

TULE-MODEL

A model for the development and planning of
future age-friendly living

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Artificial intelligence (M365 Copilot) has been used in the translation of this document.

The TULE model and its concept tool have been created as part of the Future Senior Housing (TULE) project. The project was carried out at the Faculty of Built Environment at the Knowledge Centre for Real Estate Development (KCRED) at the University of Tampere. The project was led by Jukka Puhto, the project manager was Jaana Vanhatalo, and the researchers were Veronika Haukeland and Juha-Matti Junnonen. The project communications was managed by CoreLab (Alisa Hakola and Jaakko Kinnunen). The duration of the project was 3/2023-10/2025.

The project was a co-creation and research project in which the Centre for State-Subsidised Housing Construction (VARKE; formerly ARA) and 22 other organisations were involved as financiers and participants. Each organisation has been represented by 1-3 members. Project had also an expert member from the Ministry of the Environment.



Valtion tukeman
asuntorakentamisen keskus



Intro

- The TULE model is a process that aims to produce high-quality, age-friendly living for future needs. The assumption is that the recommendations and solutions from the previous phases will also follow into the next phases.
- The basic principles behind the model are design for all, sustainability, place-based solutions, communality, participation and diversity, as well as innovations and change in attitude (see page 5).
- In addition to the principles, the process itself and its phases, the model includes an intro, user role tables related to the different phases, and a concept tool. The structure of the model is presented in the diagrams on pages 6 and 7.
- The real estate development and construction phases of the model are based on textbook examples, and age-friendliness is not a new thing either. So, what's new in the model?
 - The model aims to provide an overall view of the entire process of developing, planning and designing age-friendly living, including its phases and stakeholder roles.
 - The model presents a regional discussion forum, regional development and the formation of a regional vision for age-friendly living at the beginning of the process. This responds to the cooperation and planning required by law.
 - Bringing age-friendly approach to housing development and design.
 - As part of the model, a concept tool has been developed for the real estate development phase.
 - The model summarises expert, research and analyses related to age-friendliness.
- The backgrounding of the model can be found in the final report of the Future Senior Housing (TULE) project (published in Finnish). Due to the extensive number of sources, the sources are mainly only included in the report. The sources mentioned in this model document are listed on page 48.

- The recommendations provided in the model are based on the research and analyses conducted during the project, but also on discussions, meetings, and data collected during site visits both in Finland and abroad.

Model's applicability outside Finland

- The aim of the project was to develop Finnish age-friendly living and therefore the model was created to Finnish operational environment. However, it is applicable also elsewhere.
- What can be used as such?
 - Process description as a whole with the main phases is suitable everywhere as well as the guiding principles.
 - Recommendations for different phases are mostly suitable also elsewhere, except for example certain accessibility related measures which might vary according to national regulations.
- What has to be adapted to local operational environment?
 - Stakeholders and their roles might vary a lot country by country. For example the entities responsible for land use planning, planning for senior housing on general level and the one responsible for providing care vary. From these parts however the model can be finetuned to local conditions.
 - Pay attention to and modify if needed:
 - the diagram of involved stakeholders (p. 8),
 - the participants in the regional discussion forum (p. 11) and
 - the tables for stakeholder roles in each phase (p. 15-16, 23-24, 32, 40-41 and 46).
 - Certain parts of phases, especially the design and implementation phase of housing production, as the steps of planning and designing can vary locally.
 - Pay attention also to points including local regulations.

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GUIDING PRINCIPLES

DESIGN FOR ALL

Age-friendly housing is suitable for everyone. Homes and living environments must be functional, accessible and safe for different needs and functional abilities. Everything related to housing and the living environment should be designed so that everyday activities, social connections, and access to the local environment and nature can be maintained even when functional ability declines.

SUSTAINABILITY

When developing the living environments for aging population, **ecological, social, economic and cultural sustainability must be taken into account.**

Housing must be developed in a resource-wise manner, primarily utilising the existing building stock, utilising underused premises and making existing apartments and residential buildings age-friendly.

When building a new building, it is important to take into account and prepare for future changes with flexible solutions.

PLACE-BASED SOLUTIONS

Housing solutions must be location-specific, i.e. based on local starting points and needs.

Different places have different needs, strengths and challenges, resources and their own local identity. Identifying and utilizing these factors, along with local knowledge, supports finding solutions that meet needs and leads to more sustainable outcomes. The solutions must also support aging in place.

INNOVATIONS AND CHANGE IN ATTITUDE

In designing and developing age-friendly living, it is essential to continuously seek new solutions rather than remain tied to traditional housing models and practices. Innovation does not automatically mean higher costs. **This requires an open mindset**, active monitoring of international developments, the involvement of research and development, and collaboration among different stakeholders. National decision-making should create an environment that encourages and enables experimentation and testing. **Existing systems should also be actively challenged.** In other words, if something does not work, it must be changed. **Change starts with all of us.**

COMMUNALITY

A sense of community supports the quality of life of older people and also brings quality to housing. A sense of community and its creation cannot be forced, but it can be supported. The importance of social resources in the immediate environment is emphasised as we age. Opportunities for community and social contacts should be offered both through spatial solutions and through various actions. Community must therefore be taken into account in development, planning and housing itself.

PARTICIPATION

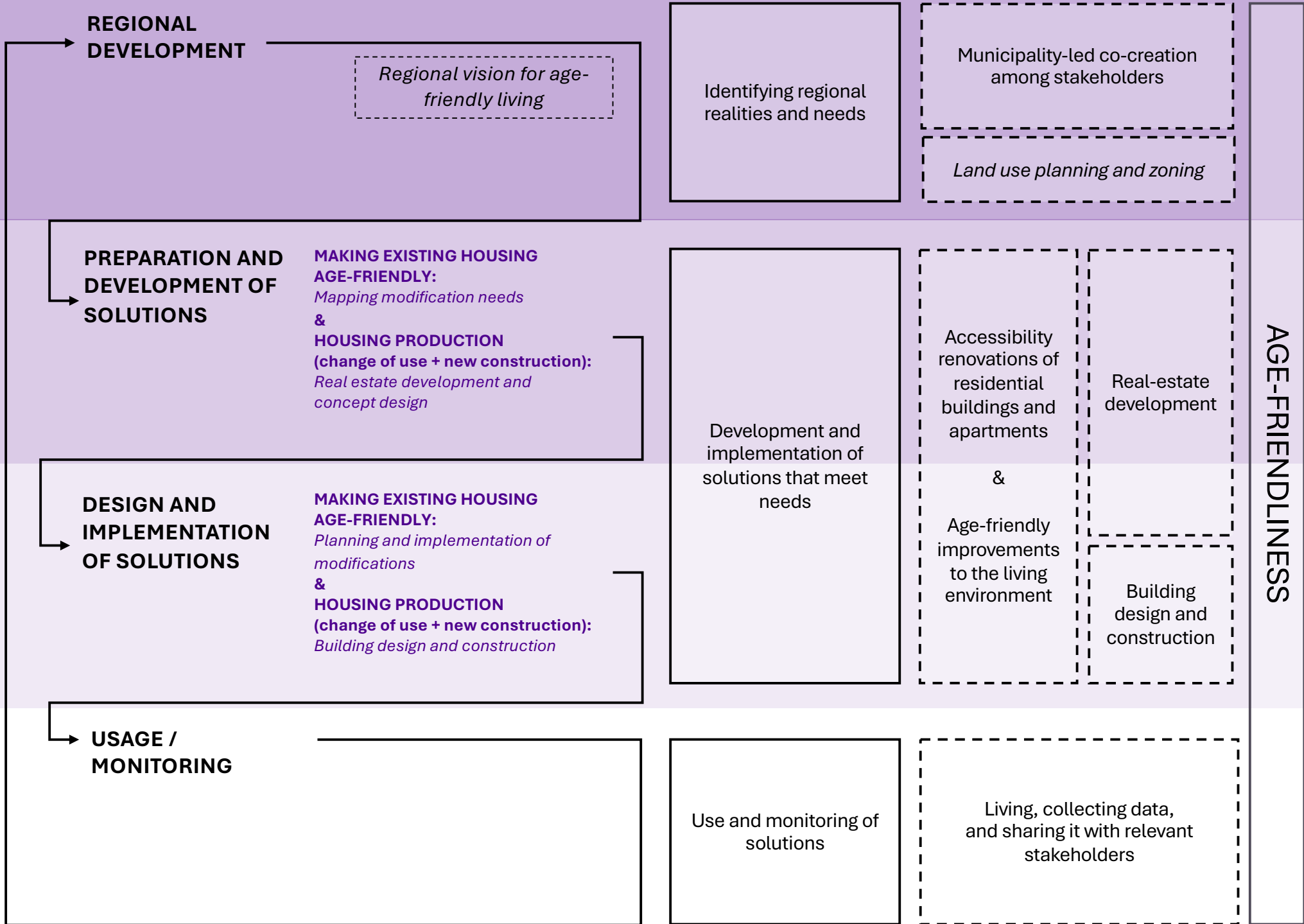
Involving older people is essential in all projects related to housing and living environments: from planning to implementation and the collection of user feedback. Current and future older people are experts in expressing their own needs. At the same time, it is important to involve their close relatives and those acting as informal caregivers. Attention should be paid to the methods of participation, and these should be developed to ensure that even those in the most vulnerable positions have their voices heard.

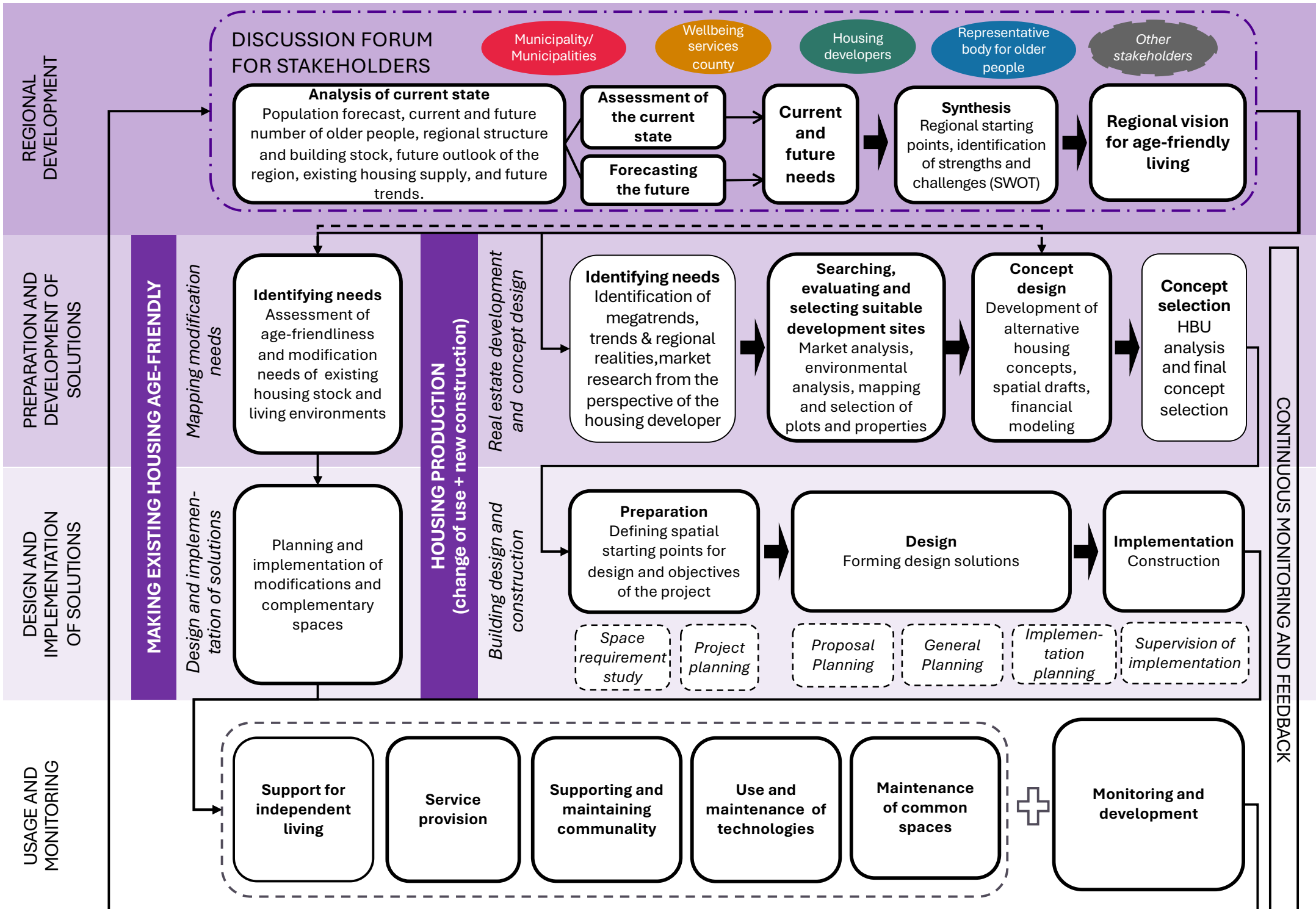
DIVERSITY

Older people are not a homogeneous group. Therefore, no single concept can serve as a universal solution for housing in later life. **A wide range of housing options** should be offered to older people—from detached houses to apartment buildings, from shared living arrangements to private homes, and from multi-generational housing to housing designed exclusively for older people.

All housing must enable a **high quality** of life.

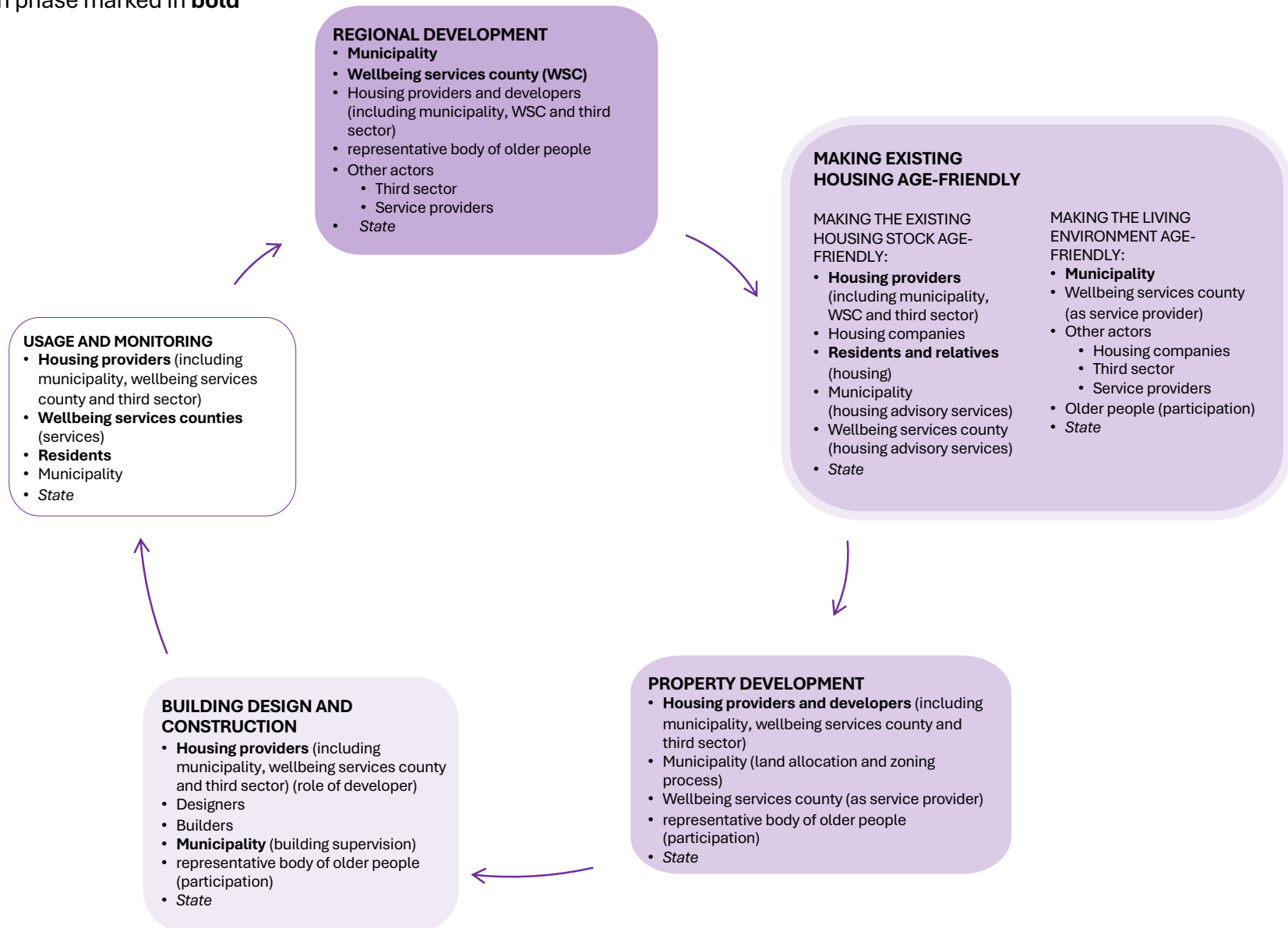
An attitude shift is needed in how we view older people and ageing. Ageing is part of almost everyone's life course. Negative perceptions of ageing are formed early and are shaped by societal structures and assumptions about older people. These perceptions influence intergenerational relationships and older people's self-image. (WHO 2025.) Research shows that negative views on ageing are linked to poorer health outcomes later in life (WHO 2025) and also affect housing-related decisions (Aclan ym. 2023). Accepting ageing, on the other hand, enables more active ageing and proactive housing planning (Aclan ym. 2023, p.6).





Stakeholders involved in different phases

Main actors of each phase marked in **bold**



Flow of feedback & information

REGIONAL DEVELOPMENT

PREPARATION AND DEVELOPMENT OF SOLUTIONS

MAKING EXISTING HOUSING AGE-FRIENDLY:
Mapping modification needs
&
HOUSING PRODUCTION (change of use + new construction):
real estate development and concept design

DESIGN AND IMPLEMENTATION OF SOLUTIONS

MAKING EXISTING HOUSING AGE-FRIENDLY:
planning and implementation of modifications
&
HOUSING PRODUCTION (change of use + new construction): *building design and construction*

USAGE / MONITORING

Data on the use of services, communality and other functions (how much is used) and related feedback (why is used, why is not used) to parties developing concepts.

Monitoring the changes made and the effects of housing solutions, e.g. falls, need for care, etc.

 User feedback on housing solutions, new common areas, environmental modifications, the process of making one's own apartment age-friendly, etc.

Training and communication of information to different stages and different actors

MAKING EXISTING HOUSING AGE-FRIENDLY

 Feedback from users on new shared spaces, environmental modifications, the process of making their own home age-friendly, etc.

 Implemented accessibility improvements and shared spaces

Deficiencies in analyses carried out in the regional development phase

 Transferring knowledge developed during the concept design process into discussions between actors

Communicating feedback on the functionality, accessibility and aesthetics of spaces to designers

REGIONAL DEVELOPMENT – Regional vision for age-friendly living

In the regional development phase, a vision for age-friendly living in the region (municipality/municipalities) is created. This vision is formed in a **discussion forum for age-friendly living**, convened by the municipality/municipalities, bringing together local stakeholders (wellbeing services county, housing developers (social housing + ordinary housing), **representative body for older people**, and other parties important for age-friendly living).

The vision is based on an assessment of the current circumstances and future foresight, carried out through municipality-led analyses. The results of these analyses are discussed among the forum participants, and based on a shared consensus, a **regional vision for age-friendly living** is established to support the development of age-friendly living in the area.

The vision outlines:

- **Quantitative demand for age-friendly housing:**
 - Demand for making the existing housing stock age-friendly
 - Demand for regional community spaces supporting independent living
 - Demand for new dwellings (including change of use & new construction)
- **Areas to be developed:**
 - Areas suitable for age-friendly housing
 - Potentially usable plots or properties
 - Areas to be improved in terms of age-friendliness
- **Sustainability principles**
 - Consideration of sustainability in implementation
- **Demand for service development**
 - Services supporting independent living

The discussion forum decides its meeting frequency itself. The municipality and the wellbeing services county act as coordinators, and the municipality maintains up-to-date information on the implementation of the vision (alternative arrangements can also be agreed upon in the forum).

The purpose of the discussion forum is to gather information from different actors, ensure information exchange, and promote cooperation among stakeholders. **The aim of the vision is to create a unified direction and picture of the development of age-friendly living in the region, and thereby support evidence-based decision-making.** The vision is not static but continuously evolving (in line with strategic planning approach). Development is based on collected data and feedback, as well as indicators agreed upon as part of the vision: Is the vision being implemented as planned? Is there a need for changes in actions or guidelines? At certain intervals, a more extensive update of the vision is carried out.

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DISCUSSION FORUM FOR STAKEHOLDERS & VISION

The forum focuses on upper-level discussions and negotiation. A competitive setting is not part of the forum.

The municipality and the wellbeing services county clarify the situational picture through analyses and initiate the discussion.

The goal is a shared **CONSENSUS**.

The forum also provides a good platform for identifying and considering opportunities for cooperation between stakeholders.

If needed, visits by different experts is arranged by invitation.

Stakeholders' resources and benefits in formulating guidelines

Slow change

MUNICIPALITY
Regional development perspective, land use planning, Long-term development, Political decision-making

Integration of issues into zoning and strategies, Increased efficiency in housing planning, Enhanced cooperation with stakeholders, Reduction of conflicts

REPRESENTATIVE BODY FOR OLDER PEOPLE

User perspective, wishes, needs, identification of attractiveness factors

Responding to needs, opportunity to influence living arrangements

Housing developers' strategies

Regional vision for age friendly living Guidelines:

Demand:
Needed amount of housing

Spatiality
Areas to be developed

Sustainability
Sustainable implementation and consideration of future use

Demand for services supporting independent living

Fast change

HOUSING DEVELOPERS
Understanding of the market and demand, current realities, innovations, cost awareness

Increased efficiency in concept development, Clarification of the operational field, Enhanced cooperation with other stakeholders, Avoidance of unnecessary work

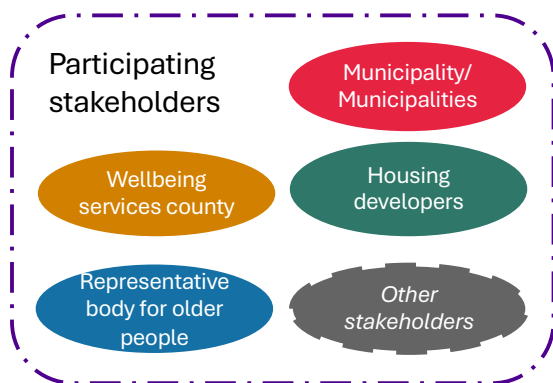
WELLBEING SERVICES COUNTY

Care perspective, regulations, Provision of supported housing for older people, regulated by law regional perspective

Integration of issues into strategies, Identification of challenges, Targeting and planning of supported housing regulated by law, Enhanced cooperation with other stakeholders











Wellbeing services county's strategies

Municipal strategies



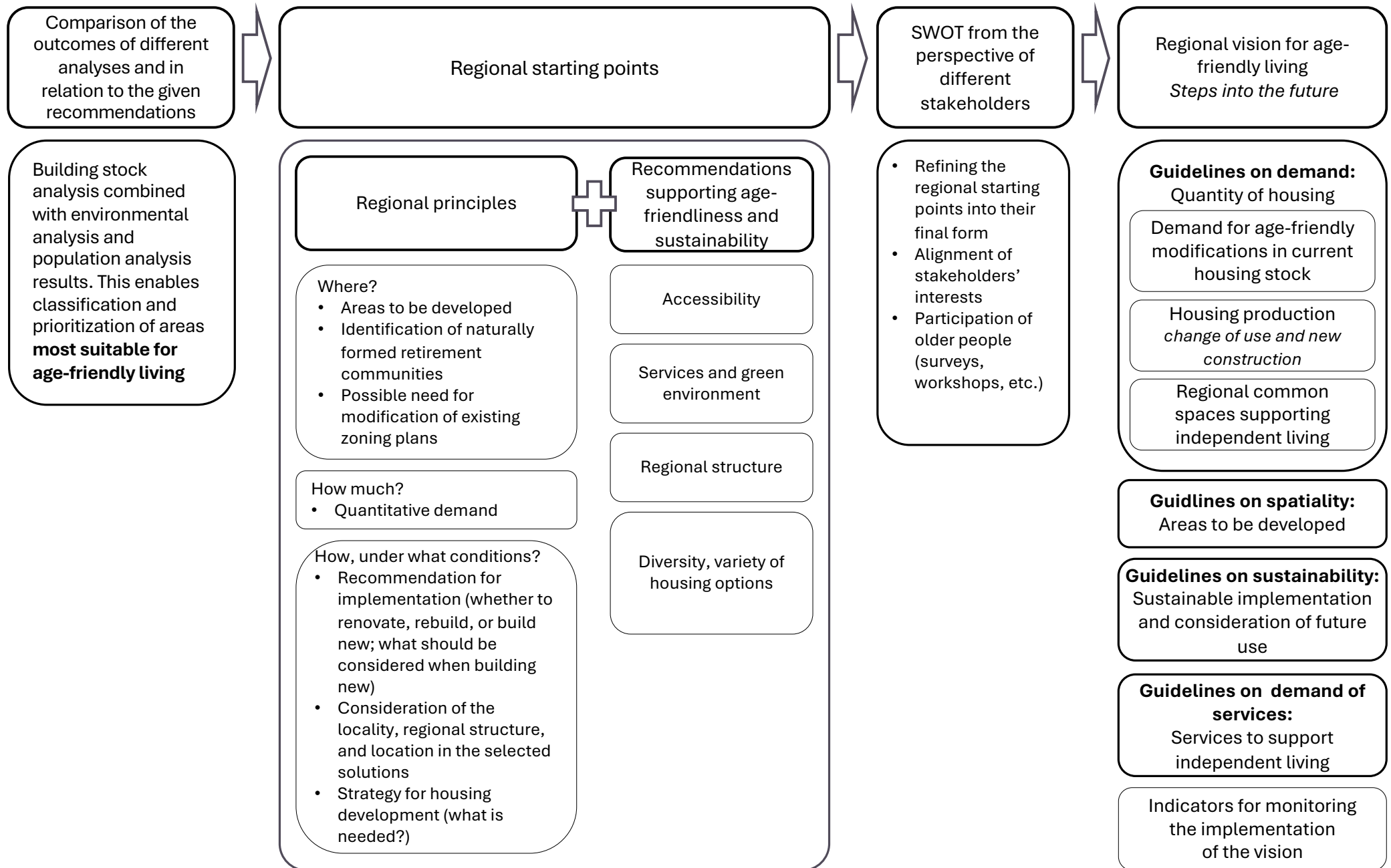
ANALYSIS OF CURRENT STATE & CURRENT AND FUTURE NEEDS

Guidelines of public strategies 

| Analysing the current state  | | | | Forecasting the future | |
|--|---|---|--|---|--|
| Population analysis | Environmental analysis <i>Grid-based analysis (GIS)</i> | Building stock analysis | Zoning analysis | Population forecast & Potential buildings  | Future vision  |
| Number of older people Distribution of older people in the area <ul style="list-style-type: none"> Naturally formed clusters Sparsely populated areas with older people Existing housing designed for older people Number of middle-aged people Health status of older people  Housing preferences of older people   <ul style="list-style-type: none"> Participation through surveys and workshops | Location and mapping of services and identification of service clusters <ul style="list-style-type: none"> Everyday services <ul style="list-style-type: none"> Grocery shops Pharmacies Post offices Banks Health services Sports and exercise services Public transport <ul style="list-style-type: none"> Public transport stops Service interval Service transportation Leisure services Services targeted at older people Community spaces Location of green areas <ul style="list-style-type: none"> Parks and forests Outdoor routes Urban greenery Accessibility analysis <ul style="list-style-type: none"> Slope of pathways mainly max 5% (SuRaKu 2008) Low-traffic areas Utilization of reports & surveys on accessibility and traffic safety, e.g.: <ul style="list-style-type: none"> Accessible walking routes <ul style="list-style-type: none"> Well-lit walking routes Resting places Winter-maintained walking routes Traffic safety <ul style="list-style-type: none"> Car-free zones Separated cycling and walking paths Low-speed zones | Available plots Underutilized or vacant buildings <ul style="list-style-type: none"> Office buildings Shopping centers Government buildings Hotels Historical sites Schools, daycare centers Commercial premises Care facilities Service housing Existing rental apartment buildings or housing cooperatives where residents are mainly older people Renovation needs of existing building stock <ul style="list-style-type: none"> Multi-storey buildings without elevators | Existing zoning plans <ul style="list-style-type: none"> Future development areas and their suitability for age-friendly residential use | Demographic change <ul style="list-style-type: none"> Changes in age group distribution, emphasizing the ageing population Observations also spatially when possible Potential future vacant or underused buildings | Megatrends <ul style="list-style-type: none"> Major global megatrends affecting society Trends <ul style="list-style-type: none"> Smaller-scale trends affecting housing for older people “Future older people” <ul style="list-style-type: none"> Housing preferences of today’s young and middle-aged people |
| | | | | Supply of housing for older people  | |
| | | | | Existing housing for older people | |
| | | | | Market review of upcoming housing projects targeted at older people | |
| | | | |  | |
| | | | |  | |
| | | | | Current and future needs  | |
| | | | | <ul style="list-style-type: none"> Demand for housing for older people now and in the future Demand for housing support services for older people Demand for making existing housing stock age-friendly Demand for new age-friendly housing (conversion and new construction) Demand for cooperation between stakeholders Demand for services supporting independent living | |

The content of the table is based on expert knowledge, same things have also been expressed in e.g. SYKE's IKKUNA report (Rehunen et al. 2025).

SYNTHESIS & VISION ● ● ● ●



RECOMMENDATIONS FOR THE REGIONAL DEVELOPMENT PHASE

Factors influencing the spatial realization of the vision

When locating housing, the following must be considered:

Location of services and green areas

For age-friendly living, it is important to ensure:

- Direct connection to nature (green views, yard enabling outdoor activities, outdoor route within <500 m)
- Proximity to services (grocery store, pharmacy, etc. <500 m)
- Proximity to a public transport stop or availability of transport services
- Proximity to leisure services: library, theatres, cafés, restaurants, etc.

Accessibility of the immediate environment

For age-friendly living, it is important to consider:

- Flat terrain, avoiding slopes over 5% (SuRaKu 2008)
- Low-traffic
 - Low driving speeds
 - Separated pedestrian and bicycle paths
 - Car-free zones
- Accessible walking routes
 - Well-lit walking routes
 - Winter-maintained walking routes
 - Abundance of resting places (benches)

Location of older people in the area

- Recognition of needs
- Identification of natural retirement communities

New Construction vs. Renovation

If the population is expected to decline significantly in the future, priority should be given to:

- Age-friendly modifications in current housing stock
- Utilizing vacant spaces
- Renovations
- Change of use
- Relocatable and reusable structures (circular economy)

Impact of forecasts and regional structure on the vision

- When assessing quantity and locating housing, future forecasts and regional structure must be considered
- Housing should primarily be located in or near service clusters
- All housing solutions must consider multi-functionality and the possibility of changes in use in the future
- The more sparsely populated the municipality is and the longer the distances, the more attention must be paid not only to housing solutions but also to mobile services and service transportation

Engage current and future users as well as family members.

In all decisions and solutions, resource wisdom should be prioritized by developing what already exists. When building new structures, prepare for changes with flexible solutions.

Selected solutions must also be suitable for other age and user groups.

Ensure diversity and abundance of housing options in all decisions and solutions.

Consider community and its support at different levels.

Always adapt decisions and solutions to the local context.

ROLES OF STAKEHOLDERS (1/2)

| | STATE | MUNICIPALITY/MUNICIPALITIES | WELLBEING SERVICES COUNTY |
|--|--|---|---|
| TASK IN THE FORUM / IN CONNECTION WITH THE FORUM | <ul style="list-style-type: none"> Ministries Bodies guiding housing matters for the older people | <ul style="list-style-type: none"> Zoning and land use Building control services Real estate and housing Services for older people | <ul style="list-style-type: none"> Housing services and services for older people |
| INFORMATION TO BE BROUGHT TO THE FORUM AND VISION | <ul style="list-style-type: none"> Visiting forums Research, mapping of housing conditions and solutions at the national level | <ul style="list-style-type: none"> Convening stakeholders Division of labour with the WSC concerning housing for older people Compilation and analysis of initial data in cooperation with other actors (p. 12) Compilation and dissemination of information produced in the Forum | <ul style="list-style-type: none"> Participation in the discussion forum and vision development Division of labour with the municipality concerning housing for older people |
| INFORMATION EXPORTED FROM THE FORUM AND VISION | <ul style="list-style-type: none"> National policies and national guidance Legislation | <ul style="list-style-type: none"> Municipal housing policy guidelines, including housing for older people Starting points for land use planning, zoning and the municipality's strategic policies The state of accessibility of the existing housing stock (building control archives, data from building permit applications) (Arpiainen et al., 2021, 78) | <ul style="list-style-type: none"> Service needs of older people Strategies for housing services and services for older people under HVA's responsibility |
| BENEFITS FOR STAKEHOLDERS | <ul style="list-style-type: none"> View and knowledge of local measures | <ul style="list-style-type: none"> Conveying the vision's policies and the information shared in the forum to municipal decision-making, plans and strategies, as well as zoning practices and building control services Understanding of the circumstances in the field of housing for older people in the area | <ul style="list-style-type: none"> Taking the vision policies and the information shared in the forum into the planning and strategies of housing services and services for older people Understanding circumstances in the field of housing for older people in the area |

ROLES OF STAKEHOLDERS (2/2)

| | HOUSING PROVIDERS AND DEVELOPERS <ul style="list-style-type: none"> Housing providers (including the municipality, WSC and the 3rd sector) property owners Real estate developers housing developers | OTHER STAKEHOLDERS <ul style="list-style-type: none"> E.g. service providers, third sector, experts | REPRESENTATIVE BODY OF older people (AND RELATIVES) <ul style="list-style-type: none"> e.g., councils of older persons, senior citizen advisory boards |
|--|---|--|---|
| TASK IN THE FORUM / IN CONNECTION WITH THE FORUM | <ul style="list-style-type: none"> Participation in the discussion forum and vision development | <ul style="list-style-type: none"> Participation in the discussion forum and vision development | <ul style="list-style-type: none"> Participation in the discussion forum and the development of the vision (also in workshops and surveys carried out separately in the forum) |
| INFORMATION TO BE BROUGHT TO THE FORUM AND VISION | <ul style="list-style-type: none"> Market, innovation and cost data Good and bad practices | <ul style="list-style-type: none"> Expert knowledge Good and bad practices | <ul style="list-style-type: none"> The perspective of older people Housing preferences Empirical knowledge |
| INFORMATION EXPORTED FROM THE FORUM AND VISION | <ul style="list-style-type: none"> Putting vision policies into practice Information shared in the forum Market, innovation and cost data Good and bad practices | <ul style="list-style-type: none"> Putting vision policies into practice Information shared in the forum | <ul style="list-style-type: none"> Current circumstances and development of housing and services for the elderly |
| BENEFITS FOR STAKEHOLDERS | <ul style="list-style-type: none"> Enhanced information sharing and collaboration Resource-efficient development of services and housing A common direction and a well-functioning division of labour between the actors | | <ul style="list-style-type: none"> Services and housing that meet needs Opportunity to make a difference |

Flow of feedback & information

REGIONAL DEVELOPMENT

Training and communication of information to different stages and different actors

PREPARATION AND DEVELOPMENT OF SOLUTIONS

MAKING EXISTING HOUSING AGE-FRIENDLY:
Mapping modification needs
& HOUSING PRODUCTION (change of use + new construction):
real estate development and concept design

MAKING EXISTING HOUSING AGE-FRIENDLY
Feedback from users on new shared spaces, environmental modifications, the process of making their own home age-friendly, etc.

Deficiencies in analyses carried out in the regional development phase

Transferring knowledge developed during the concept design process into discussions between actors

DESIGN AND IMPLEMENTATION OF SOLUTIONS

MAKING EXISTING HOUSING AGE-FRIENDLY:
planning and implementation of modifications
& HOUSING PRODUCTION (change of use + new construction):
building design and construction

The impact of design solutions on costs.

Feedback on the sufficiency of preliminary information.

Completed age-friendly housing projects and community facilities

Implemented accessibility improvements and shared spaces

USAGE / MONITORING

Data on the use of services, communality and other functions (how much is used) and related feedback (why is used, why is not used) to parties developing concepts.

Monitoring the changes made and the effects of housing solutions, e.g. falls, need for care, etc.

User feedback on housing solutions, new common areas, environmental modifications, the process of making one's own apartment age-friendly, etc.

Communicating feedback on the functionality, accessibility and aesthetics of spaces to designers

MAKING EXISTING HOUSING AGE-FRIENDLY:

Promoting age-friendliness of the existing housing
stock and living environment

MAKING EXISTING HOUSING AGE-FRIENDLY:

Promoting age-friendliness of the existing housing stock and living environment

In this phase, the existing housing stock and living environments will be developed to be more age-friendly. The age-friendliness of the existing housing stock should be promoted by increasing awareness of the importance of age-friendly housing among both current and future older people and by supporting the accessibility renovations of existing residential buildings and apartments.

In addition to the housing stock and the apartments themselves, existing living environments must also be taken into account. By identifying areas with a large number of older people and by mapping the accessibility needs and the needs for meeting places that support social resources, targeted changes can promote ageing in place.

When making existing housing age-friendly, regional input is incorporated through **the discussion forum for age-friendly living** (including the municipality, HVA, representative body of older people, and housing developers). This forum has outlined **a regional vision for age-friendly living** agreeing on key principles that guide this phase, including:

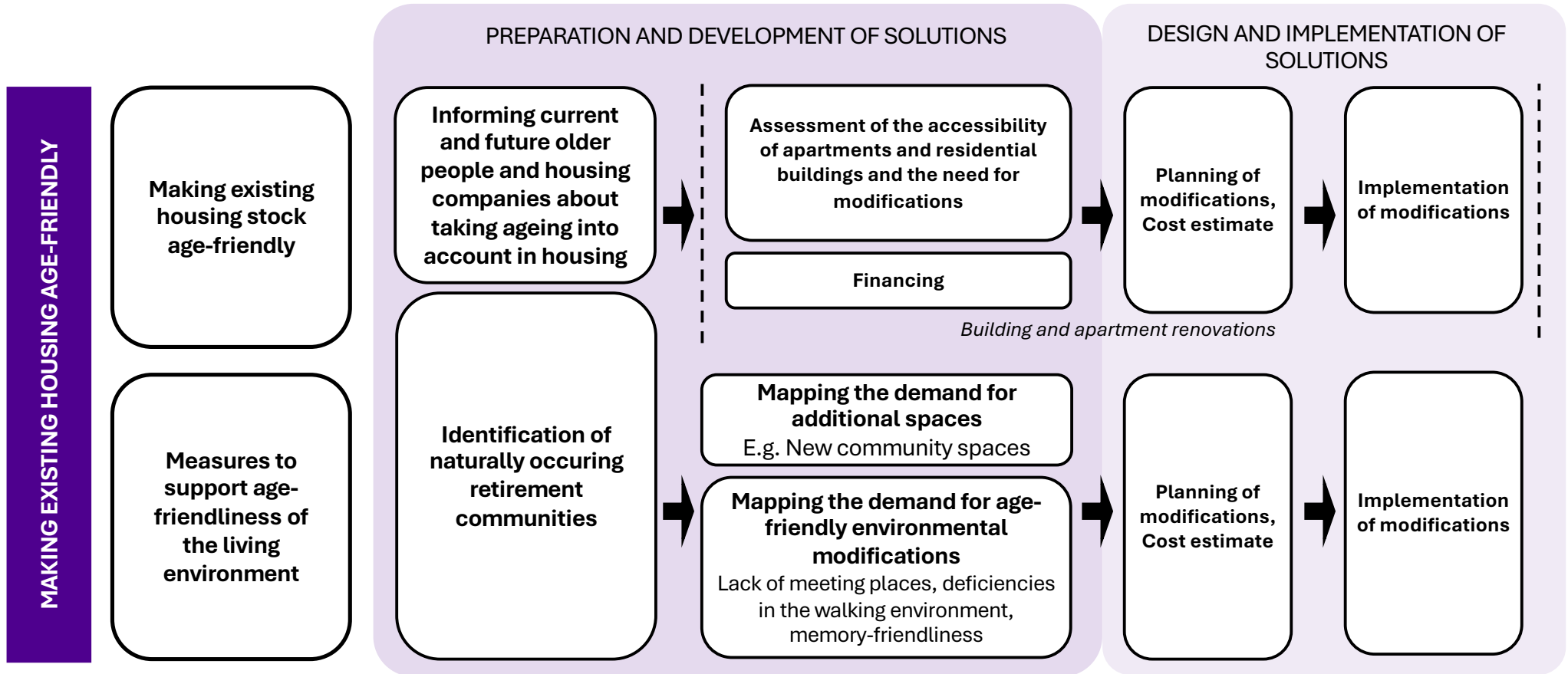
- **The quantitative demand for age-friendly housing**
 - Demand to make the old housing stock age-friendly
 - Demand for regional facilities that support housing
- **Areas to be developed**
 - Areas with suitable conditions (naturally formed communities)
 - Potential usable plots or properties
 - Areas to be developed in terms of age-friendliness
- **Sustainability principles**
 - Taking sustainability into account in implementation methods
- **The Demand for service development**
 - Services supporting independent living

The vision and its policies are based on the current and anticipated future needs of the region identified through analyses and discussions in the forum. The analyses are available as source materials (see p.12).

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MAKING EXISTING HOUSING AGE-FRIENDLY



MONITORING AND FEEDBACK

To the regional development phase:

User feedback on new community spaces, environmental modifications, the age-friendliness process of one's own apartment, etc.

Implemented accessibility improvements and community spaces

RECOMMENDATIONS FOR MAKING EXISTING HOUSING AGE-FRIENDLY PHASE 1/2

Participation

- Investigate the accessibility needs of the living environment together with older people and their relatives, e.g.
 - Accessibility walks
 - Accessibility surveys

When locating new community spaces, the following should be considered:

Location of older people in the area

- Identification of naturally occurring retirement communities

• Accessibility and reachability of the location

- Flat terrain, avoiding slopes over 5% (SuRaKu 2008)
- Traffic safety
 - Low driving speeds
 - Separated pedestrian and bicycle paths
 - Car-free zones
- Accessible walking routes
 - Well-lit, sufficiently wide walking routes
 - Winter-maintained walking routes
 - Abundance of resting places (benches)
- Proximity to a public transport stop or availability of transport services

Increasing awareness and providing guidance

- Both current and future older people should be informed about the importance of an age-friendly living environment and anticipating housing needs
 - Organizing events and information sessions
 - Campaigns
 - Providing
 - Housing advice
 - Renovation advice
 - For housing companies
 - For residents
- Communicating about events and availability of guidance

Examples:

 - Local newspapers
 - Public transport
 - Websites & social media

Engage current and future users as well as family members.

In all decisions and solutions, resource wisdom should be prioritized by developing what already exists. When building new structures, prepare for changes with flexible solutions.

Selected solutions must also be suitable for other age and user groups.

Ensure diversity and abundance of housing options in all decisions and solutions.

Consider community and its support at different levels.

Always adapt decisions and solutions to the local context.

Considerations for making homes age-friendly (Haukeland 2024, see final report, attachment 6)

1. Accessibility

- **Vision:**
 - All spaces should have sufficient and even lighting, avoiding dim areas and sudden changes in light levels.
 - Glare should be minimized by using curtains or sunshades and avoiding reflective wall or floor surfaces.
 - Interior design should utilize contrast to improve visibility (e.g., stair steps, handrails, bathroom fixtures, glass walls, doors).
- **Mobility and physical control:**
 - Multi-storey buildings should have an elevator or a stair lift.
 - Circulation spaces and doorways should be generously dimensioned.
 - Floor surfaces should be even and non-slip, and thresholds should be avoided.
- **Memory-friendliness**
 - Entrances should allow personalization (for example, with a picture or a piece of furniture)

2. Functionality and comfort of spaces

- Apartment dimensions should consider storage needs (e.g., assistive devices and incontinence product deliveries).
- Spaces should enable care and assistance with daily activities (e.g., bathing etc.).
- Attention should be paid to the appearance of assistive devices supporting mobility and activity, ensuring they do not stand out excessively from the rest of the interior.

RECOMMENDATIONS FOR MAKING EXISTING HOUSING AGE-FRIENDLY PHASE 2/2

Considerations for designing the additional common spaces

(Haukeland 2024, see final report, attachment 6)

1. Accessibility

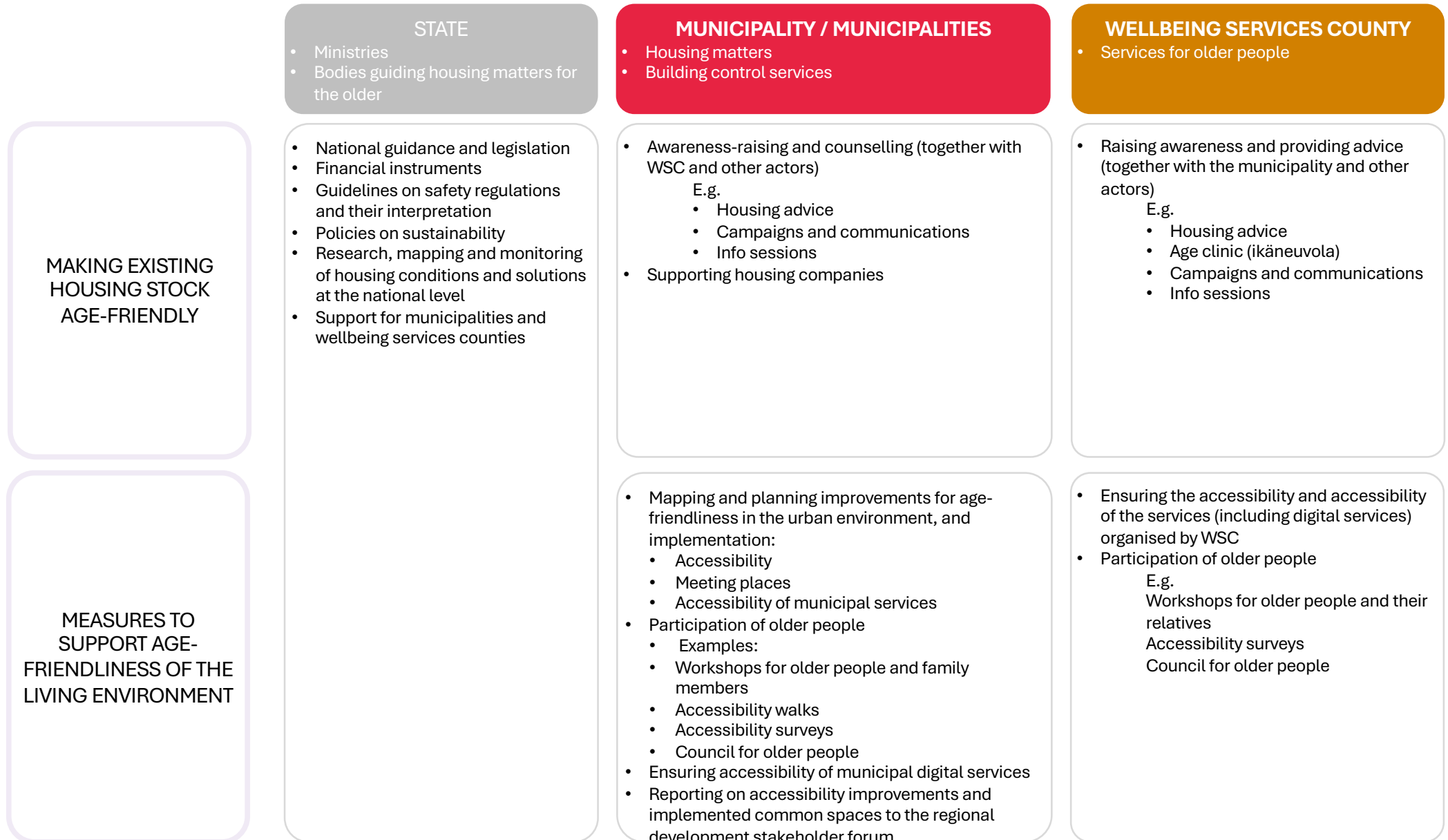
- **Vision:**
 - All spaces should have sufficient and even lighting, avoiding dim areas and sudden changes in light levels.
 - Glare should be minimized by using curtains or sunshades and avoiding reflective wall or floor surfaces.
 - Interior design should utilize contrast to improve visibility (e.g., stair steps, handrails, bathroom fixtures, glass walls, doors).
- **Kuulo:**
 - Common spaces should use materials that reduce echo and noise, such as acoustic panels
 - The layout of spaces and soundproofing solutions should ensure that sounds do not carry from one space to another
- **Mobility and body control**
 - Multi-storey buildings should have an elevator or a stair lift.
 - All circulation areas should have handrails
 - Circulation areas and doorways should be generously dimensioned
 - Floor surfaces should be even and non-slip, and thresholds should be avoided
 - Resting places should be available in circulation areas and outdoor spaces
 - An accessible toilet should be located adjacent to common spaces.
- **Memory-friendliness**
 - Long, maze-like corridors and repetitive spatial layouts should be avoided
 - Routes should mainly consist of sequences of functional spaces, where people using these spaces act as landmarks

- Visual connections between spaces should be enabled
- Colors and aids should be used to facilitate navigation (e.g., each floor has its own color code)
- Entrances should be designed to stand out from the façade
- Outdoor activities should be possible in a safe environment

2. Functionality and comfort of spaces (Haukeland 2024, see final report, attachment 6)

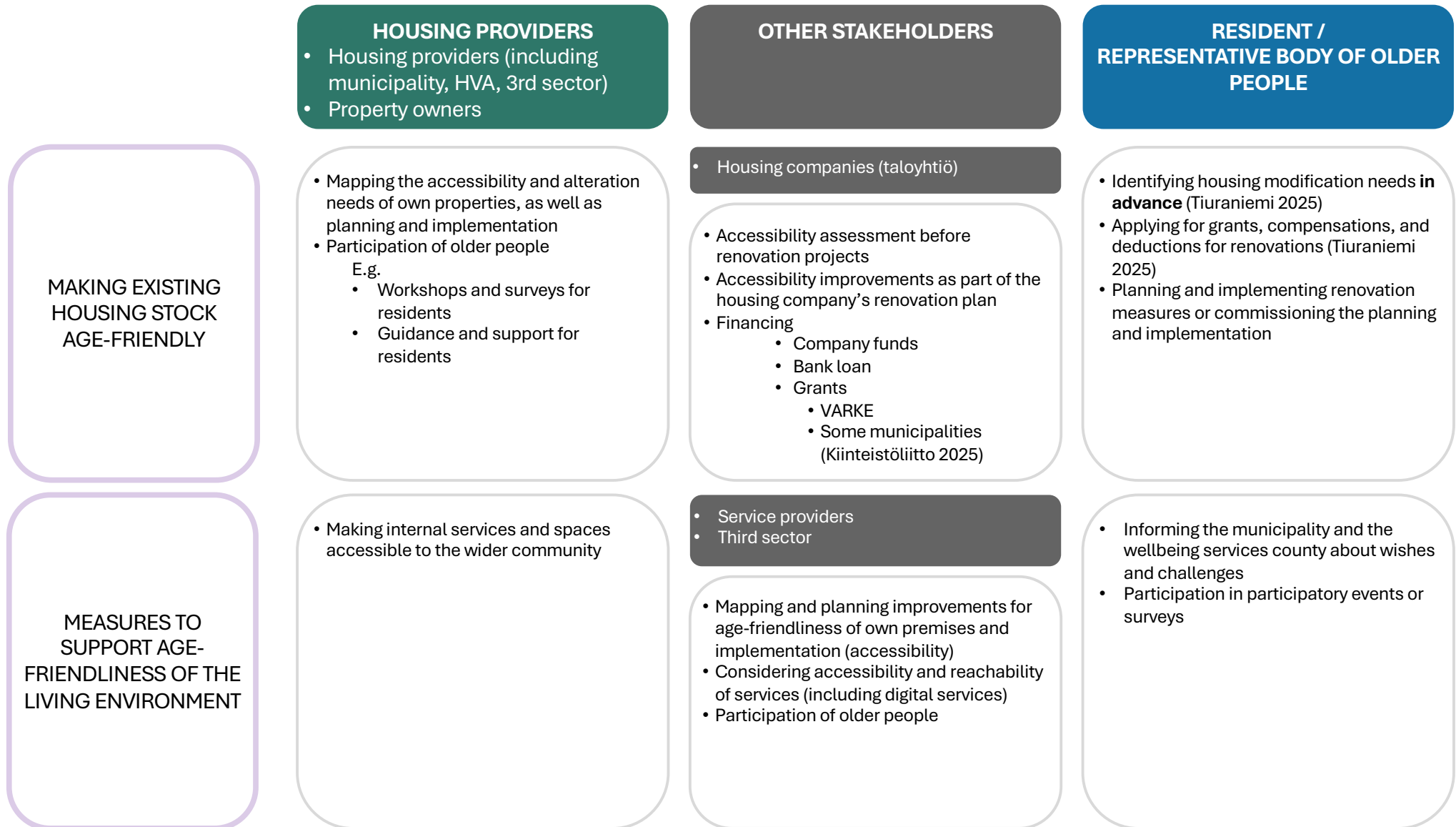
- Attention should be paid to the appearance of mobility and activity aids so that they do not stand out excessively from the rest of the interior
- Aesthetics should be considered when choosing furniture and materials
- Sufficient space should be reserved for the needs of operators

ROLES OF STAKEHOLDERS (1/2)



All stakeholders collect and provide feedback to the Regional development forum

ROLES OF STAKEHOLDERS (2/2)



All stakeholders collect and provide feedback to the Regional development forum

Flow of feedback & information

REGIONAL DEVELOPMENT

Training and communication of information to different stages and different actors

PREPARATION AND DEVELOPMENT OF SOLUTIONS

MAKING EXISTING HOUSING AGE-FRIENDLY:
Mapping modification needs
& HOUSING PRODUCTION (change of use + new construction):
real estate development and concept design

Deficiencies in analyses carried out in the regional development phase

Transferring knowledge developed during the concept design process into discussions between actors

DESIGN AND IMPLEMENTATION OF SOLUTIONS

MAKING EXISTING HOUSING AGE-FRIENDLY:
planning and implementation of modifications
& HOUSING PRODUCTION (change of use + new construction):
building design and construction

The impact of design solutions on costs.

Feedback on the sufficiency of preliminary information.

Completed age-friendly housing projects and community facilities

MAKING EXISTING HOUSING AGE-FRIENDLY

Feedback from users on new shared spaces, environmental modifications, the process of making their own home age-friendly, etc.

Implemented accessibility improvements and shared spaces

USAGE / MONITORING

Data on the use of services, communality and other functions (how much is used) and related feedback (why is used, why is not used) to parties developing concepts.

Monitoring the changes made and the effects of housing solutions, e.g. falls, need for care, etc.

User feedback on housing solutions, new common areas, environmental modifications, the process of making one's own apartment age-friendly, etc.

Communicating feedback on the functionality, accessibility and aesthetics of spaces to designers



HOUSING PRODUCTION

Change of use and new construction

REAL ESTATE DEVELOPMENT & CONCEPT DESIGN

Project ideation and development

In the real estate development and concept development phase, a housing concept is created based on identified demand. By analysing local, national, and global phenomena, an understanding of demand is formed. By analysing local conditions, the demand is anchored to the local context. By mapping examples, user needs, and ideating and testing alternative concepts, a foundation is established for a housing concept that will be detailed later during the design and implementation phases.

In the real estate development and concept design, regional input is incorporated through **the discussion forum for age-friendly living** (including the municipality, HVA, representative body of older people, and housing developers). This forum has outlined **a regional vision for age-friendly living** agreeing on key principles that guide this phase, including:

- **Quantitative demand for age-friendly housing:**
 - Demand for new dwellings (including change of use & new construction)
 - Demand for regional community spaces supporting living at home
- **Areas to be developed:**
 - Areas suitable for age-friendly housing
 - Potentially usable plots or properties
- **Sustainability principles**
 - Consideration of sustainability in implementation methods
- **Demand for service development**
 - Services supporting independent living

The vision and its guidelines are based on **current and anticipated future needs** identified through analyses and discussions in the forum. The analyses are available as source material for real estate development and concept design (see p.12).

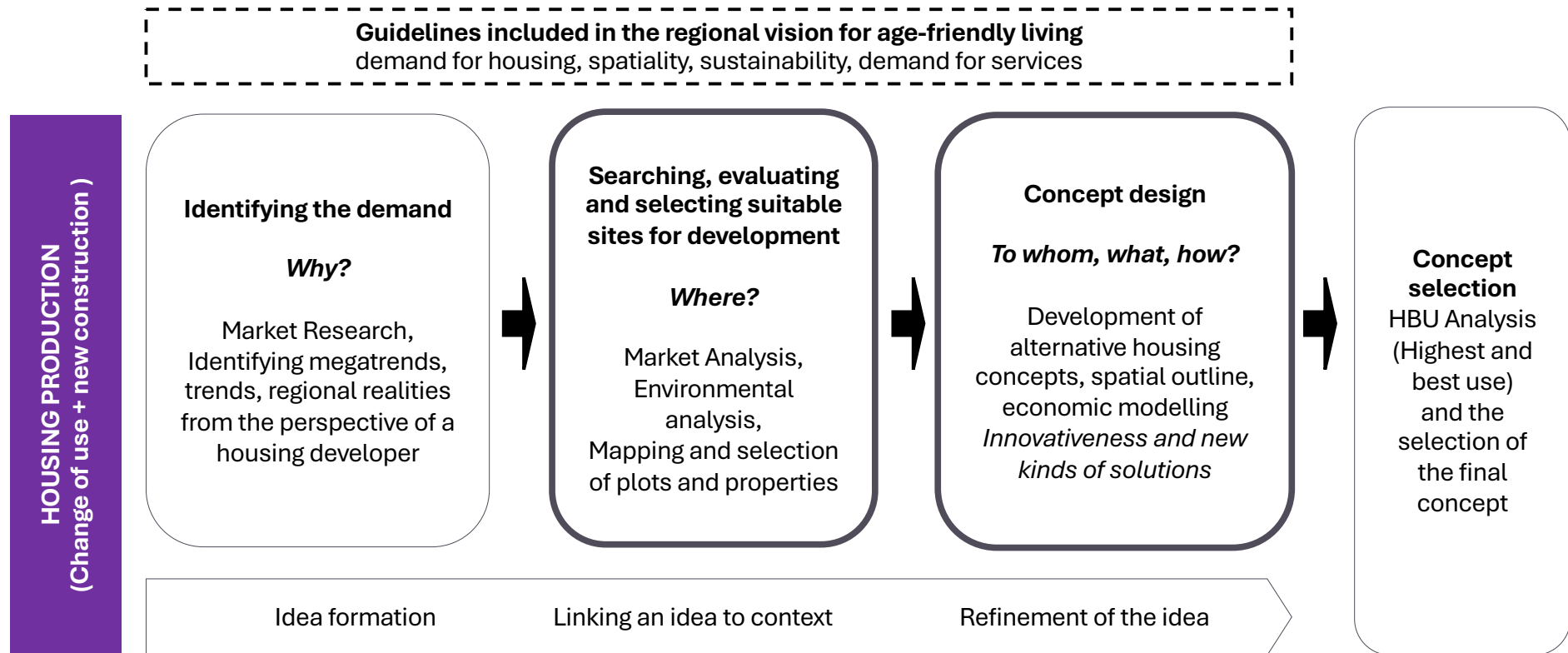
To support concept design, a concept tool developed in the TULE project can be found on page 49.

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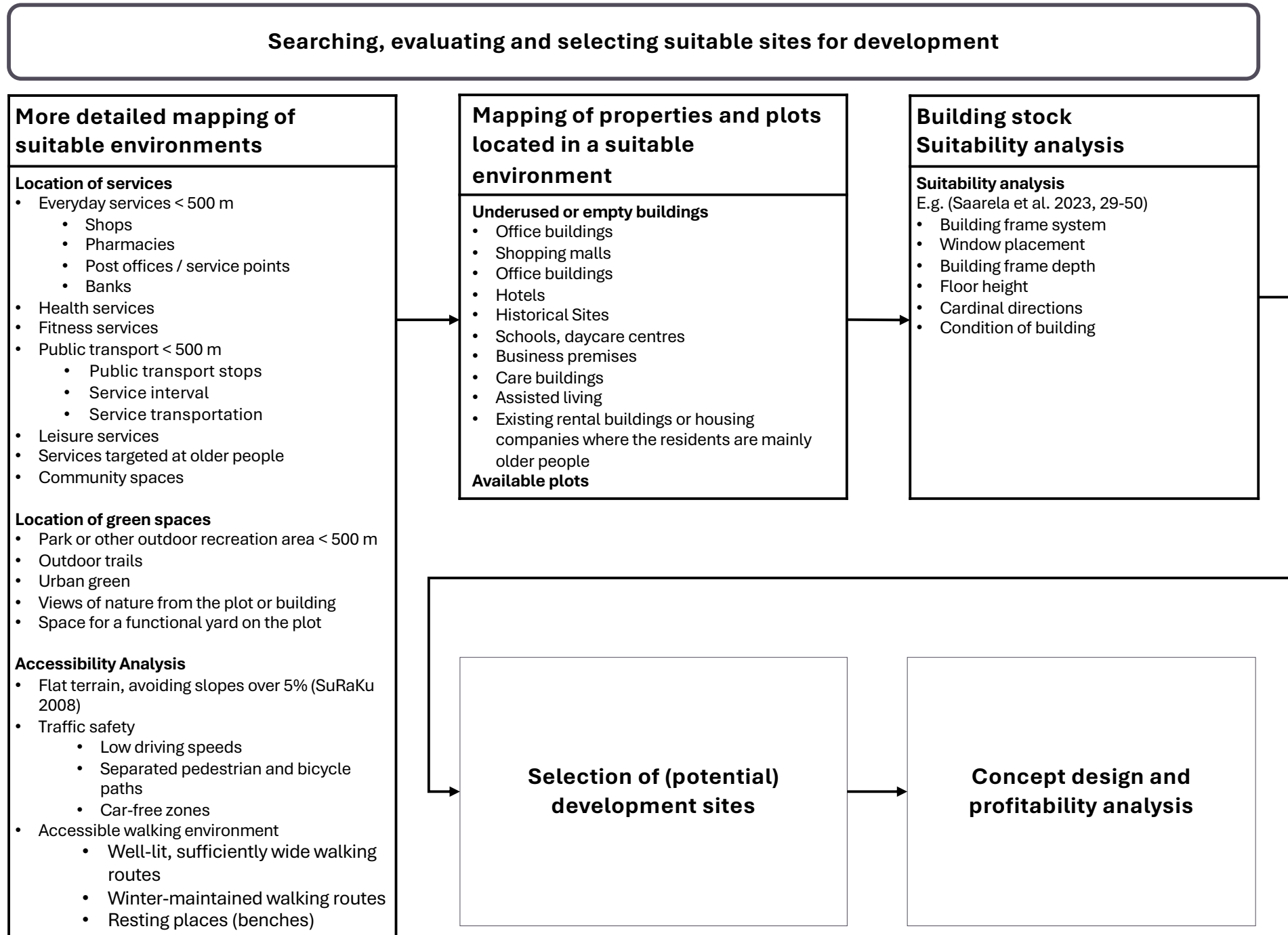
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REAL ESTATE DEVELOPMENT & CONCEPT DESIGN

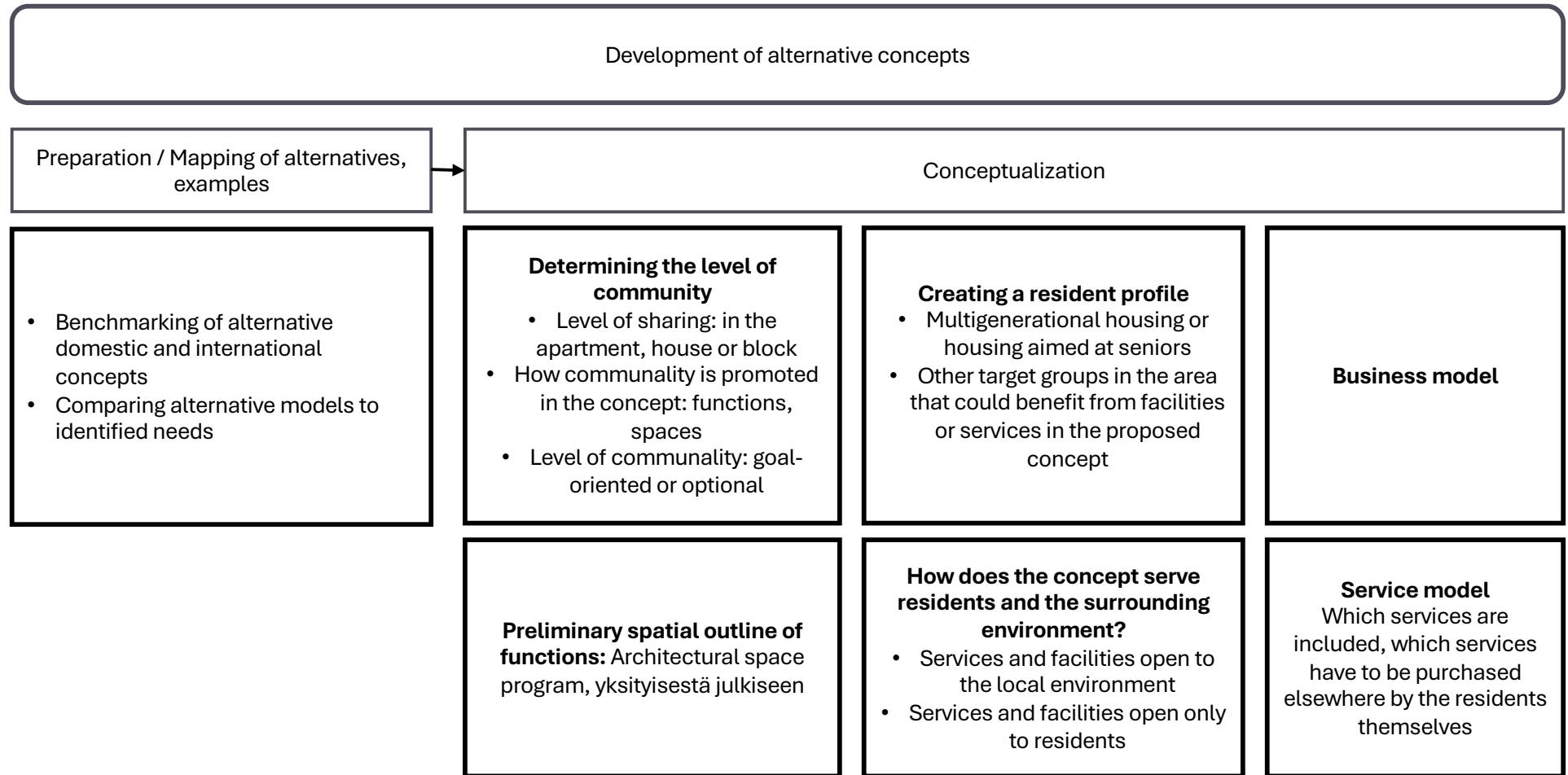
Structure adapted from Miles et al. (2015)



Searching, evaluating and selecting suitable sites for development



Concept design



RECOMMENDATIONS FOR THE REAL ESTATE DEVELOPMENT AND CONCEPT DESIGN PHASE

Participation

- Involve older people and their relatives in concept development, e.g.
 - Workshop
 - Surveys mapping housing preferences
 - Surveys to test housing concepts

Intergenerationality

- When developing housing concepts, take intergenerationality into account and try to enable meeting places for different generations, e.g.
 - Spaces and services open to non-residents
 - Housing with a mixed-age population (no age limit)

Affordability

- When developing age-friendly housing, the affordability of housing and other housing-related costs should be ensured

Sustainability

- Consider potential alternative uses for the property already at the concept stage, in case the current intended use is no longer needed in the future.
- Prioritize (when possible) existing building stock (especially in areas where housing demand may decrease in the future).

Diversity

- Take into account the diverse needs and preferences of older people when developing concepts
 - Different needs for communality
 - Different housing preferences
 - Varying need for support
- **There are no one-size-fits-all solutions, many kinds of solutions are needed**

Accessibility (see also p. 21)

- When mapping a suitable site or plot, take into account:
 - Proximity to services and communal spaces
 - Proximity to green spaces and opportunities for outdoor activities on the plot
 - Accessible location

Effects of the regional structure on services

- The more sparsely populated the locality and the longer the distances in the area, attention should be paid not only to housing solutions, but also to mobile services and service traffic/transport services.

Cooperation between actors

- When developing concepts, opportunities for cooperation and partners (service providers, foundations, voluntary organisations, municipal actors, etc.) should be mapped out.
 - To organize activities or services
 - To share spaces

Engage current and future users as well as family members.

In all decisions and solutions, resource wisdom should be prioritized by developing what already exists. When building new structures, prepare for changes with flexible solutions.

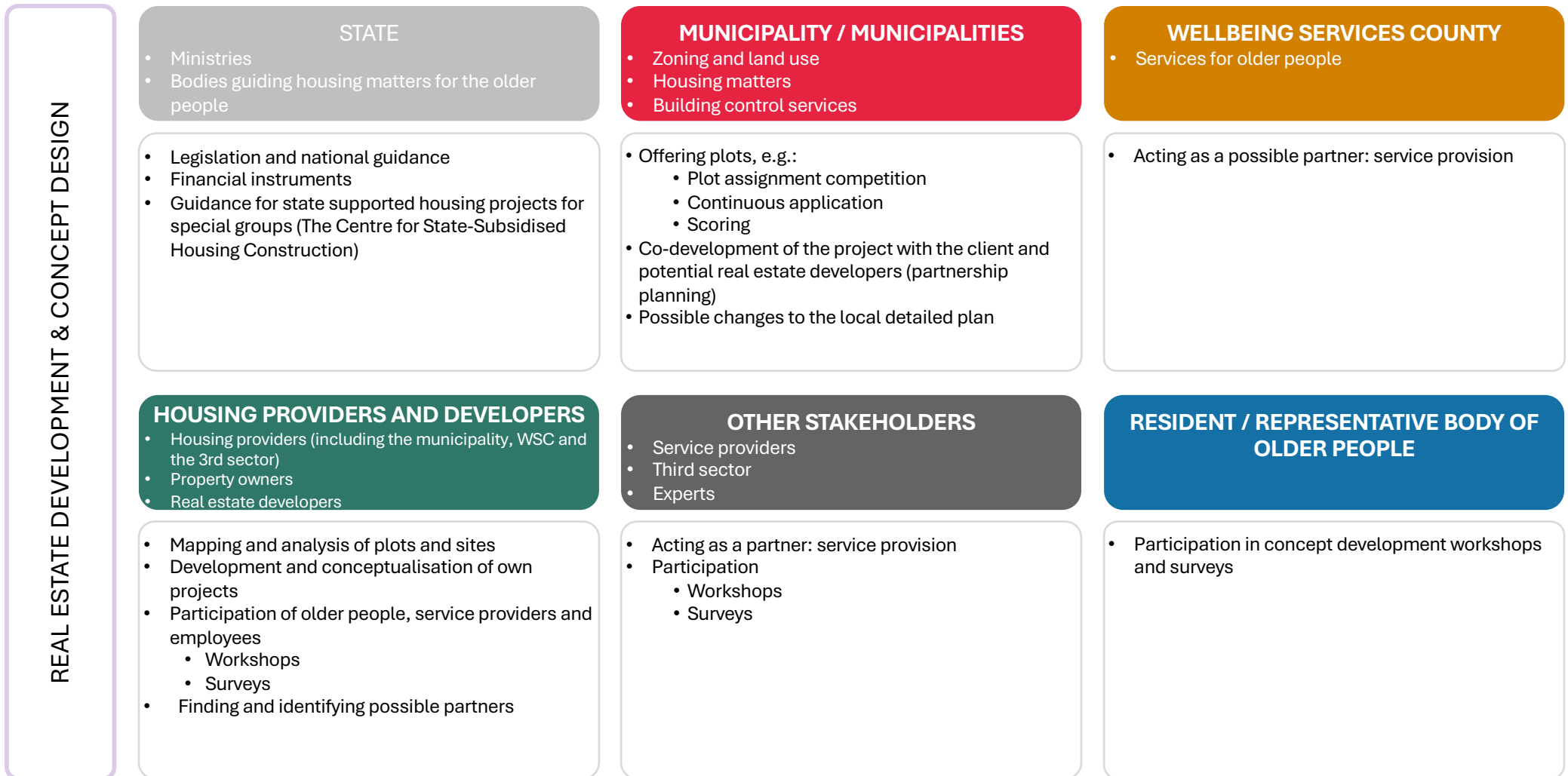
Selected solutions must also be suitable for other age and user groups.

Ensure diversity and abundance of housing options in all decisions and solutions.

Consider community and its support at different levels.

Always adapt decisions and solutions to the local context.

TOIMIJOIDEN ROOLIT Kiinteistökehitys ja konseptointi -vaiheessa



All stakeholders collect and provide feedback to the regional development forum

Flow of feedback & information

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real estate development and concept design

DESIGN AND IMPLEMENTATION OF SOLUTIONS

MAKING EXISTING HOUSING AGE-FRIENDLY:
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& HOUSING PRODUCTION (change of use + new construction):
building design and construction

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MAKING EXISTING HOUSING AGE-FRIENDLY

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BUILDING DESIGN AND CONSTRUCTION

In the design and implementation phase, functional, spatial, and financial objectives are set for the final building. Both the project process and the building and plot are designed and constructed.

- **Preparation (space requirement study, project planning):**
Objectives are defined for the project process and the final building. These include financial, spatial, sustainability, and functional aims that guide the design. For age-friendly housing, preparation emphasizes
 - considering the spatial needs of older residents and stakeholders connected to their daily life,
 - defining comprehensive design principles that support age-friendliness and social resources, and
 - setting sustainability targets.
- **Design (proposal, general and implementation planning):**
Through progressively refined plans, the spatial and technical form of the building is developed (including designs for applying building permits and implementing construction phase). For age-friendly housing, the design phase focuses on solutions that support sustainability, age-friendliness, and social resources (taking into account layout, space dimensions, material choices, etc.).
- **Implementation:**
The building is constructed.

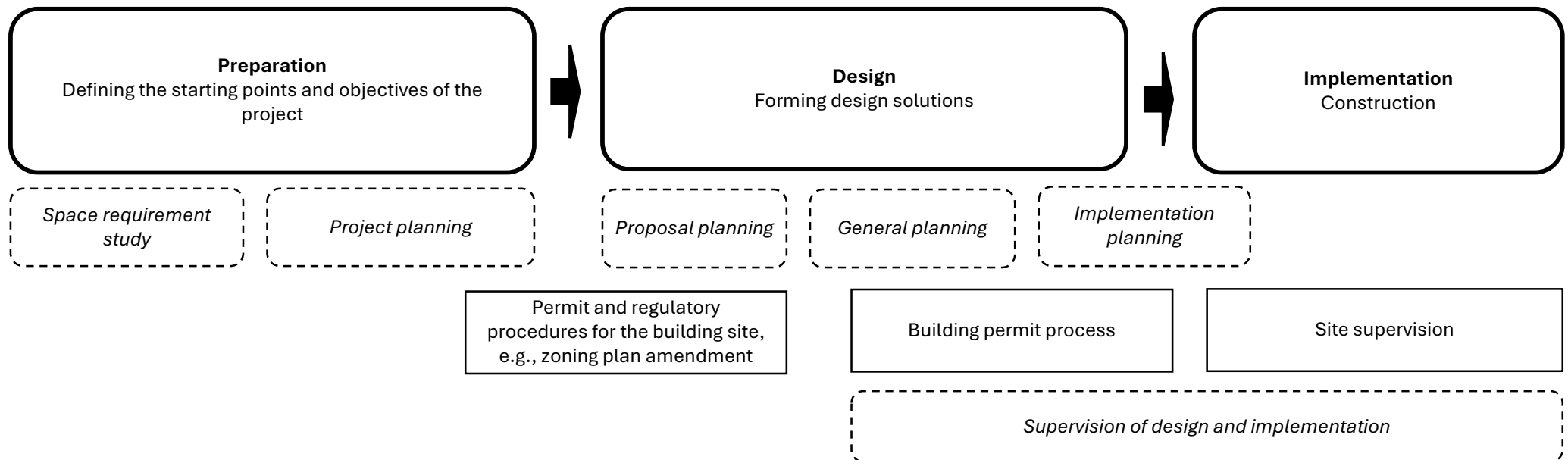
The design and implementation phase is based on the housing concept developed during the real estate development and concept design phase, the selected plot or property, and zoning regulations. The concept's functions, services, preliminary spatial layout, and chosen environment, together with financial realities, form the basis for the design. This phase also executes the regional vision for age-friendly living.

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BUILDING DESIGN AND CONSTRUCTION PROCESS

Sources for the structure and the roles of actors: RT 10-10827; RT 10-11222; RT 10-11224; RT 10-11284; (Kuusiniemi 2019)



MONITORING AND FEEDBACK

For the regional development and real estate development and concept design phase:
The impact of design solutions on costs.
Completed age-friendly housing projects and community spaces

Within the design and implementation phase, from the design phase to the preparation phase:
Feedback on the sufficiency of preliminary information.

Preparation & recommendations

Preparation

Defining the starting points and objectives of the project

Space Requirement study

Project planning

Project justifications: Preliminary space requirements and their requirements, Mapping of alternatives and estimation of their costs

Objectives for the implementation and design of the project

Preliminary space requirements

Forming an architectural space program
Distribution and dimensioning of required spaces

Defining the principles that guide the design process

Recommendations related to age-friendly housing concerning spatial requirements to be defined during the Space requirement study and project planning stages

Mapping of building site options

- The plot should have space for a functional accesible green yard

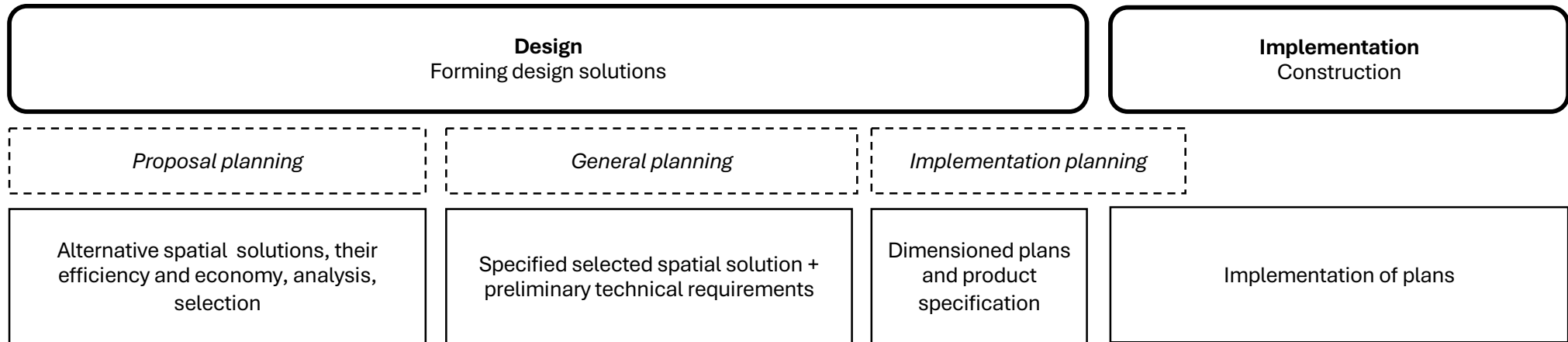
Forming a preliminary architectural space program

- Outdoor and indoor spaces should be reserved for exercise (e.g. gym, outdoor gym, lawn bowling).
- Common spaces should have functional outdoor and indoor spaces that encourage activities and exercise (e.g. workshop, gardening, planting boxes).
- The need for storage space (e.g. assistive devices, diaper deliveries) must be taken into account in the dimensioning of the apartments.
- If there are care staff in the building, the facilities intended for staff work and storage should be separated from the residents' facilities.
- In addition to the residents of the building, it is recommended that some of the common areas be directed to the residents of the surrounding area.

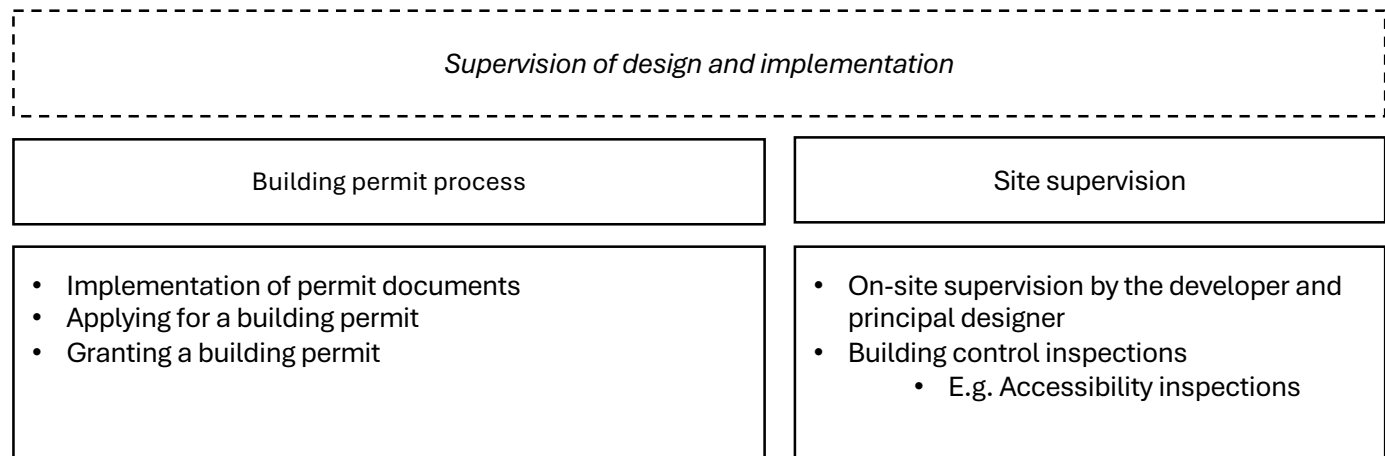
Recommendations related to age-friendly housing for defining the principles that guide the design process

- The facilities must be designed to be accessible. Please note:
 - Memory-friendly design
 - Sensory-friendly design
 - Accessibility (Mobility)
- The spatial structure should support both a sense of community and ensure privacy
- The space needs of care and storage must be taken into account
 - There should be enough storage space in the apartment and common areas (assistive devices, diaper boxes, etc.)
- Facilities must be designed to be flexible in the short and long term. E.g.
 - Provisions for building systems, and structural openings
 - Kitchen provision in all units
 - Provisions for future installation of assistive technologies and devices
- Connection with nature
 - Yard design, views from the apartments
- Age-neutral design principles
- Requirements for furniture and equipment
 - Technologies that increase safety
 - E.g. stove guards, safe stoves
 - Age-friendly and ergonomic furniture
 - E.g. decending kitchen upper cabinets, raised sockets

Design & Implementation & Recommendations



• See Recommendations for design pp. 38-39



Ensuring accessibility both in the building permit process and supervision during construction
 E.g.

- Requiring an accessibility report as part of a building permit application (Arpiainen et al., 2021, 78)
- Requirement for an accessibility survey at renovation sites and a report on the repair measures (Arpiainen et al., 2021, 78)
- Accessibility inspections as part of building control inspections
- Ensuring that the changes made during construction do not impair the accessibility of the project

RECOMMENDATIONS FOR DESIGN 1/2

1. Accessibility (Haukeland 2024, see final report, attachment 6)

• Vision:

- Sufficient and even lighting should be ensured in all spaces, and dim spaces and sudden changes in the amount of light should be avoided.
- Both artificial light and natural light should be used in lighting conditions.
- Glare should be minimized by using curtains or sun visors and avoiding reflective wall or floor surfaces.
- Contrast differences should be used in the interior to improve visibility (e.g. staircase steps, railings, toilet fixtures, glass walls, doors).

• Hearing:

- Materials that reduce echoes and noise, such as acoustic panels, should be used in common areas.
- The placement of the premises and sound insulation solutions must ensure that sounds do not carry from one space to another.

• Movement and body control:

- Multi-storey housing should have an elevator or a stairlift.
- All circulation spaces must have railings.
- Passageways and doorways must be dimensioned spaciouly
- Floor surfaces should be flat and non-slip, and thresholds should be avoided.
- There should be resting places in the circulation spaces and in the yard.
- There should be an accessible toilet in connection with common areas.
- In the apartment, the toilet should be located in connection with the bedroom.
- The doors should be easy to use, for example. assisted by electric opening.

• Memory-friendliness

- Avoid long, maze-like corridors and repetitive spatial layouts.
- Circulation routes should primarily consist of a sequence of functional spaces, allowing people using these spaces to serve as landmarks.
- Visual connections between spaces should be enabled.
- Colors and cues should be used to support navigation (e.g., each residential floor has its own color code).
- Apartment entrances should allow personalization (for example, with a picture or a piece of furniture).
- The building should provide access to an accessible outdoor courtyard.
- Apartments designed for people with memory disorders should preferably be located so that residents have direct, unaccompanied access from the residential floor to a safe outdoor area without needing an escort (via elevator or stairs)

2. Connections to the outside (Haukeland 2024, see final report, attachment 6)

- Apartments and shared spaces should offer views of green space (e.g., towards a courtyard).
- Yard design should consider ease of winter maintenance (Verma et al., 2022).
- Placement of functions on the plot should take into account how building massing and positioning affect light conditions for both the plot and the building.
- Views from apartments should, where possible, be oriented towards nature

Engage current and future users as well as family members.

In all decisions and solutions, resource wisdom should be prioritized by developing what already exists. When building new structures, prepare for changes with flexible solutions.

Selected solutions must also be suitable for other age and user groups.

Ensure diversity and abundance of housing options in all decisions and solutions.

Consider community and its support at different levels.

Always adapt decisions and solutions to the local context.

RECOMMENDATIONS FOR DESIGN 2/2

3. Communality (Haukeland 2024, see final report, attachment 6)

Design that supports social interaction

- Common areas should be designed to be functional (e.g. shared kitchen, conservatory, garden, gym, laundry room).
- Shared spaces should be centrally located in the spatial structure in relation to the apartments and in connection with everyday routes.
- The apartments should have views of the common areas (e.g. from the kitchen to the courtyard).
- The routes should be compiled mainly from functional space series, and windowless narrow corridors should be avoided.

• Design that supports privacy

- Sounds should not carry between apartments and shared spaces.
- Apartment entrances should not be located directly adjacent to shared spaces; instead, there should be a transitional zone (e.g., a resident-controlled area or stairwell) between apartments and shared spaces to protect privacy.
- Shared spaces should not have unobstructed visual access to apartments.

• An environment that supports inclusion:

- In the design of common areas, it must be taken into account that residents have the opportunity to meet with different sizes of ensembles.
- The residents' handprint should also be visible in the common areas (for example, a personalised apartment entrance).

4. Functionality and comfort

- The need for storage space (e.g. assistive devices, diaper deliveries) must be taken into account in the dimensioning of the apartments.
- The premises of the apartment must enable care and assistance in everyday activities (e.g. washing, etc.).
- Attention should be paid to the appearance of assistive devices that support movement and activity, and they should not stand out too much from the rest of the interior.
- When choosing furniture, attention should be paid to aesthetics and office-like furniture should be avoided.
- The property must have a designated parking space for care staff.

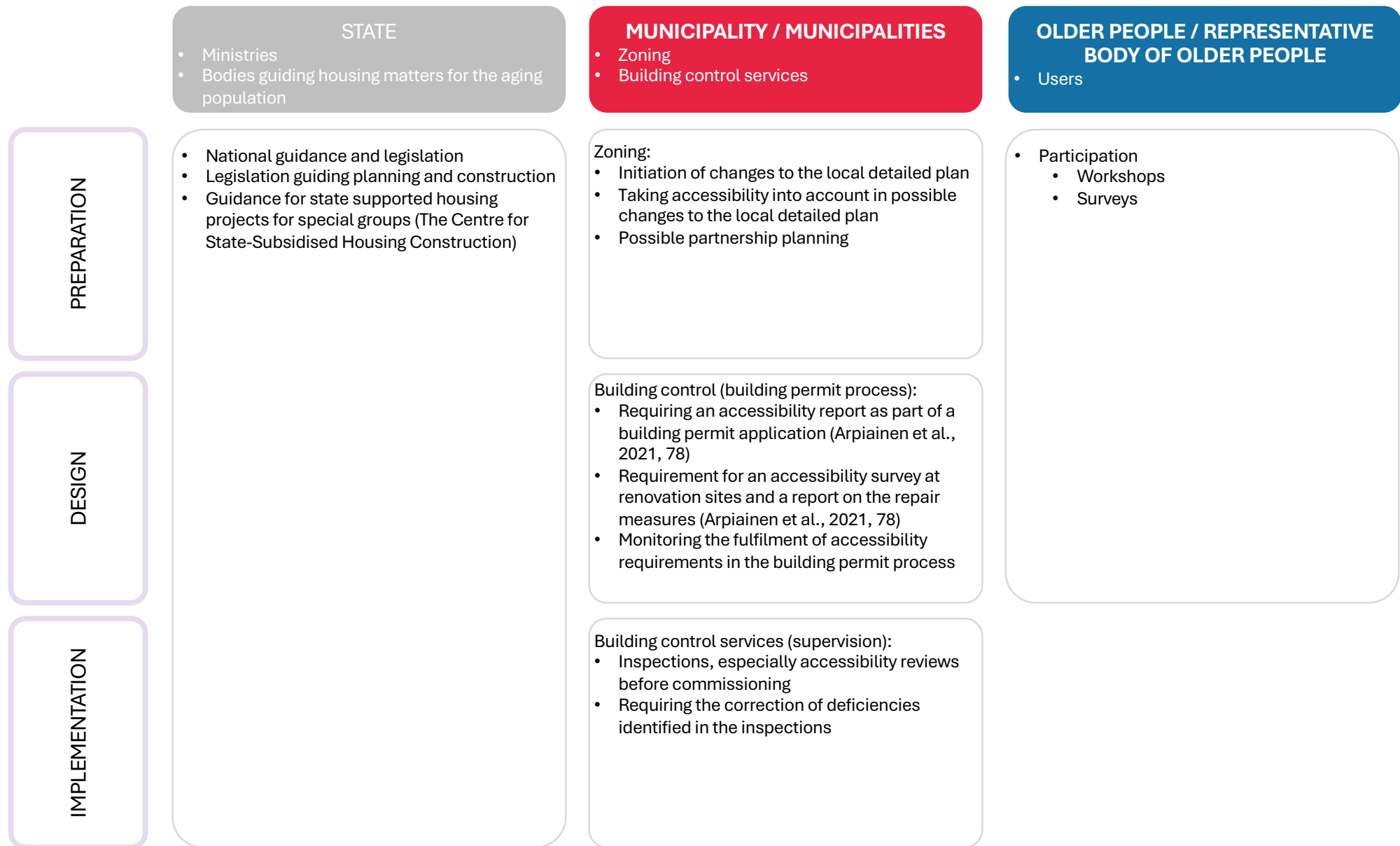
5. Adaptability

- The design should take into account how structural systems, building services, and layout affect the building's adaptability in the future (see Tarpio 2015)
 - Adaptability is made possible, for example, by long spans and pillar structures (Häkkinen and Ala-Kotila 2019).
- The window division must enable the division of spaces into smaller spaces with windows (Pelsmakers et al. 2022; Yrjänä 2024).
- The number and placement of the building's stairwells must enable versatile and flexible apartments (Yrjänä 2024)

6. Universal principles of good housing design (Pelsmakers et al. 2022)

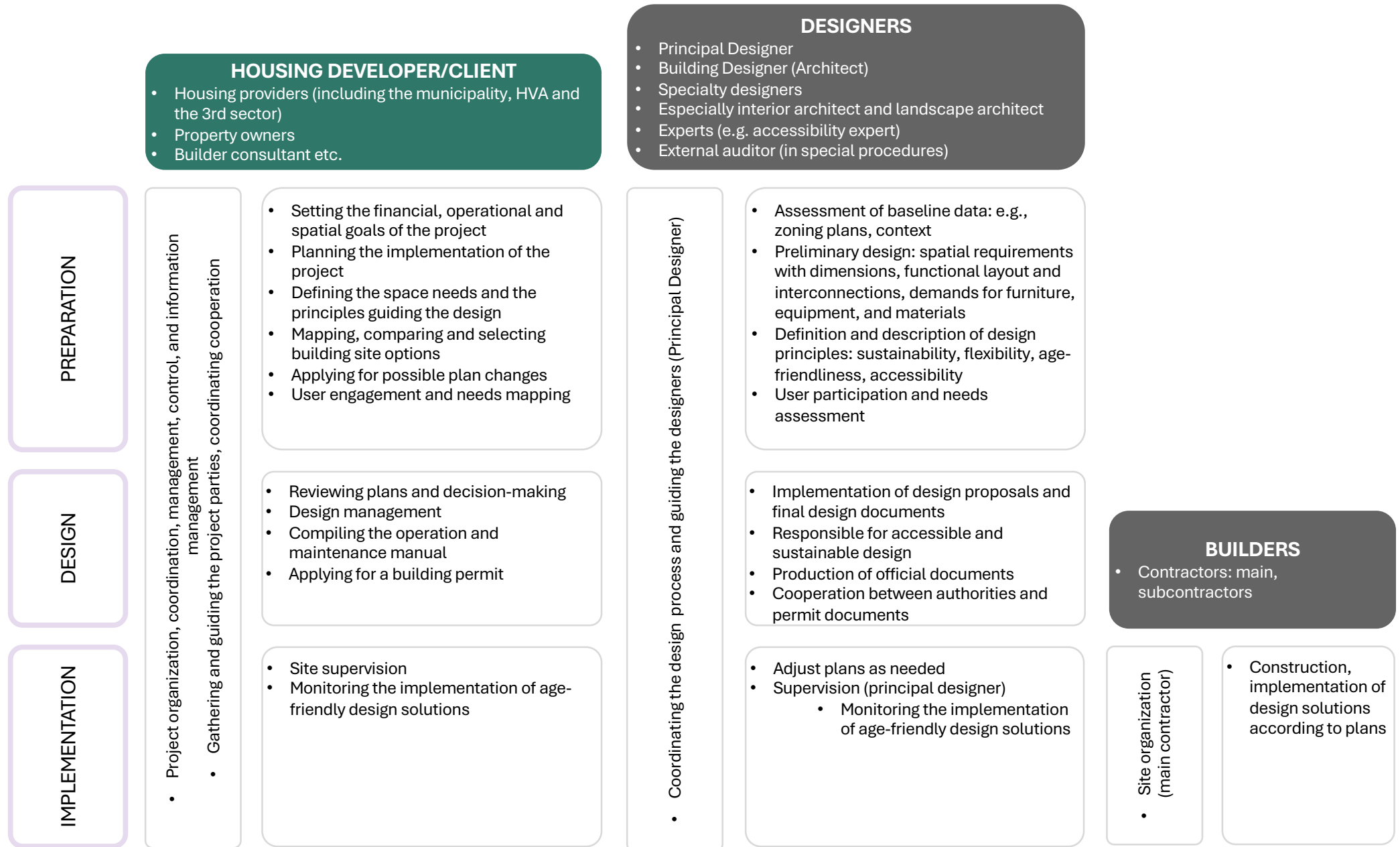
- The frame depth of the building should not exceed 12 metres
- Most apartments should open in at least two directions
- The central corridors dividing the building's frame in two should be avoided and natural light should be allowed to enter the stairwell
- All apartments should have a direct connection to the outside (terrace or balcony)
- It must be possible to furnish the apartments in several ways

ROLES OF STAKEHOLDERS (1/2)



All stakeholders collect and provide feedback to the Regional development forum

ROLES OF STAKEHOLDERS (2/2)



All stakeholders collect and provide feedback to the Regional development forum

Flow of feedback & information

REGIONAL DEVELOPMENT

Training and communication of information to different stages and different actors

PREPARATION AND DEVELOPMENT OF SOLUTIONS

MAKING EXISTING HOUSING AGE-FRIENDLY:
Mapping modification needs
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real estate development and concept design

MAKING EXISTING HOUSING AGE-FRIENDLY

Feedback from users on new shared spaces, environmental modifications, the process of making their own home age-friendly, etc.

Deficiencies in analyses carried out in the regional development phase

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DESIGN AND IMPLEMENTATION OF SOLUTIONS

MAKING EXISTING HOUSING AGE-FRIENDLY:
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Monitoring the changes made and the effects of housing solutions, e.g. falls, need for care, etc.

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USAGE AND MONITORING

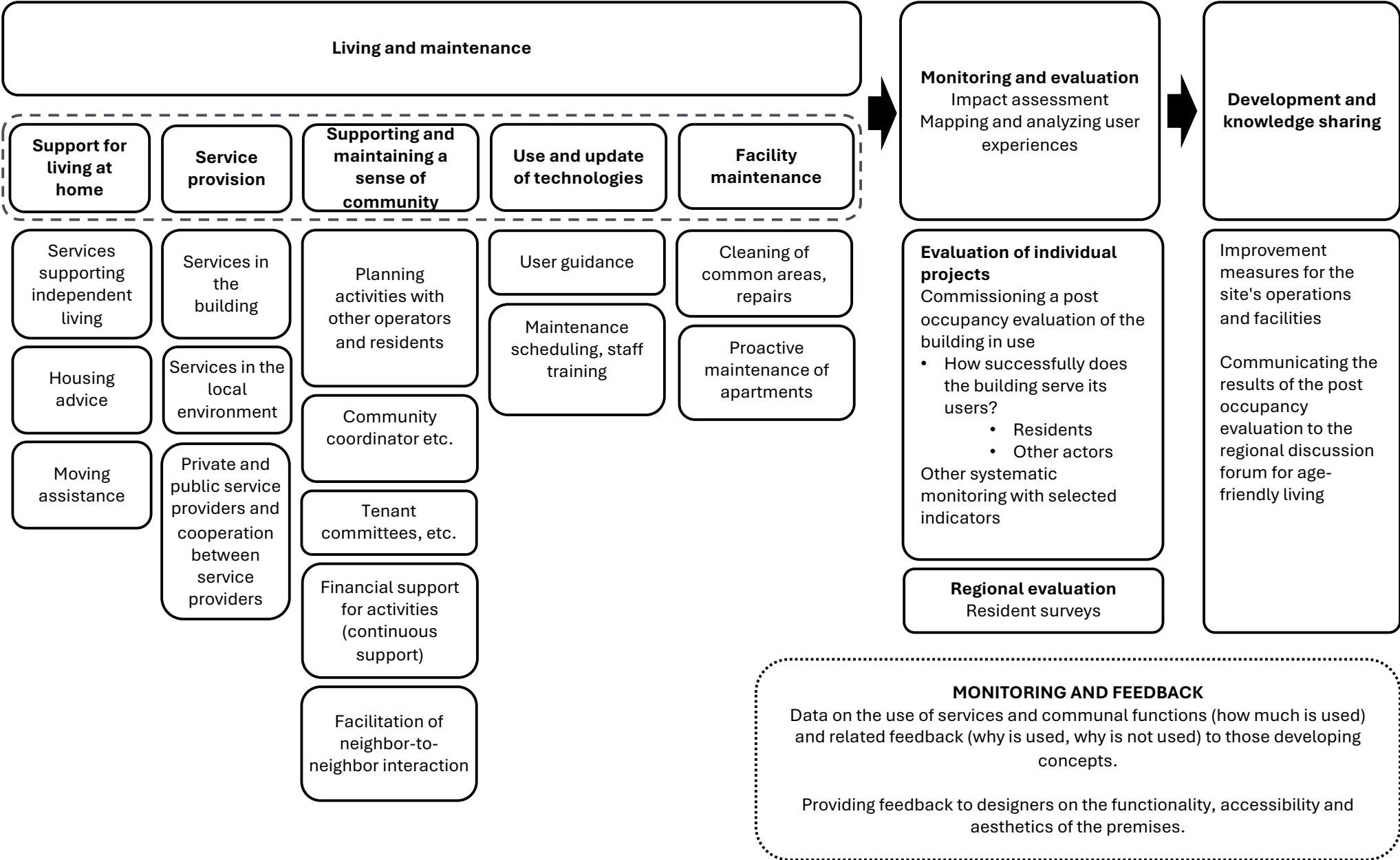
In the usage and monitoring phase, the designed building is taken into use and becomes a home for its residents. At the same time, the planned spaces, functions, services, and technologies are implemented. During this phase, independent living and active aging are supported through various measures, such as fostering social interaction. The functionality of the designed concept and spatial solutions is monitored, and feedback is collected from residents and housing management. This information is used to improve the current properties and shared with stakeholders planning new housing.

Input for this phase consists of the building designed and implemented in the previous phase, including its services, functions, and spaces, as well as its integration with the existing environment.

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USAGE AND MONITORING PROCESS



RECOMMENDATIONS FOR THE USAGE AND MONITORING PHASE

Participation

- Engage older people in the development of services and community activities
- Collect and respond to feedback from older people
- Support and enable activities organized by older people themselves

Adequate guidance

- Older people must be familiarized with the technologies utilized in housing and their proper use.
 - For example, stove guard and similar devices.
- Older people must be instructed on how to use the new apartment and the building

Supporting communality

- Activities organised by the elderly themselves should be supported and enabled.
- Cooperation with different actors and service providers should be utilised in the production of communal events and activities.
- Intergenerational communality and a sense of community within the area should also be promoted through events or activities open to non-residents.

Collecting feedback and further development

- Satisfaction with the quality of housing must be assessed, and opportunities for providing feedback must be ensured
 - For older people
 - For other stakeholders
- Identified challenges must be addressed, and efforts should be made to find appropriate solutions.
- Post-occupancy evaluation (POE) should be conducted for completed housing projects a few years after completion. The results should be reported to developers of age-friendly housing and shared in the regional discussion forum for age-friendly living

Supporting living at home

- Considering and anticipating personal housing needs
 - Housing advice
- Supporting moving into an age-friendly apartment
 - Moving assistance
- Services supporting independent living and their needs assessment

Engage current and future users as well as family members.

In all decisions and solutions, resource wisdom should be prioritized by developing what already exists. When building new structures, prepare for changes with flexible solutions.

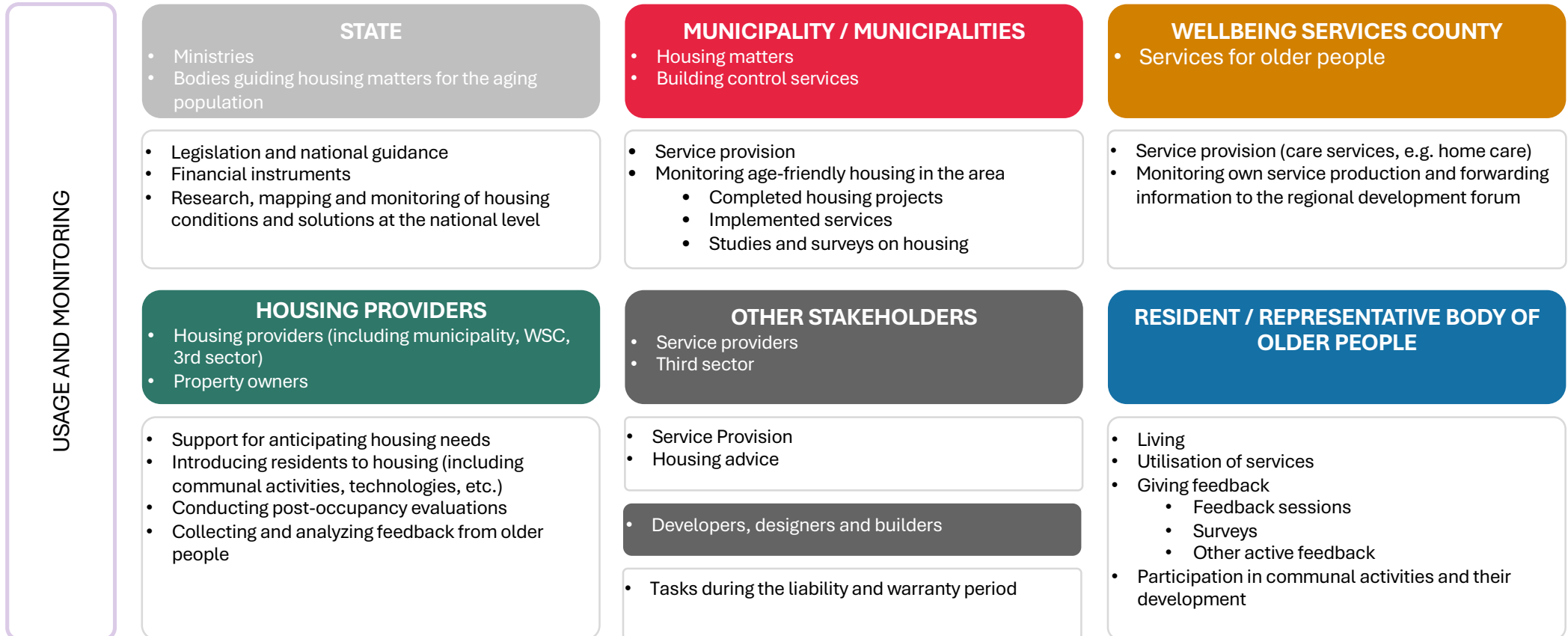
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ROLES OF STAKEHOLDERS



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Flow of feedback & information

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real estate development and concept design

DESIGN AND IMPLEMENTATION OF SOLUTIONS

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HOUSING PRODUCTION (change of use + new construction): *building design and construction*

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MAKING EXISTING HOUSING AGE-FRIENDLY

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 Transferring knowledge developed during the concept design process into discussions between actors

Communicating feedback on the functionality, accessibility and aesthetics of spaces to designers

Sources cited in the document

The background to the model can be found in the final report of the Future Senior Housing (TULE) project. Due to the extensive number of sources, the sources are also mainly only included in the report.

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TULE Concept tool



TOOL FOR CONCEPT DEVELOPMENT

The concept tool includes four themes: spaces, communality, services and technologies.

The concept tool consists of three sections:

1. Resident and residential environment profile menus (pp. 3-4)

- The profile menus can be utilised during conceptualisation, but they are not mandatory.
- One or more options can be selected from each menu column, depending on who or what the concept is to be developed for.
- The third row of the table indicates which theme of the concept tool is affected by the selections made from the column.
- The selections made from the menus recommend cells for concept creation ("Pay special attention").

2. Location of functions and degree of privacy table (p. 5)

- The table can be used to consider and illustrate the zones in which everyday activities are located and what their level of privacy is.
- The table can be filled in before creating the concept if information on where functions will be located is already available. In that case, the choices help guide the concept design. The table can also be filled in during and after the concept development process to review and check the placement of functions.

3. Concept cell set (p. 6)

- Either all themes (spaces, community, services and technologies) can be developed together, or specific themes can be delved into separately.
- Each theme is divided into categories including the selectable cells. The tool indicates whether one or more selections can be made from the categories.
- Each theme and its categories are explained in more detail on pages 7-10.
- After making the selections, the next step in concept development is to define what the chosen options mean in practice, linking them to the possible choices made in the resident and environment profile menus. For example, this may include identifying what kinds of technologies are needed to support living and daily activities, or what technologies could be provided. Location and the level of public transport services, in turn, affect needs such as transport services.

The concept development tool is illustrated with example concepts on pages 11-22.

AI (Microsoft 365 Copilot) has been utilised to translate the concept tool from Finnish to English.

Resident profile menu

| Characteristics of the resident and his or her life situation | | | | | Resident's housing preferences | | | | |
|--|--|--|----------------------|--|--|--|---|--|--|
| Lifestyle | Functional capacity Cognitive + Physical | Household size | Financial resources | Older people's attitudes towards housing | Preference for resident composition | Need for community/ need for privacy | Space requirement | The need for outdoor space | Technology-orientation |
| Services, facilities, community, technology | Services | Facilities | Services, facilities | Facilities | Communality | Communality, facilities | Facilities | Facilities | Technology |
| Home-oriented hands-on person Pay special attention to: T1a, T1b | Good functional capacity Pay special attention to: T1a | Living alone Pay special attention to: T1a | Low-income | Planner -Anticipates Pay special attention to: T2a/T2b/T2c/T2d/T2e | Prefers an intergenerational environment Pay special attention to: Y1b | Enjoys being on their own, values privacy Pay special attention to: Y2a | Wants to minimize extra space Pay special attention to: T1a, T1b | Own yard Pay special attention to: T1a, T1b | Technology-positive Pay special attention to: TG1a, TG1b, TG1c, TG1d, TGe |
| Active consumer of cultural and service offerings Pay special attention to: P1c, P1d | Slightly impaired functional capacity Pay special attention to: P1b, P1d, P1e, TG1c, TG1d, Y3b | Living with a spouse or someone else Pay special attention to: T1a | Middle-income | Adaptor - Responsive with delay Pay special attention to: T2a | Prefers living only with other seniors Pay special attention to: Y1a | Occasionally participates in communal activities, makes use of common spaces "Alone together" Pay special attention to: Y2a | Wants to live spaciouly Pay special attention to: T1a, T1b | Terrace/balcony Pay special attention to: T1a, T1b | Reserved towards technology Pay special attention to: TG1a, TG1c, TG1d PASSIVE |
| Enjoyer Convenience-oriented Pay special attention to: P1c, P1d | Poor functional capacity Pay special attention to: P1d, P1b, TG1c, TG1d, Y3b | | High-income | Stubborn - Highly resistant to change Pay special attention to: T2a | | Actively participates in community events Pay special attention to: Y2a | There is a need for a work or hobby space Pay special attention to: T1b | No own outdoor spaces Pay special attention to: T1a, T1b | Technology-negative Pay special attention to: TG1a, PASSIVE |
| Outdoor person Pay special attention to: T1a, T1b | | | | | | Wants to live their everyday life in a communal way Pay special attention to: Y2b | | | |

Environment profile menu

| Location | Growing vs. shrinking area | Access to services | Access to Green space | Access to public transportation |
|--|--|---|---|---|
| Facilities (implementation method, type of building, services) | Facilities (implementation method, type of building), services | Services | Facilities | Services |
| City Pay special attention to: T2a-e, T3a-e | Growing Pay special attention to: T2a-e, T3a-e | Lots of services in close proximity | Only urban greenery nearby Pay special attention to: T1 | Public transport stop nearby |
| Town Pay special attention to: T2a-e, T3a-e | Stable Pay special attention to: T2a-e, T3a-e | Some services in close proximity Pay special attention to: P1a, TG1 | Nearby a park etc. natural area to be used Pay special attention to: T1 | Public transport stop not nearby Pay special attention to: P1a |
| Village Pay special attention to: T2a, T2b, T2f, T3b-e | Shrinking Pay special attention to: T2a-b, T3b-e | No services in close proximity Pay special attention to: P1a, TG1 | Close to a forest Pay special attention to: T1 | Frequent service intervals |
| Rural areas Pay special attention to: T2a, T2f, T3b-e | | | | Infrequent service intervals Pay special attention to: P1a |
| | | | | Service transport Pay special attention to: P1a |
| | | | | No public transport available Pay special attention to: P1a |

Location of functions and degree of privacy

| Dwelling | Building + Yard | Neighbourhood |
|----------|-----------------|---------------|
| Private | Semi-Private | Public |
| | | |

- Sleeping
- Spending time
- Dining
- Bathing
- Using the toilet
- Sauna
- Hobbies
- Vehicle storage

Examples of location and degree of privacy of the functions of different concepts:

| Dwelling | Building + Yard | Neighbourhood |
|------------------|-----------------|---------------|
| Private | Semi-private | Public |
| Sleeping | Hobbies | |
| Spending time | | |
| Bathing | Vehicle storage | |
| Using the toilet | | |
| Dining | | |

| Dwelling | Building + yard | Residential area |
|------------------|-----------------|------------------|
| Private | Semi-Private | Public |
| Sleeping | Hobbies | |
| Spending time | | |
| Bathing | Vehicle storage | |
| Using the toilet | | |
| Dining | | |

COMMUNALITY

SERVICES

TECHNOLOGIES

Focus of community
Select 1 or more

Y1a
Community among older adults

Y1b
Intergenerational community

Formation of community
Select 1 or more

Y3a
Self-organising communality

Y3b
Supported communality

Service model
Select 1 or more, connect with services

Services included in housing concept

Self-arranged services

Smart home technologies
Select 1 or more

TG1a
Building services and home automation

TG1b
Communication technologies

TG1c
Technologies that monitor and support health

TG1d
Technologies that support living and daily act.

TG1e
Leisure and entertainment

Commitment to community
Select 1

Y2a
Possible, voluntary communality

Y2b
Community as an objective

Service distribution P1
Select 1 or more

P1a
Transportation services

P1b
Everyday support services

P1c
Leisure services

P1d
Health and care services

P1e
Well-being and fitness services

P1f
Communication and platform services

Type of use of technology
Select 1 or more, connect with technology

INTERACTIVE

PASSIVE

Technologies actively used by the resident

Technologies passively used by the resident

Concept cells

Spatiality of communality / services / technologies
Select 1 or more

- Within the apartment (communality)
 - "For the resident" (services)
 - In the apartment (technologies)
- Between apartments (communality)
 - "For residents" (services)
 - In the building (technologies)
- Within the living environment (communality)
 - "For everyone" (services)
 - In the neighbourhood (technologies)
- Wearable technologies

Type of space T1
Select 1 or more

T1a
Private spaces

T1b
Common spaces

Implementation T2
Select 1

T2a
Making existing housing age-friendly

T2b
Change of use

T2c
Extension / addition

T2d
Infill construction

T2e
New construction

T2f
Relocatable and reusable structures

Building type T3
Select 1

T3a
Multi-storey apartment building

T3b
Detached house

T3c
Mobile housing

T3d
Terraced house / Townhouse

T3e
Mixed-use building

FACILITIES

Communality

Focus of community

Select 1 or more

Y1a

Community among older adults

- Housing/activities targeted for the elderly
- Age-restricted housing/activities

Y1b

Intergenerational community

- Housing/activities for older adults and other ages
- Mixed resident base
- Multigenerational living within the family

Formation of community

Select 1 or more

Y3a

Self-organising communality

- Communality relies on residents' initiative

Y3b

Supported communality

- Communality is supported by services and activities
- For example community coordinator

Commitment to community

Select 1

Y2a

Possible, voluntary communality

- Community is not a key objective; residents can choose whether to engage
- Residents are not required to commit to community

Y2b

Community as an objective

- Community is intentional and a core part of the housing concept
- Residents actively contribute to building community, organising activities, and shaping everyday life
- Requires:
 - Residents' commitment to community
 - Willingness to get to know neighbours
- E.g. co-housing

The spatiality of communality

Select 1 or more



• Within the apartment (communality)

- The apartment is divided between several household
 - Shared housing
 - Group homes
- Not suitable for everyone
- Sufficient privacy must be ensured for residents



• Between apartments (communality)

- The residents have their own apartments, but they share the apartment's external common spaces
- Co-housing
- Communal living
- Housing with sufficient common spaces for social interaction
- Requires shared spaces in the building



• Within the living environment (communality)

- Spaces or activities open for all
- Attention must be paid to safety and the location of shared spaces

Services

Service distribution P1 *Select 1 or more*



- Housing-related transport services
- E.g. shared vehicles to be rented or reserved, group transport, driver



- Services that support independent living at home
- E.g. meal and cleaning services
- Shopping services



- Guided activities
- E.g. clubs, etc.



- Care services such as home care, nurse or doctor services



- Services that support well-being
- E.g. guided exercise, haircut, massage
 - Requires a dedicated space



- Digital platform services connected to housing, e.g. a community app for residents

Spatiality of communality / services

Select 1 or more, connect to services



- In the apartment, "for a resident"**
- Services located in the apartment
 - Often technological services, such as emergency call systems



- In the building, "for residents"**
- Services offered to the residents of the building, often e.g. community coordinator or sports and well-being services, such as guided physical activity or hairdresser



- In the living environment, "for all"**
- Services open to the building's residents as well as to outsiders: e.g. day activities and gym facilities

Service model *Select 1 or more, connect to services*



- Services included in housing**
- Services included in the rent or housing charge
 - E.g.. Compulsory service packages
 - Also free services provided by volunteers



- Self-arranged services**
- Services arranged by residents themselves
 - May include both purchased services and services based on exchange or family/friend relationships
 - Not included in housing costs

Technologies

Smart Home Technologies

Select 1 or more

TG1a

Building services and home automation

- Technologies that support independent living and increase safety
- Eg. stove guard, lighting that adapts to the time of day, smart curtains, automatic cooling

TG1b

Communication technologies

- Technologies that support communication
- Communication between residents
- Notification Technologies
- For example. Digital bulletin boards and messaging apps

TG1c

Technologies that monitor and support health

- Technologies that support and monitor health and well-being
- Eg. Sensors installed in the apartment that monitor functions and vital signs

TG1d

Technologies that support living and daily act.

- Technologies that support independent functioning in the apartment and living environment
- For example. smart canes, mobility assistance technologies, etc.

TG1e

Leisure and entertainment

- Leisure & Entertainment electronics and platforms
- Eg. Games, streaming services

Type of use of technology

Select 1 or more, connect to technology

INTERACTIVE

- Technologies actively used by the resident
- For example. messaging apps, space reservation systems, adjustable building technologies

PASSIVE

- Technologies passively used by the resident
- For example. sensors, stove guards, GPS wristbands

Spatiality of technologies

Select 1 or more, connect to technologies



Wearable Technologies

- Eg. wearable sensors, wearable GPS trackers etc.



In the apartment

- Technologies and digital services located in the apartment
- Eg. stove guard, telecare



In the building

- Technologies and digital services in the building
- Eg. Resident portals, solar panels etc.



In the neighbourhood

- Technologies that support operating in the residential environment

Facilities

Type of space T1 *Select 1 or more*



- Residents' own facilities under their control
- Eg. Apartment or room in a group home



- Outdoor and indoor spaces shared by residents
- Eg. Common lounge, common kitchen, common laundry, shared guestroom

Implementation method T2 *Select 1*



- Renovation of an apartment, residential building or living environment to make it accessible and age-friendly
- Suitable for all regions



- Change of use of a building
- Suitable for all areas if the resources for implementation are available



- Expansion of an existing building, e.g. construction of additional floors
- Especially suitable for areas with growing or stable populations
- Especially suitable in already built areas in locations that are suitable for older people (access to services, green space, public transportation etc.)



- Construction of a new building on a plot already in use
- Especially suitable for areas with growing or stable populations
- Especially suitable in already built areas in locations that are suitable for older people (access to services, green space, public transportation etc.)



- New construction
- Especially suitable for areas with growing or stable populations



- A building that can be moved, e.g. modular mobile buildings
- Especially suitable if the need for housing in the area decreases in the future

Building type T3 *Select 1*



- More than two-storey multi-storey apartment building
- Includes common areas



- A small detached house with one or two apartments:
 - Detached house
 - Semi-detached house
- Requires separate common areas



- Mobile apartment
- Requires separate common areas



- An interconnected complex of at least three detached houses
 - Townhouse
 - Terraced house
- Requires either separate common areas or can include common areas



- A building that combines public functions with housing
- Communal areas included

This concept has been created as an example using the TULE model concept tool and to illustrate how the tool can be used

CONCEPT 1: "Urban smart home"

- Theme: Technologies
- Resident segment: Technology-oriented urban dweller who enjoys being alone
- Context: Medium to small town


Resident profile menu


The persona used for developing the concept (Mr. Apoo Seppänen)

Other resident profiles the concept is suitable for

| Characteristics of the resident and his or her life situation | | | | | Resident's housing preferences | | | | |
|--|--|--|----------------------|--|--|--|---|--|--|
| Lifestyle | Functional capacity Cognitive + Physical | Household size | Financial resources | Older people's attitudes towards housing | Preference for resident composition | Need for community/ need for privacy | Space requirement | The need for outdoor space | Technology-orientation |
| Services, facilities, community, technology | Services | Facilities | Services, facilities | Facilities | Communality | Communality, facilities | Facilities | Facilities | Technology |
| Home-oriented hands-on person Pay special attention to: T1a, T1b | Good functional capacity Pay special attention to: T1a | Living alone Pay special attention to: T1a | Low-income | Planner -Anticipates Pay special attention to: T2a/T2b/T2c/T2d/T2e | Prefers an intergenerational environment Pay special attention to: Y1b | Enjoys being on their own, values privacy Pay special attention to: Y2a | Wants to minimize extra space Pay special attention to: T1a, T1b | Own yard Pay special attention to: T1a, T1b | Technology-positive Pay special attention to: TG1a, TG1b, TG1c, TG1d, TGe |
| Active consumer of cultural and service offerings Pay special attention to: P1c, P1d | Slightly impaired functional capacity Pay special attention to: P1b, P1d, P1e, TG1c, TG1d, Y3b | Living with a spouse or someone else Pay special attention to: T1a | Middle-income | Adaptor - Responsive with delay Pay special attention to: T2a | Prefers living only with other seniors Pay special attention to: Y1a | Occasionally participates in communal activities, makes use of common spaces "Alone together" Pay special attention to: Y2a | Wants to live spaciouly Pay special attention to: T1a, T1b | Terrace/balcony Pay special attention to: T1a, T1b | Reserved towards technology Pay special attention to: TG1a, TG1c, TG1d PASSIVE |
| Enjoyer Convenience-oriented Pay special attention to: P1c, P1d | Poor functional capacity Pay special attention to: P1d, P1b, TG1c, TG1d, Y3b | | High-income | Stubborn - Highly resistant to change Pay special attention to: T2a | | Actively participates in community events Pay special attention to: Y2a | There is a need for a work or hobby space Pay special attention to: T1b | No own outdoor spaces Pay special attention to: T1a, T1b | Technology-negative Pay special attention to: TG1a, PASSIVE |
| Outdoor person Pay special attention to: T1a, T1b | | | | | | Wants to live their everyday life in a communal way Pay special attention to: Y2b | | | |

Environment profile menu

 The persona used for developing the concept (Mr. Aapo Seppänen)

 Other resident profiles the concept is suitable for

| Location | Growing vs. shrinking area | Access to services | Access to Green space | Access to public transportation |
|--|--|---|---|---|
| Facilities (implementation method, type of building, services) | Facilities (implementation method, type of building), services | Services | Facilities | Services |
| City Pay special attention to: T2a-e, T3a-e | Growing Pay special attention to: T2a-e, T3a-e | Lots of services in close proximity | Only urban greenery nearby Pay special attention to: T1 | Public transport stop nearby |
| Town Pay special attention to: T2a-e, T3a-e | Stable Pay special attention to: T2a-e, T3a-e | Some services in close proximity Pay special attention to: P1a, TG1 | Nearby a park etc. natural area to be used Pay special attention to: T1 | Public transport stop not nearby Pay special attention to: P1a |
| Village Pay special attention to: T2a, T2b, T2f, T3b-e | Shrinking Pay special attention to: T2a-b, T3b-e | No services in close proximity Pay special attention to: P1a, TG1 | Close to a forest Pay special attention to: T1 | Frequent service intervals |
| Rural areas Pay special attention to: T2a, T2f, T3b-e | | | | Infrequent service intervals Pay special attention to: P1a |
| | | | | Service transport Pay special attention to: P1a |
| | | | | No public transport available Pay special attention to: P1a |

URBAN SMART HOME

Location of daily functions and degree of privacy in the concept

| Apartment | Building + yard | Neighbourhood | | | | | | | | | | | | | | | | | | | | | |
|--|-----------------|---------------|---------|--|--|----------|--|--|---------------|--|--|---------|--|--|--------|--|--|--------|--|--|--|-----------------|--|
| Private | Semi-private | Public | | | | | | | | | | | | | | | | | | | | | |
| <table border="1"><tbody><tr><td data-bbox="136 564 669 635">Hobbies</td><td colspan="2" data-bbox="674 564 2098 635"></td></tr><tr><td data-bbox="136 638 669 724">Sleeping</td><td colspan="2" data-bbox="674 638 2098 724"></td></tr><tr><td data-bbox="136 727 669 813">Spending time</td><td colspan="2" data-bbox="674 727 2098 813"></td></tr><tr><td data-bbox="136 817 669 903">Bathing</td><td colspan="2" data-bbox="674 817 2098 903"></td></tr><tr><td data-bbox="136 906 669 992">Toilet</td><td colspan="2" data-bbox="674 906 2098 992"></td></tr><tr><td data-bbox="136 995 669 1082">Dining</td><td data-bbox="674 995 1440 1082"></td><td data-bbox="1444 995 2098 1082"></td></tr><tr><td data-bbox="136 1085 669 1171"></td><td data-bbox="674 1085 1440 1171">Vehicle storage</td><td data-bbox="1444 1085 2098 1171"></td></tr></tbody></table> | | | Hobbies | | | Sleeping | | | Spending time | | | Bathing | | | Toilet | | | Dining | | | | Vehicle storage | |
| Hobbies | | | | | | | | | | | | | | | | | | | | | | | |
| Sleeping | | | | | | | | | | | | | | | | | | | | | | | |
| Spending time | | | | | | | | | | | | | | | | | | | | | | | |
| Bathing | | | | | | | | | | | | | | | | | | | | | | | |
| Toilet | | | | | | | | | | | | | | | | | | | | | | | |
| Dining | | | | | | | | | | | | | | | | | | | | | | | |
| | Vehicle storage | | | | | | | | | | | | | | | | | | | | | | |

URBAN SMART HOME

- Concept profile:
 - Technologies



Shared activities suggested by smart home platform

- AI analyses residents' psychological well-being and identifies their interests.
- Generates ideas, schedules communication and shared activities, and sends invitations to residents via home robot Masa.
 - Cancels events if there are no interested participants.
- Residents shared communication forum and calendar.



Vertical garden, managed by the house's smart platform and the buildings shared maintenance robot

- Cultivated crops are available to residents

Common space with shared kitchen and sauna

- Can be rented either for personal use or used for residents' joint events
- Rented through the smart home smart platform. Artificial intelligence manages and prevents double bookings.

VR Procedure Room

- Procedure room for demanding healthcare procedures with a robot specialising in medical procedures

Gym



An apartment that expands and shrinks as needed

- Apartment +/- 1 room principle: The size of the apartments can be adjusted as needed. There is a room between the apartments, which can be rented to the apartments next to it primarily. If neither of the residents needs the room, it can be rented to other residents as storage- or workspace with a monthly contract or used as a short-term rental. Guests use the washing and kitchen facilities in the common areas.



PASSIVE AND INTERACTIVE

Smart home platform powered by AI

- Adjusts:
 - Sensors monitoring home conditions:**
 - Sensors in the fridge that monitor consumption and expiration dates of products
 - Temperature and humidity sensors
 - Scheduling of home appliances and consumer electronics
 - Circadian lighting
 - Sensors assessing the condition of structures and technologies

Sensors monitoring the resident's health status and activity (see Technologies that monitor and support health)

Robot assistant "Masa"

Brain computer interface (BCI) communicating with smart home

- Possibility to control the home environment by thought

PASSIVE

Sensors monitoring vital functions

- Wearable sensors and smart clothing
- Smart flooring (falls)
- Smart beds: monitors vitals during sleeping

Activity sensors

- Motion sensors
- Analyses residents cognitive functioning

A brain implant that remotely monitors and treats brain health

PASSIVE AND INTERACTIVE

Health-aware and price-competitive shopping service

- The smart home's AI analyzes the health data generated by the sensors and designs a health-promoting weekly menu and shopping list for the resident. Both the menu and shopping list are approved and editable by the user themselves.
- The smart home places an order to the store where the price of the purchases is lower, pays for the purchases and orders home delivery.

PASSIVE AND INTERACTIVE

"MaaS" Mobility as a Service

- Smart city transport service with a monthly fee
- All different modes of transport (self-driving vehicles, buses, trains, city bikes, electric scooters) with one payment
- The smart home is connected to the smart city network and plans the fastest route by requesting
- Plans the trip according to the resident's functional capacity and walking speed
- Drone delivery

URBAN SMART HOME – A resident’s day (generated and translated by Copilot)

Aapo Seppänen wakes up slowly as the lighting adjusted by the smart home begins to simulate a sunrise. The smart bed has monitored his heart rate, breathing and sleep quality during the night, and has sent the data to the home’s AI platform. The robot assistant Masa greets him in a soft but alert voice: “Good morning, Aapo. You slept well. Your brain signals were calm, and your heart rate was stable during the night. Breakfast is ready. Nurse Leena suggested a VR care appointment for the afternoon – does that work for you?”

Aapo stretches calmly. He is 75 years old, but his functional ability has remained surprisingly good. The dementia diagnosed ten years ago has remained under control thanks to a brain implant that not only monitors his cognitive state but also supports memory and concentration. The implant is connected to the healthcare system, and the data it produces is monitored by a multidisciplinary team that plans Aapo’s care and everyday support.

Breakfast prepared by Masa is waiting in the kitchen. The smart home’s AI has planned the meal based on Aapo’s health data and preferences. Consumption and expiry sensors in the fridge have detected what products have been used and what is nearing expiry. The shopping list has been filled automatically, and the AI has compared prices in nearby stores. A drone will deliver the groceries in the afternoon.

During breakfast, Masa goes through the day’s schedule. “Today is a workday. The VR meeting starts at 10 a.m. After that, a VR care appointment with Leena is at 2 p.m. Leo asked you to join him in the shared space to watch the game tonight – would you like to join?” Aapo nods. “Add it to the calendar. And remind me to bring those herbs from the vertical garden.”

Aapo goes to the living room, which automatically transforms into a workspace. The lighting becomes brighter, background noise is reduced, and the desk display activates. Previously, Aapo had access to an extra room for working – a rentable space between his apartment and a neighbour’s – but after changing the full-time work into part-time, he gave it up. The room was briefly in accommodation use, but nowadays it serves as a children’s room for his neighbour Leo and Leo’s spouse.

The VR meeting begins. Aapo joins a virtual space where his colleagues from around the world discuss new smart home solutions. The brain implant helps him follow the discussion and remember details. After the meeting, he stays for a moment to chat with Yuki – a colleague from Japan who has become a friend. They talk briefly about ice hockey and exchange news. Yuki promises to join the evening game via VR.

After lunch, Masa reminds him of the VR care appointment. Aapo puts on the VR headset and moves into a virtual consultation room. Nurse Leena greets him cheerfully. “Hi Aapo! Let’s take a look at last week’s data. The brain implant looks stable, but your blood pressure is slightly elevated. I could adjust next week’s meal plan – less salt, more greens. Would that work?” “That works well. And thank you for keeping track of these,” Aapo replies. Leena smiles. “That’s our job. And Masa is doing a great job.”

In the afternoon, a drone delivers the groceries. Masa receives the delivery and puts everything in place. Aapo goes out for a short walk. The smart home has planned a route based on his functional ability and booked a self-driving vehicle through a MaaS service, which brings him back home.

In the evening, Aapo heads to the shared space where Leo has organised a game viewing. Neighbours have brought snacks, and Aapo shares the game via VR stream to Yuki. He chats with Leo and Leo’s spouse, who once again thanks him for giving up the extra room. “It really made our everyday life easier,” Leo says. “That’s good,” Aapo replies. “You have more use for it.”

After the game, Aapo returns home. Masa reminds him of VR therapy, and Aapo moves into a virtual nature environment. An AI therapist guides relaxation exercises and talks with him about the events of the day. Before going to sleep, Aapo takes one more look at the shared resident calendar. The building’s AI has suggested a shared evening gathering for the weekend. He is not sure whether he will participate – but it is good to know the option is there.

When Aapo goes to bed, the smart home switches to night mode. The lights dim, the temperature adjusts to an optimal level, and the smart bed once again begins its monitoring. Masa wishes him good night and goes into standby mode.

This concept has been created as an example using the TULE model concept tool and to illustrate how the tool can be used

CONCEPT 2: "Aging rural community"

- Theme: Communalinity
- Resident segment: A community-active resident seeking peace of the countryside
- Context: Sparsely populated rural area

Resident profile menu

| Characteristics of the resident and his or her life situation | | | | | Resident's housing preferences | | | | |
|--|--|--|----------------------|--|--|--|---|--|--|
| Lifestyle | Functional capacity Cognitive + Physical | Household size | Financial resources | Older people's attitudes towards housing | Preference for resident composition | Need for community/ need for privacy | Space requirement | The need for outdoor space | Technology-orientation |
| Services, facilities, community, technology | Services | Facilities | Services, facilities | Facilities | Communality | Communality, facilities | Facilities | Facilities | Technology |
| Home-oriented hands-on person Pay special attention to: T1a, T1b | Good functional capacity Pay special attention to: T1a | Living alone Pay special attention to: T1a | Low-income | Planner -Anticipates Pay special attention to: T2a/T2b/T2c/T2d/T2e | Prefers an intergenerational environment Pay special attention to: Y1b | Enjoys being on their own, values privacy Pay special attention to: Y2a | Wants to minimize extra space Pay special attention to: T1a, T1b | Own yard Pay special attention to: T1a, T1b | Technology-positive Pay special attention to: TG1a, TG1b, TG1c, TG1d, TGe |
| Active consumer of cultural and service offerings Pay special attention to: P1c, P1d | Slightly impaired functional capacity Pay special attention to: P1b, P1d, P1e, TG1c, TG1d, Y3b | Living with a spouse or someone else Pay special attention to: T1a | Middle-income | Adaptor - Responsive with delay Pay special attention to: T2a | Prefers living only with other seniors Pay special attention to: Y1a | Occasionally participates in communal activities, makes use of common spaces "Alone together" Pay special attention to: Y2a | Wants to live spaciouly Pay special attention to: T1a, T1b | Terrace/balcony Pay special attention to: T1a, T1b | Reserved towards technology Pay special attention to: TG1a, TG1c, TG1d PASSIVE |
| Enjoyer Convenience-oriented Pay special attention to: P1c, P1d | Poor functional capacity Pay special attention to: P1d, P1b, TG1c, TG1d, Y3b | | High-income | Stubborn - Highly resistant to change Pay special attention to: T2a | | Actively participates in community events Pay special attention to: Y2a | There is a need for a work or hobby space Pay special attention to: T1b | No own outdoor spaces Pay special attention to: T1a, T1b | Technology-negative Pay special attention to: TG1a, PASSIVE |
| Outdoor person Pay special attention to: T1a, T1b | | | | | | Wants to live their everyday life in a communal way Pay special attention to: Y2b | | | |

Environment profile menu

| Location | Growing vs. shrinking area | Access to services | Access to Green space | Access to public transportation |
|--|--|---|---|---|
| Facilities (implementation method, type of building, services) | Facilities (implementation method, type of building), services | Services | Facilities | Services |
| City Pay special attention to: T2a-e, T3a-e | Growing Pay special attention to: T2a-e, T3a-e | Lots of services in close proximity | Only urban greenery nearby Pay special attention to: T1 | Public transport stop nearby |
| Town Pay special attention to: T2a-e, T3a-e | Stable Pay special attention to: T2a-e, T3a-e | Some services in close proximity Pay special attention to: P1a, TG1 | Nearby a park etc. natural area to be used Pay special attention to: T1 | Public transport stop not nearby Pay special attention to: P1a |
| Village Pay special attention to: T2a, T2b, T2f, T3b-e | Shrinking Pay special attention to: T2a-b, T3b-e | No services in close proximity Pay special attention to: P1a, TG1 | Close to a forest Pay special attention to: T1 | Frequent service intervals |
| Rural areas Pay special attention to: T2a, T2f, T3b-e | | | | Infrequent service intervals Pay special attention to: P1a |
| | | | | Service transport Pay special attention to: P1a |
| | | | | No public transport available Pay special attention to: P1a |

AGING RURAL COMMUNITY

Location of daily functions and degree of privacy in the concept

| Apartment | Building + yard | Neighbourhood |
|--|---|---------------|
| Private | Semi-private | Public |
| <div data-bbox="152 563 573 635">Sleeping</div> <div data-bbox="152 655 651 727">Spending time</div> <div data-bbox="152 748 618 820">Bathing</div> <div data-bbox="152 841 642 912">Toilet</div> <div data-bbox="152 933 651 1005">Dining</div> | <div data-bbox="689 563 1420 635">Hobbies</div> <div data-bbox="689 655 1420 727"></div> <div data-bbox="689 748 1420 820">Vehicle storage</div> <div data-bbox="689 841 1420 912"></div> <div data-bbox="689 933 1420 1005"></div> | |

AGING RURAL COMMUNITY

- Concept profile:
 - Community
 - Communal module village close to 24/7 care unit



Living in the modular village is aimed at people over 65 years old



The residents' association of the modular village has an agreement with the wellbeing services county on the organisation of daytime activities, from which the residents' association receives funds for the maintenance of the community
Older people living nearby and residents of round-the-clock housing can visit the community's common areas twice a week, where various communal activities are organised under the guidance of the residents



104 m2 common house module (4 modules)
Community kitchen + dining area
Lounge (also used for exercise)
Sauna with washroom
Common garden

- Garden + outdoor lounge area
- Allotment



26 – 52 m2 apartment modules for 1-2 people
Studio or one-bedroom apartments
Private kitchen and bathroom
Can be tailored to the resident's individual needs (furniture, materials, lighting, technological solutions)

A module consisting of individual movable modules in the vicinity of a round-the-clock unit in the village (same module implementation)

- More modules can be ordered on a tight schedule and returned to circulation when the need runs out.
- Rented from a manufacturer who, upon return, disassembles the module and reuses the parts, or subleases the modules
 - If the need for care increases, the modules used in independent living can be transferred to a round-the-clock unit with the help of an extension piece.

Aiming for a communal lifestyle:
Planned communal activities (e.g. weekly shared meals)
Common rules and policies

Residents are responsible for community activities

- Residents have appointed roles and responsibilities in maintaining communal activities



INTERACTIVE

A shared communication platform for the community
A smart calendar that utilizes artificial intelligence

- Coordinates the residents' calendars and assist in scheduling joint activities



PASSIVE

Smart Home platform utilizing AI

- Adjusts:
 - **Sensors that monitor the conditions in the home:**
 - Temperature and moisture sensors
 - Monitoring of home appliances and consumer electronics (e.g. stove guard, shutting off the supply water)
 - Circadian lighting
 - **Solar panels**
 - Optimizes the angle and orientation of the panels to maximize energy supply
 - **Energy consumption (household appliances, etc.)**
 - Schedule household appliances according to the price of electricity



PASSIVE

Automatic alarm in case of an emergency (fall, etc.)

- Directed to the round-the-clock assisted living unit
- Sensors that monitor activity**
 - GPS sensor with individually configurable safety zone
 - Alerts the selected neighbor and ultimately Round-the-Clock Care if you leave the area
- Medicine dispenser**



INTERACTIVE

Twice-weekly self-driving self-service mobile grocery store (also delivers packages)



Possibility of meal service from the round-the-clock care unit

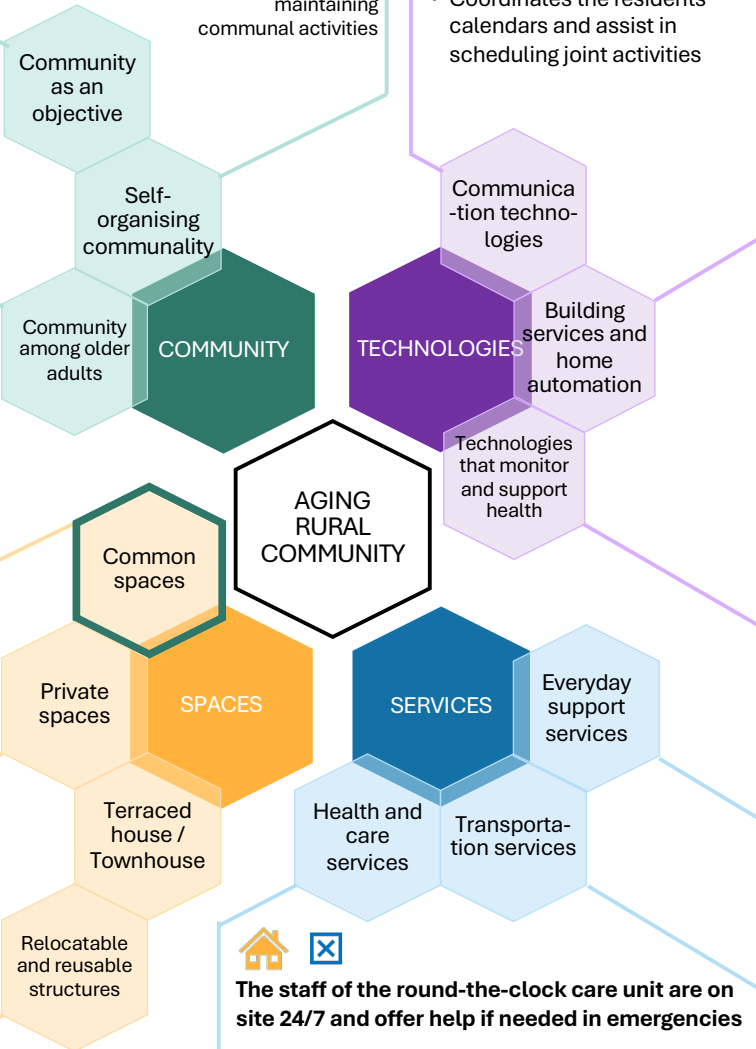


PASSIVE AND INTERACTIVE

Self-driving car-sharing vehicle

- Booked via smart calendar
- Carpooling service**
Carpooling via app

AGING RURAL COMMUNITY



AGEING COMMUNITY IN A RURAL AREA – A resident’s day (generated and translated by Copilot)

Hilja Laine wakes up early, as she usually does. The morning sun filters through the curtains, and the familiar sound of the coffee maker can be heard from the kitchen. She gets up slowly, takes her morning blood pressure medication, and sits down at the kitchen table. Outside, it is quiet. Beyond the field, the edge of the forest rises, and the community yard’s cultivation plot is bathed in early light. This is exactly what Hilja was looking for when she decided to leave the city behind.

In her previous home, Hilja spent a lot of time alone. Evenings passed in front of the television, and although she was not unfamiliar with solitude, the silence began to feel heavy. Now life is different. Living with neighbours requires some effort – shared meetings, shifts and responsibility – but it brings a sense of security. And having things to do keeps her active. Of course, sometimes someone gets on your nerves, but shared rules and clear practices help in difficult situations. Issues are discussed directly and respectfully. So far, everything has been resolved.

When Hilja moved to the modular village six months ago, she was able to choose the details of her housing module herself. The kitchen cabinets were installed at just the right height so she would not need to reach. The flooring material was chosen for good grip – she had fallen once in her old home, and the worry remained. The colours of the walls are soft and calming, just as she wished. The home feels like home.

In the bathroom, the washing machine starts quietly. Hilja pauses for a moment to listen and smiles to herself. She had already loaded the laundry and detergent into the machine the evening before – now the machine takes care of the rest on a timer, based on the price of electricity. “Technology is moving forward so fast you can’t keep up,” she mutters. She is not particularly interested in technology and does not want to deal with many devices, but solutions like this have been useful. Her electricity bill has decreased, and all she has to do is close the door. If something goes wrong, she asks the care staff for help. “Young people know how,” she says with a shrug. One thing she does value is the automatic emergency alert. If she were to fall or something happened, the information would be sent directly to the 24/7 care unit next door. That brings peace of mind.

In the morning, Hilja checks the community notice board to see what is planned for the day. A shared lunch in the community kitchen, and in the afternoon, organised day activities, with visitors also coming from the care unit and nearby villages. She has promised to bring dessert – a redcurrant pie, made with berries she picked the day before from cultivation plot. In the kitchen, she mixes the dough and adds the currants to the pie dish. When the pie is in the oven, she steps outside to greet Martta, who is raking the path in the community yard.

“Is that famous pie coming again?” Martta asks.

“It is – but with less sugar,” Hilja replies with a smile.

There is a warm atmosphere in the community kitchen. Aila and Reijo are setting the tables, and Martti brings herbal tea he has dried in the community garden. The food is prepared together – today it is Reijo’s turn to cook the main dish, and Aila is responsible for the salads. They chat around the kitchen table: about the weather, the berry harvest and the upcoming residents’ meeting, where responsibilities within the community are shared again. Hilja has been thinking that next month she might take responsibility for cleaning the shared building – it is light work, and it gives her a chance to exchange news with others. The programme for the organised day activities, cultivation plot maintenance and cooking shifts are also decided at the meeting.

For the afternoon’s organised day activities, a familiar nurse, Sanni, arrives with Eero – an older gentleman in a wheelchair who lives in the 24/7 care unit. Eero brings wooden products he has made as part of therapy. “This is a bird feeder,” Eero says to Hilja. “I thought it would fit next to your herb bed.” Hilja thanks Eero and promises to hang it the next morning. Irja, an 85-year-old widow from a nearby village, has also joined. Irja teaches crocheting and tells stories from childhood. Organised day activities are part of everyday life in the community – the residents plan the programme themselves and organise it in turns. The income generated from these activities reduces the amount paid for shared spaces, which suits everyone. Hilja is pleased to see how naturally people from different backgrounds and life situations meet.

In the evening, Hilja takes part in the shared sauna shift. After the sauna, Hilja sits on a bench in the community yard and watches the sun set behind the fields. Martta joins and they talk about the coming week’s plans.

“I was thinking of suggesting a movie night,” Martta says.

“Good idea,” Hilja replies. “We can use the screen in the common room and make popcorn.”

When Hilja returns home, only one lamp is switched on. The home adjusts to the evening, and the temperature feels just right. Hilja sits for a moment in the armchair and writes a message on the community message board: “Thank you everyone today – especially Eero and Irja. Days like this make this place a home.”

Then the lights are turned off. Outside, it is quiet.

 Tampereen yliopisto

 KNOWLEDGE CENTRE FOR
REAL ESTATE DEVELOPMENT

