The Green Loop for Active Ageing
The Landscape-based Infrastructure Design in the Shrinking Parkstad

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Key words: Aging-friendly Design, Landscape as Green Infrastructure

LANDSCAPE ARCHITECTURE MSC THESIS - JULY 2019
When you are old

WILLIAM BUTLER YEATS
1865-1939

"I believe the second half of one's life is meant to be better than the first half. The first half is finding out how you do it. And the second half is enjoying it." — Frances Lear

When you are old and grey and full of sleep,
And nodding by the fire, take down this book,
And slowly read, and dream of the soft look
Your eyes had once, and of their shadows deep;

How many loved your moments of glad grace,
And loved your beauty with love false or true,
But one man loved the pilgrim soul in you,
And loved the sorrows of your changing face;

And bending down beside the glowing bars,
Murmur, a little sadly, how Love fled
And paced upon the mountains overhead
And hid his face amid a crowd of stars.

To Frits
for the consistent guidance and help with great inspiration.

To Anne
for sharing me the knowledge and experience of Parkstad,

To Chunwei
for giving me the encouragement and patience.
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01 Introduction

Fascination, Problem Field, Parkstad’s Significance, Scope and Definition, Research Question
Aging, a world-wide trend

Aging is a common problem around the world. From the statistical results from World Population Prospects in 2017 show that the population of the world aged 60 or over was 962 million, more than twice the global population of 382 million in 1980. This number is expected to reach nearly 2.1 billion by 2050. It is estimated that by 2030, the number of older people will exceed that of children under 10 (1.41 billion to 1.35 billion); in 2050, the amount of the elderly will be more than the 10-24 years youth. The number of people aged 80 or older worldwide is projected to increase more than three times between 2017 and 2050, from 137 million to 425 million. In the world wide, Europe is the most aging area. The proportion of the elderly in the total population will reach more than 30% within 30 years. This means one out of every three people is an elderly person. And the Netherlands has the highest independent-live alone or with a spouse only- ratio (93.4%).

How to meet the new normal is a problem that all countries, especially European countries, must consider and actively deal with.

Aging-friendly World

In order to make the inclusion of the elders easier, the main strategy from the WHO (World Health Organization) is to make our world more age-friendly. Age-friendly means that the opportunity to participate in public activities is fair to everyone, regardless of age. This includes the possibility of using public places. The aim is to reduce age discrimination and increase respect for the elderly through related interventions and transformations. The core meaning is helping people stay healthy and active as they grow older. And this is also the content of this graduation design project.

Active Aging Impressions

Aging is a natural process for everyone. How to lead a healthy and carefree later life is the problem faced by the elderly today and a great challenge for us in the future as well. We are all aging. We need a high-quality life and stay with it as long as possible to the end. Retirement is an achievement for your life. It is a time to enjoy your own life, share your happiness, and find new meaning. Through this project to create an aging-friendly environment, helping people to build a positive old age impression is my basic starting point.
(1) Urban & Rural area at the border

Parkstad is an urban area in a rural environment, at the South East of the Netherlands, with an border location. The urban area has a lot of green and open areas: a real Parkcity. It is to the east of Maastricht and north(10 miles) of the German city of Aachen.

(2) Park Cities

Parkstad Limburg is a region of eight municipalities in the South-East of Limburg: Brunssum, Heerlen, Kerkrade, Landgraaf, Nuth, Onderbanken, Simpelveld and Voerendaal. The region is with 271,000 inhabitants one of the most urbanized and most densely populated areas of the Netherlands. Almost a quarter of all the people in Limburg are living in Parkstad. Heerlen is the core city. It is the third largest settlement proper in the province of Limburg. Measured as municipality, it is the fourth municipality in the province of Limburg.
Redirected Urban Renewal

Like many other industrial cities, Parkstad in Zuid-Limburg, experienced a high-speed expansion urbanism in the last century. With the closure of mine pits and decline of industry, shrinkage of population happens there especially among the urban area. In contrast to the decreasing on population, the area of green space in Parkstad is continually increasing until now. Nowadays, Parkstad becomes a promised idyllic city with the highest average green per household, which is almost 3 times as the noticeable cities in the Netherlands such as Amsterdam, Utrecht, Rotterdam and so on. With the new challenges and repositioning, it is reaching the turning point on development. New urban potential and identity need to be discovered. Urban renewal brings the new possibilities here in the coming future.

Shrinkage

Shrinking cities or urban depopulation are dense cities that have experienced notable population loss. Emigration (migration from a place) is a common reason for city shrinkage. Since the infrastructure of such cities was built to support a larger population, its maintenance can become a serious concern. A related phenomenon is counterurbanization. The shrinkage of Parkstad has already kept for over ten years.

Economically driven selective out-migration
In the urban transformation stage, the economic decline caused by industrial recession is the main reason for the population to move out.

Shrinking Core

Shrinkage in Parkstad influences most on the urban area where over 85% of residents live in. Moreover, there are over 60% of the whole population shaping the high-density living environment in the central urban area around Heerlen.
The history of Parkstad starts in Heerlen with the arrival of the Romans. They founded a military settlement, named Coriovallum on the crossroad of two main roads: Boulogne sur Mer - Cologne and Xanten - Aachen - Trier. In Heerlen and its surroundings a lot of evidence of Roman life has been excavated, especially Roman villas (country estates).

In the 19th century, Parkstad did not partake in the Industrial Revolution and it remained largely agricultural until coal mining began in the late 19th/early 20th century.

From 1890 to 1969, like many other European industrial cities, Parkstad in Zuid-Limburg experienced a high-speed expansion urbanism.

In the period 1965–1975 the coal mines were closed altogether. In the area around Heerlen-Kerkrade-Brunssum and Sittard-Geleen 60,000 people lost their jobs. A difficult period of economic re-adjustment started.

A new balance needs to be established, and the relationship between people and the landscape is linked through a livable environment.

The Dutch government tried to ease the pain by moving several governmental offices (ABP, CBS) to Heerlen but even today the city has not fully recovered from the loss of tens of thousands of jobs. In the cityshape of modern-day Heerlen very little reminds us of the once omnipresent mining industry.

Most of the typical mounts of mining debris that surrounded the coal mines, have been removed or transformed into green hills during an operation called van zwart naar groen (from black to green).

A new balance needs to be established, and the relationship between people and the landscape is linked through a livable environment.
NEW NORMAL: CARING OF THE ELDERLY

Although the population of Parkstad is decreasing, the government demographic data predicted that the percentage of people over 65 years old is going to increase from 33% to around 50% in the coming 15 years. The elderly meets more difficulties to access to the public space but has more time to use this area as a necessary part to enjoy a meaningful and healthy life.

Urban in LifeCircle:
As mentioned before, more than 85% of people live in urban areas. More than 60% are distributed near the core circle of Heerlen. With the decline of mobility and the emergence of diseases, the older people are more likely to live in cities with better medical and caring conditions.

The Older, The Faster:
People over 80 is the fastest-growing segment of the total population. Their growth rate is twice that of those 65 and over and almost 4-times that for the total population.

New Normal: Caring of the Elderly

In order to get better jobs, young generation leaves to big cities. Elders are staying in their independently with their “old” friends. “Sometimes we feel that we are eliminated.” An interviewed old man said this.
The uneven distribution of coal resources and the accompanying traffic development have made the entire region rapidly urbanized on one side. As the result, the type of landscape is very different between the two sides of the highway. One side is agriculture landscape and another has more urbanism, but both of them developed based on the valley terrain. The mining-centered approach to development has also led to a multi-center, loose urban structure.

Zwischenstadt stands for the urbanized landscape between old cities (Thomas, 2003). In 2014, the Neimed, the center which collects expertise and experiences of the shrinking regions in the Netherlands with special emphasis on the City Region Parkstad Limburg, organized a conference to understand the urban development of Parkstad. The participating experts define Parkstad which lies between ‘old’ cities Maastricht and Aachen as the Zwischenstadt (Maurice & Thomas, 2015). The non-structure and apparently incoherent development of its urban area which is labeled as unaesthetic are the characteristics of the Zwischenstadt like Parkstad. Thomas proposes that more cities in the world are actually in this state. In fact, with the progress of urbanization, the expansion of large cities, more and more regions become Zwischenstadt (Thomas, 2003).

Under the attraction of the big cities on both sides, Parkstad has a special urban form. The urban pattern is different from general cities. Plaque-like development allows cities and wilderness to coexist in the living environment. Whether or not to make better use of this particular status quo is one of the significance of the project. This also allows the project itself to have greater promotion and reference value in a wide range of such between-city area.

Reference:
A BALANCED OPTION
THE POSSIBILITY OF COMBINING ADVANTAGES

Approaches after retirement

The choices in normal cities and countryside that are provided for the elderly people have its own flaws especially the issue of sustainability, whether to choose a separate elderly apartment in the city, or a collective retirement village that needs to relocated its living place to a rural area.

Aging in the city:

Generally, living in city always means a high speed of development and efficient, tense daily life, not to mention the pollution and competitions that fill into every corner. The discriminations against older people are highlighted in the city life. As a result, dementia and non-communicable diseases are more likely to be attacked in cities where around 60% senior people live in(Siôn, 2016).

Village movement:

As for issues of the retirement village in rural area are quite obvious, the village seems to build a fence between elders and people in other ages. They try to build an aging world far away from the other public. Moreover, the best medical care and the diversity of lifestyles are distributed in the city. In my opinion, the special treatment and concentration for the elders is not helping them to integrate into the world. By contrast, it reflects another way of discrimination.

In this case, the Zwischenstadt Parkstad is more suitable for the elders with a higher average green per person from a loose pattern and more flexible direction of development. At the same time, it still meets all the elders’ living needs like shopping, medical and nursing cares, public transportation, multi-age communications, culture activities and sports facilities. All the conditions provide the chance to combine the living advantages for elders from city and countryside. It is valuable to research and understand more about this area and create a better option of the retirement life for not only the current elders but also everyone’s future life.

The following will compare Parkstad with the city and the suburbs to further illustrate its advantages.


Reference:

Pollution
Air Light Noise
Dementia
dementia in urban
double every 20 years
Non-communicable
diseases
75% people who live
with NCDs age aged
over 60. 100% people live in urban.

PROBLEMS

Relocated
Move to and from
faster
Centralized isolation
Lack of multi-age
communication
Cost and ownership
Monthly charge
Buying the right to live

OPTIONS

Parkstad

Retirement Apartment
Retirement Village

+Facility
+Space

MAIN ROADS TO ACTIVE AGING
THE CARING GREEN INFRASTRUCTURE DESIGN IN THE PARKSTAD

MAIN ROADS TO ACTIVE AGING
THE CARING GREEN INFRASTRUCTURE DESIGN IN THE PARKSTAD
Sunny
More sunshine encourages people to travel more and enjoy the outdoors. As the most inland and southern Dutch city, Heerlen is also some distance from the main waters, resulting in relatively abundant sunlight. According to the statistics of the website, the average daily sunshine time is nearly one hour longer than other cities.

Warm
A warm climate is extremely important for the health of the elderly, especially bones and cardiovasculars. The temperature in Heerlen is higher than in other cities. The highest temperature during the day is even more pronounced. It is worth mentioning that this climate advantage is not only relative to the big cities of the Netherlands. It is also about 1.5 degrees higher than Aachen.

Better Air Quality
Very high green ratios and large areas of vegetation ensure air quality in this between-city. The woods also reduce noise pollution. Life in this area is more suitable for living and people’s health. Especially in big cities, air quality is an important factor affecting people’s lives. For retired people, there is more freedom to choose a healthy living environment, and the health indicator has a greater impact on them.

COMPARISON WITH NEARBY CITIES
AMSTERDAM GRONINGEN MAASTRICHT AACHEN

Fig 1.19 strengths compared with nearby cities
Source: https://www.meteoblue.com/
https://www.buienradar.nl/
COMPARISON WITH THE COUNTRYSIDE
BETTER LIVING FACILITIES AND SERVICES

Transportation
From the Roman period to the mining period and now, the railways and buses systems in the parkstad urban area have good connections, although there are still problems in some villages. And these public transportation are friendly to the elderly. Therefore, convenient public transportation in the heerlen area is a basic condition for developing the caring landscape in this project.

Shopping
In addition to public transportation, another advantage of urban areas is the abundance of material conditions. There are also many supermarkets in the urban area of parkstad. And in the core city heerlen even has a large shopping mall. In addition, leisure and cultural facilities such as theater museums and concert halls are also complete.

Tourism
Region Parkstad Limburg is winner in the category ‘Best Travel Destination in the World’ of the Tourism for Tomorrow Award 2016. WTTC stands for World Travel & Tourism Council and is based in London, United Kingdom. This worldwide authority in the field of travel and tourism chooses every year among others the most progressive travel destination in the world. Never before has the Netherlands been nominated for a WTTC Award, let alone a region in the Netherlands as the best travel destination. The city center is also a tourism hub for travelers.

Multi-ages Communication
Cities often have better educational resources and jobs to accommodate a more diverse population. The project aims to make a group of people no longer specialized, so that the elderly are no longer alone. It is easier to create rich communication in such a multi-age environment.

Fig 1. 20 strengths compared with countryside
Source: (1),(2),(4) https://www.pararius.com/ (3) author
High Green Space

High per house green rate is one of the characteristics of Parkstad. As the space left by urban shrinkage and industrial gray turned green, unlike other regions, this ratio has grown significantly here. In 2014, average green in Heerlen is around two to three times than the general city.

Low Living Cost

One thing changing obviously with the shrinkage is the relatively low living cost. I collect the rent, basic living, education and transportation costs of Heerlen compared with other Dutch cities and nearby cities. As the result, urban area in Parkstad is easier to live with lower economic pressure especially for retired people.

Comparison with the General City

less living pressure
Why we need active aging strategies?

Across Europe, countries face an unprecedented demographic shift that will result in rapidly growing elderly populations. In most European countries, the old-age dependency ratio will rise to 50 percent or more, while the population of those 80+ will double or even triple. In the parkstad, due to the urban shrinkage, the future aging situation of Europe can be seen earlier. Under this condition, the research of the aging-friendly landscape and urban structure there is an exploration of the universal normality in the coming future.

According to CBS research, the main trends in aging include longer life and greater vitality (CBS, 2017). Along with better health, more free activities are taking place during leisure time. How to use design to improve the quality of life of the elderly is the key to this project. This is also the reason why we need active aging strategies.

What is active aging?

As the definition from WHO, active aging is about a high living quality for the elderly with three key words: health, participation and security. In this project, these three aspects need to be further understood and translated into spatial elements.

Health

Positive physical and psychological health effects. It is often associated with healing effects in the landscape. The use of natural elements such as water and plants can have a positive impact on health.

Participation

Kind and effective guidance. Providing different types of activities and a rich experience is a design that enhances participation. Accessibility is always a necessary prerequisite.

Security

The feeling under control and protection. A safe environment always reduces the possibility of accidents and injuries.

Active ageing is the process of optimizing opportunities for health, participation and security in order to enhance quality of life as people age.

—World Health Organization, 2002
Caring is the attitude that is going to be carried out in this project, and it is also the first principle for the research and design. In a people-oriented social atmosphere, how to express the caring of life in landscape through the design is worthy to explore for 21st century architects.

Landscape elements are closely related to human activities and life, and landscape design is also the design of lifestyle.

For the elderly, there is no work and a tight schedule. They have more than seven hours of leisure time. How the outdoor environment helps them arrange their time, organize their daily life and find the meaning of their living is the question that the caring landscape needs to answer.

Caring landscape is designed for the elderly and also for ourselves in the future.

— Wenbo Lai (GVL)

GVL team has put forward the design idea of “caring landscape” which puts “care” first, accepts and satisfies the elderly both physically and psychologically. With careful design, reasonable arrangement and caring details, it will build a homelike nursing space for the elderly, which will not only provide the elderly with professional care but also allow them to live freely.

Reference:
Caring Landscape, Friendly Garden – Longfor Yinian Apartment Rehabilitation Garden, China by GVL + Zhang Ling, https://www.gooood.cn/
By summarizing the above two research objects, we can draw the main problems of the research:

How can I design a landscape that reduces the shrinkage and benefits from the ageing society?

Ageing Economy & Landscape

02 Methodology

2.1 Theoretical Framework
2.2 Qualitative Research
2.3 Research through Design
2.1 Theoretical Framework

Aging Society

In the process of ageing, the physical mobility is limiting. The suitable exercising time and activity range change with our age as we grow. The caring strategies is the human-based thinking of the design research. The goal is to make the whole plan works as the caring landscape for public.

Caring Strategies

Rural and Fragmented Living Environment

The main task from this problem is to create a livable environment for people. The position of infrastructure is the relationship between “life and land” (Bélanger & Williams, 2016). A good infrastructure is the guide to a high quality lifestyle.

Landscape-based infrastructure

There are many elements involved in the research of green infrastructure. Based on the landscape, there are two main systems: the pedestrian system and the natural system. There is also a layer of services and activities that are linked to these systems (Hung, 2013).

Pedestrians Layer:

Security and Priority

Activities Layer:

Experience and Functions

About the Research Objective

The caring strategies should be thought out through the scope of activities which involves two dimensions: urban and community.

For the ready to ageing and young ageing people (<80 yrs), they have a larger range of movements, allowing them to move around the city. The senior ageing people always have certain mobility difficulties. As this physical health condition changes, the scope of their lives has also narrowed to the community.

Fig 1.30 People being taken care of
Source: author

Reference:
The research methodology is constructed by three sections: theoretical framework, qualitative interview, and research through design.

2.1 Theoretical Framework

The first element is to explore and define the issue of the location through a literature studies which combined by the literature of historical and social context of Parkstad; the analysis of economical value and requirements of elders; and the case studies on the solutions from urban planning and landscape architecture perspective.

For the purpose it is intent to build deep understandings of the located problems, the subjects and the potentials of the set. The empirical research is also demonstrated the challenges and spatial restriction which is important to be noticed and rethink through the designing. In this sense the specialist knowledge is going to be translated into guidelines or other forms. This step offered a theoretical background support for the potential benefits in wether economical or social perspective by designing a ageing friendly city.

2.2 Qualitative Research

The collecting information from literature is not enough to support the project because the highly complexity of natural and Sio-cultural system in landscape should not be ignored. The interviews is used to break the boundaries of positivist approach which only focus on natural science but ignore the human-focused Sio-cultural scope in the research. The interviews attempt to describe and discover the meanings of landscape and urban environment in the subjects’ physical life, which might touched their beliefs, human experiences, cultural preference and so on. As the designer is from a different cultural background, the interview offered the opportunity to access to the thoughts and feelings of the local subjects, and intent to provide evidences and supports for the design from a real life perspective.

2.3 Research through Design

Research through design defined design as a “vehicle” to visualise and spatialise the spatial problems, and investigate possibilities and make solutions. The elder community in Parkstad is participated in the creation of meanings by their suggestion of problems identification and data production. The research is informed to improve the quality of the design and to increase its reliability. In this form of research through design, the new knowledge of solution is the combination which partially lies within the natural workings, meanwhile others connect to social and cultural problems.

Thus, the research methods allowed to provide a reasonable and meaningful design which based on both the workings on nature and humanity concerns. The utilisation of these methods is attempted to guide the design in principles, and therefore eventually benefits the nature and people in this area in many ways.
2.3 Research through Design

CARING STRATEGIES

URBAN: DESIGN AS SYSTEMATIC EXPLORATION

COMMUNITY: LANDSCAPE AS 3D-CONSTRUCTIONS

DESCRIPTION STRATEGIES:

OBSERVATION

INDIVIDUAL INTERVIEWS

SOLUTION SPACE

GOAL SPACE

SYSTEMATIC EXPLORATION

CLASSIFICATION: TYPOLOGIES ON DIFFERENT NETWORKS

LANDSCAPE AS INFRASTRUCTURE

LITERATURE RESEARCH AND CASE STUDY

PRINCIPLES

LOGICAL SYSTEMS RESEARCH

CORRELATION STRATEGIES

NATURE NETWORK

PEDESTRIAN NETWORK

ACTIVITY NETWORK

NATURE LAYER

PEDESTRIAN LAYER

ACTIVITY LAYER

NATURE SPACE

PEDESTRIAN SPACE

ACTIVITY SPACE

3D-CONSTRUCTIONS

MAIN ROADS TO ACTIVE AGING
THE CARING GREEN INFRASTRUCTURE DESIGN IN THE PARKSTAD

MAIN ROADS TO ACTIVE AGING
THE CARING GREEN INFRASTRUCTURE DESIGN IN THE PARKSTAD
03 Ageing Economy

Ageing Market,
Caring Strategy & Design Goals
Interview and Observation
3.1 Ageing Market

**Defination**

"Ageing often have a negative connotation, especially in an economic sense. However, Ageing is not just a story of declining economic potential.

The other side of the coin shows rising demand for products and services that are tailored to the needs of the elderly. Opportunities grow for providers and investors who active in these markets.

As such, the resulting largely market supply further contributes to the option for people to enjoy comfortable life in old age."

-- ING Economics Department, May 2019

### Ageing Population of the Netherlands

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<tr>
<th>Year</th>
<th>&gt;65</th>
<th>&gt;75</th>
</tr>
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<tbody>
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<td>18.50%</td>
<td>6.90%</td>
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<tr>
<td></td>
<td>2577994</td>
<td>1147576</td>
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<tr>
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<td>20.50%</td>
<td>8.70%</td>
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<td></td>
<td>3488578</td>
<td>1495105</td>
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<tr>
<td>2035</td>
<td>27.00%</td>
<td>13.90%</td>
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<tr>
<td></td>
<td>4783173</td>
<td>2444733</td>
</tr>
<tr>
<td>2045</td>
<td>27.80%</td>
<td>16.90%</td>
</tr>
<tr>
<td></td>
<td>4916780</td>
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</tr>
<tr>
<td>2060</td>
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<td>16.30%</td>
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<tr>
<td>2100</td>
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</table>

The Dutch population of elders is about to double or even triple in the future. The requirements of the elderly for living environment are different from those of young people.

With Ageing Society, the Netherlands will need an extra 44,000 houses that suitable for elders every year from now to 2021. Landscapes play a very important role in a healthier living environment.

The economics of age-friendly landscapes are primarily related to the provision of housing.

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The ING economy takes the wealth of people aged 65 to 74 in 2018 as an estimate for the wealth of people aged 75 and over in 2030. Although wealth estimates are very volatile and therefore hard to forecast, it is plausible that the wealth ratio between different age groups in relation to each other roughly stays the same. The younger generation of elderly people (aged 65 to 74) is wealthier than the older generation (aged 75 and over) in all eleven countries. As a result, they expect a rising wealth potential of 75+ people until 2030.

Dutch financial wealth is higher than other countries due to higher (funded) pension accrual. In other words, the elderly in the Netherlands are the richest in Europe. In addition, the Netherlands is also ranked first in another survey on spending money on quality living.
The Netherlands:

“The fast-growing, financially sound seniors who are keen on senior housing”

Taking into account the effects of income, consumption, and population growth, the Netherlands comes first in the overall ranking of ageing market research by ING.

Supported by the government:

According to 2018 figures from information centre Vektis. Half of the money reserved for healthcare in the Netherlands under the Healthcare Insurance Act(Zvw) and Long-term Care Act is used to care for the elderly. 28 billion euros was spent on care for those aged over 65. When this part of the population is two or three times more than now, it will impose a heavy burden on the government.

Actually, the total cost for a person in nursing home is on average about 79,000 euro per year (Ministry of Health, Welfare and Sports, 2016). The government expect to encourage elders to age-in-place as long as possible. In this case, there is a significant increase in investment in healthy and age-friendly community environments.

Supported by the institution:

Firstly, the amount of nursing homes is rising by the senior elderly increasing. Not only the quantity but also the type and quality of institutional care that will be demanded is likely to change, because of changing ideas, expectations and preferences of how institutional care should be provided. Traditionally, institutional care for impaired elderly was hospital-like and clinically oriented. Many LTC(long-term care) institutions were built in the late 70s and early 80s and were based on hospital design, with semi-private rooms and cafeteria-style dining options (Gerace, 2012). For more than a decade, however, the delivery of institutional LTC is shifting to a home-like environment in a nursing home (Moise et al., 2004; White-Chu et al., 2009; Koren, 2010; Grabowski et al., 2014; Miller et al., 2016). For dementia care, the trend over the past two decades has been to reduce the size of the nursing ‘unit’ from 60 beds to households accommodating anywhere between 9 and 24 residents (Calkins, 2009). Smaller units appear to have a number of positive benefits such as higher motor functioning; greater friendship formation; less anxiety, sadness and depression; more positive activity involvement; and greater mobility (Calkins, 2009).
Another side of Shrinkage: Housing Market
One of the effects of shrinkage is more empty houses, and the occupancy of the elderly can fill this gap. From the economical lens, it is a huge potential in housing market. Because of shrinking situation in Parkstad, more and more vacancies happen in parkstad. At the same time, the house price in urban area is very low which means less economic pressure on people to buy one. After a simple calculation, only the real estate market in Heerlen has a potential value of more than 200 million euros. The project aims to enhance the attractiveness of the region through the creation of a healthy living environment.

Another side of Ageing Society: Nursing Home Market
Due to the influence of the aging society and the convenient living conditions in the city center, Heerlen became one of the elderly care centers in Limburg. And these institutions can support the development of better and more livable landscapes.

In general, Heerlen has great market potential to develop the pension industry.

Silver Businesss:
With the aging society of the world, there are many golden opportunities for businesses that serve the elderly. If the project can attract and gather a large number of target groups, the development of this silver business will bring great economic possibilities.

All of the above are the economic impact of the aging market, and also the response to the shrinkage problem. Next, I will study how to attract these old people through a care strategy.
3.2 Caring Strategy

One of the perspectives of the project is active ageing, and the first thing that needs to be clear is its understanding:

Ageing is not a stage of life, but a natural process.

Care of Ageing Process is about the high-quality life strategy of all-ages.

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### 3.3 Interviews and Observation

In a nursing home surrounded by a green area, an old lady told me: “There seems to be no park here. The park is far and far away, and the place next to it is just for walking.” Similar answers are heard from other seniors and care workers.

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**Urban Green Infrastructure**

- Ready to ageing <65 yrs
  - Exercising time: 1h per day
  - Active Distance: 6-7km

- Young ageing 65-75 yrs
  - Exercising time: 30min per day
  - Active Distance: 3-4km

- Senior ageing >75 yrs
  - Exercising time: 15min per day
  - Active Distance: 1km

**Community Caring Landscape**

- The Green Infrastructure
  - New possibility in economy
  - Develop the ageing Market
  - Improve these Qualities for all the inhabitants of Parkstad

- The Caring Landscape
  - New attraction for the elderly
  - Fits the requirements of the Elders to Active Age

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**Design Goals**

**Where is the Pedestrian Path?**

**Where is the Water?**

**Where is the Indoor Space?**

**Where is the Park?**

**Pedestrians System**

**Waterspace**

**Indoor Connection**

**Accessible Range**

**Senior Care**
04 Site: Caring Landscape
4.1 Site Choice

Economy Potential

The Senior Ageing Population (>75 yrs):

- Welten-Dorp
  - 2020: 678
  - 2035: 1438

- ‘t Loon
  - 2020: 186
  - 2035: 328

- Lindeveld
  - 2020: 50
  - 2035: 200

- Heerlen Centrum
  - 2020: 914 (20%)
  - 2035: 2000 (40%)

Main Roads to Active Aging
The Caring Green Infrastructure Design in the Parkstad
Senior ageing
>75 yrs
Exercising: 15min per day
Distance: 1km
Maximum path length: 1km

4.2 Site Analysis
Indoor Connection

Douvenrade care center is a residential complex that provides accommodation for 156 elders. The terrace apartment has a total of 73 apartments, including 12 apartments with 2 bedrooms. All houses have a balcony. The Corridor apartment has 88 apartments spread over ten floors. There are 1 and 2 bedroom apartments with balconies available.

Bras-Restaurant located in the monumental Hoeve de Geleenhof. De Hoeve is one of the oldest locations in Heerlen from the past and the present. For two thousand years the Hoeve de Geleenhof has managed to maintain itself, initially as a camp of the Romans and then for many years as an agricultural settlement. From December 3, 2015, it becomes a restaurant with pie, coffee, nice lunch and dinner dishes. The open time is from 10am to 10pm.
Connection to the elder’s home

Between Private and Public

Bridge and Plaza Screen

Gubei Gold Street
Location: Shanghai, China
https://www.swagroup.com/projects/gubei-gold-street/

Take use of the heritage

Open the plaza
new square with active planting and water

Grand Mansion Hotel
LOCATION: Nanjing, China

Building-oriented Square
Pedestrians System

Houston Green Loop
LOCATION: Houston, Texas United States
CLIENT: Downtown Management District
SERVICE: Planning, Urban Design
https://www.swagroup.com/projects/houston-green-loop/

Walking with the Waterline
Ricardo Lara Park
LOCATION: Lynwood, California, United States
CLIENT: City of Lynwood
SERVICE: Landscape Architecture

Watercirculation Wet landscape
LOCATION: Dwarka, Delhi, India
CLIENT: Delhi 2050
COLLABORATORS: Dutch Water Design Makkink & Bey, Arch i
YEAR: 2013-2014

60 61
Leave the path alone with security

Pedestrian Streetscape, Lighting System

Habitat For Humanity
location: Syracuse

Seperate the speed layers and keep it flat

Street-Park and Pedestrian System

Milton Street Park
LOCATION: Los Angeles, California United States
CLIENT: Mountains Recreation and Conservation Authority

A Flat New Path

Crossing in another layer

Jeffrey Open Space Park
LOCATION: Irvine, California, United States
CLIENT: City of Irvine

Street-Trees-Plants Pattern

Crossing with priority

Habitat For Humanity
location: Syracuse
Walking with the Waterline

Ricardo Lara Park
LOCATION: Lynwood, California, United States
CLIENT: City of Lynwood
SERVICE: Landscape Architecture

Watercirculation Wet landscape
location: Dwarka, Delhi, India
client: Delhi 2050
collaborators: Dutch Water Design Makkink & Bey, Arch i
year: 2013-2014

Reshape the slope
Buffalo Bayou Park
LOCATION: Houston, Texas, United States
CLIENT: Buffalo Bayou Partnership; Harris County Flood Control District

Lewis Avenue
LOCATION: Las Vegas, Nevada, United States
CLIENT: City of Las Vegas
https://www.swagroup.com/projects/lewis-avenue/

Slope Design
with water management

Water square
with better rain collecting
4.2 Site Design

**Principles**

- Indoor Connection
- Pedestrians System
- Waterspace
- Senior Care

- Building-oriented Square
- Bridge over the valley
- Connected Canopy
- Path Separation
  - keep it flat with enough width
- Water square
  - with better rain collecting
- Slope Design
  - with water management
- Colored Planting
  - space distinguish and emotion change
- Interactional Planting and Waterforms
Indoor Connection

Building-oriented Square

Bridge over the valley

Orchard Square

Dehoeven Plaza

Develop the Pond to be a water square with water management

Digging-out:
- 3000 m³ Soil

MAIN ROADS TO ACTIVE AGING
THE CARING GREEN INFRASTRUCTURE DESIGN IN THE PARKSTAD

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Pedestrians System

Connected Canopy

Path Separation
keep it flat with enough width

MAIN ROADS TO ACTIVE AGING
THE CARING GREEN INFRASTRUCTURE DESIGN IN THE PARKSTAD
Digging-out:

3000 m³ Soil
from the pond and path built
Community Activity, Irrigation System
Useful Water: From 30% to over 80%
Path-side Interaction, Impermeable Design
Useful Water: From 30% to over 80%

Wider and Shallow Water Surface
92.0

Root Treatment Zone

Impermeable Material

Water Storage

3-4m
8m
Slope Control, Path Separation
Useful Water: From 30% to over 80%
Local Special Plants in Colors

**yellow calamine violet**  
*Viola calaminaria*  
(zinkviooltje)  
10-40cm  
Flower Period:  
native spring and summer

**salad burnet**  
*Sanguisorba minor*  
(Kleine pimpernel)  
40-90cm  
Flower Period:  
native spring and summer

**military orchid**  
*Orchis militaris*  
(Orchideën)  
20-50cm  
Flower Period:  
native spring and summer

**European white elm**  
*Ulmus laevis*  
(Steeliep)  
30cm  
autumn colour: yellow

**Cornelian cherry**  
*Cornus mas*  
(gele kornoelje)  
2-6m  
Flower Period:  
native winter and spring  
Fruit Period:  
native summer and autumn

**European pear**  
*Pyrus communis*  
10-15m  
Flower Period:  
native winter and spring  
Fruit Period:  
native summer and autumn

**Saucer Magnolia**  
*Magnolia × soulangeana*  
6-8m  
Flower Period:  
Summer and Autumn  
Flower:  
Pink and White  
autumn colour: yellow

**Viola calaminaria**  
Stimulate Mental Activity  
Help Memory

**Sanguisorba minor**  
Calm Down  
Willing to Expression

**Orchis militaris**

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**Ulmus laevis**
**Cornus mas**
**Pyrus communis**
**Malus spp**
**Saucer Magnolia**

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Colored Planting  
space distinguish and emotion change
Interactional Planting and Waterforms
The Accessible Range
Analysis
Design
5.1 Accessible Range

The lifecircle caring landscape system centered on Heerlen is linked to the leisure lane project by the existing green space to complete the landscape chain of Parkstad. The attractiveness and spatial quality of the area will also be perceived to increase.
Elders in the living Core

In the core living area (over 60% of the population), the elderly over 65 years old are relatively loosely distributed, while the elderly over 75 years old are characterized by concentrated distribution.

In terms of landscape, the leisure lane project is only at the border. Therefore, the current system is difficult to reach for residents, especially for the elderly.

The lack of systematic planning of the living landscape makes the current green space fragmented.

The important value of this design is to connect these beautiful pieces in series and re-establish the relationship between landscape and people.
300m Lifecircle as a distance with Highly Accessibility

What are Accessible Natural Greenspace Standards?
The ANGSt model has its origins in a paper by Box and Harrison (1993), published in Town and Country Planning. In this paper the case for standards was made based on a review of the functions and values of natural greenspace as a provider of experience of nature to local communities, and to improve the environment and protect its biodiversity. This work was further developed by Harrison et al. (1995) in a research report, published by English Nature, entitled Accessible Natural Greenspace in Towns and Cities: A Review of Appropriate Size and Distance Criteria which subsequently became the basis for ANGSt. The ANGSt model requires that:
1. no person should live more than 300 m from their nearest area of natural greenspace of at least 2 ha in size;
2. provision of at least 2 ha of Local Nature Reserve per 1,000 population;
3. that there should be at least one accessible 20 ha site within 2 km from home;
4. that there should be one accessible 100 ha site within 5 km;
5. that there should be one accessible 500 ha site within 10 km.

Related research is about the Six-minute walking distance in healthy elderly subjects. The result also shows that the walking distance in six minutes is around 600m, and the single distance is 300m which just take steps for elders to reach.
Behind the 300m illcircles, we can find the hidden landscape system. In this Green Pattern, Based on the priority of the elderly, this system enhances the overall connectivity and landscape quality.
5.2 Analysis

Indoor Connection

The Activity Fragments

Heritages and Facilities

12x Hoeve
1x Castle
1x Watermill
1x Roman ruin
2x Indoor Playground
5x Gyms
1x Bowling

Ageing Care

13x Nursing Homes

In the range

1x Nursing Home
1x Castle
1x Watermill
1x Roman ruin
2x Indoor Playgrounds
5x Gyms
1x Bowling

Medication
Shopping
Church

Nursing  Education
5.2 Ring Analysis
(1) Mixing with other traffic layers in higher speeds
   Type one: Together with Traffic
   Type two: Single Path

(2) Crossing
   Type one: Ground crossing
   Type two: Crossing under the bridge

Escape from busy traffic

Keep the priority
Runoff volumes will increase based on the percent of impervious surface. Higher volumes of runoff result in flooding, water pollution, and erosion. Photo courtesy of LEARN NC, www.learnnc.org
Active-Ageing Care

Healthy Lifestyle Exercise

Ready to ageing <65 yrs
Exercising time: 1h per day
Active Distance: 6-7km

5-10min

Young ageing 65-75 yrs
Exercising time: 30min per day
Active Distance: 3-4km

Communication in Activities

Senior ageing >75 yrs
Exercising time: 15min per day
Active Distance: 1km

Ready to ageing <65 yrs
Exercising time: 1h per day
Active Distance: 6-7km

Exercising time: 30min per day
Active Distance: 3-4km

Too Wild to Stay

Too Far between the parks
Caring Landscape means satisfying the needs of the elderly.

From the case study, the design team from GVL has referred to the studies on the physical and psychological characteristics of the elderly, analyzing the demands of people of different ages and various health conditions. The researches show that a series of physical and psychological changes will take place when someone enters his or her later life, for example, our body functions will degenerate gradually, and we will be more attached to our families and more eager to communicate with neighbors. Therefore, the healing garden should try to create a safe and warm atmosphere which will encourage the elderly to be positive and optimistic. In consideration of the height loss due to aging, special supporting facilities such as the handrails and the chairs will be carefully designed to adapt to the elderly. And the width of the roads will take the use of wheelchairs and walking devices into consideration.

After understanding the needs of the elderly, GVL has designed six main functions in the garden: health care and fitness, gardening and rehabilitation, communication and recreation, children’s playground, pet paradise, and cultural activities. The team has combined different functions flexibly according to the practical demands.
Green Loops with routes and activity points

Lines to build the connection. Points to make the place for people.

Houston Green Loop
LOCATION: Houston, Texas United States
CLIENT: Downtown Management District
SERVICE: Planning, Urban Design
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YEAR: 2013-2014

5.3 Green Loop Design
Path through as many nursing homes and public buildings as possible

**Ageing Care**
- Direct link to 23 (+14) Nursing Home
  - The rest 4 are in 500m
  - Service for ageing communities (people ≥ 65yrs: >25%)

**Heritages and Facilities**
- 11/12 Hoeve
- 1 Castle
- 1 Watermill
- 1 Roman ruin
- 1/2 Indoor Playground
- 1 Bowling

**Using the pavement and plants to shape the corridor with walking priority**

**Little mix with the busy traffic work as an independent secure system**
A Leisure Routes for Natural Recreation

Walking along the valley

Flat side: walking inside and forest healing
Slope side: walking along the boundary
An Activity Network

MAIN ROADS TO ACTIVE AGING
THE CARING GREEN INFRASTRUCTURE DESIGN IN THE PARKSTAD
An Activity Network

5-10 min
500-700m

Ageing Market Development

2020 Park Centre
2025 Life Circle
2035 Activity Network
2060 Caring City

MAIN ROADS TO ACTIVE AGING
THE CARING GREEN INFRASTRUCTURE DESIGN IN THE PARKSTAD
Developing Phases

MAIN ROADS TO ACTIVE AGING
THE CARING GREEN INFRASTRUCTURE DESIGN IN THE PARKSTAD

120 121
132 133

40000
2020

46000
2025
Developing Phases

Jobs, Health, Leisure

MAIN ROADS TO ACTIVE AGING
THE CARING GREEN INFRASTRUCTURE DESIGN IN THE PARKSTAD
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MAIN ROADS TO ACTIVE AGING
THE CARING GREEN INFRASTRUCTURE DESIGN IN THE PARKSTAD
Reflection on Research Objectives

1. Human-based Caring Strategies

The project is implemented in order to achieve a certain goal: active aging. The first step of achieving it is to development acknowledge and understanding of the special content. Active aging is a positive attitude towards the trend of an ageing society, which suggests that aging is the natural process for everyone. It leads to the central questions: What is the needs of people in different age? The formulation of this strategy is related to sociological research such as individual interviews, observations, and collection of relevant literature, which helped me to build better understanding of their lives.

People lived in different stages in terms of their age is having different ranges of activities. There are three groups that I want to illustrate in my project. For the ready to ageing people(<65 yrs) and the group of young ageing people(65-75yrs), they usually have better mobilities that allowed to move around city. The project provided a 7,000 meters long green loops, which would provide sufficient daily activities and better environment for people in these ageing stages. Most of the senior ageing people(>75yrs) lives in nursing home or elderly community. Compare to the other two groups, the requirement of exercise of for them is relatively low(km per day). Moreover, the numbers of nursing homes and caring institutions will be increased because the numbers of accumulated numbers of elders who are attracted to live here by the establishment of green loop. The design contributed to the regional development by improving the quality and life, and build healthier lifestyle for the all inhabitants.

There are mainly three requirements that should be highlighted in the concept of all ageing groups: participation of social activities, healthy lifestyle and safety. The three requirement corresponding to the three interacting spatial elements: nature, pedestrians systems and activities(indoor and outdoor). Thus, I made three researches in related to each aspect.

Landscape Infrastructure:

The goal of the landscape infrastructure is to redefine the local environment by integrating the fragmented landscape, and thus to create a new friendly place. With the marriage of architecture, mobility and landscape infrastructure become more meaningful in regards to reducing marginalisation, segregation, integrate lands and being new forms of activities(Shannon&Smeets, 2010).

2. Urban Scale: Landscape Urbanism

As large, the role of public green infrastructure is a network which guide people’s movements and support different living systems(Gerdo, 2013) Gerdo proposed that there are two basic landscape-based layers inside the network: the second nature and pedestrian systems. Once the project relates to lifestyle, it always important to contain another layer: activities. The network will act as a contiguous recreation framework.

I used this network to integrate the fragmented rural green around heerlen, which leads to develop a liveable and enjoyable environment for public step by step. This is a study of the composite network that includes nature, human movement and staying. Based on the object of active aging, we build relationships with nature on the basis of people’s health perspectives. The green loop intend to build a healing atmosphere by providing the more contacts with natural and establishing a safer walking environment. The establishment of an ageing-friendly network enriches people’s social interaction and meanings of life for the elders who seeks to spend lots of time on leisure. Finally, the system wish to convey a positive attitude, which stated that “don’t be afraid of getting old.”

Reflection on wider world

1. The Developing Value with the Social Problem

The New Possibility of the Between-city

The emergent issue of Parkstad is shrinkage of the city in result of the transformation from an industry city to its new developments. In contrast to the economic downturn and the decline in total households, the growing number of elder people is particularly conspicuous. In my interviews with local elders, it really shocked me when I asked an old man where the park is, and he replies “it was far and far away”. The surprise fact is that the nearest park was only 300 meters away from his place. The similar responses were provided by other elders. Thus, although the green scape of per person was relatively high in Parkstad, the landscape did not offer the elders benefits in terms of caring or entertainment. In Landscape Infrastructure, Hung proposed that the integration of architecture, landscape and mobility helped the infrastructure become more meaningful. This project aims to designing new green space structure to reduce the isolation and marginalisation of elders in urban space and attempt to discover the possibilities of urban city.

Aging Society

Aging society is remarked as a worldwide problem especially in Europe. According to the statistical prediction, the percentage of elders in total population in European will increase to over 30% in 2070. Exploring new approaches for the benefits of growing amount of elder population is become increasing important. There is 30% of population in Parkstad is elders and it will still increase to 50% in the near future. Most of the elders(84%) in the Netherlands lived without any caring helpers. Therefore, to explore what kind of place is more suitable for the elderly become an important question. In the general stereotype of the public, city is more suitable for youth rather than elders because the fast lifestyle. The rural villages…..(problem). As a shrinking city, Parkstad offered a new possibilities of an place, or lifestyle: lived between urban and rural.

2. Design Value

Identity and Landscape-urbanism

“What defines a city, what deserves to be attracted, and what is the golden ratio of the population”, these issues are repeatedly argued in the studies of urban development. The most important goals for designers and planners is to improve the “liveability” of a place, which mainly focus on increasing the quality of the environment. Moreover, the quality of a place is not only determined by the physical features of an environment, but also involves the psychological factors. Thus, the consideration of social and psychological dimension of the urban environments should be taken into account in planning and design schemes. It is important to establish better understanding of the mutual relationship between people and environment to create and maintain a better place to live. Unfortunately, the realisation of the lack of coherence, diversity and flexbility is usually be discovered after some actions by people. In this project, city will be re-define and renewed through the use of tactics of landscape infrastructure.
3. Community Scale:

In the first step of urban plan is to define the problems of city. Through my analysis of the city, it is clearly showed that the general problems of here is the fragmentation of architectures, nature and pedestrian systems. The site that I chosen is a conspicuous example that has all the general issues, and some specific drawbacks. The strategies that I used here is to build 3D models and spatial imagination to simulate different possibilities and sensory experiences of this site. There are many factors that are included in this process such as the setting of trees, shape of water, line of signs and the route of the activities. Among all the experimentals, which attracted me most is the complex changes of terrain which influence the flow of ground water and sensory feelings during walking. The digital 3D model offered me a more accurate attempts to proof my thinkings.

Reflection on myself as a Landscape Architecture

PEOPLE-ORIENTED STRATEGY: INTERDISCIPLINARY WITH SOCIOLOGY

Firstly, The start point of this project is the consideration of a particular social issue, therefore it is very important to interact with sociology fields. I have researched the theoretical knowledge on urban sociology in doing each step. It is certainly improved my knowledge on relevant subjects. Secondly, to adopt qualitative research methods such as interviews, observations was an important part of my project. The conversation and discussion with sociology students also provided a border views on the the existed urban and landscape issues.

DESIGN AS SYSTEMATIC EXPLORATION

The exploration of urban systems is complex because the complex interaction between each elements. My attempt is using the problem-solving ideas to find a reasonable network. A good framework need to match local development and people’s expectations. This project I tried to divide processes into multiple stages. This exploration has greatly increased my understanding of complex systems and the interaction between people and the landscape.

LANDSCAPE AS 3D-CONSTRUCTIONS

In my previous designs, I normally used the software to simulate the site. This method of meansend prevented the exploration of various possibilities. In this project, I adopt the strategy of using spatial imagination and sensory stimulation. It improved the ideality and comprehensiveness of my project, which is easy for me to diver my thoughts and exercises space sensibility.

Reference:
“Ageing is not lost youth but a new stage of opportunity and strength.”
- Betty Friedan