



Continuing Care Retirement Community Design

— — An community design for the elderly in Guangzhou, China

Politecnico Di Torino
Master Thesis
Supervisor: Pollo Riccardo
Student: Li Xiangyang 251111

Abstract:

Countries around the world are gradually entering an aging society. With the increase of the elderly population and the rapid expansion of the elderly group, their living and entertainment conditions urgently need more attention.

CCRC (Continuing Care Retirement Community) aims to build a comprehensive and multifunctional elderly community. When people enter old age, they can get living environment and services that match their age and physical condition.

When older people have the ability to take care of themselves, they need to interact more with the surrounding space. When they have limited self-care ability, their living environment deserves more care. When their physical condition deteriorates further, they will need professional recuperation.

This project is located in Guangzhou, China, to build a multiplex elderly community based on the local population structure and the needs of older people. This makes old people of all ages and physical conditions here to find their own warm homes.

Key Words:

Elderly Community/CCRC/Self-care ability/Comprehensive care

CONTENTS

Part one:

1. Background

1.1 The arrival of an aging society

1.2 China's aging process

Part two:

2. Responses

2.1 Responses from some overseas countries

2.2 China's pension model and current status

Part three:

3. Characteristics and needs of the elderly

3.1 Physiological characteristics and needs

3.2 Psychological characteristics and needs

3.3 Behavioral Characteristics of the elderly in Traditional Chinese Culture

Part four:

4. Case study

4.1 Case Study of Small Nursing Home

4.2 Case study of large-scale elderly community

Part five:

5. Project Description

5.1 Plot Information

5.2 Guangzhou City Introduction

5.3 Introduction around the plot

5.4 Project intent

Part six:

6. Design strategies

6.1 Introduction of CCRC mode

6.2 Concept Generation

6.3 Concept References

Part seven:

7. Design drawings

7.1 Master plan

7.2 Functions

7.3 Residential area

1.1 The arrival of an aging society

1.1.1 What is an aging society?

Population ageing is an increasing median age in a population due to declining fertility rates and rising life expectancy.

According to the 1956 “United Nations Population Aging and its Socio-Economic Consequences”, when a country or region has an elderly population aged 65 and over accounting for more than 7% of the total population, it means that the country or region has entered an aging society. In the 1982 Vienna World Conference on Ageing, it was determined that the proportion of the elderly population aged 60 years and over accounted for more than 10% of the total population, which means that this country or region has entered an ageing society.

Virtually every country in the world is experiencing growth in the number and proportion of older persons in their population.

Population ageing is poised to become one of the most significant social transformations of the twenty-first century, with implications for nearly all sectors of society, including labour and financial markets, the demand for goods and services, such as housing, transportation and social protection, as well as family structures and intergenerational ties.



Image 1 : World Bank/Flore de Préneuf
<https://www.un.org/en/sections/issues-depth/ageing/>



Part one:

1. Background

1.1 The arrival of an aging society

1.2 China's aging process

Older persons are increasingly seen as contributors to development, whose abilities to act for the betterment of themselves and their societies should be woven into policies and programmes at all levels. In the coming decades, many countries are likely to face fiscal and political pressures in relation to public systems of health care, pensions and social protections for a growing older population.

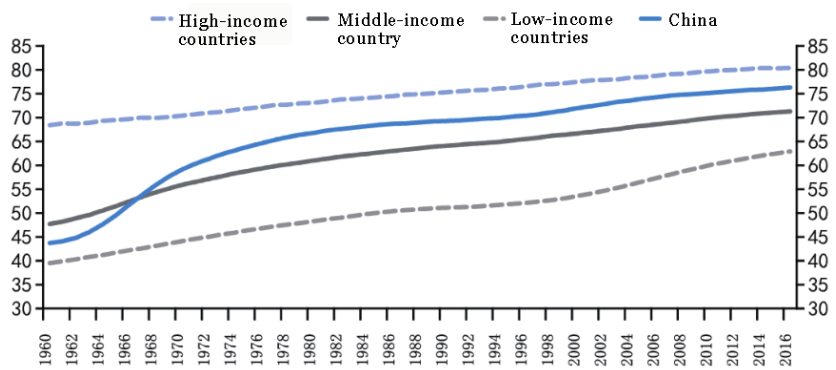
The size and age composition of a population are determined jointly by three demographic processes: fertility, mortality and migration.

1. Longevity: an engine with the aging population

The economic and social development, the improvement of living standards and the advancement of medical technology have brought about an extension of the average life expectancy of human beings. As we live longer and longer, the number of elderly people naturally increases, which drives the top of the population age pyramid.

From a global perspective, the average life expectancy of humans has risen from 67.2 years in 2000-2005 to 70.8 years in 2010-2015, an increase of 3.6 years. In the future, the average life expectancy of the population will continue to rise. It is expected to reach 77 years in 2045-2050.

Source of concept: <https://www.un.org/en/sections/issues-depth/ageing/>



Data Source: World Bank

Image 2, International comparison of the average life expectancy of the population

2.Low birth rate: an accelerator for population aging

Synchronized with the extension of life, there is also a decline in the birth rate. Affected by many factors such as work, life and culture, the global total fertility rate has continued to decline. There are fewer newborn babies, and the population age pyramid is expanding at the top, while the bottom continues to shrink, further accelerating the pace of aging.

Fertility levels are declining in most countries and regions around the world, and more and more countries are entering low fertility levels. In 2010-2015, there were 83 countries with fertility rates below replacement levels (average of 2.1 per woman), and these countries accounted for 46% of the global population. Among them, the total fertility rate of 26 countries is less than 1.5. According to the median forecast, the global total fertility rate will fall from 2.5 in 2010-2015 to 2.2 in 2045-2050, and then to 2.0 in 2095-2100.

Data Sources: United Nations, World Population Prospects: the 2017 Revision.

3.Migration: transformers with the aging population

Compared with longevity and Low birth rate, the migration of population is not the direct driving force for aging. However, the large-scale migration, especially the migration of a large number of working-age populations, can have a huge impact on the age structure of the place of move in, the place of move out , and play a direct role in alleviating or aggravating the local aging level.

As of 2017, the number of immigrants worldwide was about 258 million, accounting for 3.4% of the global population, an increase of 49% over 2000. Moreover, 75% of these immigrants are working-age, mostly 20-64 years old, accounting for 4.5% of the global working-age population. These international immigrants have made important contributions to population growth in many parts of the world, and even eased the demographic decline in some countries or regions. From 2000 to 2015, immigrants contributed 42% of the population growth in North America and 31% to Oceania countries. If there is no immigrant population contribution, the total population in Europe between 2000 and 2015 has declined^[1].

Data Sources: United Nations, World Population Prospects: the 2017 Revision.

1.1.2 Global aging trends

According to the proportion of the people over the age of 65, an aging society can be further divided into mild, moderate and severe. Mild level refers to the proportion of elderly people over 65 years old, which is more than 7% but less than 14%. Moderate level refers to the proportion of elderly people over 65 years old, which is more than 14% but less than 20%. Severe level refers to the proportion of people over 65 years old, which is more than 20%^[2].

Developed countries lead the world in aging.

Developed countries, led by France, have entered the ageing society since the middle of the 19th century.

They are the first countries and regions in the world to start aging. In 1950, the elderly population of developed countries reached 94 million, accounting for about half of the world's aging population; the ageing level was 11.6%, 3.5 percentage points higher than the world average. Since then, the size of the aging population in developed countries has continued to expand, and the level of aging has risen rapidly, far ahead of the world average. In 2015, the aging population of developed countries increased to 299 million, an increase of 2.2 times; the aging level rose to 23.9%, which is twice the world average. At present, developed countries have all entered an ageing society. Of the top 20 countries with the highest levels of aging in the world, most are developed countries. In 2050, the size of the aging population in developed countries will increase to 422 million, and the aging level will reach 32.8%.

Data Sources: United Nations, World Population Prospects: the 2017 Revision.

The speed of aging in developing countries caught up from behind

Compare the time span of the 65-year-old population from 7% to 14%, France spent 130 years, Sweden spent 85 years, America spent 70 years, Philippines spent 35 years, Mongolia spent 25 years, Thailand spent 20 years. In contrast to the aging of developed countries and economic growth, the time span is long and the development is gradual. The speed of aging in developing countries is basically twice that of developed countries. The rapid development of aging in developing countries has made the proportion of the elderly population in developing countries continue to rise in the world, 53.5% in 1950, 66.8% in 2015, 79.9% in 2050, and 86% in 2100.

In 2015-2050, 90% of the net increase in the global aging population will come from developing countries, and the proportion will increase to 98% in 2050-2100.

Global aging outlook.

Globally, the population aged 65 and over is growing faster than all other age groups.

According to data from World Population Prospects: the 2019 Revision, by 2050, one in six people in the world will be over age 65 (16%), up from one in 11 in 2019 (9%). By 2050, one in four persons living in Europe and Northern America could be aged 65 or over. In 2018, for the first time in history, persons aged 65 or above outnumbered children under five years of age globally. The number of persons aged 80 years or over is projected to triple, from 143 million in 2019 to 426 million in 2050.

Data Sources: <https://www.un.org/zh/sections/issues-depth/ageing/index.html>

1.2 China’s aging process

Four stages of China’s aging development

At the end of 1999, the proportion of China’s elderly population over 60 years old reached 10.3%, marking China’s entry into an aging society. Taking this as a starting point, China began to enter a century of aging. The National Report on the Strategy of Population Aging is divided into four stages of development in China’s century-old aging process^[3].

1.In the rapid aging phase (1999-2022), the number of elderly people increased from 131 million to 268 million, and the aging level rose from 10.3% to 18.5%. In 2009, with the first birth peak population entering aging in 1949-1958, China’s aging population entered the first growth peak, with an average annual net increase of 8.4 million, with an average annual growth rate of 4.07%. The growth rate of the elderly population(over 60 years old) is six times the growth rate of the total population in the same period. In 2022, with the second birth peak population entering the ageing in 1962-1976, China’s aging population ushered in the second growth peak, with an average annual net increase of 11.06 million, with an average annual growth rate of 3.26%. The growth rate of the elderly population(over 60 years old) is ninety eight times the growth rate of the total population in the same period.

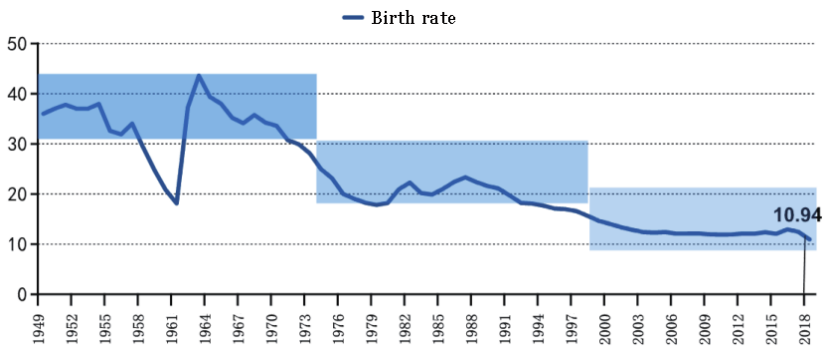
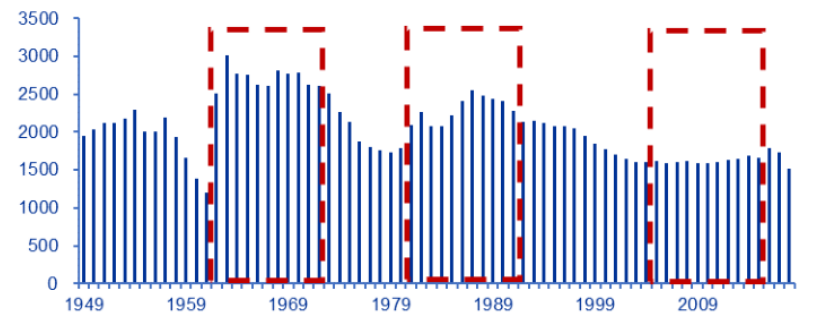


Image 3,Chinese population birth rate, Unit: %

Data Sources: Chinese Statistics National office

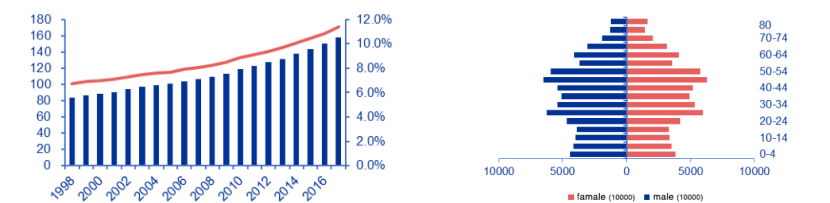
The first generation of baby boomers will become the elderly, while the third generation of baby boomers has not yet appeared



Data Sources: Chinese Statistics National office

Image 4,Chinese Annual birth population, Unit:10000

2.Rapid aging stage (2023-2036),The number of elderly people(over 60 years old) increased from 268 million to 423 million, and the aging level rose from 18.5% to 29.1%. In 2029, China’s total population reached a peak of 1.463 billion; in 2030, China’s total population began to grow negatively.



Data Sources: Chinese National Task Group on the Strategy of Population Aging

Image 5,The proportion of elderly people over 65

Image 6,Pyramid map of Chinese populationdistribution in 2017

3.In the deep aging stage (2036-2053), the number of elderly people(over 60 years old) reached 487 million from 423 million, and the population aging level rose from 29.1% to 34.8%. In 2046, with the third birth peak population entering aging in 1987-1995, China’s aging population ushered in the third growth peak, with an average annual net increase of 6.66 million and an average annual growth rate of 1.42%.

4.During the period of heavy aging platform (2054- 2100), the growth period of the aging population(over 60 years old) has dropped from 487 million to 383 million, and the population aging level has remained stable at around 34%. Compared with the total age of the developed countries in the same period, the total population of the elderly is about 205 million. In 2055, the overall size of China’s aging population began to shrink, and the level of aging declined slightly and was basically stable at around 34%.

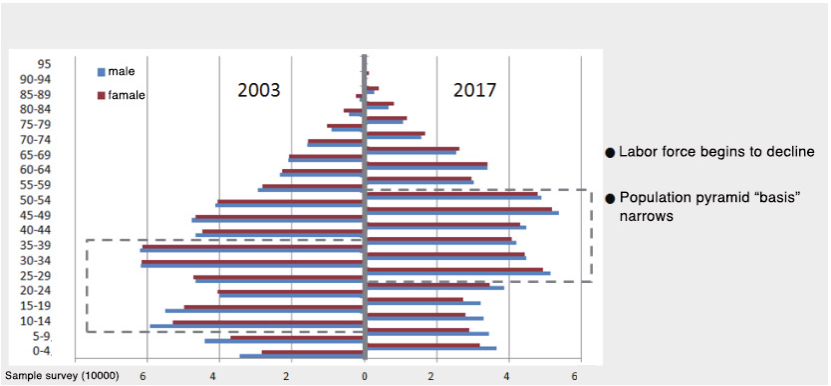


Image 7,Comparison of the 2003 and 2017 population sample surveys

With a large population base + long-term family planning policy, China’s aging is developing at an alarming rate. By the end of 2017, the number of elderly people aged 60 and over in China exceeded 240 million, accounting for 17.3% of the total population, of which 160 million were aged 65 and over, up 5.5% year-on-year, accounting for 11.4% of the total population. Continued improvement, it is estimated that the proportion of the elderly in 2030 will reach 25%, close to 350-400 million elderly.

Data Sources:China National Bureau of Statistics

Data Sources: Chinese National Task Group on the Strategy of Population Aging



Part two:

2.Responses

- 2.1 Responses from some overseas countries
- 2.2 China's pension model and current status

2.1 Responses from some overseas countries

2.1.1The international community pays attention to the process of aging

In the middle of the 19th century, France, headed by Sweden, Norway and other European countries, entered the aging society. In the 1940s, some European scholars began to explore the impact of changes in age structure on the economy. In 1956, the United Nations released the “Aging of Population and Its Social and Economic Consequences” written by the French demographer. The international community began to pay attention to aging. In 1974, the world’s first population conference confirmed the impact of aging on the economy and society. It is both an opportunity and a challenge, and calls on all countries to pay close attention to the old dream. In 1982, the first World Assembly on Ageing proposed to strengthen the ability to cope with aging from both development and humanity, to ensure that the lives of older groups can be effectively guaranteed, and to have the opportunity to contribute to economic and social development. In 1999, the Programme of Action of the International Conference on Population and Development reaffirmed that all societies must pay attention to the future of ageing. In 2002, The Second World Conference on Aging proposes the “Established a society for all ages.”

"Aging of Population and Its Social and Economic Consequences" written by B.Pichat,French demographer

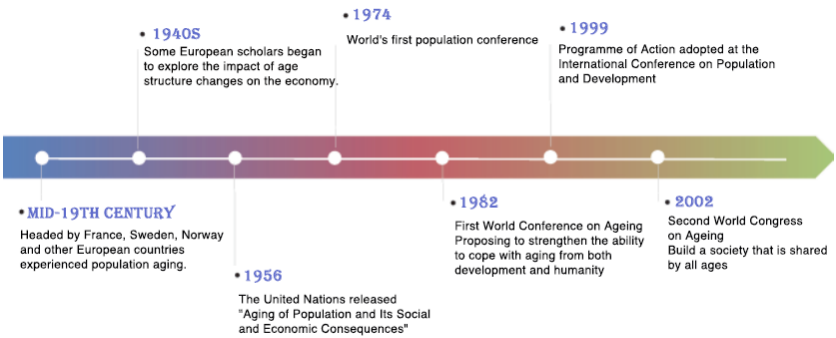


Image 1, The international community pays attention to the process of aging

2.1.2Foreign pension policy and operation model

United States

United States: Establish AARC, CCRC large-scale retirement community.The overall US pension system has also been extended from three modes: home pension, community pension, and institutional pension. Unlike China, the US pension system is more diversified. In addition to the government and business organizations, social organizations are also the main providers of US pension services. The government purchases services from social organizations to cover basic pension services. For the elderly who prefer “holding a group for the elderly”, the United States has developed a mature elderly community model, which includes both high-end communities for high-income elderly groups and mass communities for ordinary income groups. From the perspective of community services and functions, there are two common types of active retirement communities (AARC) and continuous care retirement communities (CCRC) in large-scale pension communities in the United States. The former is mainly aimed at young and active active elderly, such as the “Sun City Center” in Florida The latter can accommodate a wider range of age groups, and there are different service units and areas for the elderly with different health conditions. In addition, the elderly who do not want to live in the elderly community, but need special care for a long time, can also choose to live in a professional elderly institution such as a nursing home, nursing home, nursing home, etc.

Data Sources: Jingzhun Research Institute,July 2019, Pension Services Industry Report



Image 2, Sun City Center in Florida

Data Sources: <https://www.suncitycenter.org/>

Japan

Japan entered an aging society in 1970 and was the first country in Asia to enter an aging society. In the face of the surge in the elderly population, influenced by traditional customs, family structure transformation and economic changes, the Japanese government proposed a home-based pension model of “home-based care and home care”, which provides more economic and medical support for the elderly who are living at home. Including home services and community services, choose the right retirement home based on the wishes and physical condition of the elderly.

At the same time, Japan began implementing the Long-Term Care Policy (LTCL) in 2000 to help more elderly people live independently and reduce family burdens. LTCL emphasizes that community care is more than institutional care, and reduces hospital stays, moving the saved hospitalization costs to the long-term care system, giving the elderly more community care. The application of the LTCL model improves the independence and quality of life of the elderly, reduces the burden on the family, greatly saves medical expenses, and improves the satisfaction of the elderly care service.

Japanese home care is very popular, the main reason is that the community service is thoughtful and relatively perfect, which can enable the elderly to show their talent. Compared with Western countries, Japan’s pension system emphasizes the role of the family and emphasizes the independence of the people.



Image 3,Japanese elderly in community public restaurant

Data Sources: <https://zhuanlan.zhihu.com/p/52410448>

United Kingdom

The United Kingdom entered an aging society in 1930, 10 years earlier than the United States. The United Kingdom is a veteran welfare state, and the government has a clear commitment to provide services and support to the elderly in the form of decrees so that they can live a decent life. Community care is a social work model advocated by the UK under the changes of the welfare state policy. It is also a part of the UK’s promotion of social services. The goal is to enable the elderly to be helped in their own home or home-like environment.

At present, community care is widely used in various fields of British social services, and it is best reflected in the issue of old-age care. Community care actually includes two concepts: facility care and service management system.

Facility care is the use of community resources and care by professional staff in the community.

Community service management system is composed of managers, main staff and caregivers. The manager is a principal of a community , mainly responsible for the allocation of funds, the recruitment of personnel and the supervision of work. The main staff is responsible for caring for a certain number of seniors in the community, providing them with pensions, understanding the needs of the elderly and addressing important issues. The caregiver is a person employed directly in the life service of the elderly, mostly relatives and neighbors of the elderly, and the government gives them certain service subsidies.



Image 4, An elderly British community

Data Sources: <https://zhuanlan.zhihu.com/p/52410448>

Canada

According to Canadian statistics, the number of elderly people exceeds the number of children in Canada (2016 census). Canada now has a total of 5.9 million seniors over the age of 65, compared with a total of 5.8 million children under 14 in the country. This is the first time since the founding of Canada that the elderly population has surpassed the child population. Compared with 2011, the total elderly population has increased by 20%, which is much higher than the 5% of the total population growth rate. Among the elderly population, the proportion of the oldest population increased even more-the population over the age of 85 increased by 19.4%, and the population over the age of 100 increased by 41.3%. The evolution of the children's population, middle-aged population, and elderly population structure has brought severe challenges to the solution of the aging problem.

Under the influence of traditional Western culture, institutional pension is Canada's main pension model, and it also encourages self-nursing and family pension. In 2011, the proportion of male and female elderly people aged 65 and over in Canada in the aged care institutions was 5% and 9% respectively. The old-age service agencies can be divided into government public pension institutions, non-profit pension institutions and for-profit pension institutions. According to the elderly care needs, they can be divided into elderly apartments (full self-care), auxiliary apartments (1h medical care per day), elderly people Housing (needs day care) and nursing homes (complete loss of living capacity).



Image 5, Old Canadians Exercising in the Gym

Data Sources: <http://www.mofcom.gov.cn/article/ij/yj/1/201705/20170502576373.shtml>

2.2 China's pension model and current status

2.2.1 Social characteristics of China's aging population

2018 is the last year when China's first birth peak population has entered old age. Beginning in 2019, affected by the birth cohort during the "three years of difficulties" period(1959--1961), China's aging process will experience a three-year easing period, and the number of aging population will slow down each year. Before 2022, despite the rapid increase in the absolute number and proportion of the elderly population, China's labor supply is still relatively sufficient, and it is still in the primary stage of aging.

At the same time, with the country's and society's attention and action on aging, China is changing from the state of **"growing old without preparation"** and **"growing old without getting rich"** to **"growing old while getting ready"** and **"growing old while getting rich"**.

Concept source: proposed by Chinese scholar Sun Juanjuan and Gao Xiuwen in Beijing Daily, August 13, 2018

From a government perspective, the report of the 18th and 19th CPC National Congress and the outline of the "13th Five-Year Plan" have clearly put forward a positive response to aging. A series of related policy documents have been issued intensively, and the relevant policy system has been gradually improved. Since 2013, there have been more than 20 special plans for the elderly related to the "Thirteenth Five-Year Plan" issued at the national level. Nearly 300 policies concerning the elderly have been issued by the State Council and relevant departments.

From a social perspective, aging has become the focus and hot spot of China's entire society. The concerned population has expanded from individual professionals to all groups of the whole society; the perspective of attention has expanded from individuals, families and their lifestyles to all aspects of the society; The areas of concern have expanded from local livelihood issues such as old-age care, population policy, and social security to overall economic, political, and cultural impact.

From an economic perspective, while China continues to age, its economic development is also very rapid. At the end of 1999, the proportion of China's elderly population over 60 years old reached 10.3%, marking China's entry into an aging society. When it entered the aging society, its per capita GDP was 7,229 yuan. When China's aging level reached 17.3% in 2017, its per capita GDP had increased to 59660 yuan, an increase of 8.25 times^[4].

From the perspective of services, China has initially established a multi-level elderly care system based on home, community and institutional supplements. In 2014-2017, the number of community aged care institutions and facilities increased from 19,000 to 43,000, the number of community mutual assistance aged care facilities increased from 40,000 to 83,000. At the same time, the number of nursing home and service facilities also increased from 38,000 in 2006 to 140,000 in 2016. The number of old-age beds per 1,000 elderly people increased from 19.1 in 2011 to 31.6^[5].

2.2.2 The main classification of Chinese pension model

The existing pension models can be roughly classified into three types according to different places and service forms: including home-based care, community-based care, and mechanism care.

Home-based care: A family-centered model for the elderly. the elderly and adult children and other family members live together, or live alone at home to support the elderly. This model is cheaper, the elderly are more familiar with the environment, and the family can spend more time with them. It is the main choice for the elderly to support the elderly, and it is also in line with China's traditional family culture of filial piety.

Community care: refers to relying on public resources and service facilities in the community, or the introduction of professional elderly care services, such as community canteens, day care centers, community health service centers, etc., so that the elderly can quickly and easily get corresponding living services within the community where they live. For the elderly who are relatively weak in self-care ability or their children are not around, community care is a powerful supplement to home care.

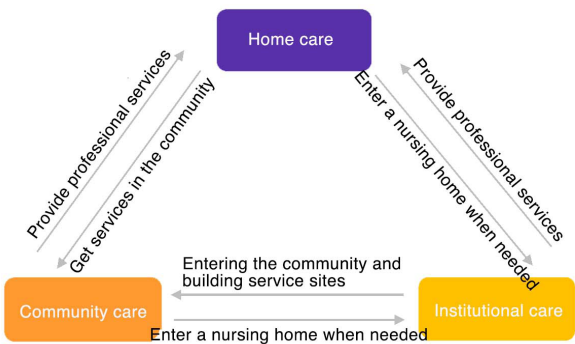
Mechanism care: It mainly refers to a pension model mainly consisting of nursing homes, health care centers, nursing homes, elderly apartments, etc., and specialized pension institutions. This model can gather the elderly to provide a full range of services such as living, dining, medical treatment, and entertainment, but it requires higher construction costs and investment of resources, and is suitable for elderly groups with a high degree of disability or dementia, and the family cannot afford to care

With the gradual liberalization of the elderly service industry, the government has basically established the basic framework of an elderly service system based on home care, community care, and mechanism care. Local governments such as Shanghai and Beijing have also successively introduced the “9073” or “9064” model, that is, 90% of the elderly live at home, 7% or 6% of the elderly rely on community care, and the remaining 3% or 4% of the elderly rely on professional mechanism.

Until now, because both home-care and community-care relied on the living environment of the elderly, and community-care service agencies also provided services for the home-care elderly, the two types of care-giving have gradually merged. In the “Thirteenth Five-Year Plan” for the development of the country’s old-age cause and old-age system construction plan issued by the State Council in 2017, the community old-age service has been put forward as a whole, and has become an important direction for the development of old-age cause from 2017 to 2020. Corresponding to other models, some experts proposed the “9802” model to further strengthen the basic position of home care for the elderly in the care service system.

Regardless of “9073” or “9802”, the basic design ideas of the aforementioned models are related to the composition of the elderly group and the characteristics of the three pension models. Of the nearly 250 million elderly people over 60 in the country, nearly 90% are under the age of 80, which means that the vast majority of elderly people have the basic self-care ability and can support at home. The proportion of semi-disabled elderly people who need to live in an elderly care institution is relatively small in the elderly group.

Data source: State Council of China, Whale Quasi Research Institute, July 2019.



- “9073” model: 90% home care, 7% in the community and 3% in the institution;
- “9064” model: 90% live at home, 6% in the community and 4% in the institution;
- “9802” model: 98% of home communities old, 2% institutional care



Part three:

- 3.Characteristics and needs of the elderly
- 3.1 Physiological characteristics and needs
- 3.2 Psychological characteristics and needs
- 3.3 Behavioral Characteristics of the elderly in Traditional Chinese Culture

3.1 Physiological characteristics and needs

3.1.1 Safety

Because of the inconvenience of movement, poor eyesight, and inflexibility of legs and feet, the elderly have greatly reduced their movement and reaction ability and are prone to danger. Older homes should work harder on safety protection, and it is quite necessary for the elderly to live safely. Then enumerate some detailed requirements for Chinese and Japanese elderly care facilities.

1. Electrical, socket and switch positions

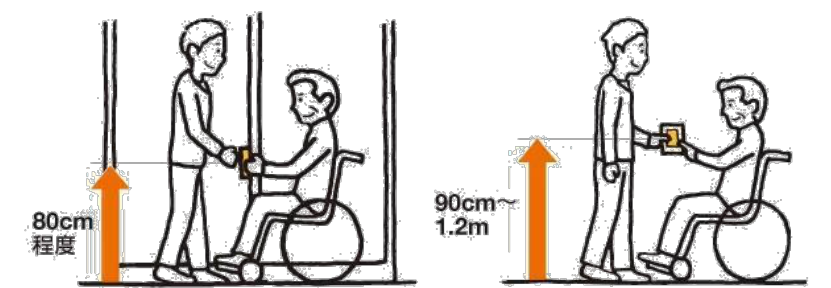


Image 1, Electrical, socket and switch positions height

The position of the switch and socket that everyone can easily ignore is actually the focus of our attention. In general, the height of the switch in the home is 120 cm, but it is high for the elderly. The height can be slightly reduced to about 90~100 cm, to avoid the electrical wires appear on the ground (easy to trip), the leakage protection of the socket, and the like.

2. Aisle, handrail

One-third of seniors aged 65 or older will fall, and some will be injured. The older they are, the higher the risk. The width of the aisle/furniture space needs to be 780mm for the elderly to move. If there is a wheelchair, it should be more than 800mm. In particular, horizontal handrails should be set up in corridors and corners.



Image 2, Suitable height of handrail

Data Sources: <https://zhuanlan.zhihu.com/p/22881579>

If we choose a round handrail, the most user-friendly diameter is: 35mm. The diameter of the handrail is too wide to grasp. On the contrary, the diameter is too thin to give people an uneasy feeling. According to the survey and evaluation results, the round handrail is 35mm.

3. Unobstructed ground

Abandon the existence of the height difference or the threshold stone, and choose the sliding door with only the upper hanging rail. In fact, due to the design of the steps, a transitional segment was adopted.

4. Non-slip floor tiles, floor

In places where there is water in the kitchen and bathroom, floor tiles or floors with non-slip materials are required. In addition, anti-fouling is also one aspect, and easy cleaning is very important (reducing the burden of cleaning).

5. Bedroom and night lighting

Night lights: Avoid dark night corridors or dark living rooms (including adding handrails) when the old man starts up at night.

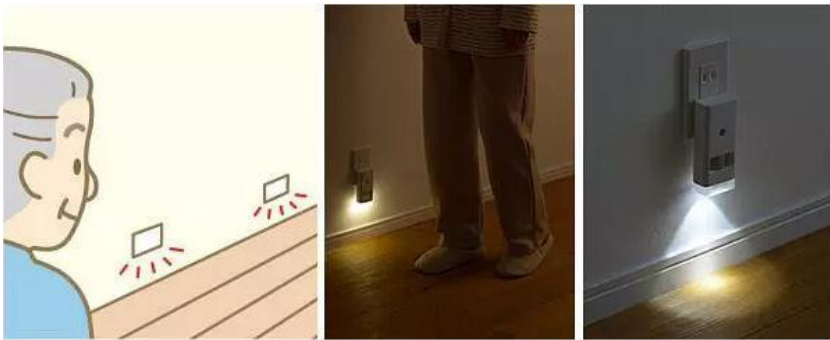


Image 3, Lighting requirements

Data Sources: <https://zhuanlan.zhihu.com/p/22881579>

3.1.2 Convenience and Comfort

1.Kitchen height

According to the height of the old man, redefine the height of the kitchen: the normal height of the normal counter that is generally recognized in the market is “height ÷ 2+5~10cm”. If the table top is low, it is easy to increase the load when bending over. The table top is high and the pain and feeling of standing fatigue is always standing. In addition, the kitchen decoration that can sit down and work is also highly recommended.



Image 4, Kitchen height

2.Wheelchair corresponding makeup cabinet

First of all, make sure there is enough space under the wash to avoid collision between the knee and the foot; the height of the cosmetic cabinet/basin can be set at about 65cm.



Image 5, Washbasin comfort height

3. Drying

It is more difficult to hang up clothes, and the floor hangers are easy to place, choose a clothes rail that can be lowered, and so on.



Image 6, Clothes drying



Image 7, Seated shower

4.Seated shower

A sitting shower designed for the elderly or those with reduced mobility can effectively prevent the old man from falling down when climbing in and out of the bathtub. The mist bath steam can raise the temperature of the whole body in a short time, and the old man can easily wash it to the toes while sitting in the seat. The sitting shower saves about 1/3 of the water compared to the bathtub, especially for heart patients (water pressure hazards in the bathtub).

5.Indoor lighting

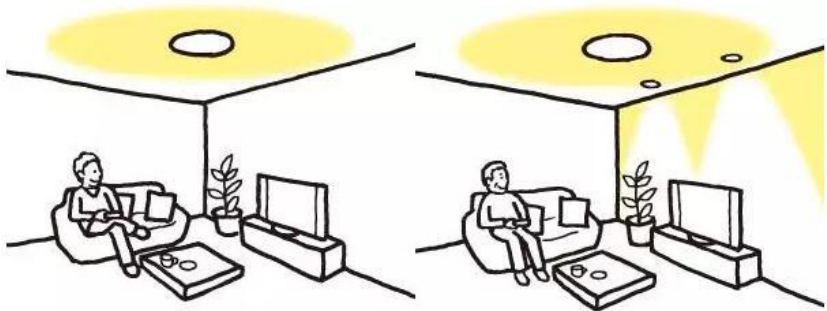


Image 8, younger 30-150lx

elderly 50-250lx

Normal lighting of the entire room, the elderly need brightness 50-250lx.

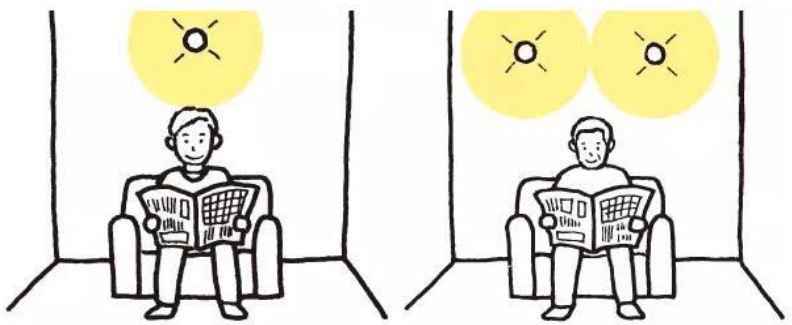


Image 9, younger 300-750lx

elderly 600-1500lx

Data Sources: <https://zhuanlan.zhihu.com/p/22881579>

Reading the lighting of the word, the elderly need to be 600~1500lx (about twice the young people).

As you get older, your vision will gradually weaken. Therefore, young people feel that the right light is dark for the elderly, and it is more necessary to enhance the brightness of the lighting than for young people. For example, when reading newspapers or writing, you can use auxiliary lighting, such as brackets, to provide good lighting for the elderly.

3.1.3 Color matching

Color not only enhances the spatial effect, but also changes the mood and physical condition of the person, creating space from the perspective of color.

The senses and mood of the room can vary depending on the color. Using these uses, optimizing the color combination, you can maximize the use of color effects to create a comfortable residential environment for the elderly.

The threshold of sensory organs in the elderly is increased, and the auditory visual function is degraded, so it is important to stimulate the senses of the elderly. From a physiological point of view, the stimulating sensation delays the decline in sensory function and has a positive stimulating effect from a psychological perspective.



Image 10, Orbec nursing home in Normandy, France

Data Sources: <https://bbs.zhulong.com>

3.2 Psychological characteristics and needs

3.2.1 Psychological characteristics of the elderly

As the elderly grow older, their physical and psychological aspects gradually change.

Physiological changes are relatively obvious externally, such as the decline of physiological functions in various aspects of the body, and the gradual disturbance of sensory systems, while the changes in psychological aspects with age are invisible. The psychological change of the elderly is, first of all, the sensation and perception of the elderly gradually weaken. The perception ability is gradually passivated or even lost, which makes the elderly feel that they are gradually isolated from the people around them, causing psychological loneliness. The loss of perception ability causes the elderly to lose the ability to acquire information to communicate with the external environment, and the enhancement of psychological loneliness will further accelerate the decline process. In the process of aging of the elderly, psychological change is a more complex issue, which is not only closely related to changes in physiological functions, but also related to the social role, cultural background, and living habits of the elderly. Psychologists roughly attribute the psychological characteristics of the elderly to three aspects: survival, nostalgia, and loneliness^[6].

Survival, psychological “survival” is divided into three aspects. First, the elderly’s physiological function is gradually declining, physical energy is weakened, resulting in often considering their own health issues, and doubting whether they can continue to live healthy. Secondly, they are worried that their illness will cause a burden on the family and society, or that they will not be able to take care of their children and suffer isolation. This psychological mechanism of the elderly directly reflects the urgent needs of the elderly for a healthy living environment, places of activity, and social services. Finally, in order to prevent or delay the decline of thinking and the aging of the structure, the elderly strive to obtain a sense of self-preservation in all aspects.

Nostalgia, with the increase of age, physical decline, family changes, social status and social roles, etc. Promote his heart full of nostalgia for the life in the past when he was young, and attach to the social life environment, lifestyle and other issues that he is familiar with, and hope to make up for it through some activities. The elderly with such psychological characteristics reflect the phenomenon that they yearn for their familiar living environment, and love to communicate with children and young people, and to participate in young people's activities.

Loneliness refers to the decline of the elderly's perception ability, the gradual decline of self-psychological tolerance and regulation mechanism, and the gradual decline of the cognitive ability, resulting in a decrease in the elderly's enthusiasm for life, low mood, increased anxiety, and malignant development of thinking modes. Will panic when guessing other people's motives or fantasizing about others' actions endangering their own safety, which leads to the narrowing of the scope of the elderly's interpersonal relationships, resulting in a closed mental state. The elderly communication facilities have a certain effect on the regulation of this mechanism.

3.2.2 Psychological needs of the elderly

Dependent needs. The main manifestation is that the elderly have a greater sense of dependence on family life, are more dependent on their children and loved ones, hope that they can have their loved ones take care of themselves, go out to the hospital with someone to accompany them, and have someone to communicate with them. They also need more respect and understanding.

Goal conversion needs. Because retired elderly people have more free time, the elderly's life center is biased towards families, children, and loved ones. They hope to share the household chores for their children and are eager to do some work within their ability. At this time, the elderly need to develop new interests, because the main goals of life before retirement are work, raising a family, and caring for children. Therefore, the elderly need to participate in more social activities that can exercise themselves.

Affinity needs. The social role of the elderly affects the changes in their interpersonal relationships, and they gradually develop a sense of loneliness in their daily lives. Therefore, the elderly at this time need to interact with others to relieve the feeling of loneliness. Many elderly people show love and closeness to children and adolescents.

Information requirement. Although the space for the elderly is small, they still need to obtain social information, understand the surrounding changes, market conditions, and understand the world^[7].

3.3 Behavioral Characteristics of the elderly in Traditional Chinese Culture

The elderly in China have less individual time and increased social time (non-work area). Chinese elderly are more willing to go out to participate in social activities. According to Shenzhen’s “Jing newspaper”, the number of square dance enthusiasts in China is between 80 million and 100 million, most of them elderly people. By comparison, we can find that active socialization is the advantage of Chinese elderly people, and it is also a special place that distinguishes Chinese elderly society from other countries.

Like to get along with children:In traditional Chinese dwellings, family members often gather in a large courtyard. Three generations of grandparents live together. Adults go out to work, and old people play with their grandsons at home. In modern society, although many family members no longer live together, due to the tight pace of life, parents often ask older people to help look after children. Such as picking them up from school and playing with them. Old people are also delighted in their own value, and together with children have brought a lot of vitality to their lives.



Image 11, Grandma and granddaughter entertain together

Data Sources: https://cw1.tw/CH/images/channel_master/c0c6a10b-9e18-42d4-a099-27c96fa46197.jpg

Frequent group activities:An important characteristic of Chinese senior citizens’ social activities is their strong concentration. At least it is in groups of three or five, such as playing ball, playing chess, boobies, etc .; at most, it is hundreds or thousands, such as practicing Tai Chi, square dance and so on. In the park, there will be multiple group activity points spontaneously. At a fixed time, there are fixed groups of elderly people to carry out gymnastics, tai chi, square dance, chorus and other activities. In large parks, there are often elderly people who organize group walking. Activities promote health while also promoting communication.



Image 12, Old people performing show, square dancing in the park

Diversified event space:There are many kinds of group activities that the elderly in China like, and they are particularly concentrated on: if there is a public indoor space, everyone will carry out traditional projects, such as playing chess, playing mahjong, and enjoying drama. If outdoor public spaces exist, plaza dancing and talent shows are the most popular. In almost every community square and park in China, old people gather to play chess and perform square dance at night.



Image 13, Old people organize outings

Data Sources: https://encrypted-tbn0.gstatic.com/images?q=tbn:ANd9GcQDEjlcKuJKEtIDhh3i7VoLFtYi_DawTcOWxJ1dhwgTjQz_fk-x&s

Traditional culture learning:Some retired elderly who like quietness, because they were busy with work or hobbies, often invest in traditional Chinese culture after retirement. In recent years, more and more senior universities have been opened. Many old people devote themselves to studying Chinese painting, calligraphy and music in their spare time. In some community centers, older people will also perform their talents and exchange their recent learning achievements.



Image 14, Practice calligraphy



Image 15, Traditional Chinese painting

Data Sources: <https://encrypted-tbn0.gstatic.com/images?q=tbn:ANd9GcSNmjUBLss46qNmj6BsGuIj660Us-NnUFuUZOHl0qy-aV7SIOXylw&s>



Hospital Complex Broussais,Paris XIV°, France,2015

Part four:

4.Case study

4.1Case Study of Small Nursing Home

4.2Case study of large-scale elderly community

4.1Case Study of Small Nursing Home

4.1.1Orbec Nursing Home in the Normandy Mountains, France

The nursing home is located in the middle of the Normandy Woods neighborhood near Aulbeck village. It is built on the mountain, expanding the living area and walking area, and optimizing the use of the landscape.



Image 1, Orbec Nursing Home

The architect used green elements in the project, while integrating the nursing home and the surrounding landscape, it also reflects the natural atmosphere of the surrounding environment. The outer skin under the cantilever and the white wall at the bottom create a light feel.



Image 2, Orbec Nursing Home Facade

Data Sources: <https://bbs.zhulong.com>

In order to better integrate the nursing home into the environment, the architect split it into several parts. Each living unit is an integral part of the building, and all living units are connected to the south-facing hillside street. This layout allows the scenery to be seen on both sides of the building, and the light flows through the traffic flow lines, which enriches the landscape.

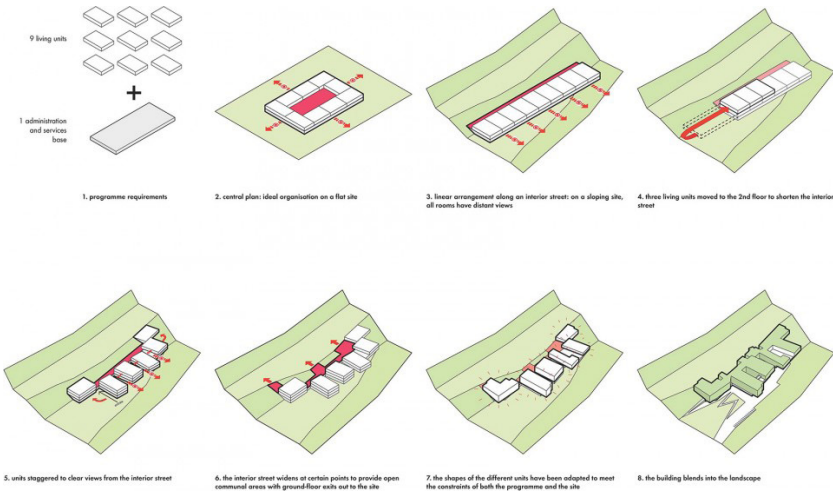


Image 3, Concept formation

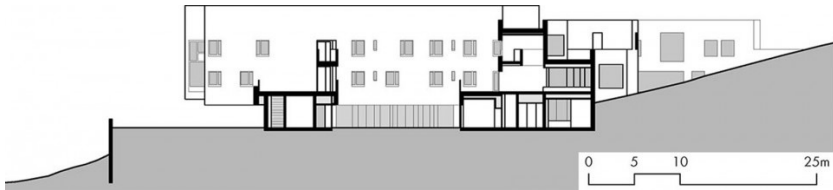


Image 4, Orbec Nursing Home Section

Data Sources: <https://bbs.zhulong.com>

4.2 Case study of large-scale elderly community

4.2.1 Admiralty Village, Singapore

The Admiralty Village Complex is Singapore's first comprehensive project that combines business and various communities and medical facilities under the same roof. The starting point is to create a livable space for the elderly. The construction background is the society that Singapore is facing. Aging.

The project is adjacent to the Admiralty subway station and was completed in August 2017. This one-stop comprehensive project is 11 stories high. In addition to the medical center, elderly activity center, there are also squares and shops, and a community garden on the top floor. The project consists of two residential buildings, with a total of more than 100 units, divided into two different areas of 36 and 45 square meters.

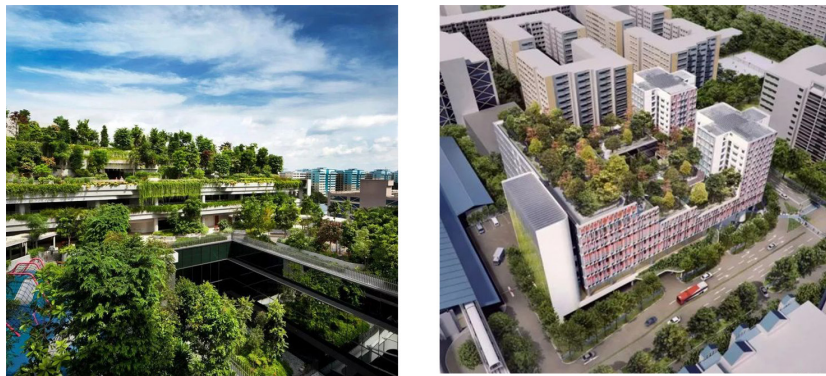


Image 5, Admiralty Village

The scheme builds upon a layered 'club sandwich' approach. A "Vertical Kampung (village)" is devised, with a Community Plaza in the lower stratum, a Medical Centre in the mid stratum, and a Community Park with apartments for seniors in the upper stratum. These three distinct strata juxtapose the various building uses to foster diversity of cross-programming and frees up the ground level for activity generators. The close proximity to healthcare, social, commercial and other amenities support inter-generational bonding and promote active ageing in place.



Image 6, Admiralty Village Section

The Community Park is a more intimately scaled, elevated village green where residents can actively come together to exercise, chat or tend community farms. Complementary programmes such as childcare and an Active Aging Hub (including senior care) are located side by side, bringing together young and old to live, eat and play. A total of 104 apartments are provided in two 11-storey blocks for elderly singles or couples. "Buddy benches" at shared entrances encourage seniors to come out of their homes and interact with their neighbours. The units adopt universal design principles and are designed for natural cross ventilation and optimum daylight.



Image 7, Admiralty Village Shopping malls and roof gardens

Data Sources: <https://www.archdaily.com/904646/kampung-admiralty-woha>



5.1 Plot Information

The plot is located in Yuexiu District, Guangzhou, China. Yuexiu Park is across the road from its east side. Not far to the west are the Military Region Hospital and Guangzhou Railway Station. On the south side, it is adjacent to the Nanyue King Museum and Yuexiu Mountain Stadium.

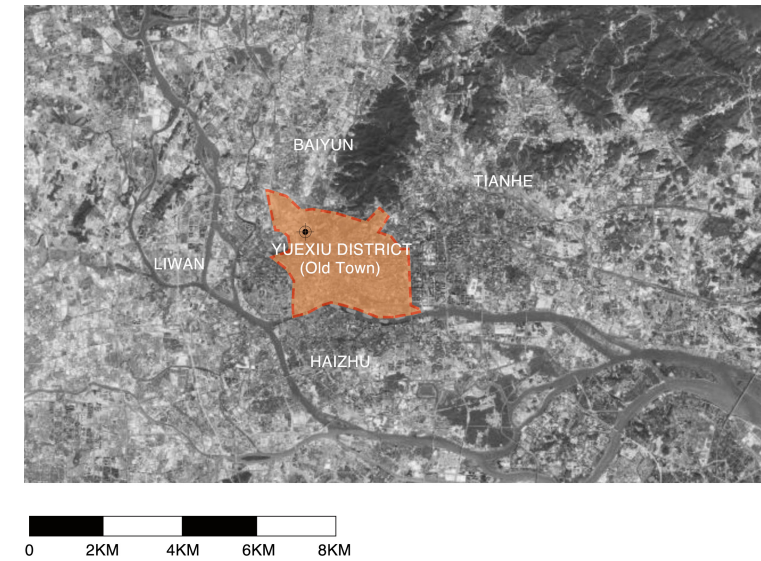


Image 1, Plot is located in Yuexiu District, Guangzhou, China



Image 2, Southwest corner of the intersection of Jiefang Road and Inner Ring Road.

Part five:

5. Project Description

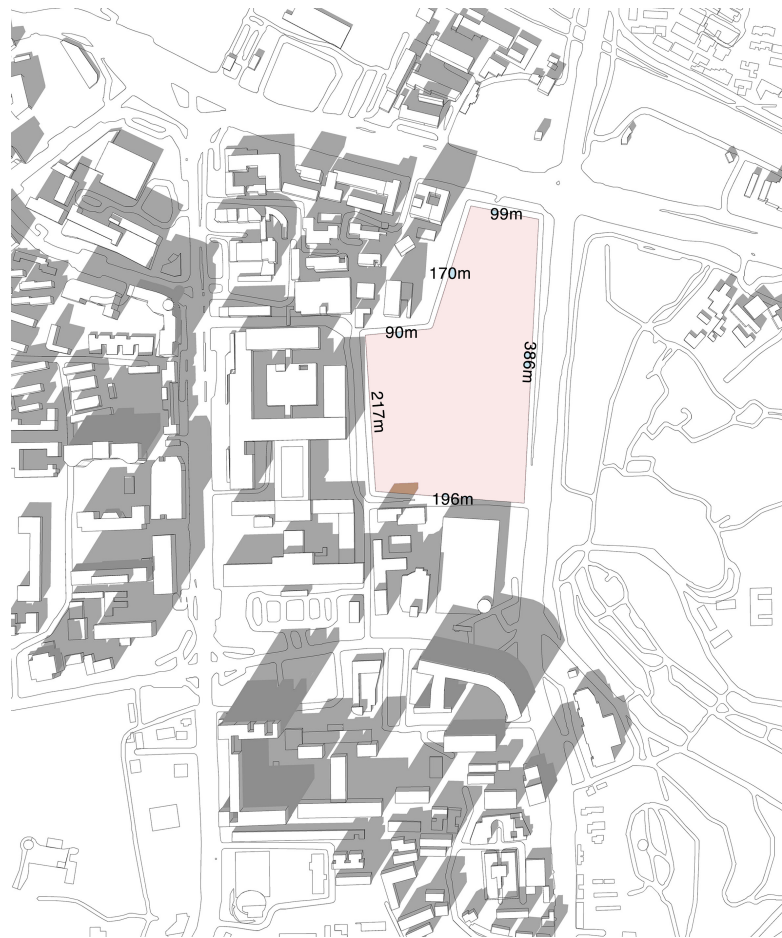
5.1 Plot Information

5.2 Guangzhou City Introduction

5.3 Introduction around the plot

5.4 Project intent

It covers an area of 63,300 square meters.



1:10000

Image 3,Plot area size

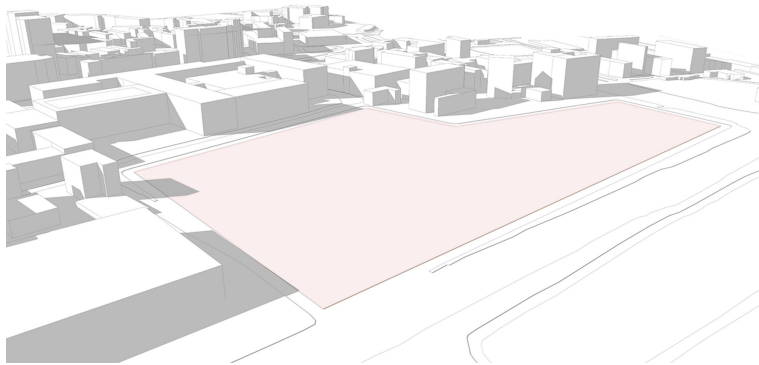


Image 4,Looking at the plot from the southeast

5.2 Guangzhou City Introduction

5.2.1 Location

Guangzhou is located in southern China, bordering the South China Sea and the northern edge of the Pearl River Delta. It is the capital of Guangdong Province.

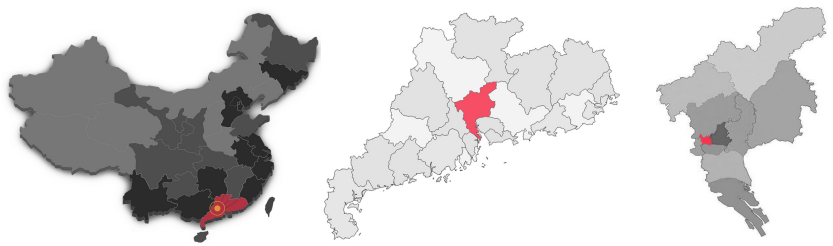


Image 5,Location of Guangdong Province,Guangzhou City,Yuexiu District

In urban planning in China, Retirement community can only be seen in big cities. Due to restrictions in population, resources, and people's perceptions in ordinary cities, there is no high demand for elderly communities. However, big cities have a large population base and a large number of immigrants, then their market demand is high.

The economy of Guangdong Province is developed and there are many migrant workers. At the same time, due to the large population base, The level of aging population is also one of the highest in China.As of the end of 2018, the number of elderly residents registered in Guangzhou was 1.692 million, accounting for 18.25% of the registered population.

Data Sources:<http://www.cnsf99.com>

Beijing, Shanghai, and Guangdong were analyzed from Environment (degree of air quality), Climate (degree of livability for the elderly), Facility (degree of supporting facilities), Living cost, and Migration (degree of demand).

Then Guangdong was selected for project exploration.

Guangzhou is the capital of Guangdong Province. It is also the third largest city (from the economic, political,demographic, and transportation perspectives) in China.

Data Sources:<https://www.ocs-gz.gov.cn>

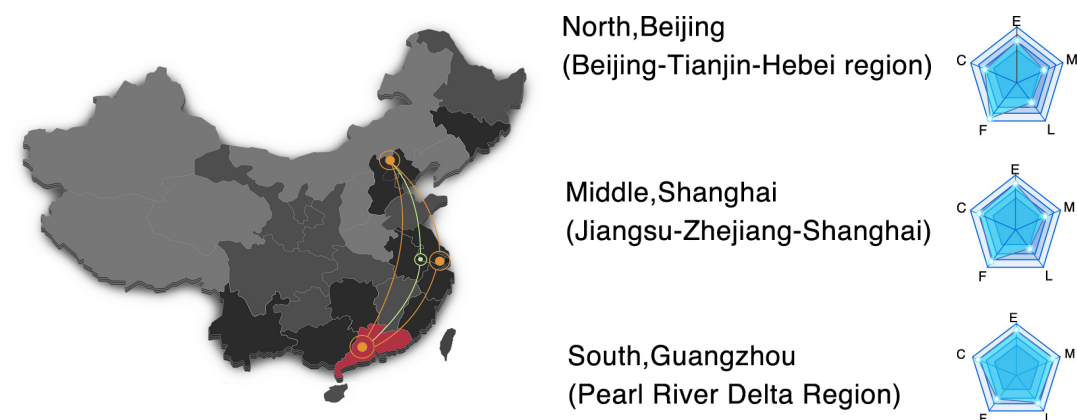


Image 6, Location of Beijing, Shanghai, Guangzhou, and various assessments

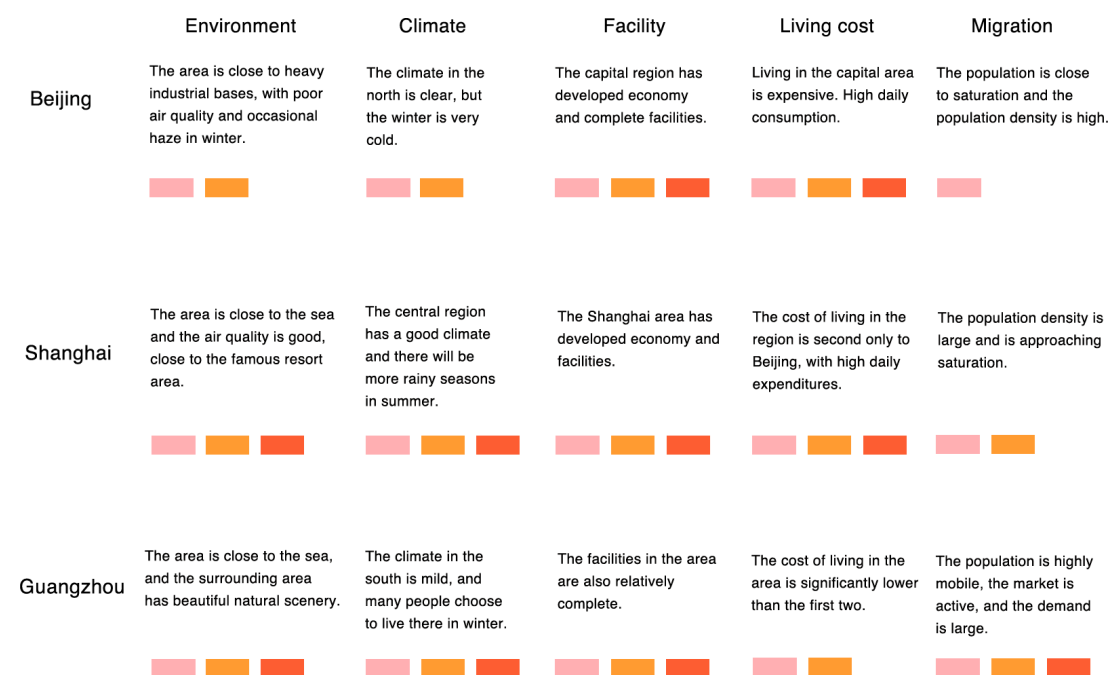


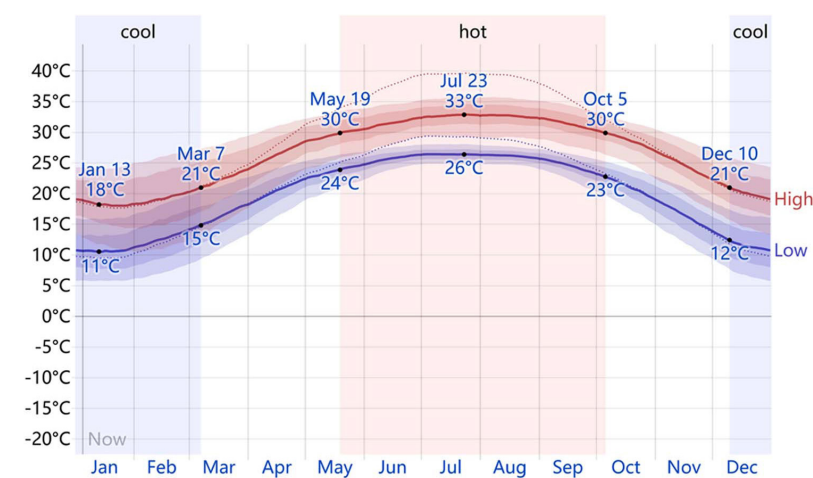
Image 7, From the perspective of Environment, Climate, Facility, Living cost, and Migration, the advantages and disadvantages of the three large cities.

Due to the suitable temperature, good air quality and perfect urban facilities, in recent years, more and more elderly people choose to travel or live in Guangzhou every winter.

5.2.3 Climate

Guangzhou(23°07'N, 113°15'E) belongs to the marine subtropical monsoon climate, which is characterized by warm and rainy, abundant light and heat, long summers, and short frost periods. The annual average temperature of 20-22 °C is one of the largest cities in China with the smallest annual average temperature difference. The average relative humidity is 77%, and the annual rainfall in the urban area is about 1,720 mm. During the same period of hot and cold water throughout the year, there is abundant rainfall, which is conducive to plant growth. It is a “flower city” with ever-green and colorful flowers in all seasons.

Data Sources: <https://zh.wikipedia.org/wiki/%E5%B9%BF%E5%B7%9E%E5%B8%B2>



Data Sources: <https://weatherspark.com>

Image 8, Average High and Low Temperature

The daily average high (red line) and low (blue line) temperature, with 25th to 75th and 10th to 90th percentile bands. The thin dotted lines are the corresponding average perceived temperatures.

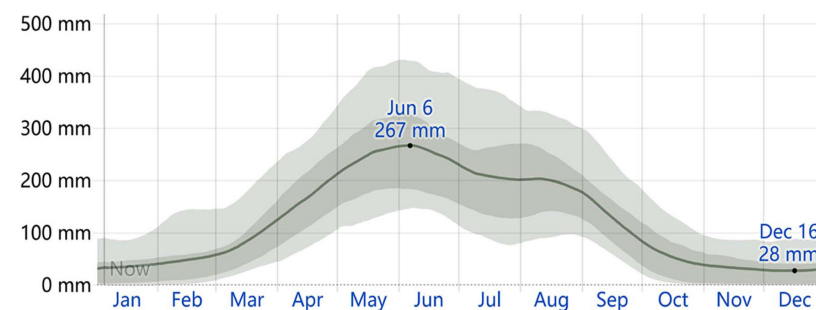


Image 9, Average Monthly Rainfall

Rain falls throughout the year in Guangzhou. The most rain falls during the 31 days centered around June 6, with an average total accumulation of 267 millimeters. The least rain falls around December 16, with an average total accumulation of 28 millimeters. Guangzhou has a lengthy monsoon season, spanning from April through September.

Data Sources: <https://weatherspark.com>

Data Sources: <https://zh.wikipedia.org/wiki/%E5%B9%BF%E5%B7%9E%E5%B8%82>

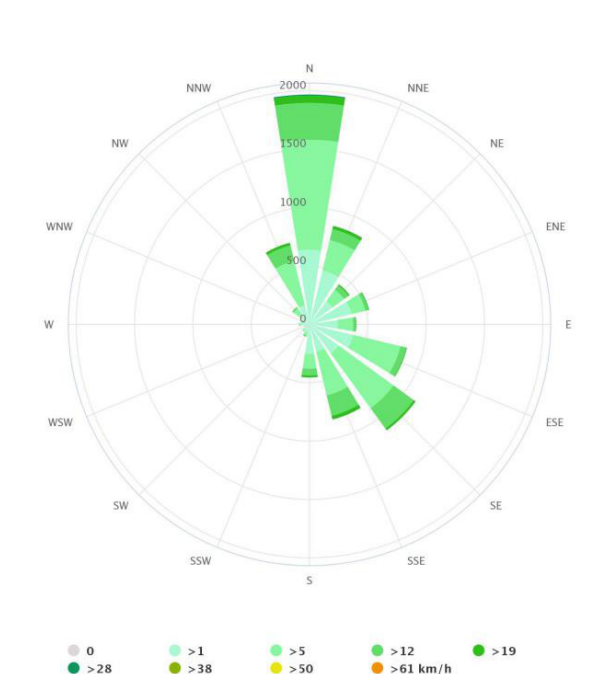


Image 10, Wind rose Guangzhou

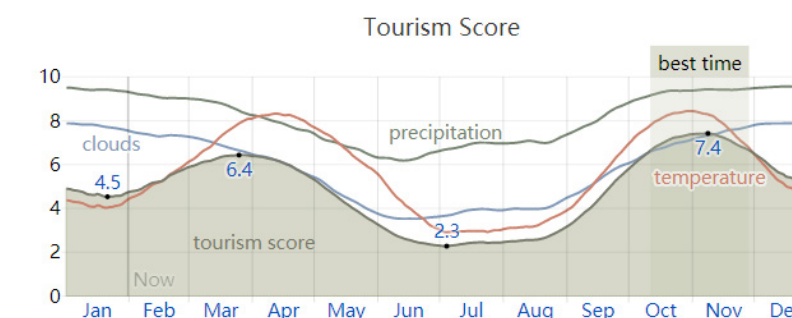


Image 11, Tourism Score

The best time of year to visit Guangzhou for general outdoor tourist activities is from mid October to late November, with a peak score in the first week of November.

Data Sources: <https://weatherspark.com>

5.2.4 Demographics

The 2010 census found Guangzhou's population to be 12.78 million. As of 2014, it was estimated at 13,080,500^[8], with 11,264,800 urban residents. Its population density is thus around 1,800 people per km². The built-up area of the Guangzhou proper connects directly to several other cities. The built-up area of the Pearl River Delta Economic Zone covers around 17,573 square kilometres (6,785 sq mi) and has been estimated to house 22 million people, including Guangzhou's nine urban districts, Shenzhen , Dongguan , Zhongshan , Jiangmen , Zhuhai , and Huizhou's Huiyang District. The total population of this agglomeration is over 28 million after including the population of the adjacent Hong Kong Special Administrative Region. The area's fast-growing economy and high demand for labour has produced a huge "floating population" of migrant workers. Up to 10 million migrants reside in the area least six months each year. In 2008, about 5 million of Guangzhou's permanent residents were hukouless migrants^[9].

Hukouless: not obtain the local identification

5.2.5 Local leisure activities

Guangzhou has been the political, economic and cultural center of Guangdong and even Lingnan since ancient times. In various cultural fields such as architecture, art, religion, drama, music, literature, painting, crafts, food, gardens, customs, etc., it has a long history and distinctive personality. Guangzhou is the birthplace of Cantonese opera. Most civil society groups, especially the elderly, are very familiar with and love this. Traditional entertainment Mahjong is also very popular, tea houses and chess rooms can be seen everywhere in the streets.

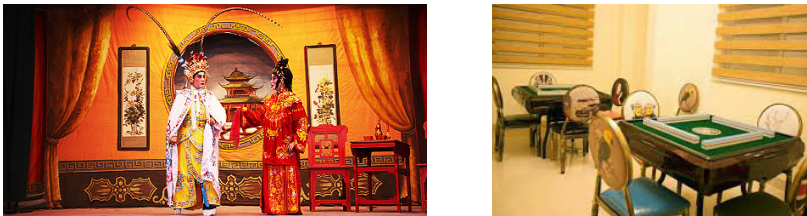


Image 12,Local opera show and Mahjong room

Data Sources:<https://m.discoverhongkong.com>

5.3 Introduction around the plot

5.3.1 Yuexiu District Introduction

The plot is located in Yuexiu District, near Yuexiu Park and the railway station. Yuexiu District is the smallest urban central area with the highest population density in Guangzhou. It belongs to the old town of the city. The total area of Yuexiu District is 33.8 square kilometers and the total registered population is 1.17 million. The population density is 34,615 people per square kilometer. Yuexiu District has 293,900 elderly people, accounting for 17.68% of the city’s elderly population of 60 years and over. According to the aging rate, the population aging rate in this district exceeds 20%, and it has entered a moderate aging^[10].

<http://mzj.gz.gov.cn/>

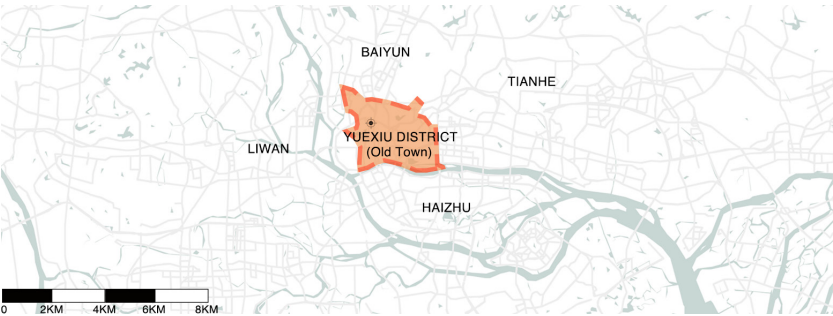


Image 13The location of Yuexiu District,the old district of the central city.

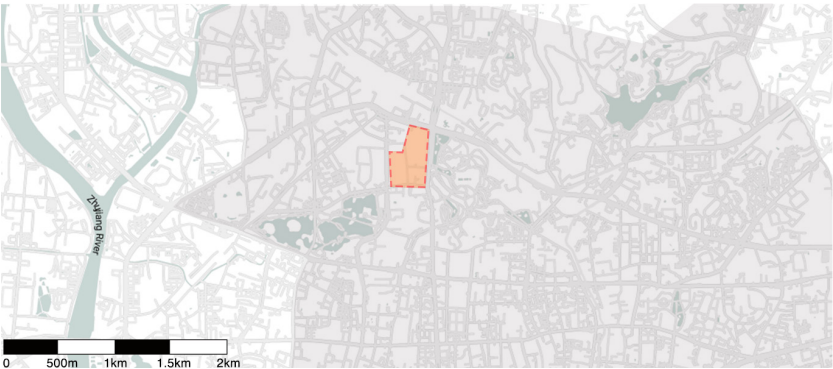


Image 14, The location of the plot is in the center of the city, allowing older people to actively participate in the vitality of the city.

5.3.2 Surrounding facilities



- | | | | |
|------------------|----------------|----------------|---------|
| Residential area | Shopping malls | Schools | Museums |
| Hospitals | Railwaystation | Subway station | |

Image 15, Surrounding facility type, location

The surrounding facilities of plot are complete, including residential areas, schools, shopping malls, museums, parks, stations and so on. Because it is an old district, the residential areas and facilities are quite old, and the level of aging population is high. Therefore, the living environment of the elderly needs urgent improvement. At the same time, the plot is adapted to the local policy direction. The local government is working on a community reconstruction plan. This area was included in Guangzhou's "82 Modern Service Industry Projects, 52 Urban Renewal and Land Reserve Projects to Promote the Revitalization of Old Cities"^[11].

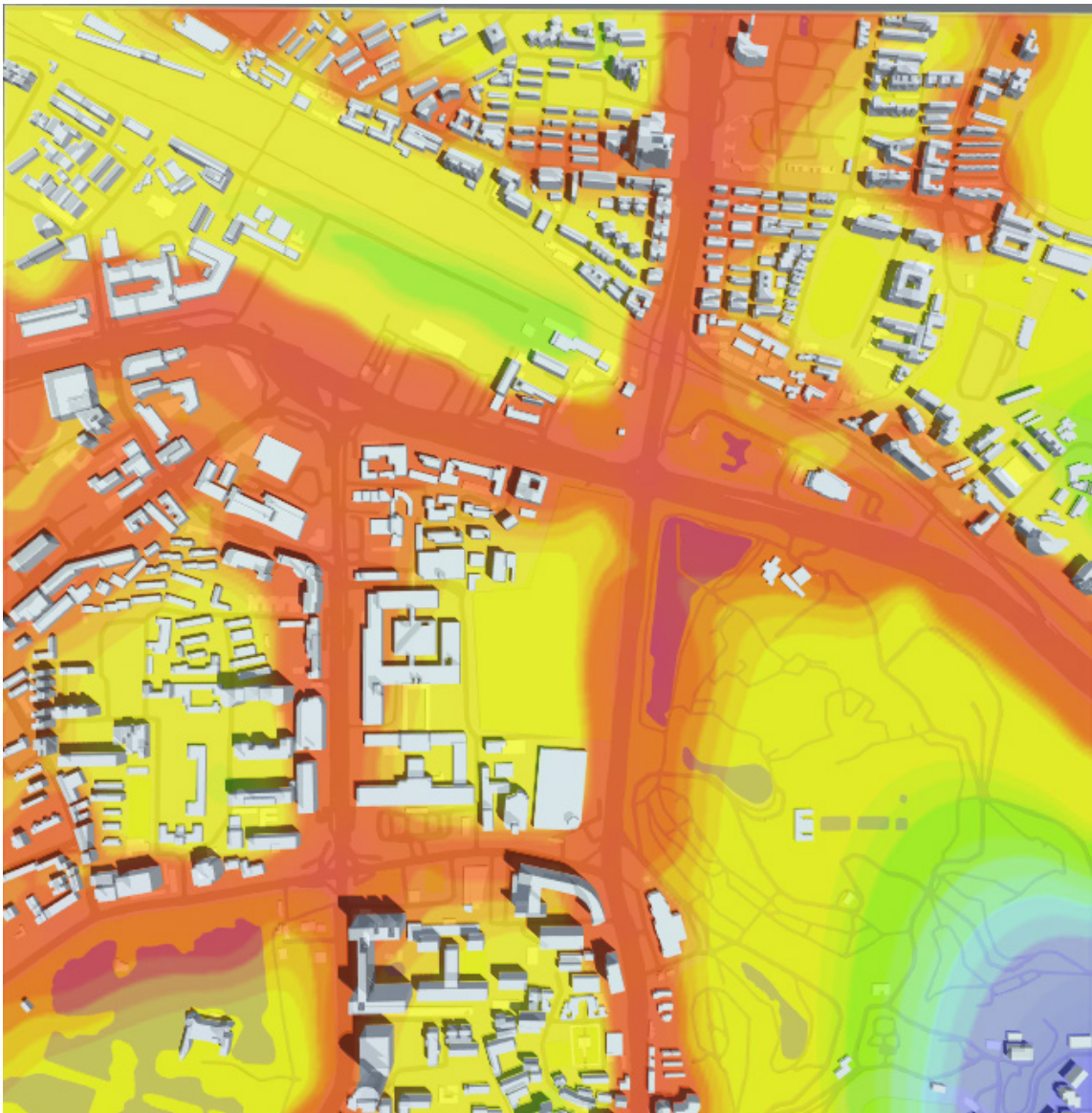


Image 16, Noise influence of surrounding environment on plot

The depth of color represent the degree of influence of the noise (red represents severe impact and yellow represents lower impact). It can be seen from the figure that the noise of the main roads on the east and north sides has a great effect on the plot.

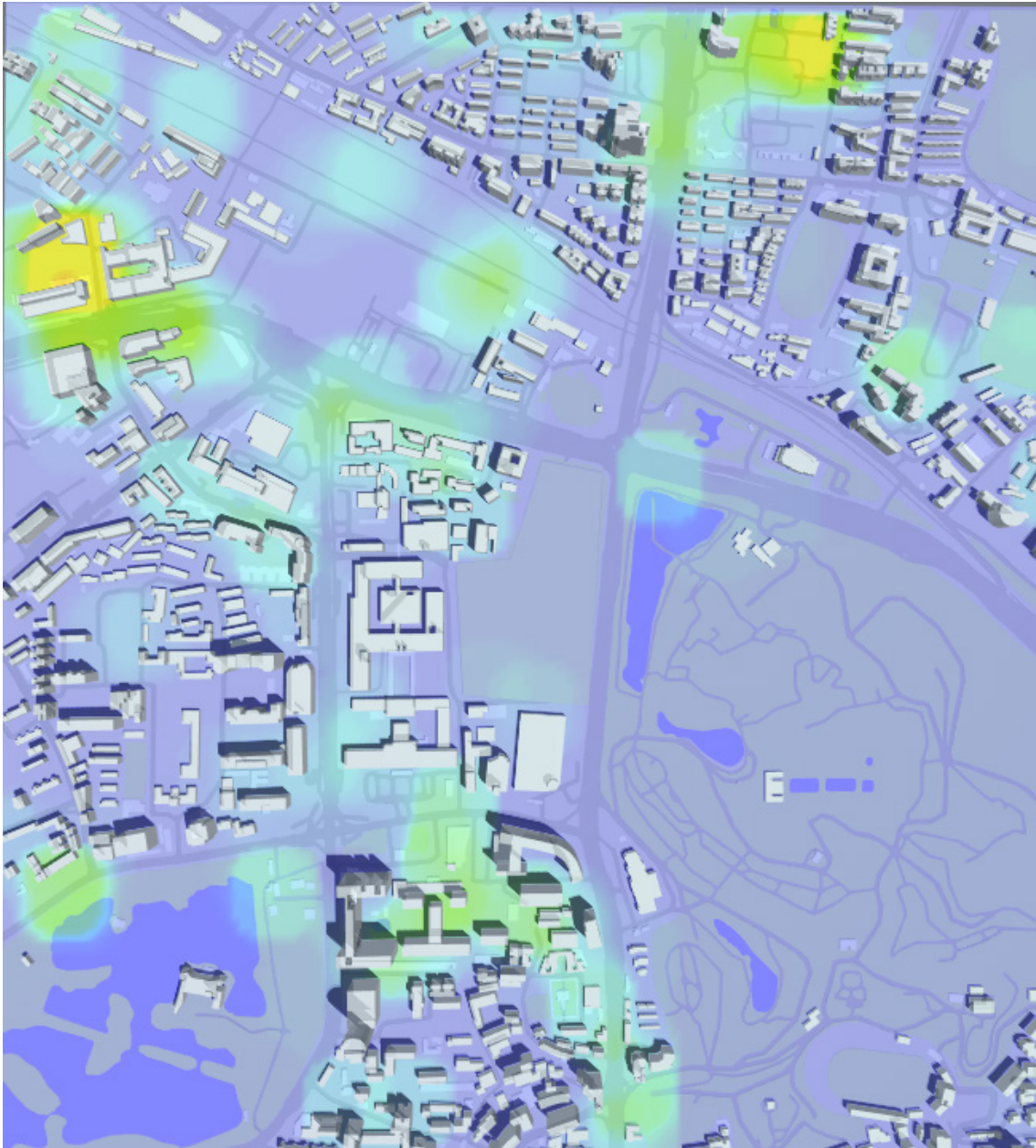


Image 17, Business vitality analysis

The depth of color represents the size and crowd density of the surrounding malls (yellow represents the size of the mall there is large and usually crowded. The cyan represents the size of the mall is small and the frequency of people visiting is low).

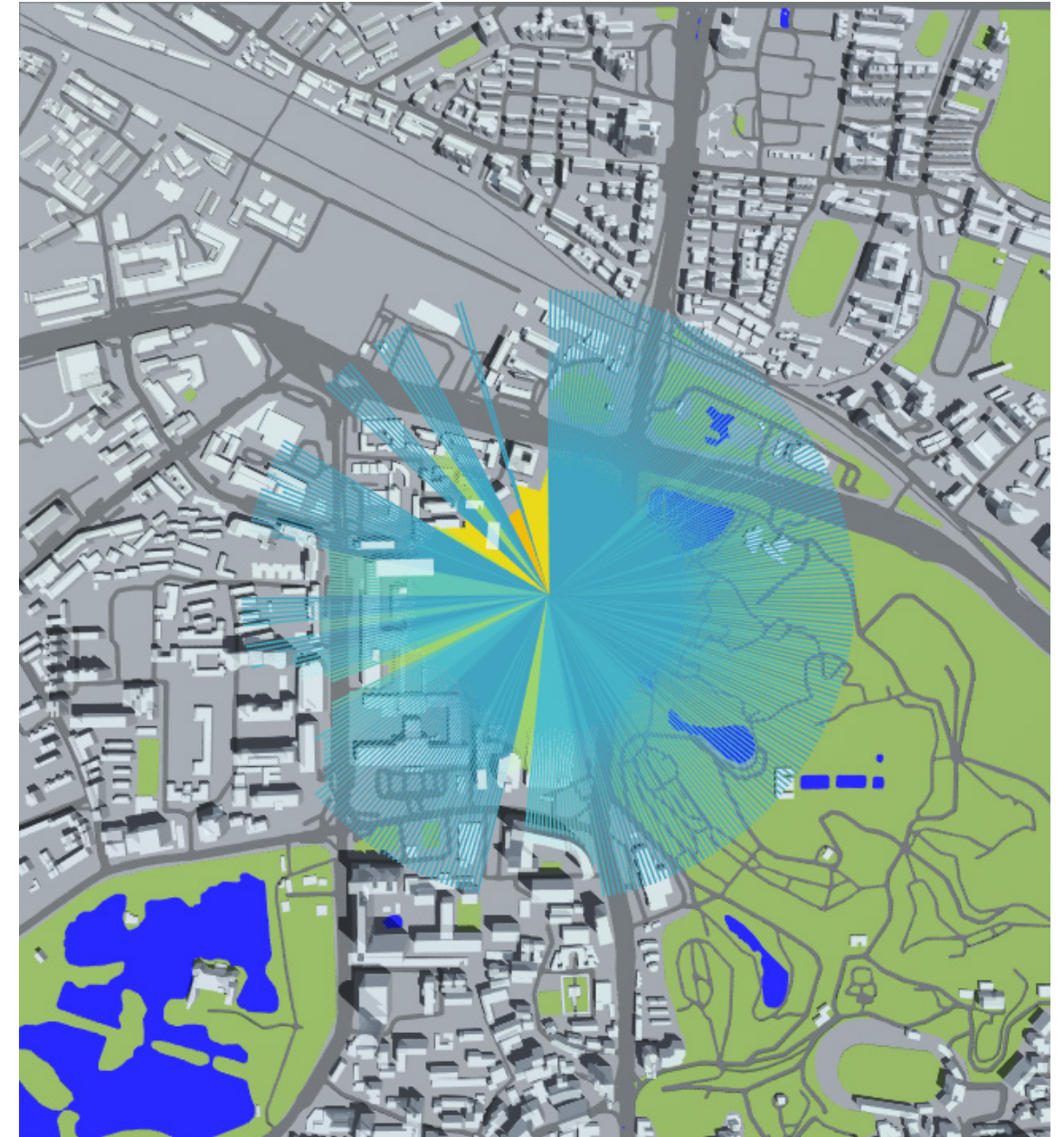
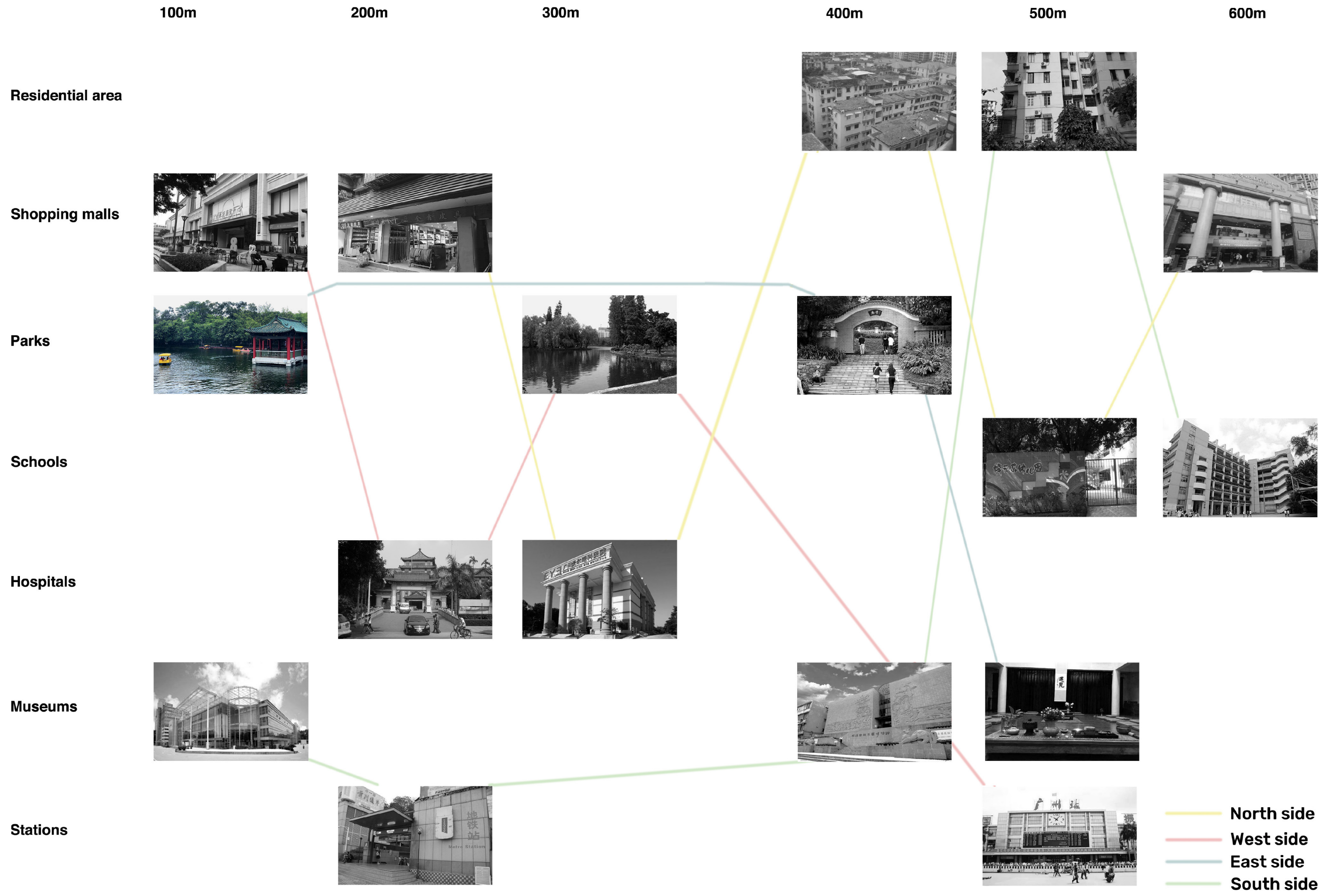


Image 18, Base line of sight analysis

The color depth represents the extension levels of the vision to surrounding area when standing in the center of the plot (blue represents no tall buildings on the line of sight. Yellow represents that buildings are blocking sight in this direction.).



5.4 Project intent

At present, many pension real estate companies and insurance companies in China are constructing pension communities in Guangzhou, such as Taikang House's Guangdong Garden and Vanke Project. But Guangzhou still lacks sufficient elderly communities. Due to the large local population base and complex population structure, a large integrated elderly community is a good choice, which can provide a full range of services for different levels of the elderly. From they just entered old age to the end of their lives, They can live here all the time and get high quality of life.

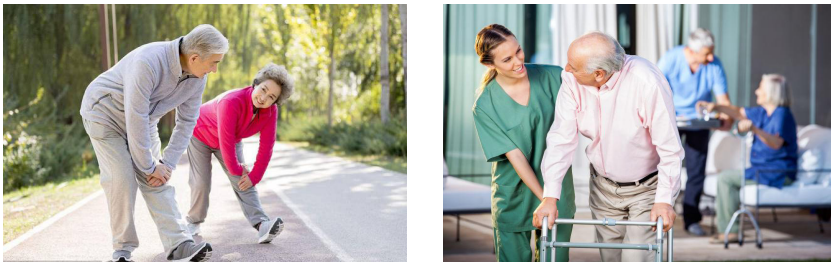


Image 19,Healthy elderly are exercising, disabled elderly are receiving care

Data Sources:<http://www.gztaikangzhijia.com/>



Clark-Lindsey Village, a CCRCin Urbana, Illinois.

Part six:

- 6.Design strategies
- 6.1 Introduction of CCRC mode
- 6.2 Concept Generation
- 6.3 Concept References

6.1 Introduction of CCRC mode

Continuing Care Retirement Community: Its prototype is an organization founded by the American Church. The CCRC realizes the continuity of life by providing self-care living, nursing care services, and integrated living facilities and services for the elderly. It provides a reference for building large elderly communities in cities.

Data Sources: <https://bbs.zhulong.com>

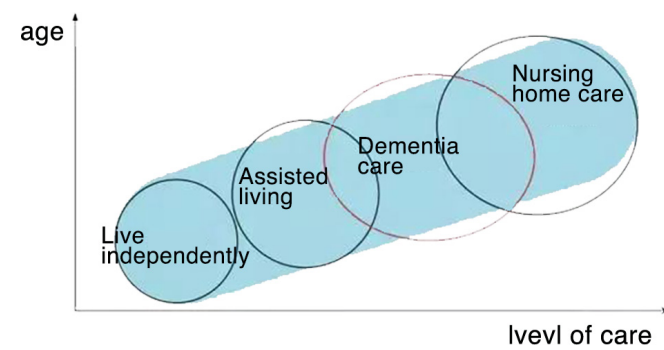


Image 1, As people get older, the level of care they receive is getting higher and higher

Self-care elderly: can take care of themselves	IL
People with disabilities or cannot live independently	AL
Elderly who need 24-hour nursing home care	HC

Image 2, According to the ability to take care of themselves, the elderly are divided into three levels

Independent elderly:enjoy recreation and fitness, education and training, catering and other services provided by the community center.

Assisted elderly: enjoying assisted services such as assisted living care and rehabilitation treatment, you can also enjoy some of the services in the community center.

Nursing elderly: enjoy 24-hour full-time nursing services such as life care, professional medical care and medical rehabilitation.

6.2 Concept Generation

The lifestyle of Self-care elderly need to diversify
Most of these elderly people have just entered the aging stage, and their lifestyles and ideas have not changed for a while. They don't yet think they are old. They generally want to get the same attention and treatment as ordinary people, instead of being seen as older people (vulnerable groups) who need special care. And most of these elderly have just retired and have a lot of free time. Therefore, in the areas where the elderly live and work, in addition to ensuring that the facilities can meet their basic needs for action, more public spaces should be added for their entertainment.

Add more vitality to the Assisted residence area
These are elderly who need equipments or help from others in some extents. Their lifestyle is different from the general population. These elderly usually feel depressed in psychology. On the one hand, it is eager to return to society, to contact with the outside world, to embody self-worth and respect, on the other hand, they hope that the surrounding environment can provide more vitality to eliminate the boredom of daily life^[12]. Based on their psychological changes and needs, cultural place can be added to the areas where they live, allowing interested elderly to display or study art projects in a relatively quiet state. And can also set up a kindergarten in the surroundings to let the children's smile and communication to dilute their loneliness and the fear of aging.

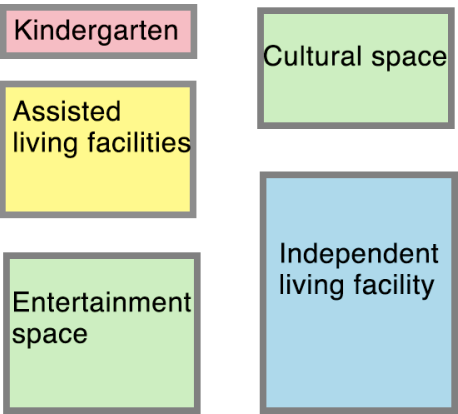


Image 3, Function layout

24-hour full-time area independence

In the nursing facilities, the physical and mental conditions of the elderly who need to be cared for are weaker, requiring 24-hour supervision, and they are generally arranged independently. Separation from other elderly people in the community is also to reduce contact with healthy elderly, so that healthy elderly can not see old people who need special care and associate with the inconveniences of their future lives, thereby deepening their fear of time.

These elderly people have very low demand for entertainment, so they basically don't need to use entertainment places. All need to do is creating a quiet garden-like environment so they can better receive treatment.

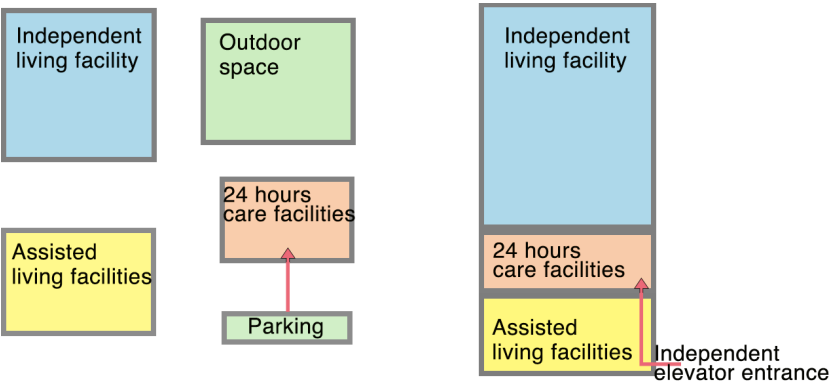


Image 4, 24-hours care residences independent in plan and vertical

Progressive layout

The progressive layout mainly reflects the progressive function in the horizontal direction. This progressive performance is the transition from self-care space to nursing space. Due to the different health conditions of the three different types of elderly people, they have different needs for living, thus forming different living environments. The three major living areas often need a gradual transition to form the integration of different living environments. In the horizontal direction, the mobility and independence of the elderly also weakened accordingly. This layout meets the needs of the function, because the elderly in independent living houses have weaker care needs, and the elderly with special care must be close to the care center.

Data Sources:<https://bbs.zhulong.com>

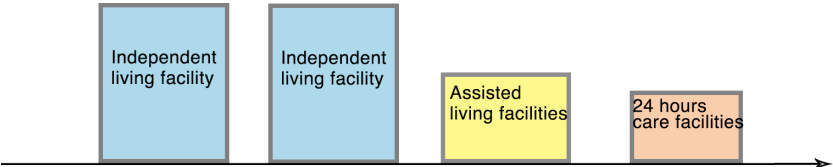


Image 5, Progressive layout

Life connection

Independent living facilities and assisted living facilities are connected to the community center, which not only can conveniently enjoy the services of the community center, but also allows the elderly in different residential facilities to communicate, thereby reducing the sense of closure of similar elderly people. At the same time, specific and psychological channels are set up between the assisted living facilities with assisted living services and those who can live independently. It will help encourage an existing feeling of neighborhood while maintaining an independent state of mind.

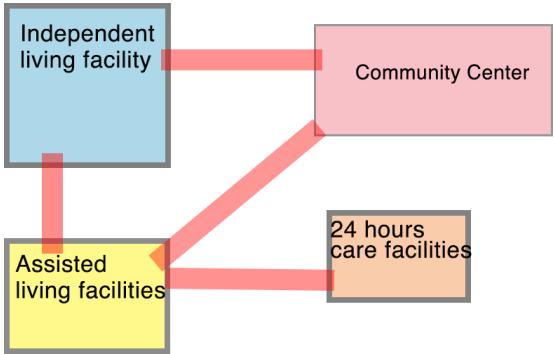


Image 6, Life connection

Local elderly population structure

By investigating the self-care ability of the elderly in the local area, the proportions of independent elderly people, assisted elderly people, and elderly people who need nursing at 24 hours are obtained. In this way, the proportion of various housing types in the community can be determined.

Self-care ability \ Age	Healthy fully self-care (26146)	Basic health (17379)	Rely on equipment (3009)	Can't take care of themselves (874)
60-64	45% (11870)	30% (4855)	6% (367)	12% (51)
65-69	26% (6702)	23% (4009)	6% (372)	13% (55)
70-74	13% (3493)	17% (2951)	9% (460)	15% (80)
75-79	9% (2255)	15% (2568)	17% (567)	19% (150)
80+	7% (1826)	17% (2994)	62% (1242)	41% (539)

Self-care ability \ Age	60-64 (17144)	65-69 (11138)	70-74 (6984)	75-79 (5540)	80+ (6603)
Healthy, fully self-care	69% (11870)	60% (6702)	50% (3493)	41% (2255)	28% (1826)
Basic health	28% (4855)	36% (4009)	42% (2951)	46% (2568)	45% (2994)
Rely on equipment	2% (367)	3% (372)	7% (460)	10% (567)	19% (1242)
Can't take care of themselves	1% (51)	1% (55)	1% (80)	3% (150)	8% (539)

Image 7, Sample survey of 47,408 elderly people in the local area, their self-care abilities situation

Source of income \ Age	Labor income (4182)	Rely on pensions (35072)	Depend on others (8154)
60-64	2521	11991	2632
65-69	916	8269	1952
70-74	397	5322	1266
75-79	165	4438	938
80+	183	5052	1366

Image 8, Sample survey of 47,408 elderly people in the local area, their source of income situation

Data Sources:<http://www.gzstats.gov.cn/>

Data Sources:<http://www.gzmz.gov.cn/>

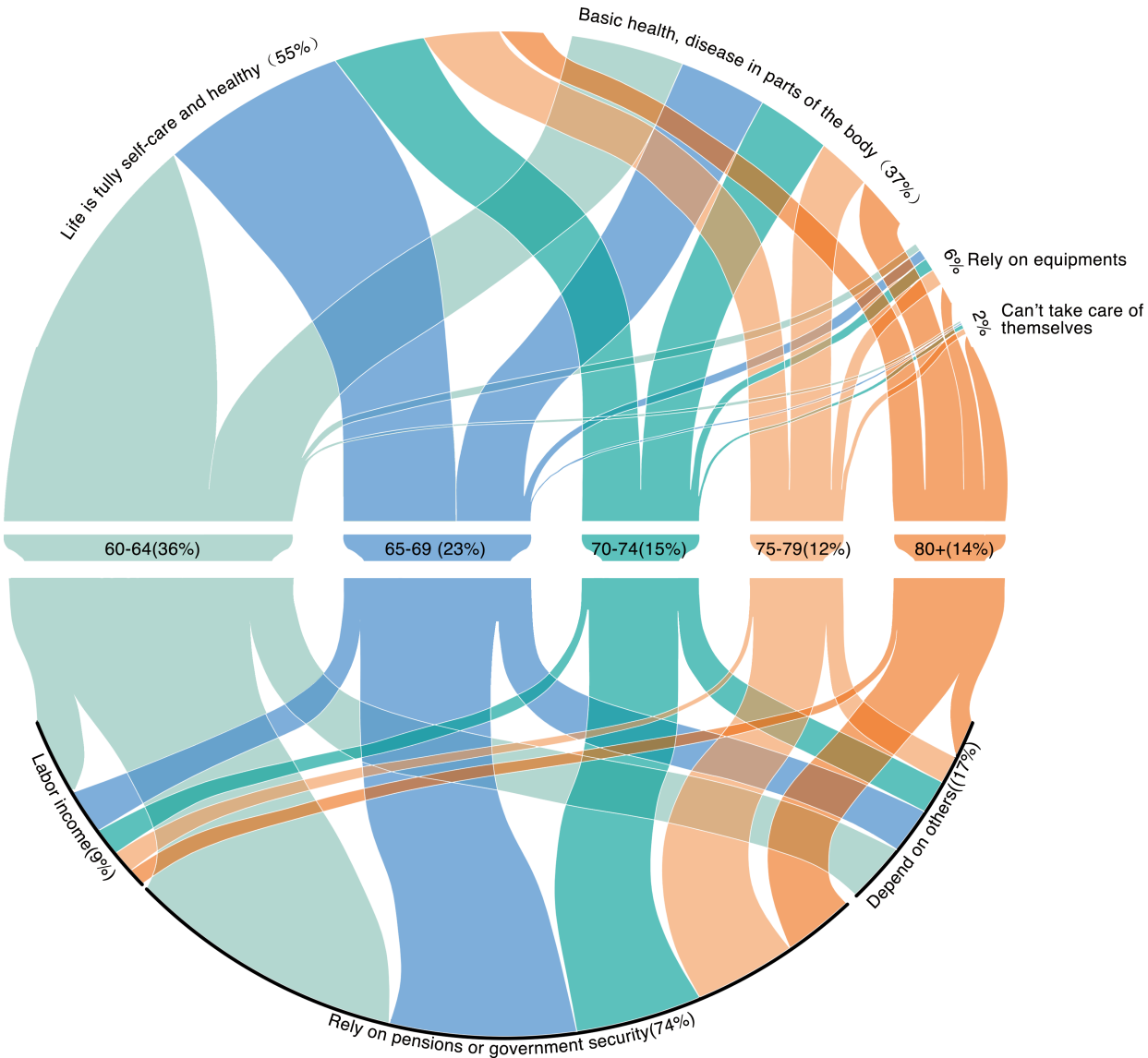


Image 9, Self-care ability, income source proportion diagram in Guangzhou

Conclusion
Among the community housing types, the proportion of self-care homes, referral homes, and 24-hour nursing homes should be about 90%, 8%, and 2%.

Design Principles

Residential group size:“Urban residential district planning and design regulations” pointed out that the general residential group size ranged from 1,000 to 3,000 persons. The group size of the elderly community should be smaller. It is also advisable to adopt a Multi-layer (Less than 7 layers) residential form^[13]. For example, the living group of healthy elderly is between 500 and 1,000 people, and the living group of the elderly who need to nursing care is between 150 and 300 people. On one hand, the elderly have limited mobility, and oversized residential groups are not conducive to their travels, and it is not convenient for the community to provide services. On the other hand, the elderly’s memory and cognitive abilities have deteriorated, and their ability to discern the living environment and surrounding people has declined. They cannot remember that too many neighbors . Therefore, the group size of the elderly community should be smaller so that the elderly can better understand the residents in the surrounding area and get a sense of belonging to the community^[14].

Roads and parking:The elderly community should not only ensure the separation of people and cars, but also should set up the parking near the houses. The purpose of the former is to ensure that the elderly can walk safely in the community without being disturbed by motor vehicles; the latter is to allow the vehicles can be parked near the entrance of the buildings when necessary. The main roads in the community should be connected to each residential group, and the walking paths should be connected as much as possible.

Building function and layout:The residence buildings will have different layout due to their functional configuration and requirements demand. Residences built for healthy elderly people can be unitized, while residences designed for semi-self-care or non-self-care elderly people will usually adopt the corridor style. The corridor itself and the large space on the corridor side can have activities, services and management functions^[15].

6.3 Concept References

Fangshan Suiyuan Project

The Fangshan Suiyuan Project has a construction area of about 26,000 square meters and a floor area of about 33,000 square meters. There are 475 guest rooms, including 391 self-care units for active elders and 84 care units for semi-disabled elders. Suiyuan House is the core supporting area of the entire Suiyuan, located at the center of the project. As a place dedicated to the four major issues of eating, drinking, and having fun, whether the living scenes created here can trigger the elderly’s longing for a better life in the future in the garden.



Image 10, Fangshan Suiyuan community



Image 11, Rest space next to the activity room

Five self-contained apartments are arranged around the event center, making it easy for users from all directions to get there. On the south side, there are assisted apartments and a separate 24-hour care center. Intermediary apartments are connected to the event center through corridors. It guarantees a certain degree of independence and connects the community.



Image 12, General layout

Part seven:

- 7.Design drawings**
- 7.1 Master plan*
- 7.2 Functions*
- 7.3 Residential area*







7.1 Master plan



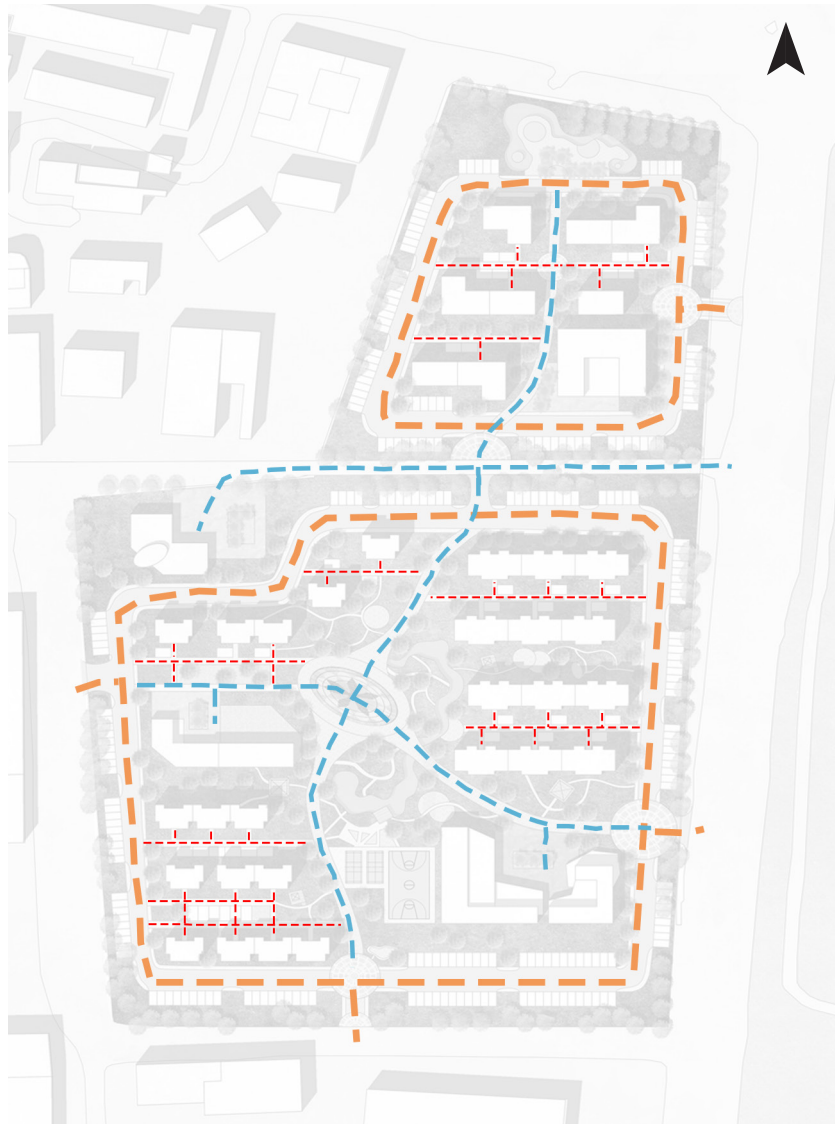
1:2500

7.2 Functions



- | | | |
|---|---|--|
|  Independent Residence |  Assisted Residence |  24-hour nursing home |
|  Activity Center |  Medical service station |  Kindergarten |

Streamline Analysis



- **Community main road**(traffic lane and path on both sides)
- **Community sidewalk**(connecting the various residential groups)
- **Path in front of house**(meet waste removal and fire protection requirements)

Greening axis radiation



In the east-west direction. The roads of the building group on the west side and the main road on the east side were created, which not only makes the 24-hour care area relatively independent, but also makes the people on the west side conveniently arrive at Yuexiu Park where opposite the main road.

In the north-south direction, community walkways run through the whole community.

Independent Residence



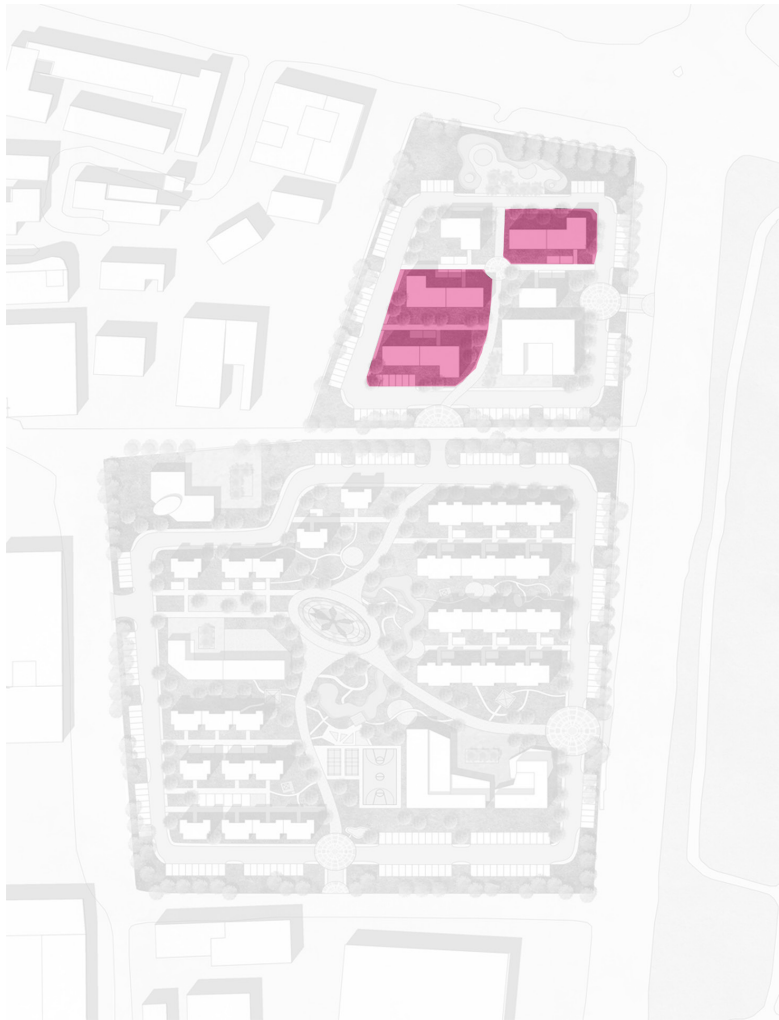
Suitable for: The elderly who are in good health and have the ability to take care of themselves
Construction area: 27720 m²
Capacity:720 persons

Assisted Residence



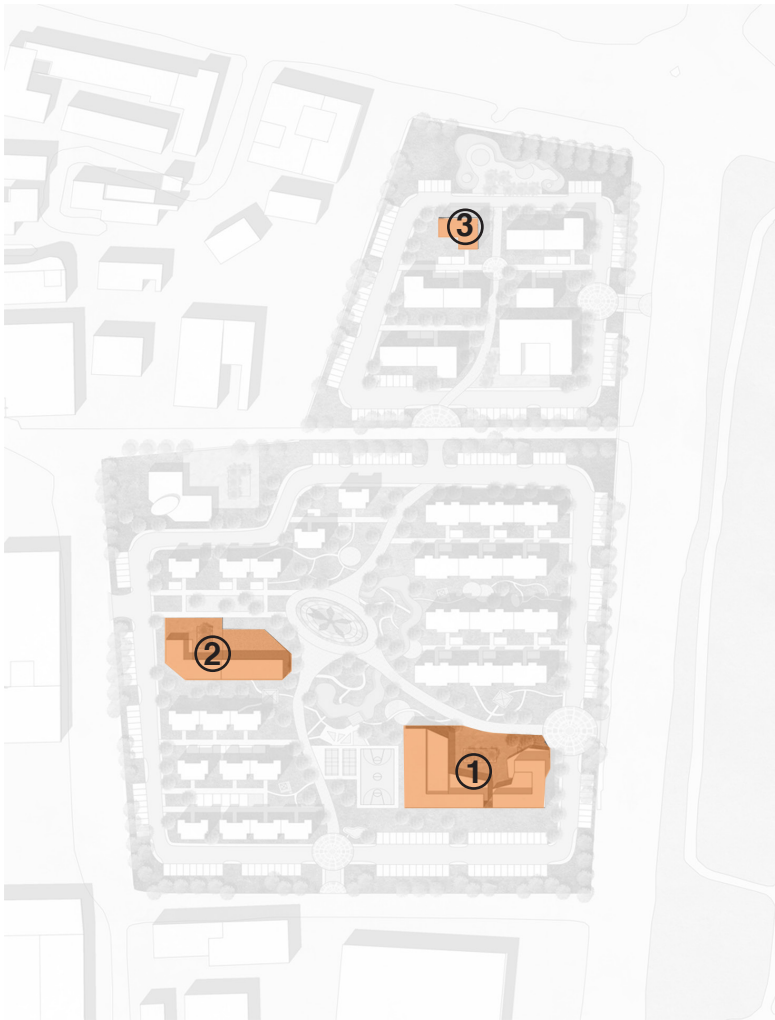
Suitable for: The elderly who need to rely on others'help or rely on equipment
Construction area: 4200 m²
Capacity:86 persons(Including elderly's relatives)

24-hour nursing home



Suitable for: The elderly who lose self-care ability and need special treatment
Construction area: 4268 m²
Capacity:90 persons(Including Nursing staff and elderly's relatives)

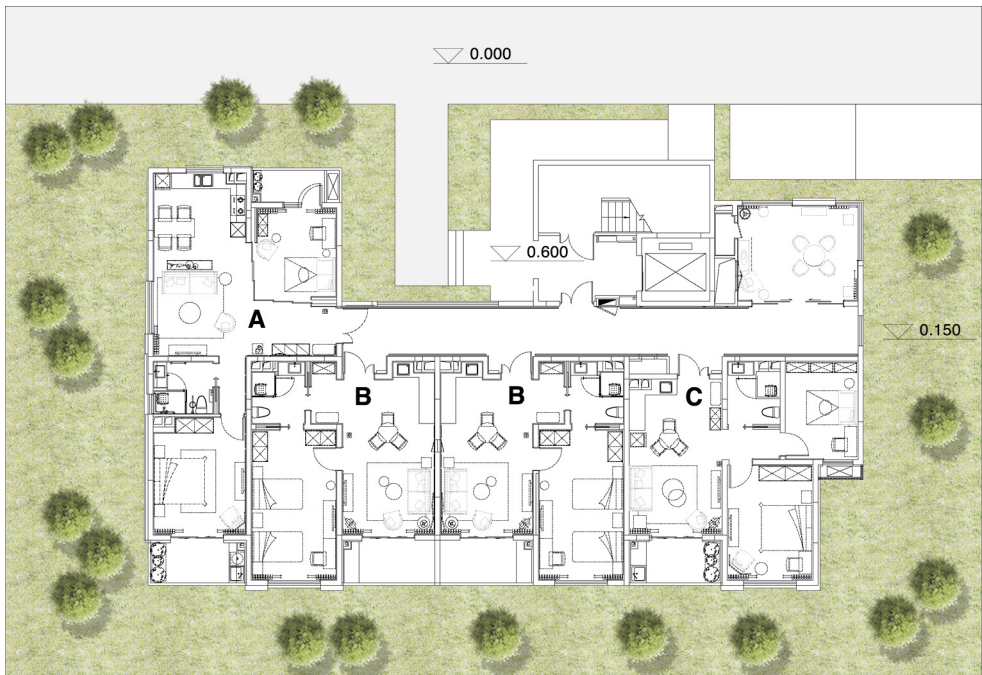
Activity Center



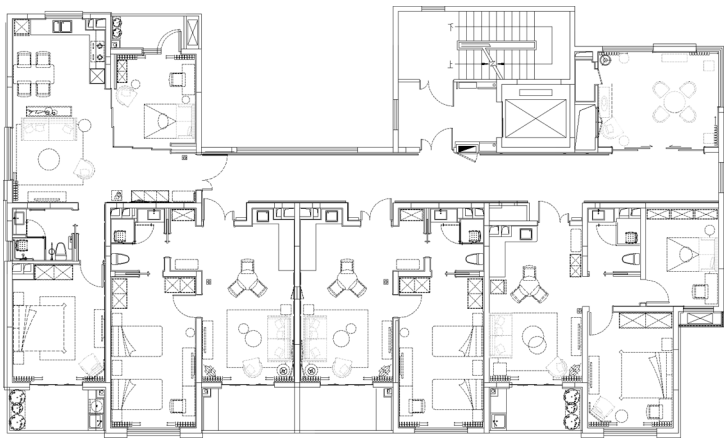
- ① Activity center: It mainly provides services for self-care residential areas, including small indoor stadiums, entertainment rooms, supermarkets, restaurants and theaters, etc.
- ② Activity Center: It mainly provides services for assisted residential areas, including libraries, art interest classes, bars, shops, etc.
- ③ Activity center: It mainly provides services for the nursing area, and is generally used by the elderly and their family members. It contains lounges, bars, shops,etc.

7.3 Residential area

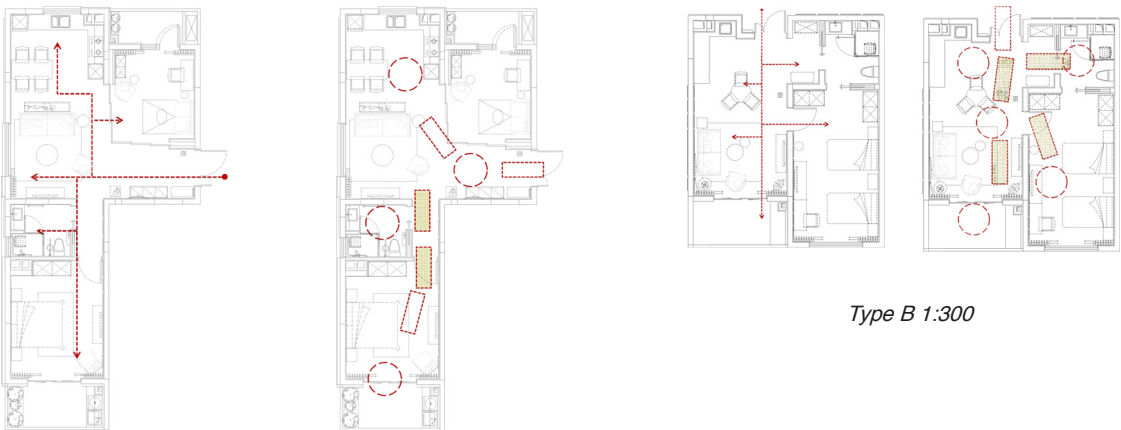
Independent Residence



Ground floor 1:300



Standard floor 1:300



Type A 1:300

Type B 1:300



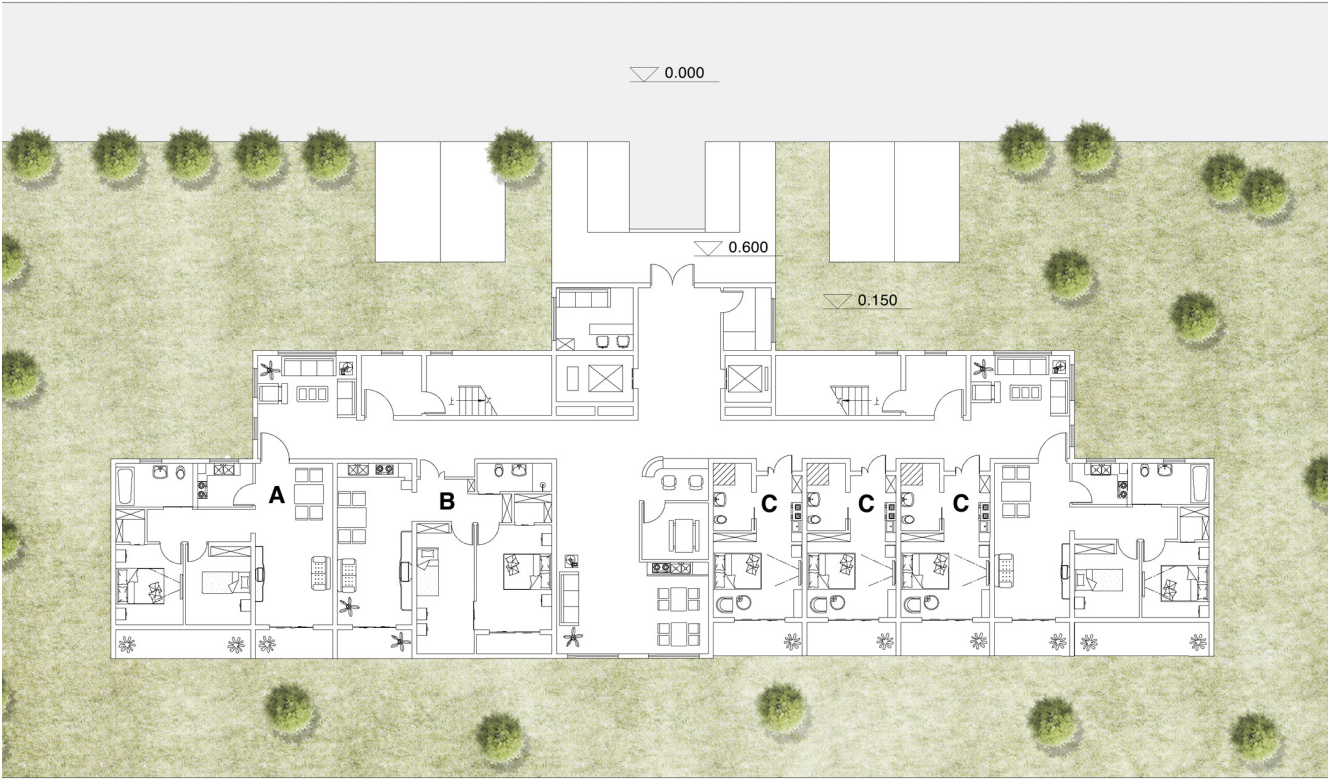
Type C 1:300

- Wheelchair swivel space, 1.5 m in diameter
- Emergency stretcher: 0.5 x 2.1 meters



North facade 1: 300

Assisted Residence



Ground floor 1:300

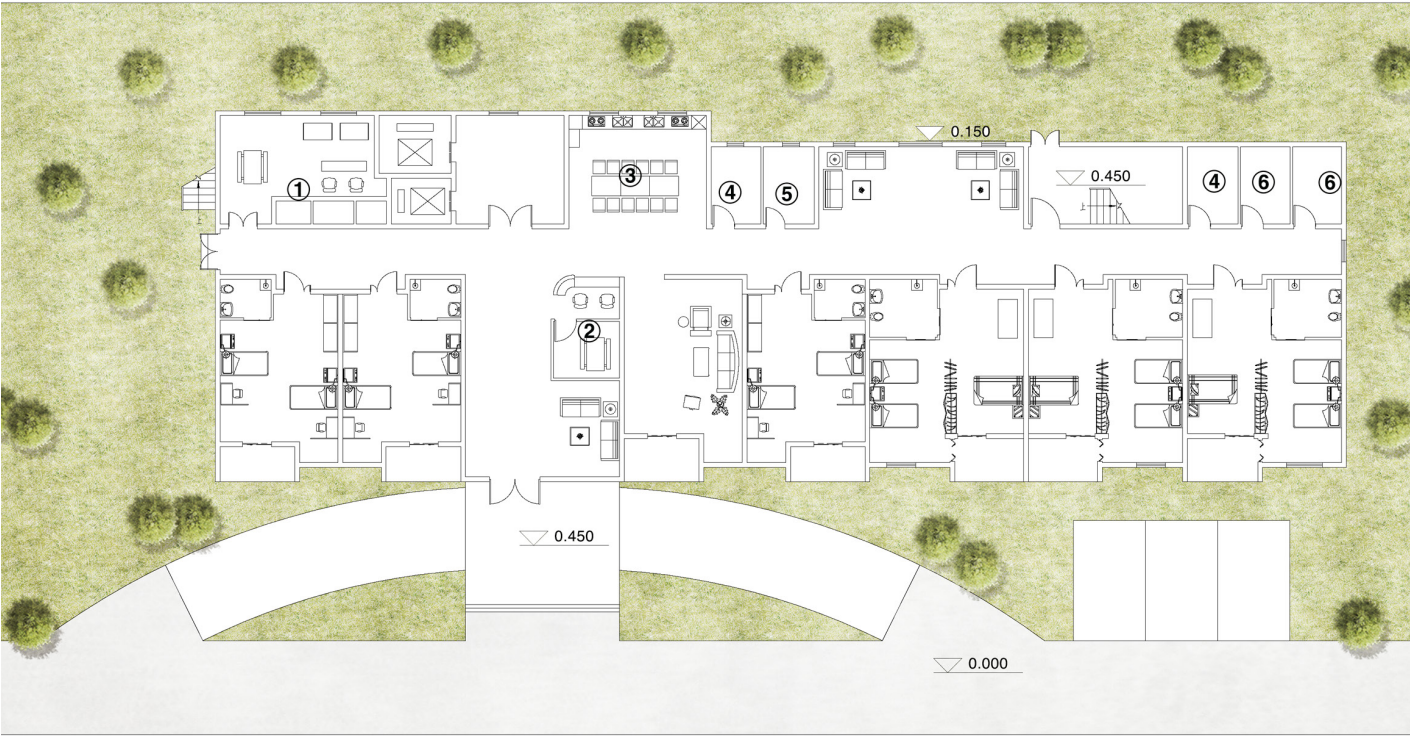


Standard floor 1:300

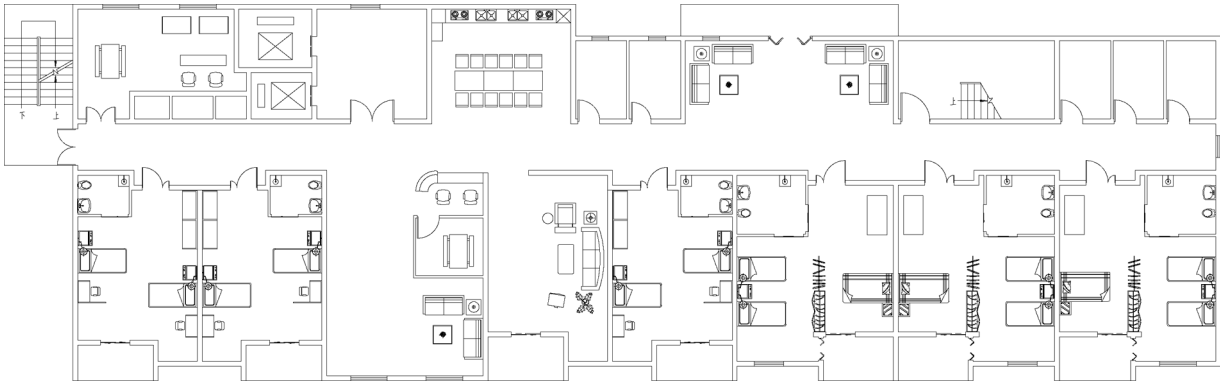


North facade 1: 300

24-hour nursing home



Ground floor 1:300



Standard floor 1:300



South facade 1: 300

REFERENCE

- [1]Department of Economic and Social Affairs in United Nations , “International immigration report 2017”, 2017,12.
- [2]Satoshi Matsubara,The Japanese Economy (Illustrated Trivia Series) Natsume[M], 2000, Page 176 .
- [3]China National Task Group on the Strategy of Population Aging, General report on national strategies to cope with population aging[M],Hualing Press,2017,03.
- [4]Sun Juanjuan, Gao Xiuwen,Growing old while getting rich: Characteristics of China's Population Aging at the Present Stage-Some Trends of Agin[J], Beijing Daily, August 13, 2018.
- [5]Du Peng, Lu Jiehua, and He Wenjiong,Chinese Population in an International Perspective—New Age Actively Coping with Population Aging Development Report 2018[M], Hualing Press, October 2018.
- [6]Kai Fu, Xiao Xiao, Research on Psychological Needs of Architectural Design for the Aged, Nanjing University of Technology[D], Nanjing, 09,2010.
- [7]Chen Mingli, Yang Feng.Analysis of the elderly living mode under the background of aging [J] .China Housing Facilities,2007.
- [8]Statistics Bureau of Guangzhou , Major social and economic indicators in main years—Guangzhou Statistical Yearbook 2012–2015 , 2016-05-21.
- [9]China Radio International, Migrants In Guangzhou,2013-03-12.
- [10]Guangzhou Municipal Committee on Aging, Civil Affairs Bureau, Municipal Statistics Bureau,2018 Guangzhou Ageing Business Development Report and Elderly Population Data Handbook,2018.
- [11]Guangzhou Municipal Development and Reform Committee , Guangzhou's Major Construction Project Plans for 2019 , 2019.
- [12]Zhou yanmin, Yang Jie .Research on residential needs of senior customers and design suggestions [J] .Fine Residential Design, 2006 (1): 96.
- [13]Code for planning and design of urban residential areas GB 50180-93.
- [14]Zhou Yandi, Lin Jingyi,Analysis of the Planning Principles of Comprehensive Pension Communities[J], Intelligent Building and City Information, 2013, Issue 8.
- [15]Zhou Yanmin. Elderly Housing. Beijing, China Construction Industry Press, 2011.

WEB

<https://www.un.org/en/sections/issues-depth/ageing/>
<https://www.suncitycenter.org/>
<https://bbs.zhulong.com>
<http://mzj.gz.gov.cn/>
<http://www.cnsf99.com/>
<http://www.gzstats.gov.cn/>
<http://www.gzmz.gov.cn/>

Reference books

- Zhou Bo, Wang Wei, Zheng Wenxia.Rural Pension, Analysis of World Pension Projects, Nanjing: Jiangsu Phoenix Science and Technology Press, 2016, 09.
- Characteristic pension, Zhou Bo, Wang Wei, Zheng Wenxia. Nanjing: Jiangsu Phoenix Science and Technology Press, 2016, 09.
- Kaibin Huang: Healthy China, Hongqi Press, 2017.
- Dang Junwu,Revolution of the Aged Society, People's Press, 2015.
- George Magnus, The era of aging population, Translated by Yu Fang, Economic Science Press, 2012.

Government report

- 1.Jingzhun Research Institute,Pension Services Industry Report,July 2019.
- 2.State Council Information Office,Development and Progress of China's Human Rights Cause in 40 Years of Reform and Opening Up,2018
- 3.Guangzhou Municipal Health Committee,Guangzhou Ageing Development Report ,2018
- 4.National Health and Family Planning Commission: China's Family Development Report, China Population Press, 2014.
- 5.United Nations,World Population Prospects: the 2019 Revision.
- 6.The World Bank,Options for Aged Care in China,Building an Efficient and Sustainable Aged Care System,2018.