



## Planning for Aging Neighborhoods

Case Luttasaari

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### Abstract

The demographic structure of population is changing. Population projections are showing a decrease in the birth rate and increase in the dependency ratio (SVT, 2012). Further knowledge and awareness is needed of how urban planning can support the population living independently at home at very old age. Housing, mobility and access to services are key factors of residential satisfaction and wellbeing. Georeferenced data as well as qualitative data can be used to plan environment supporting active aging. Cross sectoral collaboration within municipality help to develop accessible services locally.

### Background

In Finland approximately 90% of the elderly over 75 years live in their own homes (YM, 2012) and the aim is to increase this proportion in the future by offering accessible housing and services at home for frail elderly. The aim is to develop housing and services for elderly in order to enhance "Aging in place". The term Aging in place implies to have possibility to live in the place of one's choice as long as possible and get the support needed for maintaining the quality of life. To that end, both existing housing areas and local services need to be accessible to elderly citizens. Daily services, groceries, leisure activities and green areas have to be easily reachable by foot and by public transport. The planning of housing environment and local neighborhood can support inclusion and functional capacities of elderly persons.

Walking is the main physical activity of frail elderly that helps to maintain the functioning and ADL (Activity of Daily Living) capacities and independent coping. Multiple walking destinations and safe, direct, short pathways to the destinations increase the likelihood of walking. The neighborhood quality and access to local services (Perez & al., 2001) are major components of residential satisfaction. Studies indicate, that over 75-year-olds opt for apartments in city centers and sub-centers (Ristimäki et al., 2013), near local services and public transport. According to Wang and Lee (2010) more there are walking destinations in the neighborhood, more the older adults walk. Burgess (1954) argues that the local services, facilities and green areas in the neighborhood also promote the social interaction. Mixed land use and population structure is expected to increase help to maintain daily services locally.

### Methods

The spatial analyses were conducted to analyze the accessibility for elderly people to the neighborhood public services (such as health care center and libraries), recreational areas (such as parks and gardens) and the city center of Helsinki. The qualitative information about the living environment is gathered from workshops and walks in the neighborhood with local elderly residents.

Firstly, we have dealt with the geo referenced topographic maps (including urban functions, typologies of buildings, number of floors, infrastructures, orthophoto) downloadable in shape-file and raster format from PaTuli. PaTuli

*It is not only the location but it is the transport connections and services that are crucial for living even at this age*

*Resident, age 65.*

is a data download service of Finnish geospatial data sets, in particular, we used a range of datasets produced by National Land Survey. Secondly, the latest information on the services and their locations was analyzed using the Service Map ([www.Palvelukartta.fi](http://www.Palvelukartta.fi)) provided by the City of Helsinki. Then, we collected the most updated data on public transportation (route planning and travelling time related to the bus lines and metro-lines) from the '*Karttadata*' that are maps provided by the Helsinki Region Transport (HSL) and accessible to all users (and available at <http://mak.hsl.fi/>)

Even though the data on public transportation and services (mentioned above) are geo-referenced, they are not available in vector format (such as shape file) to all users. However, the vector data were used to conduct the spatial planning analyses of Lauttasaari. The maps were created using software in GIS environment called gvSIG. Accordingly, we decided to georeference the missing information. This allows us to combine this data with the other ones and create the maps no.1- The density of population over 65 in apartment blocks, no. 2 -Pedestrian accessibility. no.3 -Travel time and no. 4 -Travel time estimation.

In order to analyze the accessibility to the apartment blocks, we collected data about all buildings without lifts (provided by statistics from the City of Helsinki building (construction) register 6/2012). The information was available only in excel format and referred to the postal addresses. Then, we combined this information with the demographic data focusing on persons age over 65/ha (provided by the Service Map). Accordingly, we georeferenced both data in map seen in Fig.1.

Talen (2002) notes that the detailed data about walkability factors such as sidewalk quality are often not available in geo referenced form. The qualitative user study methods are necessary to investigate the accessibility from the point of view of the pedestrian. Furthermore, as Talen (2002) points out that the access to services has to be considered in relation to the needs and characteristics of the population residing in the neighborhood.

The law on land use ensures participation and interaction procedures to all parties who are affected by the planning. The residents are encouraged to participate in the planning and development process of their own neighborhood. The methods, however, have to be adapted to this purpose. Although the technical skills of citizens are improving, the internet based questionnaires and social media don't reach all citizens. According to a Finnish survey 17 percent of population between 75 and 89 have been using internet as source of information (Intosalmi & al., 2013). In year 2030 the proportion of elderly over 65 will be approximately 26 percent and especially the number of very old + 80 is increasing rapidly (SVT, 2012). Therefore, it is important to apply more user friendly methods to involve also the elderly residents in the planning and assessment process.

The data about apartment houses with lifts and the density of population over 65 years are found in open database. The distances to services, street connectivity as well as topography and contour lines give indication of the walkability. To get in-depth user knowledge, however, user driven qualitative methods are needed. Workshops and questionnaires were used to involve the elderly residents living independently in Lauttasaari area. The daily paths and favorite places were assessed together with the elderly persons in workshops and through observational walks.

## Results

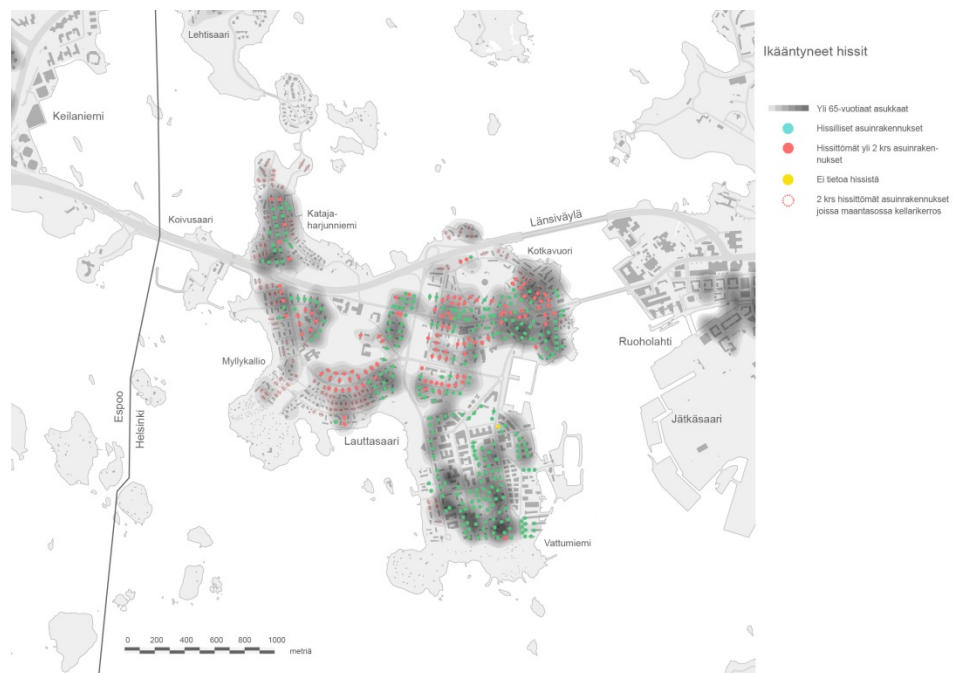
Mixed land use, proximity of housing and services as well as safe pedestrian networks and public transport enhance aging in place and mobility. The elderly population is not distributed evenly in all parts of the city, however. The geo referenced information can be used to locate neighborhoods where the percentage of elderly residents is high. Especially old neighborhoods with both elderly population and old housing stock need attention. The population grid of the Helsinki metropolitan area is available in shape file (Helsinki region info

share). It includes grid-based statistics of the age distribution, total population and population density (HSY, 2012). It helps to recognize areas with high density of older age groups. To analyze living environment and to gain knowledge supporting elderly citizens, existing information from different sources can be combined in shape files.

### Housing

The information of use of building stock as well as number of floors exists in shape files. In the case study area many old apartment buildings, where elderly persons live, lack lifts. In order to find apartment blocks without lifts, the information according to postal address in excel format was transferred to the shape file (fig. 1). This information can help to prioritize development and renovation works in old neighborhoods. The map on our study area showing age distribution and apartment block with lifts reveals, that elderly population is moving to the new apartment blocks in the south of the island, where the old industrial buildings aside and give place to accessible housing. In order to offer more suitable apartments for elderly locally, densification and new accessible apartment blocks can be planned accordingly.

**Figure 1. The density of population over 65 in apartment blocks.** The density of people +65 (in grey) and apartment blocks over two floors high without lifts (in red) reveals areas that need more consideration.



### Pedestrian accessibility

The topography and travel route affect the housing choice and reachability of the service. The areas with high density of elderly should be provided with good public transportation and direct travel routes to city center, health care centers and other services targeted to elderly persons. The internal traffic and connection to daily services, recreational and cultural services are essential for independent coping.

The characteristics of the north west of the island do not foster independent coping of elderly residents. Several problems can be identified in this part of the neighborhood. Poor provision of daily services and public transport, hilly terrain and old apartment blocks without lifts make living challenging for elderly. Furthermore, in the central part of the island the retail shops and services are located along the main road. The facilities are not easily reachable by foot due to the topography of the island. Therefore, according to our survey the entrepreneurs consider the good public transport connection as a major asset for the location of their business. The entrances of many retail shops situated in the basement of old apartment blocks are not accessible. Furthermore, public services like health center and parish center, which are important to many elderly, are both located on a hill top.

The south part of the island is undergoing transformation and densification as old industrial buildings aside from housing. The new housing and commercial

*I have been prisoner of my own house for three months. Even though I could get out of my house easily with a lift and a ramp, I couldn't get anywhere as I can't push the rollator in the snow piled on the pavement.*

*Resident, age 92.*

area located in the south part of the island is gaining importance. The services are accessible and easily reachable by public transport. The relation of elderly residents to their neighborhood changes due to the new urban development in the neighborhood. The sense of belonging can be affected by changes in the social and physical environment.

**Figure 2. Pedestrian accessibility.** The walking route from the sheltered home to the health care center and daily services is relatively short, but includes 11 meters differences of level (see section below the the map).



The sea is a major attraction and source of wellbeing for residents living in Lauttasaari. Some elderly reported, however, that they cannot access to the seashore because of long walking distances and lack of resting places. Many destinations in the neighborhood and short, straight walking paths to the destinations make walking more likely (Wang & Lee, 2010). The walking paths cross the green parks are safe and attractive. They are often used on the way to do daily shopping for groceries. Small lanes, narrow pavements with side slope, are difficult to walk especially with a walking aid. According to a Swedish study more than 60 percent of the falls and injuries of older people outside their homes happened while they were walking alone (Ståhl & Iwarsson, 2007).

The pedestrians and bicycles share the pavement in many places which is causing fear with the elderly. Low speed lanes, bicycle lanes separated from pedestrian and car traffic and clearly marked pedestrian crossings make walking environment safer. The qualitative characteristics of the walking environment are important as the walking is experienced with all senses. It is also a social and mental exercise. According French & al. (2014) positive subjective perception of walking paths and pavements as well as visually stimulating and safe neighborhood is associated also with sense of community. Our qualitative user study reveals that many elderly residents have been living long in the neighborhood and have created spontaneous social connections with some neighbors. They are aging together and supporting each other by having contact on regular bases.

According to our study people go for walks and for groceries alone even at very old age. Home delivery of goods can help some frail persons, but it does not answer to the social needs of people. To many elderly the only social contact in the neighborhood can be for example the local shop keeper. Informal interaction with between different generations is originated from accidental encounters in the neighborhood. Therefore, public and semi-public places with possibility to rest and to spend some time should be created. The immediate surrounding and court yard become more important for elderly residents as the recreational areas are not easily reachable. However, the court yards often lack possibilities for activities and leisure of elderly. Possibilities to do gardening in the yard, play chess in the park or participate passively by contemplating others add to feeling of belonging.

Long walking distances, lack of benches and resting places along the walking paths make some meaningful places, as the sea shore, inaccessible to the elderly. The local elderly association is organizing walks for seniors in good physical condition regularly during summer time. The walk along the seaside is a physical, emotional and social experience. People walk and discuss, and stop to contemplate the nature and beautiful views. The beach café is the common living room in the summer time for all people regardless of age living in Lauttasaari.

*I was carrying heavy bags and an empty bus was driving by. I asked if the bus driver would drop me near my house. The driver was responding that I'm not coming there and left. It was of no use what so ever.*

*Resident, age 85.*

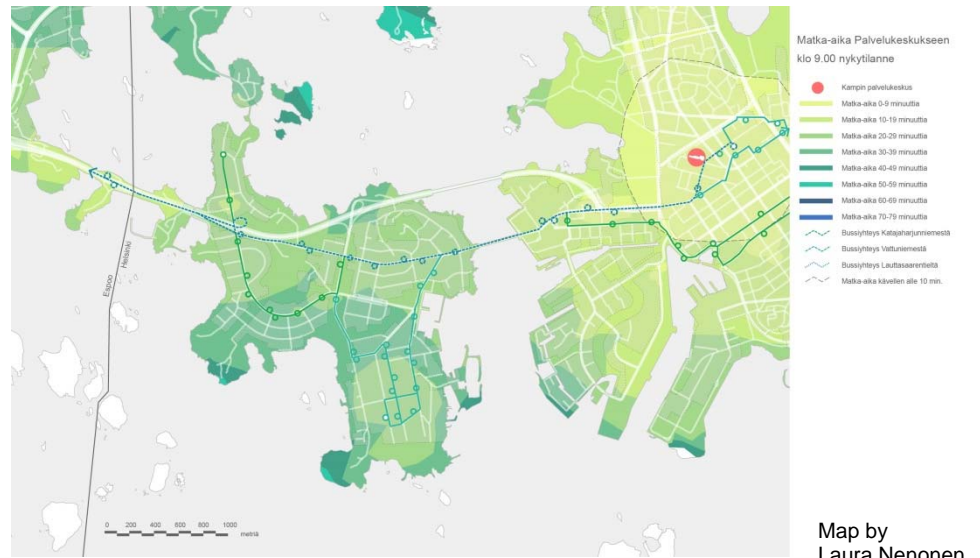
### **Mobility by public transport**

The usable and accessible local public transport is major solution for mobility of people with old age. According to WHO it is the key factor influencing active ageing (WHO, 2007). There is a link between mobility and wellbeing which can be related to accessibility as well as independence at old age. Metz (2000) is considering the mobility as possibility to achieve access to desired people and places, possibility go freely and gain new experiences, getting physical exercise and be involved in the local community and social activities. Furthermore, the possibility to travel, even if the trip is not actually undertaken is significant. Australian surveys (Healy, 2004) show that, elderly persons attend concerts, theatres and art galleries more frequently than younger people. In average, the people over 65 years visit also libraries even five times more yearly than do younger people. The direct connections to city center and cultural services enhance wellbeing.

User studies in Finland show, that a bus stop within 100 – 150 m from home promotes the use of public transport. The distance to nearest bus stop should not exceed 250m (Sahlsten, S.2013). According to Svensson (2010) in neighbourhoods, where pedestrians and car traffic is separated, the public transport stops are generally located relatively far from housing. Therefore, few people live very close to a bus stop. According to our user study 90 percent of all respondents over 65 in the case study area used public transport. However, when looking more closely to the results for people over 85, almost 90 percent were using taxi to access to services. More flexible and personalized transport possibilities would encourage elderly to use public transport. Increased possibilities for mobility may help elderly persons live independently in their own homes for longer (Metz, 2000).

The accessibility can be measured by distances from home to destination. In order to investigate accessibility of services targeted to elderly, we can also be measured the travel time as well as direct connections. Helsinki region traffic provides information about travel times by public transport (Matka-aikakartta, <http://mak.hsl.fi/>). In our case study area there will be important changes in public transport connection due to a new metro line. The travel time estimation that the changes and new connections may cause is based on the plan of new network of bus stops as well as an article by a local resident on travel times. Attention should be on areas, where there are many elderly living. Our rough estimation shows increase of travel times to the nearest elderly center.

**Figure 3. Travel time.** Direct bus connections help to reach the nearest elderly center within 30 minutes (hsl. matka-aika.fi).



**Figure 4. Travel time estimation.** The new metro line can have negative influence on travel times to the nearest elderly center especially on areas with high density of elderly (dashed) The estimation of travel time based on an article by local resident.



## Discussion

To promote user friendly accessible living environment, it has to be developed in multiple spatial scales. As Talen (2003) phrases, the priority has to be given to increase access between humans and the services they require. Furthermore, to develop aging friendly living environment collaboration within different departments of city services is needed. The detailed information about population structure helps to identify neighborhoods that are aging. Different departments of the city can collaborate to have an overall picture of the quality of the living environment. The data about population and buildings give valuable information for planners. However, more qualitative data about built environment can be transferred to geo referenced form.

Using gvSIG software can help to synthesize data from multiple sources into a single coherent view. However, the data collected need to be included in a common geographic database. This might help to make a better use of the sources, make better decision and plan successfully for elderly people. On the other hand, we need to increase the understanding and knowledge of elderly people's needs through empirical analysis (workshops, semi-structured interviews). The qualitative data might be managed with the help of geographic databases and open new ways of researching accessibility, people of all age.

The accessibility of services has to be considered in the point of view of pedestrians. The accessibility can be measured in distance, but also the slope and quality of walking infrastructure has to be taken into consideration. Maintenance of pavements, especially during winter, and separation of bicyclists and pedestrians can add to the safety of walking environment. Furthermore, the public transport has to ensure direct access to commercial

and health services as well as cultural and leisure activities. In order to be able to plan more elderly friendly neighborhoods qualitative information about the environment can be gathered together with elderly residents.

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