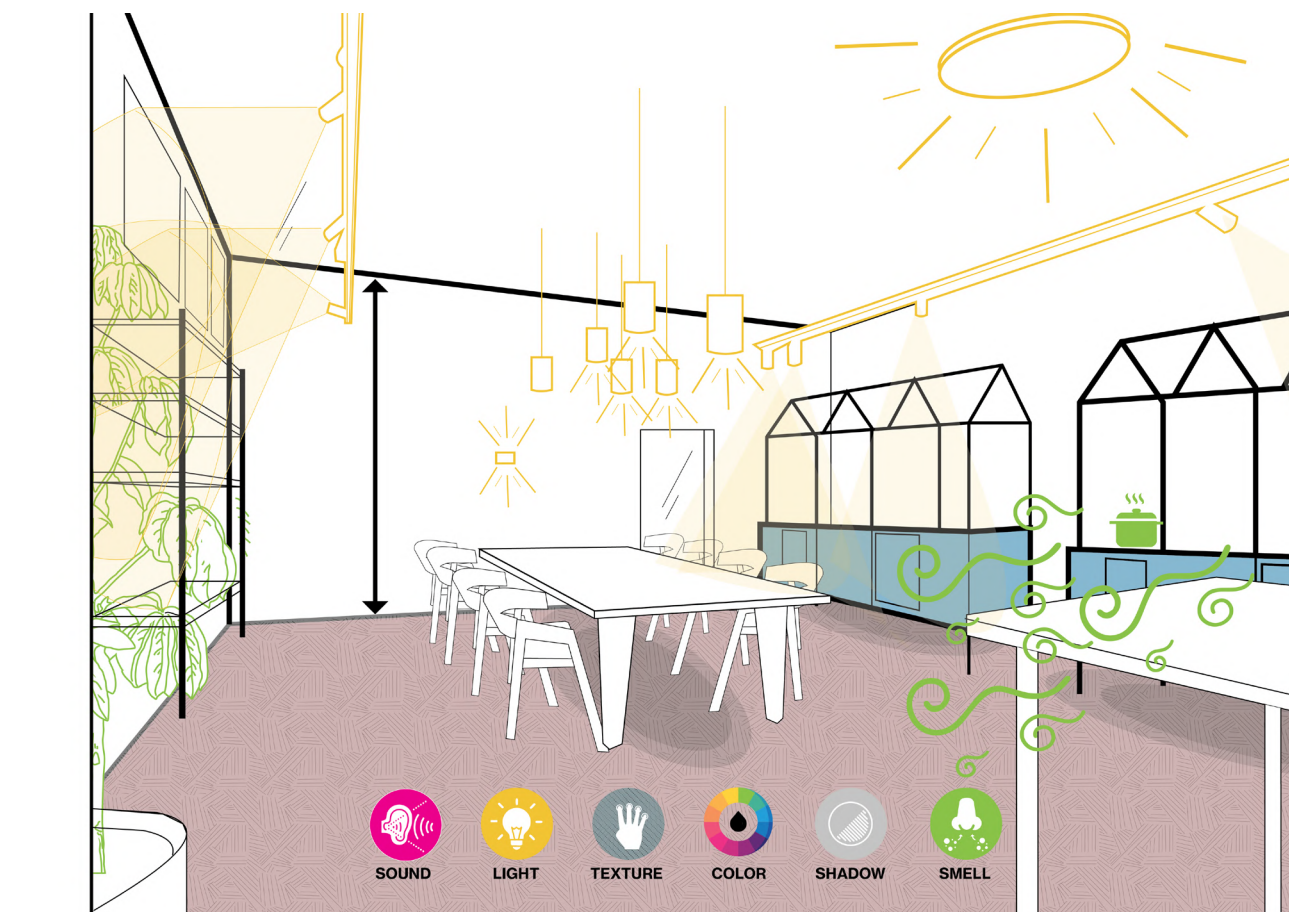
Similar to the inner garden, red hexagonal ceramic tiles are used to border the communal kitchen from the surrounding walkways and interior spaces. Other than that, the walls are white plastered.

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

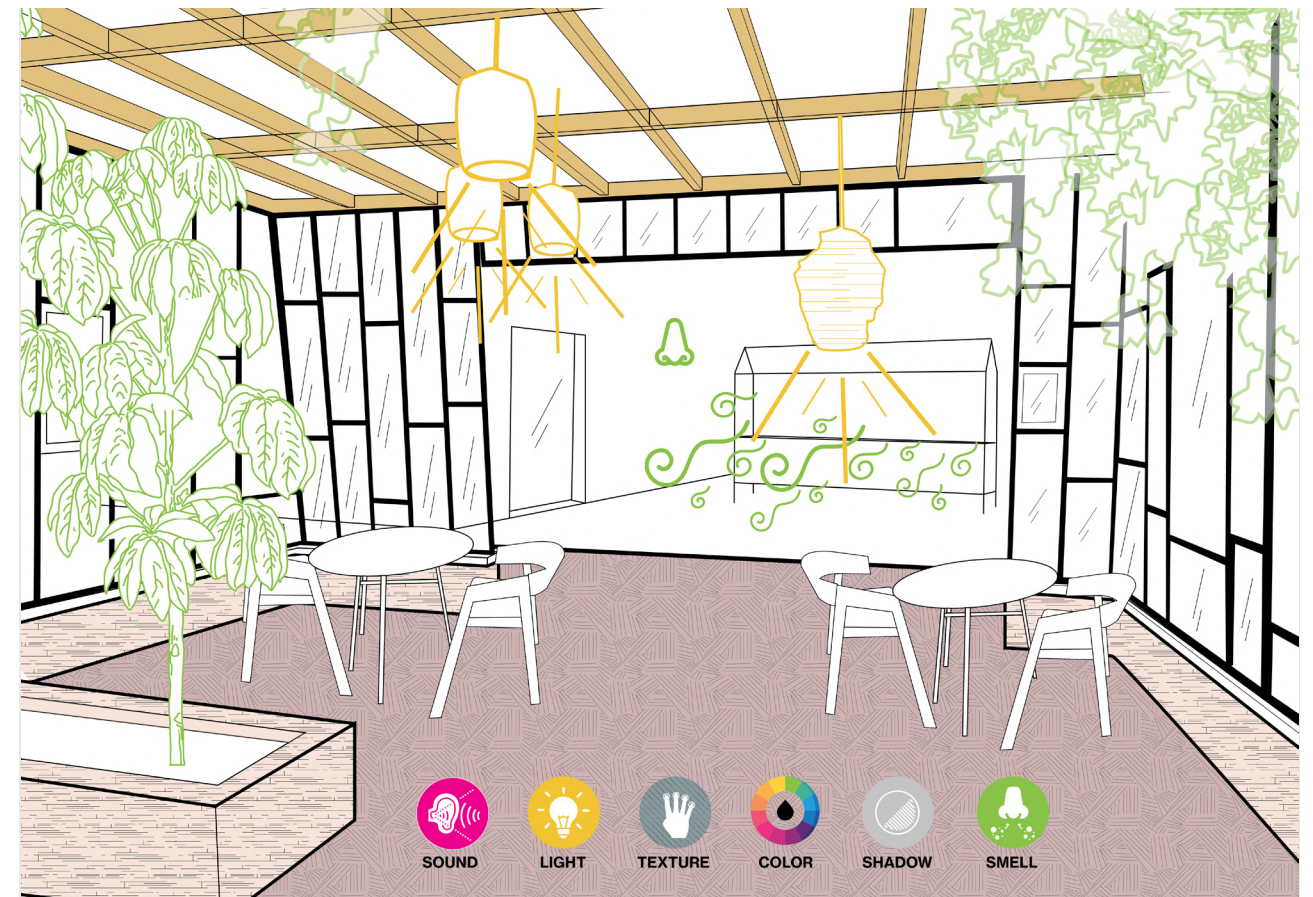
The inner garden, as the name suggests, focuses on creating a garden-like environment in the interior of the Liv Inn. By drastically bordering the floor surface texture with red hexagonal tiles of the inner garden in comparison to the walkways or other functions with a polished concrete look, a contrast 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

14

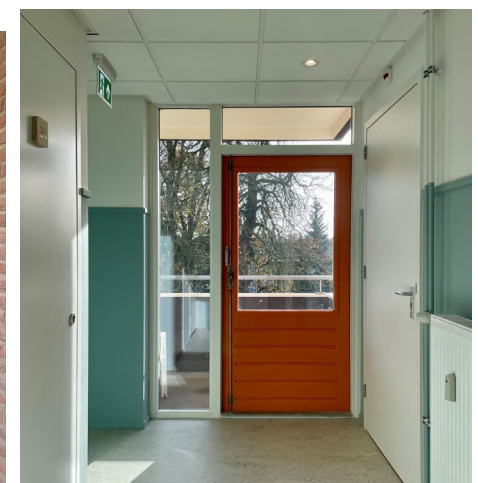
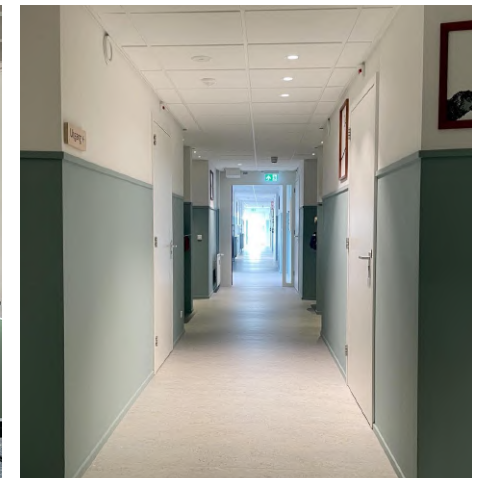
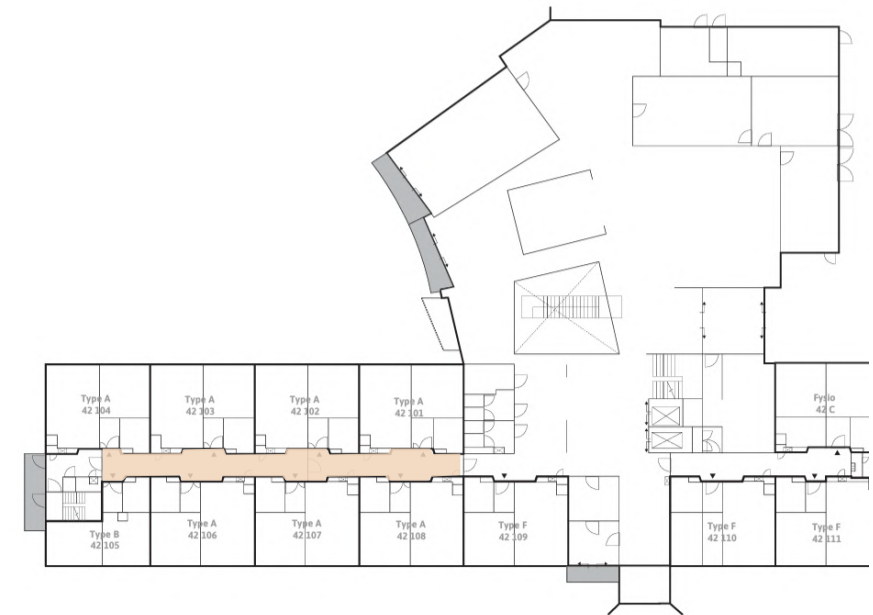
Deserted Corridors: A Study in Spatial Perception

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.

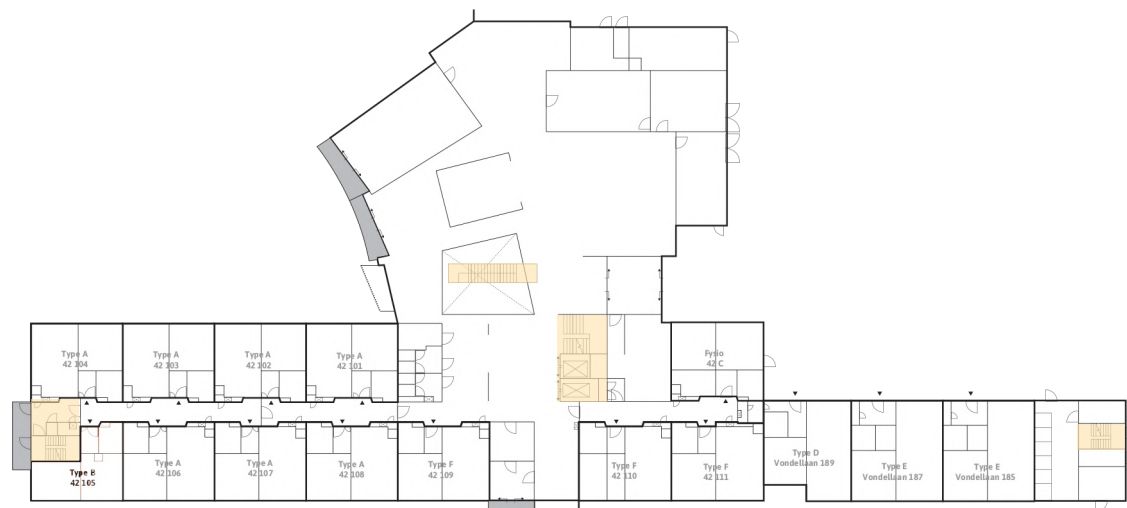


1. Gym on the second floor
2. Corridor along the first floor (newer extension)
3. Corridor along the third floor (old building)
4. Door to balcony at the end of first floor corridor (newer extension)

15

Encouraging Movement through the Built Environment

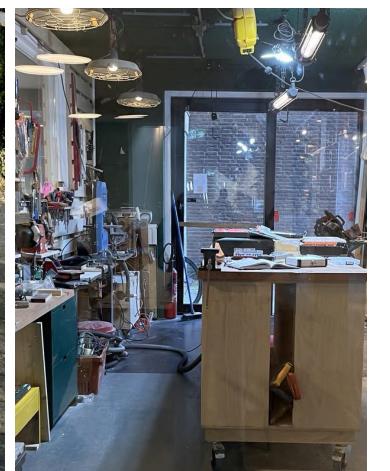
The stairwells are thoughtfully designed to promote walking and physical activity. Interviews with younger, mobile residents reveal a strong preference for taking the stairs over the elevator. The spacious, well-lit main staircase, which connects directly to the communal space, sees frequent use, while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



16

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.



17

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.

18

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.

AR3AD110: Dwelling Graduation Studio – Designing for Care in an Inclusive Environment

P5 Reflection – Shreya Sen

What is the relation between your graduation project topic, your master track (A, U, BT, LA, MBE), and your master programme (MSc AUBS)?

My project, **Active Ageing in Tarwewijk**, is part of the MSc AUBS programme and the Architecture track, aligning closely with the studio “Designing for Care in an Inclusive Environment.” This alignment stems from both academic interest and personal experience, having witnessed how ageing can become isolating even within spaces that seem functionally sufficient. I grew up watching my grandparents age actively and independently but also observed the spatial and social disconnection they experienced after relocating at an older age. This motivated me to focus on design that fosters autonomy, dignity, and meaningful community engagement in later life.

The project initially began as an inquiry into how architecture can support aging bodies and minds in structurally outdated neighbourhoods like Tarwewijk. However, through the research and fieldwork studies, it became clear that a one-size-fits-all model of aging was insufficient for the neighborhood. Tarwewijk is not only aging, it is also deeply multi-cultural, shaped by overlapping migration histories, diverse domestic practices, and informal care networks. The project thus evolved to focus not just on aging in place, but on diverse ways of aging in place.

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

The research began with a spatial analysis of the Haagse portiek typology in Tarwewijk. It studied major barriers for elderly residents, such as steep staircases, narrow entrances, and cluttered public spaces. These findings were expanded through literature reviews, field mapping, ethnographic observation, and interviews to explore how cultural patterns affect the use of space, especially within diverse Moroccan, Turkish, and Surinamese households. Themes such as privacy, gendered spaces, and informal care emerged, pushing the design beyond standard accessibility into culturally responsive strategies.

Case studies, such as Liv Inn Hilversum, confirmed that informal social ties and communal infrastructures support active aging. Yet they also showed the limits of such models: communal living needs maintenance, trust, and careful spatial thresholds between social interaction and privacy. These insights informed my design choices of

shared balconies, galleries, communal spaces, and modifiable thresholds—which were prototyped and iteratively refined.

Ethnographic insights informed design moves (e.g., reconfigured galleries, two-zone living areas, open/closed kitchen hybrids), which then raised new questions about autonomy, intergenerational living, and cultural safety. These were explored further through persona development and literature review, reinforcing a dynamic research-design feedback process.

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

The project employs a qualitative, multi-scalar methodology that triangulates:

- Ethnographic research (*Liv Inn Hilversum*)
- Field mapping and spatial analysis (*Tarwewijk*)
- Semi-structured interviews and persona development
- Typological assessment of *Haagse portiek* housing
- Literature and case studies (e.g., *Klarenstraat*, *Kalkbreite*, *Cité du Grand Parc*)

This framework—moving from interior unit → building block → neighbourhood—allowed for addressing aging as a spatial, social, and systemic challenge. The theoretical grounding from the WHO’s *Active Ageing Framework*, Lawton’s *Ecological Model of Ageing*, and Sheller’s *Mobility Justice* theory helped bridge spatial analysis with social narratives.

The iterative approach between research and design maintained sensitivity, particularly during interviews and persona development. Ensuring representation and mitigating subjectivity were key challenges, addressed through continuous ethical review and reflection. This methodology allowed for responsive, user-centred design without sacrificing spatial depth.

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

Academically, this project contributes to the evolving field of the “architecture of care,” particularly in relation to aging, migration, and spatial justice. It challenges dominant design assumptions that often reflect Western, nuclear-family norms. By centering

diasporic spatial practices such as enclosed kitchens, dual living areas, and gender-sensitive thresholds, it broadens the architectural discourse around inclusivity.

Ethically, the project rejects prescriptive design. Instead, it offers open-ended and adaptable spatial tools. Older residents are not treated as passive recipients of care but as agents within their networks. The project avoids displacement and promotes community stability through incremental retrofitting. This approach is especially relevant in gentrifying urban contexts.

Societally, it emphasizes low-cost, scalable solutions that can be applied across Dutch cities, given the prevalence of Haagse portiek flats. The cultural flexibility and spatial adaptability (e.g., modular partitions, customizable thresholds) make it relevant across ethnic and generational lines. The project also promotes co-creation and institutional engagement strategies, drawing from examples like Klarenstraat and Liv Inn, fostering systems of care beyond architectural form.

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

The strategies proposed such as modular retrofitting, spatial adaptability, culturally sensitive layouts are broadly transferable to similar housing contexts in the Netherlands and beyond. The Haagse portiek typology exists in many Dutch cities, and the layered, incremental design logic makes it suitable for low- and middle-income neighbourhoods.

Because the project responds to cultural, generational, and economic diversity, the principles are adaptable across communities. The tools developed such as modular kitchen systems, shared balconies, visibility corridors, and persona-based programming can be customized by housing associations and residents themselves. Furthermore, the open-ended design framework supports a variety of care arrangements and household types, making it useful as a flexible planning tool.

Reflection Question 1: How can spatial design support aging-in-place in multicultural neighbourhoods without compromising cultural specificity or community identity?

Spatial design can support aging-in-place by recognizing and embedding cultural preferences within the layout and use of domestic and communal spaces. In this project, this is achieved through hybrid kitchens, gender-sensitive thresholds, and multi-zoned living areas, which allow residents to engage with familiar cultural practices without being forced into generic design templates. Designing for *plurality*, not uniformity, is key. Spaces must accommodate diverse ways of living while facilitating intergenerational and intercultural interaction.

Reflection Question 2: How can architecture enable everyday social mobility, for instance through balconies, galleries, or courtyards, without relying on formal programming?

Architecture can foster everyday social mobility by creating *vital zones of friction*, which are spaces where social encounters occur naturally, without planned events. In this project, elements like shared balconies, galleries, and communal spaces serve as spatial catalysts for informal interaction. These areas balance visibility and privacy, encouraging participation while allowing retreat. By embedding such features into the physical form, architecture promotes social presence and well-being without depending on structured programs.