

Borderless community

An innovative design of the residence for the elderly
in Guangzhou, China

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Tutor: RICCARDO POLLO
Co-tutor: MATTEO TRANE

POLITECNICO DI TORINO
Corso di Laurea Magistrale in
ARCHITETTURA PER IL PROGETTO SOSTENIBILE

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Abstract

At present, China's aging is becoming more and more serious. According to statistics, my country has entered an aging society in 2011. There is an idiom mentioned in the book "People's Livelihood 民生主义", which is 衣食住行 yī shí zhù xíng, that generally refers to the basic needs of life such as clothing(衣 yī), food(食 shí), housing(住 zhù), and travel (行 xíng). In these four parts, "housing" seems the topic on which Chinese elderly people are most concerned about. The economic take-off in the 1980s caused a generation of Chinese born in the 1950s to undergo radical changes. "House" has actually become the "meaning of life" for this generation, who have experienced the definition of "house allocation", "buying a house", "buying a house for children (marriage house)", "school district house" and other definitions throughout their lives. In 2015, most of the parents of the first batch of only-children born in the 1980s had reached the retirement age. In other words, the time when a pair of young people we have been worried about will support 4 old people and 1 or 2 children.

This works move from the problems arising from the "suburbanization" of urban construction sites and proposes a new direction for the "communization" of the construction of elderly care buildings. Through a field survey of Guangzhou's urban retirement buildings, it analyzes and expounds the influence of elderly behavior on space use. The design deals with the outdoor environment, with respect to the quality of green areas and common open spaces, and with the indoor spaces, providing mixed-use areas at the ground floor and comfortable apartments, divided into several typologies. Finally, the project hope to provide suggestions for the construction of community senior care buildings in the future.

The first part is divided into three chapters. The first mainly provides a general overview of the basic conditions and development trends of Chinese elderly buildings. The second investigates the situation and policies of the elderly in Guangzhou, with an overall outlook of this city. The third

analyzes the overall situation of the plot and its surroundings.

The second part is mainly divided into four chapters. The first chapter explains the basic concepts of the design proposal. Three concepts are introduced here: smart elderly care, co-living&co-working and Shanshui City. The second chapter is about the use of architectural design schemes to realize a new type of residential community for the elderly. Here, a community elderly care complex is adopted as a new model for high-quality development of the elderly service industry. The third chapter is on how to realize the application of intelligent elderly care and intelligent elderly care solutions in this design. The fourth chapter shows the overall effect of the design, including the landscape and interior and exterior architectural view of the building.

Acknowledgments

This research and design proposal would never have been able to be accomplished without the support and guidance of Politecnico di Torino.

To Riccardo Pollo, thanks for his elegance, friendliness, and rigorous attitude and he always pushes me forward.

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To Han xu, thanks for the discussion to expand the story of this project, and introduce the basics information of the site to me.

To My family that give me valuable feedback and support based on their professional knowledge.

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Chapter One: Design Research

1 Introduction

2. Investigation and research on the elderly in Guangzhou

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1 Introduction

1.1 The overall situation of China's elderly buildings

1.2 The future development of Chinese elderly buildings

1.3 Principles and specifications for planning and design of residential buildings for the elderly

1.1 The overall situation of China's elderly buildings

Countries around the world do not adopt a unified standard for the definition of the elderly, but most countries are divided according to the two age nodes of 60 or 65. Correspondingly, there are two different ways to judge whether a country has entered an aging society.



Refer to the aforementioned definition of the elderly in the World Health Organization (WHO) related research report

<http://www.who.int/healthinfo/survey/ageingdefolder/en/>

There are many ways to subdivide the elderly. For example, divide the elderly into youngest-old, middle-old, and oldest-old by age. At present, the concepts often mentioned are the elderly and the young.

source:<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6301865/>

Classification	Age	Remark
youngest-old	60-69 years	"Younger age" in the usual sense
middle-old	70-79 years	
oldest-old	80 years and over	"Advanced age" in the usual sense

Classification of the elderly based on age

The definition of advanced age is often related to the country's welfare policies. Because each country's policies are different, the age definition standards for advanced age are also different. At present, China refers to seniors aged 80 and above as 'advanced age', and the state will have corresponding welfare measures for advanced age, such as monthly allowances. In some developed countries, 85 is the age limit for the advanced age.

There is currently no strict concept of younger age, which usually refers to the 60-69-year-old group. There are also some market studies that include prospective seniors aged 55-59 into the younger age category.

Forman D E, et al. PTCA In the elderly: The "young-old" versus the "old-old" [J]. Journal of the American Geriatrics Society. 1992, 40(1): 19-22.

1.1.1 Status and characteristics of China's population aging

In 1999, China's population of 60 years and over accounted

for more than 10% of the total population, officially entering an aging society. As can be seen from the figure, China's population structure is gradually transitioning from a growth type (young people account for a larger proportion of the total population) to a stable type (the number of people in each age group is roughly equal).



Image source: <https://www.wbur.org/commonhealth/2020/01/30/who-coronavirus-world-health-organization-declares-global-emergency>

党俊武, 探索应对老龄社会之道 [M]. 北京: 华龄出版社, 2012: 39。

李本公, 中国人口老龄化发展趋势百年预测 [R]. 北京: 华龄出版社, 2006: 1。

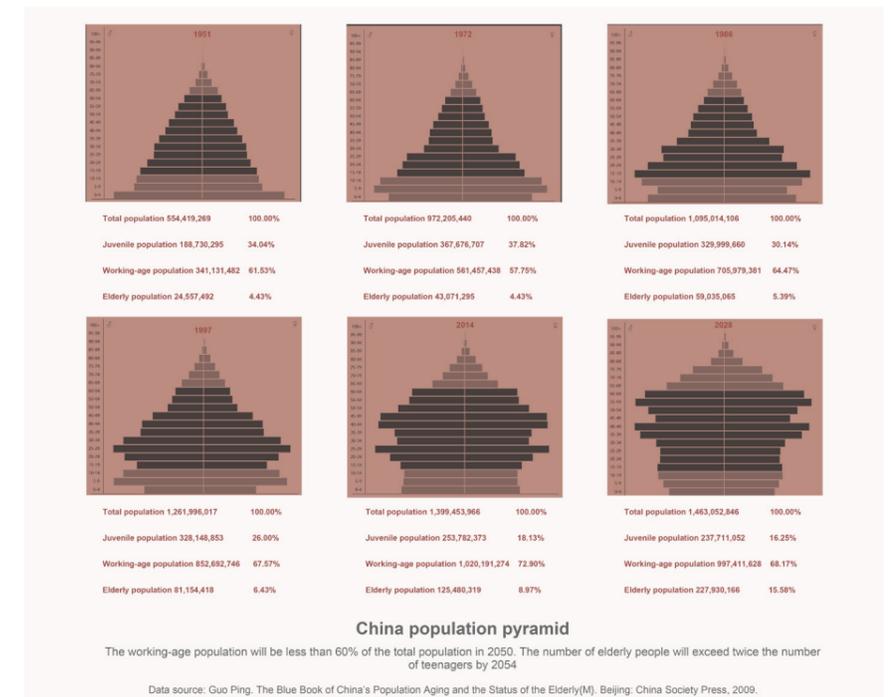
Dang Junwu, exploring ways to deal with an aging society[M]. Beijing: Hualing Publishing House, 2012: 39.

Li Bengong, a hundred-year forecast of the development trend of China's population aging[R]. Beijing: Hualing Publishing House, 2006:1.

Since entering an aging society in 2000, the degree of population aging in our country has continued to deepen. By around 2022, China's population over the age of 65 will account for 14% of the total population, realizing the transition to an aging society. The "China Development Report 2020: Development Trends and Policies of China's Population Aging" released by the China Development Foundation made the above predictions. According to the report, the aging population presents both challenges and opportunities. From now to the middle of this century is a period of the rapid development of China's population aging, and it is very important to actively, scientifically, and effectively deal with population aging.

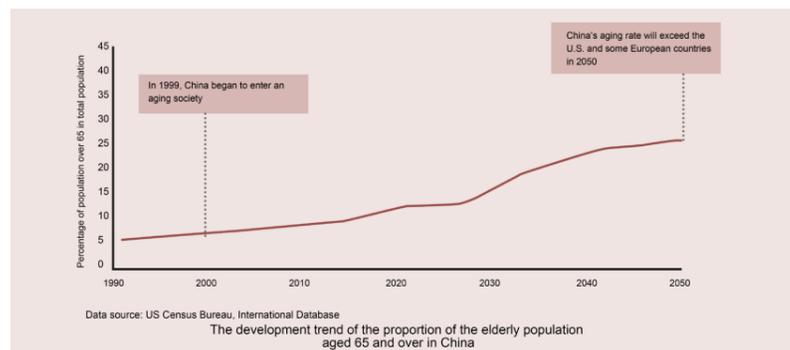
The current period is the rapid development of my country's

population aging. Actually, It is estimated that by 2050, the number of elderly people in China will reach its peak, and the proportion of elderly people aged 60 and above will reach 30%. (ONU 2020)



1.1.2 Comparison of aging development trends between China and other countries in the world

By comparing the proportion of the population aged 65 and over in the total population of various countries, it can be found that although Asian countries represented by China, Japan, and South Korea have entered an aging society later than European countries, the rate of aging development is significantly faster than that of European countries.



·The advantage of demographic dividend is gradually disappearing

The demographic dividend refers to a country's working-age population (15-64 years old) accounting for a large proportion of the total population, and the population dependency ratio (that is, the ratio of the number of non-working-age population to the number of working-age population) is low.

Since the 1980s, China has been in a period of rising demographic dividend. With the accelerated development of aging in recent years, my country's population dependency ratio has begun to rise, and the demographic dividend advantage is gradually disappearing.

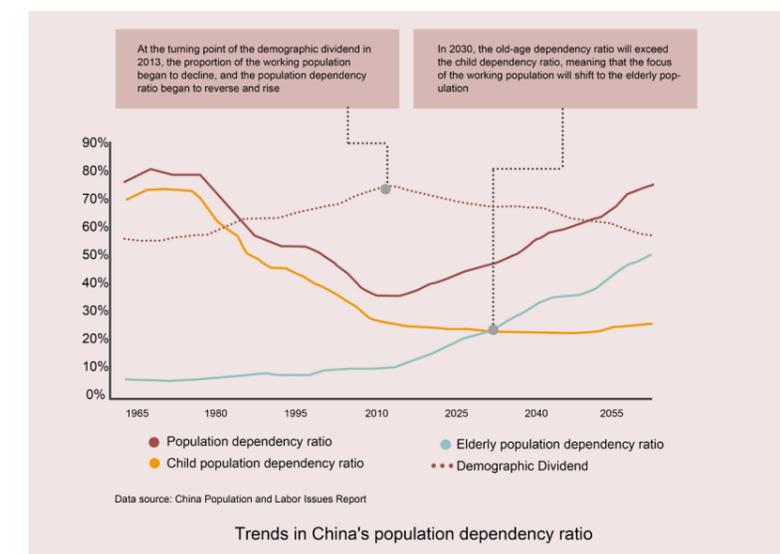
·The focus of supporting the working population will shift from

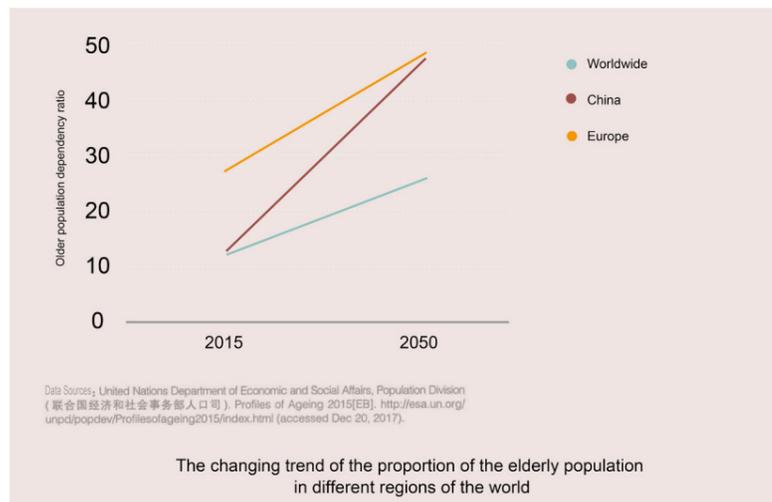
children to the elderly

It is estimated that by 2030, the proportion of the elderly population aged 65 and over in my country will exceed the proportion of children aged 0-14. Correspondingly, the dependency ratio of the elderly population will exceed the dependency ratio of the children population. It can be seen that the focus of raising the working-age population will shift from the young population to the elderly population.

·The burden of raising the elderly population has increased sharply

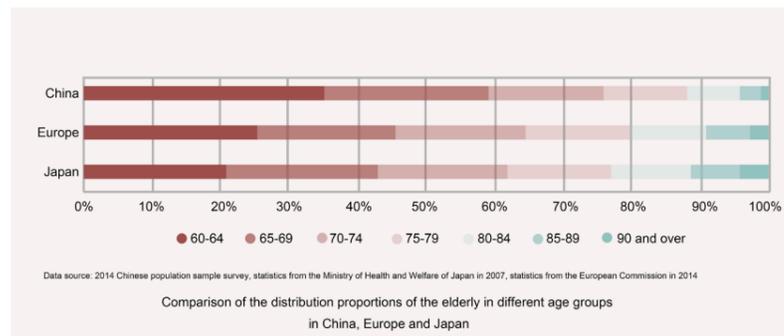
In 2015, China's elderly dependency ratio was basically the same as the world average. From 2015 to 2050, China's elderly support burden will increase dramatically, far exceeding the average level in Asia, North America and other regions, and will be close to the European average level.





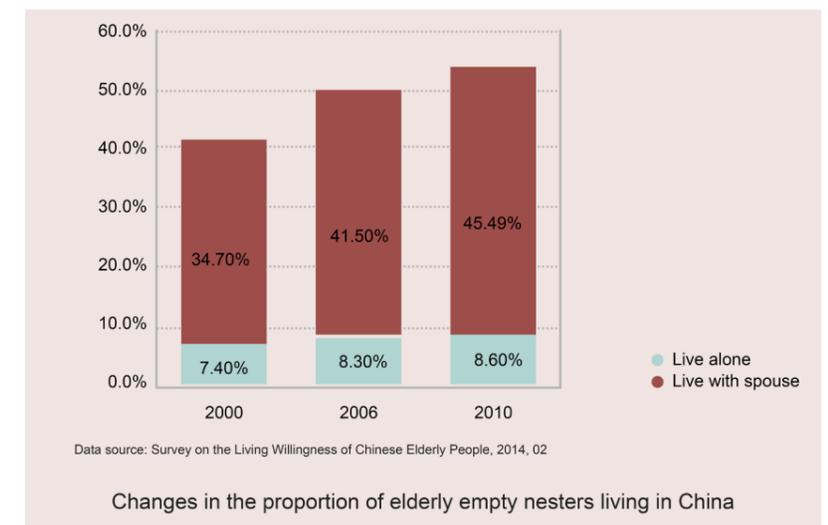
1.1.3 The current proportion of younger age in the Chinese elderly population is high

Unlike Japan, Europe and other countries that are currently facing advanced age, the situation is different in China. Although the number of elderly people in China is increasing rapidly, more than one-third of the elderly are 60-64 years old. This is due to the large number of people born in China's first baby boomers entering the aging stage. In the future, after these elderly people enter the ranks of advanced age, the burden of care and care for advanced age will also increase.



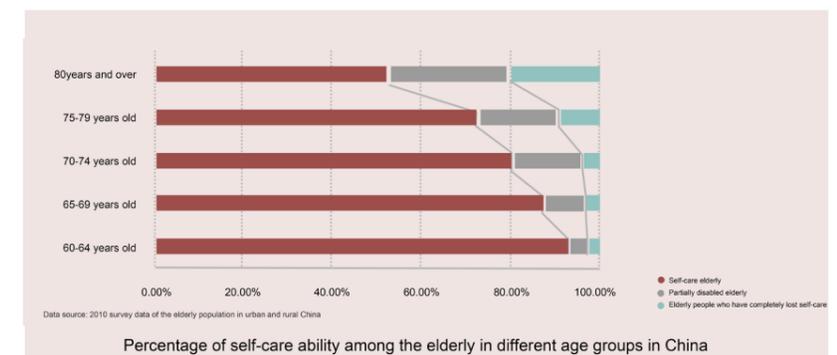
The proportion of empty nest elderly in urban areas is gradually increasing

At present, the proportion of elderly people living in empty nests in urban areas in China has increased significantly, and living with their spouses has become the main way of living for urban elderly people.



High proportion of disabled elderly in advanced age

With the increase of the age of the elderly, the proportion of the disabled elderly population has increased significantly. Nearly half of the elderly people aged 80 and above in China are partially disabled or completely disabled.



1.1.4 The elderly care industry model and demand in China

The elderly care industry model in China will rely more on the government

The old-age care model in China is changing from traditional family care to a combination of family care and social care. This is not only related to changes in population and family structure at the objective level, but also related to changes in the willingness of the elderly to provide for the elderly at the subjective level.

陈赛权. 中国养老模式研究综述 J. 人口学刊, 2000, (03): 30-36.51.

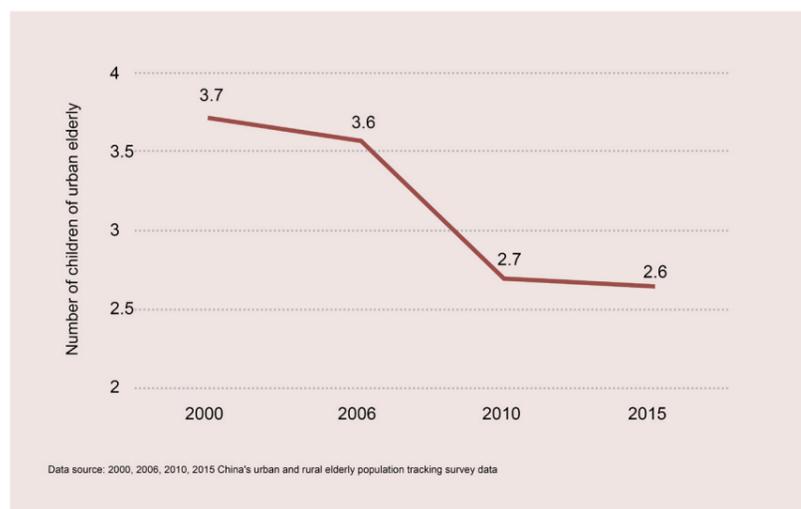
孙鹏娟, 沈定. 中国老年人口的养老意愿及其城乡差异—基于中国老年社会追踪调查数据的分析 J. 人口与经济, 2017, (02): 11-20.

Chen Saiquan. A review of research on China's pension model J. Demographics, 2000, (03): 30-36.51.

Sun Pengjuan, Shen Ding, China's elderly population's willingness to provide for the aged and its urban-rural differences: An analysis based on data from the Chinese elderly social tracking survey J. Population and Economy, 2017, (02): 11-20.

The decline in the number of children makes it difficult for the elderly in traditional families

For a long time, the elderly in China mainly provide for family support, and their daily life caregivers are mainly children and spouses. However, in recent years, as the average number of children of the elderly has decreased, the burden of raising children on the elderly will also increase, and the traditional family pension model will be unsustainable. Especially for parents with only children, it will be more difficult for them to rely on their children to provide for the elderly.

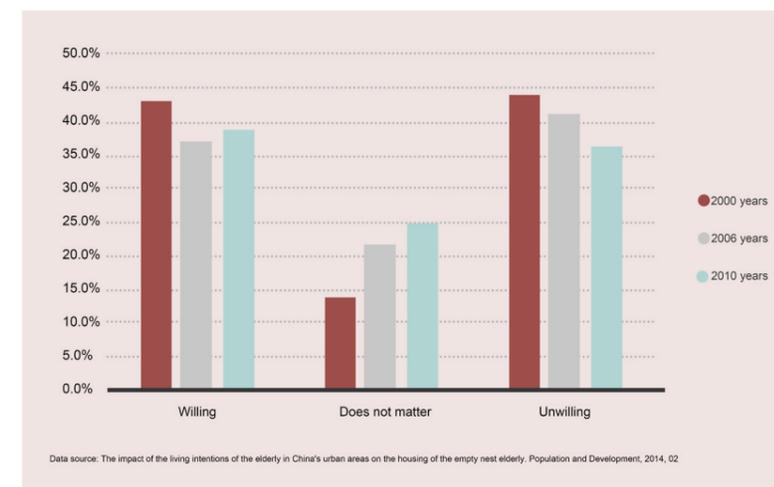


Chinese elderly are gradually able to accept other ways to provide for the elderly

Urban elderly people tend to live separately from their children According to the data from the three national tracking surveys of the elderly population in China in 2000, 2006 and 2010 by the China Research Center for Aging The willingness to live with their children is also declining. It can be seen that the willingness of the elderly to pursue independent living and independent pensions is gradually increasing.

Elderly people in cities tend to live in nursing homes

According to the data from the 2014 Chinese Elderly Social Tracking Survey by Renmin University of China. It can be seen that the urban elderly tend to live independently or live in elderly care institutions. The data shows that the portion of urban young people under 70 who intend to live in nursing institutions reaches 8.2%. The portion of urban senior citizens with higher incomes who intend to live in elderly care institutions reached 12.7%.



The needs of the elderly are diversified

To spend the old life by traveling is more and more popular. With the improvement of economic ability, the consumption idea and pattern of consumption of the elderly are constantly enriched and developed. After retiring, they can enjoy travel and health care, and the lifestyle of living in a different place is recognized by more and more elderly people. This part of the group is dominated by the elderly who are young, healthy and economically better. According to statistics, in November 2014, Hainan Province (the southernmost province of China) had 400,000 elderly people living in different places, of which 190,000 were from Harbin (the capital city of Heilongjiang). In the summer of 2016, the number of out-of-town elderly people who went to Heilongjiang Province (the northernmost province in China) for leisure and elderly care increased by more than 30% over 2015, and the total number exceeded 1 million.

黄媛艳, 三亚异地养老老年人协会运行, 为候鸟老人提供服务 [N]. 海南日报, 2014-11-03.

郭铭华, 今夏超百万候鸟老人到我省养老养生 [N]. 黑龙江日报, 2016-09-29 (001).

Huang Yuanyan, run by the Sanya Association for the Elderly for the Elderly, provides services for the elderly in migratory birds [N] Hainan Daily, 2014-11-03.

Guo Minghua, over one million elderly migratory birds came to our province this summer to provide for the elderly and maintain health [N] Heilongjiang Daily, 2016-09-29 (001).

<http://news.hainan.net/shz/2014/11/03/2116124.shtml>

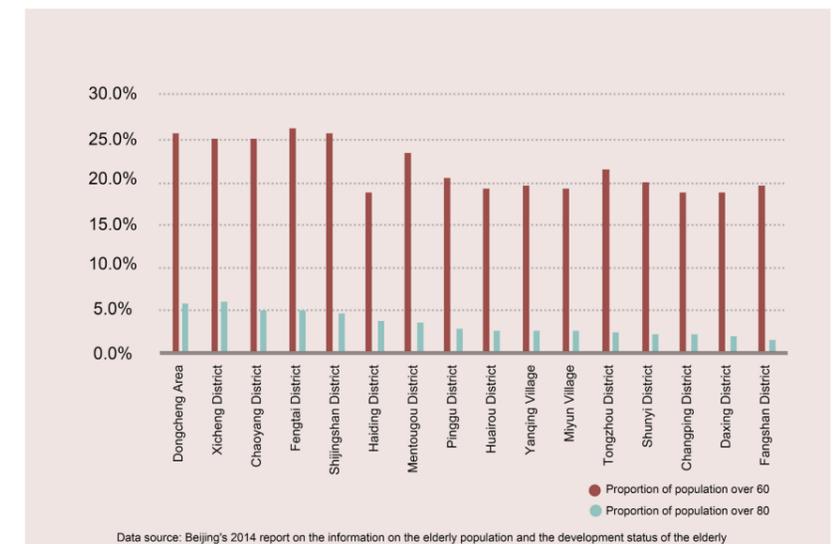
There are regional differences in the needs of the elderly for the elderly

The acceptance of elderly care institutions in different cities varies.

Related research found that some elderly people in second- and third-tier cities believe that staying in elderly care institutions means that their children are not filial and they are abandoned. Elderly people in first-tier cities (Beijing, Shanghai, and Guangzhou) are more positive about living in elderly care institutions. It can make children worry-free, and recognize the professional medical care and rich daily activities of elderly care institutions. This is related to the more open concept of elderly care for the elderly in first-tier cities, better economic conditions, and more adequate urban care resources. It is also related to the miniaturization of families in these areas, the greater degree of empty nesting, and the insufficient ability to care for children.

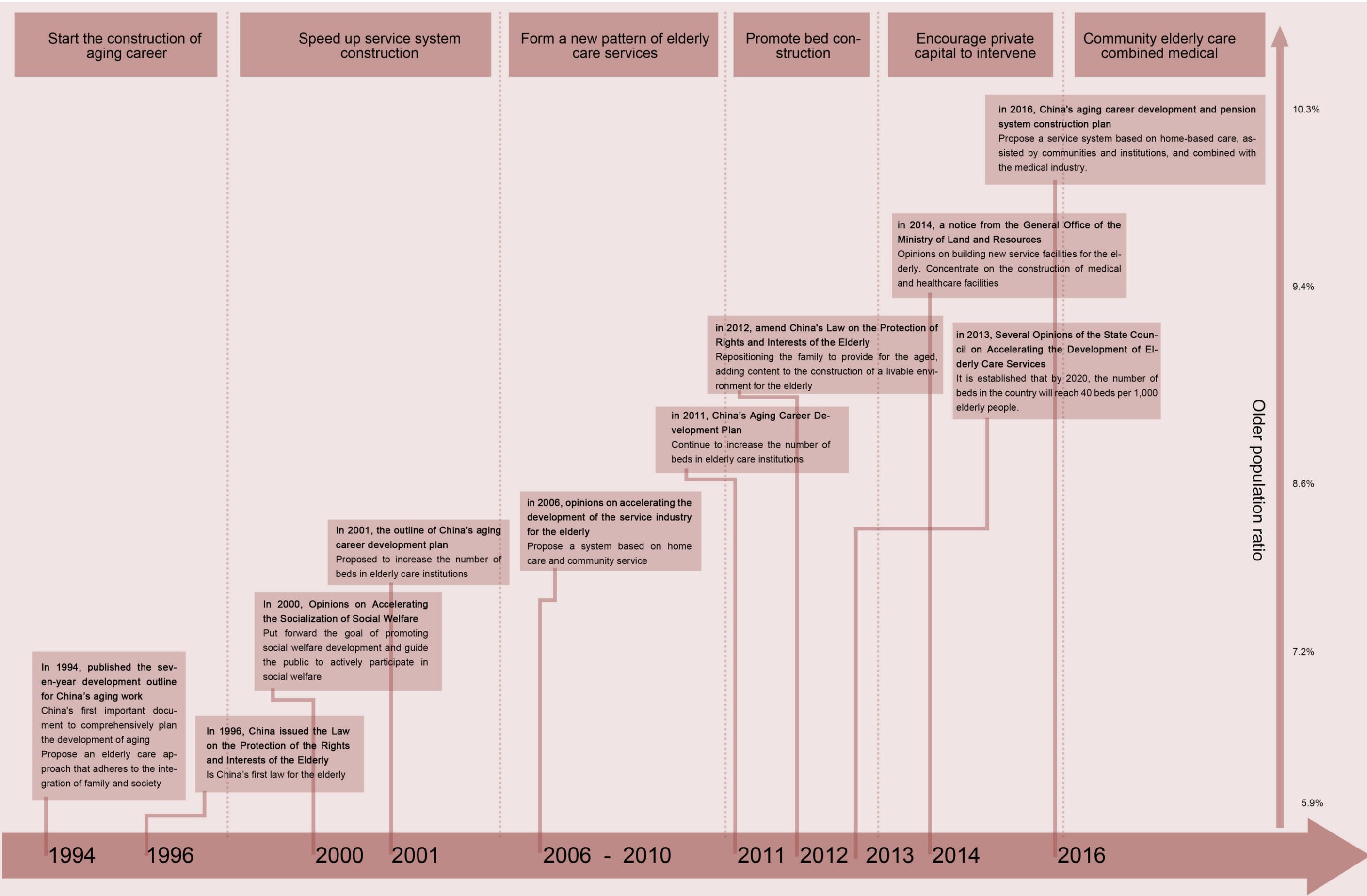
There are differences in the needs for the elderly in different areas of the city.

Taking Beijing an example. The urban and suburban areas have different degrees of aging, and the demand for elderly care services is also different. The central urban area (the six districts of the city) has a high degree of aging, and the care needs of disabled elderly people are more prominent than other districts and counties, and the supply of elderly care beds is insufficient. Therefore, there is a shortage of elderly care beds in the central city.



1.1.5 The development history of China's pension policy

In 1994, following the release of the 'Seven-Year Development Program for China's Aging Work (1994-2000), China's aging work and aging cause began to enter a planned development track.



The development history of China's pension policy

1.1.6 The names of the main types of buildings for the elderly in China

Types and names commonly used in elderly buildings in my country

China's aged buildings are still in the early stages of development, and their type system and terminology are still being gradually improved. On the one hand, the national standards and regulations define the type names of elderly buildings; on the other hand, when promoting the development and construction of elderly service facilities, local governments will also determine some type names according to the needs and characteristics of each region. At the same time, as the market explores pension projects, new types of names are constantly emerging. This part is mainly based on national standards and norms and combined with my country's current social elderly service system, to introduce some common types of elderly buildings and their corresponding service positioning. In the past, Chinese norms usually generalize the institutions and places that provide care services for the elderly in buildings as elderly facilities.

Comparison of characteristics of different types of aged buildings
The differences between different types of buildings for the elderly are mainly reflected in the target groups of the elderly and the service management models adopted.

At present, most residential houses for the elderly are for the elderly who have the ability to take care of themselves to carry out independent living life as a family unit. Nursing homes for the elderly and nursing homes mainly provide concentrated residential and nursing services for the elderly with varying degrees of disability. Correspondingly, the two will also show different characteristics in architectural form. Residential houses for the elderly usually adopt a unit layout similar to ordinary

houses, while nursing homes usually adopt a corridor layout to facilitate the efficient development of nursing services.

"Elderly apartment" and "elderly housing", the difference between elderly care facilities

The term "apartments for the elderly" has appeared a lot in the market at present. Many people have a vague understanding of this concept, and there are certain misunderstandings. Judging from the current standard and normative definitions, the apartment for the elderly refers to a type of building that provides independent or semi-independent homes for self-care and mildly disabled elderly people between the care facilities for the elderly and the elderly residence. Compared with the elderly residence, the elderly apartment itself will be equipped with some living care, cultural and recreational facilities to provide services for the elderly. Compared with care facilities for the elderly, which are mainly for the moderately and severely disabled elderly, apartments for the elderly prefer home-style services and space atmosphere, usually with "suites" as units rather than "beds." At present, some nursing homes on the market are also named elderly apartments. Some are named after the past, while others feel that the name is more cordial and easier to be accepted by the elderly and their families.

Comparison of building types for the elderly

	Apartments for the elderly	Housing for the elderly	Elderly Care Center
Definition	Provide independent or semi-independent homes for the elderly, including complete supporting facilities	Special housing for families with the elderly as the core	Provide elderly care services focusing on collective life
Method of sales	Rental housing	Sell	Bed rental
Management Service	The facility provides catering, leisure and entertainment-based life care services and comprehensive management services for the elderly	The elderly mainly use the public facilities in the community	Provide professional services of life care, rehabilitation care, spiritual comfort, culture and entertainment

Types of buildings for the elderly

Housing for the elderly

Apartments for the elderly

Elderly Day Care Center

Seniors Activity Center

Nursing home

Elderly Rehabilitation Center

Residential buildings
for the elderly

Elderly service facilities

Community service

Institutional Service

Community elderly care facilities usually provide services such as door-to-door meal delivery, bathing, and housework for elderly residents in surrounding communities

Some institutional elderly care facilities that rely on the community often also provide community elderly care services such as day care and elderly dining tables, as well as home care services such as door-to-door meal delivery

service system

Home care services

With the assistance of social services, the elderly care for the elderly through family care

Community Elderly Service

The elderly rely on community care

Institutional Elderly Service

Elderly people live in elderly care institutions



1.2 The future development of Chinese elderly buildings

1.2.1 The current situation of China's elderly buildings

China's elderly building model

In recent years, the development and construction of construction projects for the elderly in China has been very hot. Developers and investors are constantly exploring the model of elderly care projects, and more and more actual projects have been built and put into operation on the market. I summarize the most common project models in the current market into the following three categories:

Whole-age community equipped with pension products

Usually when developing ordinary residential areas, part of the land is allocated to build a certain proportion of pension products. The specific product type and construction form can be flexibly selected according to the project positioning. For example, it can be equipped with a special elderly residence or apartment group, or it can be equipped with a single apartment or senior care facility. Such a community is not only for the elderly, but also for residential groups of all ages. It is an all-age community.

Building a comprehensive elderly care community

This type of community refers to a comprehensive retirement community specifically for the elderly, including various products such as elderly residences, elderly apartments, elderly care facilities, and related medical, entertainment and other service facilities. Its characteristic is that it can meet the care needs of the elderly in various stages of physical conditions from self-care to needing care, and is more similar to the CCRC (Continuing Care Retirement Community) abroad.

Increase in existing communities and rebuild old-age facilities

Refers to the use of free land or unused buildings in existing communities to increase or rebuild them to become community elderly care facilities that can provide elderly care services to the surrounding elderly, such as day care centers, elderly meals, nurseries, elderly activity stations, etc. . According to the actual needs of the elderly in the surrounding communities and the construction conditions of the project, the facilities can be multi-functional or single, but the scale is usually not too large.

Emerging development model of elderly construction projects

With the vigorous development of China's elderly care industry and the continuous introduction of various elderly care policies, some emerging elderly care project development models have emerged in the market. Among them, the three models that have received more market attention are the combination of medical resources, tourism resources, and insurance products.

Integrate with medical resources to develop elderly care projects that integrate medical care

Model characteristics: "Integration of medical care and elderly care" is a model that our country currently vigorously advocates, and the country has also issued relevant policies to support it. The elderly rely on medical resources to a greater degree, and when choosing facilities for the elderly, they often value their medical service levels. In particular, elderly care facilities for the moderately and severely disabled elderly must be equipped with corresponding medical facilities to provide comprehensive nursing services. Therefore, projects that combine medical and elderly resources are of practical significance.

Integrate with tourism resources to develop elderly care projects

that combine tourism and care

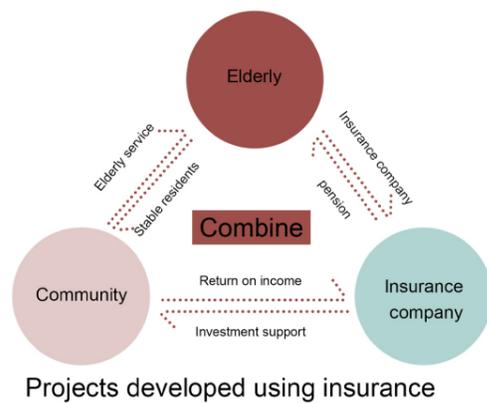
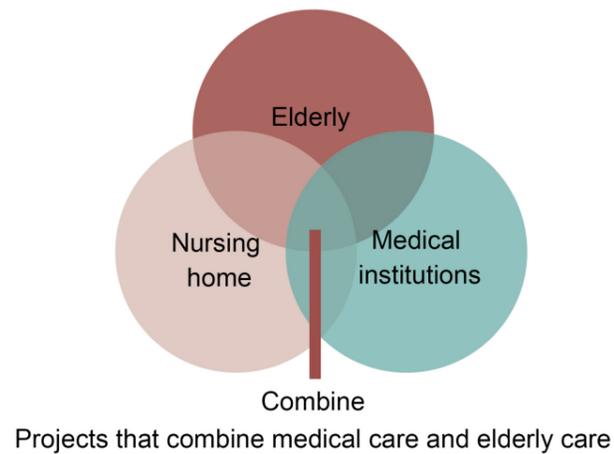
Mode characteristics: With the rapid development of tourism, in recent years, the development of elderly care projects combined with tourism and health preservation is gradually heating up. The increasing proportion of the elderly in the tourist group has made the elderly care projects combined with tourism resources more and more popular in the market. After retirement, the lifestyle of enjoying tourism and health care and old-age care in different places is being recognized by more and more elderly people. Relying on tourism resources to build elderly care projects has become a development model explored by many developers.

Integrate with insurance products to develop pension projects that combine insurance and support

Model characteristics: The emerging model of investing insurance funds in the construction of pension projects has developed rapidly in recent years. With the relaxation of national policies on the investment of insurance funds in real estate assets, many insurance companies are actively exploring the "insurance + pension products" model. For insurance companies, the return on investment of pension projects is stable, is not affected by economic fluctuations, and has stable cash flow, which is consistent with the capital characteristics of insurance funds that pursue long-term and stable returns.

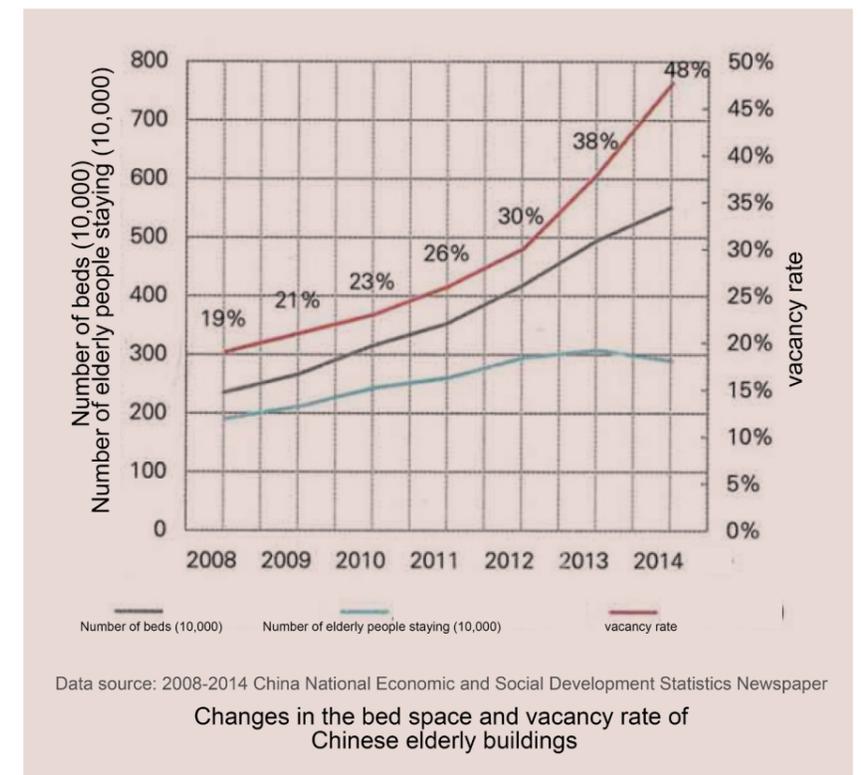
1.2.2 Current construction problems of elderly construction projects

Mismatch between supply and demand of institutional care beds
The phenomenon of vacant beds in elderly facilities coexists with "difficult to find a bed. Although the total number of beds in China's elderly care facilities is increasing year by year, the vacancy rate of beds is also rising. At the same time, some elderly care institutions in the core areas of big cities have experienced the phenomenon of "difficult to find a bed", which



indicates that the supply and demand of elderly care beds in my country are not matched.

The location of newly-built care facilities is far away and it is difficult to effectively alleviate the pressure of shortage of beds. The aging rate in central urban areas is relatively high, and the demand for nursing care is more significant. Many newly built facilities for the elderly are located in the suburbs of the city. Although there are plenty of beds, they cannot attract the elderly due to the long distance and lack of comprehensive medical supporting resources.

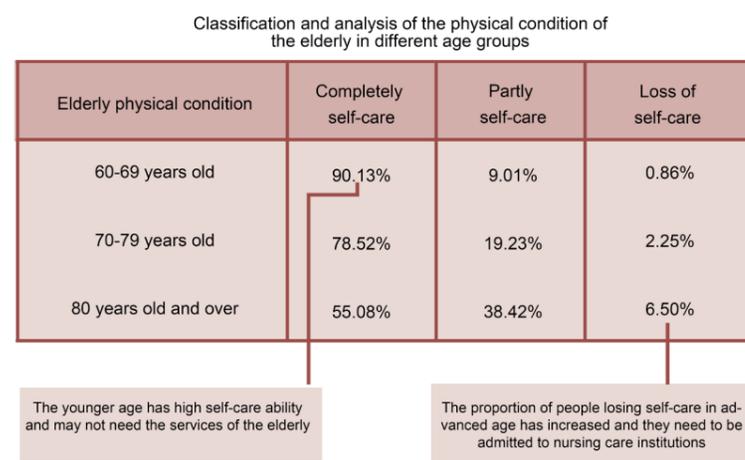


Misunderstandings in the construction of institutional elderly care facilities

Some institutions have overemphasized the task of building indicators for nursing facilities and beds. During the "Twelfth Five-Year Plan" period, the state proposed to add 3.4 million

elderly care beds to achieve the national goal of 30 elderly care beds per 1,000 elderly people. Affected by the policy, various localities have made great efforts to promote the construction of elderly care facilities, which has resulted in a substantial increase in the number of beds. But this has also caused some local governments to unilaterally pursue the speed of construction and only use the "number of beds" as an indicator of political performance. The slogan of building thousands of beds for elderly care facilities has repeatedly appeared everywhere in order to meet the standards as soon as possible. However, there is a lack of long-term and in-depth considerations as to whether the project is in harmony with the overall development of the region, whether it meets the needs of local elderly care, and whether it can continue to operate effectively after construction, resulting in a large number of idle beds after completion.

The elderly population is getting younger, and the need for institutional care for the elderly is not yet significant. The node where the elderly live in nursing facilities is mainly the advanced age stage that needs care and nursing. Despite the rapid development of aging in our country, the current elderly population has a relatively large proportion of low-age elderly and their degree of self-care is relatively high, and most of them do not need to be admitted to elderly care institutions to receive nursing services.



Data source: The fourth sampling survey of the living conditions of the elderly in China by the National Office on Aging in 2015

Community elderly care facilities are repeatedly provided and the demand is low

The supply of community facilities presents an extraordinary development

During the "Twelfth Five-Year Plan" period, the supply of community elderly care facilities across the country increased rapidly. Taking community day care facilities for the elderly as an example, as of the end of December 2015, the number of residential and day care beds in the community reached 2.787 million.

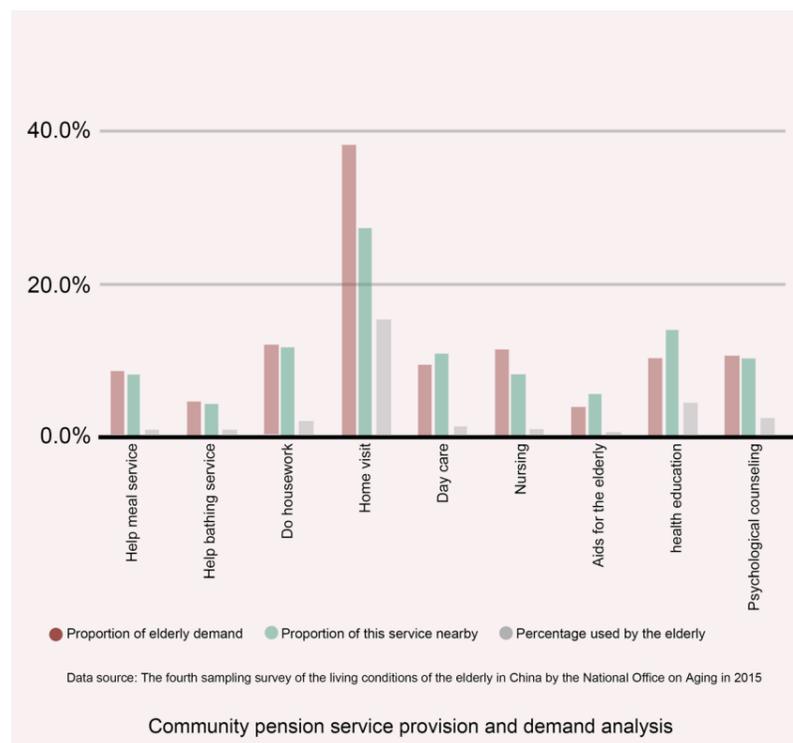
Poor utilization of community facilities

Although the total number of community facilities is growing rapidly, the survey shows that the percentage of community facilities or services that the elderly really use effectively is very low. On the one hand, because the current national policy is more from the perspective of encouraging supply, emphasizing "repairing bricks", it has not yet achieved demand-based customization. Many facilities did not have accurate market positioning during construction, resulting in inconsistency with actual demand after construction, and eventually leading to long-term idling or even closure. On the other hand, the level of community care services and management capabilities have not been followed up with the construction of hardware facilities. For example, due to the lack of professional service personnel, some day care facilities are difficult to carry out corresponding care services. They can only become activity rooms and chess and card rooms for healthy elderly people. The needs of elderly people who really need day care cannot be obtained at the community level.

Facility construction lacks integration with regional needs

Through the research on the development of the elderly in foreign communities, it can be known that community facilities should be closely integrated with the needs of the elderly in the area, and due to the differences in the needs of various

regions, various types and construction forms will be formed. At present, the problem of “one size fits all” policy standards often arises in the development of community elderly care facilities in China. It is hoped that a unified construction scale and functional configuration can be used to guide the construction, but the lack of integration with the needs of community elderly care in various regions results in the form of facility construction and regional needs Discrepancies, idle facilities and other issues.



Refer to the social service statistics of various provinces in the fourth quarter of 2015, Ministry of Civil Affairs of the People's Republic of China.

Reference from the Research Group of the National Development and Reform Commission's Social Development Research Institute, "Research on the Revision and Final Evaluation of China's Twelfth Five-Year Plan for the Development of Aging Undertakings" (Expert Review Draft), December 2015.

Designers lack experience and relevant knowledge of elderly architectural design

The number of elderly construction projects is increasing, but the relevant design experience is insufficient

Compared with the aging development process of developed countries for decades or even hundreds of years, my country has entered an aging society for only more than ten years. Whether it is in urban and rural planning, urban space environmental

construction, or architectural design, interior decoration design, There is a lack of ideal guidance and practical experience suitable for aging. In recent years, with the increase in the construction volume of aged buildings, many designers have been more or less exposed to the planning and design of aged buildings. However, because there is no relevant design experience before, and there is a lack of mature domestic cases for reference, it often feels "unable to start" when designing, and I don't know how to make it relevant to the elderly. There are also some design projects that simply apply foreign planning and design forms, but have not deeply explored or understood the policies, service management models, and living habits of the elderly that have an impact on their design. The design results are not suitable for China's national conditions.

Inadequate understanding of the needs of the elderly

Judging from the reality, most of the people in the design industry are young and middle-aged people, and they have no personal experience of the physical and mental characteristics of the elderly and their housing needs. Although there are some domestic researches on the physiological and psychological characteristics of the elderly, they are still inadequate compared with developed countries, especially in the research on ageing of the architectural design. Due to the lack of relevant knowledge and professional education, designers' understanding of age-appropriate design often only stays at the level of standards and specifications, or simply thinks that “appropriate ageing” is equivalent to “no obstacles”, without in-depth and detailed observation and understanding. The behavioral characteristics of the elderly and their living habits.

Improper implementation and understanding of standards and specifications

One-sided interpretation and implementation of standards and specifications, creating constraints on design

China has compiled and revised many standards and codes related to aged buildings. However, in actual application, due to

the lack of detailed descriptions or insufficient explanations of some provisions, the implementation standards of various places are different. In order to avoid liability risks, some approval departments strictly enforce the requirements in the specification, which has an impact on the design. In addition, some provisions in the current standard specifications are insufficient to explain the design goals, and only have index requirements. This will have certain problems for the old renovation facility projects. For example, some spaces cannot meet the corresponding size requirements, and the specifications lack pertinence. The flexible handling measures made the code less adaptable in actual projects.

The understanding of standards is relatively rigid, and the design and processing are not flexible

The standard specification focuses on directly giving conclusions on the allocation of houses, area indicators, and technical requirements, but does not elaborate on the formation process or reasons behind it. The designer knows it but doesn't know why. In the specific design, they can only adhere to the specifications or copy the standard diagrams. The actual needs are handled flexibly, resulting in a more rigid design plan. In addition, due to the lack of participation in the whole process of project planning and operation plan formulation, it is often difficult for designers to grasp and coordinate the design plan from an overall perspective.

兰洁。日间托老所为何空转 4000 家日托所关了三分之二 [N]。北京晚报, 2016-03-28。

Lan Jie. Why do day nurseries turn around two-thirds of 4000 day nurseries[N]. Beijing Evening News, 2016-03-28.

<http://help.3g.163.com/16/0328/16/BJ8OPFTJO0964J40.html>.

Misunderstandings in design ideas and concepts

Copy hotel, hospital design ideas

Because they don't know about buildings for the elderly, many designers or developers think that apartments for the elderly are similar to hotels and hotel-style apartments, and nursing homes are similar to hospitals. They are designed according to the ideas of hotels and hospitals. However, it ignores the long-term residential characteristics and service operation mode of elderly buildings, resulting in the design plan not meeting the final use and operation requirements.

The design lacks consideration of operational service requirements

Design failed to integrate with operational requirements

Aged buildings often do not have the participation of the final operator during the design period. Developers, investors or designers have not thoroughly considered the future operation mode of elderly care facilities, but blindly design, which leads to differences in the needs of the actual operation team after the completion of the project. Fit, facing the problem of remodeling and decoration.

Design lacks flexibility and diversity

The design lacks a long-term perspective, and adaptability is not well considered.

The space of elderly buildings is not static. The types of elderly residents, changes in physical conditions and adjustments in service modes will all put forward new requirements on the layout, spatial form and area of the building. However, many elderly buildings did not consider the possibility of future renovation at the beginning of their design. For example, some old-age facilities that were originally positioned as healthy, self-care facilities for the elderly are transformed into nursing-type old-age facilities after operation. It is necessary to re-divide the group form and change the space function, but it is often difficult to achieve due to the limitations of the building structure or original layout.

Pursue luxury blindly without paying attention to details

Many domestic developers are transforming from real estate,

hotel industry and other fields to the elderly care industry. When developing elderly care projects, they do not understand the needs of elderly customers. They believe that high-end hardware facilities can attract the elderly, but they ignore software services and Related detailed design requirements.

Insufficient attention to the needs of nursing and logistics services

The designers' lack of attention to the nursing and service modes of elderly care facilities has led to an adverse impact on the service and management of staff by the building space. During the investigation, it was found that some elderly care facilities have too long service flow lines due to the improper layout of nursing stations; some elderly care facilities have insufficient logistics and auxiliary space design, which affects the development of drying and cleaning work.

The diversification of the needs of the elderly, lack of individualized understanding

Compared with developed countries, China's architectural design for the elderly still lacks attention to the diversification and individual needs of the elderly. For example, in the design of the elderly's living room, the needs of the elderly's personalized layout are rarely considered, and uniform furniture configurations are often used, leaving little room for the elderly to adjust freely. The public space of retirement facilities is relatively monotonous in design and decoration style, and the spatial atmosphere is not rich enough.



1.2.3 The future development trend of China's elderly buildings

Returning to the community is a common trend in the development of elderly buildings in developed countries

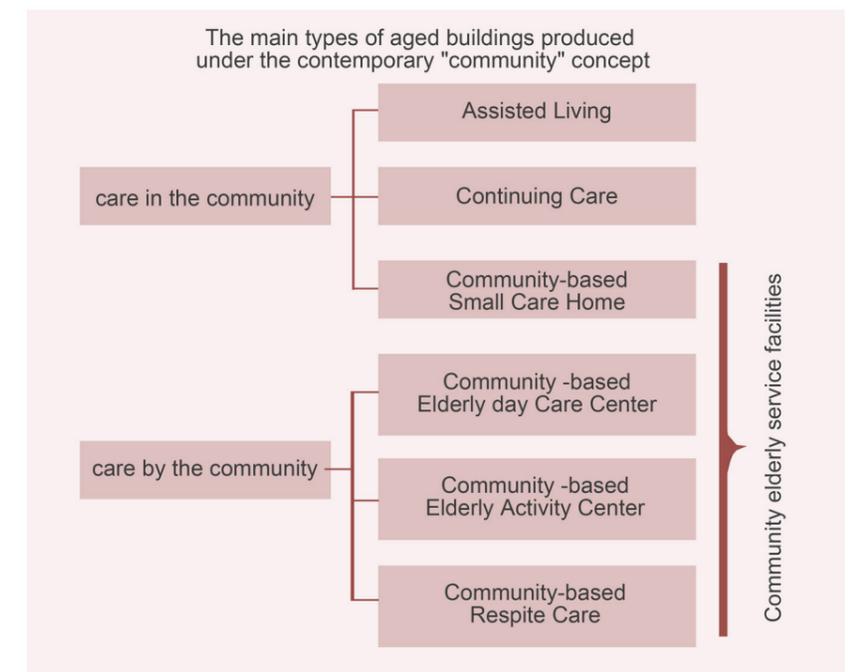
The development process of the old-age housing model in developed countries has generally experienced a transition from hospital old-age care to institutional old-age care, and then to home and community care. Since the middle of the 20th century, Western developed countries have gradually realized that a large number of blindly building nursing homes, nursing homes, and allowing the elderly to live in institutions to receive inpatient care will not only increase the government's financial burden, but also detrimental to the maintenance of the elderly. The original way of life and the continuation of past social relations'. In recent years, some developed countries such as Japan and Europe have begun to advocate and promote the return of "community care" for the elderly in institutions, aiming to maximize the various resources and service functions of the community, so that the elderly can stay in the original community as long as possible. Reduce the reliance on institutional pension facilities.

The influence of the concept of community care on the development of aged buildings

Under the influence of the concept of community care, the current construction strategies of senior buildings in developed countries have gradually evolved in the direction of communityization, miniaturization, and familyization, and two types of mainstream community elderly care facilities have been developed:

1. The types of elderly care facilities established in accordance with the concept of "care in the community" mainly refer to assisted living elderly apartments, continuous care apartments for the elderly, small nursing homes in the community, etc. The elderly live in special elderly apartments or service organizations in the community, and can be taken care of by professionals, so that the elderly can live in a familiar community environment.

2. The types of elderly care facilities established in accordance with the concept of "care by the community" mainly refer to community day care centers, community elderly activity centers, community respite services, etc. These facilities connect the community and the family's resources for the elderly, so that the elderly in the community who need care will continue to live at home.



Schwarz B, Brent B.(eds). Aging, autonomy, and architecture: Advances in assisted living[M]. JHU Press, 1999.

Means R. Smith R. From poor law to community care: Development of welfare services for elderly people 1939-1971[M]. Policy Press, 1998.

Cox C B. Community care for an aging society: Issues, policies, and services[M]. Springer Publishing Company, 2004.

Elderly complex building model

The elderly care complex is a form of elderly housing that integrates the functions involved in the clothing, food, housing, transportation, and entertainment of the elderly to solve the

problem of elderly care. As a new elderly care model, it has attracted more and more attention. It can not only meet the needs of the elderly for the elderly, but also reduce the burden of the family for the elderly.

The diversified development of the elderly care industry shows that traditional elderly care formats can no longer meet the growing demand for elderly care of modern people. Modern people generally expect the emergence of higher standards and higher quality elderly care buildings, from "elder care" to "new elder care", "tourism + The old-age building model of the "culture + leisure + old-age care" composite elderly care complex has gradually become an emerging architectural model. The elderly care complex refers to the provision of integrated solutions for elderly care, leisure, entertainment, culture, medical care, and fitness. It is composed of nursing homes, hospitals, shopping centers, food bases, hotels, schools, parks, apartments and so on. It is a highly integrated building group that meets the needs of the elderly.

It can meet the comprehensive service community needed by the elderly in all aspects of life, including three levels: one is to meet the basic needs of medical care, dining and entertainment, and residential care; the other is to meet the basic guarantee for health, recuperation, shopping and leisure functions Demand; the third is to meet the spiritual needs of higher-level life such as education, health preservation, and entertainment for the elderly. The emergence of elderly care complexes meets the growing demand for elderly care for modern elderly people. The development and construction of elderly care real estate has brought practice ahead of theory. In recent years, various complex buildings with the theme of elderly care have been built across China. The study found that these senior care complexes have clear characteristics in terms of environment, location, service, and operation in the process of project development and construction. This article will analyze the characteristics of the new type of architecture of the senior care complex from four aspects.



1.3 Planning and design principles and norms of nursing homes

1.3.1 Development status of China's elderly building standards

In 1999, as China entered an aging society, China issued the first standard specification for building design for the elderly, filling the gaps in the Chinese engineering construction standards in this field. With the rapid development of aging in recent years, the country has continued to compile, promulgate, and revise relevant standards. From 1999 to the present, China has issued and implemented the standards and codes for elderly buildings.

Building code sheet on elderly building

laws	laws number	Execution date	status
Code for design of buildings for the elderly	JGJ122-99	1999-10-01	Repealed
Design standards for residential buildings for the elderly	GB/T 50340-2003	2003-09-01	Repealed
Standards for Planning of Urban Elderly Facilities	GB 50437-2007	2008-06-01	Executing
Building standards for community day care centers for the elderly	GB 143-2010	2011-03-01	Executing
Construction standards for nursing homes for the elderly	GB 144-2010	2011-03-01	Executing
Code for the architectural design of elderly care facilities	GB 50867-2013	2014-05-01	Executing
Code for design of residential buildings for the elderly	GB50340-2016	2017-07-01	Executing

1.3.2 Excerpts from Design Specifications

Code for design of residential buildings for the elderly (GB 50340-2016)

(4.1.4) The distance between residential buildings for the elderly should not be lower than the standard of 2h sunshine in winter

(4.2.1) The road system should ensure that the ambulance can park at the main entrance and exit of the building.

(4.2.3) Pedestrian roads should meet barrier-free traffic requirements, and the clear width should not be less than 1.20m. The local width should be greater than 1.80m. The slope of the pedestrian road should not be greater than 2.5%, and the pavement should be paved with non-slip materials.

(4.2.5) For the centralized construction of residential buildings for the elderly, it is advisable to set barrier-free motor parking spaces at not less than 5% of the total motor vehicle parking spaces. The barrier-free motor parking spaces should be reserved for the installation conditions of motor vehicle charging piles, and should be set up near the entrance of the building.

(4.2.6) Non-motor vehicle parking lots should be set up around the building, and its location should be kept at an appropriate distance from the entrance and exit of the motor vehicle parking lot.

(4.2.7) Non-motor vehicle parking lots should meet the requirements of sheltering from rain and sun, and charging devices for electric mopeds should be installed

(4.3.3) The activity site should not have a slope, and when there is a slope, the slope should not be greater than 2.5%. When the slope between the sites is greater than 2.5%, steps should be set locally, and wheelchair ramps and handrails should be set at the same time.

(4.4.1) The green area rate of newly built residential buildings for the elderly should not be less than 30%.

(4.4.2) Local tree species should be selected for greening planting, mainly arbor, and the clearance under forest should not be less than 2.20m. Green planting should not cause harm to the health of the elderly.

(4.4.3) When the depth of the viewing water body is greater than 0.50m, safety protection measures should be provided.

(4.5.1) Outdoor ramps should meet the following requirements:

1 The clear width of the outdoor wheelchair ramp should not be less than 1.20m, and the starting and ending points of the ramp should have a wheelchair turning space with a diameter of not less than 1.50m;

2 The slope of the outdoor wheelchair ramp should not be greater than 1:12, and a platform should be installed every time it rises 0.75m. The depth of the platform should not be less than 1.50m;

3 Railings and handrails should be installed on the airside side of the outdoor wheelchair ramp, and safety blocking measures should be installed.

(4.5.2) Outdoor steps shall meet the following requirements:

1 A wheelchair ramp should be set at the same time;

2 Steps should not be less than 2 steps, step width should not be less than 0.32m, step height should not be greater than 0.13m; the clear width of steps should not be less than 0.90m;

Summary

The new type of senior care building should be a complex community senior care building

The community is the most basic social organization in a modern city and an important place for the elderly to live. If the urban retirement buildings are placed in the community, the community's medical services can be used. "Relatives" and "activity venues for the elderly" are an important part of the life of the elderly. Relatives refer to the social relationship formed by

blood ties between the elderly and their children and relatives; the elderly activity venues refer to the social relationships formed by the elderly in their lives with neighbors, friends and various organizations in the region. Nowadays, the urban elderly care buildings are not configured according to the distribution of the elderly population and actual needs, so that the elderly in the elderly apartments are far away from relatives and lose the original familiar environment. In this unfamiliar environment, the elderly are more prone to loneliness and loneliness. Mental problems. There are also a number of well-equipped, high-quality urban retirement buildings in cities, but there are no special planning and design specifications for the network layout, and lack of consideration due to different aging speeds and different regional characteristics, resulting in the current situation of resource shortage and waste.

2. Investigation and research on the elderly in Guangzhou

2.1 Guangzhou pension status and policies

2.2 Guangzhou city appearance and architectural features

2.3 The impact of floating population on the social and economic development of Guangzhou

2.4 Survey and research on the elderly population in Guangzhou

2.5 Investigation on the family structure of the elderly

2.6 Research on the location and time of activities for the elderly in Guangzhou

2.7 Analysis of the needs of the elderly in Guangzhou



2.1 Guangzhou pension status and policies

2.1.1 Features of Guangzhou Institutional Pension

As a city with a developed economy and a relatively mature market, Guangzhou has also developed rapidly in institutional care. By the end of 2005, Guangzhou had developed 187 social welfare institutions of various types, with a total of 19,533 beds (of which 55 were privately-run, accounting for about 50% of the total). The current Guangzhou institutional pension has the following characteristics. (Data source: Guangdong Provincial People's Government, Development of Elderly Services 2019)

· There is an obvious shortage of beds in institutions for the elderly

Relevant data show that in 2005, there were 945,000 elderly people over 60 in Guangzhou, accounting for 12.85% of the city's total population. A sample survey conducted by relevant departments of Guangzhou on the needs of the elderly for social elderly care services shows that the people most in need of living in elderly care institutions account for about 4% of the city's elderly population, and those who wish to move in account for 10.4%. However, the current beds in Guangzhou can only provide 2.07% of the total number of elderly people in nursing homes, and the remaining nearly 98% of the elderly can only take care of the elderly at home. If the elderly living in elderly care institutions are calculated at the proportions of 4% (that is, those most in need) and 6% (that is, the current median value of 5%-7% in Western countries) of the total elderly population, the beds in Guangzhou institutions It should be doubled and doubled to meet the demand.

· The institutional pension model began to diversify

Although Guangzhou's institutional elderly care providers and funding sources are complicated, they are roughly divided into

three types: First, public elderly care institutions. The survey shows that the current funding sources of these pension institutions run by the government, neighborhoods, state-owned enterprises and institutions are mainly various "public funds". Therefore, this is a public pension institution with obvious relief and welfare (referred to as "Public institutions") can be classified as public institutions. The second is private non-profit elderly care institutions. Such elderly care institutions are mainly established by private forces, and are registered as "private non-enterprise units" in the civil affairs department. They are social welfare elderly care institutions. The third is private for-profit elderly care institutions. Such institutions are invested and established by private or private enterprises, and are registered as "private enterprise units" in the industrial and commercial sector, and are profitable pension institutions. As the Guangzhou Municipal Government does not currently provide financial subsidies to non-profit elderly care institutions not only for for-profit elderly care institutions, the civil affairs department does not clearly distinguish between these two types of institutions, but collectively referred to as "private social welfare institutions."

·Private elderly care institutions increase rapidly

As Guangzhou's economy is relatively developed and public pension institutions are far from meeting social needs in terms of quantity and quality, private pension institutions have emerged, especially for-profit pension institutions. Statistics show that at the end of 2000, the number of beds in elderly care institutions in urban areas in Guangzhou was 8,565, and by the end of 2004, the number of beds reached 16,678, nearly doubling in four years. Among them, the number of beds in public welfare institutions increased from 4,274 to 7,074, an increase of 65.15%; the number of private elderly care institutions increased from the initial 2 to 55, and the number of beds increased from 4291 to 9,604, an increase of 123.8%.

·Different models of elderly care institutions present a competitive landscape

Due to the different models of institutional pensions, the economic and social pressures they bear are different, and

the management and operation methods are also significantly different. In general, public institutions rely on government financial resources, with relatively complete hardware and supporting facilities, and have capital and policy advantages that non-public institutions do not have. But on the other hand, public institutions have less economic pressure, low cost awareness and competitive awareness, and have strong traces of planned economy in management, and there is an obvious waste of human and financial resources. The market-oriented nature of private institutions determines that they have a strong sense of cost and service. In recent years, many private elderly care institutions have expanded the scale of their homes while competing with their peers in terms of prices and services.

2.1.2 The problem of Guangzhou institutional pension model

From the perspective of institutional elderly care models, the problems of Guangzhou institutional elderly care are concentrated in the following: model differentiation is not obvious, model positioning is not clear, and model service targets are not specific. The mode differentiation mentioned here is not obvious, which means that, on the one hand, public-owned and private-run models have not yet differentiated in public institutions; on the other hand, private-owned institutions have not really made profit and treatment for applying different policies and treatments. Non-profit distinction.



2.2 Guangzhou city appearance and architectural features

2.2.1 Guangzhou City Geographical Environment

·Location

Guangzhou is located in the south of China, south-central Guangdong Province, and the north-central edge of the Pearl River Delta. It is adjacent to the South China Sea, with Boluo and Longmen counties to the east, Sanshui, Nanhai and Shunde to the west, Relying on the downtown area of Qingyuan, Fogang County and Xinfeng County, it is connected to Dongguan City and Zhongshan City in the south, and faces Hong Kong and Macau across the sea. Guangzhou is one of the starting points of the Maritime Silk Road. Guangzhou is the core city of the Guangzhou-Foshan metropolitan area, the Guangdong-Hong Kong-Macao metropolitan area, and the Pearl River Delta metropolitan area.



Image source: Guangzhou Planning and Natural Resources Bureau

GUANGZHOU
CHINA

23°08'N 113°16'E

·Soil

Guangzhou is a hilly area, with high terrain in the northeast and low in the southwest. It is backed by mountains and faces the sea. Toward north there's a hilly mountainous area with concentrated forests. The highest peak is Tiantangding at the junction of Conghua City and Longmen County in the north, with an elevation of 1,210 meters; , There is Baiyun Mountain known as the "city lung"; the center is a hilly basin, and the south is a coastal alluvial plain, which is a component of the Pearl River Delta.

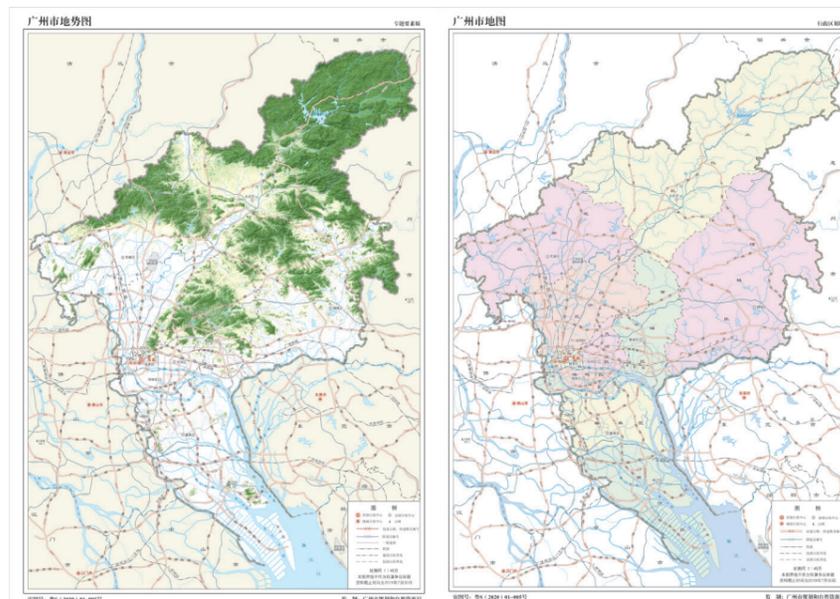


Image source: Guangzhou Planning and Natural Resources Bureau

·Climate

Guangzhou is located in the subtropical coast, with the Tropic of Cancer passing through the central and southern regions. It has a maritime subtropical monsoon climate characterized by warm and rainy, abundant light and heat, long summers and short frost periods. The annual average temperature is 20-22 degrees Celsius, which is one of the largest cities in China with the smallest annual average temperature difference. The hottest month of the year is July, with an average monthly temperature

of 28.7°C. The coldest month is January, with an average monthly temperature of 9-16°C. The average relative humidity is 77%, and the annual rainfall in the urban area is about 1,720 mm. Throughout the year, the rainy season is from April to June, the weather is hot and typhoon from July to September, the temperature is moderate in October, November, and March, and the cool winter is from December to February. The water and heat are at the same time throughout the year, and the rainfall is abundant, which is conducive to the growth of plants. It is a "flower city" with evergreen flowers in all seasons.

2.2.2 Guangzhou demography

At the end of 2019, Guangzhou had a permanent population of 15.3059 million, with an urbanization rate of 86.46%. At the end of the year, the registered population was 9,537,200, and the urbanization rate was 79.90%; the annual registered population was 139,800, and the birth rate was 14.86‰; the dead population was 48,300, and the death rate was 5.14‰; the natural growth population was 91,500, and the natural growth rate was 9.72‰ . The household registration population is 21,500, the emigrant population is 43,000, and the growth population is 167,500. (Data source: Guangdong Provincial Bureau of Statistics, 2019 Guangdong Provincial Census)

·Out-of-town population

As a big city, Guangzhou has a large number of foreigners flocking to Guangzhou to work, but there are some contradictions between "locals" and "outsiders", and it also causes a series of social problems. In 2014, the Guangdong Provincial Government issued a document that clearly required the control of the population size of the megacities in Guangzhou and Shenzhen. In 2008, migrant workers accounted for 40% of Guangzhou's population. Most of them were female migrant workers, and 61.7% were unmarried.

Statistics at the end of 2013 showed that the registered

population of Guangzhou was 8.32 million, while the registered floating population of Guangzhou was 6.867 million. According to a certain missed registration rate, the actual floating population in Guangzhou was about 8.37 million, which has exceeded the registered population. Young adults account for the vast majority, 88% are 16-45 years old, Bachelor degree or above accounted for 12%. Among them, the floating population in Baiyun District, Panyu District and Tianhe District exceeds one million. There are 1.117 million registered migrants in Panyu District, and migrants' household registration covers 30 provinces, autonomous regions, and municipalities directly under the Central Government. In terms of gender ratio, there are slightly more men, accounting for 53.5% of the total.

·Foreign population

Guangzhou is one of China's most important opening-up policy cities. As a window for foreign trade, coupled with its proximity to Hong Kong and Macau, there are many foreigners from North America, Japan, South Korea, Europe, the Middle East, Africa and other regions. Among them, most of them are black people of African descent, so Guangzhou is known as the "capital" of the Third World. They mainly live in Guangzhou's Huanshi East Road, Xiushan Tower, Taojin Road, Garden Hotel, Jianshe Liuma Road, Jianshema Road, and the offices of foreign companies in buildings around Tianhe North Road in Tianhe District; some properties in Panyu District include There are also many foreigners in Qifu New Village and Lijiang Garden.

Statistics from the Exit-Entry Administration Division of Guangzhou Public Security Bureau in October 2014 showed that there were 118,000 foreigners registered in Guangzhou, including 71,000 temporary residents and 47,000 permanent residents for more than half a year (including nearly 10,000 international students) People from Europe, America, Japan and South Korea account for the majority. More than 4,000 registered foreigners from Africa; about 10,000 people come from Arab countries and regions. Although there is no large-scale settlement, they often appear in the Xiaobei-Dengfeng area. Trade in the business district; Tangjing Street also has more Koreans. In 2013, there were more than 10,5 million passengers

The opening-up policy is a policy to develop and strengthen foreign economic and technological exchanges, participate in international exchanges and international competition, promote economic reforms, transform China's economic structure from a closed economy to an open economy, and promote the healthy and rapid development of the national economy.

<https://baike.baidu.com/item/%E5%AF%B9%E5%A4%96%E5%BC%80%E6%94%BE>

entering and leaving the Guangzhou port, of which 540,000 were from African countries, most of which were repeated entry and exit by the same person. Most of them were due to visas allowing shorter stays or business needs, rather than immigration. In recent years, Guangzhou's public security issues have sometimes involved Guangzhou blacks, causing dissatisfaction among the Guangzhou people. In response to the "three nons" (illegal entry, illegal residence, and illegal employment) caused by a large number of foreigners in Guangzhou, the Guangzhou Public Security Bureau has established four law enforcement service teams to deal with the matter; since 2008, Guangzhou The establishment of "Foreigner Management and Service Workstations" in communities where more than 200 foreigners live, and vigorously crack down on the "Three Non-Affects" problem of foreigners, has achieved results.

2.2.3 Traditional and modern architecture

During the Ming and Qing Dynasties, Guangzhou had 18 gates, mainly located in the present Yuexiu District. In 1920, Guangzhou was completely demolished when the road was opened. Now only the Ximenkou and other sites are left. Place names derived from the city gates such as Dadongmen, Ximenkou, and Xiaobei Road (Xiaobeimen) are still in use today. In recent years, although the government has continued to repair and protect traditional buildings, such as the Wuxian Temple and Guangzhou City God Temple, some cultural relics have still been brutally demolished and destroyed. In 2009, the developer demolished the small foreign buildings in the Dongshan Xinhepu Nature Reserve, and was called to an emergency stop only after a joint letter from cultural and architectural experts to the mayor.

·Arcade in Guangzhou(The shophouse in Building overhang)

Arcade are a common architectural form in the Lingnan area. The large-scale construction of Guangzhou Arcades began in the 1920s. In the 11th of the Republic of China (1922), the "Road List of No-Building Arcades in Guangzhou" and the 19th of the Republic of China (1930) Under the guidance of

the "Construction Regulations", a pattern that continues to the present has been formed. In the 1990s, the Guangzhou authorities were obsessed with large-scale buildings. They demolished a large number of Arcades including Zhongshan Road, Baohua Road, Jiefang Road and Liuer San Road, causing irreversible damage to historical buildings and forced closure of many time-honored brands. In the 21st century, the authorities began to restrict the demolition of the arcade block. In the "Protection Plan for the Historical and Cultural City of Guangzhou", the protection of the arcade block occupies a considerable amount of space. However, some arcades, such as those on Enning Road, Beijing South Road, Yide Road, Wanfu Road, etc., still face the crisis of relocation and demolition in the reconstruction of old areas and subway projects, and their decision to stay has also triggered heated discussions in the community.



Image source: Guangzhou Qilou Baidu Encyclopedia

·College

Beijing Street used to stand the largest group of ancient academies in China since the late Qing Dynasty(1840-1912). The ancient academies of the Big Horse Station are distributed within an area of about 20,000 square meters on both sides of the Big Horse Station and Liushuijing Streets on the west side of Beijing Road. In the early years, there were 12 academies reserved and 6 existing academies. Among them, there are 3 on the west side of Xiaoma Station (Zeng Family Ancestral Hall, Lianxi College and Jianda College); 3 on both sides of Liushuijing (Lujiang College and Kaoting College on the west, and Guanying Academy on the east). As most of the Guangzhou Academy has been in disrepair over time, and some are quite

dilapidated, the Guangzhou Municipal Government plans to allocate funds to repair the Academy. In Guangzhou, the most representative academy and ancestral hall building is Chen Clan Ancestral Hall.

·Modern architecture

Guangzhou has a developed economy. There are more than 400 high-rise buildings above 90 meters, and the number and density of high-rise buildings above 150 meters rank among the top cities in mainland China and even the world. High-rise buildings are mainly concentrated in Tianhe District and Yuexiu District. With the acceleration of Guangzhou's urbanization process, more and more super high-rise buildings are being constructed. Zhujiang New Town, the central business district, is planning 18 high-rise buildings above 200 meters and about 50 high-rise buildings above 150 meters. Among them, the representative tall buildings include Guangzhou Chow Tai Fook Financial Center (commonly known as East Tower, 530 meters), Guangzhou International Finance Center (commonly known as West Tower, 443 meters), CITIC Plaza (391 meters), China International Center (269 meters) And Guangdong Telecom Plaza (260 meters), etc. The main body of the Canton Tower is 450 meters, the antenna mast is 150 meters, and the total height is 600 meters. It has become the world's second tallest TV viewing tower after Tokyo Skytree.



Image source: <https://wtpartnership.asia/our-team-experience>

·Religious buildings

As a famous historical and cultural city and a long commercial port in China, Guangzhou retains many precious religious buildings, most of which are densely distributed in the old city. At least one of the five major religions has been included in the list of national key cultural relics protection units, a total of 9 items. In addition, there are 5 cultural relics protection units listed in Guangdong Province, 21 municipal key cultural relics protection units, and 12 cultural relics protection units registered in Guangzhou. Among them are the Liurong Temple Pagoda and Guangxiao Temple in Buddhism, the Catholic Church of the Sacred Heart of the Sacred Heart, the Church of Our Lady of Sacred Heart, the Light Pagoda of Huaisheng Temple in Islam, the Shamian Church in Protestantism, and the Taoist Temple of Five Immortals and Nanhai Temple. All are national key cultural relics protection units. The most representative is the Sacred Heart Cathedral, which was built in 1863 and completed in 1888. It is one of the four all-stone Gothic churches in the world.



Image source: Guangzhou Qilou Baidu Encyclopedia

·Protected building

After many years of local architectural development, Guangzhou has accumulated many historical monuments, especially in

terms of architecture, and a considerable number of them have also been evaluated for protection. As of 2019, there are 429 national, provincial, and municipal cultural relics protection units in Guangzhou. Among them, 34 are national key protection units, 48 are provincial-level cultural relics protection units, and 347 are municipal-level cultural relics protection units. The tomb of the Nanyue King was built in the Western Han Dynasty. At present, the three historical sites of the Nanyue Kingdom, including the site of the Palace Office of the Nanyue Kingdom, the Tomb of the Nanyue King, and the Relics of the Water Gate of the Nanyue Kingdom, are now jointly declared for the United Nations World Heritage. Guangxiao Temple, Liurong Temple, Huaisheng Temple, etc. have a history of more than 1,000 years, as well as the Nanhai Temple built in the Sui Dynasty, the Temple of Five Immortals, Zhenhai Tower, and the Lotus Pagoda in the Ming Dynasty, and the Chen Family Temple and Yuyin Mountain House in the Qing Dynasty. The historical sites of modern revolution include the site of the Peasant Movement Workshop hosted by Mao Zedong, the Guangzhou Uprising Martyrs Cemetery, the Tomb of the 72 Martyrs in Huanghuagang, the site of the Huangpu Military Academy, the Zhongshan Memorial Hall, and the former residence of Hong Xiuquan.



Image source: <https://www.sohu.com>

2.2.4 The evolution process of Guangzhou urban spatial form

Historical characteristics of urban spatial morphology evolution

Guangzhou is located at the foot of Baiyun Mountain and on the banks of the Pearl River. It is adjacent to Foshan and the South China Sea to the west. It is restricted by administrative boundaries and blocked by the Pearl River to the south. Its development is slow; it bypasses Baiyun Mountain to the north and is the Guanghua Plain at the lower reaches of the Liuxi River, which is low-lying; To the east, the terrain is flat and the transportation is convenient. The city of Guangzhou was basically expanded slowly on the original site of the opening of the port. The location of the city center has basically not changed in the past two thousand years.

Guangzhou is a unique landscape city. "All six veins lead to the sea, and the green mountains and half into the city" is an image summary of the spatial form of the ancient city. Guangzhou Mianshui (Pearl River) and Back Mountain (Baiyun Mountain), in the 9th century BC, human settlements have formed under Baiyun Mountain. Nanhai County was set up in Qin Dynasty, with an area of about 0.2km², which was an ancient military town to defend the border. In the early Han Dynasty, the Nanhai Captain expanded the area of the urban area by 10 times, with an area of about 1.5km². During the Song Dynasty, the city wall of Guangzhou was expanded more than ten times, and the area increased to about 5km². After the Tang Dynasty, Guangzhou's appearance scale developed slowly but continued to expand. In the Ming Dynasty, the expanded city wall reached the Hailou in the north of Yuexiu Mountain and the Pearl River in the south, covering an area of nearly 10km². In the Ming and Qing Dynasties, other trading ports were cancelled twice and left in Guangzhou alone. In 383 AD, Guangzhou was able to "trade with one port". At that time, the urban area was 10-15km². In the Qing Dynasty, the natural coastline of the Pearl River moved south. To strengthen defenses, east and west "wing cities" were added to the riverfront. Guangzhou was the country's largest trading port at that time. In 1860, the Anglo-French concession of Shamian was built, and the Shisanyi Pavilion and many shippers' wharves

were built along the Pearl River. The urban area of Guangzhou expanded to the east, west and south, forming four old towns, Liwan, Yuexiu, Dongshan and Haizhu, with a total area of 15-20km². Before and after the Revolution of 1911, Guangzhou's modern industry gradually developed and its urban functions became increasingly integrated. Commercial and financial industries were concentrated in the direction of Shamian and Donghao. University scientific research areas were formed in the northeast of the city. By 1923, the entire urban development area of Guangzhou was concentrated from Liwan to the old city of Dongshan. The southwest area became a new commercial activity place, and the urban space was in the form of a wheel-shaped mass. The Haizhu Bridge was built in 1933, and the bus lines between the urban area and Henan were opened, which promoted the development of Haizhu District, and the area along the river became a prosperous business district.



Graphic source: <https://www.mdpi.com/>

After 1949, Guangzhou gradually became the center of textile and foreign trade in South China. After more than ten master plans and long-term construction, it formed a spatial pattern

centered on the old city and developed eastward along the north bank of the Pearl River. In the middle and late 1950s, Guangzhou built the Huangpu Port in the lower reaches of the Pearl River, and successively built a number of large and medium-sized enterprises along the Pearl River Channel. During this period, although the overall urban layout has not changed much, it already has several obvious tentacles extending outward. The development of the Xicun and Henan Industrial Zones, as well as the development of the Dongshan residential area, enabled Guangzhou to break through the old development pattern, and the city began to expand along the traffic lines outside the urban area. In the 1960s, many productive projects were built in Guangzhou. On the one hand, mountains and high-yield vegetable plots restrict the city from expanding further; on the other hand, deep-water ports move eastward, attracting large-scale industrial projects to jump out of urban areas and arrange them in the suburbs. The combined effect of these two aspects makes Guangzhou gradually form a scattered group Spatial structure. From the late 1960s to the 1970s, the construction of the new Guangzhou railway station led to the development of the northwestern fringe of the city, and the construction of Huangpu Port drove the development of the city along the east axis of the Guangzhou-Shenzhen Highway, and the development trend of the city along the Pearl River system became more obvious. In the 1980s, with the implementation and implementation of the reform and opening policy, Guangzhou's urban construction entered a new stage. During this period, three major urban clusters, including the first cluster with the old city as the center of the city, the second cluster with the Tianhe Sports Center as the center, and the third cluster in the Huangpu area, were connected to form a strip of urban structure. After 1990, Guangzhou's urban spatial morphology has changed significantly. With the continuous improvement of road traffic conditions, the city has developed rapidly, forming tentacles in multiple directions and expanding outward.

Urban space expansion and changes

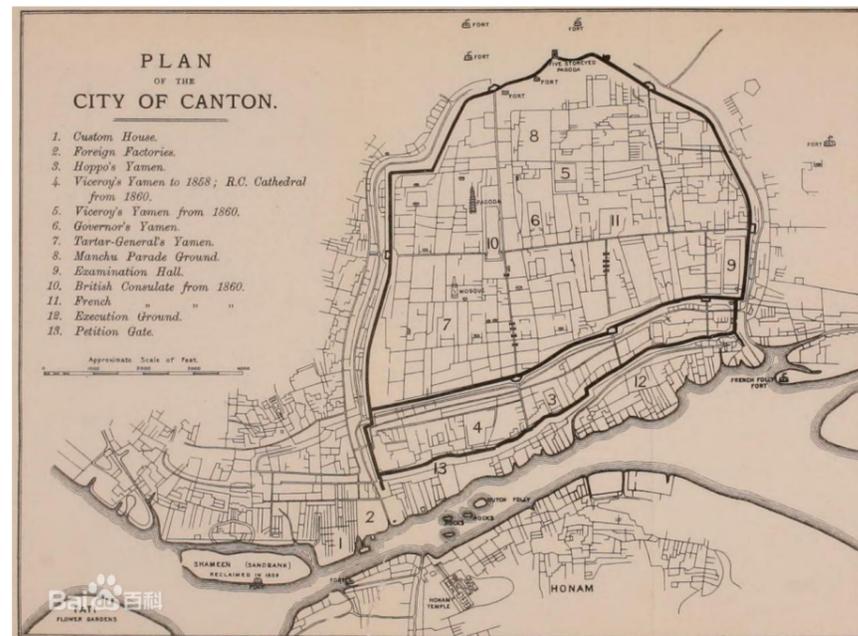
Before the reform and opening up, the driving force for the expansion and renewal of Guangzhou's urban spatial form was

very weak, and the overall urban form basically continued the form before the founding of the People's Republic of China. After the reform and opening up, Guangzhou, as the frontier of reform and opening up, has undergone major changes in the social and economic system, and the urban spatial morphology has changed significantly. Using remote sensing monitoring results, the built-up area of Guangzhou's downtown was 156.90 km² at the end of the 1970s. As of 2004, the built-up area has expanded significantly. The total area of the central built-up area has reached 542.76 km², which is 3.46 times the area of the built-up area in 1979, with a net increase of about 385.86 km² and an average annual expansion of 15.43 km².

The expansion of Guangzhou's built-up area basically takes the old city as the center and expands to the periphery, and the expansion speed varies significantly in different periods. The urban areas of Nanhai, Sanshui and Shunde, which are adjacent to Foshan in the west of Guangzhou, are already connected. Therefore, Guangzhou mainly expands to the east, northeast and southeast. In the 1970s, Guangzhou's built-up areas were dominated by old urban areas, with a total area of less than 160km². The built-up areas are mainly located in Yuexiu District, Haizhu District, Dongshan District and Liwan District. After the implementation of my country's reform and opening up, Guangzhou's socio-economic development has gradually accelerated, and the built-up area has continued to increase, but the overall expansion speed has lagged behind the socio-economic development.

During the period from 1979 to 1990, Haizhu District, Huangpu District and Tianhe District expanded, and the built-up area increased by 6.39km² each year, which was only about 1/2 of the average expansion rate in 25 years. Guangzhou's first high-speed expansion started in 1990 and ended in 1996. It lasted for 6 years. The built-up area increased by 236.19 km², with an average annual increase of 39.36 km². The 6-year expansion area accounted for approximately 25 years of the total expansion area. 61.21% of the total. During this period, Fangcun District, Huangpu District and Tianhe District developed rapidly. The newly added built-up areas are obviously affected by traffic, and most of them are distributed along the main traffic lines. In the

mid to late 1990s, the expansion of Guangzhou's built-up areas stabilized, with an average annual increase of 6.56 km² from 1996 to 1998, and a slight acceleration in the expansion speed from 1998 to 2000, with an average annual increase of 7.63 km². By the end of the 20th century, after Guangzhou's first high-speed expansion after reform and opening up, its area had increased by 326.46km² compared with 1979, which was 3.08 times the initial monitoring period. The entire Guangzhou built-up area develops along Huangpu Avenue and Guangyuan Expressway in the east, along the Guanghua Expressway and Huanshi Expressway in the north, and connects with Guicheng in the Nanhai District of Foshan City to the west. In this process, some previously independent urban construction land and Guangzhou built-up areas have been continuously integrated, which has accelerated the expansion of Guangzhou's built-up areas to a considerable extent.



In the first four years of the 21st century, Guangzhou's built-up areas once again entered a period of rapid expansion, with an area increase of 51.00 km², an average annual increase of 12.75 km², and the expansion speed was significantly lower than the

first period of rapid development. The newly added built-up areas are mainly located in the northeast of Huangpu District, the north of Baiyun District and the east of Panyu District. During this period, Panyu District was withdrawn from the city and set up as districts. The Guangdong Olympic Sports Center and Guangzhou Gymnasium in Huangcun, Dongpu Town, Tianhe District were completed one after another. Guangzhou University, located on Panyu Xiaoguwei Island and its south bank area in southeast Guangzhou, with a total area of about 18km² Construction began in 2003. The new Baiyun Airport in Huadu District was completed and opened; Guangfo Exit Radiation, Guangyuan West-Guanghua Radiation, Guangyuan East Road Extension, Huanan Road North Extension, Xiagang Avenue, New Airport Expressway North Extension Important roads such as the southern section and the Beijing-Zhuhai Expressway have been completed and opened to traffic during this period. Throughout the past 27 years, the entire development process of Guangzhou's central built-up area has gradually accelerated. It has experienced a period of slow development in the 1970s, a period of relative stability in the 1980s, a period of rapid development in the early 1990s, and a period of rapid development in the early 1990s. The period of stable development in the middle and late period and the period of rapid development in recent years are currently a period of rapid expansion, and new areas continue to appear around the original central built-up area.



2.3 Survey of the elderly population in Guangzhou

Although the aging rate of the registered population is still far lower than that of Shanghai and Beijing, Guangzhou has already experienced "regional aging".

This was revealed in the "2018 Guangzhou Ageing Career Development Report and Data Manual for the Elderly Population" (hereinafter referred to as the "Data Manual") jointly issued by the Municipal Committee on Aging, the Civil Affairs Bureau, and the Municipal Bureau of Statistics on 2019-10-14. The "Data Manual" shows that in the three old urban areas of Guangzhou: Yuexiu District, Haizhu District and Liwan District, the number of registered elderly population reached 299,300, 264,200 and 206,900, respectively, accounting for more than 20% of the local registered population. According to the aging rate, the population aging rate exceeds 20% and enters a moderate aging rate. This means that the above three districts of Guangzhou have entered a moderately aging society with registered population. However, due to the continuous influx of population, the age structure of the overall permanent population in Guangzhou is still not too large.

The "Data Manual" is divided into four parts, one is the city's elderly population data; the second is the elderly population data in each district; the third is the development of the city's aging career; the fourth is the appendix. The population data involves the number and changes of the city's elderly population in various age groups, the situation of purely old families, the number of elderly people living alone, the number of disabled elderly people, and the causes of death of the elderly. The development of the cause for the elderly involves the city's basic medical care, endowment insurance, minimum living allowance, work service institutions for the elderly, and cultural entertainment, education, and legal assistance for the elderly. While the "Data Manual" statistically reflects the data of 2018, it also compares with similar data from 2014 to 2018 in order to more accurately and comprehensively reflect the development trend of our city's aging population.

In 2018, the city's elderly population and aging services have the following characteristics:

First, the degree of aging is high, and the old urban area has entered a moderately aging society. As of the end of 2018, the number of registered elderly people in our city was 1,692,700, accounting for 18.25% of the registered population. There are 3 districts with an elderly population of more than 200,000, namely Yuexiu District, Haizhu District and Liwan District, with 299,300, 264,200 and 206,900 respectively, accounting for 17.68% of the city's elderly population of 60 years and over. %, 15.61% and 12.22%. According to the aging rate, the aging rate of the population exceeds 20%, entering moderate aging, and 3 districts in Guangzhou have entered moderate aging (Yuexiu District, Haizhu District, Liwan District). There are 5 districts with an elderly population of 100,000 to 200,000, namely Baiyun District, Panyu District, Zengcheng District, Tianhe District and Huadu District; the total number of elderly populations in Conghua District, Nansha District and Huangpu District is equal. There are more than 70,000 people, 84,400, 72,300 and 71,000 respectively.

Second, the problem of empty nesting is severe, and there is a big gap between the old and new urban areas. In 2018, the population of "purely old families" in Guangzhou was 209,300, a total increase of 17,800 over 2017. From the perspective of regional distribution, in 2018, the number of "purely old families" in Guangzhou exceeded 20,000 in Haizhu District, Baiyun District, Panyu District, Huadu District, Zengcheng District and Nansha District. The number of "purely old families" was 2.60 respectively. 10,000 people, 25,000 people, 24,300 people, 22,900 people, and 20,700 people. In 2018, there were 62,600 empty-nest elderly people in Guangzhou. Among them, Liwan District had the largest number of 11,000, accounting for 17.51% of the total number of empty-nest elderly in the city. The number of empty-nest elderly in Huadu District exceeded 8,000, ranking No. Two, accounting for 13.73% of the total number of empty nest elderly in the city. In 2018, there were 32,600 elderly people living alone in Guangzhou. The number of elderly people living alone in each district is Liwan District, Yuexiu District, and Huadu

District. The children of elderly people living alone are away from home and even separated from the elderly, unable to provide daily care and interaction. , Need more attention and support from the government and the community where it is located. In 2018, there were 14,900 lonely elderly people in Guangzhou. Among them, Yuexiu District has the most distribution, with 3171, accounting for 21.29% of the total number of lonely elderly people; Liwan District has the second largest number of lonely elderly people in each district, 2012, accounting for the total number of lonely elderly people. 13.50% of

Third, the situation of the elderly with disabilities is included in the statistics. In 2018, there were 72,900 disabled elderly people in Guangzhou. Among them, Zengcheng District had the largest number of disabled elderly people at 9,300; Conghua District and Yuexiu District ranked second and third respectively, with 8695 and 8193 disabled elderly populations. . Among the disabled elderly in Guangzhou, the number of elderly with physical disabilities is the largest, with 39,700, accounting for more than half of the city's disabled elderly population, accounting for 54.47%; the number of elderly with hearing disabilities also exceeds 10,000, accounting for 14,000, accounting for The elderly population with mental and visual disabilities both exceeded 6000, accounting for 10.07% and 9.36%, respectively; the elderly population with speech disabilities was the least, 514, accounting for 0.70%. From the perspective of the level of disabled elderly population, in 2018, the number of disabled elderly population in Guangzhou with severe disability (i.e. first and second) accounted for more than half, accounting for 58.78%; the number of people with mild disabilities (i.e. third and second level) Level 4) is 30066 people, accounting for 41.22%.

Fourth, pension and medical insurance have been increasing steadily year by year. In 2018, the number of people receiving basic pensions for urban enterprise employees in this city was 716,300. Compared with 2017, the number of people receiving basic pensions for urban enterprise employees in 2018 increased by 54,500. Looking at the overall situation from 2014 to 2018, the proportion of elderly people receiving basic pensions for urban enterprise employees in this city is on the rise. The number of people receiving pensions for urban and

rural residents in the city was 432,200. Compared with 2017, the number of people receiving pensions for urban and rural residents in 2018 increased by 9,057 people. There are 840,900 elderly people with household registration in the city participating in social medical insurance for employees. A total of 551,700 elderly people with household registration in the city participate in social medical insurance for urban and rural residents. In 2018, a total of 840,900 elderly people with household registration in Guangzhou participated in long-term care insurance. Guangzhou is the first pilot city for the national long-term care insurance system. Long-term care insurance promotes the establishment of a long-term care service management mechanism from the three aspects of service behavior, treatment qualifications, and agreed points, and explores the establishment of a social insurance system that provides service guarantees for the basic life care of long-term disabled persons and medical care closely related to basic life. In 2018, Guangzhou City issued old-age subsidies to 683,500 elderly people aged 70 and above.

Fifth, the construction of service facilities for the elderly has continued to advance, and the provision of the elderly has been further implemented. In 2018, Guangzhou had a total of 3909 home care service institutions in urban and rural communities, an increase of 116 compared with 2017, 3,852 beds in day care places, an increase of 150 beds over 2017, and 1,565 neighborhood committees with day care places. The coverage rate of rural day care places is 100.00%, and 1144 village committees have day care places. In 2018, there were 189 pension institutions in the city, including 59 public pension institutions and 130 private pension institutions. There are 65,403 beds in senior care institutions, 19,966 beds in public senior care institutions, and 45,437 beds in private senior care institutions. There are 40 old-age beds for every thousand elderly people.

Sixth, "canteens for the elderly" improve the level of community home care services. There are 1011 community home-based elderly care service meals and catering points in the city, and the coverage rate of community home-based care services catering assistance meals is 100%. A full-coverage service network of "10-15 minutes in the downtown area and 20-25 minutes in the outer urban area" has basically taken shape. The connotation of

multi-level services continues to expand, the service carrier with multiple supports continues to strengthen, and the multi-subject service structure is basically formed. Operation accounted for 91%, becoming the main force in providing catering services. According to public opinion surveys by third-party organizations, the awareness rate of catering services reached 95.4%, and the satisfaction rate of the elderly exceeded 90%. "The establishment of 'canteens for the elderly' in Guangzhou to improve the level of community care services for the elderly" was published and promoted by the Central Reform Office and included in the audit report on the implementation of major national policies and measures in Guangdong Province in the second quarter of 2018 by the National Audit Office. This is a positive model, which was included in the 10 reform cases of the provincial comprehensive deepening reform work conference, which was promoted by the provincial party committee and the provincial civil affairs department throughout the province.

Seventh, the integration of medical and nursing care is developing vigorously. Guangzhou has established a municipal joint meeting system for the integration of medical and elderly care and actively promotes the pilot program for the integration of medical and elderly care. The city's home elderly family doctors' contracted service population coverage rate is 65.74%, and the health management rate for the elderly over 65 years old is 42.11%; there are 55 geriatric departments in general hospitals above the second level, accounting for 40.4%; it has integrated medical care services. The coverage rate of functional elderly care institutions is over 85%. The city's 107 streets and towns have established medical and nursing service partnerships to provide medical and health services to 248 community home service agencies. Actively explore innovations in the integration of medical and elderly care, and explored and launched the "smart health and elderly care" medical and elderly integrated service model to provide continuous, nearby and convenient medical evaluation, diagnosis and treatment, and health consulting services for the elderly in the community.

Eighth, the healthy development of the spiritual and cultural life of the elderly. In 2018, there were 213 senior education institutions in the city, and 30,000 senior students participated

in various senior education schools. There are 2,593 senior activity rooms in the city, with an average daily number of 80,700 participants, and 1998 senior cultural and sports teams with 49,200 members. There are 1,687 elderly associations in the city, which play the role of self-management, self-education, self-service and self-supervision of the elderly. In order to play a leading and exemplary role, at present, the city has established 30 exemplary grass-roots elderly associations, which has better promoted the vigorous development of the city's grass-roots elderly associations.

·The number of elderly registered residents is 1.69 million

As of the end of 2018, the number of elderly registered residents in Guangzhou was 1,692,700, accounting for 18.25% of the registered population. There are 3 districts with an elderly population of more than 200,000, namely Yuexiu District, Haizhu District and Liwan District, with 299,300, 264,200 and 206,900 respectively, accounting for 17.68 of the city's elderly population of 60 years and over. %, 15.61% and 12.22%. According to the aging rate, the population aging rate exceeds 20% and enters moderate aging. According to this standard, the three districts of Yuexiu District, Haizhu District, and Liwan District in Guangzhou have entered moderate aging.

·62,600 empty-nest elderly

In 2018, there were 62,600 empty-nest elderly people in Guangzhou. Among them, Liwan District had the largest number of 11,000, accounting for 17.51% of the total number of empty-nest elderly in the city. The number of empty-nest elderly in Huadu District exceeded 8,000, ranking No. Two, accounting for 13.73% of the total number of empty nest elderly in the city.

In 2018, there were 32,600 elderly people living alone in Guangzhou. Liwan District, Yuexiu District and Huadu District had the largest number of elderly people living alone.

In 2018, there were 14,900 lonely elderly people in Guangzhou. Among them, Yuexiu District has the most distribution, with 3171, accounting for 21.29% of the total number of lonely elderly

people; Liwan District has the second largest number of lonely elderly people in each district, 2012, accounting for the total number of lonely elderly people. Of 13.50%.

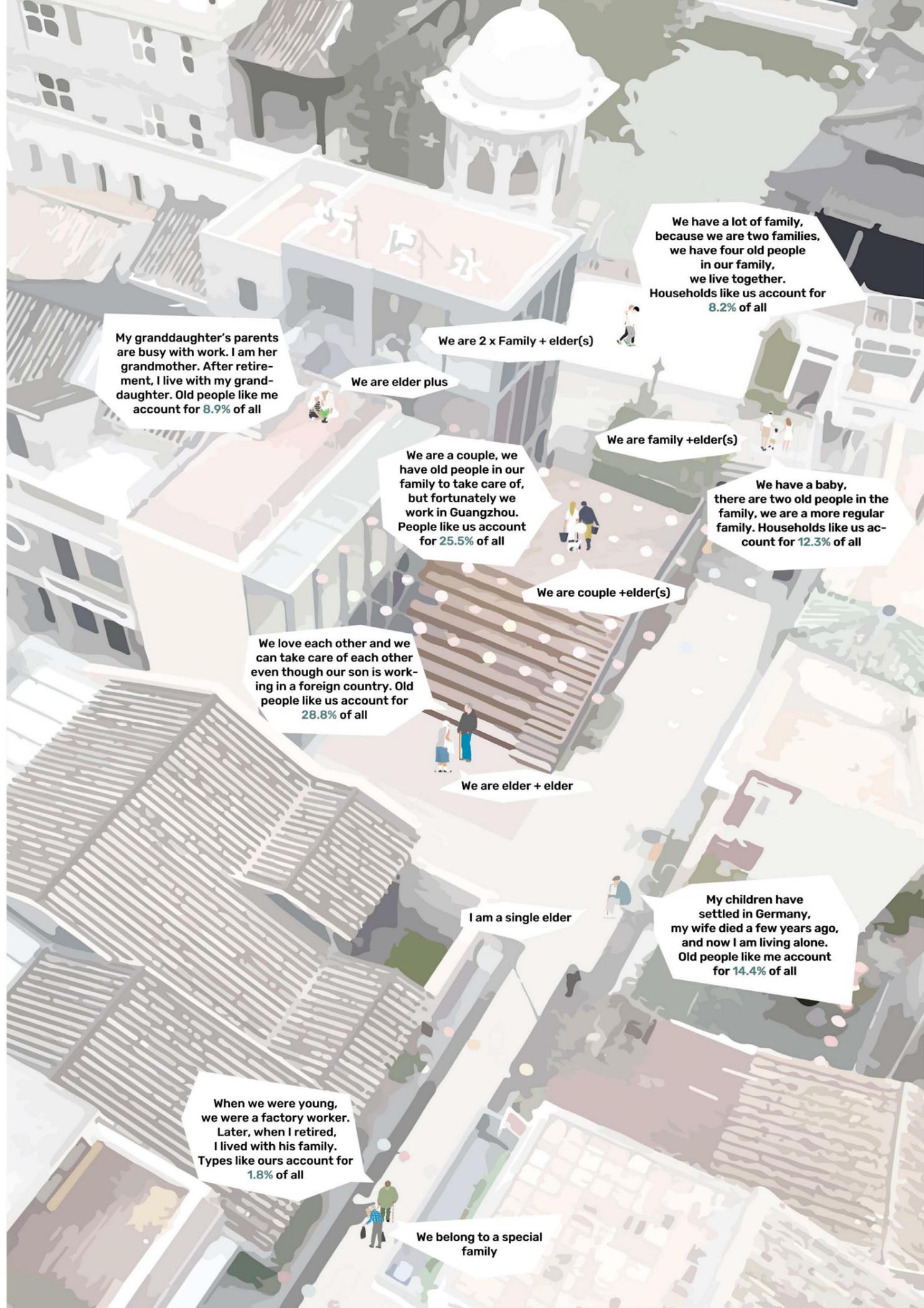
·There are 189 elderly care institutions in the city

In 2018, Guangzhou had a total of 3,909 home care service agencies in urban and rural communities, an increase of 116 compared with 2017, and 3,852 beds in day care places, an increase of 150 compared with 2017. There are 1,565 neighborhood committees with day care places, the coverage rate of rural day care places is 100.00%, and 1,144 village committees have day care places.

In 2018, there were 189 pension institutions in the city, including 59 public pension institutions and 130 private pension institutions. There are 65,403 beds in senior care institutions, 19,966 beds in public senior care institutions, and 45,437 beds in private senior care institutions. There are 40 old-age beds for every thousand elderly people.

Summary

It can be seen that the old urban area of Guangzhou has entered a moderately aging society, and the empty nest problem is serious. At the same time, the elderly care and medical security have been increasing steadily year by year, the construction of elderly care service facilities has continued to advance, and the coverage rate of the community's "canteens for the elderly" has reached 100%, the coverage rate of contracted services by family doctors for the elderly at home has reached 65%, and the spiritual and cultural life of the elderly is also developing healthily.



2.4 Survey on the family structure of the elderly

2.4.1 Changing family structure and traditional pension model

With changes in population institutions and disease spectrum, China is undergoing tremendous social changes. China is undergoing major changes in urbanization, family structure, and more and more women joining the labor market. These changes have challenged the traditional family-based pension model.

According to Chinese social traditions, the extended family is like a social security system that guarantees the basic life of all family members including orphans, the disabled, the elderly, widows, and the temporarily unemployed. In a large family, there are three generations or more of members (including all siblings and their family members) living together, sharing property and income. Under this patriarchal family structure, the son inherits his father's business and ensures the continuation of relevant knowledge and skills from generation to generation. This traditional family system attaches great importance to the social role of the elderly. However, educational progress, domestic population mobility and technological development are changing the traditional pattern. In today's Chinese society, older people do not often live with young people as they used to, and young people no longer follow their parents' orders. This will directly affect the elderly's access to social care and economic security, and even affect their quality of life and mental health.

China's family size and structure also reflect these changes. Between 1930 and 2010, China's family size and structure changed drastically. In 1974, the average family size was slightly less than 5 people, by 1990 it was about 4 people, in 2000 it was 3.4 people, and in 2010 it was 3.1 people. In 1930, about 48% of Chinese households had three generations. The proportion of households with two generations was similar, with less than 5% of households with only one generation. However, by 2010, the proportion of Chinese households with three generations fell to 18%, and the proportion of households with two generations

reached the highest between 1980 and 1990, and then began to gradually decline. Correspondingly, since 2000, the number of families with only one generation has gradually increased; by 2010, almost 80% of Chinese families have only one or two generations, and in 1930 this proportion was about 50%.



http://www.stats.gov.cn/tjsz/tjsj/tjcb/dysj/201608/t20160808_1385890.html

Push factors such as population pressure, and pull factors such as more money-making opportunities and more modern communication methods, have led to the migration of young people from rural areas to cities.

Young people migrating to cities may find themselves in financial difficulties and unable to provide financial support to their parents. Therefore, many elderly people who remain in rural areas must continue to work even if they have disabilities. They are lonely and isolated from society.

The changes in the social status of Chinese women and their continuous participation in the labor market have also adversely affected the care of elderly family members. In 2010, the employment rate of women aged 18 to 64 was 71%, of which the employment rate of women in this age group was 61% in urban areas and 82% in rural areas. Although many working couples believe that following parents can provide emotional support and help take care of young children, the high cost of living and health care expenditures make it difficult for adult children to live with their parents. Women's roles and personal expectations

have changed. They value privacy and personal space. They don't want to be fettered by the long-term responsibility of taking care of elderly parents. They have to take on work outside the home and pursue careers ambitiously. These all mean that young family members can use it. There is less and less time to care for the elderly. Therefore, it is no longer possible to rely on young family members (mainly children) for all the responsibilities of long-term care of the elderly.

The accelerated development of population aging, the burden of aging-related diseases, and the aforementioned changes in the elderly care model strongly suggest that policy interventions are urgently needed to deal with China's population aging. At this stage, although China has made a statement on its social welfare goals, the construction of a social security system for the elderly is still in its infancy, and a care system based on the principle of fairness in obtaining and using related services has not yet been established. The existing care system for the elderly is mainly driven by the market and weak supervision; this has exacerbated the inequality in health for the elderly in China. Moreover, the informal care services provided to elderly people with chronic diseases in China are very limited. There is no effective exploration on how to establish a nursing staff-led long-term care model in nursing institutions with multi-skilled support, and how to develop multidisciplinary comprehensive care services. Therefore, most elderly people with multiple diseases and unable to complete activities of daily living (ADLs) still need to rely on their children and spouses for care. The quality of care and quality of life of this population are the concerns of many published research papers.

The result of the above-mentioned status quo is that many Chinese people still need to work hard after they enter the old age. In 2010, 7.2% of elderly women and 22.9% of elderly men participated in paid labor. It is particularly common for the elderly in rural China to continue to work. Most people are still working between the ages of 60 and 69, and the labor participation rate only drops below 20% after the age of 80.

2.4.2 Analysis of the family structure of the elderly in Guangzhou

With the deepening of the reform and opening up policy, Guangdong's economy and society have undergone tremendous changes, and the size and structure of family households have also undergone major changes. The total number of family households continues to increase. Sixty percent, one-generation and two-generation households are the main family models, and the proportion of elderly households over 60 years old continues to increase. The resulting social issues such as housing, education, medical care, and elderly care must arouse social attention.

Compared with the sixth national census in 2010, the number of households and their proportions in various cities in Guangdong have increased or decreased. Generally speaking, most cities in the Pearl River Delta region have shown an upward trend, while other regions have basically shown a downward trend. From 2010 to 2015, the largest increase in the number of households in the province was Guangzhou, which increased by 734,700 households in five years, and the proportion of households in the province increased by 1.36 percentage points. In 2015, the average household of permanent residents in Guangzhou was 3.24 persons, an increase of 0.13 persons from 2010 (3.11 persons/household) and 0.14 persons higher than the national level (3.10 persons/household).

In 2015, among the Guangzhou households, the two-person households had the largest proportion, accounting for 20.95%, a decrease of 1.73 percentage points from 2010; the second was single-person households, accounting for 20.15%, a decrease of 1.66 percentage points; three-person households accounting for 19.70 %, a decrease of 0.2%. Compared with 2010, the total proportion of households with three or less households has dropped by 3.59%, but still exceeds 60% of the number of households, and the small family lifestyle is still dominant. The proportion of households with four persons or more increased to varying degrees, and the proportion of households with four

persons increased the most, reaching 1.33%.

With the continuous deepening of reform and opening up, Guangzhou's economy has developed by leaps and bounds, people's living conditions and living environment have been effectively improved, and the past phenomenon of several generations of people living together due to housing conditions has gradually changed. In 2015, two generations of households in Guangzhou accounted for the largest proportion of living together, accounting for 41.60%; the proportion of one-generation households ranked second, accounting for 38.43%. Compared with 2010, the gap between the proportions of first-generation and second-generation households has further widened, and the proportion of third-generation and above households has slightly increased. At present, households in Guangzhou are still dominated by one-generation and two-generation households, which together account for 80.06% of the households. Although there is a decrease from 2010, it still exceeds 80%. It can be seen that in the intergenerational relationship of Guangzhou households, one-generation households and two-generation households together become the main body of Guangzhou households.



Elderly family
Image source: Deseret News Church News

With the economic and social development, the quality of life of the people and the improvement of medical conditions, the

average life expectancy of Guangzhou's permanent population continues to rise, and the elderly population also expands. More and more families have elderly people aged 60 and above. In 2015, households with elderly people aged 60 and above accounted for 29.69% of households in Guangzhou in 2015, which was close to one-third of households, an increase of 4.31 percentage points from 2010. Among them, households with one, two, and three elders over 60 accounted for 17.38%, 11.97%, and 0.34%, respectively, an increase of 0.82, 3.39, and 0.1 percentage points from 2010. In 2015, the proportion of households living independently with the elderly aged 60 and above accounted for 6.28%, an increase of 0.54 percentage points from 2010; only the living conditions of the elderly and minors improved, from 0.82% in 2010 to 0.75% ; And the proportion of households living with the elderly and adult family members rose from 18.59% in 2010 to 22.33%, an increase of 20.12% in five years.

Issues worthy of attention

·Under the current pressure of high housing prices, the increase in the number of urban households has put increasing pressure on housing. With the continuous growth of the urban population and the number of households, the rigid demand for housing and the demand for improvement have further increased. The current rapid rise in housing prices in most cities has made the urban population more and more pressure on housing.

·A large number of foreign households pose great challenges to the public resources flowing into the Pearl River Delta. Since the reform and opening up, Guangdong's economy has undergone earth-shaking changes. A large number of migrant workers from both inside and outside the province have gathered in economically developed areas, and more and more migrants are setting up businesses or moving in with families in the influx areas, resulting in an increasing number of migrant families. Large-scale migrant families play an active role in promoting economic development and social construction in various parts of Guangdong, but also pose challenges to the limited public resources in the inflow areas. A series of issues such as family

pension, medical treatment, and children's schooling of migrant families will increasingly prominent. Therefore, there is a long way to go to solve social issues such as compulsory education, employment, old-age care, and medical care of the migrant population in accordance with the law.

·The size of the elderly living alone is relatively large, and their physical, mental, health and elderly care issues should arouse social attention. Since the founding of New China, the average life expectancy of the permanent population in Guangdong has continued to rise, the proportion of the elderly has continued to increase, and the population aging has increased. Based on the results of the 1% national population survey in 2015, Guangdong's permanent population over 60 years old reached 13,259,700, accounting for 12.22% of the total population. There were 9,580,800 households with elderly people aged 60 and over, of which 2,083,600 were living alone. Household. The huge group of elderly people has increased the pressure on the support of society and families, especially the large number of elderly people living alone, lack of care in daily life, relatively empty spirit, lack of comfort, their physical and mental health and elderly care issues should arouse social attention.



2.5 Research on the location and time of activities for the elderly in Guangzhou

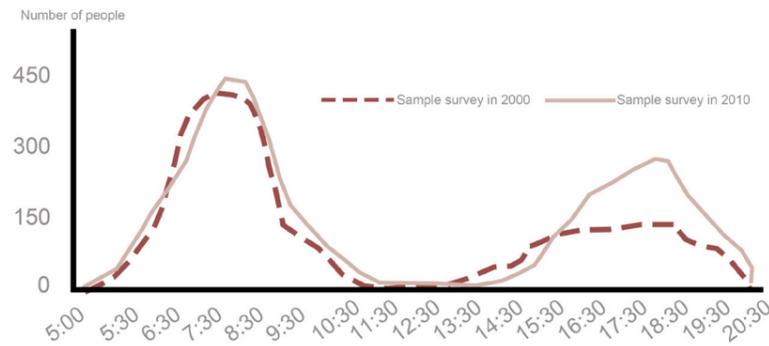
2.5.1 Leisure time characteristics

Intensity of leisure time

In terms of the time intensity of outdoor leisure activities for the elderly, in 2000 the elderly went to the park on average 12.8 times a month, and the average daily park leisure time was 0.64 hours. In 2010, it increased to 18.24 visits to the park every month, with an average daily activity time of 2.56 hours. The average outdoor activity time increased by nearly two hours compared with 2000. The increase in outdoor leisure time means that the leisure time at home for the elderly has decreased compared with a decade ago. The main reason is that the service facilities and public leisure facilities in Guangzhou Park have improved in the past ten years, especially the increase in public restrooms and barrier-free facilities, which greatly improves the convenience of the elderly in the park and meets the leisure needs of the elderly.

Distribution of leisure time

In terms of the time distribution of outdoor leisure activities for the elderly, the number of respondents who carried out outdoor activities every morning in 2000 was significantly higher than that in the afternoon and evening, and there was only a clear peak in the time spectrum. A survey in 2010 found that the time nodes of park leisure activities for the elderly showed two peaks, generally concentrated in the two time periods of 7:00-9:00 and 18:30-20:30. Morning and evening exercises have become the main content of outdoor activities for the elderly. The biggest feature of leisure activities for the elderly is regularity. Their outdoor activity time intensity varies in different seasons. The leisure time in summer will be slightly longer than that in winter or other seasons, but the frequency of activities is not much different.



Outdoor leisure table for the elderly in Guangzhou

Gender differences in leisure time

Regarding the gender difference in outdoor leisure activities for the elderly, the average park leisure time of elderly men in 2000 was 1.07 hours longer than that of elderly women; in 2010, the average daily park leisure time of elderly men was 2.77 hours and that of women was 2.49 hours. The difference is only 0.28 hours, which is 0.79 hours shorter than ten years ago. The difference in leisure time between women and men is also not obvious, indicating that the difference in leisure time between elderly men and elderly women in Guangzhou is gradually shrinking in the past decade. The traditional role distribution of Chinese families is that "men take charge of the outside and women take charge of the inside." Housework and purchasing daily necessities take up most of the leisure time of women. This is the main reason why women have less leisure time than men.

2.6.2 Preference for leisure activities

According to the different content and functions, the leisure activities of the elderly can be divided into seven categories: puzzle, pleasure, sports, learning, social interaction, public welfare activities and daily labor. In 2000, the elderly participated in the most educational leisure activities. Their main leisure methods were reading books and newspapers, watching TV and playing mahjong. Watching TV during weekends and evenings was the first leisure activity for the elderly and ranked second. It's

sports leisure. In 2010, sports and recreational projects became the primary leisure activity for the urban elderly. Regardless of the degree of preference or the actual degree of participation, the recreational sports ranked first, and the educational leisure ranked second. Activities, such as watching TV, listening to the radio, reading newspapers, etc., indicate that the health concept and awareness of health care of the elderly have increased in recent years. Walking, dancing, singing, aerobics and other activities suitable for park leisure have been favored by many elderly people. Love and acceptance, physical fitness has become the main motivation for the elderly to participate in leisure activities. It is worth noting that daily leisure activities (such as "doing housework and bringing children") rank 9th in the preference of the elderly, but in actual life the participation time of the elderly ranks 4th, indicating that housework still occupies most of the leisure time of the elderly in Guangzhou.

Type of activity	Preference	Sort	Participation	Sort
Fitness activities	19.55	1	18.55	1
Watch TV and listen to the radio	17.76	2	15.65	2
Read books, read newspapers	15.10	3	12.76	3
friends gathering	8.75	4	9.12	5
tourism	8.24	5	6.16	6
Chess	7.91	6	4.52	8
Keep pets and flowers	5.87	7	3.90	9
Shopping malls, supermarkets	3.83	8	4.92	7
Do housework	3.57	9	10.72	4
Calligraphy, painting	2.26	10	1.64	11
Go online	2.26	11	3.28	10
Play collection	1.39	12	0.11	14
other	0.40	13	0.95	12
Charitable activities	0.29	14	0.51	13

2.6.3 Leisure location characteristics

Leisure Park Selection

In the past ten years, the elderly in Guangzhou's choice of parks and green spaces has not changed much. The interviewed elderly people generally say that they prefer to go to parks for leisure activities between community green spaces and open parks. When choosing leisure places, they have "convenient

transportation" and "Beautiful environment" is the primary consideration for the elderly. Secondly, "free admission to the park" and "more elderly friends" are also important reasons for attracting the elderly to go to the park for leisure, while "leisure projects" and "leisure facilities" are important for the elderly to relax. The choice of the park has less influence. It can be seen that transportation, environment, consumption level and social interaction are the main factors that affect the choice of elderly parks. Leisure parks are not only a place for the elderly to keep fit, but also provide a space for social interaction to meet the psychological needs of the elderly.



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Transportation

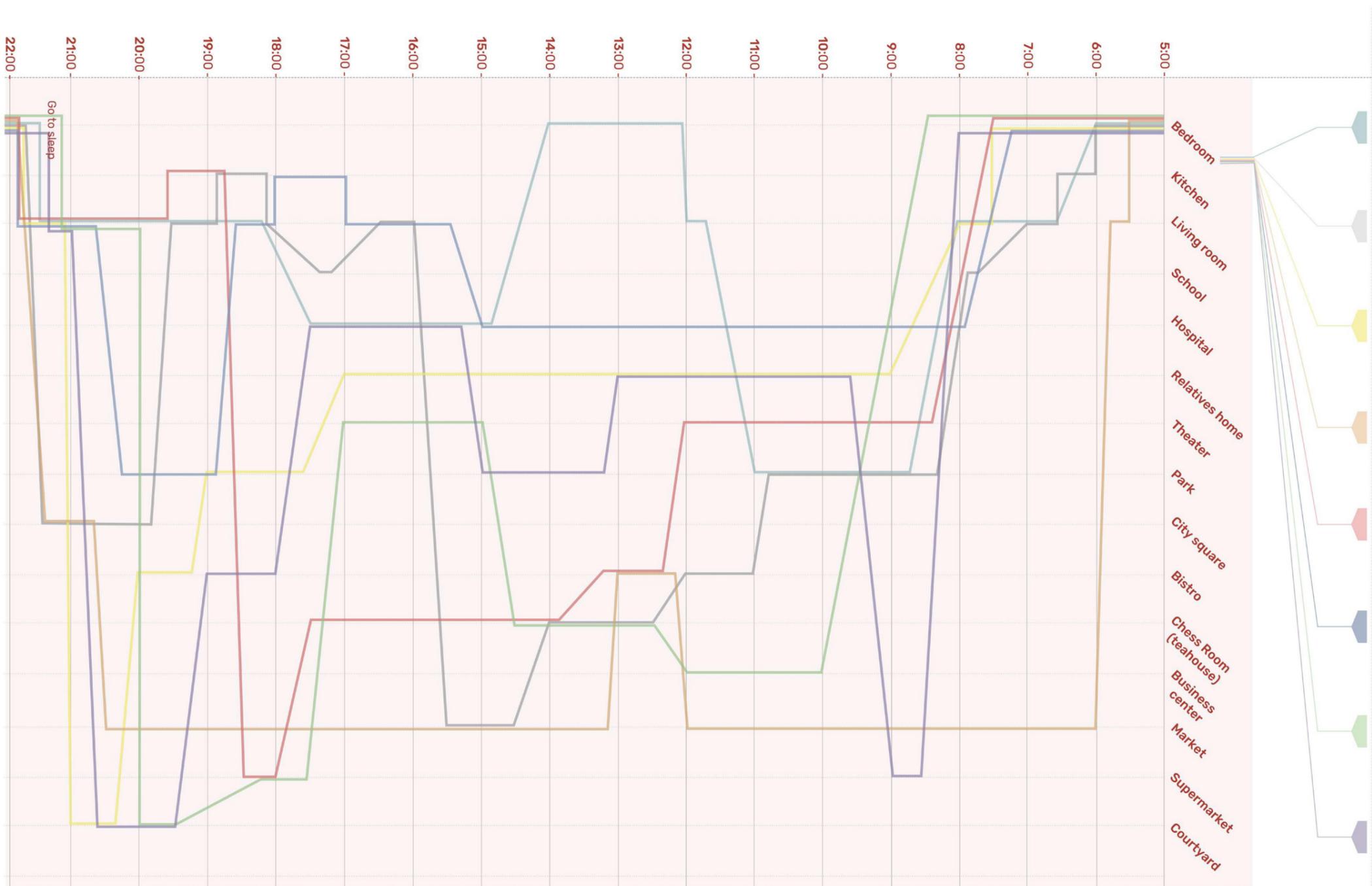
Elderly people often use walking in parks and green spaces, accounting for 65.7% in 2000 and 62.6% in 2010. There has been little change in the past ten years. This is because the elderly generally choose parks close to home. The most prominent change is the application of public transportation. In 2000, only 17% of the elderly chose public transportation to go to parks for leisure, and this increased to 31.5% in 2010. The elderly usually choose public transportation or subway to travel to a well-known or far away from home. Park. Self-driving leisure transportation is gradually emerging among the elderly.

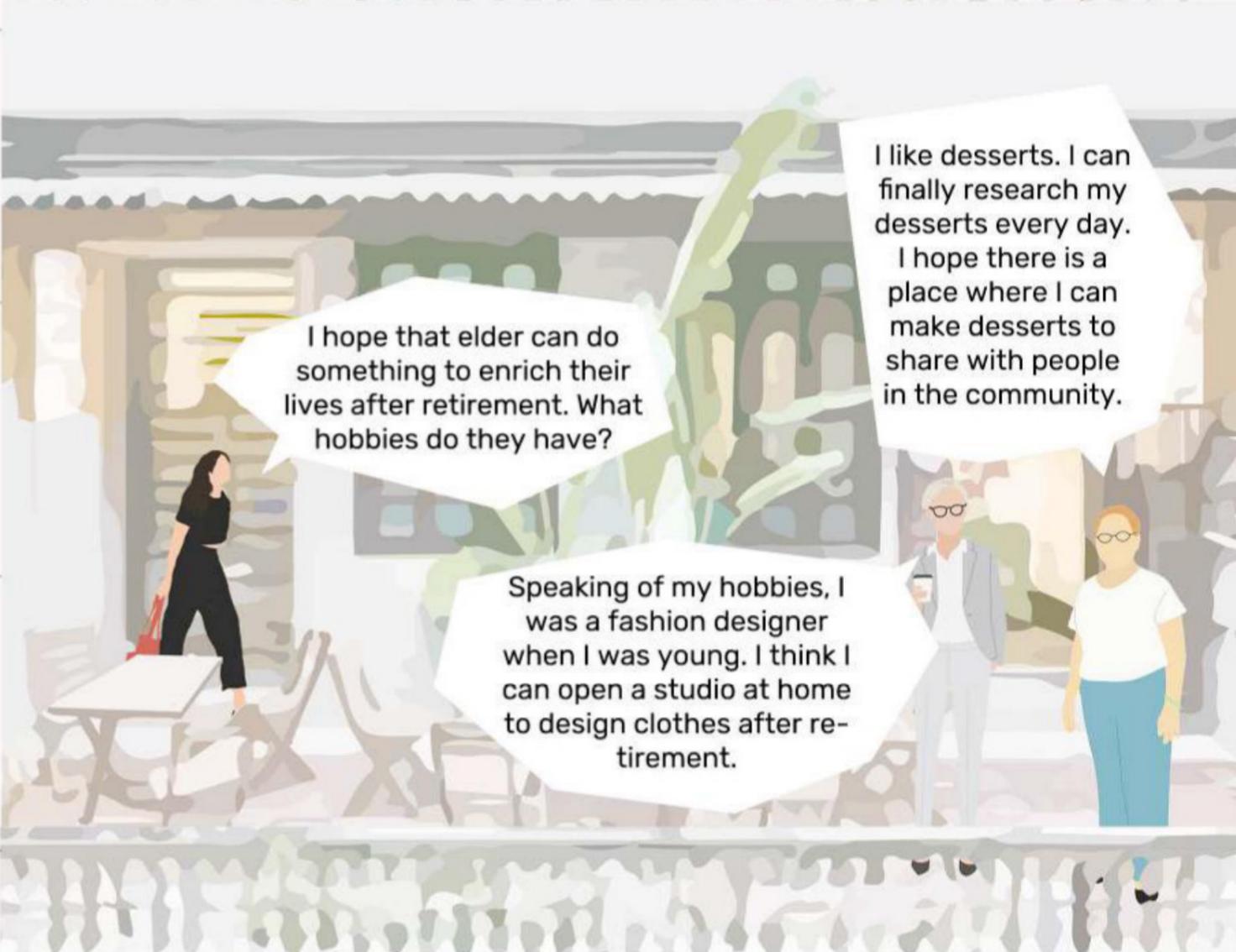
For example, Zhujiang New Town (located in the civil activity area in the center of Guangzhou, covering an area of 6.44 square kilometers, has developed into an important commercial activity center in South China, Guangzhou Tower, Guangzhou Many landmark buildings in Guangzhou, such as Chow Tai Fook Financial Center and Guangzhou International Finance Center, are located here. 32% of the elderly in the sample survey often drive to the park with their children on weekends.

2.6.4 Investigation and analysis of the itinerary of 8 elderly people of different types in Guangzhou

According to the analysis, many elderly people spend a lot of time on the way to the destination. As Guangzhou has developed into a super huge city, it sometimes takes an hour to reach the destination. This has caused great inconvenience to the elderly. Therefore, new buildings for the elderly should be equipped with facilities and functions necessary for the lives of the elderly. From the survey, it can also be learned that although many elderly people live by themselves, they still need the company of their relatives, and they spend a lot of time to visit their children or relatives' homes. If conditions permit, elderly communities should design areas where relatives live.

	Typical elderly
	Alzheimer's disease I have Alzheimer's since I was 65 years old, and it is getting worse now. I have to take care. My children take care of me in the living room. Some- times I need to go to the hospital for regular check-ups.
	Live with children My children are very busy at work, my wife and I take care of our grandchildren. We usually lead him to school. During the day we go for a walk in the park, play chess with friends, then do chores at home and wait for the children to leave school. Play with him after school and have dinner with the whole family in the evening.
	lots of children and grandchildren My children work and settle around. The grandsons also take care of themselves. Usually they visit me occasionally, and ev- eryone will gather to- gether on weekends. I occasionally go to their home for the whole day, watching TV and chatting.
	Market seller I came here with my migrant children. Without a suitable job, I opened a grocery store. Keeping the shop during the day, often chatting with neighbors in the eve- ning will go to the square to work, out and dance with my friends. At weekends the family will gather together.
	Member of Cantonese Opera I retired from the com- pany. I really like Can- tonese opera, and now I finally have time to enjoy and study it. I also know a lot of friends who have the same hobbies. Every day we do activities with them. In the af- ternoon I will go to the teahouse to play Mah- jong with them. My children will come to see me at the week- end.
	Office worker I'm a doctor and the hospital retired me to continue working. My husband is a college teacher. After work, we will buy ingredients together, go home to cook, and then visit the park at night.
	Retired civil servant I have retired from the government depart- ment and now live outside the city with my wife. I'm too busy at work. I often drink tea and play mahjong with my friends and do some leisure activities. I usually grow vegeta- bles in my yard. I also visit relatives occa- sionally.
	Live with each other I am in good health, but my spouse has in- convenient legs and needs facilities to help me walk. Every day I need to take care of her life. In the after- noon I will take him to the park, and to the mall together. Children will often visit us.





2.6 Analysis of the needs of the elderly in Guangzhou

2.6.1 How the elderly arrange their life after retirement

What should the elderly do after retirement? What should old people do after retirement? Many elderly people relax after retirement and do not know what to do, but feel uncomfortable even more. There are also some elderly people who choose to travel after retirement, but some elderly people still choose to find part-time jobs to continue working after retirement. So what should the elderly do best after retirement? How do the elderly arrange their life after retirement?

In addition to social security payments, what methods do people use to supplement their pensions? For many Chinese people, the answer is simple: to save more from work income. Almost half of non-urban respondents believe that work income is the main source of funds after retirement. This implies that they plan to continue working to an older age and/or to accumulate more from their current work income. Even if they are not sure about the age of their savings, retirees recommend that incumbents save more money for retirement.

2.6.2 Survey on the characteristics of the needs of the elderly in Guangzhou

Due to the particularity of Guangzhou's geographical location, Guangzhou people have their own unique language and culture. The elderly in Guangzhou have different customs and habits compared to the elderly in northern China. Therefore, the design of buildings for the elderly cannot be separated from the investigation of the living habits of the elderly in Guangzhou. This survey research is based on 7 aspects of elderly care, health and medical needs, economic needs, livable environment, social participation needs, spiritual needs and information needs.

Life care needs

Living care is the most basic need of the elderly. When asked

"what is the most desired service or help", in addition to 44.3% of the elderly who choose "none need", 24.9% of the elderly choose "elderly table or meal delivery", 10.1% of the elderly choose "Doing housework at home", 8.5% of the elderly chose "daycare or nursing home", 3.4% and 3.1% of the elderly chose "psychological consultation" and "elderly service hotline" respectively. This shows that daily care is still the most urgent need of the elderly.

The situation of the help or service that the elderly most want		
Service type	Frequency	proportion
None of the above	246	44.3%
Home visit	8	1.4%
Service Hotline	17	3.1%
Accompanying a doctor	15	2.7%
Help daily shopping	5	0.9%
Legal aid	4	0.7%
Do housework	56	10.1%
Elderly dining table or meal delivery	138	24.9%
Nursing home	47	8.5%
Psychological counseling	19	3.4%
total	555	100.0%

The physical condition of the elderly directly affects the strength of their life care needs. The survey results show that when the physical condition is "relatively unhealthy", the proportion of people who need help in daily life and housework is 22.7% and 45.4% respectively; when the physical condition is "very unhealthy", in daily life and housework The proportion of people needing help from others has risen to 50.0%. As the physical health of the elderly deteriorates, their needs in life care will greatly increase.

Health and medical needs

The high health and medical needs of the elderly are determined by their physiological characteristics such as decreased physical function and high incidence of chronic diseases. Among the interviewees, more than 30.0% said that they need community medical institutions to provide "home care", "home visits" and "health file establishment" services, and "free physical examination" has the highest demand, exceeding 50.0%; and Paradoxically, the proportion of elderly people who have used these services (except for "free medical examination") does not exceed 5.0%, and the use rate of the most demanding "free medical examination" is only 10.5%. On the one hand, there is a huge demand for health and medical treatment, on the other hand, there is a very low service utilization rate, and there is a huge gap between demand and service.

Do you need community medical institutions to provide the following services			
Service type	Yes or No		
	Yes	No	No idea
Home care	30.1	56.6	13.3
Home visit	33.2	54.4	12.4
Rehabilitation	24.7	58.2	17.1
Rental of rehabilitation aids	27.4	56.9	15.7
Free medical examination	50.3	40.5	9.2
Create health files	34.2	52.6	13.2
Health Class	25.6	55.7	18.7

Economic needs

In a modern society based on the basic principle of distribution according to work, the economic risks faced by the elderly increase sharply as they withdraw from the labor market, and economic security is the basis for satisfying other needs.

Therefore, meeting the economic security needs of the elderly is essential Important. Through analysis, it is found that among the elderly interviewed, 27.9% have a total income of less than 13,200 yuan in the past 12 months, the proportion of 30,000 to 50,000 yuan is the highest, 48.3%, and the proportion of 50,000 yuan and above is 16.4%. It can be seen that nearly 28.0% of the elderly have a low annual income, and their economic security needs urgently need to be met.

From the perspective of source of income, 88.3% of the elderly's primary source of income is their retirement pension/annuity, followed by spouse income and children's assistance, accounting for 61.1% and 19.8% respectively. It can be seen that under the current pension model with family pension as the mainstay, the economic security of the elderly mostly depends on the income of themselves and their spouses.

Livable environment requirements

With the change of family concepts, the family structure tends to be simplified, and it has gradually become mainstream for the elderly to live alone with their children. In the absence of child caregivers, the creation of a livable environment for the elderly is particularly important.

Among all interviewees, up to 93.2% of the elderly live in buildings, but more than 80.0% of buildings do not have elevators installed. In terms of living facilities in residential houses, the ownership rate of infrastructure such as bathrooms, indoor toilets and flush toilets is relatively high, all exceeding 94.0%; network signal coverage is poor, and only 73.0% of elderly people say they have the Internet. Compared with housing facilities, the ownership rate of community activity facilities is generally low. The data shows that the rate of possession of activity rooms for the elderly is the highest, reaching 65.0%; followed by outdoor venues, with a rate of 59.1%; the rate of library ownership is only 33.5%; the rate of possession of chess and card rooms and gymnasiums is lower, only 20.0% and 20.0% respectively. 5.0%.

Status of family and community activities/life facilities			
area	facility	Yes%	No%
Residential house	elevator	19.3	80.7
	bathroom	94.6	5.4
	Public toilet	94.2	5.8
	Flush toilet	94.6	5.4
	The internet	73.0	27.0
community	Seniors Activity Room	65.0	35.0
	Gym	5.0	95.0
	Chess Room	20.0	80.0
	library	33.5	66.5
	Outdoor venue	59.1	40.9

Social participation needs

After the elderly withdrew from the labor market, their original group network and professional identity gradually disappeared. The participation of the elderly in social activities has become an important way for them to obtain a sense of satisfaction, belonging and identity. The analysis results show that the social activity with the highest participation rate of the elderly in the past three months is the "community security patrol" with a ratio of 18.2%, while other community activities are generally "cold" and the elderly participation rate is less than 1.5%; However, the proportion of elderly people who have not participated in social activities in the past three months is 21.1%, while the proportion of elderly people who have "never participated" is close to 60.0%. The reason is that more than half of the people choose to participate in the society and cannot be recognized. Secondly, too far away and not interested in volunteer activities are the main reasons for the low rate of social participation of the elderly.

Mental comfort needs

With the basic material needs being met, the elderly's spiritual comfort needs are increasingly being valued. The survey found that in terms of family support, close to 50.0% of the elderly can only meet or contact with no more than 2 relatives each month; more than 60.0% of the elderly can only talk about private matters with no more than 2 relatives. ; And only 44.5% of the elderly have 3 or more family relatives to provide assistance when needed. In terms of peer support, more than 10.0% of the elderly said that they had no friends to meet or contact, talk about personal matters with confidence and provide help when needed; 63.2% of the elderly could only meet or meet with no more than 2 friends a month. Contact; 78.0% of the elderly can only talk about personal matters with no more than 2 friends; only 28.2% of the elderly have 3 or more friends to help when they need it. The role of peer support network in the spiritual comfort of the elderly needs to be strengthened.

Social situation of the elderly		
Social situation of the elderly	NO	1-2 people
How many family members can you meet or contact at least a month?	2.0	5.9
How many relatives can you talk to me at ease?	5.2	24.0
How many family members can help when you need it?	4.7	15.1
How many friends can you meet or contact at least a month?	10.3	14.1
How many friends can you talk to?	10.5	19.6
How many friends can help when you need it?	10.3	20.2

Information needs

In the era of rapid development of information technology, everyone needs to obtain information to survive and develop, and access to information resources is also crucial to the quality of life of the elderly. The survey shows that information media such as newspapers, magazines, and radio are marginalized in the lives of the elderly. For more than 80.0% of the elderly, television is still the main source of information, followed by the

Internet (including mobile Internet access), with a ratio of 15.0 %, data analysis shows that more than 55.0% of the elderly use smartphones.

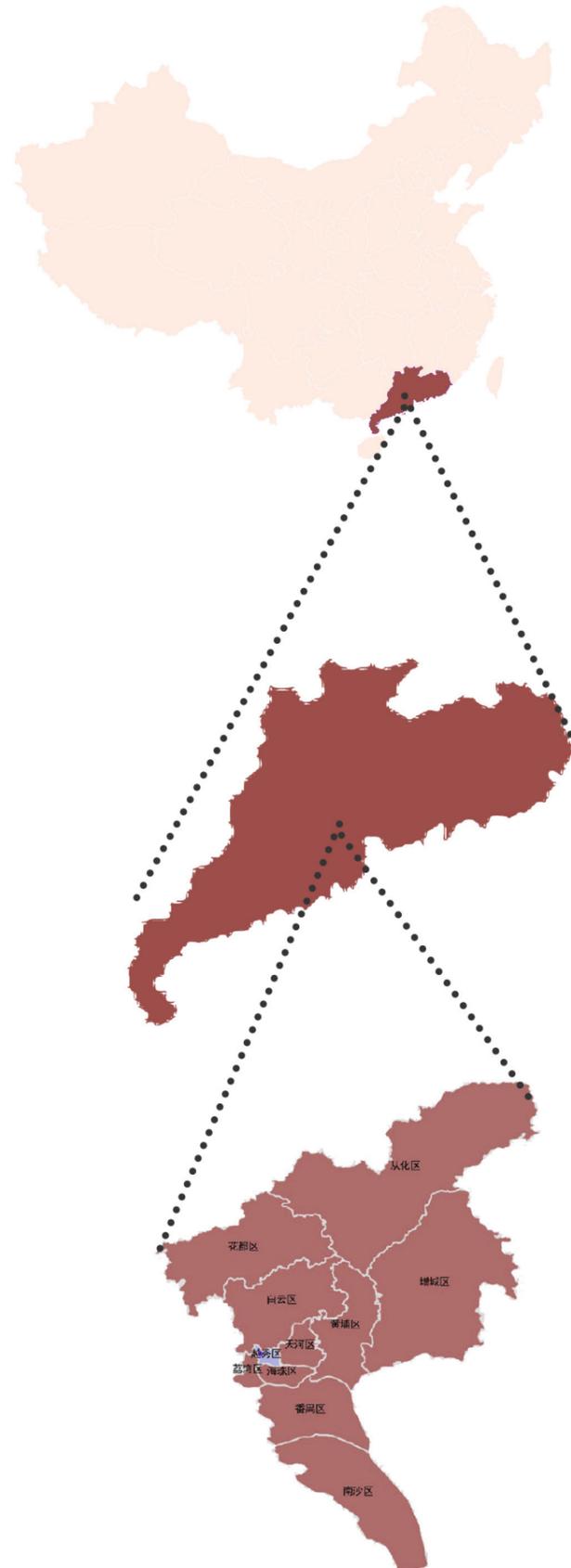
The use of media by the elderly and their main sources of information			
media type	Never	Rarely	Sometimes
newspaper	35.5%	26.7%	27.0%
magazine	71.2%	20.5%	6.7%
broadcast	46.7%	23.6%	27.2%
TV	0.2%	0.7%	15.0%
the Internet	43.8%	13.3%	24.5%
SMS News	65.2%	23.1%	11.2%

3 Preliminary site analysis

3.1 Plot location analysis

3.2 Site analysis

3.3 Climate analysis



3.1 Plot location

The central and southern part of Guangdong Province and the central and northern margins of the Pearl River Delta are the confluence of the Xijiang, Beijiang and Dongjiang rivers, bordering the South China Sea, with Boluo and Longmen counties in the east, Sanshui, Nanhai and Shunde in the west, and Qingyuan City and the Buddha in the north. Gang County and Xinfeng County, adjacent to Dongguan City and Zhongshan City in the south, and facing Hong Kong and Macau across the sea, are one of the starting points of the Maritime Silk Road. , The core city of the Pearl River Delta Metropolis. It covers an area of 7434 square kilometers and has a population of 14.0435 million in 2016.

Yuexiu District, a district under the jurisdiction of Guangzhou City, is located in the central part of Guangdong Province. It starts from Guangzhou Avenue in the east and borders Tianhe District; borders the Pearl River in the south and faces Haizhu District across the river. Baiyun District is adjacent. Yuexiu District has 18 subdistricts under its jurisdiction, with a total registered population of 1,158,400 (sixth census), and a population density of 34,735 people per square kilometer. In 2005, Yuexiu District became the central city with the smallest area and the highest population density in Guangzhou. Yuexiu District is the oldest central city in Guangzhou. Since the Qin Dynasty established Nanhai County in Yuexiu District, Zhao Tuo, the King of Nanyue in the Western Han Dynasty, built the Nanyue Palace Office and Liu Gong of the Southern Han Dynasty built Guangying Palace. Since the establishment of Guangzhou in the Soochow, the military and administrative centers established in all dynasties were in the Yuexiu area



SECTION



PARK

HOSPITAL

COMMERCE

HOSPITAL

UNIVERSITY

TRAIN STATION

600m

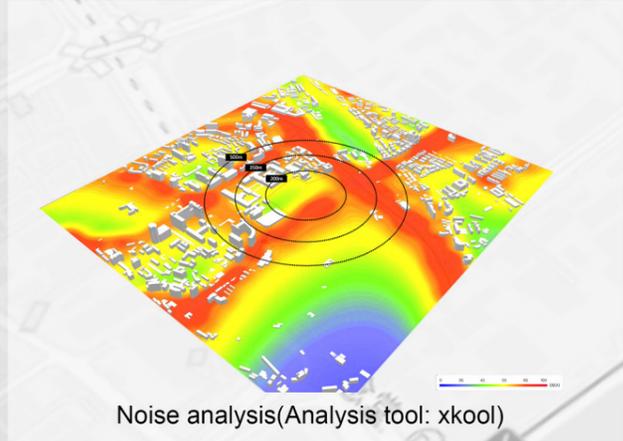
350m

200m

UNIVERSITY

PARK

PARK



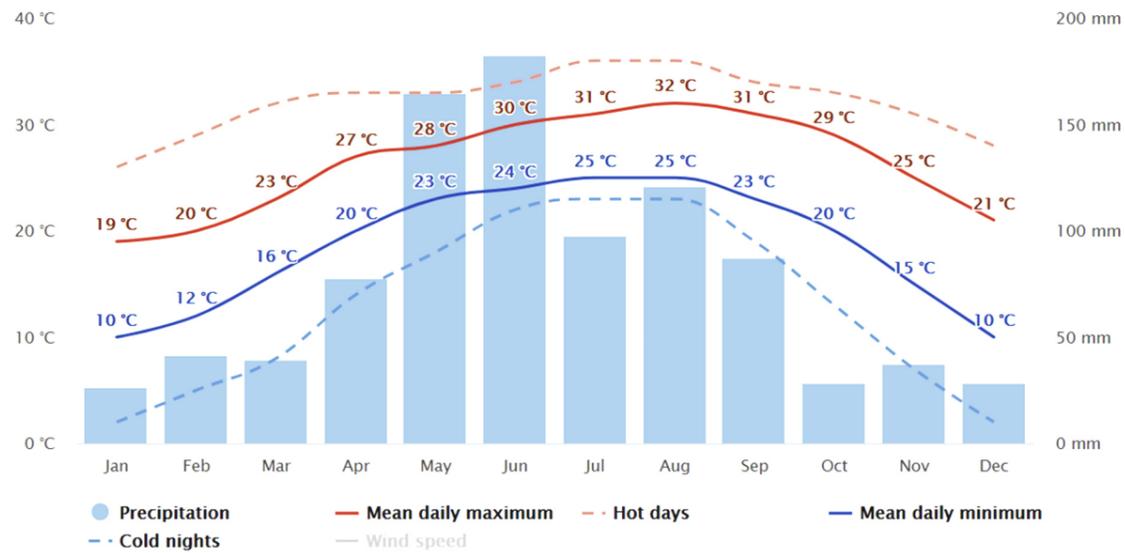
Noise analysis(Analysis tool: xkool)



- 60 mins
- 30 mins
- 20 mins
- 15 mins
- 10 mins

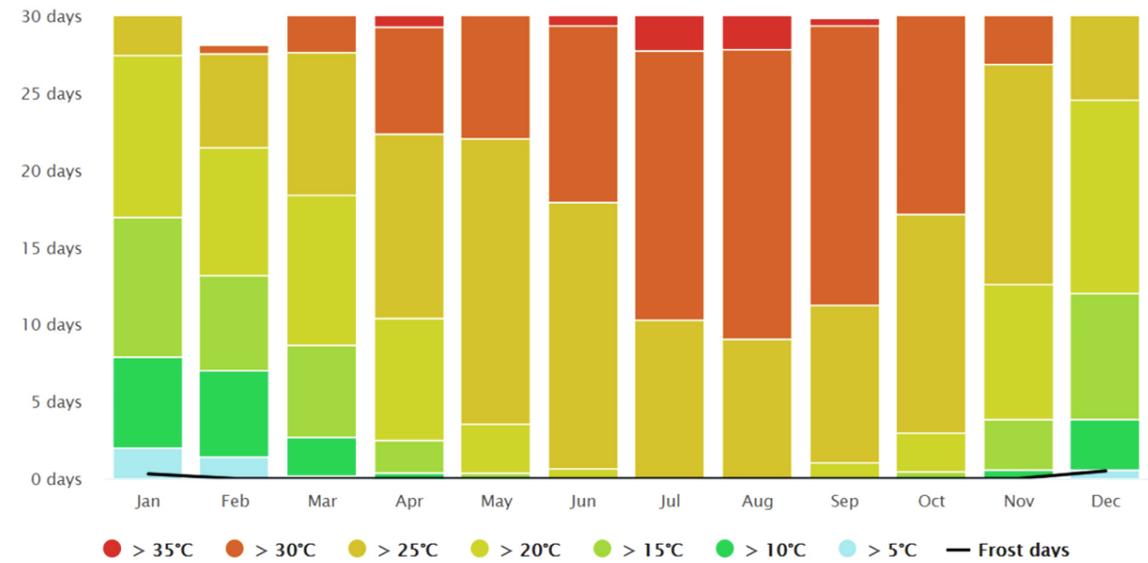
3.3 Climate analysis

Average temperatures and precipitation



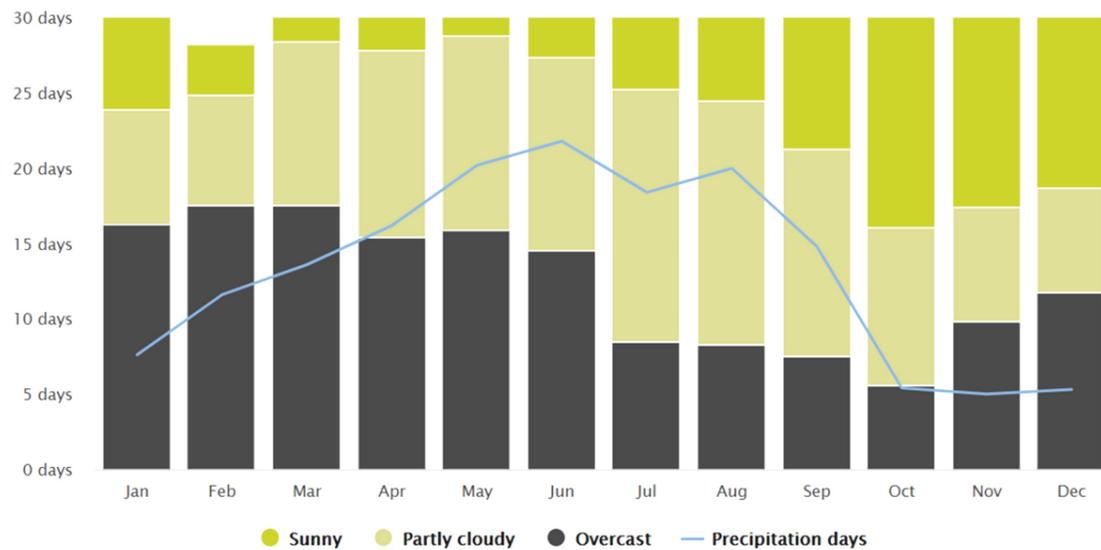
The "mean daily maximum" (solid red line) shows the maximum temperature of an average day for every month for Guangzhou. Likewise, "mean daily minimum" (solid blue line) shows the average minimum temperature. Hot days and cold nights (dashed red and blue lines) show the average of the hottest day and coldest night of each month of the last 30 years. For vacation planning, you can expect the mean temperatures, and be prepared for hotter and colder days. Wind speeds are not displayed per default, but can be enabled at the bottom of the graph.

Maximum temperatures



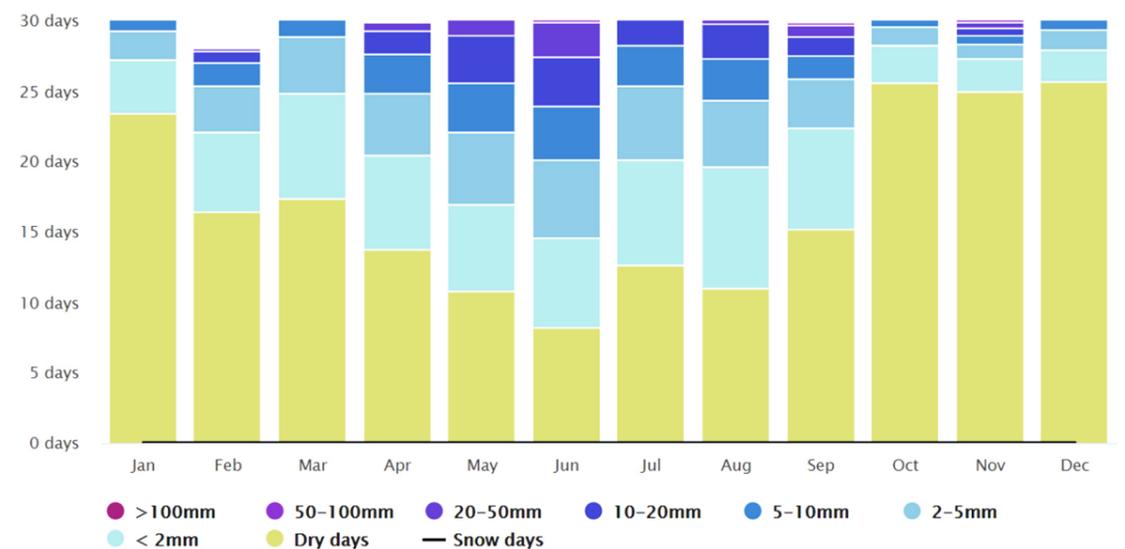
The maximum temperature diagram for Guangzhou displays how many days per month reach certain temperatures.

Cloudy, sunny, and precipitation days



The graph shows the monthly number of sunny, partly cloudy, overcast and precipitation days. Days with less than 20% cloud cover are considered as sunny, with 20-80% cloud cover as partly cloudy and with more than 80% as overcast.

Precipitation amounts



The precipitation diagram for Guangzhou shows on how many days per month, certain precipitation amounts are reached. In tropical and monsoon climates, the amounts may be underestimated.

Chapter Two: Design Proposal

1. Concept proposed
2. Architectural design
3. Smart system analysis
4. Site planning and overall layout

1 Concept

1.1 A new model of residential area for the elderly that combines communityization and intelligence

1.2 Co-living & Co-working

1.3 Shanshui City



1.1 A new type of old-age care model combining community and smart old-age care

1.1.1 How far are we from the "smart city"?

For a city, disasters bring not only suffering and pain, but also warnings and reflections. I can't help but sigh whenever I recall the disasters that humans have suffered in recent years. Can the city we live in become more "smarter"? When a disaster strikes, it can be warned as soon as possible, or humans can be protected by highly automated equipment. Obviously, we need "smart cities".

The concept of smart cities originated from the "New Urbanism" and "Smart Growth" movements in the 1990s, with the purpose of solving many problems caused by urban sprawl.

The clear definition of "smart city" is different for different people. The office worker said: "The roads are not so congested, and it is not so difficult to buy tickets when going home during the New Year, it is a smart city.

The old man said: "I have a heart attack. If I suddenly fall ill at home, I can be sent to the hospital as soon as possible, which is a smart city."

It is difficult to list such examples, but they all point to the core feature of smart cities—people-oriented. The essence of any technology is to make people stronger, make the environment more suitable for people's lives, provide people with more development opportunities, and make people communicate more smoothly.

In 2008, IBM of the United States put forward the concept of "smart earth", which includes the concept of "smart city". In November 2008, at the beginning of the global financial crisis from 2007 to 2012, IBM's "Smart Earth: Next Generation Leaders' Agenda" theme report put forward in Fully used in all walks of life. This vision in turn triggered a wave of global smart city construction. The global Internet giant Google also put

forward the idea of a "modular city" in 2015, which is closer to reality. Google named this project "Sidewalk Toronto". Simply put, it is a highly automated and intelligent urban transformation project in terms of transportation, housing, and sustainable development. They opened up a transportation network that can transport goods and rubbish underground in the city, greatly reducing the traffic pressure on ground transportation. In the near future, the series of problems of congested traffic, polluted air, and high housing prices may be changed by this project.



photo by YIZHUYISHI

"Smart City" is Internet + Internet of Things

The "smart city" we are discussing today is composed of two core sectors: Internet + Internet of Things. The Internet has been born for more than 40 years and has greatly changed the production and lifestyle of mankind. Cyberspace is a brand-new dimension different from the real space of human beings. It is the second space and virtual space of human beings. Based on hardware resources and operating rules, the core components of cyberspace are ID, data, and connection, while the core elements of real space are people, things, and things. The various elements of the two spaces can interact with each other. You can simply understand the "reality" here as the "Internet of Things".

Mapping reality to the network can generate massive amounts of data; while mining and using the data in the network can counteract the real space, making the city "smart". The interaction of these two spaces has become the technical basis for smart city construction. There is no doubt that a smart city is a high-level stage of urban development and a complex system with a high degree of information and digitization. Compared with the current "unsmart" cities, the wisdom of smart cities lies in their ability to better solve urban problems, and technology is only a means that can be adopted. "Smart city", a new term that seems out of reach, has actually become relatively mature after several years of development.

Which cities have already implemented

Since the beginning of the 21st century, the United States, Germany, the Netherlands, the United Kingdom, Japan, Singapore, South Korea, etc. have pioneered the practice of smart cities, and many classic cases have been born, which is very forward-looking from the current perspective.

The first "Smart City"-United States-Dubuque

Dubuque is the first smart city in the United States and the world's first smart city. It is characterized by its emphasis on intelligent construction.

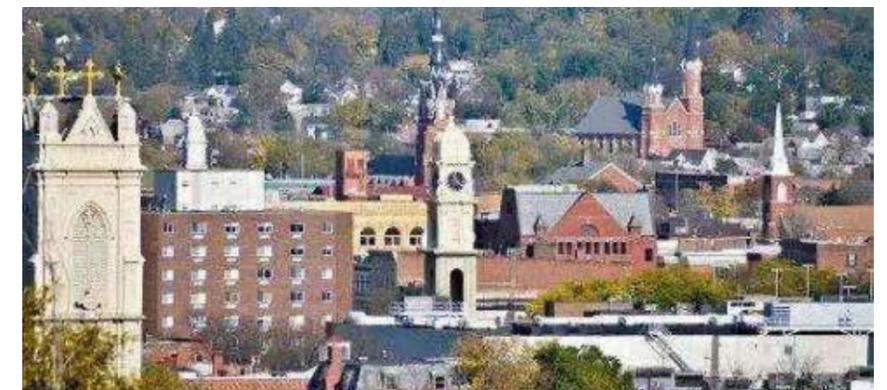


photo bu YIZHUYISHI

In order to maintain the livable advantage of Dubuque and have greater business development, the city government and IBM plan to use the Internet of Things technology to digitize and connect all the resources of the city, including water, electricity, oil, gas, transportation, Public services, etc., and then intelligently respond to the needs of citizens through monitoring, analysis and integration of various data, and reduce the energy consumption and cost of the city.

They took the lead in completing the data construction of hydropower resources and installed numerically controlled hydropower meters for households and shops in the city, not only recording resource usage, but also using low-flow sensor technology to prevent resource leakage. The data recorded by the instrument will be reflected on the comprehensive monitoring platform in time for analysis, integration and public display.

Huge city-level sensor network-Chicago, USA

In the daily lives of the citizens of Chicago, the ubiquitous sensors are applied to the lampposts on the streets of Chicago. At first, the people were very disgusted with this method and believed that their privacy was infringed. The Chicago City Information Technology Commission later publicly stated that the "lamppost sensor" only detects signals, does not record the location of mobile devices, and will not infringe on personal privacy.



photo by NAE Cities Index

Through the "lamp post sensor", relevant departments can collect urban road surface information and detect environmental data, such as air quality, light intensity, noise level, temperature, wind speed, etc., so as to provide targeted and accurate help for urban governance.

The pioneer of urban cloud services-South Korea-Seoul
In the "Smart Seoul 2015" plan, the Seoul Metropolitan Government puts forward the slogan "Using Big Data to Solve Small Problems of the Citizens", and is committed to using data to analyze population and bus route information to develop a reasonable late-night bus route plan for overtime work Company employees who return late provide convenience.

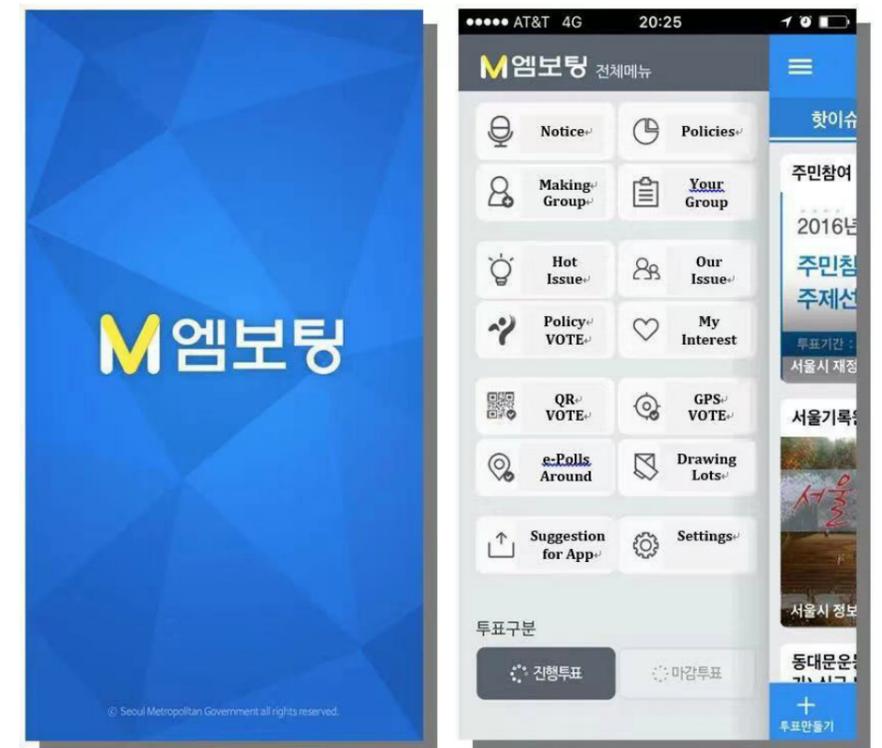


Image Source:M-Voting software

Relying on the support of a huge database, the Seoul Metropolitan Government has also launched the "Mobile Seoul" official client to search for the nearest restrooms within the city, the convenience facilities for the disabled, the arrival information

of buses and subways, information in 76 areas including disaster warning and evacuation information, cultural performance information, and employment information.

At the end of 2013, the Seoul Metropolitan Government also released a piece of software called "M-Voting", which allows citizens to vote directly from the Internet and speak out when the government makes decisions. Looking at the world, this was second to none at the time.

Therefore, a true "smart city" must have at least: a prosperous economy, convenient transportation, a comfortable and healthy environment, open and transparent policies, and a huge data network.

The cities of those countries that started earlier are developing in full swing on the road of "smart cities", changing the living environment of residents more or less in the fields of transportation, environment, and safety.

What about China?

From the emergence of the concept to the promulgation of policies, from small-scale pilots to full-scale development, smart cities have no obvious stage nodes in China, but a general development context can be sorted out based on the time sequence.

In 2011, Shanghai, Nanjing and other cities formulated relevant plans. In November 2012, the Ministry of Housing and Urban-Rural Development promulgated the "Interim Management Measures for National Smart City Pilots", and smart cities have since become a national policy.

In July 2013, the China Electronics Standardization Institute issued the "White Paper on Standardization of China's Smart Cities". At that time, my country was still at the turn of a digital city and a smart city, and the main tasks were focused on

Internet coverage and information digitization. It is also from that time that we have gradually entered the 4G era from 3G.

From 2014 to 2015, 4G officially began to spread, and the rapid rise of mobile Internet made the construction of smart cities urgent. In 2015, after the concept of "Internet +" became popular, various Internet giants have deployed smart cities. Alibaba and Tencent each enclose their territory, combined with "Internet +", Alipay and WeChat have launched their own "city services". It is also from this time that the "smart city" has become a new technology within reach of people from a concept and policy implementation.

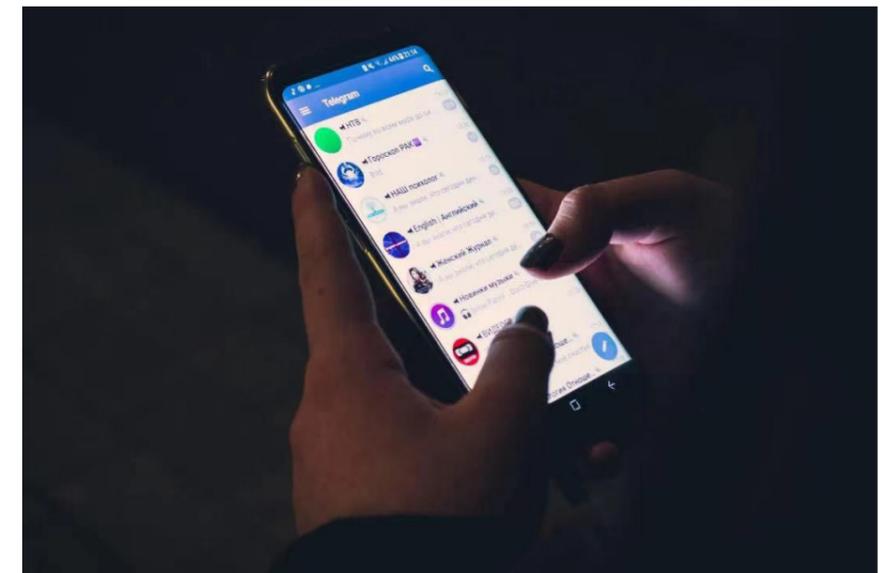


Image Source:weixin yizhuyishi

Since 2018, more than 1,000 smart cities have been launched or under construction worldwide, and nearly half of them (500 pilot cities) are in China. As of 2019, including all supporting related industries, the scale of my country's smart city market has exceeded 10 trillion.

In February 2018, JD City was established, taking the lead in proposing the concept of creating a "smart city system". Since its establishment, it has undertaken the construction of smart cities in Xiongan New District, Beijing, Suqian, Nanjing, Nantong,

Chengdu and other cities.

In June 2019, "JD City" cooperated with relevant departments of Nantong City, and through full efforts to promote the convergence and integration of video resources, successfully constructed the city's video resource co-construction, sharing, and sharing mechanism, and tailored the "city comprehensive governance calculation for Nantong City" Service platform" effectively improved the modernization level of comprehensive urban governance.

These layouts seem to require a certain development cycle to be effective. However, in the two months of 2020, under the envelope of the epidemic, this kind of usage scenarios built on big data and cloud algorithms are growing exponentially.

On February 10th, Hangzhou City introduced the "Hangzhou Health Code" measures. Hangzhou citizens and people who intend to enter Hangzhou can apply online. After passing the review, they will receive a color code. The green code is passable, the yellow code is isolated within seven days, and the red code is isolated. 14 days. At the same time, Chengdu High-tech Zone has launched an information platform for epidemic prevention and control. It includes four sub-platforms: community residents' declaration, enterprise resumption filing and employee health management, home observer health information reporting, and emergency supplies management.

At present, platforms such as community residents' declaration, enterprise resumption filing, and employee health management have been operating smoothly. Through this platform, citizens can independently report required data and enter and exit their lives and workplaces more conveniently.

Although some of China's "smart cities" are still in the developing stage, there are still some minor flaws in the implementation and implementation of some policies, and related supporting facilities have not reached 100% coverage. However, the 5G era is close at hand. With the current relatively mature Internet of Things + Internet system, the results of "smart cities" will soon be very significant, and the cost of use for ordinary people will become

lower and lower. Today's seemingly cutting-edge technology is believed to become commonplace in the near future.

1.1.2 Smart City 2020

It is foreseeable that 2020 will be a very important year for the development of smart cities in China, and various new trends and changes are also emerging.

It has been more than ten years since the concept of smart city was put forward. The response of urban development to emerging technologies such as ICT has penetrated into every link of planning, construction, operation, and management, and is completely changing the mode and concept of urban operation. Especially after 2015, with the maturity of technologies such as the Internet of Things, artificial intelligence, and 5G, more and more construction entities have participated, and smart cities have ushered in new developments under the guidance of dense central and local policies.

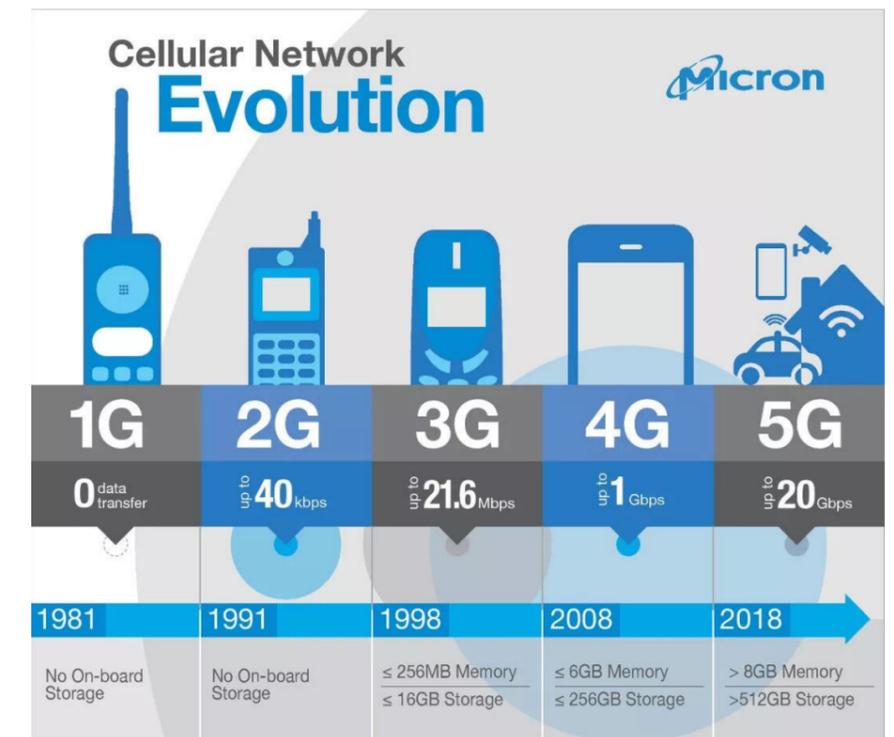


Image Source:micron

In 2019, 5G was officially commercialized, and big data administrations were successively established everywhere, and smart cities have entered a new stage of data-driven development. It is foreseeable that 2020 will be a very important year for the development of smart cities in China, and various new trends and changes are also emerging. The next development path and direction of smart cities are embodied in four areas.

·5G:

In 2020, as the early stage of 5G network construction and popularization, progress in the construction of the Internet of Things and application ecology will be relatively limited, and the biggest changes related to it will be reflected in the intensive construction of 5G base stations and deep integration with urban space.

·Digital government:

At present, the focus of digital government construction will go beyond the previous sectoral and industry applications focused on smart city construction, and pay more attention to cross-departmental applications and super applications. Super APPs, leadership cockpits and data sharing and exchange platforms are the most typical of them.

·unmanned:

Cities such as Beijing, Guangzhou, Shenzhen and Changsha have successively issued the manned test licenses required by RoboTaxi, and the L4-level driverless taxi fleet has begun normalized trial operation.

Following Sidewalk Toronto, Toyota Motor is another company that has launched a Woven City planning and design plan based on changes in streets and travel methods.

I believe that in 2020, there will be more similar explorations in urban space planning.



Image Source from BIG Architects

·City Information Model (CIM):

CIM is not a simple combination of GIS and BIM, but in addition to seamlessly connecting spatial data of various scales, it pays more attention to the access and calculation of massive real-time big data from the Internet of Things, and has a complete description and calculation of space-time flows and fields. ability.

The prototype of the true CIM platform may also appear this year, and replace the traditional GIS and BIM as the core part of the city center.

1.1.3 From Smart City to Smart Elderly care

Smart elderly care is a sensor network system and information platform for the elderly at home, communities and elderly care institutions, and on this basis, it provides real-time, fast, efficient, low-cost, IoT, interconnected, and intelligent elderly care services.

Informationized elderly care is based on the collection of data from informatized elderly care terminals, using the Internet, mobile communication network, Internet of Things and other means to establish a system service and interactive platform, and integrate public service resources and social service resources to satisfy elderly customers in safe nursing and health management. , Life care, leisure and entertainment, family care and other aspects of the elderly care needs, thus providing a new type of elderly care solutions for the majority of elderly groups.

With the advancement of science and technology, new old-age care methods are becoming more and more popular, and a series of high-tech products such as TV boxes designed only for parents have emerged in the society to improve the quality of life of the elderly in their later years and solve the problem of loneliness of the empty-nest elderly. Smart pension, migratory bird-style pension, information-based pension, new form of Chinese pension. After more than a year of good operation and rapid growth, Smart Pension has received extensive attention and recognition from the government, industry, the public and the media. Let the elderly fully enjoy the convenience and comfort brought by the Internet of Things.

Formulate product standards for smart health and elderly care equipment, establish unified equipment interfaces, data formats, transmission protocols, testing and measurement standards, and realize the open sharing of data information between different equipment. Prioritize the formulation of intelligent testing equipment products and data service standards for blood pressure, blood sugar, blood oxygen, heart rhythm and electrocardiogram in five categories of common physiological health indicators applicable to individuals, families and

communities. Improve the process specification and evaluation index system of smart health and elderly care services, and promote the standardization and standardization of smart health and elderly care services. Formulate information security standards for smart health and elderly care and privacy data management and use specifications.

In terms of smart elderly care service platforms, it is diversified, and smart elderly care service platforms built by different companies in different cities have different functions. For example, Shandong Lanchuang Technology Smart Elderly Care Solution" takes the intelligent elderly care service platform as the core, and integrates intelligent call center, intelligent elderly wristband products, and intelligent elderly health detection products to provide home care operators with the integration of software and hardware. Full-process solution; to create a smart home care scene for the elderly, let the elderly stay in it, and easily realize the family and medical interaction with their children and third-party elderly care institutions.

The platform software in the entire scene application includes five modules: "Smart Elderly Care Service Operator Platform", "Smart Elderly Care Service Provider Platform", "Intelligent Call Center", Smart Elderly App Child End, and Smart Elderly App Service End. Through big data Analyze, make efficient links between operational resources and service resources, and make services more accurate; intelligent elderly wristband products rely on accurate positioning monitoring to achieve accurate terminals for emergency calls, anti-lost, and service resources for the elderly, collecting blood pressure meters, blood glucose meters, and smart The measurement results of the camera and other terminal equipment are uploaded to the cloud, and from the cloud to the mobile phone APP and service platform, so that children and service platforms can understand the health status of the elderly in the first time, so as to achieve early detection, early prevention and early treatment.

The smart health and elderly care industry system will basically form a new generation of information technology and products such as the Internet of Things, cloud computing, big data, and smart hardware, making it possible to effectively connect and

optimize the allocation of resources for individuals, families, communities, institutions and health and elderly care, and boost The upgrading of the pension model. According to the Department of Electronic Information of the Ministry of Industry and Information Technology, by 2020, my country will basically form an industrial system covering the entire life cycle, establish more than 100 smart health and elderly care application demonstration bases, and cultivate more than 100 leading enterprises with exemplary and leading roles. While the industrial environment continues to improve, 50 smart health care products and service standards will also be formulated.



1.2 Co-living & co-working

1.2.1 What is co-living?

Co-living is a way to live and share an apartment with other like-minded people. Co-living is fast gaining in popularity across the globe as the younger urban generation increasingly puts more value on flexibility and convenience of living.

It's important to note that modern co-living comes in all shapes and forms. The term has been used loosely for different kinds of living arrangements: from "big box co-living" buildings with hundreds of small pod-style rooms to family-style apartments turned co-living homes (think of the apartment from "Friends").

What all these co-living arrangements share is the willingness to create a place to live that both provides some private space as well as plenty of shared space to facilitate community engagements.

1.2.2 The attraction of co-living

One of the main reasons why many people like co-living is that it creates many new ways of socializing and increases social opportunities.

It sounds interesting, right? You may subconsciously think that those who choose co-living are just to save money. Everyone shares some infrastructure, and then they can move into communities that they can't afford to live in. But when asked about the biggest benefits of this approach, most people answered that they can enjoy social life.

Unexpected but reasonable. Whether in low-income, middle-income or high-income countries, the number of single apartments is increasing. Many young people no longer like to live with their parents before marriage. More and more people like to move out and live alone. The divorce rate has risen and there are more and more people living alone, but this does not

mean that these people like living alone. Research shows that we are becoming more and more lonely and no longer have a sense of belonging in the community. It has become rarer to say hello to neighbors, and the city is full of similar but strange faces.

Although we spend more and more time on social software, our actual social circle is actually much smaller than 50 years ago. A comprehensive social survey in the United States showed that the number of people without close friends has tripled since 1985. In many countries, young people and old people feel more lonely than ever. In February 2018, the British government even set up a "Loneliness Minister" to deal with loneliness.

In this way, the appeal of co-living is self-evident. People want to have a stronger sense of belonging to the community and have more social life where they live.



Image source from KrSpace in Beijing

1.2.3co-working

In daily work, 80% of the tasks need to be completed in collaboration with colleagues, coordinate resources with other departments, or report to the leader; 80% of the work is in an open environment, such as special requests, emergencies, temporary reports, Project collaboration, event organization, opinion collection, communication and coordination, etc.

Therefore, through the use of flexible collaboration processes, employees can easily realize brainstorming, division of labor, collaboration, and resource integration with other colleagues, and they can use self-built templates and self-built templates. The use of the construction process makes many jobs in a random and divergent state to be orderly, traceable, and traceable, and to achieve the unity of work agility and effectiveness. Simply put, it is to realize the work of employees 1+ The effect of 1>2.

1.2.4 The house is rented, but life is not

Adding the co-working model to the co-living foundation makes it a new concept. This means that older people can not only work together, but also have fun together (co-play) and eat together (co-eat).



1.3shanshui city

The shanshui city is a modern city concept derived from the traditional Chinese landscape culture and the lyrical sentimental yearning for nature by literati. It embodies the blueprint for the construction of a future city with Chinese characteristics—returning to classical and natural art, and it is also the highest state that countless art scholars aspire to achieve. In modern times, Qian Xuesen first proposed the concept of "Shanshui City". After that, many obscure design scholars worked hard to improve it and tried to prove its feasibility and feasibility. Among them, the most striking is Ma Yansong's design practice: floating island; fish tank; ink ice; urban forest and many other design schemes all reflect his longing and yearning for the construction of "shanshui city".

2 Architectural design

2.1 Concept Generation

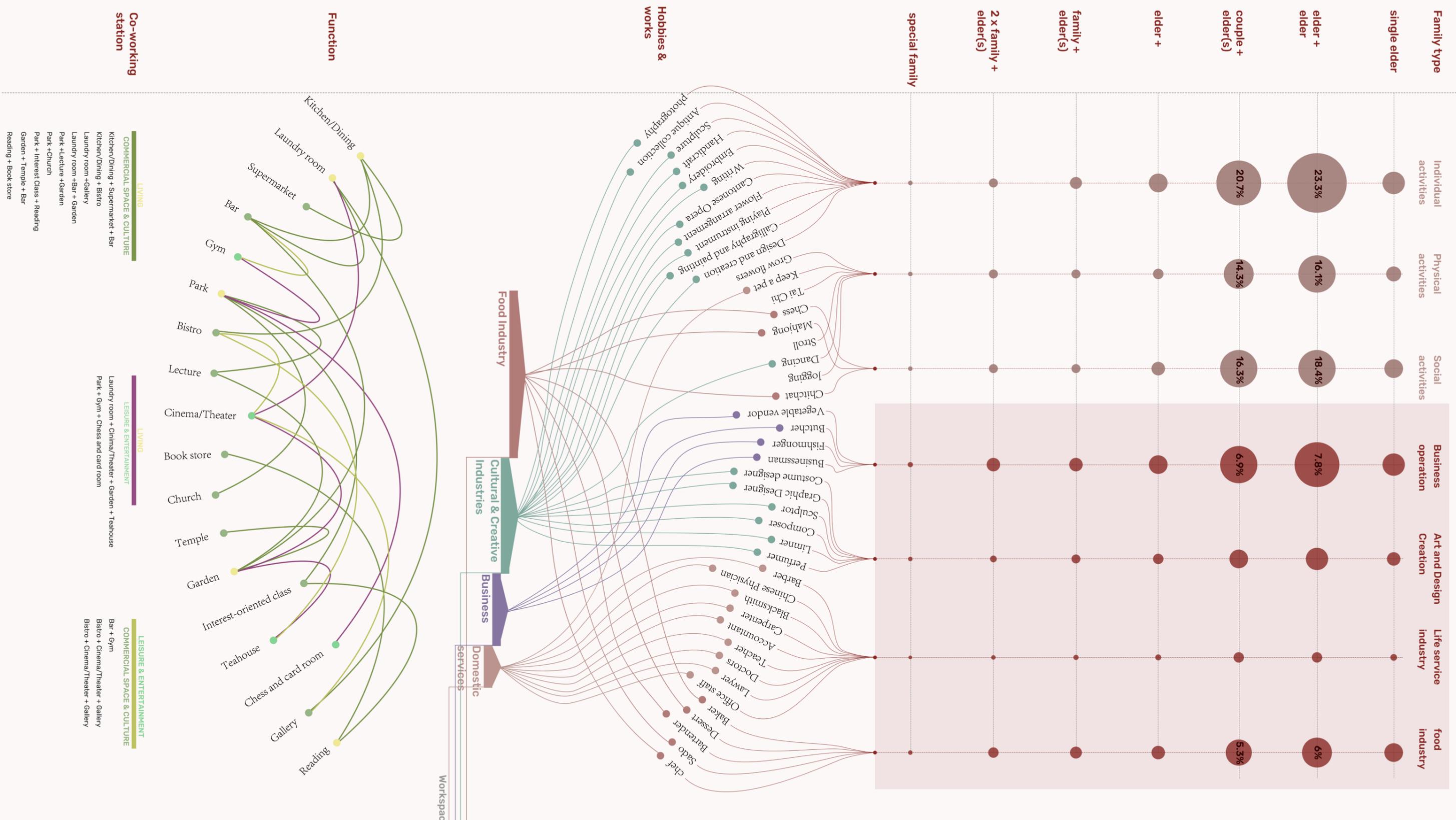
2.2 Living space design

2.3 Public space design

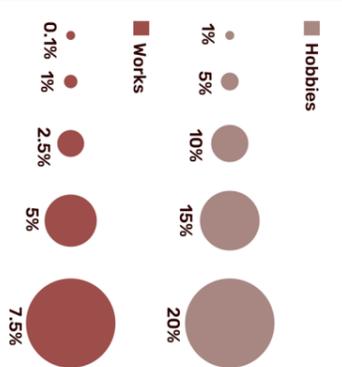
2.1 Concept Generation

The original concept-(data visualization based on the needs of the elderly)

Based on the various needs of the elderly and the proportion of the different family structures of the elderly in Guangzhou, the needs of the elderly in Guangzhou are visualized and drawn, and the needs of the same category are represented by the same color. Try to develop a co-working space for the elderly according to their hobbies. Finally, the spaces with different functions are combined with each other. So the original concept of the elderly community was formed.



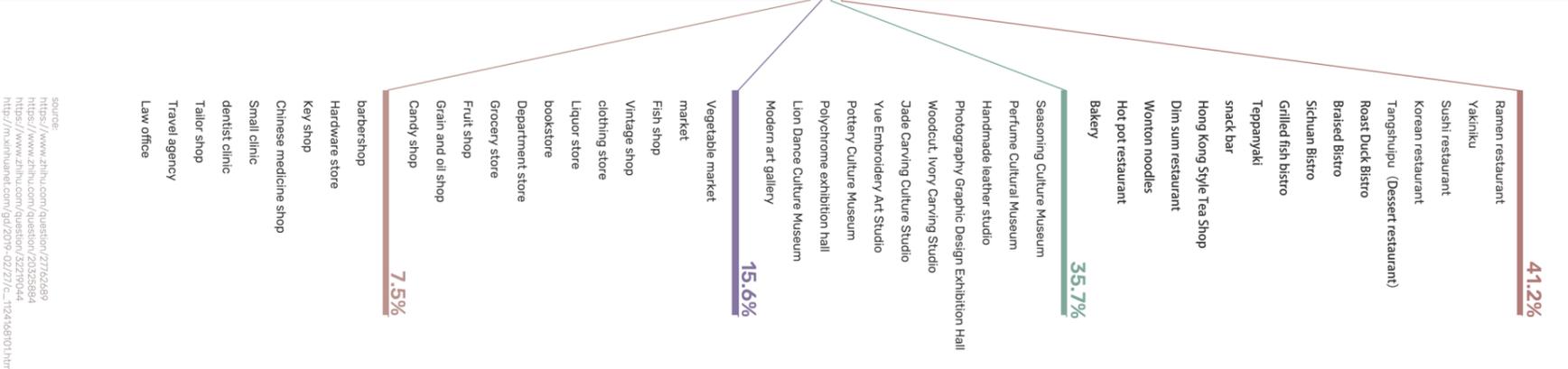
How to read



The red circle in the top half of this analysis chart indicates the percentage of people who have such hobbies or jobs as a family type. When the red circle is bigger, it means more people in this category. From this we can see that the elderly pay more attention to which functional spaces.

The middle part of this analysis chart illustrates the hobbies and work that the elderly can contribute to the community. I divide hobbies and work into four categories and draw to scale. Based on these four types, the specific store functions that the community needs are assumed.

The bottom part of this analysis chart envisions the public spaces needed by the community, and divides them into three categories according to different colors: **LIVING**, **COMMERCIAL SPACE & CULTURE**, **LEISURE & ENTERTAINMENT**. Then the concept of co-working is proposed to create more opportunities for the elderly to communicate. So new functions are created, communication space.



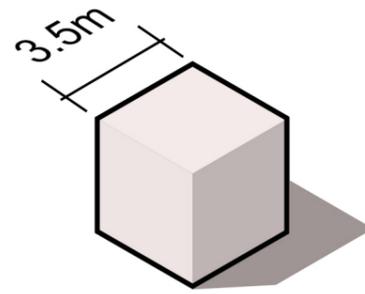
Co-working station

LIVING
COMMERCIAL SPACE & CULTURE
Kitchen/Dining + Supermarket + Bar
Kitchen/Dining + Bistro
Laundry room +Gallery
Laundry room +Bar + Garden
Park +Lecture +Garden
Park +Church
Garden + Temple + Bar
Reading + Book store

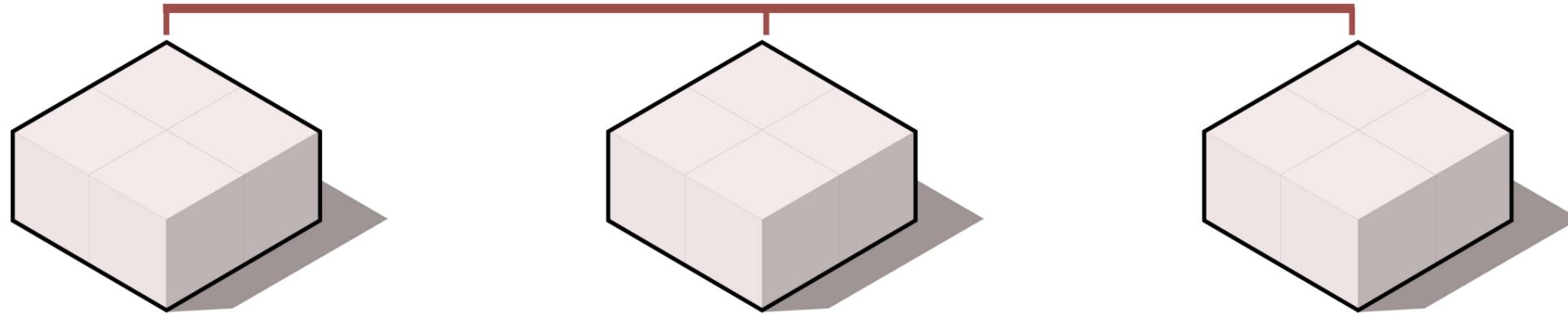
LIVING
LEISURE & ENTERTAINMENT
Laundry room + Cinema/Theater + Teahouse
Park + Gym + Chess and card room

LIVING
LEISURE & ENTERTAINMENT
COMMERCIAL SPACE & CULTURE
Bar + Gym
Bistro + Cinema/Theater + Gallery
Bistro + Cinema/Theater + Gallery

SOURCE:
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https://www.zhihu.com/question/32709044
https://www.xinhuanet.com/gd/2019-02/27/c_1124468101.htm
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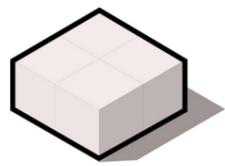
Cube



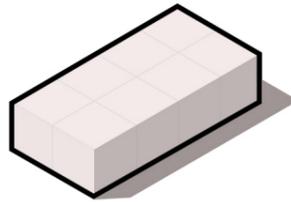
Co-Living

Living

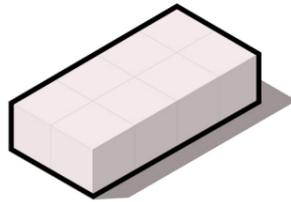
Co-Working



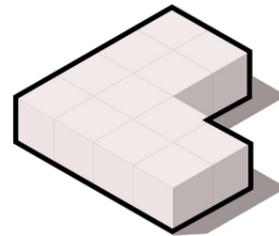
Single elderly
1 elderly



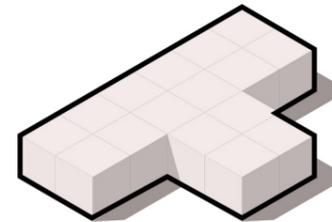
Elderly + Elderly
2 elderly



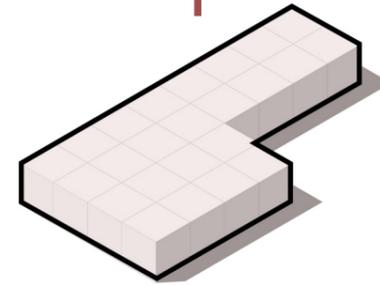
Elderly +
1-2 elderly



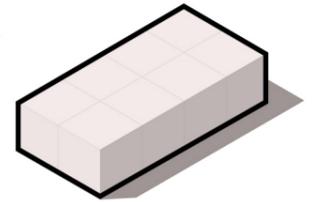
Couple +Elderly(s)
3-4 people



Family + Elderly(s)
4-5 people



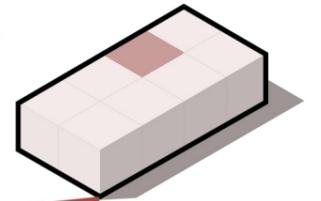
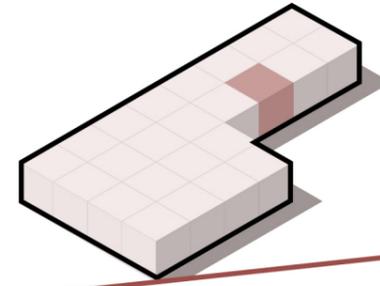
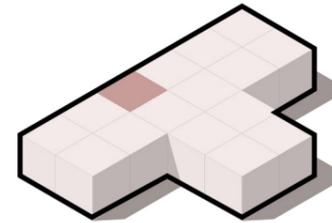
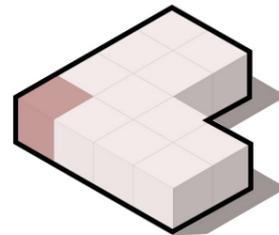
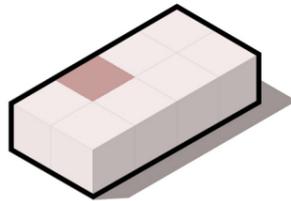
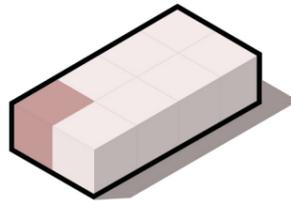
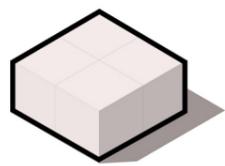
2 x Family +Elderly(s)
6-8 people



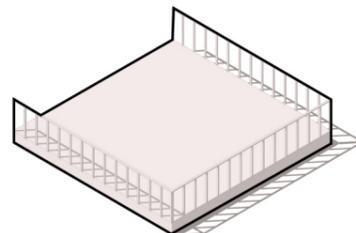
Special Family
2-4 elderly



Hobby



Co-Hobby



Co-Stage

1. Single elderly

2. Elderly + Elderly

3. Elderly +

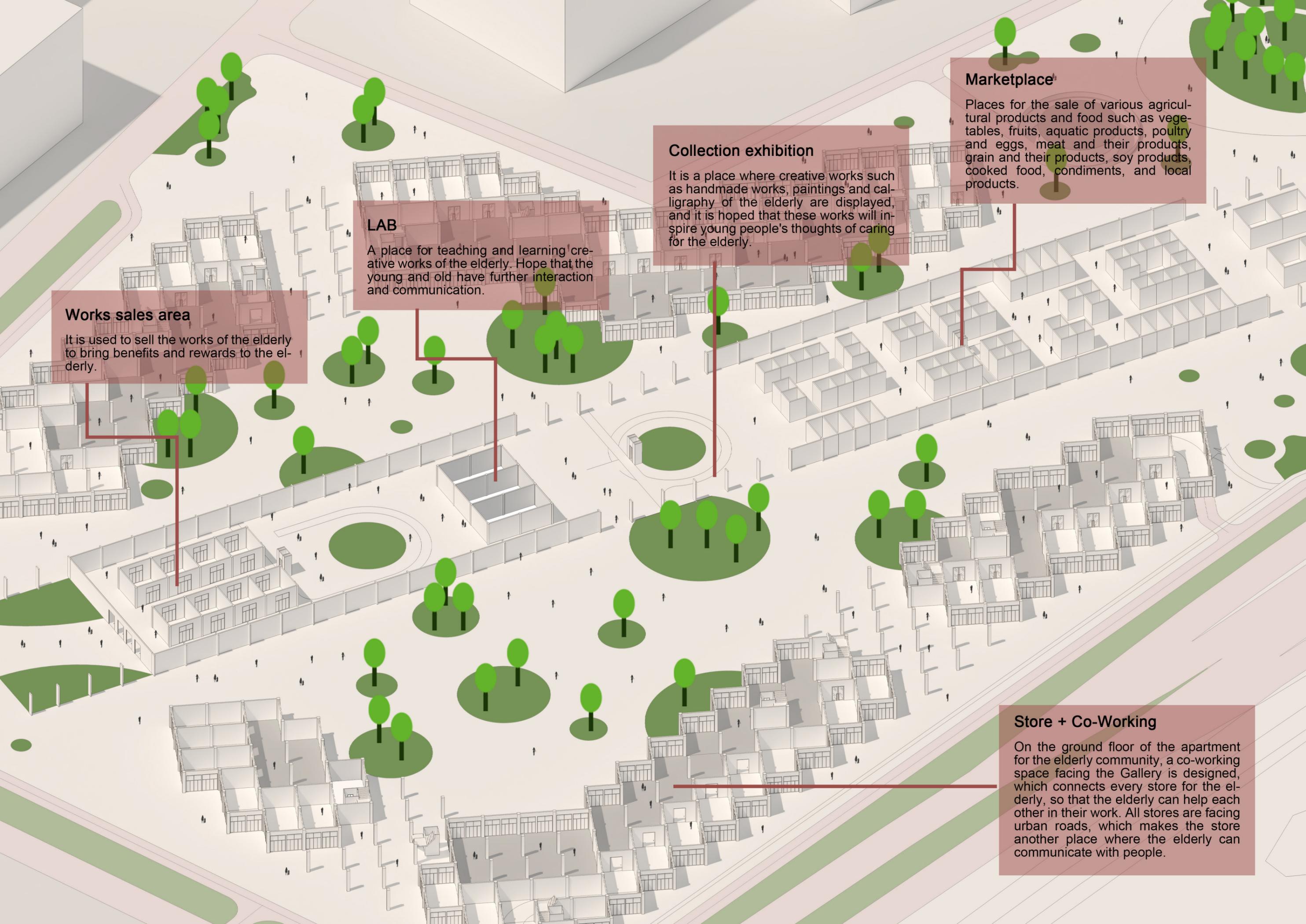
4. Couple + Elderly(s)

5. Family + Elderly(s)

6. 2 x Family + Elderly(s)

7. Special Family





Works sales area

It is used to sell the works of the elderly to bring benefits and rewards to the elderly.

LAB

A place for teaching and learning creative works of the elderly. Hope that the young and old have further interaction and communication.

Collection exhibition

It is a place where creative works such as handmade works, paintings and calligraphy of the elderly are displayed, and it is hoped that these works will inspire young people's thoughts of caring for the elderly.

Marketplace

Places for the sale of various agricultural products and food such as vegetables, fruits, aquatic products, poultry and eggs, meat and their products, grain and their products, soy products, cooked food, condiments, and local products.

Store + Co-Working

On the ground floor of the apartment for the elderly community, a co-working space facing the Gallery is designed, which connects every store for the elderly, so that the elderly can help each other in their work. All stores are facing urban roads, which makes the store another place where the elderly can communicate with people.

3 Smart system analysis

3.1 The smart home system

3.2. Smart community

At present, elderly care, medical care, housing, and education have become the four hot topics of people's livelihood that the whole society pays most attention to. Although for some people born in the 1960s and 1950s, it means "a lot of money in old age", but for most people it is still "old when there is not much money"; For the elderly born in the 1940s, 1930s or even earlier, many people "have no money when they are old." On the other hand, since most of the senior care workers can neither obtain a good professional evaluation from the society, nor obtain a reasonable professional income, the serious shortage of senior care workers, especially nursing staff, will exist for a long time. Therefore, it is very There may be a combination of "no money to provide for the elderly" and "no one to provide for the elderly" for a long period of time. Therefore, the support of smart technology and modern technology is very, very important. Through smart technology and modern technology, we can hand over to machines, robots, or equipment to do things that humans cannot do, that they cannot do well, or that they are unwilling to do. As a revolution to the traditional old-age care model, smart old-age care will combine the advantages and power of information technology to provide new ideas and practical roads for the problems and difficulties faced by China's old-age care industry and industry.

Smart elderly care embodies the integration of information technology, integrating elderly service technology, medical care technology, intelligent control technology, computer network technology, mobile Internet technology and Internet of Things technology, etc., so that these modern technologies are integrated to support the service and management needs of the elderly . Secondly, Smart elderly care embodies the people-oriented thinking, taking the needs of the elderly as the starting point, through high-tech technology, equipment, facilities and scientific and humanized management methods, so that the elderly can enjoy high-quality services anytime and anywhere. . Thirdly, Smart elderly care embodies high quality and high

efficiency. Through the application of modern science and technology and intelligent equipment, the quality and efficiency of service work are improved, while labor and time costs are reduced, and fewer resources are used to maximize the satisfaction of the elderly. demand. These smart devices, through the corresponding aging design, can serve the old people who do not want to do it, cannot do it well, or even cannot do it manually. Finally, in addition to the material life of the elderly, the connotation of smart elderly care also includes the spiritual life of the elderly. At the level of material life, it is mainly to provide adequate support for the lives of the elderly. At the level of spiritual life, it is mainly to enrich the spiritual life of the elderly so that the elderly can live more meaningfully. Smart elderly care allows the wisdom of the elderly to be reused and utilized. Through network technology and social network platforms, the experience and wisdom of the elderly can be used to rejuvenate the elderly in their lives.

3.1 The smart home system

3.1.1 The composition of the smart home system and the characteristics of the elderly

Remote control of everything in the house through the mobile phone, all indoor lighting, temperature and humidity, audio anti-theft and other systems can be adjusted as needed. The kitchen has automatic cooking equipment, the balcony, and the garden have an abnormal alarm system. Microsoft founder Bill Gates' future "House" satisfies all people's illusions about the "digital home". It leads smart homes and enters people's vision. Smart homes are based on houses as a platform, using integrated wiring technology, network communication technology, security technology, and automatic control technology. , Audio and video technology will integrate facilities related to home life to build an efficient management system for residential facilities and family schedule affairs, improve home safety, convenience, comfort and artistry, and realize the current mainstream smart living environment in the market The home system is mainly divided into several major functions such as intelligent lighting control, intelligent electrical control, security monitoring system, and central control system.

The smart home system is very helpful for the elderly and can be said to be a typical application of wisdom to help the elderly. This is because the elderly have the following physical and psychological characteristics.

(1) Weakened perception. As the functions of the various organs of the elderly are gradually weakening, the elderly's ability to perceive the surrounding environment is increasingly weakened, mainly in terms of vision, hearing, touch, taste and smell. In terms of vision, the main performance is that the vision of the elderly is gradually blurred, and the ability to distinguish colors is reduced. Even bright colors will gradually become dark in the eyes of the elderly. The decline in the hearing of the elderly is mainly due to the insensitivity of the elderly to the surrounding sounds. If you can't hear the sound of boiling water, the sound of doorbells, etc.; and the weakening of the olfactory function makes the elderly insensitive to the peculiar smell in the air. The

weakening of the touch makes them easy to burn or burn.

(2) Aging of nerve function. The degeneration of the nervous system of the elderly is mainly due to the slow response caused by the decrease of brain cells, which makes the elderly reduce their thinking ability, memory decline, and the cognitive ability of external information. This also leads to their decline in their ability to adapt to the new environment and get lost. The steering often occurs in the elderly.

(3) Deterioration of athletic ability. Studies have shown that the average person's muscles reach their peak at the age of 20 to 30, and then show a downward trend. At 70, its strength is generally only half of that of 30. Therefore, most elderly people feel that their flexibility is reduced, and the strength and control of their muscles are also declining. At the same time, bones gradually become brittle with age, and bone regeneration ability gradually decreases. This is also an important reason why the elderly are prone to falls and fractures after a fall and difficult to recover.

(4) Deterioration of disease resistance. As the years grow, the human body's immune function declines and the body's aging is developing in parallel. It is manifested in the elderly often suffering from various chronic diseases, and often some inconspicuous diseases may cause the recurrence or even loss of these diseases. Self-care ability.

(5) Increase in loneliness and loss. The main change in the mentality of the elderly is that they are prone to loneliness and loss. The changes and decline of the elderly's physiological functions make them less communicate with the outside world. In addition, their children are busy at work and unaccompanied. This kind of psychological depression will further promote decline and aging, which will affect the health of the elderly.

3.1.2 Products of Smart Home System

In the smart home products for the elderly, we have analyzed the psychological and physiological characteristics of the elderly. Obviously, the idea of treating the elderly the same as the average adult is unscientific. We must fully consider the particularity of the elderly, and design a comfortable, convenient, safe, and healthy intelligent living environment for them according to their own characteristics. At the same time, due to the deterioration of the organ function of the elderly, there will be certain difficulties in the operation of smart products. Therefore, the most basic principle for the design of all our smart products for the elderly is that the design of the operation interface should be the best. Simplicity-Use the largest possible function buttons, the color distinction between the buttons should be clear, and use simple and easy-to-understand operation methods such as voice control and gesture control as much as possible. Below we combine the layout of the room to introduce smart home products that the elderly may use in smart houses.

1. Smart living room

When the old man returns to the door of his house, he does not have to worry about forgetting to bring his key. The iris recognition door of the residence will scan the old man's iris and match it with the iris stored in the control center. If the match is successful, the door will open automatically. After entering the door, the touch control panel at the door automatically lights up, click on the "home mode" on the control panel, the sensor light in the smart living room slowly turns on, allowing the elderly's eyes to slowly adapt to changes in indoor brightness, and the smart coffee table in the middle of the living room enters In boiling water mode, the weather sensor outside the window transmits outdoor temperature, humidity, wind speed and other data to the control center. The infrared camera at the door scans the number of people entering the door, and the smart shoe cabinet at the door automatically pushes the corresponding number of indoor slippers for the elderly. You don't have to bend over to put on suitable shoes. At this time, the old man has adapted to the indoor light, the sensor lights are slowly turned off, the electric

curtains are opened, the control center judges the outdoor temperature according to the data of the weather sensor, the wind speed is suitable, and the electric windows are opened. The old man walks to the sofa in the living room. The fall prevention sensor installed on the floor automatically senses the old man's pace and posture changes. If there is any abnormality, it will automatically alarm. The control center will also send a warning message to the set mobile phone or make a call in time to cause a sudden fall. The old man who fell down received timely help. The old man sits down on the sofa, the TV is turned on, and the sofa automatically obtains the data of various indicators from the wearable device on the old man's body, and stores it in the health file of the control center. The control center sends the data to the smart coffee table at the set time according to the data in the health file. After issuing an instruction, the smart coffee table pops up the medicine in the designated grid on the surface of the coffee table according to the instruction to remind the elderly to take the medicine in time. Children who work abroad use their mobile phones or computers to automatically dock with the TV to make video calls with the elderly, alleviating the loneliness and loss of the elderly.

2. Smart kitchen

The elderly leave the living room and enter the kitchen to prepare for cooking. The smoke detectors and gas detectors installed on the kitchen walls will always monitor the changes in the air in the kitchen. If there is an abnormality, they will immediately alarm. The control center controls the kitchen electric windows to open, and the kitchen air conditioning starts. Ensure the temperature in the kitchen is appropriate. The smart refrigerator door in the kitchen shows the storage time and quantity of all foods in the refrigerator. If the storage time is approaching the expiration date, remind the elderly to eat as soon as possible. If the expiration date is exceeded, the elderly will be prompted to discard them by voice, and the display will display the food with insufficient stock. "Order" button, tap the "Order" button, and the supermarket bound to this residence will automatically deliver it to your door. In addition, there is an electronic display on the side of the refrigerator, and the elderly can watch TV or listen to the radio during cooking. The cooked food will be taken

to the smart insulation table at the entrance of the kitchen. The temperature sensor on the surface of the table detects the warm food and turns on automatically. Insulation function. The floor sensor in the kitchen senses that the old man has left the kitchen for more than 15 minutes, and sends out a sound prompting the old man to check. If it is detected that it is not cooking soup and the elderly does not respond, the gas, faucet, range hood, etc. in the kitchen will be automatically turned off.

3. Smart bathroom

The elderly are going to take a deep bath, choose the "bath mode" of the touch control panel at the bathroom door, the air circulator by the window is turned on, and the wall heating sheet is heated, the bathroom temperature is controlled at 28C by default, and the elderly can also choose their own comfortable temperature. Adjust the settings yourself. The floor sensor monitors the elderly's posture changes throughout the entire process, and automatically alarms if any abnormalities such as falling and syncope occur. If the elderly go to the toilet, the smart toilet will automatically collect and analyze the elderly's excretion data and upload it to the health monitoring center. The infrared sensor on the door frame of the bathroom senses the time when the elderly enters the bathroom. If the leave time exceeds the usual set time, the warning mode will be activated. After receiving the relevant information, the children of the elderly can remotely turn on the video surveillance to see if the elderly is abnormal.

4. Smart bedroom

When the old man enters the bedroom, the sensor at the door of the bedroom senses the approach of the old man, and the sensor light in the bedroom slowly lights up. The first thing we can see is the smart weather closet on the wall. The closet receives data from the weather sensor in real time. Get ready to change clothes and go for a walk or exercise. Tap the "Travel" button on the surface of the closet. The closet can automatically push suitable clothes and give travel suggestions according to the outdoor weather conditions. If the elderly is ready to take a rest, slowly walk to the intelligent sensing bed in the bedroom,

and gently tap the "rest mode" on the touch mode control panel beside the bed. The electric curtains in the bedroom will close, and all electrical appliances in the house except the bedside lamp will also be automatically turned off. The intelligent sensor senses that the old man is lying down, the bedside lamp will slowly turn off, and at the same time a period of soothing music preset by the old man is played in the bedroom. During the sleep of the elderly, the health monitor on the smart bed will monitor various indicators of the elderly's body throughout the entire process, and if any abnormalities are found, they will immediately report to the police. During sleep, the sensor on the bed senses that the old man gets up from the bed. According to the preset, the sensor lights in the bedroom, corridor, and bathroom are slowly lit to ensure that the old man wakes up safely at midday or at night. In the wee hours, the weather sensor outside the window can sense the temperature drop, and the data is transmitted to the control center. The control center controls the power window to close, the air conditioner is turned on, and the bedroom temperature is controlled at a suitable temperature for the elderly (such as 26°C), and the air humidifier starts to work. , The air humidity is controlled at an appropriate level to provide a comfortable sleeping environment for the elderly.

Smart home system products



1. Smart toilet
2. Red infrared sensor
3. Smart insulation dining table
4. Gas, smoke detector
5. Smart refrigerator
6. Smart push shoe cabinet
7. Floor anti-fall sensor
8. Health monitoring sofa
9. Outdoor weather sensor
10. Intelligent lighting system
11. Wall heating
12. Air circulator

3.2. Smart community

3.2.1 Elderly care service models for different types of elderly

Based on the physical self-care status, age stage, and family status of the elderly in the community, the elderly are classified so that information technology can provide more targeted services for the elderly in the community.

The categorized self-care ability of community home care service objects is an important indicator reflecting the physiological function and health status of the elderly. It refers to the ability of the elderly to have five activities: independent eating, independent turning over, urinating and defecation, dressing and washing, Self-move.

Some scholars define complete self-care as the elderly who do not rely on outsiders and can independently complete the above four or more activities in daily life; semi-self-care is defined as the elderly who cannot complete three of the above five forest activities independently. Inability to take care of themselves means that the elderly cannot complete the above five activities independently. According to the family status of the elderly, the elderly can be divided into the widowed elderly, the alone elderly, the empty nest elderly and the normal elderly. According to the degree of attention and care needed, the elderly in the community are divided into four different types of elderly service targets. The first type of elderly refers to the normal elderly who can take care of themselves completely or at a low age, the second type refers to the middle-aged or lost alone, empty-nest elderly, the third type refers to the widowed or semi-self-care elderly, the fourth type refers to the completely unable to care for themselves Or the elderly. Correspondingly, we have four service models for the elderly, namely the first type of elderly service model, the second type of elderly service model, the third type of elderly service model and the fourth type of elderly service model.

3.2.2 Projection diagram of home care service model in smart community

The emergence of new network environments such as the Internet, the Internet of Things, and social networks have caused many changes in the lifestyles of the elderly. These new technologies can provide different levels of services for the elderly in the community at different ages, physical conditions, and family conditions. As shown in the figure, the details are as follows.

1.The first type of elderly service model.

The first type of elderly in the community (that is, the normal elderly who are completely self-care or low-age) perform E-service E-shopping E-entertainment, E-learning, E-exhibition on the community elderly care service platform, E-communication and other almost all required activities.

2.The second type of the elderly service model.

The second type of elderly (middle-aged,empty-nest elderly) can realize E-shopping, E-entertainment, E-learning, E-service, E-communication through the new network environment, E-health and most of the services that are beneficial to physical health and mental health.

3.The third type of the elderly service model.

The third type of elderly (lonely or semi-self-care elderly) can realize E-service, E-health, E-nursing home, Emergency rescue, and E-monitoring services through the new network environment.

4.The fourth type of elderly service model.

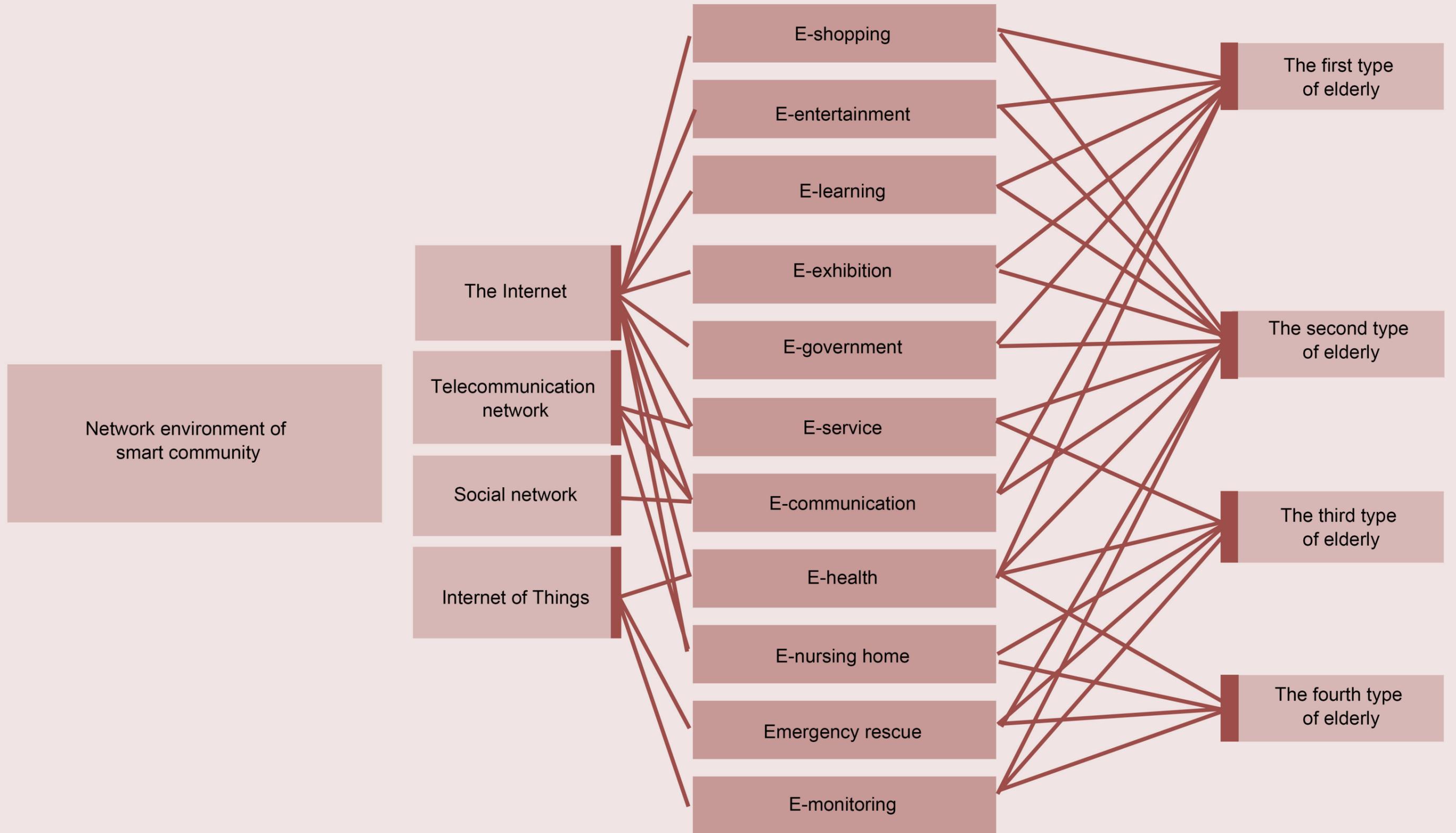
The fourth type of elderly (completely unable to take care of themselves or the elderly) can realize E-health, E-nursing home, Emergency rescue, E-monitoring, etc. through the new network environment. In addition, community managers and service

personnel can realize E-government and property management through the new network environment.

Network Environment

Service Content

Service Model



Projection diagram of home care service model in smart community

3.2.3 Features of Smart Community

To put it simply, a smart community is to make full use of the Internet of Things, sensors, and network communication technologies to integrate into all aspects of community life to achieve an ideal life from community security, home intelligence, home entertainment, and community intelligence.

Smart Ping An Community Platform, Business Circle/O2O Platform (Online To Offline), Comprehensive Governance Big Data Platform, One Face Smart Identity Recognition System, Smart Public Rental Housing/Long Term Rental Apartment Platform System, Smart Community Owner App, Smart Community Property Management App .

Intelligent hardware includes: cloud intercom access control series, face recognition access control intercom integrated machine, human identification verification integrated machine, vehicle identification, etc.

1 Smart community security

After all perimeter alarm devices, video surveillance and various sensors are added to the smart community platform, the devices can interact with each other and complement each other, so that when any emergency situation occurs in the home of the residents of the community, the relevant equipment can be automatically linked to the home. The real-time status is delivered to users, and the property and related departments are notified in time.

2 Smart community users' homes are intelligent

Users use mobile smart terminals such as mobile phones to realize home appliance control functions, such as lighting, air conditioning, etc., linked with external sensors, no matter when and where they are, realizing smart home life in a true sense.

3 Intelligentization of smart communities

Through the smart community platform, the property can provide

more high-quality services, which can not only generate income for the property, but also provide services for the owners. Residents in the community can communicate with the property even if they are not in the community and let the property staff help. At the same time, the property can release all kinds of information to each resident to improve the level of property management.

4 Integrated Services of Smart Community

The smart community is perfectly integrated and uses the online service platform to provide users with services such as online shopping, housekeeping services, convenience services, catering and food, health check appointments, etc., so that they can easily enjoy various conveniences without leaving the house.

Summary: The construction of smart communities will definitely continue to be more intelligent in the future. The smart community will become an ecological system, including basic communication transmission, etc., from solving the daily property problems of residents, to improving the convenience of residents' lives, to the establishment of the community O2O model, and finally forming an ecological chain.

Smart elevator

The elevator is monitored by human body induction. If an elderly person faints, the system of the intelligent operation center will automatically alarm the staff and get rescue time!

Smart underground garage

It can accurately sense the humidity, temperature and air indicators of the garage, and automatically start and stop. While providing a better dehumidification effect and experience, it achieves the best efficiency ratio of energy saving and consumption reduction

Smart garden irrigation system

Connect to the cloud via Wi-Fi, upload the plant growth environment's temperature, humidity, soil nutrients and other information to the plant cloud database, perform system analysis, and give advice on plant maintenance after the analysis, and the user can choose the intelligent maintenance method.

Smart building intercom

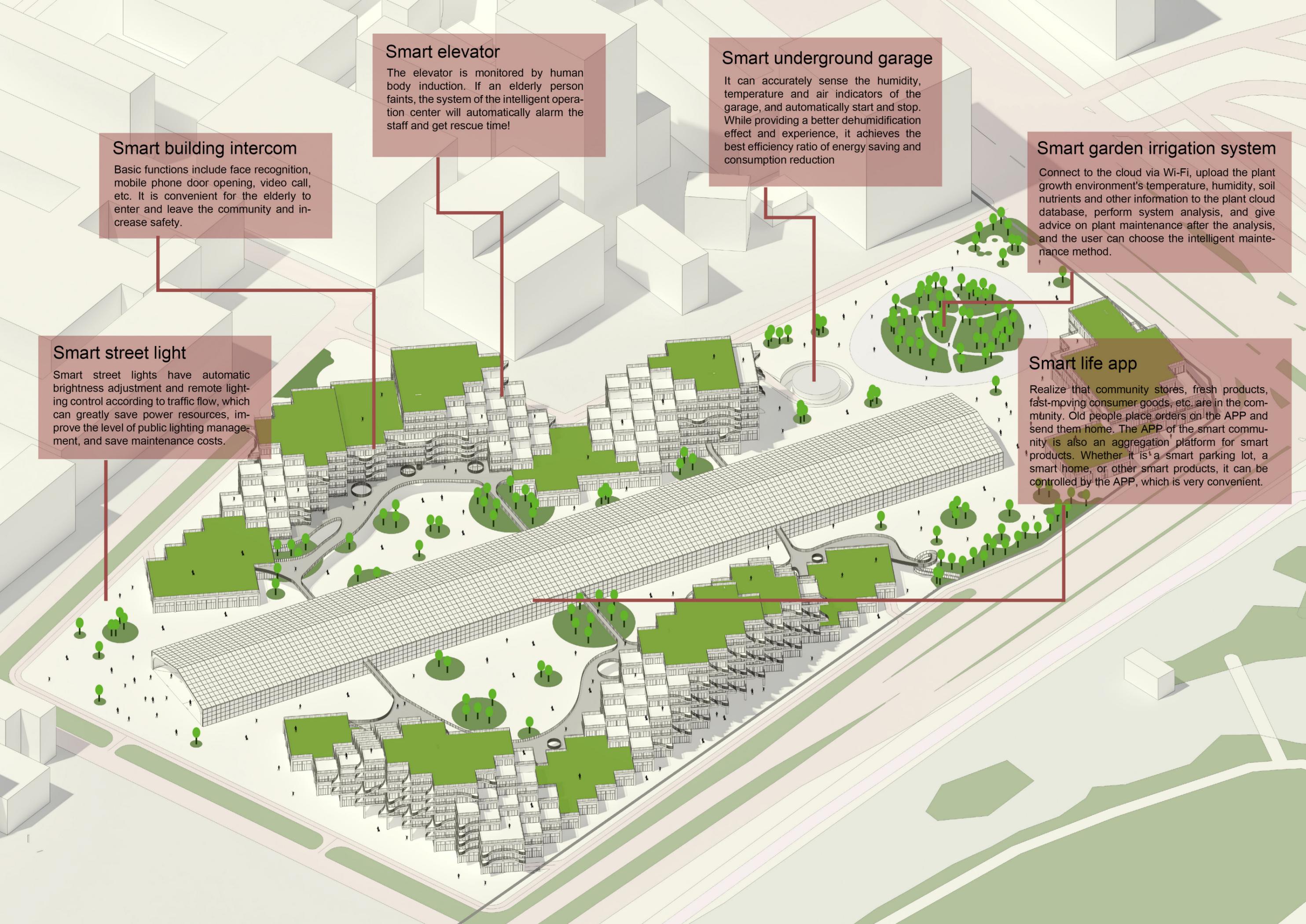
Basic functions include face recognition, mobile phone door opening, video call, etc. It is convenient for the elderly to enter and leave the community and increase safety.

Smart street light

Smart street lights have automatic brightness adjustment and remote lighting control according to traffic flow, which can greatly save power resources, improve the level of public lighting management, and save maintenance costs.

Smart life app

Realize that community stores, fresh products, fast-moving consumer goods, etc. are in the community. Old people place orders on the APP and send them home. The APP of the smart community is also an aggregation platform for smart products. Whether it is a smart parking lot, a smart home, or other smart products, it can be controlled by the APP, which is very convenient.

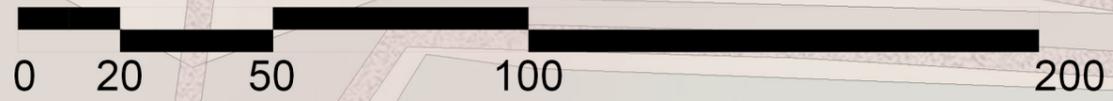
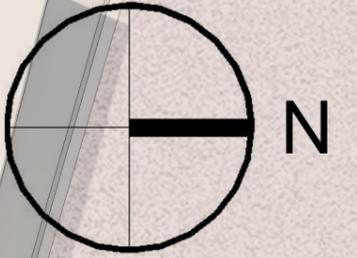


4 Site planning and overall layout

4.1 Master plan

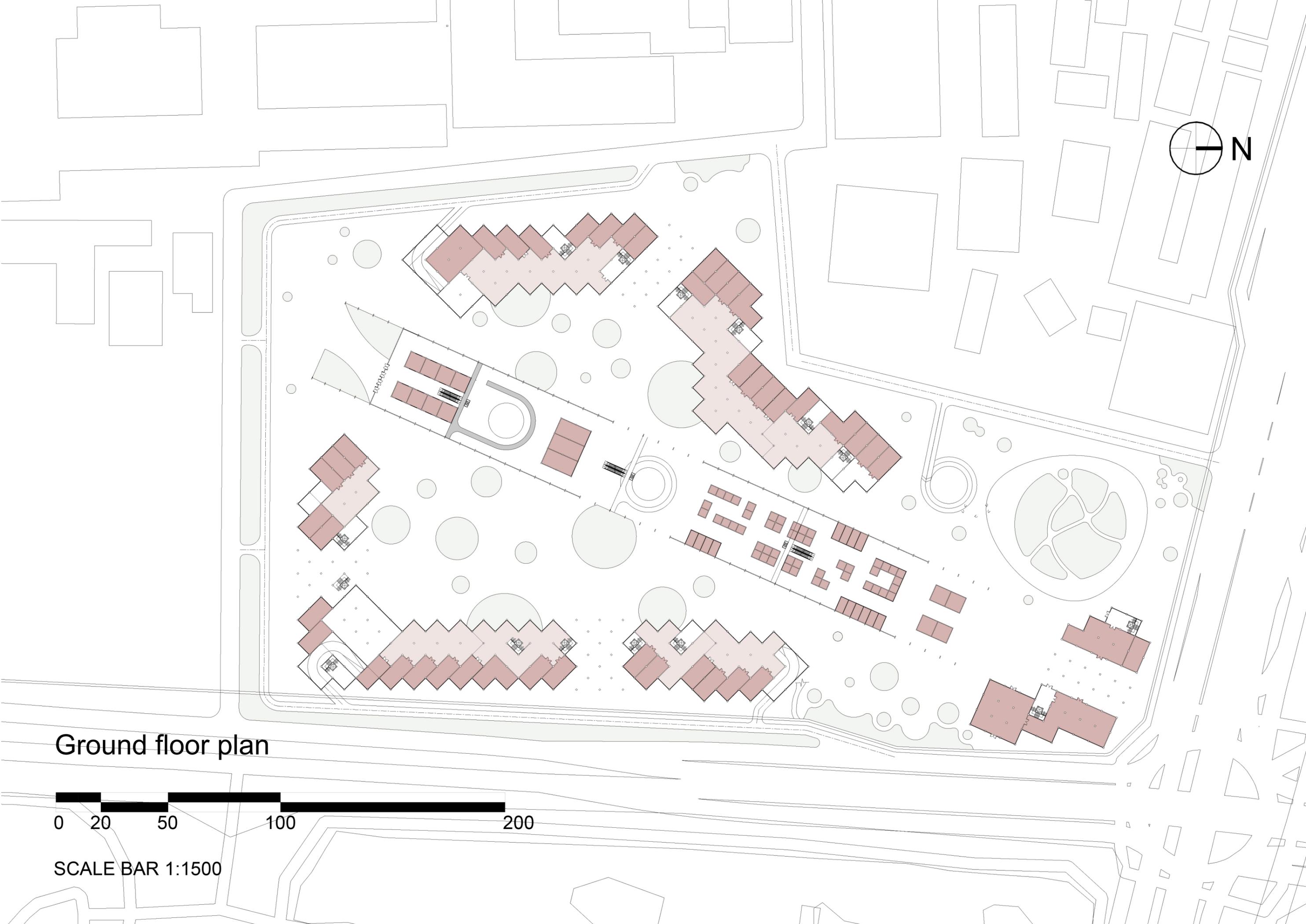
4.2 Architectural Drawings

4.3 Technical details



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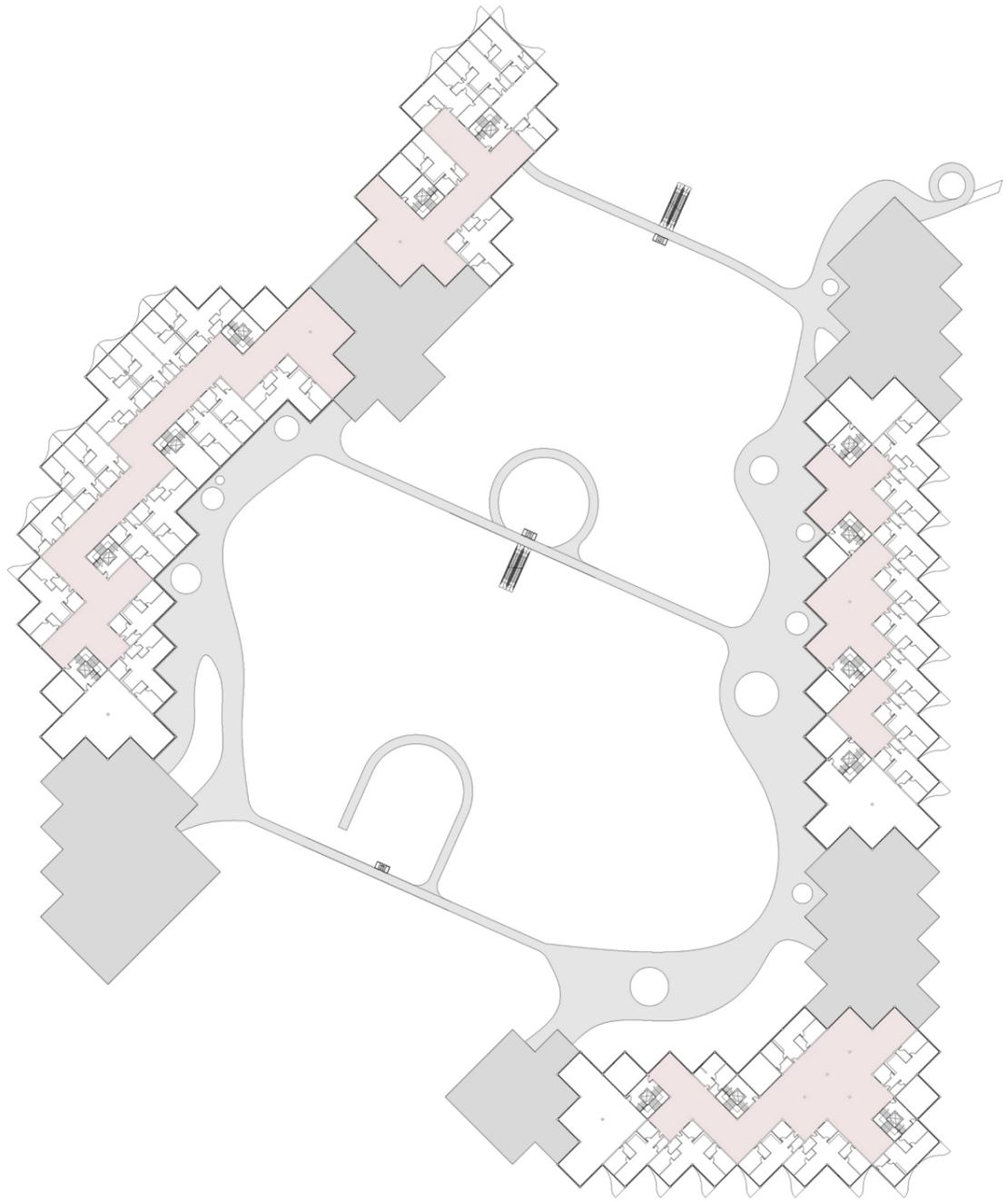




Ground floor plan



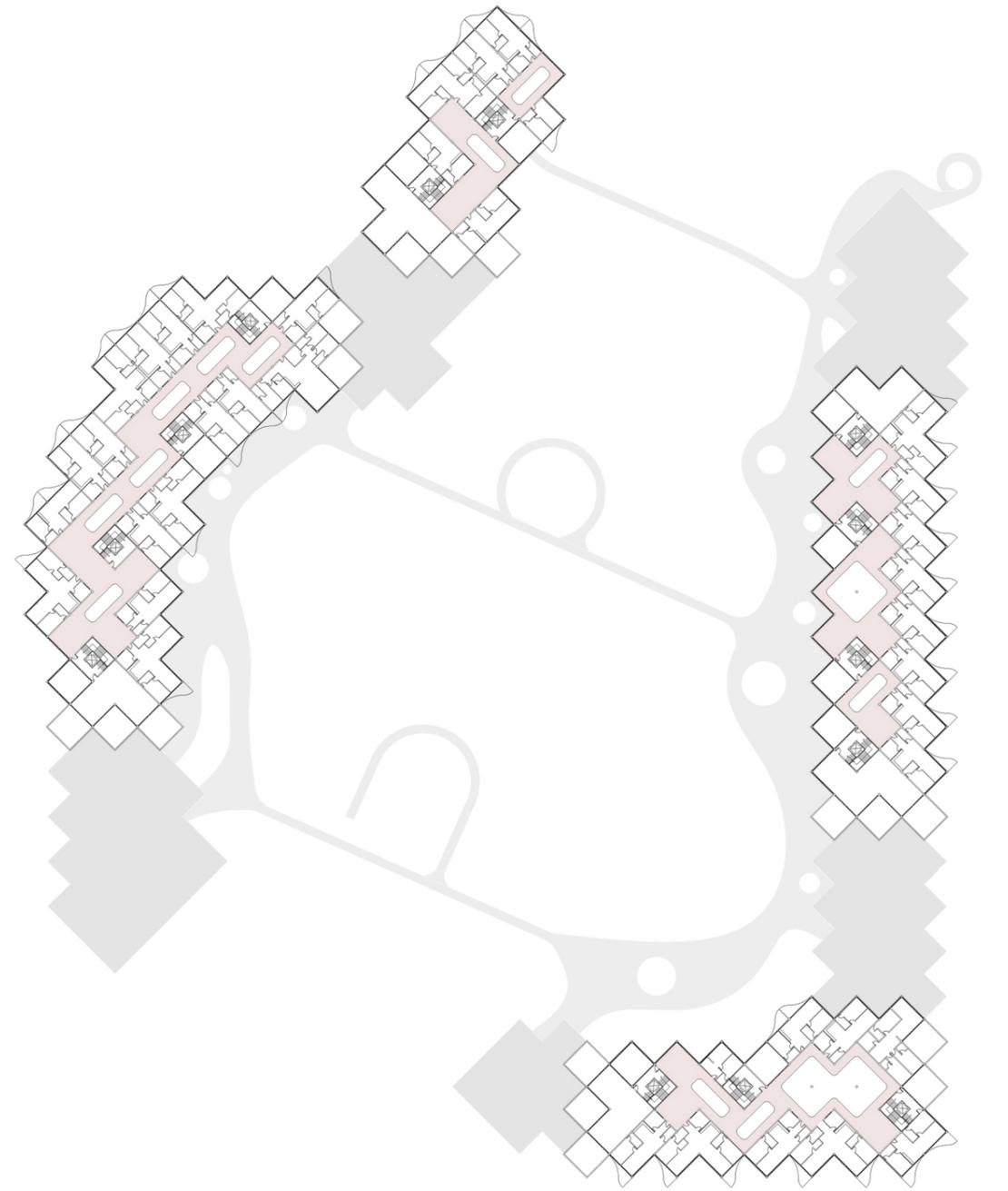
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First floor plan



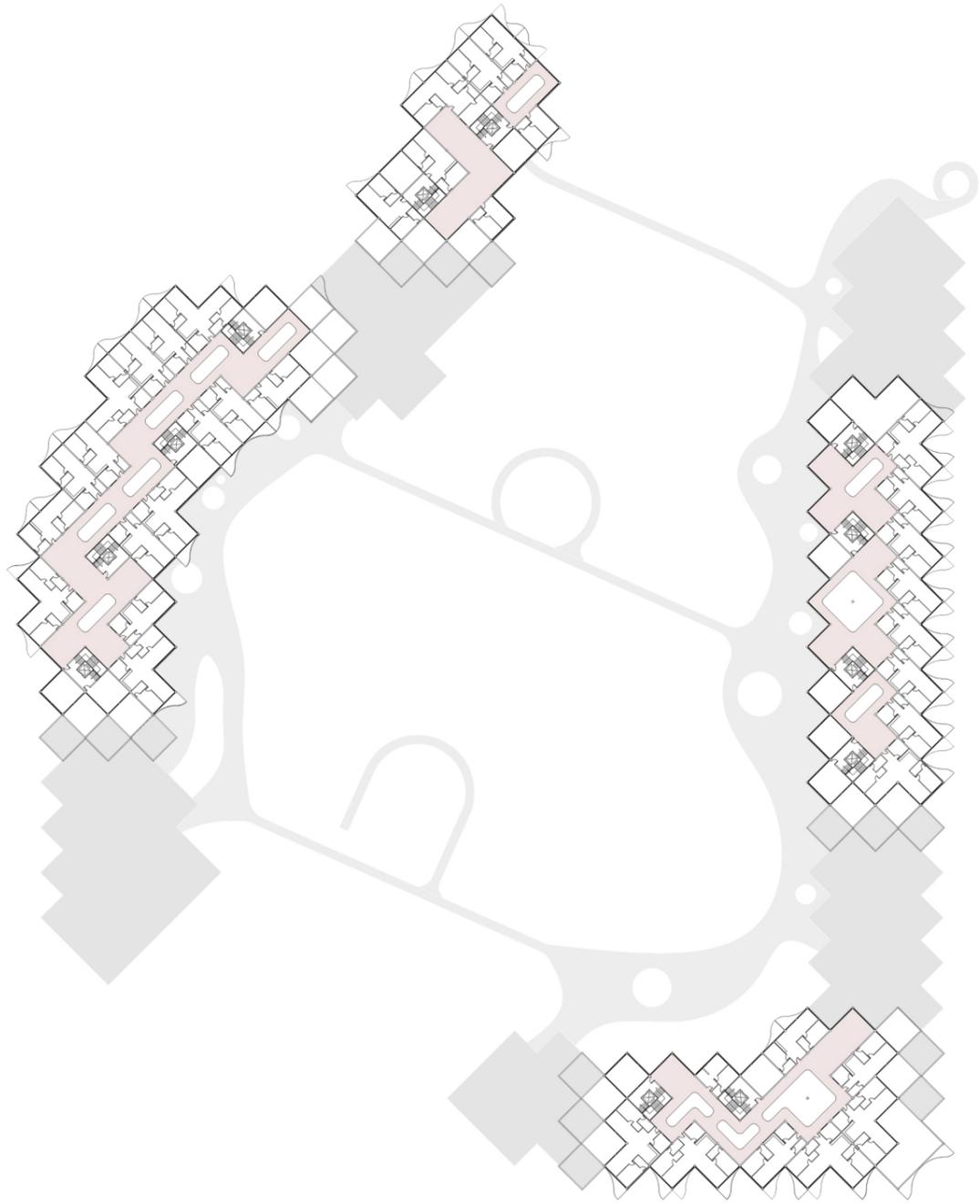
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Second floor plan



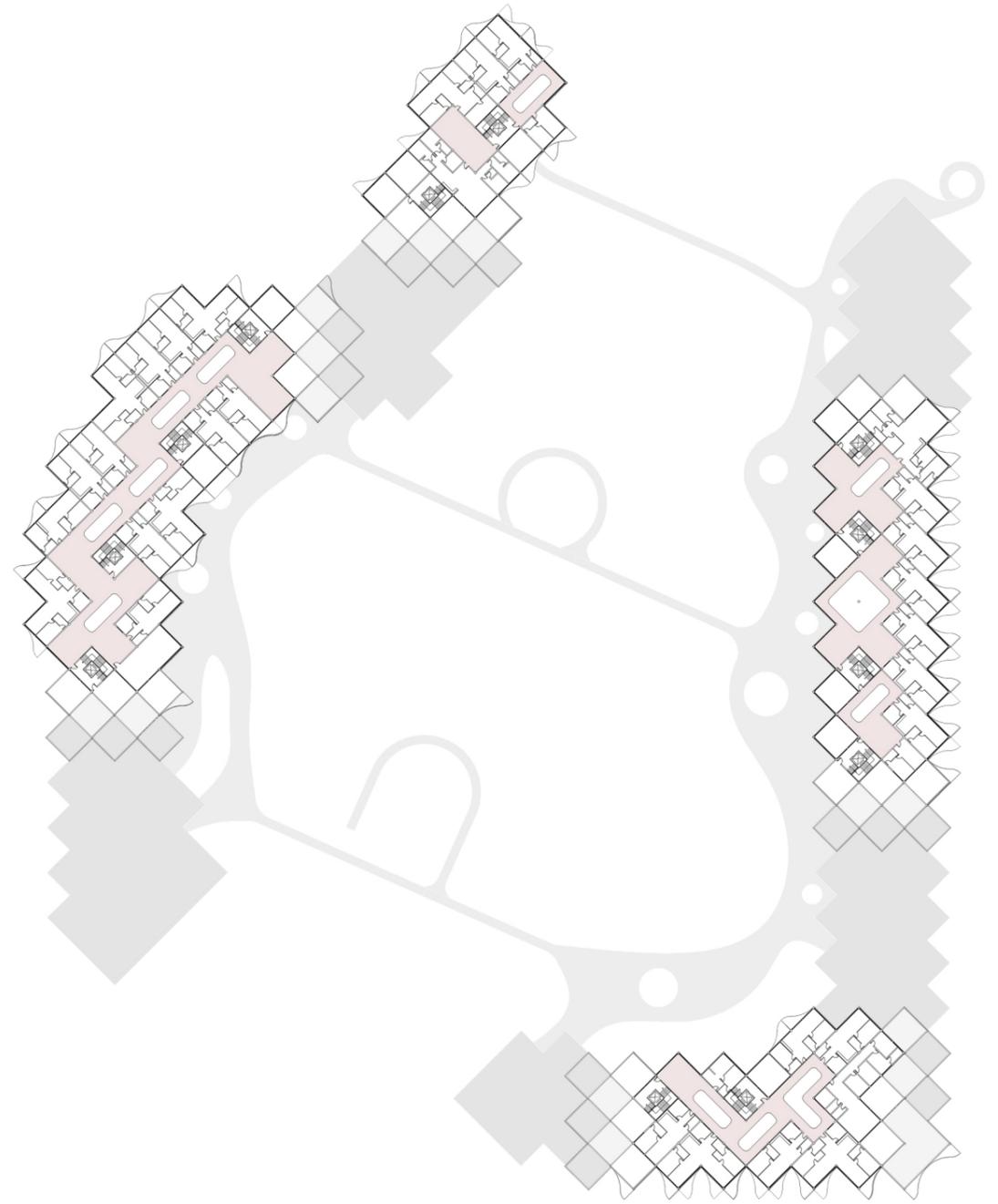
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Third floor plan



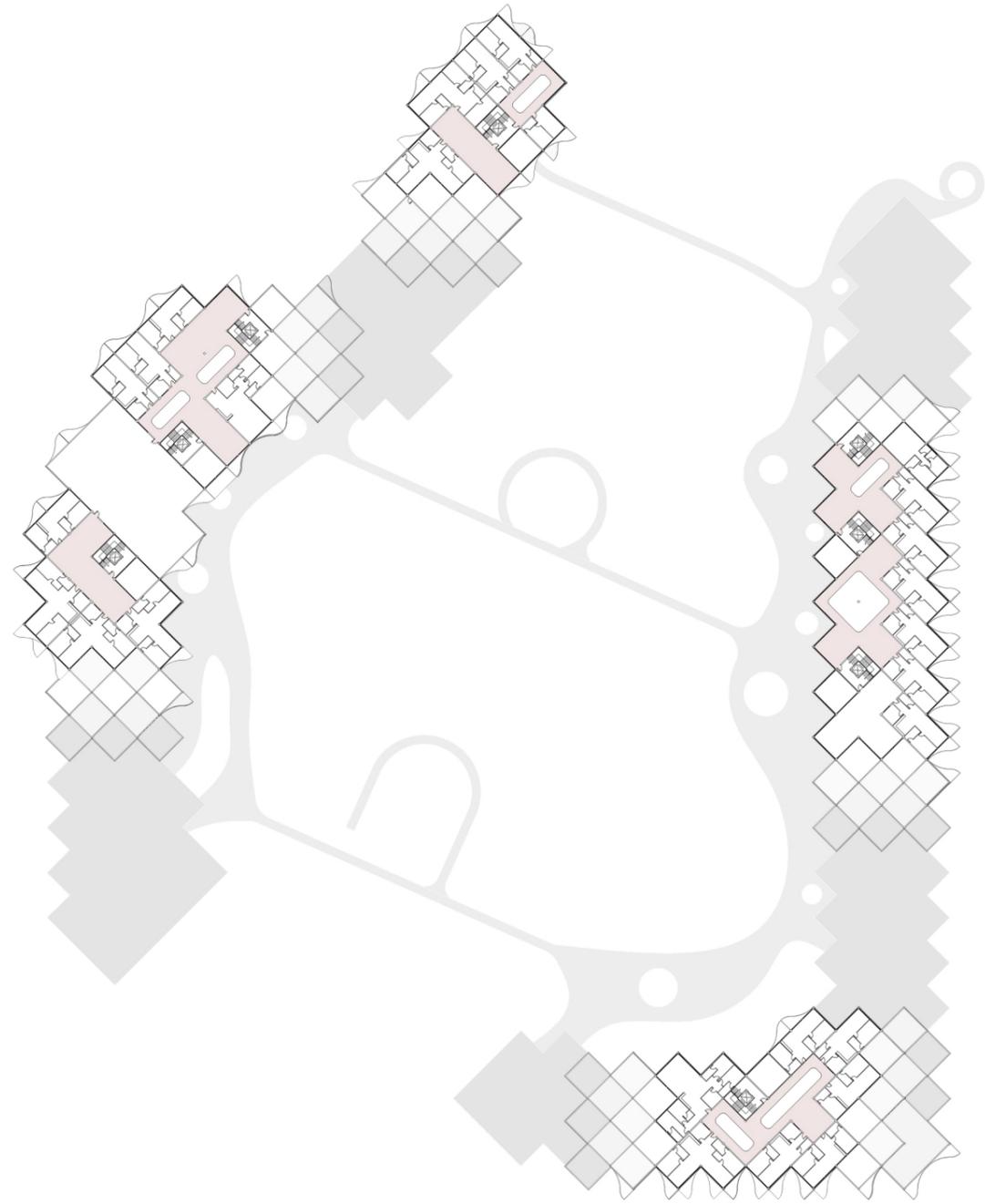
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Fourth floor plan



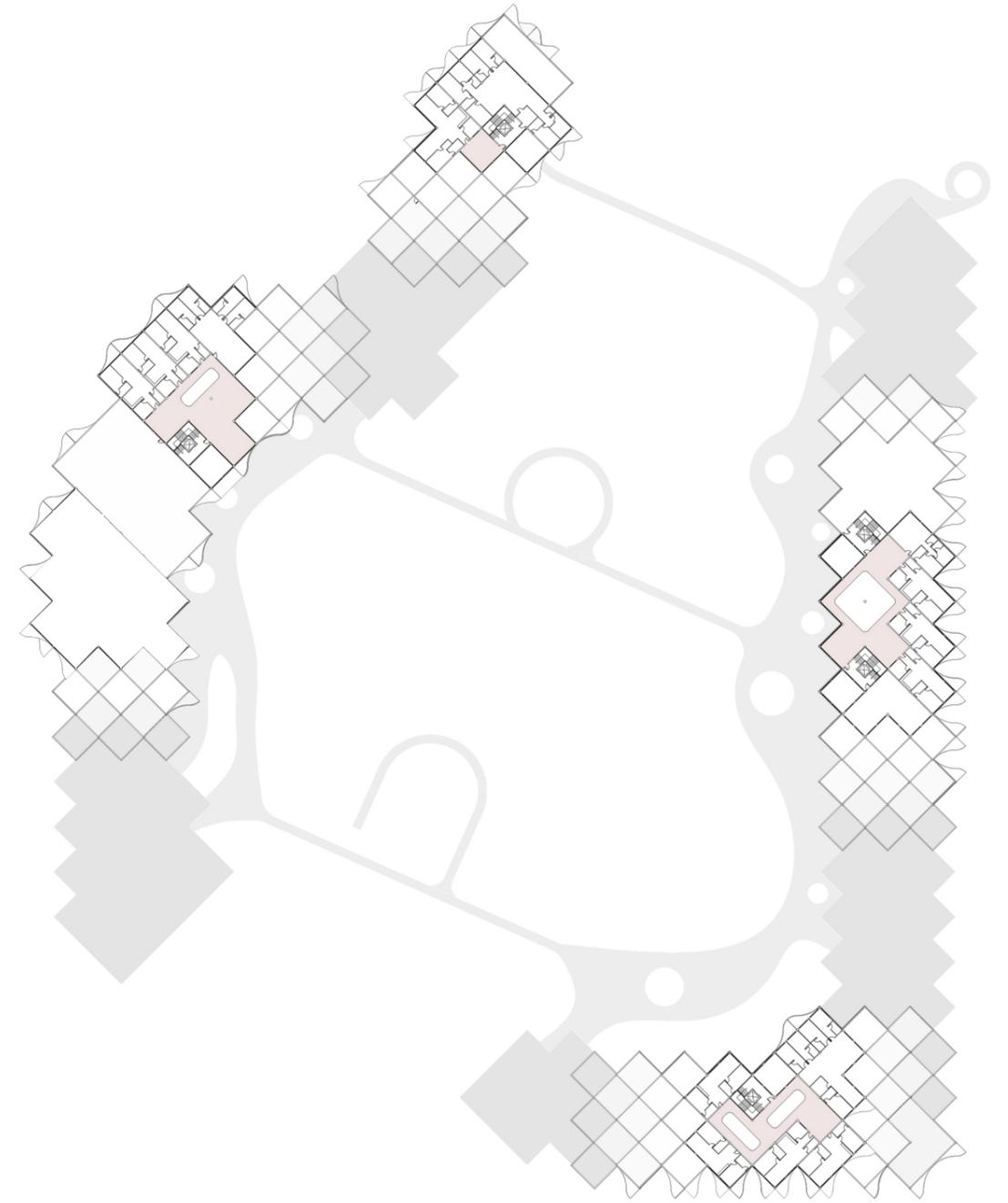
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Fifth floor plan



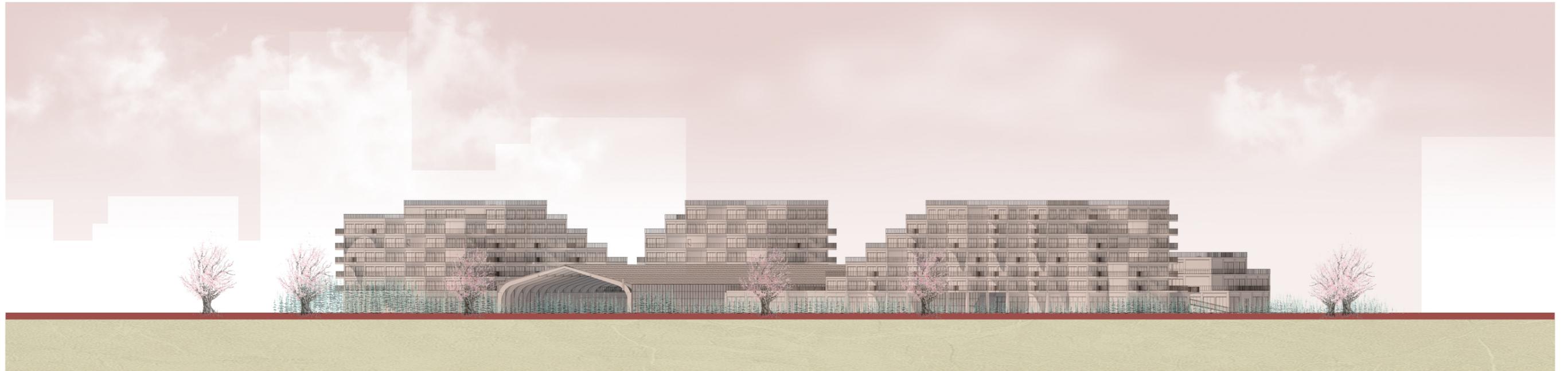
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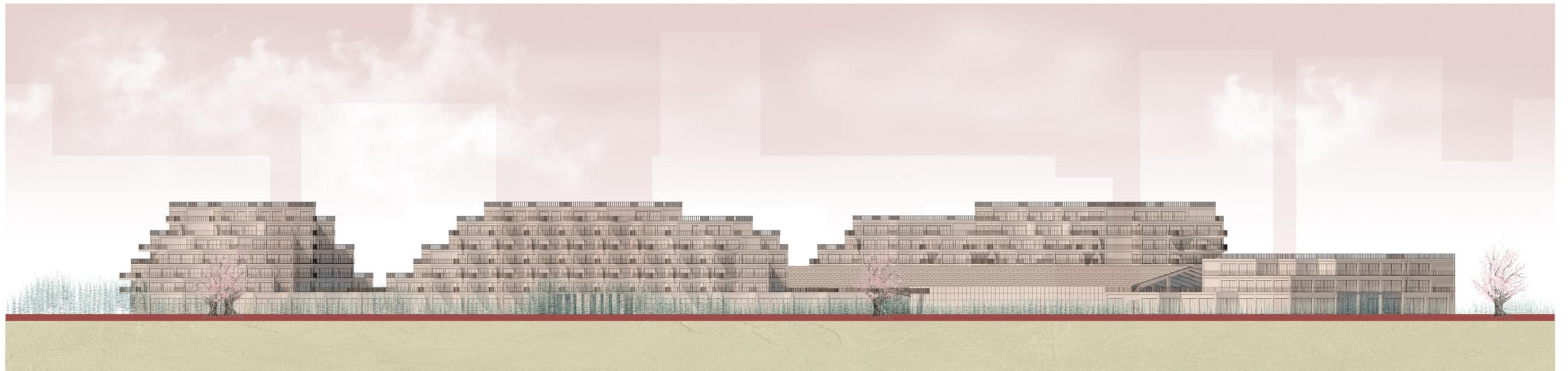
Sixth floor plan



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South elevation



East elevation

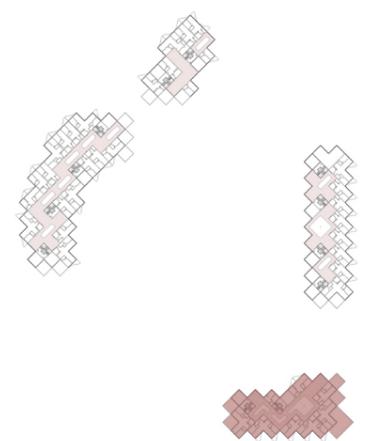


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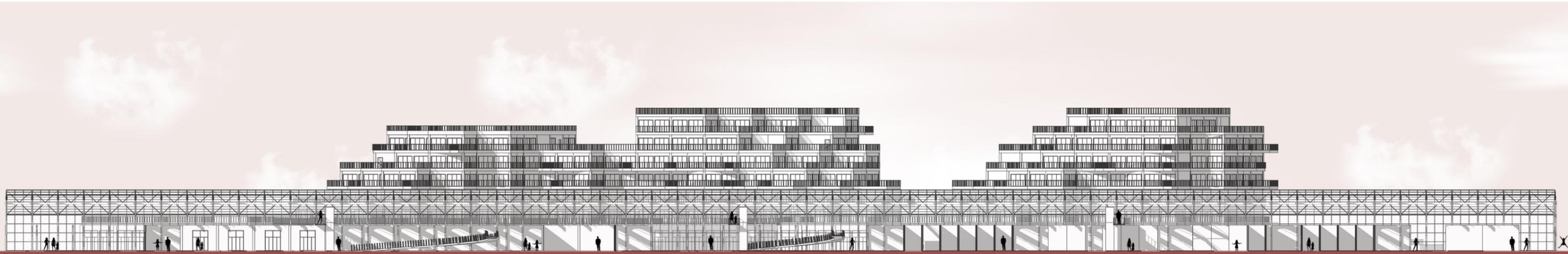
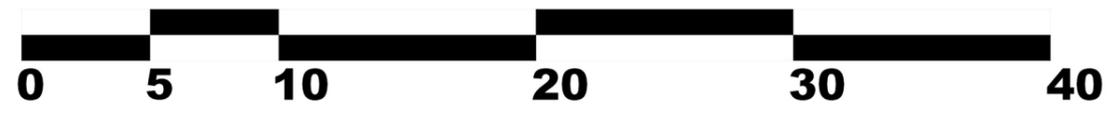




Third floor plan

Third floor plan

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Section of gallery

Connection of XLAM wall with roof slab

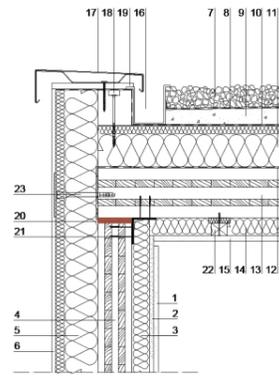
External plastered wall:

1. 12.5 mm thick plasterboard sheet
2. 12.5 mm thick gypsum fiber plate
3. Wooden frame structure filled with 50 mm panel
4. Supporting structure in XLam th. 95 mm
5. Insulating panel 120 mm
6. Finishing coat on skim coat with plaster holder net

Roof covering:

7. 60 mm thick gravel
8. Breathable waterproof sheath
9. Weakly reinforced slab for minimum 40 mm thickness
10. Containment sheet for the slab casting

11. Panel 120 mm
12. Steam control element
13. Load-bearing panel in XLam th. 140 mm
14. Pannello 50 mm
15. Lastra in cartongesso sp.12,5mm
16. Rainwater drainage channel
17. Shaped metal sheet flashing
18. Perimeter sawn
19. Closing table and support for the flashing
20. Material for acoustic cutting
21. Metal corners for joining the panels and taping for air tightness



Connection of XLAM wall with floor

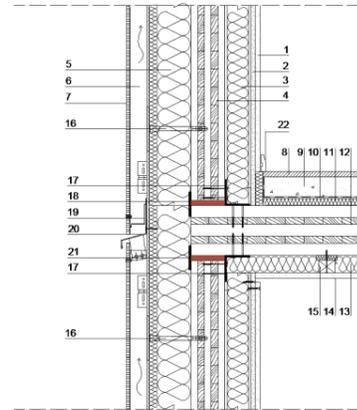
External ventilated wall:

1. 12.5 mm thick plasterboard sheet
2. 12.5 mm thick gypsum fiber plate
3. Structure with single metal frame in aluminum (Inter-cap.75 mm) filled with 60 mm panel
4. Supporting panel in XLam th. 95 mm
5. Insulating panel 120 mm
6. Aluminum substructure to support the cladding / Ventilated cavity 50 mm thick
7. Ventilated wall cladding with thin composite sheets

Intermediate floor:

8. Hardwood floor sp. 15 mm
9. Lightened screed for systems 60 mm thick
10. Sheet to contain the screed casting
11. Impact sound insulation panel 20 mm thick

12. Load-bearing panel in XLam th. 140 mm
13. Panel 50 mm
14. 12.5 mm gypsum fiber plate
15. Wooden frame to support the false ceiling with elements in resilient material to avoid the transmission of vibrations
16. Plug for mechanical anchoring of the insulating panel
17. Metal corners for joining the panels and taping for air tightness
18. External taping of the joints of the XLam panels
19. Insect protection net
20. Sheet metal profiled drip for interrupting the ventilation gap
21. Material for acoustic cutting
22. Skirting board



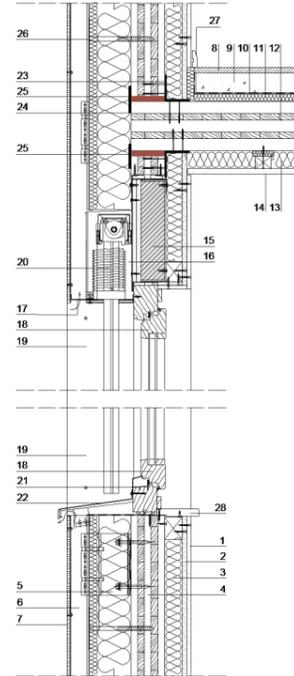
Window joint of the ventilated external wall in XLAM

1. Plasterboard sheet sp. 12.5 mm
2. Gypsum fiber sheet sp. 12.5 mm
3. Wooden frame structure filled with 50 mm panel
4. Supporting panel in XLam th. 95 mm
5. Insulating panel 120 mm
6. Aluminum substructure to support the cladding / Ventilated cavity sp. 50 mm
7. Ventilated wall cladding with thin composite sheets

Intermediate floor:

8. Hardwood floor sp. 15 mm
9. Lightened screed for systems th. 60 mm
10. Sheet to contain the screed casting
11. Impact sound insulation panel sp. 20 mm
12. Load-bearing panel in XLam th. 140 mm
13. Panel 50 mm
14. 12.5 mm gypsum fiber plate
15. Thermal break of the box sp. 80 mm
16. Galvanized box for sunblinds with front table and rear insulation
17. Insect protection net and profiled sheet metal drip
19. Perimeter closing element in wood
20. Sunscreen with adjustable louvers
21. Metal protection of the window frame
22. Flashing to remove rainwater from the facade level
23. Metal corners for joining panels and taping for air

24. External taping of the joints of the XLam panels
25. Material for acoustic cutting
26. Plug for mechanical anchoring of the insulating panel
27. Skirting board
28. Counter sill



Connection of the XLAM partition wall with floor

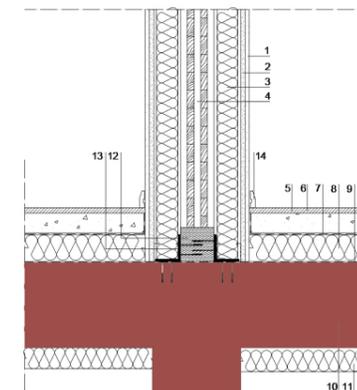
External plastered wall:

1. 12.5 mm thick plasterboard sheet
2. 12.5 mm thick gypsum fiber plate
3. Structure with single metal frame in aluminum (Inter-cap.75 mm) filled with 60 mm panel
4. Supporting panel in XLam th. 95 mm

Basic floor:

5. Hardwood floor sp. 15 mm
6. Lightened screed for systems 60 mm thick
7. Sheet to contain the screed casting
8. Insulating panel 80 mm
9. Bituminous sheath
10. Attic
11. Insulating panel 60 mm

12. Dock beam in larch, anchored to the base floor
13. Metal corners for joining the panels and taping for air tightness
14. Skirting



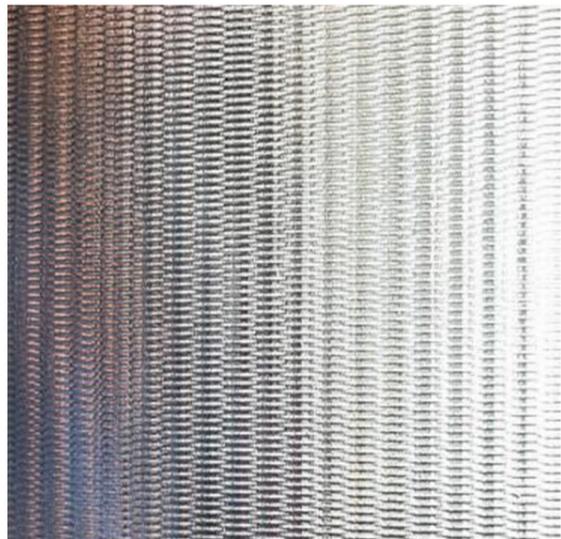
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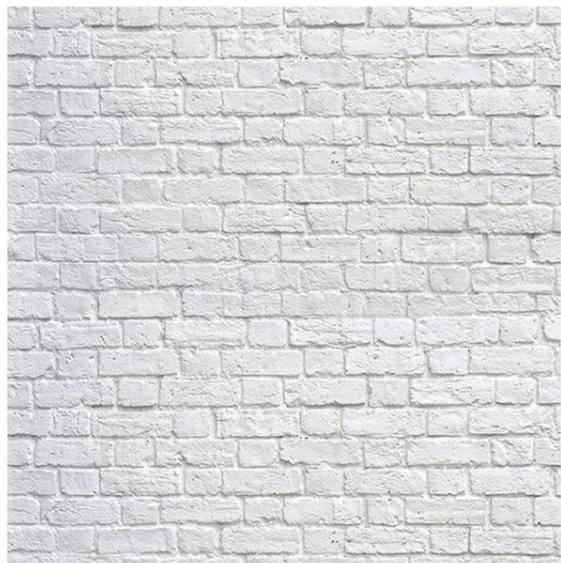
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Wooden exterior wall



Double layer low-e glass



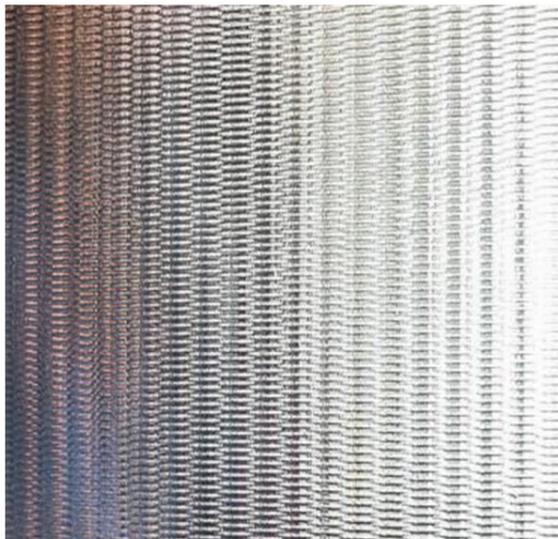
Brick wall with white paint



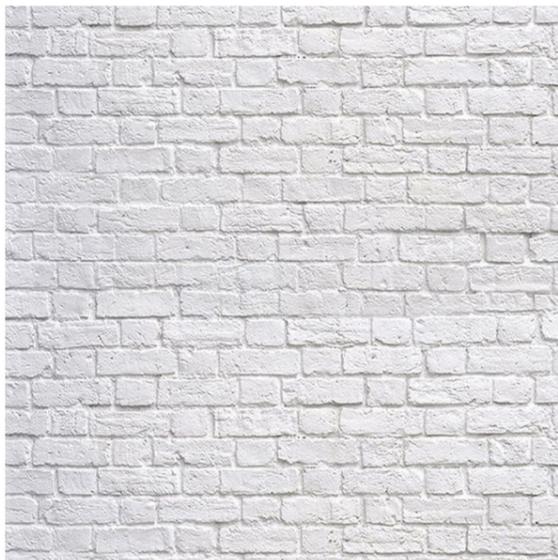
SCALE BAR 1:100



Wooden exterior wall



Double layer low-e glass



Brick wall with white paint



SCALE BAR 1:50

CONCLUSION

The old urban area of Guangzhou, China has entered a moderately aging society, with a high percentage of elderly people. Besides, the survey carried out highlights a serious problem of empty nesters. Moreover, the analysis of the family structure of the elderly in Guangzhou shows that the family structure of the elderly in Guangzhou can be divided into seven categories. After analyzing and expounding the behavior of the elderly in the use of space and their major needs, it is concluded that the elderly in the old city spend a lot of time on the road to meet their needs for life. When characterizing the elderly share of the population, it was found that a large number of elderly people still want to work after retirement, while the current nursing homes in China do not have a functional plan for the hobbies of the elderly.

After surveying the main elderly care institutions and models, it was concluded that a new type of elderly care building should be based on the sense of belonging to a community, which can meet the daily sociality needs of the elderly while providing them their own "private space" at the same time. Actually, private space here does not just mean "home", but a modern and flexible complex, with spaces for living, caring, practicing hobbies and working. In order to promote the communication and exchanges between the elderly in the community, the concepts of co-living and co-working were then put forward. Therefore, the residence of the elderly is basically divided into two parts: one is on the ground-floor, in a space mainly devoted to co-working, where elderly people can work together but which is also open to a public use. This area is flexible and multi-functional, being equipped with stores and common spaces, which can also be used for social rental and sales. The second part is co-living, on the upper floors. These co-living spaces are equipped with vertical and horizontal connections, which put into contact all the floors. In the common areas provided, elderly people

can eat together (co-eating), relax and entertain together (co-play), and socializing, strengthening the sense of "community". As for the private accommodations, different room types have been designed, according to the different family structures and financial possibilities. These innovative structures, combined with the dimension of the smart systems brought by the 5G high-speed Internet era, could make elderly people live better, sharing community resources and working efficiently. In fact, thanks to the intelligent controls imagined, it is also provided a safer and more comfortable environment, where elderly people will love life more and enhance their physical and mental health. The two functional parts (the co-working one and the residential one) are immersed in a pleasant context, where the public space hosts a big multifunctional gallery. It provides spaces for Work sales area, LAB, Collection exhibition, Marketplace, making it possible to attract people from the surroundings and converting this desert plot into a living neighborhood. Physically, it also connects the whole area in a formal and functional sense. Moreover, the public spaces and the gallery are joint together thanks to an innovative bike and pedestrian path, which enters directly the buildings and make it possible to read the public areas as a unique environment, which links the indoor and the outdoor dimensions. Finally, this connection is enhanced by the massive presence of greenery, declined in public, semi-public and private areas.

The original intention of the project was to consider the design of senior housing for elderly people with different structures and functions, according to renewed proportions. It is wished that this new type of elderly care model will be popularized by the Chinese public sector in the next future.

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