

SUSTAINABLE TRANSITIONS IN AGE-FRIENDLY COMMUNITIES IN EUROPE: A PARTICIPATORY APPROACH

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ABSTRACT. The ageing European population is driving the demand for age-friendly communities that support older individuals' health and well-being. As communities navigate this transition, Transition Design emerges as a promising approach for addressing complex social and environmental challenges. This study explores the potential of Transition Design to create age-friendly communities in Europe. Drawing on examples from several European countries, this paper describes the key principles of Transition Design and how they can be applied to the development of age-friendly communities. This article highlights the importance of participatory processes in involving older people and other stakeholders in the design process, and discusses the role of technology in creating more accessible and inclusive environments. It also considers some of the challenges of implementing a transition design approach in a European context. In conclusion, this study asserts that Transition Design offers a promising approach for creating sustainable, inclusive, and responsive age-friendly communities.

KEYWORDS: Sustainable transitions, transition design, age-friendly communities, Europe, participatory.

1. INTRODUCTION

Europeans are currently experiencing longer lifespans than ever before, leading to significant changes in society's age distribution. The population is rapidly ageing, resulting in a decline in the proportion of working-age individuals within the European Union (EU), while the number of older adults continues to grow. This trend is expected to persist in the future as the post-war baby boomer generation reaches retirement age. These demographic shifts are likely to have extensive implications not only for individuals but also for governments, businesses, and civil society. Key areas that will be affected include healthcare and social support systems, labour markets, public finances, and pension programs [1].

The elderly population, defined as individuals aged 65 years and above, is projected to experience a significant increase within the EU-27, rising from 90.5 million at the start of 2019 to 129.8 million by 2050. In contrast, the latest projections indicate a 13.5% decrease in the number of individuals under 55 years old residing in EU-27 by 2050. Although the total population of the EU-27 is expected to slightly increase from 446.8 million in early 2019 to a peak of 449.3 million during the period of 2026–2029, it will subsequently decline to 441.9 million by 2050, see Figure 1. The phenomenon of population ageing has been observed in Europe for several decades and is driven by factors such as historically low fertility rates, rising life expectancy, and, in some cases, migration patterns, particularly in EU member states with a net influx of retirees. Demographic projections indicate that the

pace of population ageing within the EU will accelerate in the coming decades, with a rapid expansion in the number and proportion of older individuals [1].

The increasing prevalence of population ageing has led to the emergence of the concept of “age-friendly cities”, which was initially introduced by the World Health Organization (WHO) in 2005. This term “Age-Friendly Community (AFC)” has been adopted in numerous government policy documents, following over ten years of dedicated efforts to promote age-friendly cities and communities. Academic and policy researchers have shown significant interest in studying age-friendly communities in the past decade, indicating a growing focus on this field [2]. In Europe, the WHO established the Age-friendly Environments in Europe (AFEE) project, which aims to create age-friendly cities and communities in Europe where people of all ages can reach their full health potential in a sustainable and equitable manner, with a special focus on the three modules European guide for age-friendly environments, Tools for monitoring and evaluation, and Templates for municipal action plans on age-friendly environments [3]. In recent years, scholars have generally agreed that creating and maintaining an age-friendly environment is a core component of a positive response to the challenges of population ageing [4]. Ageing in place is commonly cited as a policy goal (as cited in [4–6]). Governments and international organisations now agree that it makes economic and social sense to support older people to continue living in the community for as long as possible. However, enabling older people to age in place is a complex task. This requires comprehensive

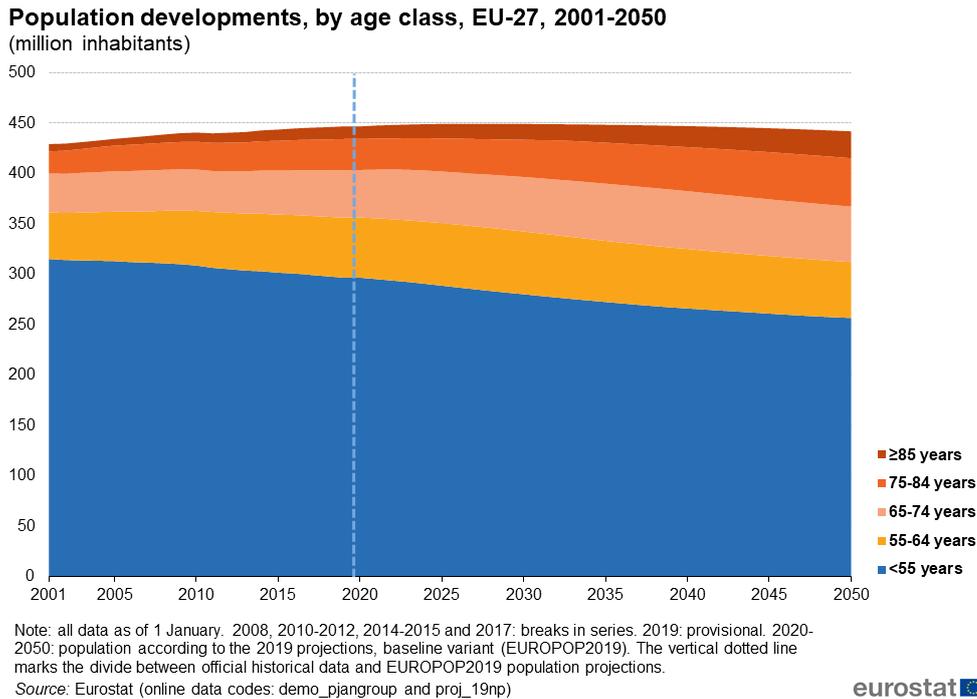


FIGURE 1. Population developments, by age class, EU-27, 2001–2050 (million inhabitants) [1].

planning and the provision of a wide range of support services in the community, as well as the removal of barriers that segregate older people and limit their activities [7]. Advances in ageing-in-place policies have highlighted the need for “age-friendly communities” [4]. Simultaneously, the emerging importance of environmental gerontology has contributed to the debate on age-friendly communities [8–10]. Current research evidence suggests that well-being in later life is also closely related to the physical environment, which is an important factor in moderating the experience and opportunities of ageing [11, 12]. The multifaceted combination of factors has led to a growing urgency for research on the transition to older communities and the creation of sustainable age-friendly communities.

In recent years, there has been an increasing number of cases in which the design discipline has been involved in solving transformative social problems, and attention has begun to be drawn to the broader creativity and potential of design beyond the aesthetics of art. Transition design is a burgeoning and emerging design discipline that is attempting to shape itself into an integrated discipline capable of solving complex ongoing problems and transforming society with multiple knowledge and skills to act as a facilitator, accelerator and guide for transitions [13]. Transition design focuses on solving wicked problems which are multiple, cyclical, and with no apparent relationship between cause and effect in the context of socio-technical change [14, 15], advocating the design of systemic and medium- and long-term strategies to solve complex and interrelated problems found at multiple levels of a system [16]. Given the close connection between social and complex issues, the transition

design process emphasises the need to design the transition of social behaviour to a sustainable future [17] and to understand the dynamics of complexity based on local and regional lifestyles and stakeholder visions to bring about fundamental changes at the systemic level. Therefore, engaging in sustainable transitions in age-friendly communities through a transition design approach and emphasising the importance of stakeholder participation in the design decision-making process will provide a more systematic and sustainable transition strategy and a vision closer to a desired future for active ageing in communities. At the same time, digital technology is recognised as a support for age-friendly environments [18], particularly in terms of the use of friendly and sustainable design, the acceptance of technology, and the need for implementation and caregivers [19–22], will provide more possibilities for the realisation of design actions to accelerate and facilitate inclusive transitions in communities.

This paper seeks to address the issue of community transitions in Europe and better meet the complex challenges of building age-friendly communities in the future from a design perspective through transition design approaches and principles to systematically address the complex issues associated with population ageing. It adopts an interdisciplinary and participatory approach that integrates gerontology, design, and technology to provide a more comprehensive analytical perspective and solution. The paper will be beneficial in bridging the gap in exploring a more systematic and integrated strategy to address ageing in Europe from a design perspective, taking into account demographic trends, design principles, and digital technologies.

2. PRINCIPLES OF TRANSITION DESIGN IN AGE-FRIENDLY COMMUNITIES

2.1. REFRAMING NEW VISIONS

Vision is driven by the desire for a longer-term, humanist, and more sustainable way of life. Transition Design argues that, to effectively address complex societal challenges, it is necessary to develop compelling and imaginative visions of the future that can guide and inspire projects today. Whether acknowledged or not, every stakeholder affected by a wicked problem has an implicit or explicit vision of the future associated with it [23]. Stakeholders directly describe intractable problems and uncover potential connections between issues with the aim of exploring a shared vision of the future, transcending differences and paradigms, and seeking collaboration and consensus [17]. As a result, stakeholders can work together to create a compelling long-term, lifestyle-based vision of the future in which the problems have been solved and the needs of most stakeholders have been met. Following on from this, it is possible to backcasting to the present to create a transition pathway to inform current tangible, consensus-based action [24].

Design tools and methods can be used to facilitate the creation and refinement of these visions [25]. Sandler suggests that vision is more than just painting an ideal picture of the future; it is a process of assessing the current situation, identifying problem areas, reaching a broad consensus on how to overcome existing problems and manage change, and having a shared vision allows communities to focus their diverse energies and avoid conflict between the present and the future (as cited in [26]). Vision creates opportunities to critically explore alternative futures and new ways of being. This allows us to suspend disbelief, forget the present, and envision what the future might look like [27], (as cited in [28]). A collective visioning process based on the integration of multiple perspectives will be central to the creation of locally adapted sustainable communities that work together locally, regionally, and globally to meet the real needs of each individual [26].

2.2. STAKEHOLDER PARTICIPATION IN THE DESIGN DECISION-MAKING PROCESS

The wicked problems and socio-technical system transitions addressed by Transition Design pose significant challenges, owing to their intricate social complexities. Despite the social roots inherent in many wicked problems, conventional problem-solving methods often fail to consider them [17]. Each social problem involves multiple parties that represent different aspects and demands of the society [29]. To effectively address wicked problems and implement transformative changes at a systemic level, it is crucial to acknowledge these social roots and actively involve all stakeholders who are impacted [30–32].

Transition Design draws upon social science approaches to gain an understanding of the social origins of wicked problems and places stakeholder concerns as well as co-design and collaboration at the core of the problem-solving process [17]. Engaging stakeholders' significance in problem-solving processes is widely recognized, particularly in domains such as policy and governance, environmental issues, backcasting, and conflict resolution [30, 33–36]. However, most traditional design-led approaches have yet to incorporate this important aspect [17].

Transition Design asserts that stakeholders, due to their deep understanding and involvement in the problem, can both hinder the resolution of wicked problems and play a vital role in developing effective interventions [37]. Consequently, it is of utmost importance to actively engage stakeholders throughout the entire design process, considering them as “first point of view” design practitioners who have the power to shape both the design process itself and the future trajectory of design [29, 38, 39].

Therefore, the involvement of older people and community-related stakeholders is crucial in the sustainable transition to age-friendly communities, which will largely influence the analysis of this wicked problem and the direction of future design, and help designers and policy makers to more systematically recognize the full picture of a community that is truly in the interest of its residents.

2.3. DESIGN INTERVENTION – PROTOTYPING AND TESTING SOLUTIONS AND OBSERVATIONS

Design intervention is an essential stage when using the Transition Design approach. According to Irwin [17], a myriad of interventions at multiple levels within a larger spatio-temporal context (over a long period of time) to understand the present problem at higher and lower system levels and to look back to understand the root causes and evolution of the problem. Knotty problems are linked and addressed through different system levels to understand the divergence and consequences of wicked problems, their causes and development, and where in the system interventions can work most effectively. Interventions can take a variety of forms, particularly in policy-related design, and prototyping is a commonly applied research tool that can help policy makers better understand the root causes of public problems and their underlying interdependencies or “problem architectures”, as well as help give form to policies in practice to clarify, guide and illustrate them [40–42].

Participatory prototyping, particularly when combined with digital technology, plays a vital role in the practice of transition design. This is a key method used to engage stakeholders, including community members, designers, policymakers, and other relevant actors, in the co-creation and testing of solutions

for sustainable and inclusive transitions. Design interventions using digital technology aligns with the principles of transition design by emphasizing user-centeredness, collaboration, testing and validation, learning and adaptation, and empowerment. This enables the co-creation of solutions that are contextually relevant, responsive to user needs, and capable of driving sustainable and inclusive transitions in age-friendly communities.

Transition Design principles implemented through prototyping and testing solutions [42] provide the basis for achieving sustainable transitions in age-friendly communities. The active participation of stakeholders, including the elderly, throughout the design process should be emphasized [43]. Prototyping plays a crucial role by creating concrete representations and models of proposed interventions, enabling stakeholders to visualize and engage with possible solutions [44]. Through iterative prototyping, ideas can be refined and developed based on valuable user feedback and insights from testing [45]. This participatory prototyping process enables age-friendly solutions to be tailored to the specific needs and preferences of older people, promoting inclusiveness and enhancing the overall well-being of the community. By testing these solutions on a small scale, the feasibility, effectiveness, and feasibility of proposed interventions can be evaluated and provide valuable information for the development and implementation of larger age-friendly interventions.

Meanwhile, working in large, slow-moving systems will involve cycles of activity and intervention, balanced by intervals of observation and reflection to understand how the system responds to perturbations. Transition designers must think in terms of “solutions” rather than “design solutions” over long periods of time and at multiple levels [17], and designing for system-level change requires a completely different mindset and posture [28]. Therefore, system-level change requires a certain amount of time to observe the transformation and wait until the intervention has had some effect before intervening again to make adjustments. This process contradicts the 21st century expectation of quick, conclusive, profitable and quantifiable results and is therefore challenging [17].

3. METHODS

In this study, we utilised secondary sources, including peer-reviewed publications, journal articles, reliable sources of information, verifiable media reports, and medical expert opinions related to the ageing population. To achieve the objectives of this study, we conducted data collection and narrative assessment of case studies related to the intersection of transition design principles, digital technologies, and ageing. The following criteria were used to select the case studies:

(1.) The case studies dealt with ageing in the population aged 65 years and over.

(2.) The case studies were conducted in European countries.

(3.) These involve the use of at least one digital technology relevant to the topic.

(4.) It is linked to transition design principles and age-friendly living environments.

(5.) This research has been conducted within the last ten years and has been documented in English.

The selected case studies will be scrutinised against the above criteria to assess how digital-technology-led transition design principles have contributed to and impacted the transition to age-friendly cities and communities.

4. TRANSITION TO AGE-FRIENDLY COMMUNITIES IN EUROPE

4.1. CASE STUDIES OF AGE-FRIENDLY COMMUNITY PROJECTS IN EUROPE

In this section, we will explore case studies of age-friendly community projects in Europe that incorporate a digital technology orientation. These projects demonstrate the application of transition design principles in fostering sustainable and inclusive communities for older adults.

Analysing these case studies provides insight into how digital technology-led transition design principles facilitate the transition to age-friendly communities. The three case studies below highlight innovative initiatives from European countries, and provide authentic citation references for further research and exploration.

AAL Programme: A European funding initiative called the Active Assisted Living (AAL) Program encourages the creation of cutting-edge Information and Communication Technologies (ICT) solutions for senior citizens. Many AAL Program-funded initiatives use participatory prototyping to involve older individuals in the design and evaluation of digital technologies, which might range from social engagement platforms to health monitoring systems [46]. In the design and development process, the AAL Program uses a variety of prototyping methodologies for user integration, feedback gathering, and evaluation. The Walt Disney approach promotes creativity by producing new and realistic ideas from many perspectives, whereas brainwriting helps generate ideas from end users or stakeholders. Through pairs of participants, co-discovery improves usability testing by fostering natural and vibrant feedback. By replicating system behaviour through a human operator, the Wizard of Oz technique enables usability testing with prototypes that are not yet completely functional. While paper prototyping provides testing of interface functionality and layout, cognitive walkthroughs offer analytical evaluations from a user’s perspective. The methodical selection of product features is aided by selection lists, and UTE analysis identifies the fundamental

requirements based on user characteristics, task processes, and environmental factors. Storyboards aid in identifying flaws or challenges with acceptance, while self-documentation and shadowing help acquire insights into user wants and behaviours. These methods work together to support iterative changes and user-centred design, which eventually result in better user experiences [47].

Smarticipate: Smarticipate is an EC-funded project that is spearheaded by the pilot cities of Hamburg, Rome, and London. Smarticipate seeks to increase citizen participation in urban planning processes, especially that of senior citizens. They understand how crucial it is to involve a variety of groups, including older people, in creating age-friendly urban environments. In order to accomplish this, Smarticipate uses a participatory prototyping methodology that enables senior citizens to actively contribute their thoughts, observations, and feedback. Older folks can actively participate in the design and testing of digital platforms that are tailored to their needs and preferences. This will help communities grow. Age-friendly amenities like accessibility, safety, and social inclusion are given top priority in urban development initiatives thanks to this participatory method. Smarticipate works to develop dynamic, inclusive cities through citizen, stakeholder, and technological collaboration [48].

UrbanAge, Helsinki: The city of Helsinki, Finland, has been at the forefront of developing age-friendly communities that embrace technological innovations. The Age-Friendly Community Project in Helsinki aimed to enhance the quality of life for older adults through the integration of AI technologies. This project has received funding from the European Union's Horizon 2020 research and innovation programme [49].

To promote independent living and provide personalized support, the project implemented AI-powered virtual assistants for older adults. These virtual assistants were designed to assist with daily tasks, such as medication reminders, appointment scheduling, and accessing relevant information. The AI algorithms behind the virtual assistants learned from individual preferences and patterns to provide tailored recommendations and reminders.

Recognizing the importance of accessible healthcare for older adults, the project incorporated telehealth and remote monitoring solutions powered by AI. Through wearable devices and smart sensors, older individuals could have their vital signs and health data monitored remotely. The AI algorithms analyzed the data in real-time, detecting anomalies or trends that could indicate potential health issues. Healthcare professionals could provide timely interventions and advice, reducing the need for frequent in-person visits.

Addressing social isolation among older adults, the project implemented AI-driven social engagement platforms. These platforms utilized AI algorithms to match individuals based on common interests, hob-

bies, and location. Older adults could connect with like-minded peers, join virtual interest groups, and participate in online activities and events. The AI technology also facilitated personalized activity recommendations and encouraged social interactions, fostering a sense of community and reducing loneliness.

To support aging in place, the project integrated AI-based smart home automation systems. These systems utilized AI algorithms to learn residents' daily routines and preferences, adjusting lighting, temperature, and other environmental factors accordingly. The technology also incorporated voice commands and wearable devices, enabling older adults to control various aspects of their homes effortlessly.

The Age-Friendly Community Project in Helsinki conducted rigorous evaluations to assess the impact of AI technologies on the well-being of older adults. Surveys, interviews, and user feedback were gathered to understand the effectiveness and usability of the implemented solutions. The project reported positive outcomes, including increased independence, improved access to healthcare, enhanced social connections, and a greater sense of security among older adults [50].

4.2. THE ROLE OF TECHNOLOGY IN CREATING ACCESSIBLE AND INCLUSIVE ENVIRONMENTS

Through the utilization of technological advancements, communities can address the specific requirements of the elderly population and cultivate an environment that embraces diversity [51]. Technological innovations have revolutionized the way society caters to the needs of older individuals, providing them with greater autonomy, comfort, and social integration.

One significant role of technology in supporting the elderly is improving accessibility through innovative solutions such as automated smart home systems, assistive devices, and digital tools [52]. These advancements enable older individuals to navigate their living spaces with greater independence while ensuring their safety, comfort, and mobility. For example, smart home systems equipped with motion sensors and voice-activated controls can automate tasks like turning on lights or adjusting the thermostat, reducing physical exertion and potential hazards for seniors.

In addition to enhancing physical accessibility, technology also fosters social integration among older adults. Digital platforms, social media, and communication tools enable virtual connections, reducing social isolation and encouraging meaningful interactions [52]. Older individuals can engage with family, friends, and communities online, participate in virtual support groups, and explore shared interests, creating a sense of belonging and social connectedness.

Furthermore, technology plays a crucial role in enhancing healthcare services for older adults. The advent of telemedicine allows healthcare providers to remotely diagnose, treat, and monitor patients,

eliminating the need for frequent visits to medical facilities [52]. This approach proves especially beneficial for older individuals with mobility challenges or limited access to healthcare facilities. Remote monitoring technologies and wearable devices enable continuous health tracking, providing real-time data on vital signs, activity levels, and medication adherence. This data empowers older adults to actively manage their health, detect early warning signs, and seek timely medical support.

By incorporating technology into the principles of transition design, age-friendly communities can establish environments that prioritize accessibility, inclusivity, and well-being for older adults. Transition design emphasizes collaborative efforts between designers, stakeholders, and older individuals themselves to create solutions that address the specific needs and aspirations of the aging population. By leveraging technological advancements, these communities can develop age-friendly infrastructure, services, and social systems that promote independence, social integration, and a high quality of life for older adults.

4.3. CHALLENGES

We also acknowledge the challenges of funding, policy, and management that arise in the context of the transition design principles applied to age-friendly communities in Europe. While these principles provide a foundation for sustainable and inclusive transitions, they are often confronted with various obstacles at institutional and organizational levels. Understanding these challenges is crucial for implementing effective strategies and ensuring successful realization of age-friendly communities.

Funding Challenges:

- Limited funding opportunities for age-friendly community projects.
- Fragmented funding landscape across sectors and governance levels.
- Establishing sustainable funding models for long-term support.

Policy Challenges:

- Policy silos and lack of coordination between aging, health, urban planning, and social welfare policies.
- Discrepancies and inconsistencies between policies at different governance levels.
- Implementation gaps in translating policy intentions into practical actions.

Management Challenges:

- Coordinating multiple stakeholders involved in age-friendly community projects.
- Capacity building to enhance knowledge and skills among stakeholders.
- Develop robust monitoring and evaluation mechanisms.

The challenges of funding, policy, and management in Europe pose some hurdles to the implementation of transition design principles in age-friendly communities. Addressing these challenges requires collaborative efforts between designers, policymakers, funders, community leaders, and stakeholders. By acknowledging and actively working to overcome these obstacles, it becomes possible to create supportive funding mechanisms, coherent policy frameworks, and effective management strategies that foster sustainable transitions towards age-friendly communities in Europe.

5. CONCLUSIONS

In summary, this study explores the potential of Transition Design in European engagement in the development of age-friendly communities and proposes Transition Design principles in age-friendly communities, particularly from a participatory perspective. It highlights the importance of reframing perceptions and visions of ageing environments, involving stakeholders in the design process, and implementing design interventions through prototyping and observation, which is a significant guide for future designers, technicians, community residents, and policy makers. Case studies demonstrate how these principles have been applied to various projects from a digital technology perspective and explore the challenges in terms of funding, policy, and management. Transition Design holds promise for addressing the complex challenges of creating age-friendly communities, but continued multi-disciplinary research and collaboration is needed with a view to transitioning to more inclusive and supportive environments that empower older people and create opportunities to embrace a more sustainable ageing society.

ACKNOWLEDGEMENTS

This research was supported by grant: SGS23/081/OHK1/1T/15 by the Faculty of Architecture, Czech Technical University in Prague.

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