

ELDERATHOME

The prerequisites of the elderly for living at home: Criteria for dwellings, surroundings and facilities

ELDERATHOME

Ikäihmisten kotona asumisen edellytykset. Asunnon, ympäristön ja palvelujen suunnittelukriteerit

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Abstract

The purpose of the project has been to improve the conditions of living at home of the elderly. The aim of the project has been to encourage both the supply of and demand for innovative solutions. The final demand is among the ageing people and their relatives. The project has aimed at educating - and at preparing material for such education in the future - the seniors into demanding solutions that make independent living at home possible. The project has also aimed at providing planners, builders, promoters and policy makers with a model that will help them to improve the supply of such solutions. The main focus was on the material or practical manageability of the housing functions. They were analysed from the point of view of three areas: Dwelling itself, the surroundings, and the facilities (services).

First, the present practices in the four participating countries (Finland, Denmark, the Netherlands and Spain) were studied. The wishes and needs of the elderly were studied by means of interviews that were carried out in a number of interesting cases in these countries. Development challenges were identified and articulated in the form of criteria presented as a qualitative Model of Independent Living which takes into account important variables, together with Activity cards that concretize the model.

The criteria were tested in nine cases for their functioning as planning tools in the planning process, as well as for their power in ensuring function fulfilment according to the wishes and needs of the elderly. The case work showed that the criteria can successfully be used as a participatory planning tool.

Tiivistelmä

Projektin tarkoituksena oli parantaa ikäihmisten kotona asumisen edellytyksiä. Tavoitteena oli rohkaista innovatiivisten ratkaisujen kysyntää ja tarjontaa. Projekti pyrki nostamaan ikäihmisten ja heidän omaistensa tietoisuutta itsenäisen asumisen mahdollistavista ratkaisuista. Projekti pyrki myös tarjoamaan suunnittelijoille, rakentajille ja palvelujen tarjoajille mallin, jonka avulla näitä ratkaisuja voidaan kehittää ja tuottaa. Projekti keskittyi ensisijaisesti asumisen toimintojen fyysisiin piirteisiin. Niitä tarkasteltiin kolmelta kannalta: asunnon, ympäristön ja palvelujen näkökulmasta.

Tutkimuksen aluksi selvitettiin neljän osallistujamaan (Suomi, Alankomaat, Espanja ja Tanska) nykytilanne. Näissä maissa myös tehtiin valikoitujen ikäihmisryhmien keskuudessa haastatteluja tarpeiden ja toiveiden selvittämiseksi. Kehittämishaasteet tunnistettiin ja niiden perusteella muodostettiin kriteerit. Tässä hankkeessa kriteereillä tarkoitetaan laadullista itsenäisen asumisen mallia, joka ohjaa ottamaan huomioon tärkeät näkökohdat, sekä toimintokortteja, jotka konkretisoivat mallin sisällön.

Kriteeristöä testattiin yhdeksässä tapaustutkimuksessa sekä suunnittelun apuvälineenä että halutun lopputuloksen näkökulmasta. Tutkimus osoitti, että kriteerit toimivat hyvin esimerkiksi asukkaiden ja remontin suunnittelijoiden yhteistyön apuvälineenä.

Keywords / Avainsanat
Ageing people, independent living, criteria, planning tool, participation / Ikäihmiset, itsenäinen asuminen, kriteerit, suunnittelun työkalu, osallistuminen

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CONTENTS

ELDERATHOME THE PREREQUISITES OF THE ELDERLY FOR LIVING AT HOME: CRITERIA FOR DWELLINGS, SURROUNDINGS AND FACILITIES.....	5
FOREWORD.....	6
TIIVISTELMÄ.....	7
1 AGEING IN EUROPE: TRENDS AND CHALLENGES.....	8
2 INDEPENDENT LIVING AT HOME: PURPOSE AND OBJECTIVES OF THE PROJECT.....	11
3 APPROACH OF THE PROJECT AND STRUCTURE OF THE REPORT.....	13
4 PRESENT PRACTICES IN THE FOUR COUNTRIES.....	15
4.1 Policies and principles.....	15
4.2 Housing.....	15
4.3 Surroundings.....	18
4.4 Services.....	18
4.5 Main differences.....	20
4.6 Conclusions towards criteria development.....	20
5 WISHES AND NEEDS OF THE ELDERLY.....	21
5.1 Introduction.....	21
5.2 Method and data.....	21
5.3 Results.....	23
5.3.1 Demographic and background characteristics.....	23
5.3.2 Scenarios for lifestyles.....	26
5.3.3 Housing, surroundings, services and communication.....	27
5.3.4 Existing regulations, standards and recommendations.....	33
5.4 Conclusions towards development and use of criteria.....	34
6 DEVELOPMENT CHALLENGES.....	36
6.1 Introduction to the criteria development.....	36
6.1.1 The challenge.....	36
6.1.2 Background and approach.....	36
6.1.3 The Model of Independent Living - The Ball Model.....	38
6.1.4 The activity cards.....	39
6.2 Criteria for dwellings.....	40
6.2.1 The aim of the criteria for dwellings and the meanings of home.....	40
6.2.2 Activities at home.....	41
6.2.3 Resources of the dwelling.....	43
6.2.4 Qualities of the habitation.....	44
6.2.5 Abilities of the occupant.....	45
6.3 Criteria for surroundings.....	47
6.3.1 The aim of the criteria for surroundings and defining surroundings.....	47
6.3.2 Activities and surroundings.....	48
6.3.3 Abilities and surroundings.....	49
6.3.4 Resources and surroundings.....	50
6.3.5 Qualities and surroundings.....	51

6.4	Criteria for services	52
6.4.1	Activities and services.....	52
6.4.2	Abilities and the need for services.....	53
6.4.3	Resources and services	55
6.4.4	Qualities of services	56
7	TESTING AND DEVELOPMENT	60
7.1	Introduction	60
7.2	Selection of cases.....	60
7.3	Introduction of a social caretaker in the housing estate Engholmen Nord in Copenhagen (case 1, Denmark).....	62
7.4	Installation of mini-elevators in existing multifamily buildings (case 2, Denmark).....	64
7.5	Participatory planning of dwelling modifications in a block of flats in Helsinki (case 3, Finland).....	66
7.6	Functional planning of collective areas (Case 4, Finland)	68
7.7	Service bus line (case 5, Finland)	70
7.8	Mobile community centre (case 6, The Netherlands).....	73
7.9	Opplussen (Case 7, The Netherlands).....	75
7.10	Barcelona Accessibility Plan (Case 8, Spain)	77
7.11	Homedoor (case 9, Spain)	78
7.12	Conclusions.....	80
8	CRITERIA IN PRACTICE: ESPARREGUERA.....	81
8.1	Introduction	81
8.2	Description.....	81
8.2.1	Location	81
8.2.2	Functional programme.....	81
8.2.3	Functional description.....	82
8.2.4	Project justification	83
8.3	Construction	84
8.3.1	Outside walls	84
8.3.2	Roof cover	85
8.3.3	Carpentry	85
8.3.4	Walls and coatings	85
8.3.5	Flooring	85
8.3.6	Furniture	85
8.4	Plans	86
9	SUMMARY AND CONCLUSIONS.....	100
	REFERENCES	103
	Annex 1. List of deliverables	
	Annex 2. The criteria for dwellings – the ball model and the activity cards	
	Annex 3. The criteria for surroundings- the ball (wheel) model and the activity cards	
	Annex 4. The criteria for services – the ball model and the activity cards	

ELDERATHOME The Prerequisites of the Elderly for living at home: Criteria for Dwellings, Surroundings and Facilities

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FOREWORD

One of the political and social priorities of the future is to support elderly people living in their homes as long as possible. This report summarises the results of the project ELDERATHOME: The Prerequisites of the Elderly for Living at Home: Criteria for Dwellings, Surroundings and Facilities (Contract No QLK6-2000-00405). The project was a part of the specific programme “Quality of Life and Management of Living Resources” within the Fifth Framework Programme of the European Union. It also got funding from several organisations and companies in the four participating countries.

The partners of the research project were

- TTS Institute, Finland, co-ordinator
- ProASolutions, Spain
- Danish Building and Urban Research, Denmark
- VTT Building and Transport, Finland
- Wageningen University, the Netherlands

This report is based on the work carried out in the Work Packages of the project, and reported in the various Deliverables. The contribution of many individuals was needed. The persons who worked to produce the content of this report are listed below, starting with the Work Package leader:

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Ans Groot-Marcus (WU) worked with the project in the preparatory phases. Pirkko Kasanen (TTS) co-ordinated the project and edited the final report.

The Deliverables and a selection of conference papers are available at www.tts.fi.

Rajamäki, Finland, October 2004

TTS Institute
Department of Home Economics

TIIVISTELMÄ

ELDERATHOME

Ikäihmisten kotona asumisen edellytykset. Asunnon, ympäristön ja palvelujen suunnittelukriteerit

Ikäihmisten määrä ja osuus väestöstä on kasvussa EU:n alueella. Iän karttuessa monille tulee vaikeuksia selviytyä jokapäiväisistä toimista itsenäisesti. Yksi tulevaisuuden haasteista on parantaa ikäihmisten edellytyksiä asua kotonaan mahdollisimman pitkään. Useimmat tulevien vuosikymmenien asunnoista on jo rakennettu, niinpä olemassa olevien asuntojen ja elinympäristöjen parantaminen on keskeinen haaste.

Projektin tarkoituksena oli parantaa ikäihmisten kotona asumisen edellytyksiä. Tavoitteena oli rohkaista innovatiivisten ratkaisujen kysyntää ja tarjontaa. Projekti pyrki nostamaan ikäihmisten ja heidän omaistensa tietoisuutta itsenäisen asumisen mahdollistavista ratkaisuista. Projekti pyrki myös tarjoamaan suunnittelijoille, rakentajille ja palvelujen tarjoajille mallin, jonka avulla näitä ratkaisuja voidaan kehittää ja tuottaa.

Projekti keskittyi ensisijaisesti asumisen toimintojen fyysisiin piirteisiin. Niitä tarkasteltiin kolmelta kannalta: asunnon, ympäristön ja palvelujen näkökulmasta. Kolmen tarkastelunäkökulman pitäminen esillä yhtäaikaisesti on tärkeää, koska silloin on mahdollista löytää tapauskohtaisesti parhaita asunnon, ympäristön ja palvelujen kehittämisen ratkaisuja.

Tutkimuksen aluksi selvitettiin neljän osallistujamaan (Suomi, Alankomaat, Espanja ja Tanska) nykytilanne. Näissä maissa myös tehtiin valikoitujen ikäihmisryhmien keskuudessa haastatteluja tarpeiden ja toiveiden selvittämiseksi.

Kehittämishaasteet tunnistettiin ja niiden perusteella muodostettiin kriteerit. Tässä hankkeessa kriteereillä tarkoitetaan laadullista *itsenäisen asumisen mallia*, joka ohjaa ottamaan huomioon tärkeät näkökohdat, sekä *toimintokortteja*, jotka konkretisoivat mallin sisällön.

Malli lähtee *toimintojen* määrittämisestä. Tässä on tarkoitus kattaa laajasti elämän koko kirjo, unohtamatta sosiaalisia toimintoja ja itsensä toteuttamista. Mallissa *resurssit* ovat niitä tekijöitä, joita muuttamalla olosuhteita parannetaan, siis asunnon ominaisuuksia, laitteita, ympäristön osatekijöitä tai erilaisia palveluja. *Laatutekijöitä* ovat esim. estetiikka, mukavuus, toimivuus ja turvallisuus. Ikäihmisen *kyvyt*, kuten aistit, liikkuminen tai muistaminen vaikuttavat muutoksen tarpeeseen.

Kriteeristöä testattiin yhdeksässä tapaustutkimuksessa sekä suunnittelun apuvälineenä että halutun lopputuloksen näkökulmasta. Tutkimus osoitti, että kriteerit toimivat hyvin esimerkiksi asukkaiden ja remontin suunnittelijoiden yhteistyön apuvälineenä.

Uusia rakennuksia suunniteltaessa olisi erityisen tärkeää varmistaa niiden soveltuvuus ikäihmisen itsenäiseen asumiseen. Tämän raportin lopuksi esitellään Kataloniaan, Esparregueran kaupunkiin rakennettavan kerrostalon suunnitelmat, joita laadittaessa kriteeristöä on käytetty hyväksi.

I AGEING IN EUROPE:TRENDS AND CHALLENGES

Bea Steenbekkers and Marlies van der Linden

There are about 60 million people of at least 65 years within the EU area, which equals 15 % of the total population. By the year 2030 the number will be around 90 million. Especially the number of people over 80 years of age will rise.

In table 1 the total population for all European countries in 1999 is shown. Also the part aged 15 years and younger and the part aged 65 years and older is shown. Especially the latter age category is relevant for this project.

Table 1. European population in 1999

	Population, 1-1-1999	Part 15 years and younger (in %)	Part 65 years and older (in %)
Austria	8.078.000	17.1	15.4
Belgium	10.239.000	18.0	17.0
Denmark*	5.330.000	18.4	14.7
Finland*	5.160.000	18.4	14.7
France	58.518.000	19.0	15.8
Germany	82.037.000	15.8	15.9
Greece	10.516.000	15.6	16.7
Ireland	3.745.000	22.1	11.3
Italy	57.613.000	14.7	17.1
Luxembourg	436.000	18.7	14.1
Netherlands*	15.760.000	18.5	12.5
Portugal	9.968.000	16.9	15.2
Spain*	39.853.000	15.5	16.3
Sweden	8.861.000	18.5	17.3
United Kingdom	59.237.000	19.2	18.7

* Participating in Elderathome project

Source: ministry of VROM (Netherlands Ministry of Housing, Spatial Planning and the Environment), The Netherlands (2000)

As is shown in table 1, in 1999, the United Kingdom, Sweden, Italy and Belgium had the highest proportion of people aged 65 years and over. From the participating countries in the EU-project Spain leads the group with the highest proportion of people aged 65 years and older (16.3%), followed by Denmark (14.7%), Finland (14.7%) and the Netherlands (12.5%).

The number of people aged 65 years and older will increase rapidly during the next decades. This future estimate is shown in table 2.

Table 2. Future estimated age structure

	Age	2005	2010	2015	2020	2025	2030
Denmark	0-14	19	18.5	17.9	17.5	17.7	18.3
	15-64	66.1	65.7	64.2	63.5	62.6	61.2
	65+	14.9	15.8	17.9	19	19.7	20.5
Finland	0-14	17.3	16.1	16.0	15.9	15.8	15.5
	15-64	66.9	66.5	63.7	61.5	59.9	58.8
	65+	15.7	17.1	20.3	22.5	24.3	25.7
Netherlands	0-19*	24	24	23	22	22	22
	19-64*	62	61	60	59	58	56
	65+	14	14	17	19	20	22
Spain	0-14	14.6	15.0	15.2	14.4	13.2	12.2
	15-64	68.1	67.2	66.3	65.8	65.3	64.1
	65+	17.3	17.8	18.5	19.7	21.5	23.7

Source: www.tilastokeskus.fi, www.cbs.nl, www.ine.es

* Due to the available data the age category of the Netherlands is different from the other countries. The most important part of this table is the age category 65+ so this difference is acceptable.

As can be seen from table 2 the biggest increase of the number of elderly people will be in Finland (10% in 25 years), followed by the Netherlands (growth of 8% in 25 years), Spain and Denmark (growth of 6% in 25 years).

The number of older people is increasing. This is due to the fact that people are living longer than in the past. Table 3 gives information about the life expectation of men and women.

Table 3. Table 3 Life expectations for men and women

	Men	Women
Denmark (1999)	74.0	78.8
Finland (1999)	73.7	81.0
Netherlands (2000)	75.5	80.6
Spain (2000)	75,7	83.1

Source: www.cbs.nl, www.tilastokeskus.fi, Danish National Statistical Bureau, 2001, www.ine.es

One of the political and social priorities of the future is to support elderly people living in their homes as long as possible. More attention is needed to ensure that homes are accessible, convenient and safe and capable of meeting the needs of occupants with declining capacity. Most of the dwellings that older people will require are already in existence. It is a great challenge to adapt the existing housing stock to the needs of the elderly.

When people get older, sooner or later many of them encounter more or less severe difficulties while coping with daily life. The following tables show examples from three countries about data concerning such difficulties.

Table 4. Table 4 Denmark: elderly that can do certain activities without trouble in 1997, %

Can without trouble	Age					
	52	57	62	67	72	77
Cut toe-nails	94	92	89	82	73	59
Walk on stairs	94	91	88	83	77	66
Walk around outside the house	94	96	96	93	88	81

Source: Danish National Institute of Social Research, 2000

Table 5. Table 5 Finland: major problems or total incapability in certain activities, %

	65-69 years		70-74 years	
	Male	Female	Male	Female
Hearing	22	13	32	18
Seeing	7	15	14	29
Going up and down the stairs	15	24	24	39
Doing day-to-day shopping	4	8	11	18
Carrying the shopping bag	9	16	19	29
Using public transport	4	10	12	19
Doing heavy domestic work	23	40	30	54

Source: Nissinen & Santalo, 2001

Table 6. Table 6 the Netherlands: elderly that have no difficulties with the following activities 1998, %

	Daily shopping	Preparation of hot meals	Washing	Light household work	Dressing and undressing
55-64 years	81	77	96	87	94
65-74 years	82	74	95	89	93
75 years and older	59	64	80	74	82
Total 55 years and older	76	73	92	85	91

Source: Ministerie van VROM, The Netherlands (2000)

It is thus a challenge to improve the existing dwellings and their surroundings, and to provide services, so that a growing number of elderly people can continue to live independently despite some difficulties in managing daily tasks.

2 INDEPENDENT LIVING AT HOME: PURPOSE AND OBJECTIVES OF THE PROJECT

The purpose of the project has been to improve the conditions of living at home of the elderly, and to influence factors affecting the ways in which one can govern one's life and make independent decisions while the capabilities (psychological, physical and social) weaken.

The aim of the project has been to encourage both the supply of and demand for innovative solutions. The final demand is among the ageing people and their relatives. The project has aimed at educating - and at preparing material for such education in the future - the seniors into demanding solutions that make independent living at home possible. The project has also aimed at providing planners, builders, promoters and policy makers with a model that will help them to improve the supply of such solutions.

The main focus was on the material or practical manageability of the housing functions. They were analysed from the point of view of three areas: Dwelling itself, the surroundings, and the facilities (public, market or third sector organisations and related rules and regulations) providing the necessary infrastructure and services for organising the housing activities. The surroundings and the facilities are instrumental in taking care of the social interaction and the quality of the wider living environment. The conditions for these vary by locational and building characteristics (urban/rural; individual homes or flats etc.).

The objectives of the project were

- To make an inventory of the state of the art of products, guidelines and practices related to housing, the surroundings and facilities used by elderly persons, and to clarify the prerequisites for independent living.
- To identify the wishes and needs of the elderly concerning these three aspects, and to identify differences in wishes and needs of the elderly in the participating countries, on the basis of institutional and cultural differences.
- To identify the criteria for these aspects in order to improve possibilities for independent living.
- Based on the criteria, to identify critical improvement needs in the prerequisites for independent living, and to focus suggestions for new solution development on those.
- To adapt existing methodologies in the area of user needs to the purposes of this topic.

The chosen solutions should be suitable for all users or easily adaptable, in order to reach mass markets rather than serving small, special segments. This will make it more profitable to provide such solutions.

The project has developed planning criteria, which were tested in practice during the project. There are already numerous efforts to create standards or criteria for housing, environments, appliances etc. The specific purpose of the project was to focus on the prerequisites of living at home in presently existing dwelling stock, rather than ideal newly built environments. While the criteria can

also be used in new developments, the underlying idea has been to find adaptable solutions for a variety of existing situations.

Another priority of the project has been to find creative combinations of housing improvements and facilities providing services, in order to answer a multitude of existing and developing challenges. Present efforts in standards development often focus on individual features rather than total packages of improvements.

Nowadays the word *criterion* is often taken to mean something exact and quantitative. The criteria produced and suggested by this project are more qualitative guidelines about what should be considered and how various important elements should be taken into account. This more open approach is justified because of the focus on the future: we need to be open to new solutions for which today's measurements are meaningless; and because of the ambition to combine the possibilities of the dwelling, surroundings and services in flexible and creative ways.

It is our belief that we can create a virtuous circle by enhancing independent living and managing with daily tasks while maintaining social contacts and a feeling of coping. This will enable people to stay in better overall condition despite weakening capabilities, thus being able to live longer independently.

In terms of theory and methodology, the most challenging aspect of the study has been to adapt user evaluation methods for this purpose. Such methods are badly needed even for standardisation work, to complement traditional methods based on committee representation.

3 APPROACH OF THE PROJECT AND STRUCTURE OF THE REPORT

The project was carried out by five partners in four countries, Finland, Denmark, The Netherlands and Spain. The research was organised into seven work packages (WP) that proceeded to a great extent simultaneously with each other. Each work package produced its own report or set of reports (deliverable). A list of these deliverables is in Annex 1 of this report. The full deliverables can be found at www.tts.fi.

Figure 1 shows the structure of the project in work packages. This report follows the same structure. The following chapter summarises the findings of work package 1, Present practices. This work package consists of an inventory of the state of the art of the present practices regarding policies and principles, housing, surroundings, and services in the participating countries.

After that, the wishes and needs of the elderly are reported, based on research in work package 2. The results are from interviews carried out in the four countries.

The criteria are the heart of the project. They were developed in work packages 3-5. They are described in the chapter Development challenges. The chapter consists of a common discussion of the purpose and methodology of the criteria work as well as an outline of the model used for each set of criteria. The three sets of criteria are then presented. This chapter also incorporates the conclusions concerning the criteria that were made from case studies.

The case studies are, however, presented in their own chapter, Testing and development. Work package 6 consisted of specifying the variables that would be relevant when choosing case studies, and of the choice and initial description of the cases. Work package 7 consisted of carrying out nine different case studies, reporting them and making conclusions towards criteria development.

To emphasise our ambition to use the criteria in practice, we devote a chapter to a construction project in Esparreguera, Catalonia. The criteria were used in planning this project. While the purpose of the project was to help improve conditions in existing dwellings, the criteria can well be applied when planning new buildings.

In the last chapter are the summary and conclusions.

In figure 1, the tall and narrow box on the left stands for the Network of users. In the early phases of the project a network of relevant users of the results was established in each participating country. The purpose of the network was to make accessible to the project such expertise as was already existing in the field, to reach the real end users, and to prepare for the dissemination and exploitation of the results. Deliverable 2 by Kasanen (2003) describes the network in greater detail.

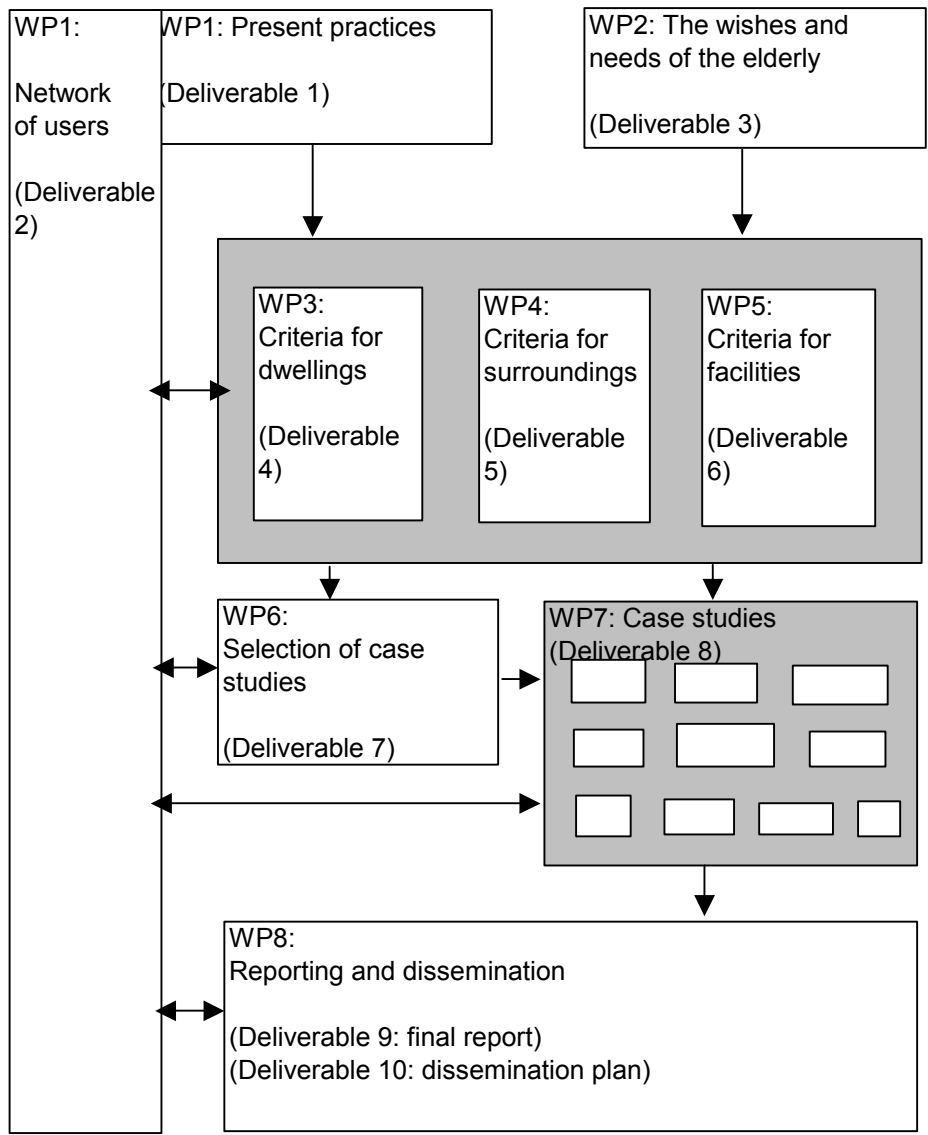


Figure 1. The structure of ELDERATHOME project

4 PRESENT PRACTICES IN THE FOUR COUNTRIES

Bea Steenbekkers and Marlies van der Linden

To provide a basis for identifying development challenges, the present practices in the four participating countries were studied. The inventory covered aspects of housing, surroundings and services, relevant for independent living of the elderly. It also focused on policies and principles designed to improve these living conditions. Main differences among the four countries were identified, and conclusions for directing the work on criteria were made.

The inventory was based on country reports from Denmark, Finland, The Netherlands and Spain. The reports were compiled using a common framework in order to make sure that the same issues were covered by all. The country reports were based on information collected from literature reviews, market surveys and expert interviews. The existing standards, criteria and guidelines in each country were also reviewed. For more detail, see Deliverable 1 by van der Linden and Steenbekkers (2003).

4.1 Policies and principles

The guiding principle of the Danish and Dutch governments is the maintenance of independence of older people for as long as possible. The Dutch government tries to reach this by for example large-scale home care. Another aim of the large-scaled home care is to reduce intramural care. When elderly need care they can choose care offered by home care organisations, or they can choose the *Persoonsgebonden Budget* (Individual Care Budget). In this system, people get a certain amount of money (dependent on the extent of care they need) and they can choose the help they prefer. This kind of care gives elderly much more freedom compared with the care received from home care organisations.

In Finland in the 1990's a significant project took place to change the structure of social and health services from institutional care to the direction of non-institutional services. The challenges of the future deal with the amount, quality and economy of services for the elderly. Municipalities have the main responsibility to offer care services to the elderly.

The general housing policy in Spain does not take the elderly people's needs into account. This is probably due to the fact that almost all Spanish elderly that experience problems with independent living or those needing care move in with their relatives.

There are 17 autonomic communities, which have exclusive power regarding housing. Catalunya (one of the regions in Spain) is leading the evolution both in demographic and socio-economic terms.

4.2 Housing

Mostly, the elderly attain a high age and live long independently. Only a small proportion of the elderly live in institutions. In certain parts of Europe it is com-

mon for the elderly to live with relatives, in other parts it is more common to live independently for as long as possible and to receive help to achieve this.

In *Denmark* 72% of people aged 67 years and older live independently (they do not receive home help and do not live in institutions); 24% receive home help and 4% live in institutions. Of people aged 80+, 4% receive more than 20 hours home help per week. 87% of people aged 65 years and older in *Finland* live at home independently, 7% live at home independently but with some help. 5% live with relatives and 2% in institutions (Nissinen and Santalo, 2001). In *the Netherlands* 92% of people aged 65 years and older live independently and 8% live in institutions (Ministerie van VROM, 2000). In *Spain* 54% of people aged 55 years and older live independently, 40% live with relatives and 3% live in institutions.

As is obvious from the above numbers there are major differences between the four countries. In Spain a large proportion of elderly is living with relatives and a smaller proportion of Finnish elderly lives with relatives. On the contrary, this way of living does not occur in Denmark and the Netherlands. Compared with the other countries, in the Netherlands the largest proportion of elderly live in institutions.

As regards the housing situation on the whole, Denmark and Finland have a relatively large number of detached dwellings. Spain has a high number of people living in large-scaled apartment buildings. In the Netherlands more than half of the people live in terraced dwellings.

Among the elderly people (65+), living in single-family dwellings (45%) is as common as living in a block of flats (41%) in Finland, and 12% of the elderly live in terraced dwellings (Nissinen & Santalo, 2001, www.euhousing.org). In the Netherlands two-thirds of people aged 55 years and older live in single-family dwellings, the rest live in apartments. As people grow older in the Netherlands they more often move to apartments with elevators (de Klerk, 2001). In Spain about 43% of elderly people live in single-family houses, alone or in a couple (Eurostat, 2001).

There are also some differences regarding ownership of the dwelling between the countries participating in the Elderathome project. In Denmark more than half of the dwellings are owner-occupied, this are mainly single-family dwellings. In the Netherlands the situation is almost the same as in Denmark. On the contrary, in Spain 81% of the dwellings are owner-occupied. Fifty percent of the Spanish apartments/flats are owner-occupied. This information was from 1996. In Finland in 1998, 60% of dwellings were owner-occupied and 30% were rented.

The situation of the elderly people differs somewhat from the general trends in some countries. In Finland 70% of older people live in owner-occupied housing (Nissinen & Santalo, 2001). In Finland the trend can be noticed that the ownership of the dwelling increases with age. In the Netherlands 43% of the elderly live in a privately owned dwelling (compared with 51% of the total population). 57% of the Dutch elderly live in rented dwellings, which are both social and private rented dwellings (de Klerk, 2001). In Spain about 81% of the elderly live in owner-occupied dwellings while only about 12% live in rented dwellings (Ministry of the Environment, 1999).

Table 7 shows the results of a study that was conducted about problems regarding the housing situation and surroundings in Europe. In the table it can be

seen that in Portugal 16% of households have no bath or shower and another 22% have no hot water. From the participating countries in the Elderathome project Denmark is doing the best and Spain the worst.

Table 7. Problems in housing and surroundings in Europe, 1995, in percentages

	No bath/shower	No hot water	Dwelling too small	Liquid/leak or wood rot	Noise	Vandalism
Austria	4	3	17	14	21	9
Belgium	4	5	13	22	20	17
Denmark*	3	1	16	12	13	10
Finland*(1)	-	-	-	-	-	-
France	4	2	14	24	25	21
Germany	2	6	12	12	29	9
Greece	6	-	26	25	20	7
Ireland	4	5	12	14	9	14
Italy	2	2	18	12	27	17
Luxembourg	2	3	13	13	17	12
Netherlands*	1	1	10	21	24	20
Portugal	16	22	30	42	17	21
Spain*	2	4	22	24	31	24
United Kingdom	0	0	21	25	21	29

* Participant of Elderathome project

(1) Data from Finland are missing.

Source: ministry of VROM, (2000)

In *Denmark*, old institutions are closed or reconstructed to so-called housing for the elderly i.e. adapted two-room flats. The elderly living there have a normal tenancy agreement and can obtain housing allowance as can everybody else in the rented housing sector. The elderly need to pass an assessment of need before they can move to a flat in the new housing for the elderly; if they need help they are allowed to live in the new housing for the elderly.

In 1988 a reform took place by which housing and services were as from then handled separately. Elderly need a separate assessment for their dwelling and when they want to receive services.

During the last 10 years there has been a growing interest in communes for elderly aged 55 years and older. However, many of the elderly living in communes do not choose this kind of housing because of the possibilities of common activities but because it is a way to get a smaller, a more modern, or an accessible dwelling. Only 0.2% of elderly live in a commune.

In *Finland*, the market sector consists of the private market sector and non-profit sector. In the non-profit sector there are many organisations that focus on housing, repairs, welfare and social security of the elderly.

In *the Netherlands* there are several organisations that deal with quality, safety and flexibility of dwellings. An interesting project is the cum-care complex. The starting point of this kind of housing are elderly who live independently, but if it is necessary, a full package of care is available.

In the 1980s the first commune especially for elderly was originated. The initiation of communes lies in the hands of elderly themselves. Elderly who live

in communes like to have their own dwelling and the possibilities of undertaking activities with others.

In *Spain* dwellings with common services are rare, only some such apartments are built in the private sector. There is an interesting project in Barcelona where students live with older people. The students help in the housekeeping and keep the elderly company. They may live there free of charge. This initiative is not taken over by other cities yet.

The dwelling market for the elderly is underdeveloped due to economic factors. Among the Spanish people there is very little mobility regarding housing; people buy a dwelling when they are getting married and most of them do not move anymore. These dwellings are financed by mortgages and people do not have money to adapt or rebuild their dwellings when necessary.

4.3 Surroundings

Loneliness and helplessness are typical problems in Finland among elderly, and probably this is a problem prevalent in many countries. The problems of rural areas are the long distances and lack of certain services. The problems that many elderly perceive in urban areas are crime, violence, a crowded environment. A clear technical problem is the lack of lifts in many buildings.

In the Netherlands, 33% of the elderly do not feel attached to the neighbourhood they live in. Another problem for 21% of elderly is the fact that people in the neighbourhood barely know each other.

In Spain more people aged 65 years and older live in rural areas than in urban areas.

4.4 Services

The number of comparable international studies regarding services is limited. However, in 1991 a collaborative, cross-national study funded by the European Community focusing on services and policies of care for older people in the EC member states (excluding Spain, Portugal and Luxembourg) took place. This study is known as ACRE, which is short for Age Care Research Europe. The aim of the study was to see how far different systems of health and social care were adapting to the changing needs of ageing populations.

Some findings of the study can be summarised as follows:

- There is a vast variation between countries as regards the proportion of older people receiving home help. To this can be added that the variations within each of the countries studied were also considerable.
- The services were distributed in different ways within countries. For example, in France the service is rather 'thinly' spread over a larger proportion of the population, whereas others like the Netherlands would appear to give relatively more people a larger number of hours. In Denmark overall provision is generous compared with any other country studied, so that the service reaches a very large number of people, some of whom receive a few hours of service weekly, but a

considerable proportion of others receive a large amount of care (Evers and van der Zanden, 1993).

The study is dated, but it shows that there were considerable variations between the EU-countries. We assume that some of the variations between countries remains today.

Evers and van der Zanden (1993) conclude the following: Denmark and the Netherlands and, to a lesser extent, the United Kingdom seem to be the countries with the most extensive infrastructure of services among the Northern European Union countries. However, even in the leading countries, the levels of home care services are not sufficient to keep pace with the rising need created by socio-demographic change.

In *Denmark*, services delivered at home have gone through a rapid development since the 1960s. The explicit policy - like the general policy of the government regarding housing - has been the maintenance of independence of older people as long as possible. The local authority decides who shall have home help and how many hours of help will be offered. The local authorities also decide about minor adaptations of the dwellings. There are also some services offered by the market segment, for example services that are not dealt with by the home-helpers or if people want more help then they are offered by the local authority.

A nurse or a therapist offers all elderly (age 75+) visits once a year to discuss whether or not they need some kind of assistance (or more assistance than they receive now).

In *Finland* the offering of services has been reduced during the period 1988-1996. However, the supply of services is improving nowadays.

The insufficient non-institutional services are an increasing problem and the gap between supply and demand is increasing as well. Especially regional inequality in getting services is a reality in Finland.

There are hundreds of firms that offer social and health services, but many are very small. These firms try to sell their services to the municipalities as well as directly to customers.

Elderly expect qualitative and individual services. They regard as important the right to equal treatment, self-determination and dignity of behaviour also when they are not any more able to cope with all the daily activities independently. Society is expected to secure the prerequisites of good life and to secure the sufficient care.

The offering of services is rising in *the Netherlands*. Several businesses are interested in investing in the services market. For example, housing associations and insurance companies are offering services now as well.

In *Spain* home medical assistance is given in emergency situations. So, it is not aimed at independence on the long term. However, the number of day-care centres is increasing. In these day-care centres no medical assistance is given.

There are several services in Spain for which the Ministry of Labour and Social Affairs is responsible. There are also private companies that offer services.

4.5 Main differences

There are several differences between the four countries participating in the project. The biggest differences are discussed below.

Both Denmark and the Netherlands have an explicit policy regarding the maintenance of independence of older people for as long as possible. Finland also pays attention to the independence of elderly; in Finland policy is aimed at a change from institutional care to non-institutional care. On the contrary, in Spain no special attention is given to elderly in general housing policy.

In Denmark, Finland and the Netherlands people try to maintain their independence for as long as possible. They can receive medical, domestic and practical help to cope with daily life. In Spain people can get help as well, but in the majority of cases Spanish elderly move in with relatives when their physical or cognitive state is decreasing. However, in Finland a small proportion of elderly lives with relatives as well. This does not occur in Denmark and the Netherlands. In the Netherlands a bigger proportion of elderly, compared with other countries, lives in institutions.

In Denmark and Finland there is a relatively large amount of detached dwellings. The Finnish elderly live in single-family dwellings or in blocks of flats. Spain has a large number of people living in large-scaled apartment buildings. In the Netherlands most people live in terraced dwellings, most elderly live in single-family dwellings; the rest lives in apartments.

From a European research it became clear that the quality of dwellings in Spain is worst compared with the other countries participating in the project. For example, noise is a problem for 31% of households, vandalism and leak or wood rot is problematic for 22% of houses and 22% of households judges the dwelling as too small.

In Finland we have to consider the long distances and connected with that the lack of certain services in rural areas. In the Netherlands it appears that a lot of elderly do not feel attached with the neighbourhood they live in.

In all countries the market that offers services is growing. In Denmark services were already offered from the 1950s. In Spain several services are only given in emergency situations.

4.6 Conclusions towards criteria development

It is obvious that there are several social and cultural differences between these four countries. Denmark and the Netherlands have some common features, but Finland and Spain are more different. These social and cultural differences have to be taken into account in the criteria work.

There is a lot of information available about dwellings and to a lesser extent about surroundings. Existing standards, criteria and guidelines deal with these aspects. The practices and guidelines concerning services are less developed. Services are, however, developing fast and services are a good instrument to help people to live independently. When facing the challenge of independent living, we develop a framework that can at the same time accommodate the existing knowledge and open doors for new, innovative solutions.

5 WISHES AND NEEDS OF THE ELDERLY

Mervi Himanen and Jutta Jantunen

5.1 Introduction

This chapter reports some of the results of the work concerning the wishes and needs of the elderly. The results are from interviews that were carried out in a number of interesting cases in the four participating countries. The objective of this part of the project was to identify the wishes and needs of the elderly concerning housing, the surroundings and facilities, with respect to function fulfilment. This included considerations of the wider living environment, including opportunities for social interaction. It was considered important to gain insights into the wishes and needs of future elderly people, which raised important methodological issues. This chapter discusses also differences in wishes and needs of the elderly in the participating countries, on the basis of institutional and cultural differences. The full results are in the country reports in Deliverable 3 by Himanen and its annexes prepared by the other partners (2004).

The work in this work package was divided into 4 tasks:

- a. Survey of study methods. Various quantitative and qualitative methods have been developed to assess user needs. These methods were reviewed in order to find and adapt for use the most suitable for this purpose.
- b. Preparation of a study framework. Based on the survey, a methodological framework was developed and used by the partners in all the participating countries
- c. Study of wishes and needs in the participating countries: Using the common framework, the partners carried out studies in their own countries.
- d. Identification of improvement needs in terms of dwelling, surroundings and facilities. By comparing the state of the art as reported in the chapter on Present practices, and the wishes and needs, development needs were identified.

5.2 Method and data

The study of the wishes and needs was carried out as case studies in the four participating countries. Larger numbers of individuals, belonging to selected target groups, were interviewed. This approach was chosen because of the future orientation of the study. The selection of respondents and the content of the interview are clarified in this section.

To assist in targeting and formulating the questions, researchers conducted a literature review (cf. existing regulation, standards, recommendations, etc. in Deliverable 1 by van der Linden and Stenbekkers [2003]).

The questionnaire was divided into four parts as follows:

- Housing, surroundings, services for independent living and communication, to study the present situation and the future needs and wishes
- Testing current standards of such selected areas as personal hygiene, storing rooms, safety, home appliances, home control, surroundings,

conveniences, asking if respondents (1) have them already, (2) would like to have them now or (3) would like to have them when they need them or (4) they don't want to have them

- Scenarios of daily activities and services; (1) of food or nutrition, eating, cooking and shopping, (2) of cleaning and (3) of personal business and mobility
- Demographic data (age, gender, education, household type, income) including also health condition, activity level and willingness to pay possible extra costs due to needs of getting older.

The most future oriented part of the interview was the scenarios of lifestyles. The scenarios were short stories of stereotype alternatives of everyday activities.

Structured questions were composed for the interpretation purposes. The questionnaire was translated into all four languages. In the case of difficulties in harmonising national differences of questions two means were used:

For each question it was possible to use three "standard" answers: refusal, unknown or not applicable. Additional questions were used in each country in such situations, where essential information could be missed without them.

Despite the fact that in all countries except in Denmark Euro has recently become the common currency, the previous national currencies were used during the interviews when questions concerning money were asked.

The questionnaire was pre-tested in each country except in Finland, because almost all of the questions included into the questionnaire had been previously used in interviews in Finland.

In each country the researchers selected the target group. No effort to find identical groups in each country was made. The main criterion for choosing a case was to find interviewees who were active in the respect of the plans and ideas about their future housing and living conditions. The willingness to live as independent life as possible was also important. The target group, i.e. case, selection criteria were as follows:

- Active elderly who have had a reason to consider their future living conditions,
- Those who have recently become clients of a service organisation (younger than 80),
- Other groups of elderly with a future oriented approach.

If the case consisted of a large number of individuals (larger than hundred), the respondents were chosen randomly or a meaningful subgroup was selected, such as the first on a waiting list. If the size of the case was less than hundred, all were interviewed, or a list for a selected subgroup was made.

The selected case groups in each country were as follows:

Denmark: 30 visitors of advisory office for elderly who consider to move or to make changes in their housing situation in the second largest municipality Aarhus with nearly 300.000 inhabitants.

Finland: altogether 106 respondents from three cases; (1) 32 members of Aktiiviset seniorit association, a group of active seniors, who plan a senior house of their own called "Loppukiri" at the Arabianranta housing area in the city of Helsinki, (2) 28 tenants of two housing companies As. Oy Säästökartano and As. Oy

Säästöranta in Puotila housing area in the city of Helsinki, where the elderly are the majority and their houses need repairs, and (3) a randomly accessed group of 46 elderly in the largest and easternmost residential area in city of Helsinki in Vuosaari, where population is growing rapidly and new housing development has started in 1990's in greater extent since 1960's, the time of the establishment of the residential area.

The Netherlands: altogether 30 seniors consisting of three cases, (1) a group of five elderly in the town of Wageningen who try to initiate a kind of commune for elderly and a second group of eleven people who were regular visitors of a recreation and information centre, (2) eight regular visitors of a recreation and information centre for elderly in the town of Lopik, a more rural village and (3) six residents of an institute in the city of Nieuwegein.

Spain: altogether 100 respondents from 15 cases in the city of Barcelona and the neighbouring towns, living (1) in regular housing, (2) in senior housing, (3) in private and (4) municipal service homes.

The study was carried out by personal interviews in each country, because it might have been difficult to get written answers from the eldest and because it is more reliable method than the posted questionnaire. The data collection took place in Denmark in the beginning 2003, in Finland from September 2002 to May 2003, in the Netherlands in October 2002, and in Spain in January and in February 2003. A more detailed description of the method and the data can be found in Deliverable 3 by Himanen (2004).

5.3 Results

When discussing the results of the interviews it is important to remember their qualitative nature. While it can be stated for example that the majority (x %) of the respondents in a certain case had a certain opinion, the result cannot be extrapolated to mean that the majority of the elderly, even in the country or city in question, share that opinion. When comparing results from one country with those from another, the purpose is to acknowledge the importance of the context where people live, rather than a comparison in a statistical sense. Overall, the results are used to point out important issues that should be considered, either for realism or for inspiration, when developing the future independent living conditions of the elderly.

5.3.1 Demographic and background characteristics

Altogether, the mean age of the respondents was 71 years. The respondents in Finland were youngest of all cases (average 64 years) and those in Denmark eldest (average 76 years). Respondent belong mainly to the baby boom generation born after the Second World War.

The sex ratio (men per 100 women) in the population aged 60+ in 2004 was 80 in Denmark, 71 in Finland, 78 in the Netherlands and 77 in Spain (United Nations Statistics 2000). In all participating countries the ageing population consists largely of women. The cases in Finland and in the Netherlands were following the national gender distribution while those in Denmark and Spain included more men than the total age group.

There were both single people and couples among the respondents in all the cases. In Spain, and to a lesser extent in Finland, there were respondents who lived with their children. Also in The Netherlands two respondents lived in a nuclear family. On the whole living with one's children is more common in Spain than in the other three countries and very rare in The Netherlands and in Denmark (see Deliverable 1). However, the alternative of living within nuclear family is not at all in favour among the Spanish elderly that belong to the cases that were studied.

The question concerning a wish of living companion in the future was not asked in Denmark. In Finland, in the Netherlands and in Spain it is clearly found that the single status is less wanted than what is the current reality.

About half or more than half of the respondents in all cases considered themselves to be quite healthy. A smaller number had some disease that they took regular medication for, or in Spain, were living in a special home because of a more permanent or severe medical reason.

Most respondents shared the vision of not knowing what will happen in the future in the health condition. Still, especially the respondents from the Danish and Finnish cases believed that taking care on one's health is the best one can do for oneself.

All participating countries belong to high-income countries but today's elderly tend to have lower incomes than the population on average. In all cases a vast majority of the respondents was pensioned.

All the cases were selected by the researchers with the interest in planning the future dwelling as a dominant factor. This resulted in a very positive response to the question concerning planning one's future (Table 8). Only in Spain almost half of the respondents report simply that they do not plan their future and an additional third of them do not plan their future because of the possible unexpected changes in life. The interviewer got the impression that the interviewees did not want to know right now much about matters concerning growing old and the plans of dwelling quality then.

The activities and desired activities of the respondents were studied. The difference in having hobbies and other activities is striking between the Spanish and Nordic responses to the interview (in The Netherlands the question was not asked). Half of the respondents of Spanish cases reported that they do not have any hobbies. As many respondents of Nordic cases reported to have a hobby which takes almost as much time as a job. In addition, a good share of Finnish respondents had a hobby which takes time periodically.

Here it is a question of what is meant by a hobby. The response might have been different if the options of spending leisure time, entertainment and having fun (reading, watching television, listening to music, playing cards, surfing in Internet and chatting, etc.) had been included in the question. Some of these were studied in the context of services for independent living. It was found that the Spanish respondents go to coffee shops and restaurants or visit the church more often than the Finnish respondents who go to library or swimming hall more often than the Spanish respondents. A good share of respondents in the Spanish cases had other activities. Regardless of the difference in activity, the most common response from all cases was the same: no added activities were wished.

A fifth of the respondents in the Finnish and Spanish cases were working voluntarily for charity or looking after old, sick, disabled or children. No one was doing so in the case in Denmark (the matter was not studied in the Netherlands).

Improvements of a dwelling and services can be costly. Therefore it is interesting to study the attitudes towards paying for such improvements.

The respondents in the Spanish cases were more often than the Finnish respondents willing to pay for services which are not covered by municipalities or the state, especially if those services are something very necessary (Table 8). If not willing to pay themselves, the majority of respondents in both countries hope that the national or municipal social and health care take care of costs. Almost one fifth of the Finnish answers showed willingness to have a voluntary insurance for such costs while that option was not rated high among in Spanish case.

Also willingness to pay for renovations is different between the respondents of the Finnish and Spanish cases. Moving was given as an alternative for renovation costs. Almost a quarter of the Finnish respondents approve the option of moving while only a few of the Spanish respondents thought moving would be a good way to avoid renovation. This could be a matter of housing markets or reflect the willingness to stay at one's present home, as well as the overall housing histories of the countries.

An additional possibility to avoid renovation costs was given: the option of suffering from an inconvenient situation. A quarter of both Finnish and Spanish respondents thought that they rather suffer from an inconvenient situation than pay themselves for renovation costs.

Two options for covering the costs of renovation were given: managing without any special financial arrangements, or making the renovation possible by some financial arrangements. The option to manage the renovation with financial arrangements such as a loan was much more popular among the Spanish respondents than among those in Finland. As a matter of fact half of the Spanish respondents thought that making the renovation possible by some financial arrangements would be their way of taking care of the possible needed renovation costs themselves, while a third of the Finnish respondents chose the option of managing without any special financial arrangements.

In the open question about the future plans the Spanish respondents made it clear that they were not interested in repairs and changes in their homes, because most of them think that it is going to be a nightmare. Instead, everyone wanted to talk about inadequate pensions, the high cost of living. This was the case in the rental housing in particular.

There is one factor that can influence this willingness to pay for renovation. The investment in dwelling has not been very high in Spain during the last part of 1990's and lower than in Finland (Haffner & Dol, 2000, p. 17). Housing needs tend to become acute after they have been unsatisfied long enough. Ageing is then adding the pressure by increasing the assortment of needs and making the renovation more necessary.

Table 8. Summary of cases on the values and attitudes of respondents.

Factor	Denmark	Finland	the Netherlands	Spain
Existence of future plans for living and dwelling	Almost all plan	$\frac{3}{4}$ plan Less than one fifth don't plan	Almost all plan	Half don't plan One third don't plan because of unexpected events
Level of activity	Hobbies taking time like a job	Hobbies taking time like a job Hobbies periodically		No activities or Other activities than hobbies
Future activities	No additional hobbies	No additional hobbies		No additional hobbies Like to but cannot
Willingness to move	Most moved already or wanted to move	A majority plan to move	Most have no plans to move	Most have no plans to move
Reason to move or not to move	Change in health condition	Change in health condition Wish to lead easy life		Don't want to give up present home
Willingness to renovate	$\frac{3}{4}$ do not	$\frac{3}{4}$ do not Some indoor repair Some larger repair	$\frac{3}{4}$ do not	$\frac{3}{4}$ do not Some indoor repair
Willingness to pay for renovation	(adaptations are free of charge in Denmark)	Rather move Managing without financial arrangements		Managing with financial arrangements
Willingness to pay for services	(many services are free of charge in Denmark)	One fifth not willing to pay Half pays for necessities About one third pays for extra		Only few refuses to pay Over half pays for necessities One third pays for extra

¹ A group of people was interviewed who had asked advice for either moving or making changes in their current home

Blank square: not asked

5.3.2 Scenarios for lifestyles

The desired lifestyles were studied by means of scenarios of daily activities and services for independent living in Finland and in Spain (the questions on similar subjects were asked differently in The Netherlands and Denmark, see country reports in Himanen 2004, Deliverable 3 for more detail). Three areas of daily living were studied:

- Food or nutrition, eating, cooking and shopping,
- Cleaning and
- Personal business and mobility.

In Spain the questions were about wishes for good life. In Finland also the desired situation for independent living in the future in case help is needed was studied.

In the Finnish and Spanish cases respondents share the idea that daily quality cooking is important instead of simplicity and easy cooking or eating out. Also with cleaning the ideal was to keep as it is at present.

Also differences appeared. In addition to these main wishes the Finnish cases showed also the interest in keeping cooking as a hobby, which included also gardening, fishing, etc. This was not popular among Spanish respondents.

Further, the Finnish cases showed also the interest in making cleaning easy for oneself which was not popular among Spanish respondents. The Spanish respondents chose the option of "cleaning together with an assistant" as a popular one. Among the Finnish respondents this kind of help would not be desired unless help for independent living was needed. In this case, however, most Finnish respondents would like to ask for help from a cleaning service provider.

Running personal errands is most convenient either by living in a neighbourhood that has the services available, by using public transport or by driving one's own car. The respondents in the Spanish cases were mostly in favour of the services of the own neighbourhood, and the Finnish interviewees were fond of public transport for mobility. In the case of difficulties in coping with independent living the Finnish cases suggest the solution of bringing services to the home. A good share was trusting also on communication and services via Internet and emails.

If help was needed for cooking the Finnish respondents preferred to solve it either by getting meals-on-wheels or using modern technique for easier cooking. Some elderly criticised meals-on-wheels in their oral response. At time of the interviews, a combination of freezer and microwave oven, able to make meals, was on the market and in use already in several homes of elderly and disabled. It was well liked. However, the facility is not available any more due to the unexpected bankruptcy of the provider.

5.3.3 Housing, surroundings, services and communication

Moving, renovating and choosing the ideal dwelling

Most of the respondents (about $\frac{3}{4}$) of all the cases do not plan to make any changes or repairs in their dwelling. Most often the reason is that there is no need. For example the Finnish respondents did not feel very confident about their knowledge of changes and repairs of their home. This was also the case in Spain. The oral response to open questions was that the technical matters are too expensive and complicated to understand – even though there was a male bias in the Danish and Spanish cases.

A good few of those Finnish respondents who plan to make changes or repairs are planning to make indoor reparations. Equally many are planning a renovation on a larger scale or feel that the home needs some changes because of the age of the building. Those Spanish respondents who plan to have their home repaired are thinking of smaller repairs which they can arrange relatively easily.

To test how seriously the interviewed senior citizens plan to make changes, adaptations or repairs in their dwelling, a question was asked about the recent repairs. A half of the respondents in Spain and in the Netherlands had made repairs, in Finland one third and only a few in Denmark. The economy of the respondents and the willingness to invest on housing can influence the result. In

Denmark, the willingness to invest on housing has been very constant and average for a relatively long period (Haffner & Dol, 2000, p. 17).

The female dominated Dutch cases consisted of women who have made home repairs and are planning to do so in the future. It is not known whether the same group of respondents has made home repairs and will continue to do so, or whether those who have not yet renovated are planning to start.

Questions concerning the willingness to move got a mixed response. Most of the Spanish and Dutch respondents have no plans to move. This is also the case with many Danish respondents. A majority of the Finnish respondents will move more willingly, but there was also a good portion of those who want to stay in their current home.

Among the Finnish cases are the members of Aktiiviset seniorit association who have a new commune type house built for themselves. Obviously they are willing to move to this new house. Among the rest of the Finnish cases half of the respondents are willing to move.

The Danish case was special in this respect while a group of people was interviewed who had asked advice for either moving or making changes in their current home. Therefore, most moved recently already or wanted to move.

One third of the interviewees in Spain lived already in a special home, which might influence their unwillingness to move. A half of the interviewed senior citizens in the cases in Spain and in the Netherlands had recently made changes, adaptations or repairs in their dwelling, to facilitate future daily life, which also might influence the unwillingness to move.

The most common reason among the Spanish respondents not to move is the unwillingness to give up their present home. The reason for the Finnish respondents to move is either the change in health condition or the wish to make life easier. The open question of the circumstances under which those who belong to the Finnish case groups would move, show that ageing and weakening health are important reason for moving to a new dwelling.

The questions about the details of future housing plans in the case of moving were asked from everyone in Finland, whereas in Spain only those who were willing to move were asked these questions. The detailed questions of moving were answered by 15 people in Spain while most of the Spanish respondents didn't want to move.

From the answers to open questions was concluded that the most common reason in Spain was that respondents had problems regarding space and had difficulties in keeping the house clean and tidy. The present dwelling was either too big or too small.

The most desired housing type among the Finnish respondents was an apartment in a multi-storey building with an elevator. Also many Spanish respondents share this wish. The second best, but far less attractive alternative was an apartment in a row house.

Such special types of housing as senior house, service house, nursing home or commune all had their small numbers of supporters among the Finnish interviewees. In Finland the most popular future wish home option turn out to be a community with people of different ages. Also in Spain a small number of respondents had a dream to spend the last years of their life with some friends on a

big farm in the middle of nowhere. The idea was to join economic efforts with community services.

In the discussions during the Finnish interviews it was found that some elderly feel that it would be good to have someone around whole day long, even if they received home help. In this situation many feel that they have to move somewhere, where constant care is available.

The relative unpopularity of private senior housing might be caused by the varied quality of those existing. A municipal service house was a popular option within the Finnish cases. According to the interviewer a reason for that was what the respondents knew about the municipal service homes for elderly near the Puotila and Vuosaari housing areas because of acquaintances or friends living there and being satisfied with the quality of those homes.

The Finnish respondents were not confident about their knowledge for making decision where to live when older and over half of them said they needed further information for a final decision.

Building, dwelling and second home

In general dwellings in Finland are small in size and Spanish ones spacious (Haffner & Dol 2000, p. 23). Despite the fact of small dwellings in Finland in general and despite the fact that Finnish elderly respondents had smaller dwellings than the Spanish, half of the Finnish elderly who were interviewed wanted to have less space than now and many wanted to keep it as it is; half of the Spanish respondents wanted to keep the dwelling space as big as it is now, and some even wanted more space.

In Finland, the members of Aktiiviset seniorit association were a big group wishing to have less space. Many of them wanted to move from suburban area to the city centre which meant that due to the higher prices of the property or rents the next apartment will most probably be smaller.

The size of family can be an explanatory factor influencing the need of space also in this study. In general (Haffner & Dol 2000, p. 12) and among the cases of this study the household size is larger in Spain than in Finland, since in Spain many interviewees lived with their children.

In the dwellings of Finnish cases there are most often three rooms and a kitchen (or kitchenette) but also two and four rooms apartments are common. Apartments with four or more rooms are the most common in the dwellings of the Spanish cases. The number of rooms is relatively high in the Finnish dwellings compared to the floor area. No wonder that the wishes of the future number of rooms are opposite in Finland to those in Spain. A half of the Finnish respondents want to have less rooms and a half of the Spanish respondents want to have more rooms.

The wishes of the respondents in the Netherlands were quite similar to those in Finland, although there were some more wishes for more space than in Finland. These Dutch wishes of less space are obvious while the Dutch dwellings in general are the biggest ones in Europe and also there were many big dwellings in the study.

In Spain the studied multi-storey buildings had more often an elevator than those in Finland. This might be due to the difference in numbers of elevators in general in those countries or because of the selection of buildings, which was fa-

vouring buildings designed according to the needs of the elderly while such a buildings were not in the Finnish cases.

The one-family houses of the Finnish cases have less often stairs than those in the Spanish cases. The mean of solving possible future problems with accessibility was in most cases moving among the Finnish elderly respondents while their Spanish fellows would rather stay in those floors of the present dwelling accessible for them.

In most cases in Finland, in Denmark and in Spain the dwellings had one floor, while in the Netherlands there were as many one floor dwellings as those with two floors. Despite this difference, all elderly respondents favoured a dwelling on one floor in the future.

The question about the building type revealed that a building with an elevator is more popular than one without. The question was not taking into the count costs. However, elevators are very costly to install and that is why they are not common in all residential houses.

The costs of an elevator should be weighed against cost of the service which might become necessary if the ageing resident is unable to manage his or her daily life because of the stairs.

As regards the shortcomings of the present housing, the needs of kitchen repair, lack of elevators, poor soundproofing and indoor air quality, difficulties to use bathtub, or the wish to have a balcony (or two), a need for an easy access out and lack of natural light are common to all cases.

A second home is an extension of the permanent dwelling. It can influence the need of space and it carries also many values, which are not all dwelling oriented. In this study, the interest on the whole was in if elderly are wishing to have a second home or not.

The summer cottage is a typical Finnish second home and one fifth of all households in 1994 owned one. The number of summer cottages has been increasing during the last years. Summer cottages are not only a part of Finnish and Scandinavian culture, but for example in Spain they are quite common, whereas in some other European countries like in the Netherlands they are very rare.

In Finland and in Spain almost a half of the respondents owns or has access to a second home. Also in the Danish case a quarter of the respondents has a summer cottage. The legislation in Denmark is making it easier for the elderly to stay at summer cottages even permanently if they wish.

In Finland a quarter of the respondents is still dreaming of having a second home in the old ages, while only one person in the Spanish case shared the same dream. These "second homes of dreams" were either for leisure or for a home abroad.

The case studies in Finland and in Spain show that second homes are used a couple of months per year (one to three) and the respondents plan to use them similarly or slightly more in the future (two to four months).

Present and ideal surroundings

In the Finnish cases most people live in suburban areas either in row houses or in apartment buildings. If they want to move, it is either to the city centre or to a rural area in countryside or village, or elsewhere (not named). All these three options are almost as popular.

Roughly a half of the respondents in Spain dwell in apartment buildings in suburban areas and one third of them in the city centre. It seems that if willing to move, those who live in the rural villages wish to move most willingly to suburban into a row house or a single family house.

In the Danish case the respondents willing to move wish to move either from a suburban area or rural area to the city centre. People interviewed in the most crowded country in Europe (Haffner & Dol 2000, p. 6) in the Netherlands wanted to move from a suburban area to rural areas in the countryside.

It was also asked if the elderly had favourite places in the hometown or city (coffee shops, clubs, recreation and meeting places, etc.), which they liked as places to visit, alone or in company, and which are important as meeting places. In all cases half of the respondents had such a place and another half didn't.

Services

There are a few services which people quite often cannot do without: a post office, a bank, an office of municipal and social services, a grocer or a kiosk, a supermarket, a healthcare centre and a pharmacy. Within the Finnish and Spanish cases¹ they all seemed to be necessary.

In Finland relatively few answered the question that tried to extract the one they could manage without; most respondents said right away that all are needed. The few thought they can manage without municipal and social services within walking distance. The result from the Spanish cases was totally different. They needed an office of municipal and social services most of all in the near neighbourhood.

Especially in the Puotila housing area in Finland the respondents stressed the need of basic services because the services have started to vanish one by one. The larger commercial centres at Itäkeskus and Vuosaari create increasing competition to the services in Puotila.

When asked about the three most liked services in the neighbourhood, a market place and a shopping centre, as well as nature around or a park were important for half of the Spanish respondents. Around a quarter of the Finnish respondents needed all the services mentioned in the question (a shopping centre, nature around or a park, a place where to sit outside, a terrace or shelter for social events in the courtyard or in the garden, a hairdresser or barber) except a market place and a hairdresser or barber, which were not very important for the Spanish respondents either.

The Finnish respondents do not find it so important to have all the services in their own neighbourhood. Such services

- a coffee shop, bar or restaurant
- a beautician and/or a solarium
- a masseuse
- a cinema
- a theatre
- a church
- a library
- an education or training centre

¹ Modified questions in Denmark and in the Netherlands.

- a service station
- a car repair shop
- a swimming hall or a sport centre
- a boat club
- a golf club.

The Spanish respondents had visited a coffee shop, bar or restaurant, a massage and the church much more often than the Finnish respondents. The Finnish respondents had used the services of a library and a service station, as well as attended a swimming hall or a sport centre quite often while most Spanish respondents had not used them at all.

Connections for communication

In Spain most of the respondents of the interview meet other people - friends or relatives -regularly or often while only one fifth of Finnish respondents visit others that often. An additional third of Finnish respondents has a chance to talk with someone daily about worries or when something nice has happened. One fifth has good neighbours whom they visit occasionally. A quarter of the Finnish respondents keep contact frequently with friends or relatives by phone, by mail or via email, if they live far away or it is otherwise difficult to meet them except on special occasions.

Almost all the Finnish respondents had or wanted to have both a wired and a mobile phone, while in Finland the younger generation has started to have only mobile phones and the number of fixed phone lines is declining. In Spain the number of fixed lines is still increasing when all inhabitants are taken into account. Also all the Spanish interview respondents had or wanted to have wired phones but there were also many present or future holders of mobile phones.

More than a half of the Finnish respondents had or wanted to have a connection to information networks while every tenth respondent of Spanish cases had or wish to get access to information networks.

Similarities and differences were found from the result of the Elderathome interview when studying which means were used for contacting various target groups: children, relatives, friends, neighbours, health care, social workers and home help. Health care and social workers were named most often among those with almost no connection at all by all studied groups. If contacted, health care was reached by phone and visit. Some of the Finnish respondents said they phone to the social workers.

Within the Spanish cases people kept in touch with children, relatives and friends by phoning and meeting. Also the Finnish respondents did it, but in addition to that they used mail and email for the purpose. A few users of emailing were found already to keep in contact with children, relatives and friends in Spain, too.

The most important reason for having ICT at home in Spain is to keep in contact with relatives and friends and for safety reasons. In Finland multiple purposes are reported about how to use ICT.

Video phones are not at all popular, although experiments of the use of it in senior service homes in the town of Tampere have given proof of its usefulness for example in preventing loneliness, because the video contact is more personal

than the voice phone. The low quality of the video image exchange – due to the high capacity requirements of the video information – has been said to be a reason for the inconvenience of using video phones.

5.3.4 Existing regulations, standards and recommendations

The questions about the usefulness of existing regulations, standards and recommendations covered seven topic areas: personal hygiene, storing rooms, safety, home appliances, home control, surroundings and those for one's convenience.

The Spanish respondents have already most of the facilities for personal hygiene, while the Finnish respondents didn't have them as often as respondents in Spain. However, they wanted to have them all except a wardrobe in bathroom for the clothes and slippers. Both Finnish and Spanish respondents have their suspicions about handrails in bathrooms, but responded that they would like to have them if needed. In Denmark the responses were divided: some had already some facilities which are recommended, while others did not want to have them.

A Finnish curiosity is the sauna. The popularity of common sauna was a bit better than of that in an apartment.

Most of the respondents of all cases were using the kind of storing rooms that were covered in the questions. It can be interpreted as an expression of satisfaction with current situation and with the existing regulations, standards and recommendations of storage spaces. However, the response from the Finnish cases showed a need of space for seasonal clothes and for visitors' bedding.

The respondents from the Spanish and Finnish cases mostly accepted the safety aspects suggested in the questions. They were more often in use in the Spanish than in the Finnish cases. Among the Spanish respondents are many who live already in a service home. The Finnish respondents wanted to have them when needed. The only exception was an alarm system, which can be installed easily in the future. A good number of Spanish respondents did not want to have it and several Finnish and Spanish respondents have their suspicions about it while responding that they'd like to have it if needed.

The security of surroundings was not a major consideration among respondents from the Finnish and Spanish cases. The question was testing the Dutch design recommendation, the "Woon Keur Certificate" about paths behind housing to be social secure, conveniently arranged and not inviting for unauthorised people. This unpopularity of the Dutch recommendation within Finnish and Spanish cases might have something to do with the population density which in the Netherlands is the highest in Europe and the lowest in Finland and relatively low also in Spain (Haffner & Dol 2000, p. 6).

There are different responses to the questions of home appliances. The Finnish respondents want to have home appliances with safety features when needed, but they do not want to have equipment which has to be maintained by them selves. The Spanish response was favouring the kind of domestic appliance which prevents incorrect use, as well as those to be maintained by the end-users, but the response to fixed safety control setting was mixed.

The interview showed that the elderly within the cases in Finland and in Spain accepted a temperature limiter in the water faucet. Many respondents had it already.

Such home control which is related to safety (alarm buttons, safety bracelet, motion sensor and equipment facilitating connections in emergency situation) is very well accepted according to the response of the interview. Most of the respondents in Finland and in Spain were fond of home control facilitating easy living and energy efficiency such as lamps that turn on automatically, when entering a room, and off, when no one is present. But there were also many who did not want to have this kind of control.

5.4 Conclusions towards development and use of criteria

This chapter has highlighted some of the results of the study of the wishes and needs of the elderly. The very rich material from the four countries is reported in detail in Deliverable 3 by Himanen and its annexed country reports (2004). In the work to develop the criteria for dwelling, surroundings and services, the material has been studied in detail, question by question. The work on the criteria is summarised in the next chapter of this report.

Some more general findings concerning the wishes and needs can be brought up here. These findings are mostly about the situations and approaches that should be considered when applying the criteria.

The variety and high level of activity of many respondents is impressive. The criteria should be open to this variety, encouraging and supporting it, rather than settling for some minimal level and variety. Staying active, within the limits of one's health and abilities, is in itself a factor that improves the possibilities of living longer independently.

People differ in how prepared they are to plan for their future. Even those who do plan admit that it is impossible to know what happens in terms of one's health and that of one's companion. Many try actively to keep in good health or otherwise maintain the quality of life, and the criteria should encourage such activity. When situations change and adjustments are needed in the dwelling, surroundings or services, a set of criteria would be a useful tool for an elderly person and a professional planner or service provider to assess the situation.

Such assessments and plans should cover financing possibilities – from affordable, small repairs for which special financing might not be needed, to loans or public subsidies that are available. People's willingness to pay and their capacity to pay vary according to their economic situation and the ownership of their dwelling, as well as the type of housing.

House repairs require know-how and management to be successful. To encourage the elderly to make the repairs that would improve their quality of life, reliable repair services are needed.

In managing their daily lives many elderly pay a lot of attention to the quality of cooking and the appropriate cleaning of their house. A variety of different solutions to take care of such activities should be encouraged so as to improve the sense of personal control.

Space management is also an issue. Some people live in homes that are too large to manage. Some have too little space. If moving is not possible or desired, a possibility would be to develop a manageable core in the large apartment and

create extra storage possibilities and ensure the choice of suitable items (furniture, appliances) for the smaller apartment.

As regards services, the list of the most essential services is not common to all people. It is therefore crucial to find flexible ways of securing access to services. The ways include for example location nearby, public or shared transportation or having the service visiting the neighbourhood or the person.

When larger renovations are made to maintain the building in a good condition, the criteria for independent living should be brought up and considered. Some residents of an apartment building, or the present or future resident of a one family house could benefit from some improvements that are cost efficient and technically feasible to make in the context of a renovation.

Accessibility in general and for example an elevator in a multi-storey building is one of the most common needs. It is also one of the most costly renovations. The cost should be considered against alternative costs, such as providing service to people who cannot take care of their own errands. The problem here is that it is not the same people who pay for the different solutions. Innovative, even partial, solutions should be considered, and various financing schemes found (see case reports in chapter 7).

The criteria should be used not only to plan a minor or a major renovation but also to choose a new apartment in case a person is moving to improve his or her situation. Obviously, the criteria can be used when planning a new building, as shown in chapter 8 of this report.

6 DEVELOPMENT CHALLENGES

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6.1 Introduction to the criteria development

6.1.1 The challenge

In the previous chapters we have identified the challenge of aging and the goal of independent living at home for the ageing people. We have reviewed the present situations, practices and policies in the four countries participating in this project: Denmark, Finland, Spain and the Netherlands. We have also discussed the wishes and needs of some groups of ageing people in these countries.

In order to get a full picture of the prerequisites of living at home independently, we identify development challenges in the areas of dwelling, surroundings and facilities (services). We articulate these development challenges in the form of criteria. While the word criterion is often taken to mean something exact and quantitative, we present criteria that are more qualitative suggestions about what should be considered and how various important elements should be taken into account. This more open approach is justified because of the focus on the future: we need to remain open to new solutions for which today's measurements are meaningless; and because of the ambition to combine the possibilities of the dwelling, surroundings and services in flexible and creative ways.

The aim of the criteria is to give suggestions to ensure that the dwelling, the surroundings and the facilities (services) are suitable for an elderly person. The other aim is to raise consciousness and to help the elderly and other parties involved to think about the possible changes in the dwelling and in the surroundings and to assess the need of services. The users of the criteria will be the elderly themselves as well as their family, local community and private providers of services, the apartment house companies, product designers and the construction professionals.

The criteria will help the planning process when the special needs of the elderly have to be taken into account. The purpose of the criteria is awareness waking – giving the suggestions to the planners and to the occupants rather than giving strict instructions.

6.1.2 Background and approach

The three sets of criteria were developed separately but they followed a roughly similar approach. First the existing guidelines, rules, standards or practices in each area were collected, analysed and compiled into a preliminary set of criteria. Expert groups were asked for comments and corrections. The resulting draft was not satisfactory because it focused on the desired characteristics of solutions in great detail without recognising the overall context of independent living.

The framework was thus considered and analysed anew. The goal was to formulate criteria, which would take into account the complexity and the totality

of the elderly people living at home. This exercise resulted in the Model of Independent Living – The Ball Model.

The Ball Model is based on a holistic approach, Design for All, and user orientation. In forming the criteria for dwelling, surroundings and services, the ambition and aim are to take an individual and his/her life as a whole. The dwelling and its surroundings are a setting for the activities of a person. In addition to the physical needs of a human being, which the dwelling can support, the physical characters of the dwelling can support the self-esteem. A good environment offers a possibility to fulfill oneself and have a personal way of life. (Aura et al. 1997.) The durability and flexibility of the ego helps one to act in different communities and as a member of society (Heikkinen 1992).

Furthermore, the criteria are grounded to the Design for All -concept, behind which is a view of creating products, services and systems that are usable by people with the widest possible range of abilities, operating within the widest possible range of situations. Design for All means designing products, services and systems so that as many people as possible can use them easily – whatever their age and ability, and mainstream products are adaptable to be used with special equipment through standard interfaces, options or accessories. (ANEC / RICAbility 2000.) The Design for All -viewpoint is especially important when we think about the large number of people coming to a senior age in the near future in Europe.

Lastly, it is essential to take the users' wishes and needs into account and have knowledge of what people, and especially elderly people, actually do in their homes. That is why it is important that occupants participate in the planning of their habitation. In user centred orientation, developments should be driven from user requirements rather than from technological capabilities. When designing a product, for example, it is important to understand the user population and comprehend what they may need from products, before making specific design solutions. If a design is driven only by technical feasibility, it can lead to a poor match to users' need. In addition to that, system-oriented viewpoint is used. It is based on concepts in system theory, which propose that all technology operates within context and that in designing products it is important to look at that context in addition to the technology itself. From this perspective, all technology is seen as being part of a wider system, which must also be designed correctly if that technology is to function appropriately. Thus the designer must understand the environment where the product will be used, and how that environment should be constructed so as to facilitate rather than impede the use of that technology. (Ergonomics and Safety Research Institute 2002.)

In the criteria work, generally accessible design is taken into the main consideration and not so much emphasis is put on the special groups. Still, attention is paid to the common disabilities of the elderly. Guidelines for standard developers have been used as a useful tool in the criteria work. One of those guidelines is the CEN/CENELEC Guide 6, *Guidelines for standard developers to address the needs of older persons and persons with disabilities*.

In the finalising phases of the criteria work, the results of the interviews concerning the wishes and needs of the elderly were taken into account. The preliminary criteria were tested in nine cases (reported chapter7), and these results were also used. A workshop was organised (Vantaa, Finland, January 29, 2004)

for experts to evaluate the criteria work and other results of the project. This workshop contributed to the finalising of the criteria.

6.1.3 The Model of Independent Living - The Ball Model

In the criteria work the Ball Model was created to symbolise the overall thinking, dynamic hold, and the flexibility in the criteria. The Ball model describes an idea of taking different variables into consideration when promoting the well being of the elderly and supporting their independent living at home. It can be used in evaluating the fitness for use of a dwelling, surroundings and services for elderly people.

The model can be used in various ways. It can be used as a tool in analysing the present knowledge (guidelines, standards and regulations) and formulating the comprehension of the living conditions of the elderly out of them. It can also be used to identify new knowledge and generate new ideas.

In the Ball model four main variables are introduced: activities, resources, qualities and abilities. The following definitions of the variables in the Ball model are based on literature reviews, discussions with experts, and information gathered at seminars.

The **activities** at home are divided into the main activities and supporting activities. In the main activities, the occupant is always present. The activities like eating or dressing cannot be done on behalf of someone. The supporting activities can be taken care of by someone else, like service providers. Also the main activities can be carried out with help from service providers.

The activities in the dwelling and its surroundings can be considered as interaction between the occupant and environment, which is called resources. The **resources** in the dwelling and in the surroundings are mostly physical and material. The resources of the services are the various services available from public and private service providers.

The Ball model puts forward the **qualities** of habitation, surroundings and services, which are important to the elderly. The qualities are aesthetics, comfort, functionality, safety and security.

The model takes into consideration the cognitive, physical and sensory **abilities** of the elderly occupants. The impairments of the abilities are more common among elderly people than in other demographic groups. The impaired abilities often lead to a need of outside help or arrangements in the dwelling. They are especially significant when considering independent living at home.

The framework of the variables is common to the three sets of criteria (dwelling, surroundings and services). The emphasis and details vary, however. Each of the following sections will describe the variables again, at the risk of repetition but in order to ensure the correct context.



Figure 2. The Ball Model

6.1.4 The activity cards

The Ball Model is concretized in the Activity Cards, where nine different activities have been presented. On a card there is first a general description of the activity e.g. “Care and keeping fit”. The Activity Card describes what the activity is about. Secondly, a suggested performance specification that specifies the potential activity in a dwelling has been put into a table. The information in the Activity Card is organised from left to right – from the performance specification to the variables. Thirdly three variables (quality, ability and resources) are listed through which one can look at the activity to find solutions. In the Activity Cards, the variables are mentioned only if they are relevant concerning the performance specification.

The Activity Cards are suggestions for the dwelling taking into account the occupant’s situation and requirements. Although in this arrangement the performance specification exists first, and is explained and argued for by means of the variables, this is only one way to use the Activity Cards. There could be other ways: starting from the resources, and considering quality requirements and ability constraints. The Ball Model emphasises the idea that a starting point can be anywhere in the ball depending on the situation and what kind of point of view is taken.

In table 9, there is an example of an Activity Card. The complete lists of the Activity Cards for the tree sets of criteria are in annexes 2-4.

Table 9. The Activity Card: Care and keeping fit

CARE AND KEEPING FIT				
Care and keeping fit is the main action, which covers exercise, beauty care, watching the symptoms and treating them and taking care of mental and physical health. It appears in activities like medication, measuring blood pressure, cutting nails and beauty care like shaving and doing the hair.				
		QUALITY	ABILITY	RESOURCES
1	There is a place for home health care and for storing the equipment.	Functionality		Operable building elements Spaces
1.1	There is a lockable medicine cabinet in the dwelling.			
2	There is a place for exercise and for storing the equipment.	Functionality		Operable building elements Spaces
3	There is a place for beauty care and for storing the equipment.	Functionality		Operable building elements Spaces

6.2 Criteria for dwellings

6.2.1 The aim of the criteria for dwellings and the meanings of home

The aim of the criteria for dwellings is to ensure that the dwellings are suitable for elderly people to live. That concerns equipping and repairing dwellings to the use for the elderly. The criteria for dwellings consist of the overall plan, furniture and appliances. Collective rooms and a balcony are included in the dwelling but not a common yard and a parking area. The possible service providers should also be taken into consideration when planning the changes, because the dwelling of the elderly can be a work place for household service workers. The focus is on the existing housing stock.

Even today many of the existing dwellings are inadequately equipped. It is known that 10% of Finnish elderly people (+65) live in dwellings without basic amenities (electricity, central heating, water pipes, a toilet) (Heikkilä and Kautto 2002). It is essential that the basic amenities be first taken care of. The basic prerequisites are that a building and a dwelling are firmly built and fire protected, supply and drain off water is organised, warm water is available, the dwelling is equipped with central or electric heating, a dwelling is equipped with a water closet and a room for washing oneself, and that there are electric connections in a dwelling.

The aim of the criteria is to raise awareness and to help the elderly and other parties involved to plan the possible changes in the dwelling. The main users of the criteria will be the elderly themselves and their family, as well as planners, product and service providers and the representatives of the apartment house companies, co-operation housing associations and the local community. Product designers will also benefit the criteria because through the criteria they will get better understanding of the living of the elderly. The criteria for dwellings will help the planning process when the dwelling does not serve the purposes any more.

The dwelling should be designed to take into account special needs of the elderly. The needs of the occupants may change for example due to increased

free time followed by the retirement or due to a weakened capacity. Later changes should be possible to make at reasonable cost. If the changes in the dwelling ensuring the independent living of elderly are not possible or reasonable, they can in many cases be compensated by services. For example, if the elderly person cannot get in and out of the building because there is no elevator, a service provider has to do the shopping.

Many research traditions have contributed to the discussion of the home and the activities within it. The home economics science perspective emphasises the everyday life and the whole of the action at home. The holistic approach means that the action in the family is bound in situations and the action should be interpreted in relation to all elements involved in a situation. The social scientists point out the importance of the “feeling home” and the meanings that elderly people give to the home. The welfare researchers are interested in the resources and life arenas of people. In all the views mentioned, the physical environment and the household activities are considered important in mastering everyday life and promoting the well-being of an individual. (For a full review of these approaches see Deliverable 4 by Kivilehto and Väisänen, 2004)

6.2.2 Activities at home

Living at home consists of different activities in a dwelling. The categorising of the activities in the Ball Model has been progressed during the project. It covers the essential activities which take place in the dwelling and which may have an effect on the dwelling design. The main activities are Care and keeping fit, Eating, Personal hygiene and dressing, Moving, Recreation, communication and self-actualization and Sleeping and resting. The supporting activities are Gardening and maintenance, Housework and Storage.

The Ball Model activities can be compared with the Activities of Daily Living (ADL) -indicators, which are often used in the geriatric research of a functional capacity. Coping with activities of daily living indicates the functional capacity of a person and furthermore the functional capacity indicates the coping with the everyday life. The activities are divided into the Physical Activities of Daily Living (PADL) and the Instrumental Activities of Daily Living (IADL). The physical activities of daily living are eating, drinking, sleeping, dressing, washing one and moving (Rissanen 1999; 2002).

The Instrumental Activities of Daily Living are less fundamental to health and well being than Physical Activities of Daily living. They are more complex activities, like housework, cooking and using phone. These activities are more bounded with culture and sex, than ADL-activities. Even simple activities are not dependent on person's physical capacity, but on the interaction between a person and environment. (Rissanen 1999; 2002.)

The main activities are similar to physical activities of daily living while the supporting activities are similar to instrumental activities of daily living. The difference between the concepts is the wideness. The activity at home is a wider concept than the activity of daily living. For example, Personal hygiene and dressing covers several activities among others washing oneself, toileting and dressing.

In the architecture of housing, different classifications of the activities at home have been used. (e.g. Kahri and Pyykönen 1994.) The purpose of these classifications is to serve the functional planning of the dwellings.

In this study, the activities are defined as follows:

Main activities

Care and keeping fit is a main action, which covers exercise, beauty care, watching the symptoms and treating them and taking care of mental and physical health. It appears in activities like medication, measuring blood pressure, cutting nails and beauty care like shaving and doing the hair.

Eating covers the small-scale food preparing e.g. heating the half-prepared food, dining, and the storage of the food, dishes and waste, washing up the dishes and separating the waste.

Personal hygiene and dressing covers washing oneself, going to the toilet and dressing up.

Moving is a main activity that covers walking inside the dwelling and going out from the dwelling, opening the doors, carrying things and climbing the stairs.

Recreation, communication and self-actualization covers entertainment, social life, hobbies and studying, outdoor recreation, watching TV and listening to the music.

Sleeping and resting covers night sleep and resting in the daytime.

Supporting activities

Gardening and maintenance is a supporting action, which covers the duties like the repairs of the ventilation or the pipe system, mowing the lawn and snow clearing.

Housework covers cooking, textile care and cleaning. There are lots of activities including in the housework, like washing, cutting, boiling, freezing, hanging the clothes, vacuuming, mopping and wiping. Housework activities are also small duties like changing a battery to a fire alarm, cleaning the hood and changing the draperies.

Storage covers all kind of storage from outdoor clothes to a walker.

The aim of these definitions is to consider the activities in such a way that the occupant's activities are more important than the established room locations. This point of view serves a possibility to think freer and produce new solutions to meet the needs of the occupant.

Some of the activities are quite clear, like "sleeping and resting", but some of them need more explaining. Nowadays, some of the activities at home have more emphasis than before. One of them is care and keeping fit. Self-care has been studied increasingly, because its forms are connected with coping at home (Backman 2001). Care and keeping fit means intentional actions, which aim at promoting health and good feeling. It consists of exercise, beauty care, watching the symptoms and treating them and taking care of mental and physical health. Caring for oneself supports self-esteem and satisfaction to life. The elderly people are interested in health and exercise (Manderbacka 2001) and interest in different cares and treatments is increasing.

In the Ball Model, eating has been brought up and separated from the food management. In this study, we use a term "cooking" describing the whole of food

management. Eating is a different activity by nature if we compare it with cooking activity. In cooking, a variety of special equipment and appliances are needed when eating needs only a table and chairs at minimum. The requirements to the space and the resources for activities of cooking and eating are very different, and that is why it is reasonable to tell them apart in the Ball Model. Additionally, when cooking is housework, eating is often an activity with pleasure and a nice moment to share with other people. Eating is definitely the main activity that a person does him/herself, whereas cooking can be directed to a service provider and that is why it is a supporting activity.

In previous studies the need for bigger storing space has been recognized (Helminen-Halkola et al. 2001). In the Ball Model, storage has seen important because of increased amount of property, but also because of special equipment needed along ageing. One piece of special equipment is a walker.

Spending time and working, as an activity defined in the literature for the housing architecture, is narrow. In the Ball Model, it is viewed more widely. That is because the dwelling and time spent in it have many meanings to the occupant, and if we use only a narrow definition of spending time, it does not cover the inner meanings. The name “recreation, communication and self-actualization” characterizes better the intention of the activity.

6.2.3 Resources of the dwelling

The activities at home and in a dwelling can be considered as interaction between the habitant and environment, which is called resources. As it was stated before the simple activities are not dependent on a person’s physical capacity but on the interaction between a person and the environment (Rissanen 1999; 2002).

It is very important to take the physical environment into account when supporting and improving the independent living of the elderly. The causes of the difficulties at home are often due to poor living conditions or the problems with ability. The coping with daily activities at home can be improved by making the dwelling and the surroundings suitable to the needs of the elderly person or by purchasing outside help. However, the services should not be a substitute to a bad design.

Much is known about the accessible dwelling, which responds especially to the weakened physical capacity. Existing material has been used to select the areas of the dwelling, here called the resources in the dwelling. Also some subjects under public and professional discussion have been included in the resources. The literature review, connections with experts, seminars and other occasions, which have influenced the criteria, are in Appendix 3 of Deliverable 4 by Kivilehto and Väisänen (2004).

There are some ready-made classifications, which are used in the list of resources. The following classification is a modification of Tweed’s and Gavan’s (2000; 2002) and it concerns home devices, equipment and services, which are put into six categories:

1. Domestic appliances - washing machine, cooker, dishwasher etc.
2. Home entertainment - audio/visual, TV and Hi-fi, PC.
3. Telecommunications - telephone, alarms and telefax
4. Building services – heating, lighting and utilities.

5. Operable building elements – doors, windows, switches, locks, water taps, ceiling, walls, floor, entrance, elevators, stairs, staircases and storage.
6. Wearable devices – pendant alarms, vital signs monitors.

In addition to these, there are categories ‘Furniture’, ‘Domestic devices’ and ‘Spaces’ in the Ball Model.

6.2.4 Qualities of the habitation

The qualities in the Ball Model are connected with improving the quality of life of the occupant like fulfilling herself and having social interaction. The qualities are aesthetics, comfort, functionality, safety and security. They do not concern only the elderly people, but they may have more emphasis among older people.

People seemingly face some changes in their lives when they get older. Not all elderly have disabilities, but the prevalence of disability or limitations is the highest amongst this demographic group. Because of retirement, many have more spare time to focus on different interests like hobbies, studying or meeting people. Some of the elderly feel lonely when retiring on a pension. The feeling of helplessness and fear of crime and violence can increase with ageing. Many older people in Europe still suffer from lack of amenities, crowded living conditions, problems with housing expenses, lack of lifts and habitability of old houses (Ministry of the Environment 1999).

Additionally, when the physical ability weakens the privacy at home and the mastery of one’s own space gets on the weighing scales. When growing old, the emotional security at home gets important. (Vilkko 2001.)

In this study, the qualities are defined as follows:

Aesthetics is an important quality when considering the coping independently. It has a certain influence on the mood. A good mood, an experience of good health and coping with daily life, seems to form a positive spiral that supports the well-being of elderly people.

A recent medical study, carried out in Northern London, shows that an unattractive environment cause depression. In the study concerned, the demographic and socioeconomic factors were standardized. According to the research, depressions were more common in the areas built after 1969. Typical for these areas was that there were lots of graffiti, and not many private gardens or collective amenity areas in the neighborhood. (Weich et al. 2002.)

A theme interview concerning smart home, carried out in Helsinki metropolitan area, studied people’s attitude towards future home and the importance of home. The research shows that home is seen as an aesthetic place, where the things have different important meanings. For that reason the new techniques should also be aesthetic and suitable for the interior decoration. (Leppänen 2001; 2002.)

As many elderly people suffer from depression, the good mood has been noted to have a positive influence on coping with daily life. A good feeling of the elderly people is often linked with a health experience and the health care of one’s own. Personal capacities and coping with daily life are considered essential factors, which indicate the health of the elderly people. (Rissanen 1999; 2002.) A

dwelling can also support the self-esteem. A good environment offers a possibility to fulfill oneself and have a personal way of life. (Aura et al. 1997.) When people get old, they don't become similar to other older people, but on the contrary, they become more and more themselves (Sinkkonen et al. 2002). The durability and flexibility of the ego helps one to act in different communities and as a member of the society (Heikkinen 1992).

Aesthetics is also important because it is the way to make products desirable. It has been discovered that the elderly people reject the helping devices. If the equipment, which helps the elderly in coping independently, are good design and generally used (Design for All), they will become more popular among the elderly, too.

In the criteria, **comfort** means the conditions as a consequence of good house technique. In a comfortable dwelling, there is suitable warmth and moisture, there is no draught, there is sunlight in the spaces etc. Comfort also means cosiness and a safe feeling at home.

Functionality means fulfilling a purpose. Functionality is an often-demanded quality of the elderly dwelling, because a dwelling should respond to the occupant's needs.

Safety is an essential quality of the dwelling for the elderly people. It can be defined as a state of being safe and protected from danger or harm. In the Ball Model, it concerns danger, which is caused from unsafe environment (slippery floor or lack of light) or on the other hand, hazards on account of state of health, seizures or impaired functional capacity.

Disabilities with vision, hearing, balance and moving easily cause accidents at home. A state of health and seizures often cause an abrupt need of help. Manipulation impairments can be problematic with appliances, doors and faucets. Hearing impairments can cause trouble, for example, when you do not hear the changed functioning voice of a broken machine.

In the Ball Model **security** means a state of being protected from danger of intruders and information security. Security has become more important quality than before. In a Dutch certificate for new buildings, the concept of "socially secure" was emphasized as a dwelling quality (Woonkeur 2002). In addition to social security, the occupants have to be conscious of the hazard of the information security. That is more actual now when new technique integrates into the dwellings. The procedures and the device must not enable the misuses of personal information. Individual privacy has to be secured.

6.2.5 Abilities of the occupant

In the Ball Model, three areas of abilities have been taken into account: cognitive, physical and sensory abilities. The ability areas in the criteria are based on the division of European standardization organization (CEN/CENELEC Guide 6).

The cognitive abilities are divided into **alertness, concentration and memory**.

The physical abilities consist of **balance, dexterity, movement, manipulation, reach, seizures, and strength**.

The sensory abilities are **hearing, seeing, smelling/tasting and touching**.

As people get older, there can be some influence on cognitive abilities. Older people may have more difficulty concentrating and continuing to pay attention to a task. Changes in the sleep/wake rhythm can cause sleepiness and thus people can be less alert during the day. Memory can fail. Conditions such as dementia, which is more predominant among older persons, leads to progressive intellectual decline, confusion and disorientation. (CEN/CENELEC Guide 6.)

In old age, manipulation can be impaired by inability to use both hands when carrying out an activity. Speed of manipulation also declines as a result of slower reaction time and slower movement. Movement can be impaired in many ways. Walking speed and step length and height can be reduced, the range of movement in the joints of arms, legs and spine can be restricted and difficulty carrying out a controlled and coordinated movement can appear. The strength and endurance usually reduce by aging. (CEN/CENELEC Guide 6.)

The incidence and severity of visual impairment increase with age. Typical impairments are inability to judge distances and temporary inability to see whilst an eye adjusts to different lighting levels. Many older people suffer also from hearing problems. Often they lose sensitivity and can no longer rely on touch and pain to give early feedback to the temperature or injury. The ability to detect odours decreases. The incidence of balance impairments increases with age and that leads to falls. (CEN/CENELEC Guide 6.)

There has been a lot of research concerning the functional capacity of elderly, but they mainly concern people in institutional care, not people living at home (Kaikkonen and Paukkunen 2002). Activities of Daily Living (ADL)- indicators are often applied to geriatric research of a functional capacity. Coping with activities of daily living indicates the functional capacity of a person. In the research, the results can be based on the assessments of an examinee, experts or close relatives. (Rissanen 1999; 2002.)

The activities were presented in the part 'Activities at home'. In addition to PADL (Physical Activities of Daily Living) and IADL (Instrumental Activities of Daily Living)-activities, activities have been divided into **extended** and **advanced** activities of daily living. Extended activities of daily living (EADL)-indicator is for the managing of independent living among the paralysis patients and it includes four areas: moving, kitchen work, household work and free time. Advanced activities of daily living (AADL) -indicator is produced to identify early changes in the functional capacity and the concern of the evaluation in social interaction (visiting, hobbies, travelling) and the physical and psychological state of health (Laukkanen 1998). When creating the guidelines for repairing a dwelling, it is important to focus on the extended or advanced activities, because they bring up important issues concerning the daily activities of the elderly living independently.

Impaired physical capacity partly comes from biological aging, but it is also a consequence of an adaptation to a lower level of activities (Rissanen 1999; 2002). Accelerating disabilities often lead to a reluctance of perform and reduced physical activities. This is a poor trend, because physical exercise is a cornerstone maintaining the functional capacity needed with independent living (Kaikkonen and Paukkunen 2002).

In the CENELEC guide the impairment of abilities is phrased as follows: "The needs and abilities of people change as they advance from childhood to old

age and the abilities of individuals in any particular age group vary substantially. It is important to recognise that functional and cognitive limitations vary from comparatively minor such as the mild hearing loss or use of spectacles only to read, to severe loss such as blindness, deafness, or the inability to move part or all of one's body. It should be noted that although some limitations may be minor in nature, in combination, as in the case of ageing, these could pose a significant problem." (CEN/CENELEC Guide 6.)

It is important to notice that even minor problems with functional capacity predict the going down of an elderly person and for example getting into institutional care. Memory loss, impairment with reaction speed, delusions, reduced psychological flexibility, decreased emotional life and activities are common psychosocial features. Impaired psychological capacity is not an aging phenomenon, but a consequence of cumulated diseases and impairments. (Rissanen 1999; 2002.)

The social functioning can be defined as the ability to act in an appropriate way not only in close relationships, but also in the communities and in the society (Laukkanen 1998). Relationships and the social network are indicators of social functioning (Hartikainen and Kivelä 2001). Social functioning has been taken into account in the activity "Recreation, communication and self-actualization" in the Ball Model.

6.3 Criteria for surroundings

6.3.1 The aim of the criteria for surroundings and defining surroundings

The aim of the criteria for surroundings is to ensure the connection to the outside world from the dwelling, and that the surroundings of the dwelling are suitable for elderly persons to live. The criteria are also extended towards the scenes of activities of the elderly outside the home.

The surroundings are defined as the area and channels connecting the inhabitants to the outer world, services, activities and social life. The connections and access to services, transport and relatives, friends and other people are needed. This connection can be a concrete one as a corridor, a courtyard, a path. It can be a more abstract one as a link via communication technology or even as an access by virtual reality.

Apart from the technical aspects of the surroundings of the building, the quality of the wider living environment or neighbourhood has also been considered in the development of criteria. In this project the neighbourhood is the space within the walking distance from home and surroundings means the area next to the houses. The walking distance is dependent on the ability to walk, but often it means the distance within around 15 minutes' walk. This is for a healthy person roughly 1 km (or some hundred meters more).

For surroundings, the previously introduced "Ball Model" could be called the "Wheel Model".

6.3.2 Activities and surroundings

In the Wheel Model the surroundings are considered through the activities taking place outside home or activities which connect home to the outside surroundings and services. They are not divided into the main activities and supporting activities.

Mobility is a basic activity related to surroundings of homes, the nearby neighbourhood and connections by information and communication technology and media from home. Mobility is firmly connected to travelling and transportation. In the context of elderly housing, mobility is a phenomenon of moving around rather than mobility in the sense of travelling.

It is impossible to enumerate on a detailed level all the possible activities a person might have. Activities applied in the "Wheel Model" and some examples of their content are listed below:

Eating out

- Going to restaurants, canteens and coffee shops
- Having meals in the balcony or in the garden
- Having a barbecue in the courtyard, etc.

Domestic work in shared spaces

- Using the common laundry rooms
- Airing and drying clothes and linen

Shared or outside home storing

- Use of cold storage rooms (e.g. in cellar)
- Storing delivery from tele-shopping
- Storing sport equipment, walkers, etc.
- Storing special equipment: car wheels, tools for hobbies which take much space such as sails, gardening equipment, etc.

Care and keeping fit outside (sport)

- Walking, cycling, skiing, etc.
- Recreation in special (shared) in-house and outdoor sport facilities such as swimming pools, saunas, gyms, room with mirror wall, etc.

Health care

- Visiting the health care centre
- Visiting social workers' offices

Welfare services

- Visiting hairdresser, beauty shops, etc.
- Having in-house services at home or in shared spaces

Activities of outside service providers at ones home

- Accessibility to enable housework help, medication, hygiene, etc.
- Workspace design

Running errands

- Personal business: visits municipal offices, meetings in lawyer's office, etc.
- Shopping
- Banking
- Posting

Communication

- Keeping in contact with relatives, friends, neighbours by new communication tools
- Getting entertained via media (utilizing new media)
- Tele-shopping, tele-banking, virtual classes, distant working (tele- or flexiwork), tele-medicin, tele-lawyers, etc.

Sociality

- Meeting others at home, in the courtyard, etc.
- Visiting relatives, neighbours and friends

Recreation, self-actualisation: hobbies, edutainment

- Visiting church, library, theatre and movies, sport events, etc.
- Social events and meetings in shared spaces for hobbies such as meeting and hobby rooms (such as golf simulators, tele-cottages, reading rooms, silent spaces, small church, etc.), banqueting room, accommodation for visitors, repair shops, spaces for workshop
- Education: taking courses outside home

Resting

- Resting in the areas of housing surroundings
- Rest possibilities in the neighbourhood when running errands

Working

- Business, entrepreneurship or work at home: commuting, visiting clients and authorities, material supply, etc.
- Voluntary or charity work: taking care of children, relatives, friends, etc. either at home or at their place

Taking care of green areas in the yard and gardening

- Gardening or treating flowers of the flower beds in the (shared) courtyard
- Possibilities to enjoy greenhouses

Property maintenance

- Using the services of facilities management: waste management (recycling), repair and housing services, courtyard cleaning and snow removal (by the caretakers or by the tenants)
- Taking part in the maintenance work

Transportation

- Running vehicles
- Timing and route planning after information of timetables and chains
- Getting transportation services and escorting.

The activities form the basis for the reasoning behind the criteria. They suggest why something is needed. They are related to the motivations of doing.

6.3.3 Abilities and surroundings

The abilities were determined by Mervi and Veli Himanen on the basis of the work they have done on human and technological intelligence (Himanen 2003), on CEN/CENELEC Guide 6 and literature on psychology (e.g. Le Doux 1998). They are as follows:

- Physical (dexterity, movement, manipulation, reach, seizures, strength, voice)

- Psychological (temperament, feelings, behaviour patterns; habits, addiction, motivation)
- Emotion (the consequence of bodily reactions and mental modes due to stimulus, or sensing and feeling)
- Instinct (genetically programmed behaviour)
- Sociability (social relationships, group behaviour, social life and norms)
- Sensory (hearing, sight, taste, smell, touch, balance)
- Cognitive (understanding, integrating and processing of information)
- Intellect (know, comprehend and reason; knowledge management, memory, learning)
- Spiritual (intelligence for creativity or for satisfaction of needs, intuition to reach tacit knowledge and handle instincts with intelligence, mental growth and transcendency).

In the old ages the physical abilities, senses and cognition tend to weaken (Steenbekkers & van Beijsterveldt 1998). On the other hand many elderly can trust their life experience and their good psychological and social skills as well as their mentality in the independent living conditions, if something unexpected happens or despite the impairments of old ages (Dunderfelt 1992, Rauhala 1992). On the other hand also these previously mentioned abilities might fail and cause problems. Some elderly are for example too lonely or too scared to live alone or independently, although their physical condition would allow them to do so.

Some of the abilities are very personal in nature and related to intra-personal not inter-personal activities. That is they are defined in the discussion of the criteria but not included in the activity cards of surroundings:

- Emotion (the consequence of bodily reactions and mental modes due to stimulus, or sensing and feeling)
- Instinct (genetically programmed behaviour)
- Intellect (know, comprehend and reason; knowledge management, memory, learning).

The abilities which the activity cards of surroundings refer to are:

- Physical (dexterity, movement, manipulation, reach, seizures, strength, voice)
- Psychological (temperament, feelings, behaviour patterns; habits, addiction, motivation)
- Sociability (social relationships, group behaviour, social life and norms)
- Sensory (hearing, sight, taste, smell, touch, balance)
- Cognitive (understanding, integrating and processing of information)
- Spiritual (intelligence for creativity or for satisfaction of needs, intuition to reach tacit knowledge and handle instincts with intelligence, mental growth and transcendency).

6.3.4 Resources and surroundings

As stated before, the activities are not only dependent on persons' physical capacity but on the interaction between a person and an environment. The activities at

home and in the surroundings can be considered as interaction between the habitant and environment, which is called resources.

The physical environment is important in the process of supporting and improving the independent living of elderly. It takes into consideration the overall planning and appliances of facilitation of the activities of mobility. The criteria for surroundings refer to for example the following resources:

- Operable building elements (fence, gates, doors, stairs, ramps, lift, locking, doorbells, door telephones and video monitoring)
- Active structures (automated doors, windows, thresholds, curtains, shadings, etc.)
- Storage rooms near entrance for walkers, bikes, skis, other sport equipment, etc.
- Entrance halls or other space for to move or bring in and out goods (groceries, deliveries, repair equipment or furniture)
- Telecottages (and satellite offices), meeting and banqueting rooms, extra quest rooms, space for welfare service or maintenance providers
- Technical and maintenance spaces
- Shelter (shelter for entrance, terraces, barbeques, separate storage buildings, etc.)
- Yards and gardens
- Seats and rest areas on housing surroundings and in the neighbourhood
- Hobby and recreation areas and facilities (plays, shared equipment, etc.)
- Possible domestic appliances outdoors
- Paths (walking paths, sideways, shortcuts)
- Back lanes and streets
- Neighbouring housing, nature and public buildings
- Personal transportation: access to vehicles and parking places or storages
- Public transport: stations, stops and platforms, information (signs, signals, labels and timetables)
- Surfaces, coverings and pavements
- Location of personal business, services or public transport
- Telecommunication – media connections (e.g. cable television, satellite dishes), telephone and data lines, cables and antennas, personal devices of home health care e.g. wearable devices – pendant alarms, vital signs monitors, alarms for safety and security systems (burglar, fire).

6.3.5 Qualities and surroundings

There are a good number of qualities which belong to the general concept of good housing practice or building and maintaining housing. Any of them cannot be left without attention when designing and facilitating built environment. Still, certain ideas of them can be named more important to the criteria of surroundings than those of the dwelling or services (table 10). For mobility the accessible design (accessibility) is one of the main considerations. Other important qualities for mobility, physical surroundings and connections are availability, Design-for-

All, sustainability, re-thinking of chains, safety and security, user-connectivity, usability, Technology-for-All and transparency. Some qualities (availability, affordability, Design-for-All, user-connectivity, productivity, quality engineering and standards, usability) concern all activities and are not mentioned in the activity cards separately. However, some of them are not very well developed in the context of built environment: user-connectivity, usability, Technology-for-All and transparency.

Table 10. The qualities of the Model of Independent Mobility of Elderly.

LATEST EFFORTS
Accessibility Transparency Re-thinking of chains Design-for-all User-connectivity Sustainability Eco-efficiency Flexibility Adaptability (spatial and periodic)
SPECIFIC FOR COMMUNICATION
Assortment (branding) Information efficiency Usability Technology-for-all
TRADITIONAL DESIGN CRITERIA
Safety & security Functionality (functionalism) Comfort & amenities Aesthetics Affordability Availability Productivity (economy, efficiency, effectiveness, efficacy) Quality engineering and standards

For a more detailed description and discussion of these qualities, see Deliverable 5 by Himanen & Jantunen (2004).

The Activity Cards are suggestions for the surroundings taking into account the elderly person's situation, activities and requirements. The complete presentation of Activity Cards for surroundings is in annex 3 of this report.

6.4 Criteria for services

6.4.1 Activities and services

The aim of the criteria for services is to raise awareness and to help elderly and other parties involved to assess the need of services. The users of the criteria will be the elderly themselves, their family, local community and private providers of services.

Some elderly people need help for some daily activities. They can get help from their spouse, from the other family members within or without the household and relatives or from public or private service providers. The term “service” is only used if service providers provide the help.

The activities are mostly the same and defined in the same way as for the criteria for dwellings. However, some activities – sleeping and resting, and storage - do not make sense in this context and are thus not included. However, certain services, like food deliveries to homes, pose challenges to the development of storage systems to receive the deliveries (see the cases Homedoor and Tampere).

Main activities

Care and keeping fit is a main action, which covers activities like exercise, home health care, medication, measuring blood pressure, cutting nails and beauty care like shaving and doing the hair.

Eating covers the small-scale food preparing e.g. heating the half-prepared food, dining, and the storage of the food, dishes and waste, washing up the dishes and separating the waste.

Personal hygiene and dressing covers washing oneself, going to the toilet and dressing up.

Moving is a main activity that covers walking inside the dwelling and going out from the dwelling, opening the doors, carrying things and climbing the stairs.

Recreation, communication and self-actualization covers entertainment, social life, hobbies and studying, outdoor recreation, watching TV and listening to the music.

Supporting activities

Gardening and maintenance is a supporting action, which covers the duties like the repairs of the ventilation or the pipe system, mowing the lawn and snow clearing.

Housework covers cooking, textile care and cleaning. There are lots of activities including in the housework, like washing, cutting, boiling, freezing, hanging the clothes, vacuuming, mopping and wiping. Housework activities are also small duties like changing a battery to a fire alarm, cleaning the hood and changing the draperies.

6.4.2 Abilities and the need for services

Most elderly living in the general housing stock do not have problems with the physical activities. In a Danish representative study from 1988 with elderly people 70+ living in the general housing stock gave for example these results (Platz 1989):

Table 11. How elderly in the oldest age groups cope with some important personal activities

	70-79 years	80+ years
	Pct.	Pct.
Dressing		
Can without problems	90	77
Can but with some trouble	7	19
Cannot without help	3	4
Washing oneself		
Can without problems	89	72
Can but with some trouble	6	16
Cannot without help	5	12
Cut toe nails		
Can without problems	65	34
Can but with some trouble	10	14
Cannot without help	25	52

As for these 3 activities only the very complex activity of cutting toenails was a problem for the majority of the oldest age group 80+. It is complex because you have to combine coarse and fine motor functions and eye and hand coordination at the same time.

The Katz Index measures the need of assistance in various activities (see Deliverable 6 by Gottschalk, 2004 and Pacolet et al., 2000 for details). The lower the index value, the more independent the person; the higher the value, the more help a person needs.

According to Hansen and Platz (1996) the younger age groups of elderly men and women in the fifties and sixties hardly needed help. For those in the seventies, the situation was nearly the same. Only 6-7 pct. in this age group needed help to perform at least one of the activities. It is only in the age group 80+ there is a substantial share (16-23 pct.) that need help to perform at least one of the activities.

It is also interesting to notice the different situations for men and women. Life expectancy is shorter for men than for women, so in the oldest age groups there are far more women than there are men. The surviving men in these age groups are, however, not as frail as the surviving women. So the vast majority of those in need of help is elderly women 80+ years.

The performance of some instrumental activities is not only dependent upon age, sex and fragility, but also upon household composition. Cooking can serve as an example of this and of the size of the problem for elderly households living independently:

Table 12. Cooking abilities of the elderly by gender and marital status.

Cooking	Men 70+		Women 70+	
	Married	Not married	Married	Not married
Able to cook alone	27	57	82	79
Able with some trouble	3	5	8	10
Not able	7	17	8	9
Do not know if they can	62	21	2	3

(Platz, 1989)

So for married men 70+ cooking is not a favourite task. Only about 1/4 is able to cook. Most do not even know if they are able to cook. For unmarried men 70+ the situation is the opposite: 2/3 of the unmarried men 70+ are able to cook. Most women who are 70+ (married or not) are able to cook. But from the tables above it was clear that elderly men were generally more able to perform daily activities like walking indoor, walking on stairs, washing one self etc. When married men are not able to cook this is therefore a cultural phenomenon. If trained many (un)married men would be able to cook and therefore do not need help for this activity. Probably the reason why 1/5 of the unmarried does not know if they are able to cook is that they get help for this activity instead of training.

In the ball model, three areas of abilities have taken into account. They mainly place themselves in the physiological and psychological functioning. They are cognitive, physical and sensory abilities, the impairments of which are more common among elderly people - especially the older elderly people 80+ - than in other demographic groups. The weakened capacities often lead to a need of outside help or arrangements in the dwelling and they are especially significant when considering independent living in proportion to a dwelling. The ability areas in the criteria are based on the division of European standardisation organisation (CEN/CENELEC Guide 6), and were discussed more fully in the context of criteria for dwellings.

6.4.3 Resources and services

Here we focus on resources in the form of the various services available from public and private service providers and the third sector (volunteers). The social relationships are also very important to take into account when supporting and improving the independent living of elderly. The spouse is often a resource or "a service provider".

As can be seen at the table above about cooking it is mostly not a problem for older married men, if they are not able to cook. If their spouse dies first they might get a problem with cooking and therefore they might ask for services like meal-on-wheels. On the other hand it can be seen from the same table that most elderly men living alone are able to cook. So another solution many elderly widowed men use is to learn to cook.

For the elderly coping with daily activities at home can be improved by making the dwelling and the surroundings more suitable for his/her needs. Thereby the needs of services can be reduced. Services should not be a substitute to a bad design. If an elderly person cannot do the shopping herself because she cannot get in and out of the dwelling because of stairs, for instance, escort service or delivering of goods to the home conceals the bad design. If buses, trains and platforms are constructed so that people using walkers or wheelchairs can get in and out from the vehicles without help, the need for special transport systems for disabled is minimised.

There are many kinds of community services for frail elderly. Home help for practical and/or personal matters is the most common type of help. The Danish Service Act does not use the words "old" or "elderly persons" when describing the conditions for receiving these kinds of help. The services are for persons - old

or not - who due to temporary or permanent reduced physical or psychological abilities or special social problems are not able to perform certain activities and therefore need help.

6.4.4 Qualities of services

The qualities in the Ball Model are connected with improving the quality of life of a person. like fulfilling herself and having social interaction. The qualities relevant for services are

- Variety
- Availability
- Affordability,
- Transparency
- Adaptability and user influence

Variety

The existence of a variety of services is an important quality of services. The greater the spectrum of services the better a fit can be made with the specific needs and wishes of the elderly who need help to perform certain activities.

Depending on how you define and group the services you can get a different list of services.

In this study, the following list was developed:

Getting around or getting goods into the home

- Shopping help (Escort services)
- Delivering of goods from shops/books from libraries/medicine from pharmacies etc.
- Transport services
- Meal distribution

Practical jobs in and around the house

- Cleaning services
- Odd jobs services (e.g. checking fire alarm, cleaning air filter)
- Clothing care
- Laundry services
- Help for cooking
- Help for snow clearance
- Help for gardening

Technical improvements at home

- Technical aids
- Tele-alarm and telecommunication services
- Home adaptations

Health and personal care

- Health advisory services

- Preventive activities (check-up visits for the need of help or changes at home or participation in activities, vaccination, yearly check up by GP's)
- District nursing
- Health services
- Mental health services
- Help for dressing
- Personal hygiene services (bathing, foot care)
- Mobile hairdressers
- Mobile dental service

Social

- Social work
- Social centres for the elderly
- Recreational services (gym, excursions, and studies)
- Day care
- Old age tourism

Temporary stay

- Short stay in old-age homes or nursing homes
- Rehabilitation homes

Other

- Security services
- Advice service about moving or making adaptations
- Information services about the various services and the conditions for having them

Availability

A prerequisite for getting access to a certain service is that the service is available and that the elderly person, household or family know that this kind of service is available and on which conditions it is available in the area where the elderly household lives.

All the above-mentioned services are not available in all European countries. In fact in some European countries, there are only a few community services. Therefore elderly in need of help will have to move to residential or semi-residential settings with services in order to get help or they will have to rely on their family. There are also differences as to availability within some countries where there are more services available in the urban areas a few or none in the countryside.

Affordability

Affordability is another prerequisite/quality of services. If you cannot afford a service, it is not of much use for you. Throughout Europe there are various ways of financing services. Services - to the extent that they exist locally - can be financed fully or partly by taxes or by various health insurance schemes or mostly by the elderly person or the family.

A prerequisite for living independently is not only a question of availability and affordability of services. It is also a question of affordability of the rent and other housing and living costs.

Transparency

In order to get access to an available service you will have to know that this particular service exists. For example, according to the Danish Service Act it is up to the local authorities which kind of services they will deliver and on which conditions. They are, however, obliged to publish their policies in these matters. Thereby the elderly and their families can compare the offered services in different municipalities. In practice, the offered services do not differ much. Some local authorities introduced for instance home help and district nursing around the clock and some years later these services existed in all municipalities.

The most common services like home help for practical and personal matters, meals-on wheels, connection to alarm systems, district nursing and the possibility to visit a day centres for the elderly are probably well known by the elderly in countries where these services exist. From the interviews, it turned out that some of the more special services were not as well known. Some elderly Danes said they were willing to pay for adaptations of their dwelling should they become frailer and needed removal of thresholds, the installation of ramps etc. They did not know that these services actually were free of charge. The same was the case with special transportation services for disabled. Elderly who were not disabled and who did not use these services did not know the rules and some did not know of the existence of these services. They would only need to know the detailed rules if and when they experienced problems, which could be solved by or compensated for by these services.

Information about services can be provided in many ways, for instance:

- Pamphlets you can pick up at libraries, post offices and other public places
- Periodical papers sent to all receiving old age pensions or other public pensions (younger people with disabilities).
- Information offices
- Special information and advice phone lines
- Web pages

Special types of services like the possibility of housing adaptations or respite care might not be as well known as home help. The same is probably the situation for the various kinds of special equipment frail elderly persons can get or lend. Therefore the service of obligatory, preventive visits to the elderly 70+ might be one of the more efficient ways of informing about services, of detecting needs and proposing individual solutions.

Adaptability and user influence

Some private services like window cleaning might be available for all who pay all the costs themselves. In this case you have 100-pct. user influence. Most EU countries subsidise services like home help for practical and personal matters to some degree. Therefore you can only get these services after an indi-

vidual assessment of your needs. In this assessment the three other variables of the ball model and also other individual circumstances are taken into account:

- which activities do you need help for
- which abilities do you have in relation to these particular activities
- which resources of yours should be taken into account (the dwelling, the surroundings, help from the spouse or family members)

In the guidelines to the Danish Service Act it is underlined that "Help should be provided and organised in close collaboration with the client and support the client in keeping or regaining a physical or psychological level of function or rectify special social problems. It is important to keep attention to the activating goal that is an essential element in the aid. The primary goal of the help is to make the client independent of help. If this is not possible the goal is to make the client capable of performing as many activities as possible."

There are often more solutions to the same problem. If the problem is the preparation of meals, for instance, one solution could be training for newly widowed men. This would be in line with the guidelines quoted above. Another solution could be meals-on wheels and here there are various ways: the delivery of hot, cooled down or frozen meals. However, some elderly dislike frozen food. So if it is the only form of meals-on-wheels locally available there is not enough user influence for these elderly. A third solution could be to have meals more days a week in a day centre for the elderly or in a community centre and if needed transportation to and from the centre.

So for many activities that the elderly person needs help for there is more than one solution and the elderly person should have influence of which one it should be.

A final aspect of user influence is the right to appeal decisions taken about the kinds of services and the amount of services.

7 TESTING AND DEVELOPMENT

Francesc Aragall, Francesc Cruz and Alba Masides

7.1 Introduction

The aim of the criteria for dwellings, surroundings and facilities (services) is to raise awareness and to help the elderly and other parties involved to plan the possible changes in the dwelling. The main users of the criteria will be the elderly themselves and their family when they discuss possible improvements with planners, product and service providers and the representatives of the apartment house companies, co-operation housing associations and the local community. Planners, building companies, product designers and service providers will also benefit from the criteria because through the criteria they will get better understanding of the living of the elderly.

The purpose of the testing phase is to test the criteria in concrete situations, cases, covering dwellings, surroundings and service facilities, and representing different countries. The selection of cases was carried out in a systematic manner, considering a number of important parameters. The selection parameters and the resulting list of cases is described in the next section of this chapter.

The criteria were tested for their functioning as planning tools in the planning process, as well as for their power in ensuring function fulfilment according to the wishes and needs of the elderly. The criteria were adjusted and improved based on the experience gathered in the case work. This approach is more fully reported in Deliverable 8 of the project.

The cases are quite different from each other, and therefore the methodologies used are chosen for each case and described in each case report. The full case reports are available as annexes of Deliverable 8.

In this chapter, a summary of each case is presented. Finally, some general conclusions and recommendations, concerning future use of the criteria, are made based on the results of the cases.

7.2 Selection of cases

The selection of cases represents the variety of existing housing stock, issues in surroundings, and service approaches, as well as different scopes and ways of using the criteria. The underlying idea is to find adaptable solutions for a variety of existing situations. In choosing the cases certain parameters have been taken into consideration. The parameters of the cases are clarified below.

Promoter. The promoter parameter is needed to identify the cases and to formulate necessary contacts for the study. It is also relevant to know in whose interest it is to develop the suggestions put forward in the cases and how large the number of the beneficiaries would be.

Involvement. In the parameter of involvement, one outlines the type and the plan of the cases. It is relevant to know in what phase/phases of the construction or renovation project the criteria would be used. The aim of the cases is to study

criteria in different situations. The construction projects are often prolonged and for that reason it would be difficult to be involved in the entire process. The involvement can be planning, implementation and evaluation of a completed project.

Use of the criteria. It is relevant to know how the criteria would be used. The criteria will be tested for their functioning as planning and evaluation tools in the planning process, as well as for their power in ensuring function fulfilment according to the wishes and the needs of the elderly.

Scope. This parameter is relevant to ensure the adequate focus of the project's field. The focus can be the dwelling, surroundings and facilities.

The size range of operations. The project aims at less costly changes. It is relevant to know the size range of operations to estimate the costs. The size range of operations will also influence on the timetable of the case. It can be for example a repairing work or an entire reconditioning.

Location. The main division of the location is rural or urban area. In addition to that the basis of division like a city centre, a town centre, a densely built-up area, a suburb and a sparsely populated area are defined. The problems of the elderly are different in rural or urban areas concerning for example long distances, available services, and fear of violence, a crowded environment and lack of lifts in apartment buildings.

The type and interest. The main types of housing are in private or commune housing. There are a large variety of different types of dwellings from single-family dwellings to large-scale apartments. The interests in dwellings include rooms, appliances and furniture. The interest in surroundings is for example parking areas, recreational areas and public transport. The interest in services goes from meals-on-wheels to laundry and home nursing. The focus of the project is in different areas. The parameters are relevant to ensure the adequate aspects in the field of the project.

Ownership and producer of the services. It is relevant to know whose interest it is to develop the solutions, how widely the solutions can be applied and how big is the number of the beneficiary in the case. In rented dwellings it is not necessarily possible to make the same kind of repairs than owner-occupied dwellings.

Each case is summarised individually, and the conclusions that were made towards criteria development are presented in this chapter. The list of chosen cases is as follows:

Table 13. The ELDERATHOME cases for testing the criteria

case number	case name	country	scope
1	Introduction of a social caretaker in a housing estate Engholmen Nord in Copenhagen	Denmark	services
2	Installation of minielevators in existing multifamily buildings	Denmark	dwelling
3	Participatory planning of dwelling modifications in a block of flats	Finland	dwelling
4	Functional planning of collective areas	Finland	dwelling
5	Service bus line	Finland	surroundings
6	Mobile community center	The Netherlands	services
7	Opplussen	The Netherlands	dwelling
8	Barcelona Accessibility Plan	Spain	surroundings
9	Homedoor	Spain	all

7.3 Introduction of a social caretaker in the housing estate Engholmen Nord in Copenhagen (case 1, Denmark)

In the 1930's, 1940's and 1950s many Danish municipalities built housing estates for low-income pensioners. In Copenhagen 13 estates with a total of 5.000 flats were built. The flats were very small with one or two rooms, a kitchen and a toilet. They had central heating, but no bath. Only in some estates some of the blocks had elevators. So the flats were not meant for frail elderly. They were meant for low-income pensioners. A thorough modernisation became necessary.

The municipality sold the housing estates to non-profit housing companies which were responsible for the modernisation of the flats in the 1990's.

In one of the 13 housing estates - Engholmen Nord - a pilot project was made about 10 years after the modernisation process: A social care taker was employed by the non-profit housing association. An evaluation of this special service is what this case is about.



Figure 3. Engholmen Nord housing estate in Copenhagen



Figure 4. A social caretaker was employed for Engholmen Nord.

After the modernisation process there were 87 2-room flats and 40 1-room flats, total 127 flats. So most of the previous 1-room flats had been merged to 2-rooms flats.

There is a common garden. In the cellar there is a relatively large common room for social activities, a common laundry and an office for the social caretaker.

About 40 pct. of the elderly receive regular home help from municipal home-helpers who also serve other elderly persons in the neighbourhood.

About 10 years after the non-profit housing association (AKB) took over and modernised the buildings, AKB considered at several occasions how to supplement the services delivered by the municipality with other forms of services. There were already two ordinary caretakers employed by AKB and taking care of maintenance and other common practical tasks. The idea was that the employment of a so-called social caretaker could make every-day life easier, and could raise the general feeling of safety and security among the residents. More specifically the caretaker could:

- Help in improving contacts between the individual residents and the municipality and other authorities when this was needed
- Provide odd services like keeping an extra key, fill in forms, reading official letters etc. to the individual residents when needed
- Give practical help like moving of furniture in the homes of the residents when needed

Another important task was to stimulate the local democracy. In all Danish non-profit housing estates there is a board of residents. This was therefore also the case in Engholmen Nord. In such housing estate where most of the residents are 65+ years it can, however, sometimes be somehow difficult for the board to perform many common activities.

The pilot project started in April 2002. A social caretaker - a former nursing home assistant - was employed. She had to define and develop her job herself. In

the pilot project period (2 years) AKB and the municipality of Copenhagen financed the project. If the project developed successfully it should be a permanent extra service financed by the residents themselves via higher rents. A prerequisite for this to happen was that it was approved by a referendum among the residents. The referendum was held in September 2003. A great majority voted for a continuation of this service and it therefore became permanent.

The activities of the social caretaker have a wide scope. During the first 4 months of this service the contacts with residents, altogether 462 contacts, were related to the following:

- Providing services
- Help in improving contacts with the authorities
- General personal contacts
- Practical help in the home or for groups of residents
- Fieldwork/contacts to other service providers

As the project has continued, the patterns of contacts and activities are roughly the same.

This particular service started as pilot project and ended as a permanent service financed by the residents themselves via increased rents. So there was a need for this particular service especially with some areas like contacts to the authorities, personal help and odd jobs for the single residents and common social activities. As one of the interviewed persons phrased it, some of this might have been done by home-helpers from the municipality, but then the housing estate would have been more institutional-like.

Due to the experiences the municipality of Copenhagen will negotiate with the non-profit housing associations from the other 12 similarly modernised housing estates where all the residents are elderly people in order to establish similar arrangements there. Thereby the elderly in the other housing estates will have a social caretaker employed by the housing associations as a supplement to the normal municipal home-helpers, who serve the elderly in need of help to practical and personal matters in these special housing estates.

7.4 Installation of mini-elevators in existing multifamily buildings (case 2, Denmark)

In 2000, 29 pct. of the Danish households where the oldest person was 70+ years lived in detached or semidetached housing with only one floor and with direct access without steps to their dwelling. Another 4 pct. lived in dwellings at the ground floor and with direct access in multifamily housing. And 4 pct. lived in dwellings at the other floors in multifamily housing, but with access by elevator. So totally 36 pct. of the households where the oldest person was 70+ years lived in accessible housing in the general housing stock. (Aeldreboligraadet, 2001)

Due to the Danish Building codes the general housing stock is gradually becoming more accessible. According to the Danish Building codes the first floor in all new buildings shall be accessible and elevators shall be installed in all new normal housing buildings if there are 3 floors or more.

In the oldest part of the existing multifamily housing stock the focus has been on modernisation of installations (baths, central heating), insulation and fire protection since the early 1970s. In a very few cases and often as demonstration projects elevators have been installed in such buildings in connection to urban renewal plans.



Figure 5. Urban renewal demonstrations project where small balconies and an elevator have been installed. The elevator was installed because new flats were made in the attic. Thereby also the other flats got access by an elevator. (<http://www.paalsson.dk/>)



Figure 6. Another urban renewal demonstrations project where broad recreational balconies and an elevator were built outside the facade of an existing building. In this case one elevator gave access to more staircases. (<http://www.paalsson.dk/>)

The standard (net) size of elevators for new multifamily buildings is 1,1m x 1,4m. The minimum door width is 80 cm. For office buildings and buildings where the general public has access the net size of elevators is 2,0m x 1,4m. (<http://www.dcf.dk/>). In old buildings it is not always possible to fit such elevators. In January 2002 one of the urban renewal companies (SBS Byfornyelse)

initiated a larger development project about finding alternative possibilities for providing elevators for old buildings. This case is about the status of this development project in March 2004.

The aim of the project is to develop at least 4 standard types of mini elevators that can be installed in existing multifamily housing. It is for normal multifamily housing - not especially housing for elderly persons. Families with small children living at the upper floors could also benefit from the installation of elevators. Another reason to install elevators in such buildings is that this is a prerequisite for using the attic for new flats. When flats are made in the attic elevators have to be installed according to the building codes because this is new construction. So if it could be easier and cheaper to install elevators in existing multifamily housing more residents could get better accessibility to their flats and more flats could be build in the central areas of larger cities.

The project has 3 phases:

1. To investigate the legal, technical and economic barriers for installation of small elevators in existing multifamily housing (State of the art)
2. More detailed studies about classification of existing multifamily buildings, more detailed studies of costs and the consequences for the rents, development of models for installation of various models of elevators in different ways, carrying through of 4 demonstrations projects with installation of elevators in 4 buildings.
3. Dissemination, guidelines for builders and local authorities.

The second phase including the demonstration projects is expected to end before 2005. Different models were selected for a number of renovation projects (the models are described in more detail in the complete case report, annex to Deliverable 8). By March 2004 none of the demonstration projects had been carried through. (<http://www.gi.dk>)

In all cases the majority of the residents were positive to the idea of having elevators installed. The final conclusion of this can, however, only be made when more concrete projects have been completed and the precise consequences for the future rent is known.

7.5 Participatory planning of dwelling modifications in a block of flats in Helsinki (case 3, Finland)

This case is about participatory planning of dwelling modifications in a block of flats that was built in the year 1961. A group of seven active elderly occupants of Puotila housing area co-operated with the researchers of the TTS Institute in the home modification planning. The aim was finding solutions and good practices that should be suitable and easily adaptable to the elderly concentrating on functional planning inside the dwellings. The phases of the implementation were: 1) The evaluation of the existing dwellings through the criteria, 2) The modification plans for three dwellings and 3) The group discussions about the habitation of the elderly and about the suitability and acceptability of the modification plans for aged.

Some criticism had occurred towards the criteria being inexact as a planning tool. In answer to that it was emphasized that the criteria should be seen as a co-operative tool helping the discussion between the occupant or their representatives and the planners. The elderly themselves commented the criteria to be open for individual needs and serving as an awareness waking tool for discussing the changes. The home modification plans were under lively discussion. With pictures and spoken descriptions, they seemed to be quite a good way to concretize the changes.

The problems, which were found in the floor plans of the dwellings, were that the space was limited, there were narrow corridors and crossing doors making moving difficult. Bathrooms were too small for textile care in addition to their primary function. There were several complaints about the suitability of the existing spaces concerning sound isolation, narrow spaces, inability to furnish the space, too small kitchen and the bathroom, and too little space for storage, hobbies and accommodating guests. However, the interviewees presented with pleasure the solutions that they have implemented and they also brought up improvement suggestions. The members of the group were in many ways aware of issues concerning functionality and accessibility as well as of the new technology products.

The Ball Model seemed to be a relevant tool for classifying the independent living of elderly. Some things that were expressed in the discussion were that forgetfulness needs to be taken better into account, for example by signal lights indicating that the power is on in electric equipment. Accessibility in walking and moving inside the dwelling and out of the dwelling was also under discussion. Due to disabilities with moving and seeing, the importance of lighting was emphasized. The lights activated by a moving detector would be useful especially in the staircase for example. An updating of the electrical installations is needed. The interviewees put great hopes in the wireless equipment.

Organizing the housework well was considered very important. The space to occupy oneself is needed. Space is also needed for privacy, when there are more than one person in the dwelling. The maintenance was mentioned in association with the entrance areas. The difficulties appear because of the lacking handrails and the inoperative door pumps as well as the slippery yard. The women could not manage with carrying the heavy laundry to the basement, where the common laundry room was located, though they would have liked to do that. In the wintertime, it was even more difficult to walk with a burden, due to ice and snow in the yard. Additionally, the appliances in the common laundry were too big for the laundry of a single person.

Technology was seen as an aid; there was no desire for it, but not great resistance either. Products aimed at the elderly were not eagerly adopted by the interviewees. The design of the helping devices and products for disabled were perceived as unattractive.

The role of the apartment house company in informing the elderly dwellers about safety issues and home modification possibilities was emphasized. The home modification information is especially needed when a forthcoming general renovation project is carried out. Habitation during the renovation project preoccupied the interviewees and they hoped that the temporary living arrangements be taken care of by the renovation firm. Clear rules and blueprints by the apart-

ment house company are needed in case of sudden incidents like having a seizure and being at home behind the locked door.

Some of them are prepared to pay for the household services thinking that the municipalities are not going to pay the services any more. They want the services to be near, preferably in the same building and served by the apartment house company. The “service with a face” is needed, somebody who could watch over the elderly occupants if needed.

Attention was drawn to the value of the apartment and its suitability for the possible buyers. People dare not make big changes to the familiar housing model. The cost is not the most essential factor in home modifications if there are other advantages to be gained for the money. Still, information of the overall costs is badly needed. People want to compare and evaluate the cost and the value of the solutions.



Figure 7. A block of flats in Puotila is built in 1961 and is in need of renovations. Kitchen renovations would improve the functionality of the apartments. Many of the inhabitants are elderly people and wish to stay in their homes.

7.6 Functional planning of collective areas (Case 4, Finland)

This case is about the functional planning of collective rooms in an apartment building. The aim of the case was to test the suitability of the criteria as a planning and evaluation tool. In this case the focus was to evaluate the layouts of the common area and give suggestions to the use of them in one of the apartment houses in Multisilta area near Tampere.

Partly due to the poor accessibility, the common areas are not always used very efficiently. Common laundry rooms are often located in the basement behind several doors and thresholds. Laundry facilities in the cellar or in the next building are also too far away. New solutions need to be found for better accessibility of the laundry facilities and other common rooms of apartment houses. The need of services has arisen among the elderly. Different activities, like well-being services, repairing of clothes, delivery of goods, storage, keeping fit and social

interaction between the occupants, require space and premises. The spaces offered in the apartment houses should be accessible for many.

The main study method used in Case Tampere was the expert assessment. The group of the researchers of TTS institute looked through the layouts of the common areas concentrating on the functional points. There were certain problems noticed in the layouts that were taken into closer evaluation. The statement of the expert group is as follows.

There were several problems in the common areas. The corridors in the basement were very narrow and long. The lighting in the long corridors is not always implemented properly; there are not enough light switches and their visibility in the dark is poor. That makes it difficult for the elderly people to move about in the common area. The basement was difficult to access because of many doors and stairs. In the old buildings, the basement fireproof doors are often too heavy and difficult to open for elderly. Very often there are no handrails at all and the doors are supposed to get open only with the key. That requires strong arms. Also the stairs leading to the basement are not always accessible. Partly due to the issues mentioned above the common areas in the old apartment buildings are not in very active use. There were several suggestions for improving the common areas:

Basement

In the dark corridors there should be constant lighting, so that the elderly don't have to be afraid that the lights would go off all of a sudden. Color-coding would help orientation in the long corridors. Using transparent walls would help recognizing different areas and help orientation in the basement.

There were four "Theme areas" or departments suggested:

Recreation area with sauna, exercise room and a lounge could support social interaction in the apartment building, and it is also the means of recreation and health care.

Service area could make it easier to attract service providers. Different activities, like well-being services, repairing of clothes etc. requires space and premises. The need for cold and dry storage space for the home delivery service is recognized. There is also a need for a guest room when the visiting friends and relatives of the elderly need accommodation and apartments are small.

Laundry area in the old apartments taking care of laundry in the bathroom is problematic. Very often there is not enough room in the dwelling for a washing machine or a tumble dryer. Also the ventilation system in the bathroom or in the textile care room is not effective enough to remove all the humidity from taking a shower and washing and drying the laundry. Innovative solutions are needed especially for the drying of the laundry in the apartments. One of the suggested solutions for limited spaces in the dwelling is a drying facility on every floor. That means building a laundering and a drying place for every stair landing close to the apartment. The common laundry premises should also be easy to access.

Storage area To get more storing space there was an idea of changing some of the garages to small, private, lockable storage rooms for bikes, walkers and hobby equipment. In the storage rooms, also the water faucet should be available because of the maintenance of the equipment.

Elevators

In Multisilta two of the three-story apartment building are raised and additional floors are built. The elevators are built in connection with the construction of an additional floor. When the elevators are built the laundry facilities and other collective rooms and premises could be possible to construct close to the lifts, relating to a staircase or a stair landing.

Analysing the layouts gave information on the usability and fitness for use of the criteria (the Ball Model and the Activity Cards) as a planning and an evaluation tool. The ideas of the expert group were considered in terms of how they support the Activity Cards and introduce improvements to them.

It was noticed that the general requirements listed in the Activity Cards were relevant. Also the issues considering e.g. space, doors, stairs and storage brought up in the expert assessment was serving the purpose especially in the context of the activities of *Moving*, *Housework (textile care)* and *Storage*.

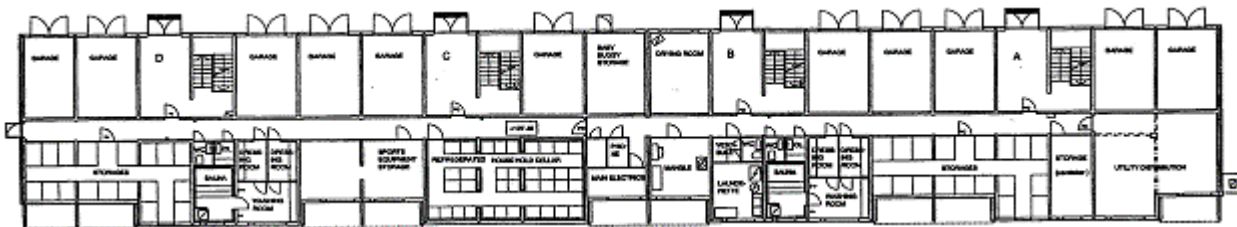


Figure 8. The basement of an apartment building could be divided between recreation, service, laundry and storage areas.

7.7 Service bus line (case 5, Finland)

Senior citizens' transport demand was studied in Finland in two suburban city areas and a rural location within two EU 5th Framework Programme projects. Two surveys were carried out by telephone interviews in Summer 2002. Also transport supply characteristics were surveyed, and the consequences of special transport services partly controlled by a travel dispatch centre were studied. Accessibility of the housing surroundings of the homes of the elderly, as well as the availability of information of the public transport alternatives were also taken into account.

A comparison of the implementation of transport services and their meaning to the conditions for independent living of the senior citizens was made between the target urban and rural areas in Finland and also against the results of the European research project.

The accessibility to services is important for independent living. Access to such basic services as a grocery store, a bank, a pharmacy, an office of municipal and social services or a healthcare centre or a post office are most important. However, the accessibility of even other than very basic services cannot be forgotten. Those are to do with meeting other people, recreation and taking care of oneself, health, beauty and hygiene. There are ways to ensure accessibility, either the elderly are able to reach the service or the service is brought to them. In both

cases, certain factors of the accessibility of the housing surroundings are essential.

Home is linked to services via the surroundings and the transport system. The transport system is mainly out of the scope of the Elderathome project, but the access to it is included. This access can mean various issues. In the first place, the services can be accessed by various modes: by walking, by cycling, by walker or sledge, by public transport, by private car or by special transport service offered to the elderly.

The garage combines the use of private car in housing design, as well as the design of accessible storage rooms, relevant for the use of bikes, walkers or sledges. The design of parking places and shelters for bikes and cars are parts of the design of housing surroundings. Walking is related to the housing surroundings via the condition of the yard and walkways, and their maintenance. The access to public transport systems is also dependent on the walking distances to the nearest traffic stops and the condition of the walkways. In Finland, for example, the house owner is responsible for the maintenance of the street by which the house is located. The possibility to use one's own car depends also on the walking conditions and the distance to the parking place or to the garage.

Normally, the bus stops are busy places and thus difficult to those elderly who have already some slowed reaction times and difficulties to move. The safety and sufficiency of pedestrian crossings are essential. The railway and metro stations, on the other hand, are often inaccessible because of the differences in the levels of the platform and the train floor. The design of these is normally beyond the design of housing surroundings.

Also, information on the availability of these alternative modes in each housing area, and information on the routes and the time tables of public transportation are needed. This information can be available by various means: by leaflets, by phone, and by new media; such as Internet or text television.

In some cases, the special transport services are serving the elderly according to the door to door principle. These services pick the seniors from their home door, take them to the door of the service place and back home again. In those cases the condition of the housing surroundings for the needs of this type of transportation relates the transport design to the housing design. In the case of such a special transport service for elderly, which is running according to a certain route, the access to the stop relates to housing surrounding to the transport system, like in other public transportation.

In the case of service personnel using the housing surroundings such factors as the access to the public transport system or the availability of parking places are important.

In this study, a special transport system using mini buses was studied. These buses drive to the home doors of the elderly in the case of rural neighbourhood, and follow certain routes in the city suburban housing areas. Thus, the criteria of easily accessible transport service and housing surroundings by walking and by car are in the focus. Also the criterion of the accessibility of services is indirectly in focus, because of the reason for most of the trips.

This was selected as a case because it takes into account many elements of the housing surroundings: the quality of the yard and walkways and their mainte-

nance, the use of the yard by car and when walking, the access to the bus stops and the information availability of the transport services.

The mobility of the elderly in the studied suburban areas in Helsinki was mainly local, rather than heading to the down town area of Helsinki, despite the good connections by metro and buses to the city centre. In the Leppavirta commune all the services are located in the village centre. Thus, all the trips are from the remote villages to the village in the commune centre. Also, in Helsinki suburban areas the services are gradually vanishing or concentrated into certain areas, and the elderly have to make trips to neighbouring suburban areas for services.

The households in the countryside owned a car more often than those in the city. Also, local differences in the car ownership between the two suburban areas in Helsinki were found. These differences correlate also to the possession of the driving licence. Men belonging to the elderly age groups have far more often a driving licence than women in the same age. According to these surveys, the elderly living in the city knew the timetables of the public transport better than the elderly living in the countryside. It was far easier to get a ride in the countryside than in the two Helsinki suburban areas.

In the countryside the trips seemed to be longer than those made by the elderly of the two cases in Helsinki, but no study on the kilometres was done. The trips to the summer cottages and the long visit trips to the friends and relatives give to the trip lengths in Finland a special character, in general. On the other hand, the number of trips was higher in the Helsinki suburban areas than in the rural village of Leppavirta. The Leppavirta survey revealed that the number of daily trips reduced with increasing age.

If the possibility of using the service line buses or the demand driven service bus was there it was used, but if not the respondents did not even know about the alternative. All users of the service buses were pleased with the service. The only problem of the use of the demand driven service buses will rise from the cost side. It seems to be relatively costly for the commune in Leppavirta to provide the service. The cost calculations did not show profitable business opportunities for the bus service providers, either, if they were to operate independently.

In the Netherlands, a problem with the demand driven buses was the insecure service supply. The driver took care of the service calls and was not always able to handle the situation. After a few failed pick ups the word spread among the elderly about the unreliability of the ride, and the dissatisfaction resulted to diminished usage of the service. In Finland, a separate dispatch call centre was used in all cases, and only in one case the trip had to be cancelled because of bad weather conditions. However, the client was informed of the skipped trip and no complaints were made.

The accessibility of the yard seemed, according to this study, to be fairly good. None of the people reached by the telephone interviews in the two suburban housing areas in Helsinki had skipped an intended trip because of the poor condition of the surrounding yard. Also the mini buses were able to reach the home doors of the elderly in the rural community in Central Finland.

7.8 Mobile community centre (case 6, The Netherlands)

In the Netherlands, housing corporations have a broad and social task: welfare for all people. It is because of this concern that the housing corporation de Woningstichting is one of the initiators of the mobile community centre. Besides the housing corporation de Woningstichting the following partners are taking part in this project: de Pauwenhof, de Nudehof, Rustenburg, Dennenrust (nursing homes), Kruiswerk West Veluwe, Stichting Welzijn Ouderen (welfare organisations), SMD voor Thuiszorg (home care organisation), and the municipality of Wageningen. These organisations are joined together in the WZW-kring.

The mobile community centre does not yet exist but is still in the planning phase. The trend is that more and more elderly live longer independently in their own house. Research shows that many elderly have difficulties knowing where to get a service or information. Some elderly do not know where to go when they are facing a problem in the field of housing and welfare. There are so many (public) organisations that aim at elderly and try to help them. This can be very confusing. There is a need for a 'one-stop-shop' information counter. One of the possible solutions for this problem is the mobile community centre. The mobile nature of the community centre can be very important for less-mobile persons who have problems going to the offices of the various organisations they have to deal with. This way the mobile community centre can be a supplement to the current sources of information and help for elderly in Wageningen, for example; newspapers, the elderly advisor and de Wielewaag (a community centre for elderly).

The mobile community centre aims to fulfil the following purposes:

- Provide information
- Advise
- Tracing need for care
- Mediate
- Offering services
- Social meeting point in neighbourhood
- Use by others (doctors, insurance company, housing corporation, and so on)
- PR-related

Staff of the various organisations that have initiated this project, joined in the WZW-Kring, will host the bus. When there are no customers to help, they will go on with their daily business by using the Internet. In this way human resources can be used optimally. So far, nothing is known yet of any comparable projects in the Netherlands.

Does a mobile community centre provide a solution for the problems of the elderly living in Wageningen? For answering this question it was decided to have two focus group discussions. In total 10 elderly persons have joined the focus groups, in which they could give their opinion on mobility and services in Wageningen and on the proposed mobile community centre.

To answer this question we first need to know which problems the elderly in Wageningen face in this context: The elderly that participated in the two focus group discussions do not seem to experience many physical problems and they

hardly seem restricted in their mobility by this. The majority can get around in Wageningen very well, by bike, by foot and sometimes by car. When visiting destinations further away the inadequate quantity and quality of public transport seems to give the elderly problems. For more information concerning elderly who experience a restricted mobility and their opinion on the mobile community centre, we recommend further research, since this group was not clearly represented in our focus groups. More problems seem to occur when it comes to finding and reaching the right source of information. Many respondents say to have some (minor) problems with that. There are a variety of information sources that can be contacted or consulted, which can be confusing. Finally, many participants tell about family, neighbours or acquaintances who, according to them, are in a more problematic situation concerning mobility, having access to information and services and having a (social) network.

When hearing about the proposed plan of the mobile community centre, the participants reacted mainly positively, though all these positive remarks mainly have to do with 'others'. The positive remarks concern both the idea of one information counter with information about many aspects of life and growing older and the mobile character of the project. According to participants of both groups the following types of information and services could be offered in the bus:

- Municipal information (schools, housing, facilities)
- Information concerning dwelling for elderly, adjustments in the dwelling and WVG²
- Medical information (lists of General Practitioners, information on weekend services)
- Same information as provided in de Wielewaag (alarm systems, meals-on-wheels, help with filling in tax forms and so on)
- Insurance company (Amicon)
- Post office
- Help with finding a private cleaner
- Bank
- Applying for and information about home care
- Applying for and information about nursing homes
- Housing corporation (only in neighbourhoods where are lots of rental dwellings)
- Information on recreation and hobbies (painting, handicrafts, sports clubs)
- Information concerning voluntary work
- Library service
- Companies relevant for elderly (e.g. handyman) may advertise in the bus
- Medical check up (e.g. blood sugar level, blood pressure etc.)
- A place to chat with people from your neighbourhood (meeting spot)

The focus group discussions showed that there is not a very urgent and 'life-saving' need for a mobile community centre, but that it will be very convenient

² Law which deals with the adjustments in a dwelling for elderly and handicapped people and with financial compensations.

and pleasant way for elderly, and others in Wageningen, to get in touch with the many organisations and agencies that are active in Wageningen. The focus group discussions indicate that the mobile community centre is a good way to meet with the goals that the initiators of the project set themselves: Making care facilities, dwelling facilities, welfare facilities and the organisations that work in this field accessible, noted and familiar for the inhabitants of Wageningen, especially elderly.

7.9 Opplussen (Case 7, The Netherlands)

The Dutch word ‘opplussen’ means something like ‘upgrading’. Opplussen is the adjustment of existing dwellings in such a way that the elderly and persons with a minor handicap can live as long as possible and without problems in their current dwelling. After opplussen the dwelling should be accessible, safe and usable (www.opplussen.nl).

Opplussen was initiated in 1997 by SEV (organization which is engaged in experiments in public housing and related to the Ministry of Public Housing) (www.sev.nl). The SEV set up several experiments concerning adjustments in public housing complexes and evaluated these experiments. Based on these results, they set up a list of adjustments that are needed to at least reach a certain level of comfort and accessibility for elderly. A subsidy was provided for housing corporations, in order to promote ‘opplussen’, as it was named, on a national level. This resulted in Wageningen in the opplussen of two public housing complexes. After this initial stage, housing corporations were supposed to go on all on their own. In Wageningen, the housing corporation ‘de Woningstichting’ agreed with the municipality to adjust a set number of dwellings the coming years. In return the municipality would pay 30% of the expenses of the opplussen of dwellings.

The municipality of Wageningen has a shortage of dwellings appropriate for elderly and handicapped people. All new build houses are being built according to the principle of ‘levensloop bestendig bouwen’, which makes a dwelling accessible and comfortable for everyone. Since only a limited number of houses are built yearly, this cannot bring a solution for the growing demand of dwellings that are appropriate for the elderly. Therefore, it was decided to adjust existing complexes; opplussen.

Usually half of the improvements and adjustments made during an opplussen project, are made outside the dwelling: accessibility of the entrance, no thresholds inside and around the complex, sufficient lighting, anti-slip floors in stairways and so on. Inside the house the main adjustments are anti-slip floors in the bathroom, taking away the thresholds, lowering the window handles and installing a thermostatic tap in the shower. All dwellers joining in the project get the same package of adjustments, there is no individual choice. After a dwelling has been adjusted during the opplussen activities, ‘de Woningstichting’ will only let it to tenants of 55 years and older.

The housing corporation ‘de Woningstichting’ has agreed with the municipality of Wageningen not to charge the costs of opplussen to the tenants. So the rent is not increased after opplussen. Many elderly belong to lower socio-

economic classes, thus raising the rent could be a burden for those people. But this implies that the housing corporation has to be very careful with the costs of *opplussen*. The costs per dwelling are on average 4.000 Euro, for which there are no direct returns.

The specific complex we examined is called 'the Harnjeshof'. It consists of 47 dwellings and is situated near the city center of Wageningen. The complex is not only meant for older people, but in practice many elderly live in this complex and it is quite popular among them. 'De Woningstichting' decided to dedicate only dwellings on the ground floor and first floor for *opplussen*. This was decided because the whole building would only be inhabited by elderly in the future, which was not desirable, neither for the tenants nor for the housing corporation. All dwellers on the ground and first floor cooperated and had their apartment adjusted, in total 19 dwellings. Fourteen dwellings are situated on the first floor and five dwellings are situated on the ground floor. Besides individual dwellings, the entrance and public spaces on the ground floor and first floor were renovated and upgraded.

Our central question in examining *opplussen* in the 'Harnjeshof' was: *"Does 'opplussen' contribute to the diminishing of the problems elderly living in the public housing complex 'the Harnjesweg' have?"* For answering this question it was decided to interview dwellers of the 'Harnjeshof'. Due to time and other restrictions it was possible to find only eight respondents.

To answer this question we first need to know which problems the elderly in the 'Harnjeshof' have. During the interviews the following problems appeared: In seven out of eight households at least one household member is facing problems with his or her health. These problems range from diabetes, recovering from a stroke, constriction of blood vessels in legs, diminished sight, oedema in legs, asthma, light rheumatism and decalcification. The mentioned health problems manifest clearly in the daily life of the inhabitants of the 'Harnjeshof'. Many of them only go outside the building with a walker. One respondent even uses her walker in the house and only goes out in a wheelchair. Also driving a car or bicycle is no longer an option for some of them. Many respondents or their partners use medicines and have pains regularly. Many of the households receive help with the cleaning of their dwelling, by either cleaners or home-care or private cleaners. Another problem that clearly showed is a sense of insecurity. In various ways respondents mentioned (in)security as an important issue.

In general we can say that the respondents are mildly positive or very positive about *opplussen*. To a certain extent *opplussen* contributes directly to the diminishing of the problems the elderly have. Especially when the problem has to do with mobility, taking away thresholds and raising the gallery has helped.

But the main part of the adjustments done during *opplussen* are preventive in nature, like for example the roughening of the bathroom floor or the lowering of the window grips. These measurements do not improve the daily quality of life of the elderly, but can certainly make it safer. Therefore these adjustments are appreciated a little less by the dwellers. Many adjustments aim at a future in which the dweller is less mobile and weaker. However, this kind of a person might never live in the apartment. All adjustments are dwelling-specific and not dweller-specific.

A third type of adjustments are the ones that offer the dweller comfort, like for example the thermostatic taps in the bathroom. Comfort and safety are only experienced by the user, when missing. Seen in this perspective, opplussen contributes both directly and indirectly to the diminishing of the problems elderly have.

7.10 Barcelona Accessibility Plan (Case 8, Spain)

The case presents the accessibility plan of Barcelona as tool of improvement for the city, and some learning from the implementation of the plan.

Accessibility and mobility are important steps to increase autonomy of elderly people. Autonomy is enhanced when everyone can get everywhere (surroundings, city, and country) irrespective of their different capacities and the means of transport used.

This kind of plan is used like a tool to adapt in a sustainable way the thoroughfare, the municipal buildings, the transport system and the environment in general. This improvement in accessibility allows all the citizens and specially those with more problems to improve their interaction with the environment.

The Accessibility Plan uses an intervention method to guarantee the participation of municipalities and to assure development of the Plan's projects.

The objective of the Accessibility Plan is that the city of Barcelona is totally accessible by the year 2006. For this to be possible, it was essential to define clearly the desired results in each task field.

- 1. Public thoroughfare:** There are streets in Barcelona that can never be totally accessible due to their gradient. The ideal result would be that, as regards the rest of the streets, they have pavements wide enough so that two pedestrians can pass by each other, whether they are using a wheelchair or pram (narrow streets should be pedestrianised or of equal level). The security of users must also be guaranteed. The positioning of urban furniture, proper street signs (e.g. danger and road work signs), the design of different elements, the relationship between pedestrians, vehicles and cyclists, must all be given attention.
- 2. Buildings:** any person should be able to access and move around the different public buildings (those meant for the public in general and those specifically for employees) in an independent way and be able to use the services on offer.
- 3. Public Transport:** Ideally everyone should be able to use the network of public transport in an autonomous way, from boarding, use of vehicles and stops or stations, to information on timetables and routes. These means of transport should also cover the entire territory. However, those people, who because of their circumstances cannot use the public transport system, should be able to receive a "door to door" transport service.
- 4. Parks, gardens and beaches:** these public spaces are important as open public spaces meant for free time and recreation activities. They were not included in the Accessibility Plan at its initial stages. However, they were incorporated later with the aim that every citizen's se-

curity would be guaranteed and it would ensure that everyone would be able to use the installations and carry out the various activities on offer.

To achieve the final object of the Accessibility Plan we carried out a study on the different areas of intervention, with the aim of finding out the true status of accessibility and, subsequently, being able to define the priorities.

It can be stated that Barcelona, in its combination of teams and services, has approximately tripled the reality of accessibility in comparison to 1996 and is planning to invest in the next 5 years twice the resources invested in the past five years.

This evolution in accessibility in the city of Barcelona, reflected in actual data concerning the four areas of importance, is possible thanks to two factors.

- Close collaboration between politicians, technicians and citizens.
- The will to co-ordinate all the agents involved and programme the interventions.

In this way, it has been achieved that for every Euro that is spent on accessibility, four more are added on that have come from the budgets of the new contracts and acquisitions and maintenance of the city. In fact, Barcelona has been the first city in the world to apply this criteria of efficiency in accessibility, and cities like Helsinki and Stockholm have been inspired to design their own Plan of action. In addition, visits of experts in accessibility from Europe, the United States, and Japan have improved the spread of the Barcelona experience among other countries and continents.

7.11 Homedoor (case 9, Spain)

The introduction of Internet and the e-commerce is very different among the different countries of the European Union, because of the different cultures and age distribution. The project Homedoor has studied the logistics and the situation of the electronic commerce in all the European Union Countries.

The situation of classic commerce has been changing during the last years all around the world and the European countries are not an exception in that. The little grocery stores that you could find in the old city centres not so long ago are now disappearing because of big supermarkets located outside the city centre. People are changing their habits and the people who used to shop every day now prefer to go shopping just once a week, and like to find almost everything in the same place.

This means that the transport cost for the consumer is increasing because he has to take the car to go shopping. It also means that the environmental cost for society is increasing because of the energy consumption. The specialisation of the little shops of the neighbourhood is disappearing because of a globalisation that allows one to find everything in a big supermarket. For elderly people this development can be particularly problematic.

At the same time new technologies such as Internet or e-commerce are revolutionising many functions of society and its commerce as a part of it. It is now possible to make purchases in something like a virtual electronic supermarket

just by connecting to the net and choosing the goods you want. This potentially facilitates an activity that traditionally needed much more time, and could be at least a partial solution for the economic and environmental cost of the transport.

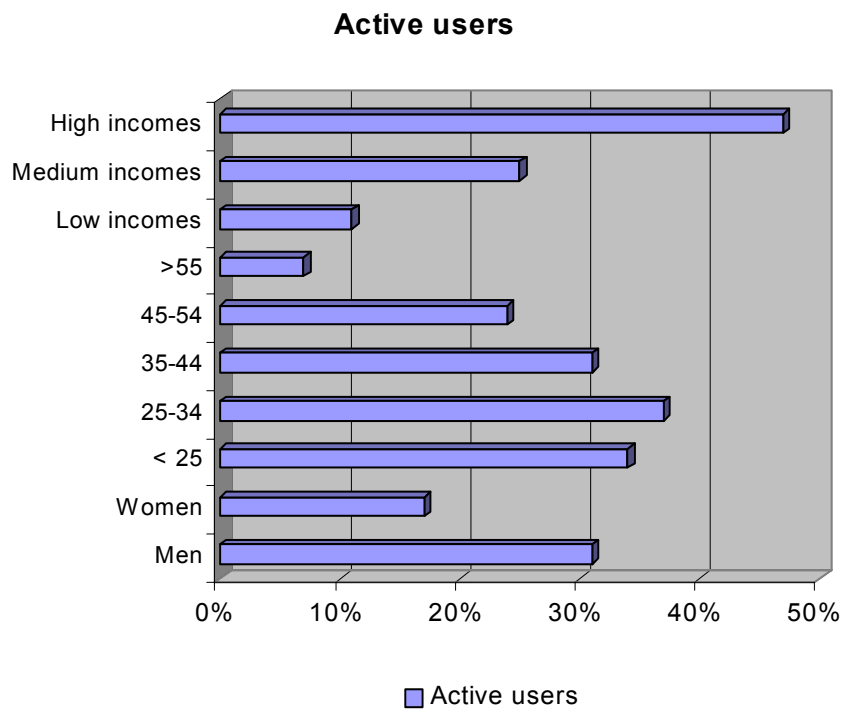


Figure 9. Active Internet users

But there is an important problem to be solved about logistics: the delivery system. When you buy something in the net there must be an efficient delivery system that brings the goods you ordered at home. There already exist different big supermarket chains that offer a delivery system to the consumers but you must be at home to receive the goods. This doesn't seem to be very practical if we take into account that the number of unattended homes during the day is increasing. Women are incorporating to the labour market, young couples spend much more time at work and outside home, and the elderly people are becoming very active with hobbies and other activities outside the home. A solution would be an unattended delivery system with no schedule constraints that would facilitate the job to the retailers and would decrease the economic cost of transportation.

Another important issue concerning the usability of the e-commerce solutions is the accessibility of the e-commerce web pages.

In Europe there are still has a lot of old houses built before 1970 that are quite difficult to adapt to the continuous changes of society, and in different countries different kinds of construction are apparent. This diversity makes it very challenging to develop unattended delivery systems that can be easily adopted in many different cities and rural areas.

7.12 Conclusions

The study of these cases and application of criteria on the cases has confirmed that the criteria may be a very good tool for planners and users. Weak points have also been found, as reported in more detail in the Summary of case studies (deliverable 8 of the project). The criteria for Dwellings have proved to be the easiest to apply as a check-list in all the relevant cases.

Some of the findings have already been used to improve the criteria into the form that is reported in this final report. Some others must be taken into account when using the criteria in different situations. The following discussion covers these considerations.

Some criteria were considered too subjective. Efforts were made to clarify the expressions that are used. However, the criteria is meant to be a framework that can process widely varying and subjective needs and wishes when taking care of the prerequisites of living at home independently. People participate in a selection of fairly general activities which can be described objectively, but the important qualities vary.

The studies highlighted some cultural differences between countries. While the general activities are the same, the applications can be very different, and the attractive solutions may not be the same.

Some criteria are too ambitious. In practice, when improving the conditions for independent living, often a partial solution is better than none. The framework can be used to find a number of possible improvements, and then to weigh their possibility and potential.

Some of the ambitious criteria may not be easily applicable in all existing buildings. They are only applicable in new constructions.

A range of evaluation methods were applied in these cases that represented improvements at the planning stage as well as projects from which there was substantial experience.

In existing buildings and surroundings the criteria are very useful as a tool to enable the planners and the users to communicate and become aware of needs and possibilities. In developing services the criteria can enhance the possibility of finding creative solutions. When planning new buildings and surroundings, the criteria can be used as a “representative” of the future user, to remind the planners of the variables that should be taken into account.

In all these cases the criteria often stop short of giving exact measurements or other detailed solutions. Once the focus of improvement is determined, the planners are referred to the relevant state-of-the-art standards and guidelines. Thus the framework is kept dynamic, allowing for solutions based on future technological improvements.

8 CRITERIA IN PRACTICE: ESPARREGUERA

Francesc Aragall, Francesc Cruz and Alba Masides

8.1 Introduction

The ELDERATHOME project has produced criteria for dwelling, surroundings and services. Much of the research on which the criteria are based, including the cases in which the criteria were tested, focuses on existing buildings. This was considered important because that is where the majority of the elderly will continue to live.

The existing buildings come with the great variety of challenges and restrictions set by the technology that was used and the decisions that were made at the time of constructing the building.

When designing new buildings it would be all the more important to take explicitly into account the prerequisites of the elderly for living at home. The criteria are well suited for this kind of planning and, if anything, easier to use when many restrictions are not there.

This chapter illustrates how the criteria are used in planning a new building. The chapter begins with a description of the project and goes on into the main choices made for construction. It ends with a set of illustrations that show the plans and highlight the way the criteria were used in making the plans.

8.2 Description

8.2.1 Location

Esparreguera is a village in the Baix Llobregat administrative region in the Barcelona province.

The piece of land planned for this home project is located between dividing walls of two buildings in the centre of the old town with face at Beat Domènec Castellet road and Montserrat road, both roads on the way to the Church of the village.

The type of construction will be of two blocs with a maximum of 11.40 meters of height, allowing a construction of three storey building (Ground Floor +2).

The limit of depth for construction in the land piece is 16m. This town planning limit, creates a green space inside all block island. This inside courtyard is a trapezoid with a maximum length of 28 meters.

8.2.2 Functional programme

The project proposal is the construction of 16 dwellings (4 in the ground floor and 12 in the two other stories) with the same dimensions: 5 meters façade at the two sides, one to the courtyard and the other to the road. The maximum length is limited to the 16 meters by the indicated town planning rules.

In the ground floor only two thirds of the land piece are occupied to allow the direct entry to the courtyard and a ramp down to access the underground garage.

The aim of the project is to follow and verify all the ideas and experiences from the ELDERATHOME project, and specially the following premises:

1. To enhance the dwelling conditions to allow an independent life of elder people by means of the layout, the furniture and the home appliances.
 - Use of information technology to simplify housework.
 - To eliminate accessibility barriers in the building, the close surroundings and the most visiting places.
 - Development of new personal services deliverable at home.
2. Design, experimental development and execution of dwellings with good orientation to European market, having quality solutions and optimised and affordable management and construction costs.

8.2.3 Functional description

The actual needs:

- The actual building products are not well fitted to the requirements of today's European families (with a low birth rate, a great number of one parent families and an increasing rate of people leaving alone).
- The need of flexible spaces with multiple uses and easy to adapt to the diversity of users and the requirement changes during the life of the building.
- Fully accessible or adaptable homes.
- Sustainable construction solutions, including the new information technology installations.

Project intentions:

- Ground Floor: Accessible dwellings for persons with some mobility impairment and elder people. (around 70m²)
- One of them could be reserved for the City Council for social emergency situations.
- Upper floors with adaptable dwellings (around 70 m²)
- Accessible elevators.
- Accessible common spaces.
- Underground garage with an accessible implementation.

Criteria to use in the building:

- Centralised installations in an accessible space with adequate dimensions, able to incorporate new potential future technologies.
- Flooring that can be moved to incorporate installations for climate, home automation or information technology.
- Use of renewable technologies such as solar thermal panels.
- Natural cooling by means of orientation of dwellings

8.2.4 Project justification

The land piece where the building will be placed has the following characteristics:

- Qualified as home area in the old city and under the regulations of the actually applicable town planning “Pla d’Ordenació Urbanística Municipal POUM”.
- A planned municipality space in Montserrat road and a reservation of green space just in front of the land piece.



Figure 10. The new building in Esparreguera will be on this street.

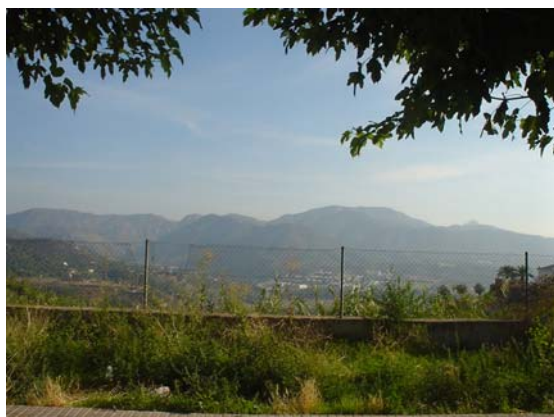


Figure 11. A view from the planned building.

- The new proposal of town planning under the approval process will change sections of both roads around the land piece to convert them into one level pedestrian roads to the level of ground floor of the building.

All this regulation and a more detailed information from town planning has been taken in account in volume definition and global design of the project.

The proposal is based on three main principles:

1. Structure type selected (Sistem BSCP – Concrete Panels):

High flexibility of interior spaces allowing a layout with one, two or three rooms.

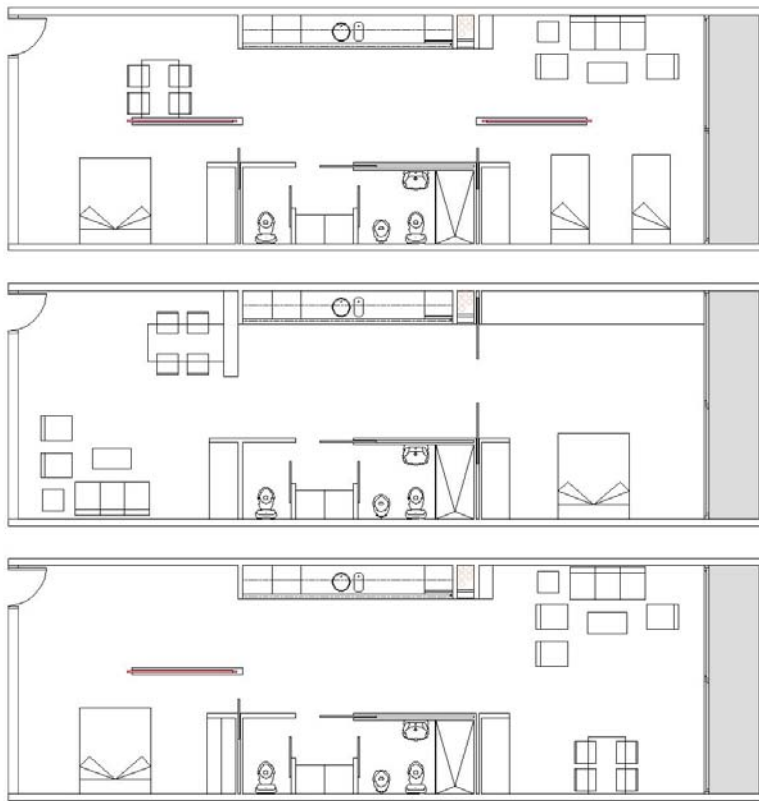


Figure 12. The space can be allocated among rooms in a flexible way.

This structural system allows a longitudinal division of the land piece in three parts that forms the dwellings on each floor. The walls limiting the distribution in each dwelling are independent of any structural parts.

Divisions in the two sides are modular soffits that offer the possibility of separating interior spaces according to the wishes of the users.

2. Central area of services and installations:

The position selected for basic core installations (kitchen and toilets) just in the central part of the plants, allows an easy vertical distribution of pipes by the walls and makes possible a position of the main rooms near the façades where they can get good ventilation.

3. Dynamic relation between inside and outside spaces:

To allow the user to enjoy the central space in the ground floor (courtyard) has been one of the principles of the project.

Also each dwelling will have a small balcony to increase greenhouse effect, refreshing the dwelling by the air flux due to temperature differences at summer time and warm up the air between the two glasses at the winter time.

8.3 Construction

8.3.1 Outside walls

All outside walls will use the same design solution. A ventilated façade with concrete panel walls (10 cm) aligned up with the outside face of wrought iron

and thermal isolation with rigid panels of expanded polystyrene (125x60x5 cm) and air chamber (5 cm) with a substructure of stainless steel to support the outside coating of mixed composition panels with natural fibres and cement and sand colour (200 x 80 and 200 x 40 cm).

The solution for an important part of the façade is the use of “Climalit” Glass to avoid heat losses at this area.

8.3.2 Roof cover

We are considering two solutions for the design of the roof cover.

One part of the dwelling will use ceramic tiles with a 30% inclination to evacuate the rain water to low interference places of the distribution (Inside walls or integrated in built-in cupboards).

The area close to the courtyard will use some horizontal flagstones to install solar thermal panels and the pipes for distribution inside each dwelling.

8.3.3 Carpentry

Outside carpentry will use painted aluminium and inside carpentry anodised aluminium with double transparent glass sheet (4+6+6 mm) for a better thermal and acoustic isolation.

All windows may be opened to warrant good ventilation and easy maintenance.

8.3.4 Walls and coatings

Inside walls will use modular panels of 5 to 10 mm thick of Pladur with isolation of mineral wool with variable thick depending on the spaces to be separated.

The panels will have a guide in the ceiling to move the separation and each panel is about 320 x 120 x 3 cm.

This structure is covered by a double sheet of Pladur with great acoustic isolation (2 cm). The ceiling will use hang-up and perforated plates of 60x60 cm and 2 cm thick with 2 cm of mineral wool. Profiles are hidden.

8.3.5 Flooring

To select the flooring, several aspects have been taken into account:

- Noise reduction and acoustic absorption for the areas of reading.
- Resistant and easy to maintain materials.
- Careful selection of warm and clear colours.
- Guide lines parallel to walls to have outputs for electricity, telephone in the same flooring to gain flexibility in the position of boxes for each installation.

8.3.6 Furniture

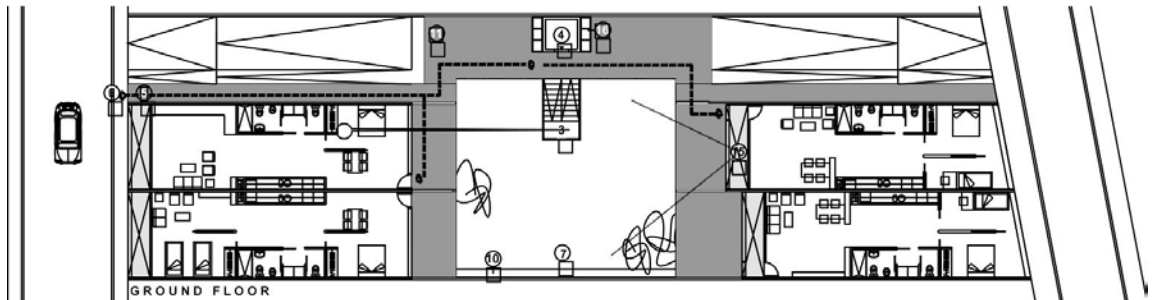
Taking into account the mobility difficulties of somebody using wheelchairs or with any other mobility impairments, the different areas of the building will have built-in cupboards.

The final position of furniture will not be defined in the project as each user may decide the best position according to their requirements or their wishes.

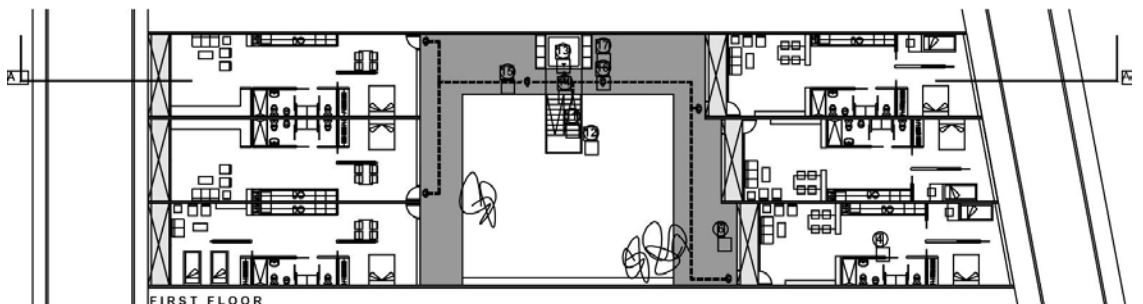
8.4 Plans

In the following the plans of the buildings and their location in Esparreguera are shown in detail. The criteria that have been applied to make the plans are referred to in the pictures.

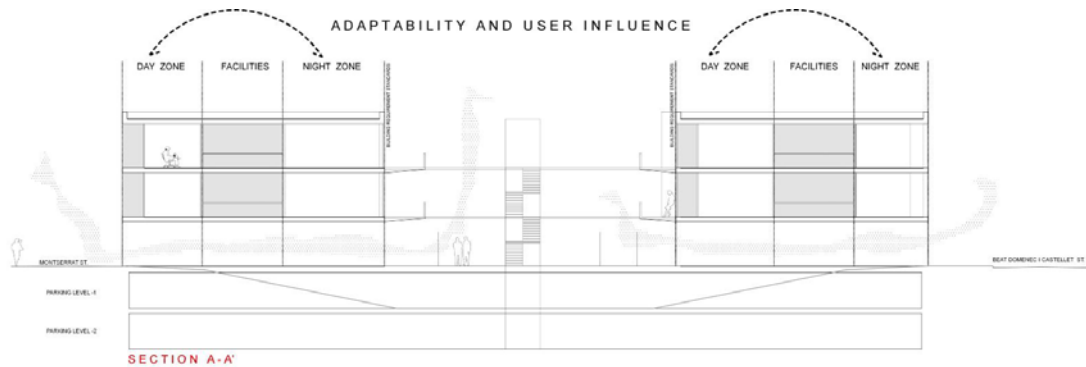
DWELLINGS



1. Courtyard shall be safe, healthy and comfortable. 2. The pavements are smooth enough and unslippery and the ramps are not too steep. 3. The stairs in housing complexes have to be good to walk upon and downwards have to be safe. There should be sufficiently handrail. 4. There are ways to move without the need to use stairs. 5. The rooms where people pass/ move (hall, portal, etc.) are of sufficient dimensions, finish and design/ layout in order they are accessible for all. These demands also apply for galleries and corridors. 6. The entrance of the dwelling is social secure and user friendly, visible from the surroundings and out of the own dwelling. 7. Background noise is minimised in the garden. 8. Level difference are avoided in the garden. 9. The pavement materials prevent people from slipping. 10. Doing by sitting is possible in the garden. 11. There is device for waste separating in the garden. 12. Energy saving products is used in the garden like solar heating for water and lighting. 13. There is space, facility, comfortability and devises for hobbies/ work outside the dwelling. 14. There is space reservation outside or in the entrance hall for moving equipment, e.g. a walker. 15. It is possible to see pleasant views from the balcony and garden. 16. Storage space outside is located on the same floor or there is an elevator.



1. There is daylight in the spaces. 2. The overall view is well designed. 3. Indoor climate is clean and healthy. 4. Level differences are avoided. 5. Sharp and protruding corners are avoided. 6. The floor material prevent people from slipping. 7. The spaces are broad enough to move without restrain. 8. Doors, windows and curtains are light and simple to open. 9. Handles, knobs and locks are easy to grip and comfortable. 10. Three-dimensional space (the walls, the ceiling and the doors) is used effectively. (There is a possibility to set hooks, wall hung cupboards and shelves easily to the walls and ceiling). 11. The height and depth of the steps are the same along the entire staircase. 12. Stairs and ramps are equipped with handrails at both sides. 13. The elevator is provided with automatic sliding doors. 14. The entrance to the elevator is on the same level at the rest of the entrance floor. 15. All floors, including basement and attic, are accessible by elevator. 16. There is space in front of the elevator. It is not adjacent a staircase leading down. 17. Storage space outside the dwelling is located on the same floor as the dwelling or there is an elevator.



ADAPTABILITY AND USER INFLUENCE



EATING: 1. There is a room for a dining table and chairs in the kitchen so that one does not need to take the dishes and the food to another room. 2. There is room for a refrigerator, freezer, cooker oven, dishwasher and microwave oven and for small appliances in the kitchen. **HYGIENE AND CLOTHING:** 3. There is space for getting off the toilet seat and for assistance in the bathroom, the sauna and the toilet. 4. Level differences between a bathroom floor of the room leading to the bathroom are avoided. 5. There are no steps or edges in the floor. To allow floor drain low slopes are accepted. 6. The toilet is located close to the bedroom. 7. There is an easy access from the entrance hall to the toilet. 8. There is a mirror in the bathroom at appropriate height. 9. Walls and ceiling are strong enough for support rails and lifting. 10. There is an access to a balcony or to a yard from the dwelling. 11. Access to the balcony is easy. 12. The floor of the balcony is even. 13. At least part of the balcony area is protected from the weather. 14. It is possible to see out from the balcony. 15. The balcony is able to furnish serving the purpose. 16. There is an individually adaptable room for occupying oneself. 17. There is a place for a washing machine in the dwelling. 18. The entrance is protected against the weather.



GENERAL REQUIREMENTS AND THEIR PERFORMANCE SPECIFICATIONS

1. The overall design serves the purpose and materials are suitable.

2. Indoor climate is appropriate.

2.1 Air moisture is suitable.

2.2 The indoor materials are chemically safe.

2.3 The warmth is comfortable. 2.4 Air draught is avoided.

3. The light conditions are appropriate.

3.1 There is enough light and especially daylight in the spaces.

3.2 Dazzling and glare from the surfaces are avoided.

3.3 Adjustment of lights is easy.

4. The acoustic conditions are appropriate.

4.1 The echo is minimized.

4.2 Background noise is minimized.

5. Information is accessible and understandable.

5.1 Information is logical and conspicuous. The language is simple and precise. Graphics, simple symbols or pictograms are used.

5.2 Functions are familiar. Grouping, colours, location and logical context are used.

5.3 Simultaneous actions are minimized and the length of sections demanding continuous control/attention is limited. Speed and pace are slow. Repetition is possible.

5.4 Colours and contrasts are used to provide visual orientation for the space and to facilitate getting information.

5.5 The information, the identification and the outlining of the space are facilitated with visual, vocal and tactile effects if needed.

6. The solid wall, ceiling and floor surfaces behind the furniture and appliances improve adaptability and adjustability.

7. There is space for special equipment.

8. There is equipment or systems in case of fire or other disaster in the house.

9. The equipment or systems in case of an abrupt need of help can easily be installed.

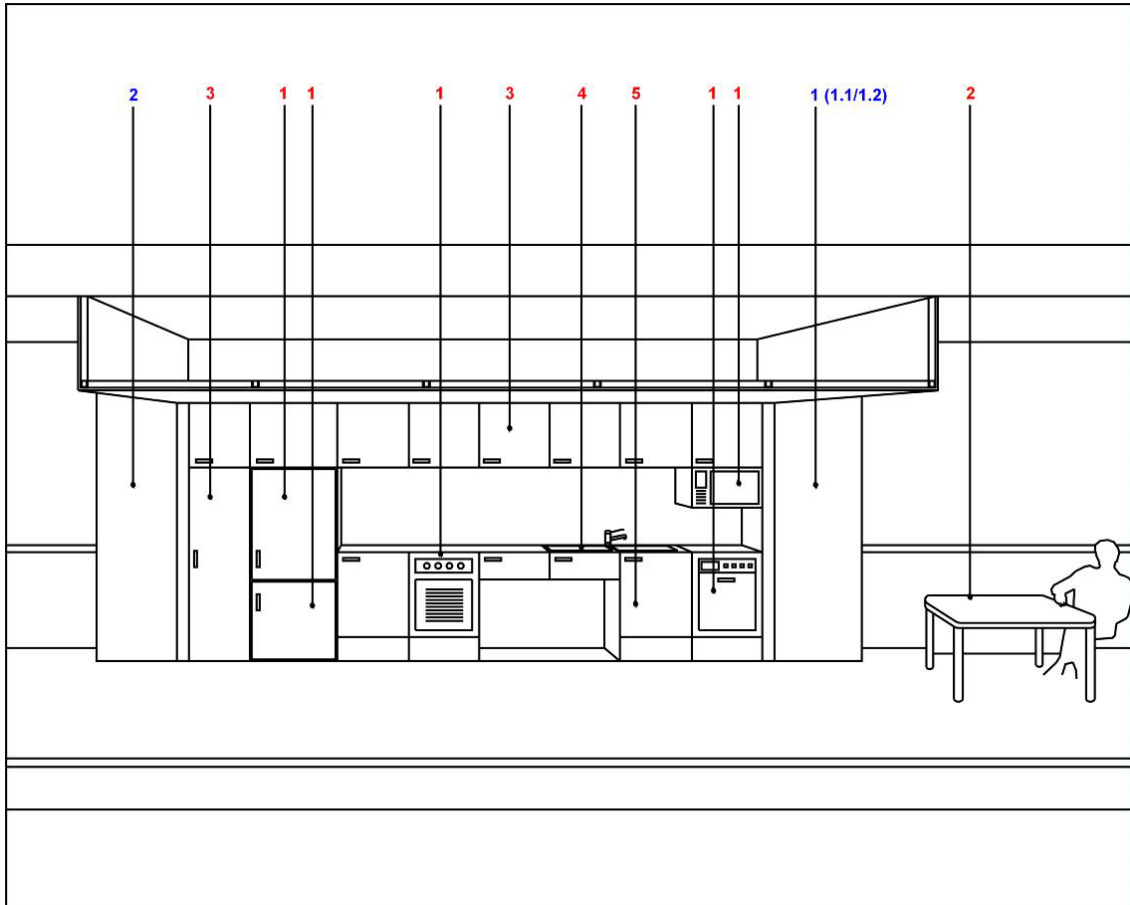
CARE AND KEEPING FIT

1. There is a place for home health care and for storing the equipment.

1.1 There is a lockable medicine cabinet in the dwelling.

2. There is a place for exercise and for storing the equipment.

3. There is a place for beauty care and for storing the equipment.

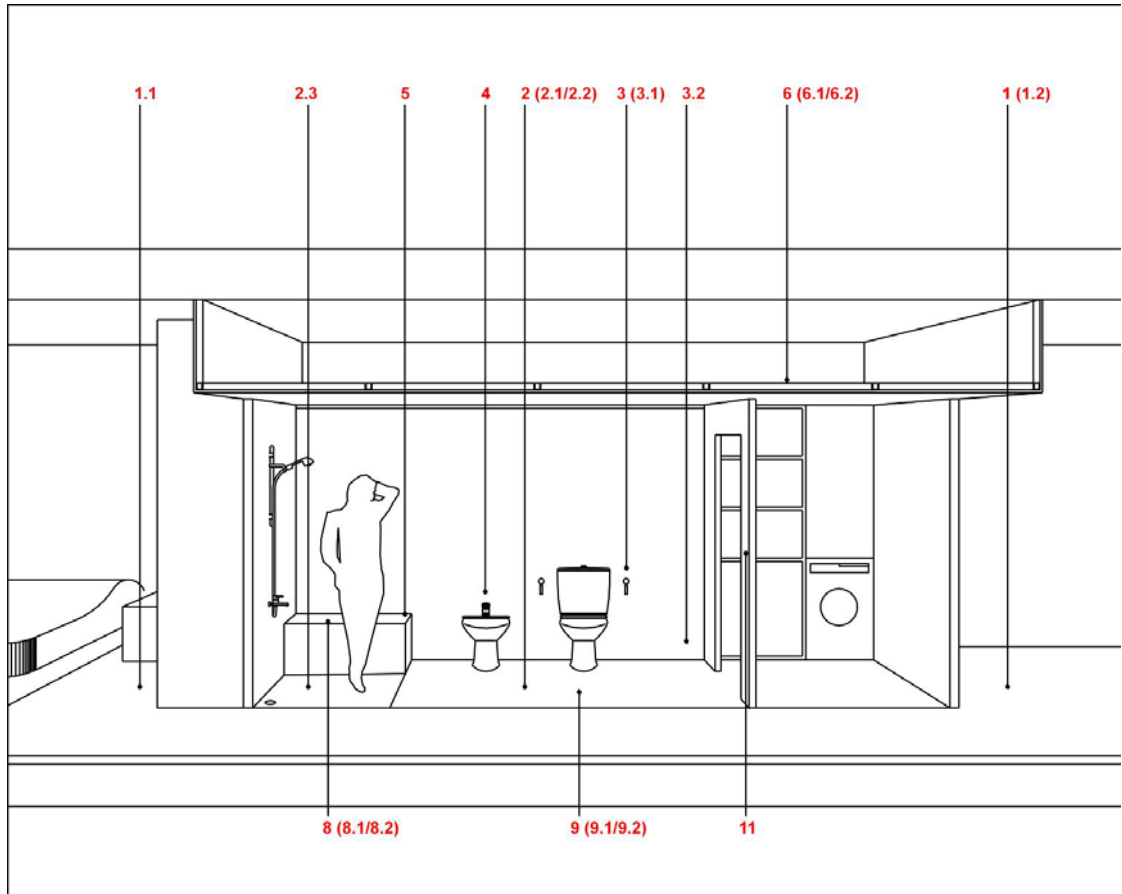


EATING

1. There is room for a refrigerator, freezer, cooker, oven, dishwasher and microwave oven and for small appliances in the kitchen.
2. There is room for dining so that one does not need to take the dishes and the food to another room.
3. There is a place for the storage of food and dishes.
4. There is a place for washing up dishes.
5. There is a place for the storage of waste.

STORAGE

1. There is enough room for storage and it is adequate and within reach.
 - 1.1 Storage should be located where the activity is performed.
 - 1.2 There is room for special equipment.
2. Storage space outside the dwelling is located on the same floor as the dwelling or there is an elevator.



PERSONAL HYGIENE AND DRESSING

1. The location of the bathroom/toilet is suitable.

- 1.1 The toilet is located close to the bedroom
- 1.2 There is an easy access from the entrance hall to the toilet.

2. Level differences are avoided.

- 2.1 There are no level differences between a bathroom floor and the floor of the room leading to the bathroom.
- 2.2 There are no steps or edges in the bathroom floor. To allow floor drain low slopes are accepted.
- 2.3 A bathtub is avoided.

3. It is easy to get down and up from the toilet seat.

- 3.1 The toilet seat is on appropriate height. It is easier to get down and up from the high toilet seat.
- 3.2 There is space for getting off the toilet seat and for assistance.

4. There is an intimate hygiene shower next to the toilet seat.

5. There is a possibility to sit while taking a shower.

6. Constructions are stable.

- 6.1 Walls and ceiling are strong enough for support rails and lifting.
- 6.2 If the washstand is used as support, it must be secured to withstand considerable load.

7. The heights of the furniture are easy to change.

8. There are counters to lay the things while performing.

- 8.1 There are shelves for spectacles, hearing aid and hygiene products next to a shower.
- 8.2 There are shelves, a cupboard and a table for hygienic personal care utensils in the bathroom.

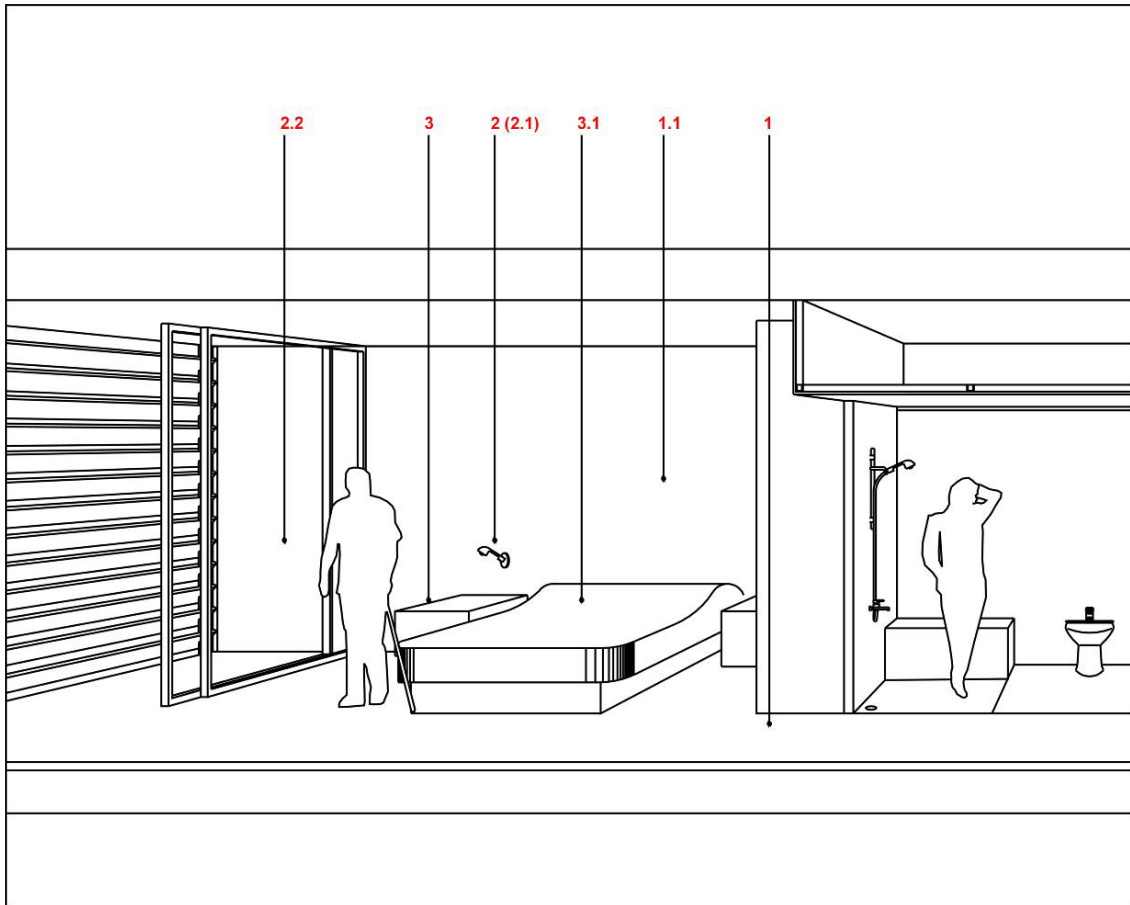
9. It is possible to dress up in the toilet.

- 9.1 There is a place for dressing up and leaving the clothes.
- 9.2 There is a mirror.

10. The faucets are appropriate.

- 10.1 There is a temperature limiter.
- 10.2 There is only one handle instead of two.
- 10.3 The faucet can be electronically controlled releasing water when holding hands under it.

11. The locked door of the bathroom should be able to open from outside.



SLEEPING AND RESTING

1. Quiet places for sleep and rest are needed.

1.1 Sound insulation is adequate

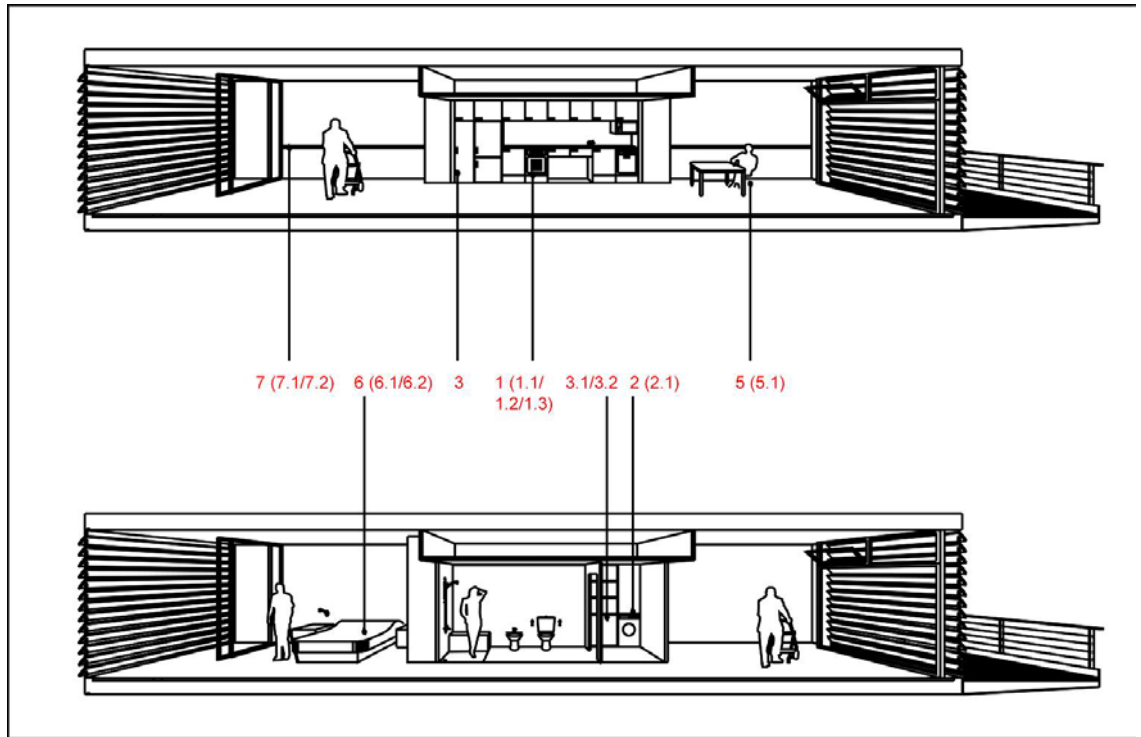
2. Lighting supports orientation to the space.

2.1 It is possible to turn on the lights from or near the bed.

2.2 Environmental control systems or constant lighting can be used.

3. The furniture is of appropriate size and shape.

3.1 It is easy to get down/up from the bed and from the armchair.



HOUSEWORK

1. There is a place for cooking and the overall space is appropriate and flexible. There is space for

- storing of food, kitchenware and equipment.
- preparation, meal making, baking and preservation.
- washing up dishes.
- separating the waste.

1.1 The cooker and water outlet are placed on the same wall.

1.2 Drawers are used under the worktop instead of cupboards.

1.3 The working points are close to each other.

2. There is a place for textile care and the overall space is appropriate and flexible.

There is space for

- storing up and sorting out laundry.
- a washing machine in the dwelling or next to the dwelling.
- drying clothes in the dwelling or next to the dwelling.
- giving an airing to bedclothes.

2.1 The clothesline is located low or it can be let down. Machined drying of the clothes can be used.

3. There is a place to store the cleaning equipment. It is reachable and easy to keep in order.

3.1 There is no footing in the cleaning cupboard.

3.2 Wide cleaning cupboards are preferred to deeper ones.

4. The housework equipment and appliances serve the purpose.

4.1 The installation height for the equipment and appliances should be in the reaching area.

4.2 The equipment and appliances are at adequate size.

4.3 The equipment and appliances are easy to store and take into use.

4.4 The equipment and appliances are easy to use and keep clean.

4.5 There is a counter space adjacent to all appliances.

5. Doing by sitting is possible.

5.1 There is space for knees under the worktop.

6. Materials and the design help the housework.

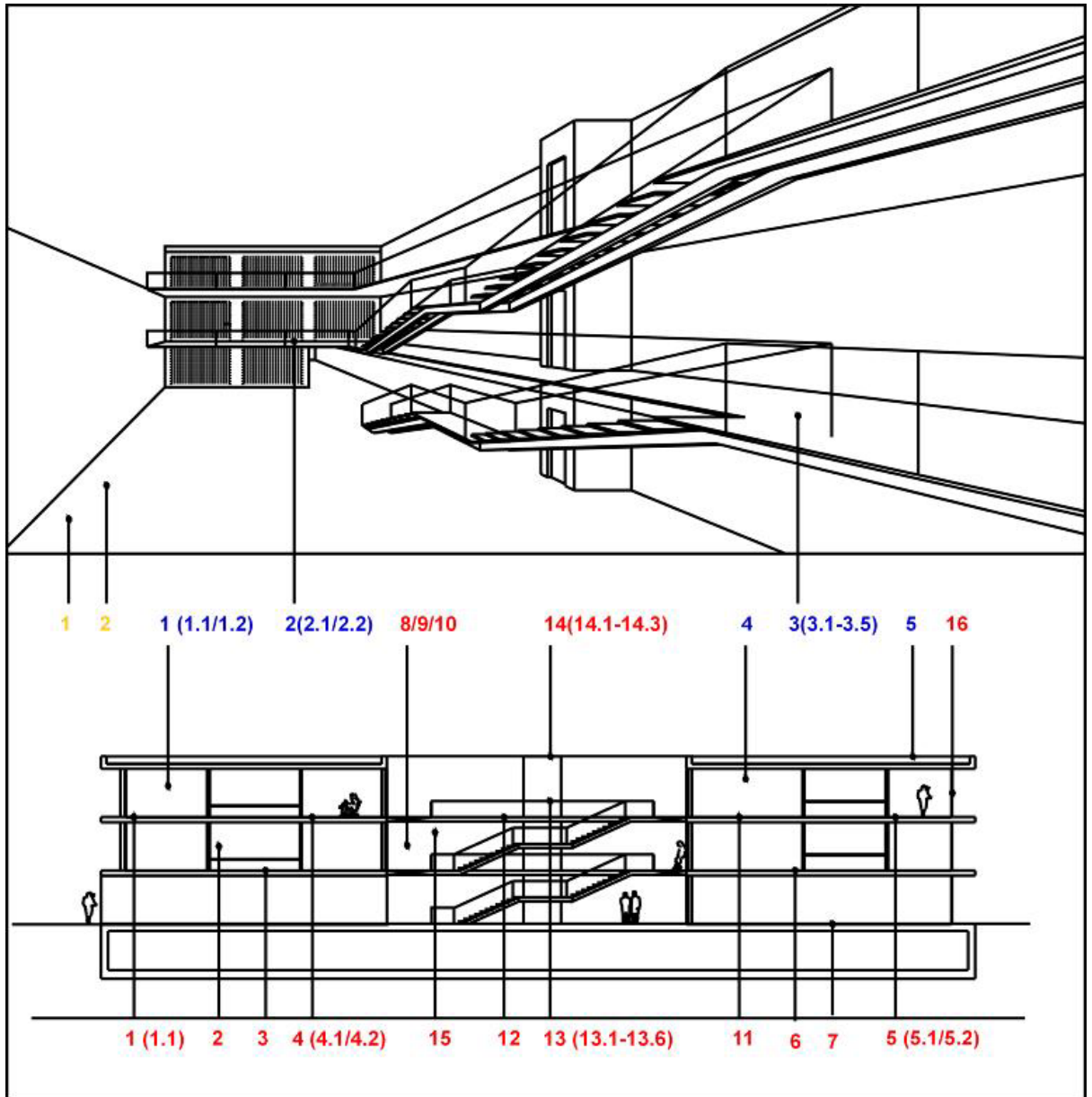
6.1 Shapes are round and even.

6.2 Surfaces are smooth and hard.

7. Electrical connections support the performance.

7.1 The wall sockets are at appropriate height and place.

7.2 Every device has its own wall socket and there are extra wall sockets for temporary and future needs.



RECREATION, COMMUNICATION AND SELF-ACTUALIZATION

1. The dwelling is flexible to individual changes.

- 1.1 Rooms are adaptable to occupying oneself.
- 1.2 The dwelling is adaptable to decoration and fittings.

2. There is room for social interaction.

- 2.1 There is room for residents and visitors to sit and have dinner together.
- 2.2 There is room for visitors to sleep over.

3. Spending time outdoors is possible.

- 3.1 There is an access to a balcony or to a yard from the dwelling.
- 3.2 At least part of the balcony area or part of the yard is protected from the weather.
- 3.3 There are places to get together at the yard.
- 3.4 It is possible to see out from the balcony when sitting.
- 3.5 It is possible to furnish the balcony appropriately.

4. There are effective spotlights for reading, writing and for occupying oneself.

5. Communication is supported.

- 5.1 Every device has its own wall socket and there are extra wall sockets for temporary and future needs.
- 5.2 The dwelling is equipped with connections for telecommunication, which enable the use of the telephone, Internet and e-mail.
- 5.3 Mail is received without difficulties.

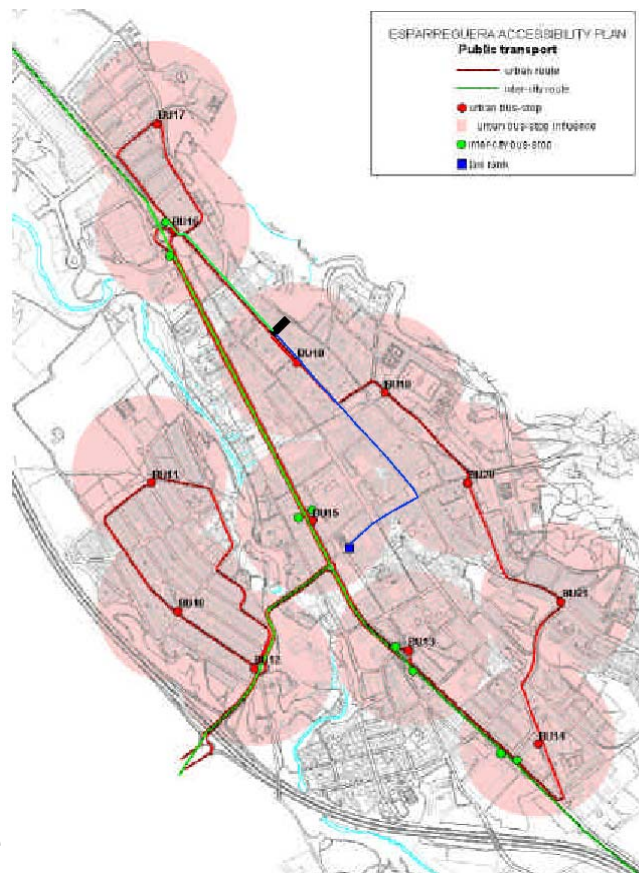
GARDENING AND MAINTENANCE

- 1. The gardening and maintenance equipment has its own spaces and so it is easy to store and take into use.**
- 2. The gardening and maintenance equipment is easy to use and keep clean.**

MOVING

- 1. Level differences are avoided.**
 - 1.1 Thresholds are avoided.
- 2. The essential spaces (bedroom, bathroom, living room, kitchen, room for textile care) are located in the main storey.**
- 3. The floor materials prevent people from slipping.**
- 4. The spaces are broad enough to move without restrain.**
 - 4.1 Spacious, simple and flexible layout facilitates accessible furnishing.
 - 4.2 Square rooms are easier to furnish than narrow rooms.
- 5. Objects are easy to handle.**
 - 5.1 Handles, knobs and locks are easy to grip and comfortable.
 - 5.2 Doors, windows and curtains are light and simple to open.
- 6. Sharp and protruding corners are avoided.**
- 7. The walls and floor covering resist the use of walkers and other moving equipment.**
- 8. The entrance is protected against the weather.**
- 9. The entrance area and the doors to the collective spaces hinder burglary.**
- 10. The entrance is clearly marked (visual and tactile) and well lit.**
- 11. There is a possibility to sit and dress up in the entrance hall.**
- 12. Goods and products from retailers can be received unmanned.**
- 13. Stairs and staircases are accessible.**
 - 13.1 The beginning and the end of the staircase are clearly marked.
 - 13.2 There are constant lightning or light switches on every stair landing.
 - 13.3 Stairs and ramps are equipped with handrails on both sides.
 - 13.4 Spiral stairs are avoided.
 - 13.5 Long staircases are divided into several flights of equal length with resting sections between.
 - 13.6 There are chairs in the resting sections on the staircase.
- 14. Elevators are accessible.**
 - 14.1 The elevator is provided with automatic sliding doors.
 - 14.2 The entrance to the elevator is on the same level as the rest of the entrance floor.
 - 14.3 The elevator is appropriate size.
- 15. All floors, including a basement and an attic, are accessible by an elevator.**

SURROUNDINGS



MOBILITY:

1. The transportation possibilities are adequately accessible. There are enough stations and stops, information signs, labels and signals available.
2. It's easy to find the way in general and specifically find the way to stations and stops and easy to find information about public transport.
3. There is possibility and adequate easiness to use private car. Parking places near dwellings are safe and conveniently arranged. Parking garages are social secure and are good to manage.
4. The personal needs for business area and recreation and other personal business are within reach by public transport and private car.

MOBILITY:

1. It's easy to move, use a rollator, walk, run, bike or use a preferred means and reach the needed destination
2. Good access routes from public way to dwellings/ housing complex
3. It feels safe and secure to move about. there is no disturbing transport. The surroundings is peaceful.
4. It is possible to move about.
5. From the dwelling the public way at which the dwelling is situated can be seen.



MUNICIPAL EQUIPMENT: 1. GYMNASIUM 2. CHURCH 3. NATIONAL HEALTH CLINIC 4. RECREATION CENTER 5. CONCERT HALL 6. MUNICIPAL LIBRARY

MOBILITY: 1. Possible paths behind housing complexes or dwellings are social secure, conveniently arranged and not inviting for unauthorised people.

EATING: 1. There are attractive places to lunch and diner in the neighbourhood. The food is healthy and rather with some variety in quality and price. There are friends to with whom to go out and socially acceptable ways to make friends with them.

HYGIENE: Hair dresser or barber shop is within an easy reach.

RESTING: 1. There are attractive rest places nearby the home like parks and chairs in the business area if one prefers to follow the busy life. 2. There are peaceful places in the neighbourhood such as a church to think, to pray or to meditate.

SERVICES



HOMEDOOR Its main objective is to develop an unattended delivery system to improve the quality of life of all the people. The system must take into account both the needs of the retailers and the needs of the users. The idea is that the user can order the goods by telephone or Internet and then he can receive them without being at home. The system needs to have a HOMEDOOR device to allow the delivery of the goods by the retailer where the user can pick them up. Elderly can take special benefit from the project because they can do the shopping with no need to go out of their home.



OBJECTIVES

- Optimize home delivery time of mail and goods
- Improve the quality of life for old or impaired people
- Guarantee privacy and security



MAIL/GOODS

- Optimise delivery time
- Goods under lock while the receiver is not at home
- The receiver can pick up the goods later on



DISABILITY/OLD PEOPLE

- Container can be provided with wheels
- Cabs with handicap seats
- Easily opening of containers



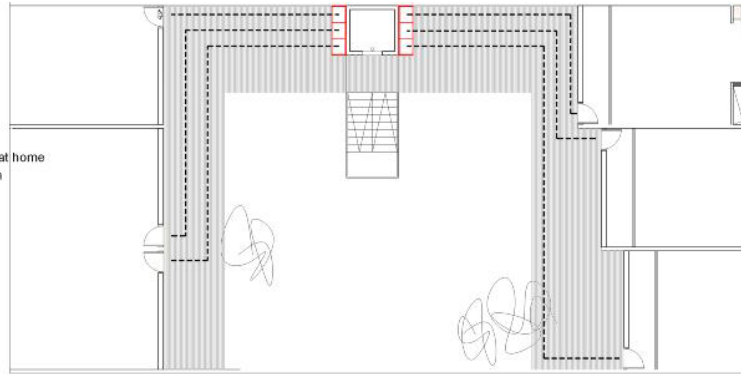
PRIVACY-SECURITY

- Guarantee privacy and security
- Strangers are kept out
- The receiver can remain anonymous



MODULARITY

- Mail (format DIN A4)
- Brief case (DIN A3)



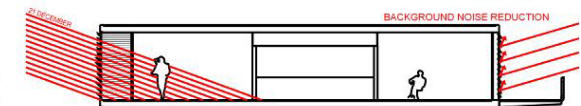
BIOCLIMATIC FUNCTIONS

WINTER SOUTH - DAY ZONE

GREENHOUSE EFFECT. Rise in interior temperature

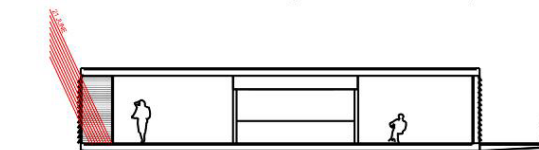


SPECIAL ORIENTABLE ELEMENT. Reflection of external noises

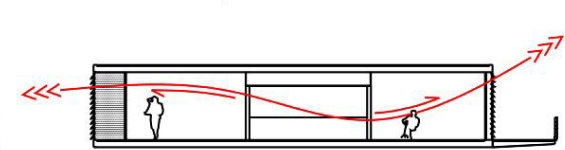


SUMMER SOUTH - DAY ZONE

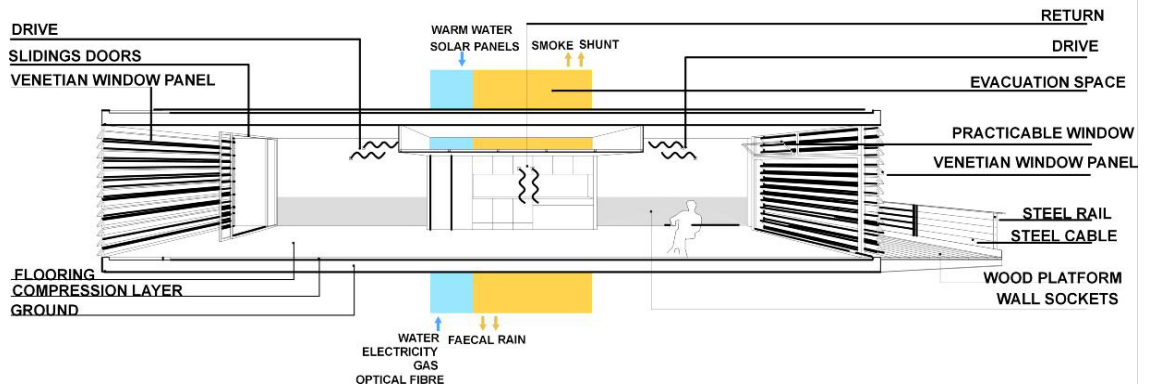
SOLAR RADIATION PROTECTOR. Projection. Venetian window panel



CROSSED VENTILATION. Opened in both sides



CONSTRUCTIVE SECTION (renewable energy sources)



S E R V I C E S: 1. Indoor climate is clean and healthy. 2. Air moisture is suitable. 3. The dwelling is equipped with connections for telecommunication, which enable the use of the telephone, Internet and e-mail. 4. Environmental control systems, like voice command or a movement detector based lights, or constant lighting can be used. 5. Sound insulation is adequate in the bedroom. 6. The appliances are at appropriate level. 7. The wall sockets are at appropriate height and place. 8. Every device has its own wall socket and there are extra wall sockets for temporary and future needs. 9. Mail is received without difficulties. 10. There is space and equipment for the use of a personal computer/ telefax/ telephone. 11. Goods and products from retailers can be received unmanned. (HOMEDOOR) 12. Goods and products from the occupant can be stored while waiting for the service company. (HOMEDOOR).

9 SUMMARY AND CONCLUSIONS

There are about 60 million people of at least 65 years within the EU area, which equals 15% of the total population. By the year 2030 the number will be around 90 million. Especially the number of people over 80 years of age will rise. When people get older, sooner or later many of them encounter more or less severe difficulties while coping with daily life.

One of the political and social priorities of the future is to support elderly people living in their homes as long as possible. More attention is needed to ensure that homes are accessible, convenient and safe and capable of meeting the needs of occupants with declining capacity. Most of the dwellings that older people will require are already in existence. It is thus a challenge to improve the existing dwellings and their surroundings, and to provide services, so that a growing number of elderly people can continue to live independently despite some difficulties in managing daily tasks.

The purpose of the project has been to improve the conditions of living at home of the elderly, and to influence factors affecting the ways in which one can govern one's life and make independent decisions while the capabilities (psychological, physical and social) weaken.

The aim of the project has been to encourage both the supply of and demand for innovative solutions. The final demand is among the ageing people and their relatives. The project has aimed at educating - and at preparing material for such education in the future - the seniors into demanding solutions that make independent living at home possible. The project has also aimed at providing planners, builders, promoters and policy makers with a model that will help them to improve the supply of such solutions.

The main focus was on the material or practical manageability of the housing functions. They were analysed from the point of view of three areas: Dwelling itself, the surroundings, and the facilities (public, market or third sector organisations and related rules and regulations) providing the necessary infrastructure and services for organising the housing activities. The surroundings and the facilities are instrumental in taking care of the social interaction and the quality of the wider living environment. The conditions for these vary by locational and building characteristics (urban/rural; individual homes or flats etc.).

The project has developed planning criteria, which were tested in practice during the project. There are already numerous efforts to create standards or criteria for housing, environments, appliances etc. The specific purpose of the project was to focus on the prerequisites of living at home in *presently existing dwelling stock*, rather than ideal newly built environments. While the criteria can also be used in new developments, the underlying idea has been to find adaptable solutions for a variety of existing situations.

Another priority of the project has been to find *creative combinations of housing improvements and facilities providing services*, in order to answer a multitude of existing and developing challenges. Present efforts in standards development often focus on individual features rather than total packages of improvements.

It is our belief that by enhancing independent living and managing with daily tasks while maintaining social contacts and a feeling of coping, a *virtuous circle* is created, enabling people to stay in better overall condition despite weakening capabilities, thus being able to live longer independently.

To provide a basis for identifying development challenges, the present practices in the four participating countries were studied. The inventory covered aspects of housing, surroundings and services, relevant for independent living of the elderly. It also focused on policies and principles designed to improve these living conditions. Main differences among the four countries were identified, and conclusions for directing the work on criteria were made. There is a lot of information available about dwellings and to a lesser extent about surroundings. Existing standards, criteria and guidelines deal with these aspects. The practices and guidelines concerning services are less developed. Services are, however, developing fast and services are a good instrument to help people to live independently.

The wishes and needs of the elderly were studied by means of interviews that were carried out in a number of interesting cases in the four participating countries. The objective of this part of the project was to identify the wishes and needs of the elderly concerning housing, the surroundings and facilities, with respect to function fulfilment. This included considerations of the wider living environment, including opportunities for social interaction. It was considered important to gain insights into the wishes and needs of future elderly people, which raised important methodological issues. Both the design of the interview questions and the selection of interviewees served this future oriented approach.

Development challenges were identified in the areas of dwelling, surroundings and facilities (services). *These development challenges were articulated in the form of criteria.* While the word criterion is often taken to mean something exact and quantitative, we present criteria that are more qualitative suggestions about what should be considered and how various important elements should be taken into account. This more open approach is justified because of the focus on the future: we need to remain open to new solutions for which today's measurements are meaningless; and because of the ambition to combine the possibilities of the dwelling, surroundings and services in flexible and creative ways.

The aim of the criteria is to give suggestions to ensure that the dwelling, the surroundings and the services are suitable for an elderly person. The other aim is to raise consciousness and to help the elderly and other parties involved to think about the possible changes in the dwelling and in the surroundings and to assess the need of services. The users of the criteria will be the elderly themselves as well as their family, local community and private providers of services, the apartment house companies, product designers and the construction professionals.

The three sets of criteria were developed separately but they followed a roughly similar approach. The goal was to formulate criteria, which would take into account the complexity and the totality of the elderly people living at home. This exercise resulted in the *Model of Independent Living – The Ball Model*.

In the criteria work the Ball Model was created to symbolise the overall thinking, dynamic hold, and the flexibility in the criteria. The Ball model describes an idea of taking different variables into consideration when promoting

the well being of the elderly and supporting their independent living at home. In the Ball Model four main variables are introduced: activities, resources, qualities and abilities. The Ball Model is concretized in the Activity cards.

The criteria were tested in nine cases for their functioning as planning tools in the planning process, as well as for their power in ensuring function fulfilment according to the wishes and needs of the elderly. The selection of cases was carried out in a systematic manner, considering a number of important parameters. The purpose of the testing phase was to test the criteria in concrete situations, cases, covering dwellings, surroundings and service facilities, and representing different countries. The criteria were adjusted and improved based on the experience gathered in the case work. The case work also showed that the criteria can successfully be used as a participatory planning tool.

The ELDERATHOME project has produced criteria for dwelling, surroundings and services. Much of the research on which the criteria are based, including the cases in which the criteria were tested, focuses on existing buildings. This was considered important because that is where the majority of the elderly will continue to live.

When designing new buildings it would be all the more important to take explicitly into account the prerequisites of the elderly for living at home. The criteria are well suited for this kind of planning and, if anything, easier to use when many restrictions are not there.

A special case of the project illustrates how the *criteria are used in planning a new building* to be located in Esparreguera, Catalonia.

References

- Aeldreboligraadet 2001. Det fremtids behov for plejeboliger.
- ANEC 2000. RICAbility. Design for All – Accessible Design: Meeting the needs of older persons and people with disabilities – guideline for product design and testing. [Electronic document]. [Referred 2002-11-15]. Available: <http://www.anec.org>.
- Aura, S., Horelli, L. & Korpela, K. 1997. Ympäristöpsykologian perusteet. Porvoo: WSOY.
- Backman, K. 2001. Self-care of home-dwelling elderly. Department of Nursing and Health Administration, Oulu University Hospital. Oulu.
- CEN/CENELEC 2002 Guide 6: Guidelines for standards developers to address the needs of older persons and persons with disabilities. [Electronic document]. [Referred 2002-11-15]. Available: http://www.cenorm.be/BOSS/supmat/refdoc/resources/c_clcgd006.pdf.
- Danish National Institute of Social Research 2000. No. 00:8. Platz, M. "Danskere med livserfaring"
- Danish National Statistical Bureau 2001. Statistiske Efterretninger: 2001:11 4. Juli 2001 Befolkning og Valg, p.2
- Dunderfelt, T. 1992. Elämänkaaripsykologia. Helsinki (Söderkulla): Dialogia Oy. 266 p. ISBN 951-01680-0-9
- Ergonomics and Safety Research Institute. Human focused design 2002. [Electronic document]. [Referred 2002-11-15]. Available: <http://www.lboro.ac.uk/research/esri/hfdc/index.htm>
- Evers, A. & Zanden, G.H. van der. 1993. Better care for dependent people living at home: meeting the new agenda in services for the elderly. NIG trend studies (6). Bunnik.
- Eurostat (EHP) SCP calculation in SCP, 2000
- Gottschalk, G. 2004. Criteria for services. ELDERATHOME Deliverable 6. Available: www.tts.fi
- Haffner, M. E. A. & Dol, C. P. 2000. Housing statistics in the European Union 2000. Delft: Delft University of Technology. OTB Research Institute for Housing, Urban and Mobility Studies. 82 p.
- Hansen, E. B. & Platz, M. 1996 "Gamle danskere" [Old Danes]. AKF. Copenhagen
- Hartikainen, S. & Kivelä, S-L. 2001. Ikääntyvien ja iäkkäiden kuntoutus. teoksessa Kallanranta, T., Rissanen, P. & Vilkkumaa, I. (toim.) Kuntoutus. Jyväskylä: Gummerus Kirjapaino Oy, 440-451.
- Heikkilä, M & Kautto, M. (toim.) 2002. Suomalaisten hyvinvointi. Helsinki: Stakes. 434 p.

- Heikkinen, R-L. 1992. Psykkis- ja sosiaalisen hyvinvoinnin sekä sosiaalisen yhteyden ja suoriutumisen arviointi. Teoksessa: Heikkinen, R-L & Suutama, T. (toim.) Iäkkäiden henkilöiden toimintakyvyn ja terveyden arviointi. Ikivihreät-projekti Osa II. sosiaali- ja terveysministeriön kehittämisosaston julkaisu ja 1991:10. Helsinki: Valtion painatuskeskus, 111-131.
- Helminen-Halkola, R., Koskinen, U.-M., Miettinen, T., Munter, A., Savikko, T. & Välimäki, A. 2001 Espoolaisten asumistoiveet (2000). Tutkimus Espoolaisten asumisesta ja asumistoiveista vuonna 2000. Espoo: Espoon kaupunki. Tieto- ja tutkimuspalvelut.
- Himanen, M. 2003. The Intelligence of Intelligent Buildings. The Feasibility of the Intelligent Building Concept in Office Buildings. Espoo: VTT, VTT Publications 492. (ISSN 1235-0621)497 p. ISBN 951-38-6038-8
- Himanen, M. 2004. Universal housing styles and cultural differences. Some European cases of elderly – Needs and wishes of dwelling, surroundings and services. ELDERATHOME Deliverable 3. Available: www.tts.fi.
- Himanen, M. & Jantunen, J. 2004. Criteria for surroundings. ELDERATHOME Deliverable 5. Available: www.tts.fi.
- Kahri, E. & Pyykönen, H. 1994. Asuntoarkkitehtuuri ja -suunnittelu [Architecture and design of dwellings]. Helsinki: Rakennuskirja.
- Kaikkonen, S. & Paukkunen, L. 2002. Myyrmäen kotihoidon K-solun henkilökunnan toimintakyvyn arviointitaitojen kehittämisprojekti: ”Kyvyt käyttöön toiminnassa”. Julkaisematon projektisuunnitelma.
- Kasanen, P. 2003. Co-operation network. ELDERATHOME Deliverable 2. Available: www.tts.fi.
- Kivilehto, S. & Väisänen, K. 2004. Criteria for dwellings. ELDERATHOME Deliverable 4. Available: www.tts.fi.
- Klerk, M.M.Y. de (red.). 2001. Rapportage ouderen 2001. Veranderingen in de leefsituatie. (in Dutch: Reporting elderly 2001. Changes in the living situation). Sociaal en Cultureel Planbureau, Den Haag.
- Laukkanen, P. 1998. Iäkkäiden henkilöiden selviytyminen päivittäisistä toiminnoista. Studies in Sport, Physical Education and Health 56. Jyväskylän yliopisto. Jyväskylän University printing House, Jyväskylä and ER-Paino Ky.
- Le Doux, J. 1998. The Emotional Brain. The Mysterious Underspinnings of Emotional Life. New York: Touchstone. 384 p. ISBN 0-684-80382-8, 0-684-83659-9
- Leppänen, S. 2001. Kodistako älykäs? Digitalisoituvan viestinnän monet kasvot. [electronic document]. TEKES. Teknologia katsaus 118/2001 [referred 2002-11-11]. Available: http://www.tekes.fi/julkaisut/Digitalisoituvan_viestinnan_monet_kasvot.pdf.
- Linden, M. van der & Steenbekkers, L.P.A. 2003. Present practices. ELDERATHOME Deliverable 1. Available: www.tts.fi.

- Manderbacka, C. 2001. Ikääntyvät kuluttajat markkinoilla. Suosituksia - kysyntää ja tarjontaa? Stakes 6/2001
- Masides, A., Aragall, F. & Cruz, F. 2004. Summary of case studies. ELDERATHOME Deliverable 8. Available: www.tts.fi.
- Ministerie van VROM. 2000. Cijfers over wonen 2000/2001. Feiten over mensen, wensen, wonen. (in Dutch: What people want where people live) Ministerie van Volkshuisvesting, Ruimtelijke Ordening en Milieubeheer, Den Haag.
- Ministry of the Environment. 1999. Housing of Older People in the EU Countries. The Finnish Environment, 354. Ministry of the Environment, Housing- and Building department, Helsinki.
- Ministry of the Environment. 1999. Housing of Older People in the EU Countries. The Finnish Environment 354. Helsinki: Edita Ltd.
- Nissinen, K. & Santalo, M. 2001. Asukas- ja kiinteistöpalvelujärjestelmä vanhusväestön kotiasumisen tukena. Loppuraportti 18.2.2001. VTT Rakennus- ja yhdyskuntatekniikka.
- Pacolet, J. et al. 2000. Social Protection for Dependency in Old Age. A Study of the fifteen EU Member States and Norway. Ashgate.
- Platz, M. 1989. Gamle i eget hjem [Older people living at home]. SFI rapport 89:12. Copenhagen.
- Platz, M. 2000. Danskere med livserfaring [Danes with life experience]. SFI 008. Copenhagen.
- Rauhala, L. 1992. Mitä on meditaatio? Helsinki: EsotericaPublishing. (in Finnish)
- Rissanen, L. 1999. Vanhenevien ihmisten kotona selviytyminen. Yli 65-vuotiaiden terveys, toimintakyky ja sosiaali- ja terveystieteiden koettu tarve [electronic document]. University of Oulu: Kansanterveystieteen ja yleislääketieteen laitos, 1999 [referred 2002-11-15]. Available: <http://herkules oulu.fi/isbn9514254414/>.
- Sinkkonen, I., Kuoppala, H., Parkkinen, J. & Vastamäki, R. 2002. Käytettävyyden psykologia. IT Press.
- Steenbekkers, L.P.A. & Beijsterveldt, C.E.M. van. 1998. Design relevant characteristics of ageing users. Subfaculty of Industrial Design Engineering, Delft University of Technology. Delft: Delft University Press.
- Tweed, C. & Gavan, Q. 2000. The design and technological feasibility of home systems for the elderly. Research Project Report. School of Architecture. The Queen's University of Belfast. January 2000. [Electronic document]. [Referred 2002-11-11]. Available: <http://www.qub.ac.uk/arc/research/projects/papers/Technology.pdf>.
- United Nations Statistics, (2000). Available <http://unstats.un.org/unsd/demographic/>;

<http://www.unece.org/stats/gender/web/genpols/keyinds/genpols-2pop.htm>;
<http://www.unece.org/stats/gender/web/genpols/keyinds/genpols-2pop.htm>)

Vilkko, A. 2001. Koti mielessä. In: Jarva, V. & Korvela, P. (eds.). Home at the crossroads of sciences. University of Helsinki. Department of Home Economics And Craft Science. Research report 9. 53-63.

Weich, s., Blanchard, M., Prince, M., Burton, E., Ernes, B. & Sporston, K. 2002. Mental health and the built environment: cross-sectional survey of individual and contextual risk factors for depression. Br J Psychiatry 2002; 180:428-33.

Woonkeur. 2002. [Electronic document]. [Referred 2002-11-15]. Available: www.woonkeur.nl. 2002-11-15

www.cbs.nl

www.euhousing.org

www.euhousing.org

www.ine.es

www.opplussen.nl

www.sev.nl

www.tilastokeskus.fi

Annex I. List of deliverables

Deliverables are available at www.tts.fi

- 1 Present practices. Editors: M. van der Linden and L.P.A. Steenbekkers, 2003
- 2 Co-operation network. Editor: Pirkko Kasanen, 2003
- 3 Universal housing styles and cultural differences. Some European cases of elderly – Needs and wishes of dwelling, surroundings and services. Editor: Mervi Himanen, 2004
- 4 Criteria for dwellings. Sari Kivilehto and Kirsi Väisänen, 2004
- 5 Criteria for surroundings. Mervi Himanen and Jutta Jantunen, 2004
- 6 Criteria for services. Georg Gottshalk, 2004
- 7 Selection of case studies. Sari Kivilehto and Kirsi Väisänen, 2003
- 8 Summary of case studies. Alba Masides, Francesc Aragall and Francesc Cruz, 2004
- 9 Final report. Editor: Pirkko Kasanen, 2004
- 10 Dissemination and exploitation plan. Pirkko Kasanen, 2004

Annex 2. The criteria for dwellings – the Ball Model and the Activity Cards

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The Model of Independent Living – the Ball Model

The Ball Model describes an idea of taking different variables into account when evaluating the fitness for the use of a dwelling, surroundings and services for elderly people. The model can be used in two ways. One can also use it as a tool in analysing the present knowledge (guidelines, standards and regulations) and formulating the comprehension of elderly habitation out of them. That means for example evaluating the products in order to detect critical points. The Ball Model serves also as a planning tool and a generator of new ideas. The purpose of the criteria is awareness waking – giving suggestions to the planners and to the occupants of the dwelling rather than giving strict instructions. In the model four main variables are introduced: abilities, activities, resources and qualities.

Activities

Main activities

CARE AND KEEPING FIT

EATING

PERSONAL HYGIENE AND DRESSING

MOVING

RECREATION, COMMUNICATION AND SELF-ACTUALIZATION

SLEEPING AND RESTING

Supporting activities

GARDENING AND MAINTENANCE

HOUSEWORK (COOKING, TEXTILE CARE, CLEANING)

STORAGE

Resources

Domestic appliances - washing machine, cooker, dishwasher etc

Home entertainment - audio/visual, TV and Hi-fi, PC

Telecommunication – telephone, alarms and fax

Building services – heating, lighting and utilities

Operable building elements – doors, windows, switches, locks, water taps, ceiling, walls, floor, entrance, elevators, stairs, staircases and storage

Wearable devices – pendant alarms, vital signs monitors

Domestic devices – cleaning equipment, kitchenware

Furniture

Spaces

Qualities

Aesthetics
Comfort
Functionality
Safety
Security

Abilities

Cognitive (alertness, concentration, memory)
Physical (balance, dexterity, movement, manipulation, reach, seizures, strength)
Sensory (hearing, seeing, tasting/smelling, touching)

Activity Cards

The model of independent living is concretized in the form of Activity Cards. There are nine different activities. On a card there is first a general description of the activity e.g. “Care and keeping fit”. The Activity Card describes what the activity is about. Secondly, a suggested performance specification that specifies the activity has been put into a table. The information in the Activity Card is organized from left to right – from the performance specification to the variables. Thirdly three variables (quality, ability and resources) are listed through which one can look at the activity to find solutions. In the Activity Cards, the variables are not mentioned if they are not relevant concerning the performance specification. The Activity Cards are suggestions for the dwelling taking into account the occupant’s situation and requirements.

I General requirements and their performance specifications

This card describes the issues that should be taken into account during all the activities presented.

	Performance specification	Variable		
		QUALITY	ABILITY	RESOURCES
1	The overall design serves the purpose and materials are suitable.	Aesthetics Comfort		All
2	Indoor climate is appropriate.	Comfort Safety		Building services Furniture Operable building elements Spaces
2.1	Air moisture is suitable.			
2.2	The indoor materials are chemically safe.			
2.3	The warmth is comfortable.			
2.4	Air draught is avoided.			
3	The light conditions are appropriate.	Aesthetics Comfort Safety	Physical (balance, movement, reach) Sensory (seeing)	Building services Furniture Home entertainment Operable building elements Spaces
3.1	There is enough light and especially daylight in the spaces.			
3.2	Dazzling and glare from the surfaces are avoided.			
3.3	Adjustment of lights is easy.			
4	The acoustic conditions are appropriate.	Comfort	Sensory (hearing)	Domestic appliances Operable building elements Spaces
4.1	The echo is minimized.			
4.2	Background noise is minimized.			
5	Information is accessible and understandable.	Comfort Safety	Cognitive (alertness, concentration, memory) Sensory (hearing, seeing, taste/smell, touch)	Building services Domestic appliances Home entertainment Operable building elements Spaces Telecommunication Wearable devices
5.1	Information is logical and conspicuous. The language is simple and precise. Graphics, simple symbols or pictograms are used.			
5.2	Functions are familiar. Grouping, colours, location and logical context are used.			
5.3	Simultaneous actions are minimized and the length of sections demanding continuous control/attention is limited. Speed and pace are slow. Repetition is possible.			
5.4	Colours and contrasts are used to provide visual orientation for the space and to facilitate getting information.			
5.5	The information, the identification and the outlining of the space are facilitated with visual, vocal and tactile effects if needed.			
6	The solid wall, ceiling and floor surfaces behind the furniture and appliances improve adaptability and adjustability.	Functionality		Spaces
7	There is space for special equipment.	Functionality	Physical (balance, dexterity, movement, manipulation, reach, strength) Sensory (hearing, seeing, touch)	Spaces
8	There is equipment or systems in case of fire or other disaster in the house.	Safety	Cognitive (alertness, memory) Physical (movement, seizures) Sensory (hearing, seeing, taste/smell, touch)	Building services Spaces Telecommunication
9	The equipment or systems in case of an abrupt need of help can easily be installed.	Safety	Physical (balance, movement, manipulation, seizures)	Telecommunication Wearable devices

II Main activities and their performance specifications

CARE AND KEEPING FIT

Care and keeping fit is the main activity, which covers exercise, beauty care, watching the symptoms and treating them and taking care of mental and physical health. It appears in activities like medication, measuring blood pressure, cutting nails and beauty care like shaving and doing the hair.

	Performance specification	Variable		
		QUALITY	ABILITY	RESOURCES
1	There is a place for home health care and for storing the equipment.	Functionality		Operable building elements Spaces
1.1	There is a lockable medicine cabinet in the dwelling.			
2	There is a place for exercise and for storing the equipment.	Functionality		Operable building elements Spaces
3	There is a place for beauty care and for storing the equipment.	Functionality		Operable building elements Spaces

EATING

'Eating' covers the small-scale food preparing e.g. heating the half-prepared food, dining, and the storage of the food, dishes and waste, washing up the dishes and separating the waste.

	Performance specification	Variable		
		QUALITY	ABILITY	RESOURCES
1	There is room for a refrigerator, freezer, cooker, oven, dishwasher and microwave oven and for small appliances in the kitchen.	Functionality	Physical (balance, dexterity, manipulation, movement, strength)	Spaces
2	There is room for dining so that one does not need to take the dishes and the food to another room.	Comfort Safety	Physical (balance, manipulation, movement, strength)	Spaces
3	There is a place for the storage of food and dishes.	Functionality		Spaces
4	There is a place for washing up dishes.	Functionality		Spaces
5	There is a place for the storage of waste.	Functionality		Spaces

PERSONAL HYGIENE AND DRESSING

‘Personal hygiene and dressing’ covers washing oneself, going to the toilet and dressing up.

	Performance specification	Variable		
		QUALITY	ABILITY	RESOURCES
1	The location of the bathroom/toilet is suitable.	Safety Functionality	Physical (balance, manipulation, movement, strength) Sensory (seeing)	Spaces
1.1	The toilet is located close to the bedroom.			
1.2	There is an easy access from the entrance hall to the toilet.			
2	Level differences are avoided.	Safety	Physical (balance, manipulation, movement)	Spaces
2.1	There are no level differences between a bathroom floor and the floor of the room leading to the bathroom.			
2.2	There are no steps or edges in the bathroom floor. To allow floor drain low slopes are accepted.			
2.3	A bathtub is avoided.			
3	It is easy to get down and up from the toilet seat.	Safety	Physical (balance, manipulation, movement, strength)	Spaces
	The toilet seat is on appropriate height. It is easier to get down and up from the high toilet seat.			
	There is space for getting off the toilet seat and for assistance.			
4	There is an intimate hygiene shower next to the toilet seat.	Functionality	Physical (balance, manipulation, movement, strength)	
5	There is a possibility to sit while taking a shower.	Comfort	Physical (balance, manipulation, seizures, strength)	Spaces
6	Constructions are stable.	Functionality	Physical (balance, strength)	Spaces
6.1	Walls and ceiling are strong enough for support rails and lifting.			
6.2	If the washstand is used as support, it must be secured to withstand considerable load.			
7	The heights of the furniture are easy to change.	Functionality		Operable building elements Spaces
8	There are counters to lay the things while performing.		Physical (balance, movement, manipulation, reach) Sensory (hearing, seeing)	Spaces
8.1	There are shelves for spectacles, hearing aid and hygiene products next to a shower.			
8.2	There are shelves, a cupboard and a table for hygienic personal care utensils in the bathroom.			
9	It is possible to dress up in the toilet.		Physical (balance, movement, manipulation, reach)	Spaces
9.1	There is a place for dressing up and leaving the clothes.			
9.2	There is a mirror.			
10	The faucets are appropriate.	Safety	Physical (dexterity, manipulation) Sensory (seeing, touch)	Operable building elements
10.1	There is a temperature limiter.			
10.2	There is only one handle instead of two.			
10.3	The faucet can be electronically controlled releasing water when holding hands under it.			
11	The locked door of the bathroom should be able to open from outside.		Cognitive (memory) Physical (seizures)	Spaces

MOVING

Moving is the main activity that covers walking inside the dwelling and going out from the dwelling, opening the doors, carrying things and climbing the stairs.

	Performance specification	Variable		
		QUALITY	ABILITY	RESOURCES
1	Level differences are avoided.	Safety	Physical (balance, movement, manipulation)	Operable building elements Spaces
1.1	Thresholds are avoided.			
2	The essential spaces (bedroom, bathroom, living room, kitchen, room for textile care) are located in the main storey.	Safety	Physical (balance, movement, manipulation, strength)	Spaces
3	The floor materials prevent people from slipping.	Safety	Physical (movement, manipulation)	Operable building elements Spaces
4	The spaces are broad enough to move without restrain.		Physical (movement, manipulation)	Furniture Spaces
4.1	Spacious, simple and flexible layout facilitates accessible furnishing.			
4.2	Square rooms are easier to furnish than oblong rooms.			
5	Objects are easy to handle.		Physical (balance, dexterity, movement, manipulation, reach, strength) Sensory (seeing)	Operable building elements
5.1	Handles, knobs and locks are easy to grip and comfortable.			
5.2	Doors, windows and curtains are light and simple to open.			
6	Sharp and protruding corners are avoided.	Safety	Physical (balance, movement, manipulation, seizures) Sensory (seeing)	Furniture Operable building elements Spaces
7	The walls and floor covering resist the use of walkers and other moving equipment.	Aesthetics		Operable building elements
8	The entrance is protected against the weather.	Comfort Safety		Operable building elements
9	The entrance area and the doors to the collective spaces hinder burglary.	Security		Building services Operable building elements Spaces
10	The entrance is clearly marked (visual and tactile) and well lit.		Cognition (memory) Sensory (seeing)	Operable building elements
11	There is a possibility to sit and dress up in the entrance hall.		Physical (balance, manipulation, strength)	The entrance hall
12	Goods and products from retailers can be received unmanned.	Functionality	Physical (balance, dexterity, movement, manipulation, reach, seizures, strength)	Operable building elements
13	Stairs and staircases are accessible.	Safety	Physical (balance, manipulation, movement, strength) Sensory (seeing)	Building services Operable building elements
13.1	The beginning and the end of the staircase are clearly marked.			
13.2	There are constant lightning or light switches on every stair landing.			
13.3	Stairs and ramps are equipped with handrails on both sides.			
13.4	Spiral stairs are avoided.			
13.5	Long staircases are divided into several flights of steps of equal length with resting sections between.			
13.6	There are seats in the resting sections on the staircase.			
14	Elevators are accessible.		Physical (manipulation, movement, strength)	Operable building elements
14.1	The elevator is provided with automatic sliding doors.			
14.2	The entrance to the elevator is on the same level as the rest of the entrance floor.			
14.3	The elevator is appropriate size.			
15	All floors, including a basement and an attic, are accessible by an elevator.		Physical (manipulation, movement, strength)	Spaces
16	Handrails can facilitate moving and help the orientation.		Physical (balance, manipulation, movement, strength)	Operable building elements Spaces

RECREATION, COMMUNICATION AND SELF-ACTUALIZATION

‘Recreation, communication and self-actualisation’ covers entertainment, social life, hobbies and studying, outdoor recreation, watching TV and listening to the radio.

	Performance specification	Variable		
		QUALITY	ABILITY	RESOURCES
1	The dwelling is flexible to individual changes.	Aesthetics Functionality	Physical (balance, dexterity, movement, manipulation, reach) Sensory (hearing, seeing)	Operable building elements Spaces
1.1	Rooms are adaptable to occupying oneself.			
1.2	The dwelling is adaptable to decoration and fittings.			
2	There is room for social interaction.	Comfort		Spaces
2.1	There is room for residents and visitors to sit and have dinner together.			
2.2	There is room for visitors to sleep over.			
3	Spending time outdoors is possible.	Aesthetics Comfort	Physical (movement, manipulation, reach)	Spaces
3.1	There is an access to a balcony or to a yard from the dwelling.			
3.2	At least part of the balcony area or part of the yard is protected from the weather.			
3.3	There are places to get together at the yard.			
3.4	It is possible to see out from the balcony when sitting.			
3.5	It is possible to furnish the balcony appropriately.			
4	There are effective spotlights for reading, writing and for occupying oneself.		Sensory (seeing)	Building services Spaces
5	Communication is supported.	Functionality Safety	Physical (balance, manipulation, movement, reach, seizures) Sensory (seeing)	Building services Home entertainment Operable building elements Telecommunication Spaces
5.1	Every device has its own wall socket and there are extra wall sockets for temporary and future needs.			
5.2	The wireless devices are used.			
5.3	The dwelling is equipped with connections for telecommunication, which enable the use of the telephone, Internet and e-mail.			
5.4	Mail is received without difficulties.			

SLEEPING AND RESTING

‘Sleeping and resting’ covers night sleep and resting in the daytime.

	Performance specification	Variable		
		QUALITY	ABILITY	RESOURCES
1	The place for sleep and rest is quiet.	Comfort	Sensory (alertness)	Operable building elements
1.1	Sound insulation is adequate.			
2	Lightning supports orientation to the space.	Safety	Physical (balance, movement, manipulation, reach) Sensory (seeing)	Building services Bedroom
2.1	It is possible to turn on the lights from or near the bed.			
2.2	Environmental control systems or constant lightning can be used.			
3	The furniture is of appropriate size and shape.	Comfort	Physical (manipulation, strength)	Furniture Bedroom Living room
3.1	It is easy to get down/up from the bed and from the armchair.			

III Supporting activities and their performance specifications

‘GARDENING AND MAINTENANCE

‘Gardening and maintenance’ is the supporting activity, which covers the duties like the repairs of the ventilation or the pipe system, mowing the lawn and snow clearing.

	Performance specification	Variable		
		QUALITY	ABILITY	RESOURCES
1	The gardening and maintenance equipment has its own storing space and is easy to take into use.	Functionality	Cognitive (memory) Physical (balance, dexterity, movement, manipulation, reach, seizures, strength) Sensory (seeing)	Domestic devices Domestic appliances Operable building elements
2	The gardening and maintenance equipment is easy to use and keep clean.	Functionality	Cognitive (memory) Physical (balance, dexterity, movement, manipulation, reach, seizures, strength) Sensory (seeing)	Domestic devices Domestic appliances

HOUSEWORK

‘Housework’ covers cooking, textile care and cleaning. There are lots of activities included in the housework, like washing, cutting, boiling, freezing, hanging the clothes, vacuuming, mopping and wiping. Housework activities are also small duties like changing a battery to a fire alarm, cleaning the hood and changing the draperies.

	Performance specification	Variable		
		QUALITY	ABILITY	RESOURCES
1	There is a place for cooking and the overall space is appropriate and flexible. There is space for <ul style="list-style-type: none"> - storing of food, kitchenware and equipment. - preparation, meal making, baking and preservation. - washing up dishes. - separating the waste. 	Functionality Safety	Physical (balance, dexterity, movement, manipulation, reach, strength)	Domestic appliances Operable building elements Spaces
1.1	The cooker and water outlet are placed on the same wall.			
1.2	Drawers are used under the worktop instead of cupboards.			
1.3	The working points are close to each other.			
2	There is a place for textile care and the overall space is appropriate and flexible. There is space for <ul style="list-style-type: none"> - storing up and sorting out laundry. - a washing machine in the dwelling or next to the dwelling. - drying clothes in the dwelling or next to the dwelling. - giving an airing to bedclothes. 	Functionality Safety	Physical (balance, dexterity, movement, manipulation, reach, seizures, strength) Sensory (seeing)	Domestic appliances Operable building elements Spaces
2.1	The clothesline is located low or it can be lowered. Machined drying of the clothes can be used.			
3	There is a place to store the cleaning equipment. It is reachable and easy to keep in order.	Functionality		Domestic appliances Domestic devices Spaces
3.1	There is no footing in the cleaning cupboard.			
3.2	Wide cleaning cupboards are preferred to deeper ones.			
4	The housework equipment and appliances serve the purpose.	Functionality Safety	Physical (balance, dexterity, movement, manipulation, reach, strength)	Domestic appliances Domestic devices Spaces
4.1	The installation height for the equipment and appliances should be in the reaching area.			
4.2	The equipment and appliances are at adequate size.			
4.3	The equipment and appliances are easy to store and take into use.			
4.4	The equipment and appliances are easy to use and keep clean.			
4.5	There is a counter space adjacent to all appliances.			
5	Working by sitting is possible.		Physical (balance, strength)	Domestic appliances Operable building elements Spaces
5.1	There is space for knees under the worktop.			
6	Materials and the design help the housework.	Functionality	Physical (balance, dexterity, movement, manipulation, reach)	Domestic appliances Furniture Home entertainment Operable building elements Spaces
6.1	Shapes are round and even.			
6.2	Surfaces are smooth and hard.			
7	Electrical connections support the performance.	Functionality	Physical (balance, dexterity, manipulation, reach) Sensory (seeing)	Operable building elements Spaces
7.1	The wall sockets are at appropriate height and place.			
7.2	Every device has its own wall socket and there are extra wall sockets for temporary and future needs.			

STORAGE

‘Storage’ covers all kind of storage from outdoor clothes to a walker.

	Performance specification	Variable		
		QUALITY	ABILITY	RESOURCES
1	There is enough storage space and it is adequate and within reach.	Functionality	Physical (balance, dexterity, movement, manipulation, reach, strength) Sensory (hearing, seeing, touch)	Operable building elements Spaces
1.1	Storage should be located where the activity is performed.			
1.2	There is room for special equipment.			
2	Storage space outside the dwelling is located on the same floor as the dwelling or there is an elevator.		Physical (movement, manipulation, strength)	Operable building element

Annex 3. The criteria for surroundings- The Ball (Wheel) Model and the Activity Cards

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Activities

Mobility is a basic activity of all activities which are related to surroundings of homes, the near neighbourhood and connections by information and communication technology and media from home. Mobility is firmly connected to travelling and transportation. In the context of elderly housing, mobility is rather a phenomenon of moving around than mobility in the sense of travelling. However, the older one gets the closer the surroundings turn to. The surroundings related to housing cannot reach far either. Mobility in the context of elderly housing is much about moving out from the house, spending time in housing surroundings and using the paths for pedestrians and cyclists, and should we say in this case for the "walkerists".

Activities applied into the "Wheel Model" and some examples of the content of them are:

Eating out

- Going to restaurants, canteens and coffee shops
- Having meals in the balcony or in the garden
- Having a barbecue in the courtyard, etc.

Domestic work in shared spaces

- Using the common laundry rooms
- Airing and drying clothes and linen
- (Beating carpets)

Shared or outside home storing – relating to how often one needs to shop,

- Use of cold storage rooms (e.g. in cellar)
- Storing delivery from tele-shopping
- Storing sport ware, walkers, etc.
- Storing special equipment: car wheels, tools for hobbies which take much space such as sails, gardening equipment, etc.

Care and keeping fit outside (sport)

- Walking, cycling, skiing, etc.
- Recreation in special (shared) in-house and outdoor sport facilities such as swimming pools, saunas, gyms, room with mirror wall, etc.

Health care

- Visiting the health care centre, to doctors' consultation and to nurses
- Visiting social workers' offices

Welfare services (corresponding hygiene)

- Visiting hairdresser, beauty shops, etc.
- Having in-house services at home or in shared spaces

Activities of outside service providers at ones home

- Accessibility to enable housework help, medication, hygiene, etc.
- Workspace design

Running errands

- Personal business: visits municipal offices, meetings in lawyer's office, etc.
- Shopping
- Banking
- Posting

Communication

- Keeping in contact with relatives, friends, neighbours by new communication tools
- Getting entertained via media (utilizing new media)
- Tele-shopping, tele-banking, virtual classes, distant working (tele- or flexiwork), tele-medicin, tele-lawyers, etc.

Sociality

- Meeting others at home, in the courtyard, etc.
- Visiting relatives, neighbours and friends
- Having affair

Recreation, self-actualisation: hobbies, edutainment

- Visiting church, library, theatre and movies, sport events, etc.
- Social events and meetings in shared spaces for hobbies such as meeting and hobby rooms (such as golf simulators, tele-cottages, reading rooms, silent spaces, small church, etc.), banqueting room, accommodation for visitors, repair shops, spaces for workshop
- Education: taking courses outside home, having study groups at ones house

Resting – specifically activities outside

- Resting in the areas of housing surroundings
- Rest possibilities in the neighbourhood when running errands

Working (extra)

- Business, entrepreneurship or work at home: commuting, visiting clients and authorities, material supply, etc.
- Voluntary or charity work: taking care of children, relatives, friends, etc. either at home or at their place

Taking care of green areas in the yard and gardening

- Gardening or treating flowers of the flower beds in the (shared) courtyard
- Possibilities to enjoy glasshouses

Property maintenance

- Using the services of facilities management: waste management (recycling and other matters of sustainable development), repair and uninterrupted housing services, courtyard cleaning and snow removal (by the caretakers or by the tenants), care-take of buildings services, etc.
- Taking part in the maintenance work

Transportation

- Running vehicles
- Timing and route planning after information of timetables and chains
- Getting transportation services and escorting.

Qualities

The list of general qualities taken into consideration in any design and facilitation of built environment and applied in good house building practise are (those essential for surroundings bolded): **Accessibility**, Aesthetics, Affordability, Assortment (branding), **Availability**, Comfort & amenities, **Sustainability**, Eco-efficiency, Flexibility, Adaptability (spatial and periodic), Functionality (functionalism), **Design-for-all**, **Information efficiency**, Multi-, inter- and transdisciplinarity, Productivity (economy, efficiency, effectiveness, efficacy), Quality engineering and standards, **Re-thinking of chains**, **Safety & security**, **Technology-for-all**, **Transparency**, **Usability**, **User-connectivity**. On the other hand, such qualities as availability, affordability, Design-for-All, user-connectivity, productivity, quality engineering and standards, usability concern all activities and are not mentioned in the activity cards separately.

For the surroundings the most important of qualities are named at time being (the three or four last mentioned are specific for the information and communication technology):

1. Accessibility
2. Transparency
3. Re-thinking of chains
4. Design-for-all
5. User-connectivity
6. Sustainability
7. Eco-efficiency
8. Flexibility
9. Adaptability (spatial and periodic)
10. Assortment (branding)
11. Information efficiency
12. Usability
13. Technology-for-all.

The traditional qualities of building are such as:

1. Safety & security
2. Functionality (functionalism)
3. Comfort & amenities
4. Aesthetics
5. Affordability
6. Availability
7. Productivity (economy, efficiency, effectiveness, efficacy)
8. Quality engineering and standards.

Abilities

Some of the abilities are very personal in nature and related to intra-personal not inter-personal activities. Those abilities related to inter-personality are referred in the activity cards of surroundings and marked with bold letters:

- **Physical** (dexterity, movement, manipulation, reach, seizures, strength, voice)
- **Psychological** (temperament, feelings, behaviour patterns; habits, addiction, motivation)
- **Emotion** (the consequence of bodily reactions and mental modes due to stimulus, or sensing and feeling)
- **Instinct** (genetically programmed behaviour)
- **Sociability** (social relationships, group behaviour, social life and norms)
- **Sensory** (hearing, sight, taste, smell, touch, balance)
- **Cognitive** (understanding, integrating and processing of information)
- **Intellect** (know, comprehend and reason; knowledge management, memory, learning)
- **Spiritual** (intelligence for creativity or for satisfaction of needs, intuition to reach tacit knowledge and handle instincts with intelligence, mental growth and transcendency).

Examples of resources

During the creation of pre-criteria some resources for the surrounding were found and listed. The final set of activity cards of surroundings might include other resources depending of the needs of each activity in concern. The examples of resources are:

- Operable building elements (fence, ports, doors, stairs, ramps, lift, locking with doorbells, door telephones and video monitoring)
- Active structures (automated doors, windows, thresholds, curtains, shadings, etc.)
- Storage rooms near entrance for walkers, bikes, skies, other sport equipment, etc.
- Entrance halls or other shared space for to move or bring in and out goods (groceries, deliveries, repair equipment or furniture)
- Tele-cottages (and satellite offices), meeting and banqueting rooms, extra quest rooms, space for welfare service or maintenance providers
- Technical and maintenance spaces
- Shelter (shelter for entrance, terraces, barbeques, separate storage buildings, etc.)
- Yards and gardens
- Seats and rest areas on housing surroundings and in the neighbourhood (movable and adjustable chairs and benches)
- Hobby and recreation areas and facilities (plays, shared equipment, etc.)
- Possible domestic appliances outdoors
- Paths (walking paths, sideways, shortcuts)
- Back lanes and streets

- Neighbouring housing, nature and public buildings
- Personal transportation: access to vehicles and parking places or storages
- Public transport: stations, stops and platforms, information (building and street signs, signals, labels and timetables)
- Surfaces, coverings and pavements
- Location of personal business, services or public transport
- Telecommunication – media connections (e.g. cable television, satellite dishes), telephone and data lines, cables and antennas, personal devices of home health care e.g. wearable devices – pendant alarms, vital signs monitors, alarms for safety and security systems (burglar, fire).

Activity Cards

MOBILITY – accessibility in general

‘**Mobility**’ covers general, personal and business mobility requirements. The equipment is considered in the section Communication. The issues here relate to the area outside home and dwelling. This card describes the general criteria, which should be taken into account during all the activities presented. The classification of the problems of built environment for all is followed without allergy and reach

- Differences between levels
- Need of space
- Reaching distance especially when carrying items
- Orientation especially in finding ones way if sight is not good
- Balance in stairs, ramps and vehicles
- Reach of small people and wheel chair users
- Lack of strength in opening doors
- Complexity in use of technology and in understanding information contents
- Safety of infrastructure and maintenance
- Allergy; respiratory in particular
- Inequality caused by environment
- Noise
- Lack of light
- Lack of awareness.

Criteria	Variable		
	QUALITY	ABILITY	RESOURCE
<p>Reaching distance</p> <p>It is important to reach certain basic services and being active on daily basis in the surrounding neighbourhood or in local village, while the visits to rural centres and cities are done more occasionally.</p> <p>It is easy and appealing to move, walk or run and reach the needed destination for running errands, reaching services, meetings and visits, promoting physical and mental health.</p> <p>There is possibility and adequate easiness to use private car.</p> <p>Of the use of vehicles for reaching cf. Transport.</p>	<p>Accessibility</p> <p>Re-thinking of chains</p> <p>Sustainability</p> <p>Eco-efficiency</p> <p>Flexibility</p> <p>Adaptability</p> <p>Assortment</p> <p>Safety & security</p> <p>Functionality</p> <p>Comfort & amenities</p> <p>Aesthetics</p>	<p>Physical</p> <p>Psychological</p> <p>Sociability</p> <p>Intellect</p>	<p>The routes are short.</p> <p>The ramps are not too steep and long.</p> <p>There are enough and comfortable resting places available in the housing surroundings and neighbourhood, in the paths and especially on the way to stops and stations.</p> <p>Parking places near dwellings are safe and conveniently arranged. Parking garages are social secure and are good to manage.</p> <p>The sitting areas; seats and other public furniture are attractive.</p> <p>There are shelters in the mobility area.</p> <p>Because it is difficult to carry items such as groceries and equipment for activities, there can be lockers for temporary storing along the routes.</p> <p>For chaining of various transport modes there are locked shelters for vehicles or moving aids for periodic storing also in the near neighbourhood (e.g. parking of a walker) or in the stations are available walkers and rollers for use during walks.</p> <p>The housing complexes are in attractive scale and the opening up is conveniently arranged and recognisable.</p> <p>Town planning is based on the human scale as well as the use of car (cf. Transport).</p>
<p>Need of space</p> <p>It is easy to use a walker and cycle or bike (or use a preferred means).</p> <p>When running errands in offices etc. it is possible to have enough space provided for to operate and put and have things in a safe place.</p>	<p>Accessibility</p> <p>Flexibility</p> <p>Adaptability</p> <p>Safety & security</p> <p>Functionality</p> <p>Comfort & amenities</p> <p>Aesthetics</p>	<p>Physical</p> <p>Psychological</p> <p>Sociability</p> <p>Spiritual</p>	<p>Sufficient dimensions, finish, design and layout of:</p> <p>Shared spaces and spaces for entering and exiting</p> <p>Courtyard and garden</p> <p>Paths, ramps</p> <p>Parking places, pathway form the parking area to the home entrance</p> <p>Streets, walkways and alleys</p> <p>Stops and stations</p> <p>Plazas</p>

<p>Differences between levels</p> <p>It is easy to pass each other and move freely in and out as well as indoors and outdoors.</p> <p>Access to the balcony, terrace and outdoors through entrance is easy. These demands also apply for galleries and corridors.</p> <p>There are ways to move without the need to use stairs.</p>	<p>Accessibility Flexibility Adaptability Assortment Safety & security Functionality Aesthetics</p>	<p>Physical Psychological Sociability Sensory</p>	<p>Level differences are avoided:</p> <p>Stairs, entrance and ramps</p> <p>Courtyard and garden</p> <p>Parking places, pathway from the parking area to the home entrance</p> <p>Paths and back lanes</p> <p>Streets, walkways and alleys</p> <p>Stops and stations</p> <p>Elevators</p> <p>Stair climbers</p> <p>Automated thresholds</p> <p>Vehicles used for the special and demand driven transport services usually have passenger lifts.</p> <p>Kneeling buses</p> <p>Alternative path routes which make it possible to change levels gradually by walking (spiral paths).</p>
<p>Balance</p> <p>The stairs and ramps in housing complexes and outdoors are good for walking upon (not heavy) and downwards (without losing balance in particular).</p> <p>The vehicles of public transport are safe enough for keeping balance.</p> <p>Cf. Maintenance and Health of prevention of accidents</p>	<p>Accessibility Sustainability Eco-efficiency Assortment Information efficiency Safety & security Functionality Aesthetics</p>	<p>Physical Psychological Sensory Instinct</p>	<p>Level, pavements, surfaces and coverings of surrounding are smooth and even enough:</p> <p>Shared spaces and spaces for entering and exiting</p> <p>Courtyard and garden</p> <p>Parking places</p> <p>Paths and back lanes</p> <p>Streets, walkways and alleys</p> <p>Stops and stations</p> <p>Plazas</p> <p>Wide gaps in duckboards and the join between coverings are avoided.</p> <p>Sufficiently handrails</p> <p>The existence, beginning and end of the staircase are clearly marked.</p> <p>Unslippery material and friction on the surface for the use of walkers and other moving equipment</p> <p>Unreflecting materials for preventing mirages on the floors</p> <p>Personal help device</p>
<p>Safety</p> <p>The impression of spaces is socially secure for feeling safe.</p> <p>Surroundings seem not inviting for unauthorised people.</p> <p>It feels safe and secure to move about.</p> <p>There is equipment or systems improving safety in case of abrupt need of help (seizure, accident).</p>	<p>Transparency Assortment Information efficiency Technology-for-all Safety & security Functionality Comfort & amenities Aesthetics</p>	<p>Physical Psychological Sociability Sensory Cognitive</p>	<p>Design of entrances in and out avoid burglary and are well lit</p> <p>Locking and automatic access control of operable building elements</p> <p>Video-monitoring of courtyard and garden</p> <p>Ramps and paths cf. Balance</p> <p>Streets, walkways and alleys cf. Transport</p> <p>Possible paths behind housing complexes</p> <p>At vulnerable places a fence on the premises must be applied.</p> <p>Colour and contrasts or luminous tags are used to facilitate seeing outside in the paths, yard and garden as well as in the streets.</p> <p>Wearable devices and telecommunications</p>

<p>Orientation</p> <p>It is easy to find the way in general and specifically find the way to stations and stops and easy to find information about public transport.</p> <p>The design of the surroundings includes detectable markings, street and land marks for seeing better and remembering later.</p> <p>For those not seeing well can be used creeks or other water sounds, or chime and trees with shivering (whispering) sleeves for detective sound.</p> <p>The entrances to the building and in and out of the own dwelling are visible from the surroundings.</p>	<p>Functionality Safety Security Transparency Sustainability Eco-efficiency Assortment Information efficiency Technology-for-all Safety & security Functionality Comfort & amenities Aesthetics</p>	<p>Physical Psychological Sociability Sensory Cognitive Intellect Spiritual</p>	<p>The entrance is clearly marked (visual and tactile).</p> <p>Signing (labels, street signs, signals (such as signals at streetlights), warnings of obstacles) and guides (icons)</p> <p>Intelligent walker with GPS (Global Position System) and multimedia to know the location and how long to walk</p> <p>Use of signs which contrast with their background, which has simple symbols and where sizes of the letters are related to the reading distance.</p> <p>Signs and guidance should be well lighted.</p> <p>Grouping, colours, location, logical context and background and conformance to procedures used for similar controls in the person's environment can be used to help the performance.</p> <p>Use of colours and changing the covering material from one to another making it easier to see where to step.</p> <p>Colour and contrasts or luminous tags are used to facilitate seeing outside in the paths, yard and garden as well as in the streets</p> <p>For easier usability commonly used facilities such as for example waste containers are colourful and of different tones for identifying the waste type.</p>
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<p>Complexity Complexity occurs when using technical devices and when getting informed. The abilities to comprehend change during the age. Large personal differences occur. Simplistically put the "liquid" brain function becomes less active and "crystallised" start to dominate. In other words, roughly said creativity on new designs, connections, etc. becomes more difficult and understanding causal connections easier. Details become less important and the whole counts more. The modern elderly quite often do not understand foreign languages and translation into mother languages is essential in information distribution. Internet is a handy mean to compare alternatives (transparency) but the final purchase might still need personal connection either by phone or face to face at home or at service providers' place.</p>	<p>Accessibility Transparency Re-thinking of chains Assortment Information efficiency Technology-for-all Safety & security Functionality Comfort & amenities Aesthetics</p>	<p>Physical Psychological Sensory Cognitive Spiritual</p>	<p>Surroundings for improving concentration Signing and guides Telecommunication Icons and standard wording help people to understand, also those with dyslexia. Information is easy to understand. (Information is logical and conspicuous. The language is simple and precise. Colour and contrast are used to facilitate getting information. Graphics, simple symbols or pictograms are used.) Information is easy to get. (Simultaneous actions are minimised and the length of sections demanding continuous control/attention is limited. Speed and pace are slow. Repetition is possible.) Information is accessible despite the impairment. (The information, the identification and the outlining of the space are facilitated with visual, vocal and tactile effects.) Never use colour as the only carrier of information. Colour should be used as a complement to textual information. Where possible, signs should have text in raised pattern, to guide visually impaired people.</p>
<p>Noise The surroundings are peaceful. Background noise is minimised in the garden and yard. There is no disturbing or noisy transport.</p>	<p>Adaptability Assortment Safety & security Functionality Comfort & amenities Aesthetics</p>	<p>Psychological Sociability Sensory (hearing) Cognitive</p>	<p>Sound walls Sound insulation in building; pipelines of buildings services, elevator (and bedroom cf. Criteria of dwelling) Sound insulating materials, structures or spatial arrangement</p>

<p>Lack of light Provide good outdoor lighting for safety, balance and orientation. Natural lighting is targeted with the shade from strong sunshine. There are constant lightning or light switches on every stair landing.</p>	<p>Accessibility Assortment Safety & security Functionality Comfort & amenities Aesthetics</p>		<p>The lighting design in the yard and garden follow the lighting design criteria for elderly and if needed that of people with impaired sight – relating not only the safety, balance and orientation but also to social reasons.</p> <p>Good lighting means for example: use of indirect lighting, use of spot lights, no glare, flicker free light, sufficient intensity of light (not less than 1000 lux on the working area), sufficient contrast, appropriate direction and distribution of the light, appropriate colour of the light, no emission of heat or UV radiation.</p> <p>Making the moving easier, lights marking the routes on the floor or in the stairs are used.</p> <p>Lighting controls based in the first place on the need of light for various situations (pre-sets of lamps) and activities (manual sets by user friendly control withes or panels) and the amount of natural lighting are used to facilitate.</p> <p>Helping device for reading, writing (listening)</p>
<p>Lack of strength In addition to which has been above said about the need to rest when reaching distances, use of short distances, help in carrying items and prevention of falling by obstacles due to the lack of strength it might be impossible to open the doors and the possibility to operate sitting becomes necessary. Exercise diminishes loose of strength.</p>	<p>Accessibility Re-thinking of chains Flexibility Adaptability Safety & security Functionality Comfort & amenities Aesthetics</p>	Physical	<p>By mechanical or electrical mechanisms it is possible to make the operable building parts and element lighter to operate.</p> <p>Often free space help in operating when lacking muscle power.</p> <p>Cf. Keeping fit ibid.</p>
<p>Awareness Being aware of the possibilities of how the environment can help in independent living. Taking in use the latest knowledge available of the built environment helping in independent living in design, in building and in renovation.</p>	<p>Accessibility Transparency Information efficiency Technology-for-all Functionality Comfort & amenities Aesthetics</p>	Cognitive Intellect Spiritual	

<p>Inequality caused by environment Of environmentally-oriented inequalities can be mention that apartment is characterised as a world of women and men dominate facilities for transportation. What is inequality or equality is much to do with values, attitudes, thinking patterns, education etc. Typical factor for equality by environment are due to differences of size of human physiology which is e.g. dependent on gender.</p> <p>The possession, the rights of using and obligations of maintaining of facilities on the common property by the end-users need to be agreed on similarly to service providers.</p> <p>To be able to influence ones environment during design, usage and renovation.</p>	<p>Accessibility Transparency Assortment Information efficiency Technology-for-all Functionality Comfort & amenities Aesthetics</p>	<p>Psychological Sociability Cognitive Spiritual</p>	<p>The differences in interests in facilitation are taken into account in R&D work of products and in town planning.</p> <p>Information of the agreements, practises and cultures are available transparently in various media.</p>
<p>Feeling of home and connected Functions are familiar and the same as long as possible.</p>	<p>Accessibility Transparency Re-thinking of chains Sustainability Eco-efficiency Flexibility Adaptability Assortment Information efficiency Technology-for-all Safety & security Functionality Comfort & amenities Aesthetics</p>	<p>Psychological Sociality</p>	<p>Surroundings are social secure and conveniently arranged.</p> <p>The public way at which the dwelling is situated can be seen from the dwelling.</p>

TRANSPORT AND ESCORTING FOR SERVICES AND RUNNING ERRANDS

‘Transport’ covers running vehicles, getting transportation services and escorting and timing and route planning after information of timetables and chains. Transport is the access to services, for running errands, to education, hobbies, etc.

Criteria	Variable		
	QUALITY	ABILITY	RESOURCE
<p>The transportation possibilities are adequately accessible for all. The personal needs for mobility area may change when aged (cf. General Activity cards).</p> <p>Because the need of public transport can increase during the years it is good that enough stops and stations are available according to demand.</p> <p>On the other hand, the tendency of elderly to maintain the lifestyle they have obtained younger make it important to reach business area for recreation and other personal business by private car. There is a possibility and adequate easiness to use a private car.</p> <p>Those people, who according to their circumstances cannot use the public transport system, should be able to receive a “door to door” demand responsive transport service.</p>	Accessibility Transparency Re-thinking of chains Sustainability Eco-efficiency Flexibility Adaptability Assortment Information efficiency Technology-for-all Safety & security Functionality Comfort & amenities Aesthetics	Physical Psychological Sociability Sensory Cognitive Spiritual	Distance between home and stops of public transport Labels and signals Location of business area Location of personal business Location of recreation areas Transport services and their requirements The design of vehicles of public transport cf. Balance and Safety in General Activities Power-operated overhead doors in garages and carports No ramps in garages
<p>Internet, call centres or travel dispatch service centres are used for getting ride or for getting information of rides, timetables, etc. as well as printed tables.</p> <p>It is advised: to order the trip at least one hour before, a time window of 15 minutes before and after arranged pick up time, make reservation for detours too, be aware of the form of transport with shared vehicle and be provided with some unprejudiced and tolerant attitudes.</p>	Accessibility Transparency Re-thinking of chains Assortment Information efficiency Technology-for-all Functionality Comfort & amenities Aesthetics	Psychological Sociability Sensory Cognitive Intellect	Classes and other guidance on ICT for elderly
<p>The access to stops and stations and the walk across the crossings may be difficult: it takes time, the observation cause trouble in busy traffic and reaction times are relatively long. There is no need or it is safe to walk near busy public transport stations and stops.</p>	Accessibility Sustainability Flexibility Adaptability Assortment Safety & security Functionality	Physical Psychological Sociability Sensor	Transport facilitation takes into account the special needs of elderly. Good access routes from public (high)way to dwellings/housing complex Functional and safe crosswalk and junctions solutions: painting, kerb stones and surface materials

COMMUNICATION FOR SERVICES AND RUNNING ERRANDS

‘Communication’ is becoming a standard service provided in the housing among other building services: telephone, electricity, water, sewerage, heating and cooling. Existing housing stock is mainly without gabling for it. Telephone lines and exchange equipment, gable television or shared satellite connections help in facilitation of the access to information highways, but additional installations are needed for it. Also wireless services are available, but some of them have turned out to be infeasible due to the weakness of signals. Communications are the access to tele-services, for running errands, to education and entertainment, hobbies, etc.

Criteria	Variable		
	QUALITY	ABILITY	RESOURCE
Several design criteria for outdoor terminals such as cash dispensers or unmanned gas stations are available. They can be applied in Design-for-All concerning also elderly.	Accessibility Transparency Sustainability Eco-efficiency Flexibility Adaptability Assortment Information efficiency Technology-for-all Safety & security Functionality Comfort & amenities Aesthetics	Physical Psychological Sensory Cognitive Intellect	Outdoor terminal should be located and designed such that the user may have full control of all valuables and possessions. Outdoor terminals requiring speech input or output, or terminals where speech input or output could be advantageous to certain user groups (e.g. visually disabled persons) should not be located in noisy areas. Information needed to use the terminal should be visible, tactile and audible. Where the terminal is installed indoors, the entrance door to the site should preferably be an automatic sliding door. For outdoor terminals, the site should be one where direct or reflected sunlight or other bright lighting is prevented from striking the display of terminal, causing glare and lowering the contrast of the screen. The surface of the floor space should be in level in the direction parallel to the user interface of the terminal. The slope in other directions should not exceed 1:20. The surface should be stable, firm and non-slip.

<p>The more advanced the information society becomes the more the elderly also connect their homes in the information highways.</p> <p>There are two ways of purchasing the connection: private or shared with others living in the same house. The last one needs an agreement on the purchase. For example according to Finnish law the majority decision is enough for getting all to share the costs. In the case of shared purchase the real estate company takes care of acquisition of technical information and decision making or use the services of the providers of ICT.</p>	<p>Accessibility Transparency Eco-efficiency Flexibility Adaptability Assortment Information efficiency Technology-for-all Safety & security Functionality Comfort & amenities Aesthetics</p>	<p>Physical Psychological Sociability Sensory Cognitive Spiritual</p>	<p>The information network connections need always extra installations and decision on the used technology. A rule of thumb says that the more users and knowledge of technology among residents the less expensive the connection will be.</p> <p>In modern house the needs of information connection are taken into account in the electrical network installations.</p> <p>Quite often the quality of telephone lines is good enough for data exchange in existing housing stock.</p> <p>In the case wireless connections are needed the distance or the possibilities to have a WLAN-knot and antennas installed counts. Wireless technology saves from the renovation of electric gabling.</p> <p>It is possible to use power gabling for the information network connections or use it together with WLAN (wireless) technology.</p> <p>Gable television network serves the purposes of information transfer well too.</p> <p>If there are many concurrent heavy users, for example those who want to watch a movie in demand at the same time very high capacity connection is needed.</p>
<p>The need of information and knowledge of the use of information networks is obvious among adults in general.</p> <p>The interest in learning how to use new technology varies individually.</p> <p>Elderly who favour it feel that they are via ICT better connected to the society and life.</p> <p>Being up-to-date gives the security not to be an exception in any ways.</p>	<p>Accessibility Transparency Technology-for-all Functionality Comfort & amenities Aesthetics</p>	<p>Psychological Sociability Cognitive Intellect</p>	<p>Classes and other guidance on ICT for elderly</p>
<p>Mail is received without difficulties.</p> <p>Items from the tele-services and goods and products from retailers are obtained safe and secure, and unmanned.</p>	<p>Accessibility Assortment Safety & security Functionality Comfort & amenities Aesthetics</p>	<p>Physical Sociability</p>	<p>The goods are stored next to the elevator if possible. If this is not possible for elderly good are delivered on the floor where the door to the dwelling is located. Locker with trolleys can be used to easy the removal of the good into dwelling.</p>

EATING OUT

‘Eating out’ covers basically the idea that elderly who don't want to cook or eat alone at home can drop in local lunch bars or coffee shops or they can visit dinner restaurants either in the neighbourhood or in the municipal centres. The other idea of eating out is to eat with family or invite friends over to have meals outdoors. Why not the service provider can deliver the meals occasionally outdoors as well?

Criteria	Variable		
	QUALITY	ABILITY	RESOURCE
<p>There are attractive places to lunch and dine in the neighbourhood. The food is healthy and rather with some variety in quality and price. There are friends with whom to go out and socially acceptable ways to make friends with them.</p> <p>The access to the coffee shops, restaurant or canteens is free of charge and without physical obstacles.</p>	Accessibility Assortment Safety & security Functionality Comfort & amenities Aesthetics	Physical Psychological Sociability Sensory Spiritual	Cf. Distance and Safety in the Section of General ibid. Cf. Transport ibid.
<p>There are alternative places for eating in addition to dining room or kitchen. Balcony, terrace or garden can be provided with a kitchen or a barbeque and table set or at least with table sets for picnics.</p>	Accessibility Flexibility Adaptability Safety & security Functionality Comfort & amenities Aesthetics	Physical Psychological Sociability Spiritual	<p>There is an accessible sheltered place (from wind, sunshine, disturbing neighbours, etc.) where to have meals on yard, in the garden or in the terrace.</p> <p>There is room for a sink and stove or for a refrigerator, freezer, cooker, oven, dishwasher and microwave oven and for small appliances in the garden kitchen.</p> <p>Water tap and devises of a reasonable quality are provided.</p> <p>There are cupboards or lockers for blankets and pillows to be used for naps or in cold weather.</p>

RESTING

‘Resting’ in the daytime; comfortable, quiet places for sleep and rest are needed also outside.

Criteria	Variable		
	QUALITY	ABILITY	RESOURCE
There are enough attractive places in the garden to rest and think or sleep peacefully.	Accessibility Flexibility Adaptability Safety & security Functionality Comfort & amenities Aesthetics	Physical Psychological Sociability Sensory Cognitive Spiritual	Garden The wind conditions or sun are considered in the rest area regarding the personal preferences of the occupant. It is easy to get down/up from the rest place.
There are attractive rest places nearby the home like parks and chairs in the business area if one prefers to follow the busy life. There are peaceful places in the neighbourhood such as a church to think, to pray or to meditate	Accessibility Re-thinking of chains Safety & security Functionality Comfort & amenities Aesthetics	Physical Psychological Sociability Sensory Cognitive Spiritual	Neighbourhood, city area Cf. Distance and Safety in the Section of General ibid. Cf. Transport ibid.

WELFARE SERVICES

'Hygiene' covers washing oneself and dressing up so that the hygienic reasons don't affect mobility. A place to wash oneself and a toilet is needed. There should be room for dressing and clothes, hygienic personal care utensils and for a mirror. Assistance can be needed. The actions can partly be performed outside home. Services for them are available such as hairdressers, beauty shops, manicure, etc.

Criteria	Variable		
	QUALITY	ABILITY	RESOURCE
<p>Service and easily accessible information of it is available of the welfare service providers and their visits at homes or in the residences or neighbouring buildings where elderly are living.</p> <p>Hair dresser or barber shop, beauty shops, massage and other welfare services are within an easy reach either by walking, but they can also be further away than in walking distance and reached by car, public transport, service bus line, etc.</p>	<p>Accessibility</p> <p>Re-thinking of chains</p> <p>Flexibility</p> <p>Adaptability</p> <p>Assortment</p> <p>Information efficiency</p> <p>Safety & security</p> <p>Functionality</p> <p>Comfort & amenities</p> <p>Aesthetics</p>	<p>Physical</p> <p>Psychological</p> <p>Social Functioning</p> <p>Physical</p> <p>Psychological</p> <p>Sociability</p> <p>Sensory</p> <p>Cognitive</p> <p>Spiritual</p>	<p>The shared spaces in the house are provided with the space and facilities for the visits of welfare service providers.</p> <p>The house can be provided with such spaces as swimming pools and saunas with wash rooms for easily accessible hygiene - maybe in a more spacious place than own bathroom. If those spaces are shared the elderly can feel safe while someone is present in case for emergency situations.</p> <p>When drawing the plan for a municipality elderly housing could be located next to services still avoiding very noisy and restless locations.</p> <p>Internet sites for accessing service providers</p> <p>Internet home pages of the individual service</p>

HEALTH CARE

Criteria	Variable		
	QUALITY	ABILITY	RESOURCE
<p>Such new services as home health care, quite often aided by information and communication technology, and the home hospital activity make it possible to stay at home even then very frail or sick.</p> <p>Tele-medicin, tele-pharmacy, etc. services are developing rapidly and they are highly in demand especially in rural areas.</p>	<p>Accessibility</p> <p>Transparency</p> <p>Re-thinking of chains</p> <p>Sustainability</p> <p>Flexibility</p> <p>Adaptability</p> <p>Assortment</p> <p>Information efficiency</p> <p>Safety & security</p> <p>Functionality</p> <p>Comfort & amenities</p> <p>Aesthetics</p>	<p>Physical</p> <p>Psychological</p> <p>Sociability</p> <p>Sensory</p> <p>Cognitive</p> <p>Spiritual</p>	<p>Extra space normally near the bed and also extra wall sockets and data links or other technical connections.</p> <p>Wall sockets preferably connected to earth</p>
<p>The safe, healthy and comfortable courtyard and neighbourhood shall be used also in a manner preventing accidents.</p> <p>For prevention of falling accidents exercise and walk in particular and arrange the environment in a safe way.</p> <p>Prevent walking on wet, waxed and blinding coverage and pavements or on wet grass.</p> <p>Keep surfaces clean and remove dirt causing fallings in particular.</p> <p>Re-furniture of the outdoor or urban furniture can be considered if they cause accidents</p>	<p>Accessibility</p> <p>Re-thinking of chains</p> <p>Flexibility</p> <p>Adaptability</p> <p>Safety & security</p> <p>Functionality</p> <p>Comfort & amenities</p> <p>Aesthetics</p>	<p>Physical</p> <p>Psychological</p> <p>Sociability</p> <p>Sensory</p> <p>Cognitive</p> <p>Spiritual</p>	<p>Cf. Maintenance, General: Differences in levels and Balance ibid.</p>

CARE AND KEEPING FIT

‘Care and keeping fit’ is the main action, which covers activities like exercise and promotion of health. Spaces exercise and for store the equipment are needed.

Criteria	Variable		
	QUALITY	ABILITY	RESOURCE
Attractive paths and exercise areas are located within reach. Communal exercise programmes and groups for elderly.	Accessibility Safety & security Functionality Comfort & amenities Aesthetics	Physiology Psychological Sociability Sensory Spiritual	Outside home area When drawing the plan for a municipality elderly housing could be located next to nature. Leaflets at shops, at social and health care centres of the communal fitness programs
The sports ware and fitness equipment is easy to store and take into use to promote sports and keeping fit. Equipment of fitness training can be used outdoors for fresh air. Quite often space in balcony or in terrace is preserved for it.	Accessibility Flexibility Adaptability Safety & security Functionality Comfort & amenities Aesthetics	Physical Sensory Cognitive	There are easily accessible storage places for all kinds of mobility equipment and means of transport (e.g. walker, bike etc.) The bicycle stands are near by the entrances.
Elderly are not necessarily interested in taking courses in the fitness centres and the facilitation for independent exercising at home is needed. In case of polluted outdoor air or severe climate space for indoors rather with beautiful scenery is needed. Equipment of fitness training needs spacious place and is used in short periods which could be located rather in shares spaces and used in turns than in each dwelling. Shared spaces are often spacious enough for the independent exercising and offer possibilities for social connections. It is also recommended to arrange fitness groups for the elderly in their own home house.	Accessibility Flexibility Adaptability Safety & security Functionality Comfort & amenities Aesthetics	Physical Psychological Sociability Sensory Cognitive Spiritual	The house can be provided with such spaces as swimming pools, a gym or ball rooms with mirror walls for easily accessible group exercise. Swimming pools outdoors are also technically possible and provide refreshing enjoyment in Northern cold climates, although they are not all energy efficient if free energy is not available. The smart card system makes it possible to have a tailored made fitness program installed in the commonly shared fitness equipment.

SOCIALITY, RECREATION AND SELF-ACTUALIZATION: HOBBIES, EDUTAINMENT AND WORKING EXTRA

‘Recreation, communication and self-actualisation’ covers entertainment, social life, hobbies, and studying, outdoor recreation, watching TV and listening to the radio. Performing the activity need room for entertaining, home entertainment and communication devices. Many activities require effective lightning design according to the requirements of elderly and comfort environment. There should be a possibility to decorate the home and occupy oneself. Sports and gardening can be considered to be classified as hobbies which they are. Within these activity cards they are taking care separately because they have much to do with the surroundings.

Criteria	Variable		
	QUALITY	ABILITY	RESOURCE
There is space, facility, amenities and devises for hobbies and (domestic) work outside the dwelling.	Sustainability Eco-efficiency Flexibility Adaptability Safety & security Functionality Comfort & amenities Aesthetics	Physical Psychological Sociability Sensory Cognitive Intellect Spiritual	Operable building elements Design criteria for work and hobby space Examples of spaces: a dining and banqueting room, a tele-cottage, a private wine cellar with bar, silent room, a car repair shop, etc. Examples of facility: a car washing equipment, a golf simulator, etc.
There are attractive places and seats for residents and visitors to sit together or meet neighbours, friends and visitors in the garden, courtyard or in the city. It is possible to have a pet at home and the entrance is provided with the facilities to clean the paws when entering the house. There is enough room for visitors to sleepover either in the dwelling or in guest room in the shared spaces.	Accessibility Re-thinking of chains Flexibility Adaptability Safety & security Functionality Comfort & amenities Aesthetics	Physical Psychological Sociability Sensory Cognitive Intellect Spiritual	Extra heating units Moveable walls or sliding window doors, other active structures Extra wall sockets, gables for television, data connections for outdoor use The entrance is protected against the weather. At least part of the balcony, terrace and garden area is protected from the weather. Possibility to furnish the balcony, terrace and garden serving the purpose of eating, for social events such as playing cards, having friends over, etc. The possibility to have permanent or temporary green houses, fire places on the courtyard or in the garden for recreation and social life can be considered.
It is possible to see pleasant views from the balcony, terrace and garden. Favourable views are often named to be to the nature or to lively plaza.	Comfort & amenities Aesthetics	Physical Psychological Sociability Sensory Cognitive Intellect Spiritual	
The design/layout of a field within the complex, a (semi) public meeting place for neighbours is not damaged by vandalism and is not inconvenient and does not make the surrounding dwellings vulnerable for burglary.	Accessibility Safety & security Functionality Comfort & amenities Aesthetics	Physical Psychological Sociability Sensory Cognitive Intellect Spiritual	Courtyard Entrance and other shared spaces

TAKING CARE OF GREEN AREAS IN THE YARD AND GARDENING

Some elderly like to work outdoors and simple the stay or presence on the yard and garden can keep up some nice social contacts for chatting, changing common ideas and information, etc. Working together creates even closer contacts. Gardening might be heavy work and replace exercise in keeping fit and function. Ergonomic space, safe automatic machines and helping devices for the work are needed.

Criteria	Variable		
	QUALITY	ABILITY	RESOURCE
<p>Doing by sitting is possible in the garden.</p> <p>It is easy and comfortable to rest for a while when working in the garden or on the yard because there are movable chairs or other means for resting to ease the garden work.</p>	Sustainability Eco-efficiency Flexibility Adaptability Safety & security Functionality Comfort & amenities Aesthetics	Physical Sensory	Garden The worktops are sufficient low worktops in the dwelling and garden There could be adjustable facilities or facilities of different dimensions. Movable chairs A cleaning place for cleaning dirty boots or the paws of a pet when entering from garden.
<p>The gardening and maintenance equipment is easy to store and take into use.</p>	Accessibility Flexibility Assortment Safety & security Functionality Comfort & amenities Aesthetics	Physical Psychological Sensory	For example a cellar in basement for the storage shall be avoided while it is not easy to carry equipment stored behind stairs. Domestic devices Domestic appliances Operable building elements
<p>The gardening and maintenance equipment is easy to use and keep clean.</p> <p>Carrying articles or using a wheelbarrow is easy for example because it is easy to move on the paths with no obstacles.</p>	Accessibility Assortment Safety & security Functionality Comfort & amenities Aesthetics	Physical Sensory	For example there are available special gardening tools which aid physical work by making it lighter when less strength or stability is needed. Domestic devices Domestic appliances
<p>It might be difficult for all to accept all the gardening work done by the residents as a hobby.</p>	Transparency Information efficiency Technology-for-all Functionality Comfort & amenities Aesthetics	Psychological Sociability Cognitive Intellect Spiritual	A solution could be to mitigate the situation and ask a specialist for a general plan and other advice for the work for easy the agreement on how to treat common yards and gardens. All are informed of the plan. There is an agreement how to use the common yard and garden which takes into account the fact that elderly (and why not others too) might have the need to work on the garden or green areas on the courtyard having it as a hobby. All are informed of this agreement.

MAINTENANCE, REPAIR AND RENOVATION

‘Maintenance’ covers the duties like the repairs of the ventilation or the pipe system, mowing the lawn and snow clearing. Maintenance is often heavy work. Ergonomic space, safe automatic machines and helping devices for the work are needed. The activity can be carried out with the help of service providers.

Criteria	Variable		
	QUALITY	ABILITY	RESOURCE
Some elderly need help with even the simplest maintenance such as changing light bulbs.	Accessibility Transparency Information efficiency Safety & security Functionality Comfort & amenities	Physical Psychological Sociability Sensory	A space or a shared space for the maintenance service providers for the dwelling could be preserved in the shared spaces of the building for making service available for those residents who cannot or don't want to maintain their dwelling themselves.
Maintaining of yard and paths (cleaning and sanding) is an important mean of preventing falling accidents.	Cf. Health ibid.	Cf. Health ibid.	Cf. Health ibid. Good maintenance of rain water system Drying of water splash and removal of sludge and slush. Banks of snow in front of stops and stations after the ploughing are removed. Repair of individual holes as soon as possible.
Voluntary work for the courtyard and garden can replace the maintenance such as keeping the paths clean and smooth or removing snow if the elderly (or other) residents like to have exercise or something useful to do.	Technology-for-all Safety & security Functionality Comfort & amenities Aesthetics	Physical Psychological Sociability Spiritual	To guarantee an uninterrupted maintenance an agreement of the share of voluntary work and services is needed.

<p>Renovation is a mean for making the inappropriate present housing suitable for independent living of elderly.</p> <p>The form of possession of the dwelling limits the possibilities for renovation.</p>	<p>Transparency Sustainability Eco-efficiency Flexibility Adaptability Assortment Information efficiency Technology-for-all Safety & security Functionality Comfort & amenities Aesthetics</p>	<p>Physical Psychological Sociability Sensory Cognitive</p>	<p>Renovation of old structures means often replacing the existing building service equipment and piping, widening of the ports, ramps and doors, removing or lowering of thresholds, or replacing them with automatic thresholds, new painting for contrasts and visual appearance, adding unslippery coverings, etc.</p> <p>The increase of light with new painting and colours of visible contrast the present dwelling can be provided better for people with problems with seeing.</p> <p>The electric gabling will be repaired to be good for the information network connections or/and a WLAN-knot and antennas are installed for wireless connections.</p> <p>The street level can be raised to facilitate barrier free access in and out of house entrances to street in cities.</p> <p>Operable building elements such as addition of waste separation in the yard and in the garden because of ecological requirements.</p>
<p>Elderly do not have enough information of the possibilities to renovate their environment or where to get a repairman.</p>	<p>Accessibility Transparency Information efficiency Technology-for-all Safety & security Functionality Comfort & amenities Aesthetics</p>	<p>Psychological Sociability Sensory Cognitive Intellect</p>	<p>Information of maintenance and repair could be available by different channels to guarantee the availability of it to all.</p> <p>User guides of the instructions of maintenance and how to use the technical facilities are available for the residents. They advice why a maintenance activity has to take place, and what residents can and cannot do themselves and in the first place what to do in emergency situations.</p> <p>There can be available for the residents a service in internet on the home page of the housing real estate of the available service providers and their services and visits to the residence.</p> <p>Municipal guidance and advice personnel and centres</p>
<p>To save trouble and inconvenience repair and renovation work should be done by avoiding unnecessary noise and dust.</p> <p>Alarms are made by sound and light to provide sufficient attainability.</p>	<p>Accessibility Transparency Safety & security Comfort & amenities</p>	<p>Psychological Spiritual</p>	<p>Silenced repair equipment Protection against dust</p> <p>The building services are designed in a manner which makes it possible to maintain them without entering the dwellings or other private spaces for making the service work easy and guarantee privacy.</p>

STORAGE

‘Storage’ covers all kind of storage from hobby equipment, clothes, accessories and footwear to detergents. As far as possible, storage should locate where the activity is performed, like outdoor in the entrance hall. It is essential that the things are reachable.

Criteria	Variable		
	QUALITY	ABILITY	RESOURCE
There is space reservation outside or in the entrance hall for moving equipment, e.g. a walker.	Accessibility Safety & security Functionality Comfort & amenities Aesthetics	Physical Sensory	Operable building element The entrance hall Storage space outside the dwelling is located on the same floor or there is an elevator.
There is space for seasonal clothes, accessories, footwear and bags. There is easily accessible storage space for heavy and big seasonal items such as car wheels or equipment for hobbies. The storage shall be accessed by car or other mean of helping in carrying the items.	Accessibility Flexibility Adaptability Safety & security Functionality Comfort & amenities Aesthetics	Physical Sensory	Storage rooms outside dwelling are not too far from dwelling because carrying the items in or out is not handy and might cause a problem. A place for resting with a place where to put the items while taking and fetching the items. A carrying aid (trolley for example) for moving several or big and heavy items in and out the dwelling could be helpful when available outside the building in several locations (in parking place, near the port or in the lobby) not only for storing but when bringing groceries from parking place or bus stop.
There is enough storage space for goods and products to support the personal needs of the occupant regarding the frequency of shopping.	Accessibility Flexibility Adaptability Safety & security Functionality Comfort & amenities Aesthetics	Physical	Storage space warm and cold

INTERACTION BETWEEN DWELLINGS AND SURROUNDINGS

In the following list the overlaps of the dwelling and the surroundings are identified. These issues can be crucial for the controllability of the surroundings for an elderly while the gaps between disciplines are often those which are forgotten. The criteria for the surroundings take into account issues related to how well an elderly can be involved and affected in the outside world. The devices in the dwelling effect on the correspondence to the outside world. Moreover, the quality, devices, spatial issues and comfortability affect the possibilities for visitors and availability of assistance.

The resources in the interacted issues are related to the dwelling:

- Rooms
- Operable building elements
- The entrance hall and other shared spaces
- Telecommunication
- Wearable devices
- Furniture
- Domestic appliances
- The kitchen
- The room for textile care
- The bathroom, the toilet and the sauna
- The kitchen
- The room for textile care
- Outside door
- The balcony/outside the dwelling
- Home entertainment
- Work space/ Room for a writing table or other work/hobby devices

COMMUNICATION

‘Communication’ means connection from home. Communication channels reach all over the house. The installations, maintenance as well as use of it need space to be reserved for it particularly.

Criteria	Variable		
	QUALITY	ABILITY	RESOURCE
<p>When housing is equipped with communication networks, which enable the use of the telephone, Internet and e-mail, the access to communication channels makes spatial demand for equipment and working area in housing.</p> <p>The exchanges and control panels, etc. need cabinets and the opening of the cabinet doors free space in shared spaces or in technical and maintenance rooms as well as in dwelling while the equipment in reaching in various places in house.</p>	<p>Accessibility Sustainability Eco-efficiency Information efficiency Safety & security Functionality Comfort & amenities Aesthetics</p>	<p>Physical Cognitive</p>	<p>Spacious technical and maintenance rooms Space reservations for gabling and equipment of communication technology Operable building elements Telecommunication</p>
<p>The use of communication channels means often writing, paying bills, surfing in the Internet, studying, etc. Many assistive activities may take place simultaneously such as reading or looking additional information from papers, making notes on paper, listening to radio, having grand children over for latest updates of plays, etc. Space and furniture in addition to equipment are needed at dwellings or those activities can be located in the shared spaces where also learning from others and social connections are more possible than at home.</p> <p>Some more expensive peripheral device can be used commonly and a tele-cottage for them can be arranged not only in the rural areas but also in the block of flats in the cities.</p>	<p>Accessibility Eco-efficiency Flexibility Adaptability Information efficiency Safety & security Functionality Comfort & amenities Aesthetics</p>	<p>Physical Psychological Sociability Sensory Cognitive Spiritual</p>	<p>Home office Studio Home library Computer desk in the kitchen Home theater for home entertainment Telecommunication</p>

OUTSIDE SERVICE PROVIDERS

Service providers can deliver the food and groceries to the occupant and help with the actions and eating outside.

Criteria	Variable		
	QUALITY	ABILITY	RESOURCE
<p>The essential rooms are located in the main storey in case of two or more storeys in the dwelling to facilitate outside services. Essential rooms are: kitchen, toilet and bathroom and bedroom.</p> <p>There is enough space in the kitchen to several people to work at the same time if elderly wish to cook with a person who help.</p> <p>There is sufficient space, equipment and safety appliances and storage in the dwelling for outside services to provide eating, home health care and cleaning services.</p>	Accessibility Re-thinking of chains Sustainability Flexibility Adaptability Assortment Information efficiency Safety & security Functionality Comfort & amenities Aesthetics	Physical Psychological Sociability Sensory Cognitive Spiritual	<p>Products and environment are failsafe for outside services and friends and relatives.</p> <p>The rooms are broad enough to move without restrain to facilitate cleaning by outside providers of services</p> <p>Materials and the design help the maintenance of the rooms relating to outside service providers.</p> <p>The placement of the furniture helps the maintenance of the rooms relating to outside service providers.</p> <p>The domestic appliances are at adequate size relating to outside service providers.</p> <p>There is plenty of storage room within reach relating to the frequency of shopping.</p> <p>Operable building elements Automated domestic appliances and self-cleaning surfaces and windows</p>
<p>There is a place for dry clothes in the dwelling or near to the dwelling.</p> <p>There is a place to give an airing to bedclothes.</p>	Functionality Comfort & amenities Aesthetics	Physical Sociability Sensory	Operable building elements The balcony The room for textile care Operable building elements The balcony/outside the dwelling
	Accessibility Transparency Re-thinking of chains Sustainability Eco-efficiency Flexibility Adaptability Assortment Information efficiency Technology-for-all Safety & security Functionality Comfort & amenities Aesthetics	Physical Psychological Sociability Sensory Cognitive Intellect Spiritual	

Annex 4. The Criteria for Services – the Ball Model and the Activity Cards

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The Model of Independent Living – the Ball model

The Ball model describes an idea of taking different variables into account when evaluating the fitness for the use of dwelling, surroundings and services for elderly people. The variables in the Ball model are selected to cover different areas of living. One can also use it as a tool in analysing the present knowledge (guidelines, standards and regulations) and formulating the comprehension of elderly habitation out of them. That means for example evaluating the products and combinations of products and services in order to detect critical points. The Ball model serves also as a planning tool and a generator of new ideas. The purpose of the criteria is awareness wakening – giving the guidelines to the planners and to the elderly rather than giving strict instructions. In the model four main variables are introduced: abilities, activities, resources and qualities.

Activities

Main activities

CARE AND KEEPING FIT
PERSONAL HYGIENE AND DRESSING COMMUNICATION AND SELF-ACTUALIZATION

Supporting activities

GARDENING AND MAINTENANCE
HOUSEWORK (COOKING, WASHING, CLEANING)
MOVING
SHOPPING

Resources

Human resources.

Elderly himself/herself and with the help of the spouse and/or other family members or other relatives

Services providers

- Municipal home help service
- Private home help service
- 3rd sector service (volunteers)

Services available for all in the surroundings (accessibility)

Services in the surroundings especially for elderly

(for instance day centers for the elderly and special transports services for elderly and disabled)

Material resources

- Income
- Machines and appliances
- Products

Qualities

Variety

Availability

Affordability

Transparency (of various types of available services)

Adaptability (to individual and changing needs) and user influence (right of appeal of decisions of delivered services)

Abilities

Cognitive (alertness, concentration, memory)

Physical (balance, dexterity, movement, manipulation, reach, seizures, strength)

Sensory (hearing, seeing, taste/smell, touch)

Activity Cards

The model of independent living is concretized in the form of Activity Cards.

The Activity Card describes what the activity is about. Secondly, a suggested performance specification that specifies the potential activity has been put into a table. The information in the Activity Card is organized from left to right – from the performance specification to the variables. Thirdly three variables (quality, ability and resources) are listed through which one can look at the activity to find solutions. In the Activity Cards, the variables are not mentioned if they are not relevant concerning the performance specification. The Activity Cards are suggestions for the help (services) available taking into account the concrete situation and requirements of the elderly person.

HOUSEWORK I: Cooking

‘Housework’ covers cooking, textile care and cleaning. There are lots of activities including in the housework, like washing, cutting, boiling, freezing, hanging the clothes, vacuuming, mopping and wiping. Service providers can do parts of the housework.

Performance specification	Variable		
	QUALITY	ABILITY	RESOURCES
<p>It is possible to have a hot meal every day. There are different ways of taking care of cooking depending of one’s choice and the availability and price of the services.</p>	Availability Affordability Adaptability and user influence	Cognitive (alertness, concentration, memory) Physical (balance, dexterity, movement, manipulation, reach, seizures) Sensory (hearing, seeing, taste/smell, touch)	Products Service providers Services Appliances

The concrete solutions are not necessarily the same for all days of the week and all times of the year. By combining the various alternatives a variety of concrete solutions can be found like:

1. You cook by yourself

You use ready made or half prepared meals.

You take training courses in cooking.

2. Someone from your family (other relatives) cooks with you or for you.

3. A service provider (home-helper) comes to your dwelling and cooks for you.

4. The meal is cooked in the central kitchen.

You get meals-on-wheels in the form of hot, cooled down or frozen meals if possible after your own choice. You re-heat the cooled down or frozen meals in a microwave oven at a time of the day when you wish to eat.

You decide the size and number of the dishes if this is possible.

You decide the menu's to the extend this is possible.

5. You have your meals outside home.

One or more times a week depending of your choice and the availability of this service you eat in a day centre for the elderly or a similar place with reduced prices (a community centre). This might be combined with transportation services.

One or more times a week depending of your choice you eat at the cafeteria.

At special occasions or more regular depending on your choice and your economy you eat in restaurants.

HOUSEWORK 2: Cleaning

‘**Housework**’ covers cooking, textile care and cleaning. There are lots of activities including in the housework, like washing, cutting, boiling, freezing, hanging the clothes, vacuuming, mopping and wiping. Housework activities are also small duties like changing a battery to a fire alarm, cleaning the hood and changing the draperies. Service providers can also do the housework.

	Performance specification	Variable		
		QUALITY	ABILITY	RESOURCES
	It is possible to get your dwelling cleaned depending of one's choice and the availability and price of the services.	Availability Affordability Adaptability and user influence	Cognitive (alertness, concentration, memory) Physical (balance, dexterity, movement, manipulation, reach, seizures) Sensory (hearing, seeing, taste/smell, touch)	Services Appliances Income Relatives
<p>By combining the various alternatives a variety of concrete solutions can be found like:</p> <ol style="list-style-type: none"> 1. You do it yourself You use good equipment and appliances. You use modern technique like automatic vacuum cleaner. 2. You get help from the family members inside or outside the household with the cleaning tasks. 3. You get help from home-helpers for common cleaning tasks like vacuum cleaning. 4 You pay service providers for extra cleaning tasks like window cleaning. If the amount of cleaning or the regularity of cleaning performed by home-helpers does not satisfy you, you appeal the decisions taken about this. 5. You do changes at home to help cleaning. You stretch some cleaning tasks over longer periods. For instance you don't do the vacuum cleaning in all rooms the same day. You reduce the amount of cleaning by changing some of the furniture or by getting rid of carpets. You reduce the amount of cleaning by not using all rooms regularly. You reduce the amount of cleaning by moving to a smaller and/or more modern dwelling. 				

HOUSEWORK 3: Washing

‘Housework’ covers cooking, textile care and cleaning. There are lots of activities including in the housework, like washing, cutting, boiling, freezing, hanging the clothes, vacuuming, mopping and wiping. Housework activities are also small duties like changing a battery to a fire alarm, cleaning the hood and changing the draperies. The housework can be done by service providers.

Performance specification	Variable		
	QUALITY	ABILITY	RESOURCES
It is possible to get your textile (cloths, linen, curtains etc) washed regularly.	Availability Affordability Adaptability and user influence	Cognitive (alertness, concentration, memory) Physical (balance, dexterity, movement, manipulation, reach, seizures) Sensory (hearing, seeing, taste/smell, touch)	Services Appliances Income Relatives

By combining the various alternatives a variety of concrete solutions can be found like:

1. You use a washing machine in your home or in the house laundry (or in the neighbourhood.)
2. Family members inside or outside the household help you with washing.
3. You get help from home-helpers to the washing.
4. You pay service providers for doing the washing.

Personal hygiene and dressing

Performance specification	Variable		
	QUALITY	ABILITY	RESOURCES
It is possible for you to get in and out of bed, to use the toilet, to get washed, to cut toenails and to get dressed.	Availability Affordability Adaptability and user influence	Cognitive (alertness, concentration, memory) Physical (balance, dexterity, movement, manipulation, reach, seizures) Sensory (hearing, seeing, taste/smell, touch)	Services Appliances Income

By combining the various alternatives a variety of concrete solutions can be found like:

1. You have a motorised hospital bed to get in and out from the bed.
2. You have a home-helper to assists you e.g. twice a day.
3. You get clothes that are easier to use, you get equipment to use to make part of the dressing process easier and/or you get assistance from home-helpers.
4. To cut toenails you get it done in a day-care centre (might be combined with the use of transportation services) or you get a service provider to give you a pedicure in your home.

Communication and self-actualisation

	Performance specification	Variable		
		QUALITY	ABILITY	RESOURCES
	It is possible to get help and communicate with service providers and other people and to participate in various activities.	Availability Affordability Adaptability and user influence	Cognitive (alertness, concentration, memory) Physical (balance, dexterity, movement, manipulation, reach, seizures) Sensory (hearing, seeing, taste/smell, touch)	Services Appliances Income
<p>By combining the various alternatives variety of concrete solutions can be found like:</p> <ol style="list-style-type: none"> 1. An emergency alarm system can be installed in your dwelling if there is a risk of falling and you know it might be difficult to get up and get the telephone in order to ask somebody for help. 2. The transportation services can be used when participating in activities with other people or in activities especially for elderly people e.g. in day centre for the elderly or in a community centre for all age groups or an association or a club. 3. The regular visits from voluntary "visit friends" can be applied if you are lonely and you do not like to get out. 				

Gardening

	Performance specification	Variable		
		QUALITY	ABILITY	RESOURCES
	It is possible for you to keep your garden	Availability Affordability Adaptability and user influence	Cognitive (alertness, concentration, memory) Physical (balance, dexterity, movement, manipulation, reach, seizures) Sensory (hearing, seeing, taste/smell, touch)	Services Appliances Income Relatives
<p>By combining the various alternatives a variety of concrete solutions can be found like:</p> <ol style="list-style-type: none"> 1. You do it yourself You use good equipment and appliances. You use modern technique like automatic lawn mower. 2. You get help from relatives or you pay for or you apply for gardening service. 3 You make changes and let your garden rearrange so it is easier to keep. 4. You move to another dwelling with a smaller garden or a flat with a balcony. 				

Shopping

	Performance specification	Variable		
		QUALITY	ABILITY	RESOURCES
	It is possible to get daily necessary goods into your home even if you cannot perform the shopping yourself or if you have difficulties only with carrying heavy merchandises.	Availability Affordability Adaptability and user influence	Cognitive (alertness, concentration, memory) Physical (balance, dexterity, movement, manipulation, reach, seizures) Sensory (hearing, seeing, taste/smell, touch)	Services Appliances Income Relatives
<p>By combining the various alternatives a variety of concrete solutions can be found like:</p> <ol style="list-style-type: none"> 1. You use special transport services for disabled persons to and from shopping centers. 2. You are escorted to the shops by a helper one or more times a week. 3. You get help for family members inside or outside the household to some of the shopping jobs. 4. A service provider (home-helper) does the shopping or only the shopping of heavy merchandises for you one or more times a week. 5. You use mobile shops serving the area and stopping outside the individual homes or groups of homes. 6. You use the delivery services provided by some shops to people that for some reasons are not able to do the shopping themselves. 7. You can also reduce the need for daily shopping by applying for meals-on wheels service if you also need this service 				

Mobility

	Performance specification	Variable		
		QUALITY	ABILITY	RESOURCES
	It is possible for you to get around inside and outside your dwelling and to get to places like shopping centre, cinemas, community centre, parks, museums, pharmacies, GP's etc. and to visit friends and relatives in the surroundings.	Availability Affordability Adaptability and user influence	Cognitive (alertness, concentration, memory) Physical (balance, dexterity, movement, manipulation, reach, seizures) Sensory (hearing, seeing, taste/smell, touch)	Services Appliances Income Relatives
<p>By combining the various alternatives a variety of concrete solutions can be found like:</p> <ol style="list-style-type: none"> 1. You buy or apply for a roller or a wheelchair. This solution is often combined with housing adaptations like the removal of thresholds or even installation of ramps. 2. An electrical wheelchair will enable you to get further around. 3. A roller or a wheelchair can also be combined with escort services or help from relatives. 4. You use special transport services if the local public transport is not designed also for wheelchair users. 				

Care and keeping fit

	Performance specification	Variable		
		QUALITY	ABILITY	RESOURCES
	It is possible for you to get various (health) care services.	Availability Affordability Adaptability and user influence	Cognitive (alertness, concentration, memory) Physical (balance, dexterity, movement, manipulation, reach, seizures) Sensory (hearing, seeing, taste/smell, touch)	Services Appliances Income
<p>By combining the various alternatives a variety of concrete solutions can be found like:</p> <ol style="list-style-type: none"> 1. District nursing 2. Yearly check up by GP's 3. Health advice services 4. Mental health services 5. Yearly vaccinations 6. Training by physiotherapists 7. Short stay in rehabilitation homes 				