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Spatial planning of linear streets based on the concept of

agro-tourism

Taking the village of Beijing, China as an example

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Abstract

As a product of the rapid urbanization process, suburban villages in large cities have blurred the traditional urban-rural boundaries and industrial models, and become experimental bases for rural development such as rural tourism. Currently, the combination of agriculture and tourism is a very representative solution for rural revitalization in China. While tourism is booming, the quality of rural public spaces has received unprecedented attention.

Street space planning has always been an important part of urban and rural design. It is also an easily overlooked part in the process of rural revitalization, but it is the part that accounts for the largest proportion of space. Streets are important linear elements of public space, and exploring the inherent laws of their vitality is of practical significance for improving the quality of public spaces. Current research on street quality is biased toward quantitative research on multiple street big data and cannot be implemented into fine-scale designs.

Given these premises, this thesis studies in detail the case of the village of Chechang, significant for its dual landscape and social value, so much so that it is defined as a "scenic point & community", and delves into the study of linear road space on a local scale, identifying their potential as important axes of public space, commercial and tourist areas in the suburban villages of large Chinese cities. By delving into the "flow space" and "field space" in spatial planning, the transformation of street space into "pedestrian areas" and the formation of public urban spaces along road axes is proposed.

Keywords: rural revitalization; agricultural tourism; street space; "walking" and "stopping"

Part I. Introduction

1. Background of rural China

Since the reform and opening up of China more than 40 years ago, China's urbanization and modernization have experienced rapid development. In this process, as the focus of the Party and the government at the beginning has been biased towards urban development, resulting in urban and rural residents in terms of income, social security, and basic public services compared to the city is still lagging in comparison, especially in recent years, the rural population is seriously hollowed out, empty nesting[1] accelerated, the dramatic loss of talent, the development of the countryside is faced with a variety of developmental dilemmas such as old age before getting rich, lack of industry new. The decline and revitalization of the countryside is a common problem in the modernization process of Western and Chinese countries.

1.1 Population movements

· Population
China has historically been a rural society, and the rural resident population has long been in the majority. Even for a long time after the founding of New China, China's rural resident population continued to increase until 1995, when the size of the rural resident population reached a peak of 859 million [1]. However, as the urbanization process continues, the urban and rural populations are gradually becoming saturated, and since 1996, China's rural resident population has begun to show a declining trend, and the rural resident population will likely continue to decline in the future: it is projected to fall to 450 million by 2025. However, because the urbanization rate of China's household registration has long lagged behind the urbanization rate of its resident population, the rural household population is still large. in 2020, China's household registration urbanization rate will be 45.4%, which means that there will still be 770 million rural household residents [2]. A large proportion of this population is employed and living in urban areas, and although some of them are still likely to return to live and work in the countryside, the rural working-age population and the employed population are still declining, both in terms of the total number of people and the proportion of the national population, as well as in terms of the proportion of the total resident population in the countryside.

Another problem facing China's population in general at present is population ageing; influenced by the movement of young people, China's rural population is ageing to a degree that exceeds the national average. Owing to geographical deviations, the characteristics of the rural population vary slightly from region to region; on the whole, the rural population has a broad distribution of age groups, with young people and the elderly predominating. According to the data, in recent years, the elderly population over 60 years old in the rural

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[1]Empty nest：*refers to families in which children have grown up and separated from their parents' families, leaving only the older generation to live alone. Empty nesting is an inevitable result of socio-economic development and social transformation.*

population has been rising year by year and has accounted for more than 50% for four consecutive years [3]. While the youth population is gradually decreasing, a large number of left-behind people have appeared, such as left-behind children, women, the elderly, and older bachelors, the scale of special populations in the countryside is getting bigger and bigger, which has become the key to maintain the development of rural families and social stability.

· Mobility

Urbanization continues to advance, making the problem of rural population mobility increasingly prominent. The slow economic development of rural areas and the habit of young people going out to work in search of better life opportunities and income have contributed to the constant flow of surplus labour from the countryside to the cities. As a result, the problem of ageing and hollowing out of rural areas has worsened, and the vitality of village development has been insufficient. Most of the young and middle-aged labourers who go to the cities to work gradually reduce their willingness to return to their hometowns after adapting to urban life, resulting in a serious phenomenon of population loss in the villages. At the same time, with the large influx of people with culture and skills in the villages going to the cities, the inheritance of the traditional culture is weak, and some of them are even facing the loss of the traditional culture, and the phenomenon of its withering is getting more and more intense, which aggravates the phenomenon of the decline of the villages [4].

The basic reason for the gathering of foreign population to the villages in the urban fringe area is the relocation of urban industries, which brings about the relocation of jobs [5]. The local population or foreign population originally living in the city is forced to move to the urban fringe villages, the local population chooses to work in the urban fringe villages during the day and return to live in the city at night according to the distance conditions, while the foreign population will be more inclined to live close to the city, firstly because of the distance advantage, and secondly because of the inexpensive rent. Villages in urban fringe areas are subject to unprecedented challenges to their living environment, public service facilities and level of municipal infrastructure as a result of population growth, and these challenges have a greater impact on the spatial layout and planning control of villages.

Changes in the population of villages have a great impact on village construction. Changes in population size will trigger the expansion or merger of villages, and villagers' residential characteristics and the actual needs of production and life are integrated with the issue of village development. To promote people-centred village construction, it is necessary to consider both the household population and the resident population and differentiate between peak-season and off-season populations in villages based on the changes in the village's household registration, from which we further propose the concept of the population change interval for village construction This will lay the foundation for planning the allocation of basic public service resources for rural construction.

1.2 Land use and industrial structure

China has a land area of 9.6 million square kilometres, while the countryside covers 8.86 million square kilometres, accounting for 92% of the country's land area. China is a traditional agricultural country, agriculture and rural farmers have always been major political and economic issues related to the quality of life of the people of the country, the foundation of industrialization and the development of urbanization in-depth development, in China there is "agricultural abundance is the foundation of a strong, rich farmers is the prosperity of the country, rural stability is the security of the community [6]" said. China's land resources have more mountains, less flat land, less per capita possession and other characteristics, although in recent years, following the trend of rapid socio-economic development, the agricultural technology and production equipment have greatly improved the output level, agriculture with the characteristics of the food by the sky, the land's natural weaknesses so that agriculture can withstand natural disasters ability is low, and occasional extreme weather will lead to a huge reduction in production, low efficiency, so relative to the industrial production, agricultural development has long been relatively lagging. Therefore, relative to industrial production, agricultural development has been lagging for a long time.

In the face of such a rural predicament, the realization of industrial revitalization has become a key strategy for rural revitalization, and rural industrial integration is an important way to realize rural industrial revitalization and the first task. Under such a setting, China's countryside aims to realize the in-depth integration and development of one, two, and three industries[1], aiming to promote the interpenetration and coordinated development of industries, which in turn promotes the generation of new business models. This is the necessary way to realize the transformation from traditional agriculture with a single planting and planting production mode to modern agriculture[2] with the integration of the three industries, and it is also an important material basis for realizing agricultural efficiency, farmers' income, and rural prosperity [7].

Excluding the agricultural industry, the emergence of non-agricultural enterprises in rural China (townships, villages and private enterprises) and their rapid growth in recent years is a striking phenomenon in the context of the new era. Almost overnight, there has been a dramatic expansion of industrial activity and a proliferation of enterprises. These changes have led to a significant increase in the incomes of rural residents and major changes in the structure of the rural labour force. In the more developed regions, industrial diversification will be reflected, with the emergence of sizeable enterprises that have a large share of the domestic market, while at the same time there are significant geographical differences in

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[1]*The criteria for classifying the three industries vary from country to country, while China's classification criteria are as follows:Primary industry: agriculture (including forestry, animal husbandry, fisheries, etc.); secondary industry: industry (including extractive industries, manufacturing, water supply, electricity, etc.) and construction; tertiary industry: industries other than the above-mentioned industries.*

[2]*Mono-tillage, mono-crop, or monoculture refers to agricultural practices in which a particular crop is produced and grown over a wide area.*

terms of ownership, institutional arrangements, level of development and degree of industrialization [8]. "Relying on the mountains to eat the mountains, relying on the water to eat the water" - different villages have different village appearances, these differences in the natural environment will affect the spatial structure of the village and the village architecture, which makes the village's unique traditional rural culture industry shows great development space and This makes the unique traditional rural cultural industry show great development space and potential, and various industrial forms such as folk handicraft industry, rural tourism, leisure agriculture, rural performing arts industry, characteristic small towns, idyllic garden complex and so on appear one after another [9], and the rural cultural industry has already become an emerging industry driving the transformation of the rural economic structure and an important force promoting the construction of the modernization of the countryside.

1.3 State of governance development

Contemporary China's rural governance system, that is the organizational system of rural governance and its mechanisms in the context of villagers' autonomy. Its basic situation is that the national grassroots power is established in townships and villages, and villagers' autonomy is practised in villages of rural grassroots communities [10]. In the course of its development, Chinese peasants have experienced first land reform and then a series of progressively escalating higher forms of collectivization, and the collectivization of China's rural areas has been one of the greatest efforts to reorganize people's lives and livelihoods in the history of the world. In the 1950s, successive waves of revolutions swept through nearly one-sixth of humankind, culminating in the formation of a system of collective agriculture [11]. Collectivization not only entailed an entirely new system of property ownership; it also gave rise to new types of working relationships. The rapid development of many township enterprises and industrial parks, and the rapid expansion of cities have made land tense, and arable land in the vast rural areas, especially on the edges of cities and towns, has been occupied on a large scale; the industrial wastes generated by these industrial parks are arbitrarily piled up in the rural areas, as well as the wanton discharge of industrial wastewater, which has caused the ecological environment of the countryside, such as the arable land, forests, waterways, and meadows to suffer from the destruction of different cities. The relative lag in the construction of environmental protection facilities in rural areas, as well as the lack of effective supervision of polluting enterprises, makes the degradation of the ecological environment in villages more and more intense [12].

In the whole academic development process of rural governance[1] research, in the research methodology from a single perspective to the integration of multiple perspectives and methods; in the main body of the research from the village research to regional research; in

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[1]*Rural governance means "the organisation and management of public affairs of rural communities by rural public power, guiding and regulating the behaviour of villagers in various relationships and systems, emphasising the co-operation between the government, villagers and self-governing organisations, in order to maximise the promotion of the public interests and social development of the rural community."*

Source：许婷.乡村治理的运行模式:浙江温岭"官治—自治"双轨制的经验研究[D].浙江： 浙江大学，2007

the focus of the research from the study of the internal process of the village to the study of the external environment of the village [13]. In the process of village governance and development, village governance subjects, objects and governance environment interact with each other and jointly affect the configuration and operation of village public resources. These processes correspond to the development process of village revitalization.

2. Background of the study on rural revitalization

2.1 Current situation and policies of China's rural revitalization

2.1.1 Current situation of rural decline in the past urbanization

The long-standing dualistic system between urban and rural areas in China has resulted in the problem of excessively rapid urban development and generally slow development in the countryside, with an obvious gap between urban and rural areas. In terms of urban development space, the city and the countryside do not exist independently but are interdependent, in the past, urban spatial development relied more heavily on the countryside to support the city, with the countryside providing the means of production and living needed by the city and safeguarding the city's ecological space, while ignoring the elements of development that the city brought to the countryside. The existence of barriers to household registration between cities and villages, the obvious differences between urban and rural resource allocation, the rapid development of cities, and the uneven development of urban and rural areas are reflected in several specific ways:

· **Population loss:**
The rapid movement of the rural population to the cities has led to a steady decline in the rural population, and the "hollowing out" of villages is becoming more and more serious.

· **Decline of traditional culture:**
The development of urbanization and marketization has accelerated the pace of life of the residents, and in the era of fast food, people's energy is more easily attracted by new things, and more people tend to be attracted by the "Netflix" effect of the big cities, and the inheritors of the traditional culture in the villages or the cultural skills of the population are also flocking to the cities in large numbers, and in addition, the ecological tourism resources in the villages have also been over-exploited, all of which have made the village "hollowed out". In addition, the ecological tourism resources in villages have been over-exploited, which has caused a great impact on the traditional culture of villages.

· **Degradation of the ecological environment:**
Rural environmental issues are important livelihood issues, involving the quality of life of urban and rural residents, as well as national food and ecological security. In the construction of new rural areas, due to the rapid development of agricultural intensification and the transformation of rural production methods, the modernization of rural residents' lifestyles, the use of scientific and technological equipment, such as flush toilets, the gradual

spread of plastics and electronic waste in domestic waste The ingredients such as these are increasing and are not treated in time and are directly discharged into the environment. A large amount of garbage accumulates, polluting rivers, ponds and farmland around the countryside, which will rapidly deteriorate the rural living environment [14].

2.1.2 Now, under policy adjustments, China's urban-rural relations have entered a new stage of integration：

In the 70 years since the founding of New China, China's urban-rural relations have gone through a stage of formation and solidification of the dual structure of urban and rural areas, a stage of adjustment of urban-rural relations, a stage of integrated urban-rural development, and a new stage of urban-rural integration and development, which is currently underway:

• **1949-1978：Formation of the dual economic structure after the New China found**
At the beginning of the founding of New China, to get rid of its backwardness as quickly as possible, China established an industrialization development strategy that gave priority to the development of heavy industry. During this period, urban-rural relations were at the stage of division; to promote urbanization, the national policy of giving priority to the development of heavy industry led to restrictions on the development of agriculture; a large amount of rural capital flowed to the cities to provide primitive accumulation for the industry and to promote industrial development; various favourable policies were tilted towards the cities; the difference in the allocation of resources resulted in the incoordination of urban-rural development and the relationship between the peasants and the workers became seriously imbalanced, resulting in the obvious division of the countryside from the cities. , widespread poverty in rural areas, the gap between urban and rural areas has widened, and it is difficult for urban and rural factors to flow with each other [15].

The large-scale industrialization construction has brought many adverse effects, a large number of rural population influx into the city, resulting in the expansion of the food supply gap, supply tension, which artificially cut off the link between farmers and the market, agriculture not only to provide funds for industrialization but also to alleviate the pressure of urban employment and indirectly maintain the social stability of the city[16], the urban-rural dual economic structure system is solidified, the urban-rural contradiction is deepened.

• **1979-2002：Relationship adjustment**
With the development of the economy, the state began to pay attention to the development of rural agriculture, the industrial structure between urban and rural areas changed, and the allocation of resources was re-optimised, easing and re-adjusting the flow of factors and resources between the city and the countryside, the farmers were given resources, the enthusiasm for production was improved, the rural industrial and agricultural industries began to develop slowly, and the income level of urban and rural residents gradually increased.

However, after the 1980s, the centre of national development shifted from the countryside to the cities, and the allocation of resources tended to be more oriented towards the cities, so that an imbalance in development between urban and rural areas once again emerged, and a larger income gap compared with that in the cities made the dual economic structure of urban and rural areas still obvious.

• **2003-2017：Integrated development**
After entering the 21st century, with the rapid development of China's urban economy, the "Three Rural Issues" have gradually worsened, and the problems of agriculture, rural areas and peasants have had a serious negative effect on China's economic development and long-term social stability. Therefore, to promote the coordinated development of urban and rural areas, the policies and institutions for the extension of cities to rural areas and the transfer of rural residents to cities have been gradually improved. improved, which has led to a certain easing of the dual economic structure between urban and rural areas and a narrowing of the gap between urban and rural areas.

Since the 18th National Congress of the People's Republic of China, with the introduction of the new urbanization strategy, the relationship between urban and rural areas has moved towards integration, with local finances tilted towards the rural areas, and with the two-way flow of factors between urban and rural areas, the characteristics of the urban-rural dichotomous economic structure have gradually been blurred.

• **2017 - present：Integration and development**
The theory of urban-rural integration was jointly proposed by Engels and Marx in the early 19th century, and the emergence of the theory signalled that the problem of urban-rural contradictions brought about by the high-speed urban development of the Western bourgeoisie had already become apparent. Marx pointed out that the urban-rural contradiction was intensified in the early stage, but would gradually fade away with the transfer of development relations in the process of urban development.

Under the guidance of the overall urban and rural development strategy, the urban-rural gap has gradually been controlled, but the narrowing of the urban-rural gap during this period is still preliminary. Urban-rural Transformation and Development The 19th National Congress of the Communist Party of China also put forward the idea of integrated urban and rural development in the rural revitalization strategy. The concept of urban-rural integration points out the direction for future urban development and construction, changing the previous single output structure of rural areas to cities and fully integrating urban and rural areas.[17]. This is a major strategic deployment made based on summarising the historical experience of urban-rural development, focusing on the actual development of the current urban-rural relationship and the development trend of the new urban-rural relationship in the future, and also marks a fundamental adjustment of the policy orientation of the urban-rural relationship.

2.2. Future challenges for suburban villages in the accelerated urbanization process

In the process of rapid urbanization, suburban villages are susceptible to direct radiation from cities and towns, and have become the areas with the fastest rate of development and change, as well as the areas with the most serious and exposed problems; urban development is changing rapidly, and the differences in scale, economy and population have made the gap between urban and rural areas around them huge, with the level of rural development lagging behind that of cities and even nearby towns. Combined with the characteristics of marginal areas, the problems of governance in marginalized villages are manifested as follows:

· Outstanding contradiction in the construction of houses by farmers:
With the increase in the volume of urban construction activities, the extension of town boundaries, etc., some agricultural land in villages is expropriated for real estate or industrial land, and villages are occupied, resulting in the original structure of villages being disrupted, and the deconstruction and reorganization of villages leads to passive urbanization due to the unequal distribution of demand and supply, resulting in the transformation of villages into urban villages. The occupation and demolition of farmers' residences will also be involved, so there will be some conflicts over the construction of houses by farmers. For example, in the planning of villages, there are problems of illegal construction due to the negligence of new housing and the renovation of old houses.

· Destruction of ecological environment:
With the rapid development of industrialization, there is noise and exhaust gas pollution, and the rubbish produced by industrial migration pollutes the soil, water source and air of the surrounding villages, which, together with the ineffective ecological control, leads to the gradual aggravation of environmental pollution in villages in the fringe areas of the towns and has already affected the villagers' daily production and life.

· Low public facility configuration:
At present, there is the problem of imperfect public facilities in the construction of public facilities in the villages on the outskirts of towns. There are a small number of basic public facilities in the village, such as the village committee, the senior citizen activity centre and the health room, but there is a lack of commercial, cultural and recreational facilities, and the public facilities are small in scale. At the same time, there are problems of arbitrariness in the erection and laying of signals, electricity and pipelines, which is not conducive to improving the aesthetics of the village [18].

3. Characterization and regeneration of marginal urban suburban villages

The urban fringe is located on the periphery of the built-up area of the city, in the transition zone between the city and the countryside(Fig. 1). In the process of urbanization, when the city continues to expand outwards, it will bring about the transfer and diffusion of urban

elements and service functions from the urban centre to the peripheral areas. Suburban villages are affected by the frequent traffic links and material interactions with urban areas and rely on the city to show a trend of growth, so their spatial structure is often in a dynamic change, showing the characteristics of a mixed urban-rural dual structure: significant location advantages, obvious land resource advantages, and at the same time, both urban and rural characteristics, manifested in the demographic, economic, social, and land-use modes of the mixed nature of the village.

| Urban | Urban fringe villages | Suburban villages | General villages |
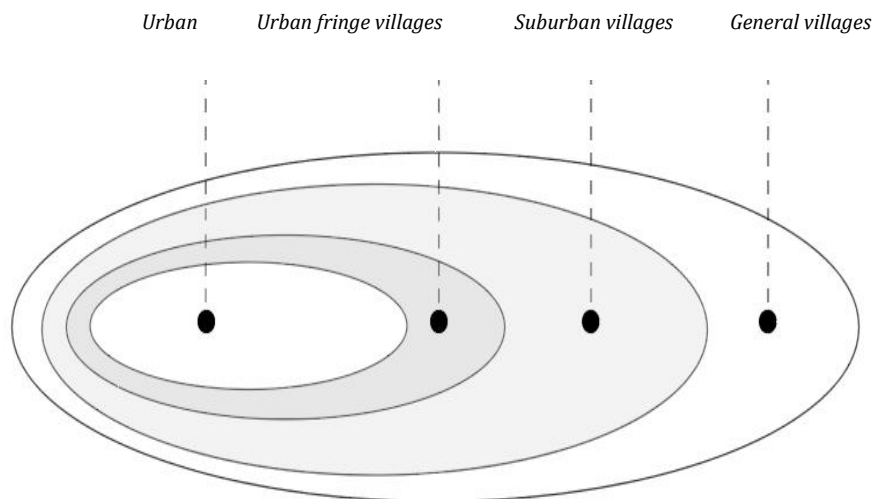
（Fig 1：Classification of urban-village relations   Source: Author's self-drawing）

The rural characteristics of suburban villages are mainly manifested in a more beautiful natural environment, cheaper land costs, the maintenance of some traditional rural life, beautiful natural scenery and an idyllic atmosphere. Its urban characteristics are mainly expressed in the aspects of residence, culture, employment and consumption, etc. Compared with the suburban villages and general villages, the urban fringe villages have better industrial infrastructure conditions, more perfect infrastructure construction, more convenient external transport and a higher level of public services, and the villagers' overall economic conditions are more optimistic, with diversified employment modes and a higher level of economic development.

Differing from general villages, the characteristics of urban peripheral villages make them become the key areas where the flow of people, logistics, capital and information flows into the city, and they are also the areas that are most directly affected by the activities in the city, which makes the original suburban villages with a single nature of land gradually evolve into areas with diversified characteristics of the nature of the land, and the villages in the urban periphery that are dominated by the primary industry are gradually transformed into urbanized areas with the common development of the primary, secondary and tertiary industries.

Under the background of urban-rural integrated development and rural revitalization strategy, the construction of villages in the peripheral areas of large cities has a frontier advantage and is more representative, which is also the focus of this paper.

4. Necessity and ways to revitalize rural agrotourism

From a spatial point of view, rural tourism refers to the form of tourism that takes place in the suburbs of metropolitan cities and further rural areas, integrating the needs of viewing, investigation, learning, experience, entertainment, leisure, holiday, shopping, health care, and old age with the natural landscape of the countryside, the agricultural landscape, the landscape of the rural settlements, the culture of the countryside, the culture of farming, the culture of the folklore, the way of life, and other tourist attractions [19].

The countryside has differences from the city, different from the city scenery and commercial atmosphere, the countryside is mainly a natural idyllic landscape based on the agricultural planting industry, which is a slow-paced lifestyle different from the fast-paced lifestyle of the city.Rural areas have rich natural resources and agricultural resources, pure folk customs and deep cultural heritage, giving rural tourism new missions and opportunities. The development of rural tourism can meet the diversified needs of tourists, improve the public infrastructure and service functions of rural areas, and optimise the spatial structure of the countryside.

4.1 The guiding role of rural tourism

In the context of rural revitalization, rural tourism can guide the various resources in rural areas and ensure a rational flow of resources, thereby optimizing the spatial layout of urban and rural areas. Through the development of rural tourism, it can ensure the implementation of the strategy of rural revitalization. Rural tourism plays an important role in guiding the revitalization of the countryside, changing the unidirectional mode of industrialization and urbanization over the long term, and driving the countryside is no longer a linear development, but rather a unification of the role of the countryside[20]:

· Rural tourism connects the city, promoting the development of suburban integration class villages:
The biggest characteristic of the village of suburban integration category is that it is closely connected with the city, and through the circulation of rural tourism, it promotes the integration of the relationship between the city and the countryside, the integration of resources, the integration of the economy, the integration of the population, and the integration of the land. Through the integration of urban and rural areas, it improves the poor urban-rural dual structure at the present stage.

· Promote the improvement of rural infrastructure：
The development of rural tourism will introduce more people, so it is necessary to accelerate the construction of public infrastructure, such as the optimization and transformation of facilities such as running water, electricity, gas, network, etc., to improve the level of health in rural areas, to expand the coverage of the network and various types of infrastructure, to ensure that rural residents can enjoy all kinds of convenient and modern services, including health care, education services, financial services, etc., and at the same time, according to the needs of tourism and the propaganda of traditional culture, to promote the development of

rural infrastructure. In line with the needs of the tourism industry and the promotion of traditional culture, art galleries, libraries and other cultural venues should also be built to provide rural residents with more cultural services. It is also necessary to pay attention to the expansion and maintenance of roads so that only when the roads are open and the ground is level, urban travellers can more easily reach rural tourist attractions for tourism consumption.

· Promote the upgrading of rural industries：

With the construction and development of transport conditions as well as other infrastructure, the fragmentation that existed in the past between the city and the countryside is constantly changing, and suburban villages are also experiencing a period of economic transition, with an increasing number of countryside industries, a more and more perfect industrial system, and the links between various industries are gradually being paid attention to. Through the implementation of industrial planning, the scale of the industry is continuously expanded to promote the development of the agricultural industry, help farmers increase their income, and realise the linkage effect. At the same time, attention is paid to the development of derivative industries, by market demand and modern people's preferences, in line with the wave of the new era, to carry out industrial innovation activities and increase the added value of the industry.

With the rural tourism industry as the foundation and agricultural ecology, and life and production as the core, through the analysis of the development status quo of rural tourism, it is found that every model formed by the integrated development of rural tourism and agriculture is based on the characteristic advantageous industrial resources in the local region. The degree of differentiation of its industrial resources is crucial to creating a competitive rural tourism brand image. For example, the model of tourism and agricultural development based on the tea industry contains both the development of cultural and creative products and the ecological experience of tour products formed by integrating with the local environment [21].

4.2 Tourism revitalization approach

In the "tourism industry development type" of rural revitalisation in urban fringe areas, the excavation of tourism resources in villages is an important path for spatial reconstruction. Through the classification of tourism resources, different tourism themes can be created, relying on the natural ecological environment of the village to form a tourism industry chain:

· Developing characteristic creative tourism：

Including the planning and design of planting and picking gardens, leisure fishing gardens, parent-child interaction gardens, etc., to form a unique rural tourism zone, with the help of the primary industry to drive the tertiary industry, combining the humanistic landscape with the natural environment, to form a recreational place with a strong cultural atmosphere and beautiful ecological landscape, which not only provides villagers with paths to increase their income but also provides urban residents with paths to rural tourism.

This can also establish a higher level of urban and rural planning system, establish a standard system for rural tourism, excavate rural civilisation and native culture, rely on local natural resources, industrial base, history and culture, build a network platform from the government level, increase the investment in public services for rural tourism, multi-channel for the off-season rural tourism promotion to attract traffic, and promote the high-quality development of regional rural tourism.

· Improve the quality of rural tourism development：
From the village itself, residents the access to employment opportunities and higher economic levels, but also to improve the quality of rural tourism practitioners, strengthen the training of the majority of rural practitioners: the use of a variety of opportunities and leisure time to teach the basics of rural tourism, to strengthen the rural residents of the service consciousness; to broaden their horizons, and from the development of rural tourism in a good place to seek experience.

At the same time, big data technology can be used to strengthen all aspects of publicity, breaking the inherent backward impression of other regions and tourists on small villages, and enhancing the attractiveness and competitiveness of the region. Through big data technology to analyse tourists' travel patterns and consumption preferences, etc. to improve the level of service, strengthen the investment in advertising on various social platforms, and actively open and promote the official tourism social account to enhance the interaction with tourists and potential tourists.

Part II. Objectives and methodology of the study

1. Purpose of the study

After studying the current situation of China's rural areas and the general background of basic policies for rural revitalization. The rural revitalization policy integrating culture and tourism is currently the most suitable way for China's suburban villages to comprehensively upgrade the rural industrial structure and spatial planning according to local conditions. In spatial planning, street space serves as a link connecting various spaces and is the basis for the development of the overall rural spatial context. The development of street space can effectively drive the construction of surrounding spaces, thereby laying the foundation for the upgrade of the overall spatial layout.

As an important component of rural life, street space can better reflect the historical context and lifestyle of a village than open public spaces. The research targets urban suburban villages in the context of rural revitalization, with the main purpose of using street space to drive overall rural development and reserving sufficient construction space for the tourism industry. The secondary purpose is how to use rural street space to re-plan and transform the original spatial distribution, and how to intervene in other elements in the street space and form a unified cultural style while retaining the original context of the street. On the basis of satisfying the complete road network, it can also meet the needs of tourists and villagers for space use, and create an overall coexistence relationship that affects each other and is independent of each other.

2. Significance of the study

2.1 Theoretical significance

Research on rural areas is increasingly becoming a hot issue in academia. However, in recent years, domestic research results on rural spatial planning have mostly focused on the planning and construction of village settlements and residential areas, and there is still a lack of sustainable planning that combines rural cultural tourism and the development of linear spatial systems. This article takes suburban villages around big cities as an example. Starting from the real situation in rural areas in my country, it is imperative to find methods suitable for suburban villages in my country.

In-depth study of the industrial value, ecological value, and cultural value contained in rural areas in the new era, analysis of existing problems in the application of existing values, and exploration of neglected potential value rural areas, so as to promote more scholars and experts in the field of architecture to focus on cultural tourism The industrial planning and linear space develop together in a coordinated manner. While giving full play to value advantages and activating value potential, we should protect characteristic values and form corresponding rural practical planning strategies.

2.2 Practical significance

Chechang Village, Zhoukoudian Town, Fangshan District, Beijing, as a typical rural village on the outskirts of a big city, has experienced the most drastic industrial upgrading and changes in rural space. As a result, it has encountered more problems and faced more challenges. Through the study of the industrial development transformation and rural street space of Chechang Village, this article attempts to find the impact of linear street space on the upgrading of the overall spatial structure, providing reference and reference for the revitalization and development of village space through the cultural tourism industry in the future, and fully Understand the revitalization method that adapts measures to local conditions and "connects the area with the line". At the same time, we are exploring how to solve the problems in the dual structure of modern cities through the cultural tourism industry and improve the quality of life of rural people. Protect natural resources and arable land resources through spatial re-planning, and ensure their sustainable development capabilities while upgrading rural industries.

3. Research methodology

3.1 Literature research method and comparative analysis method
Collect and read a large amount of literature at home and abroad, compare and analyse the research topic and sort and analyse it, analyse the background of domestic rural revitalization, books, papers and journals related to modern rural spatial development, urban fringe village planning and rural road spatial design, etc., and gain a deep understanding of the relevant research past and the current status of the research, and understand the direction of the discipline's front-line work, laying a theoretical foundation for the writing and analysis of the present thesis. The writing and analysis of this thesis have laid a theoretical foundation.

3.2 Investigation and analysis method
Research in-depth rural reality, through a large number of network research, collect the status quo of the Chechang village and the real picture as well as the relevant government website policy enquiries, to ensure the authenticity and accuracy of the results of the research, the real in-depth community, to understand the villagers in the production and life of the exhaustive problems and needs, and to enhance the research of the groundedness.

3.3 Multidisciplinary research method
This paper studies the street space planning of suburban villages in the context of agro-tourism, involving agronomy, tourism, sociology, architecture, urban planning, geography and other related disciplines, through an in-depth study of the relevant content of these disciplines, multidisciplinary integration of the research, to explore the adaptation of modern urban development and the villagers' production and life, tourists to experience the countryside roads and spatial planning strategies.

3.4 Case study method

Through the investigation of the field and current situation of the actual research object of this paper-Beijing Chechang Community, the traditional culture of Chechang Community, the relationship between the change of residents' production and living styles and the evolution of rural street space is deeply analyzed, and the rural roads and core spatial planning of small villages in China are mainly analyzed and studied, to provide the design strategy of agricultural tourism routes in Chechang Village certain reference.

Part III. Literature review

This article first studies the rural background of China. Liu Yang believes that the severe population loss is the main reason for the loss of traditional culture and rural decline. At the same time, in terms of industry, scholars such as Liu Fufu believe that a single breeding production method cannot solve the current rural situation. Faced with such a dilemma, realizing the mutual penetration and integration of primary, secondary and tertiary industries is the only way to transform agriculture. At the same time, the degradation of the ecological environment is also a people's livelihood issue that must be considered. Scholars such as Yang Bangjie have proposed that rural environmental issues are also important people's livelihood issues, because of new construction The generation of waste, pushing, and the use of technological equipment need to be controlled.

In the face of rural revitalization, for the current situation of rural China, the most practical thing is to use the advantages of rural development (mainly the revitalization of rural agricultural tourism through the integration of three industries). Scholars such as Duo Jianwei have proposed that rural tourism has a great impact on rural areas. The positive guiding role can transform the industrial style into a unified hybrid model. Tao Yu, Lou Miao and others also aimed at the "tourism industry development model".

The development method proposes specific operation methods. For street space, treating it as a whole public space is a reshaping method recognized by many scholars. Xu Lijia from China believes that in addition to the function of transportation, streets are also a rich collection of spaces that are most closely related to people's daily lives. Kevin Lynch from the United States also provided important insights into the relationship between roads and cities. At the same time, many scholars have studied and discussed how street space can better guide and facilitate different types of people. Ding Jie and other scholars discovered the relationship between street privacy and road accessibility through specific data research. Scholars such as Susan Handy in the United States have studied the special relationship between crowds and street space based on space syntax theory.

In related research on historical villages in marginal areas, the China Rural Construction Institute conducted a rural cultural tourism development in Song jiagou in Shanxi Province, China, and how to use rural original sites while retaining common rural memory points while transforming them into public spaces. There are excellent examples of architecture. Through analysis and summary, Chengdu Senna Landscape Design Consulting Co., Ltd. re-planned the street scale of Xifuli Art Village, widening or reducing the scale according to different street functions to create different experiences. It has a guiding role in street scale and spatial layout.

Among international street renovations, El-Shimy evaluated the development of a street heritage area in the center of Cairo. The practice of spatial upgrading while retaining historical features is a good example of adhering to the principles of sustainable street.

Part IV. Spatial planning of linear streets

1. The importance of street space in suburban villages

1.1 Development stages and development background of rural streets

After 1992, China's market economy developed rapidly, driving the acceleration of urbanization. At the same time, a large number of rural laborers have poured into cities, exacerbating the imbalance between urban and rural development. Rural development has become an important direction in China's new stage. In order to achieve coordinated development between urban and rural areas, roads between urban and rural areas became the first areas to be formally planned and constructed. China's rural highway construction has entered a new period of rapid development on the largest scale in history. After a ten-year construction cycle, the basic construction of rural roads radiating from the city to the surrounding areas has been completed. The country has begun further planning and renovation of internal rural roads. Hardened pavement is one of the important criteria for whether the internal roads in rural areas have been updated, so in 2017, the hardened pavement in rural China reached 99.4%. It has basically achieved the goal of farmers "going out on hardened roads and lifting their feet to board buses", which has led to a comprehensive upgrade of rural road grades and exit methods.

From 2015 to 2019, my country's rural road construction mileage showed an overall growth trend, and rural roads continued to extend to remote areas (Fig. 1). At the same time, rural roads closer to cities were the first traffic arteries put into use in the early years, and some of them were damaged. In response to this phenomenon, the state has issued new relevant regulations and proposed maintenance work on rural roads.
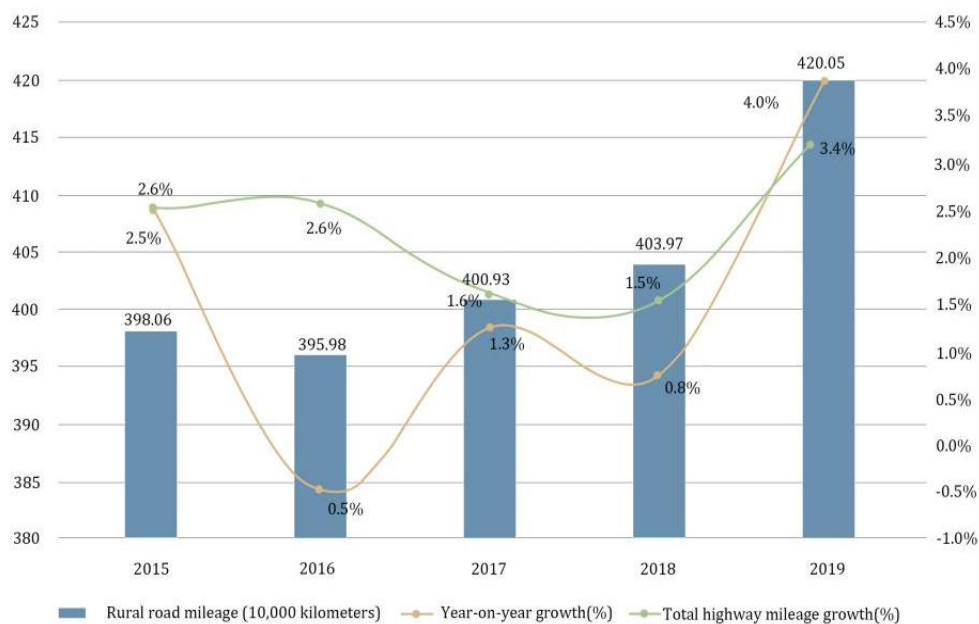
(Fig. 1： China's rural road construction mileage and growth from 2015 to 2019   Source: Author's self-drawing)

Although China's rural highway economy has entered a stage of stable development, there are still certain problems overall, including insufficient depth of road network access, lack of a complete transportation network, insufficient safety protection construction, relative lack of related infrastructure construction, management and maintenance There are obvious shortcomings, making it difficult to repair roads in a timely manner, especially roads in rural area.

1.2 The role of street space in suburban villages

Street is a kind of space, a gathering place for social activities and a social place where residents live. People will be influenced by each other in the place, and their behavior will become suitable for the place. This makes the street place with this excellent quality give birth to good behavior patterns. It is also the transportation carrier for the flow of people and logistics in social and economic activities. Streets have comprehensive functions and different characteristics. They undertake the function of transportation. They are a spatial collection with rich connotations and meanings. Streets are connected with people's daily life. The most intimate, playing the role of connection and transition between residential areas and cities or villages, and is the most living space. [24]

Streets are also symbols and microcosms of a region. There are many familiar cities that may be derived from their famous streets, and each city may also have one of the most popular local streets. For example, the Champs Elysees in France, Fifth Avenue in New York, the United States, Carinthia Avenue in Vienna, Austria, Shinjuku Avenue in Kyoto, Japan, Orchard Road in Singapore, Zhongshan 1st Road in Shanghai, China, etc. In addition to being an important part of the daily functions of the city, they are also the brand of the city and the source of vitality of attraction. These influences have made more and more managers aware of the importance of the construction, operation and maintenance of the main street system.

The use and planning of street space not only plays an important role in transportation, but also has an important impact and significance on culture, surrounding buildings and neighborhood relations. As a continuous and complete linear space, street space itself also has certain social significance. As for culture, traditional streets in different regions have different cultural expressions, but they all play a role in spreading regional culture. Most studies tend to only limit the relationship between buildings and streets to the static characteristics of the plane, and usually analyze it based on the figure-ground relationship theory, with the purpose of graphicalizing the external space and thus affecting the overall intention of the street.[25]

Spatial relationships often appear in three-dimensional dimensions. The exterior walls of buildings on both sides of the street are also the interior walls of the city's external space. The building and the block to which it belongs form an indivisible whole. The two influence each other and are interdependent. Through the building facade, the activities of the internal space are penetrated, while the overall environment of the outdoor space is introduced. The scale of the street has a crucial impact on the overall external environment. Whether you feel safe and attractive when walking on the street will be affected by the scale of the street. If the

street space lacks relative attractiveness, it means that the area lacks "street eyes".

When functional zoning is too pure, cities and large-scale blocks give you a sense of alienation. Streets become highways, squares are large but not popular. Pedestrians rush through or drive through streets filled with traffic, even if the buildings are eye-catching with billboards. The more dazzling and boring streets are not worth lingering on. "Street Eyes" are the eyes of safety, the eye of public life, and the eye of urban fun. The term was first proposed by Jane Jacobs in "The Life and Death of Great American Cities". She believed that streets, especially sidewalks, are the most important public spaces in a city and the most unique places in the city. An important part of vitality. In addition to the function of transportation, streets also play a role in safety, interaction and assimilation of children. The traditional Chinese rural streets and the unique way of getting along with the villagers have turned the street space into an exclusive space area for neighbors. This relatively small-scale street space increases the opportunities for people to meet each other in street life, thereby enhancing the sense of security on the street and forming its own unique defense mechanism. Most children feel safe on small streets. And different street space atmospheres will have a subtle impact on children's growth.

2. Public space governance and space composition methods

In modern society, the term "public space" first appeared in the book "Private and Public Space" by British sociologist Charles March in 1950. Subsequently, it sparked heated discussions on public space in various fields in Western countries and became a A statutory term in urban planning in developed countries such as the United Kingdom and the United States. In his book "Good Urban Form", American urban planner Kevin Lynch advocates that public space should play a mitigating role in crowded urban environments through different scales of space, and can connect dots to form lines that help Structure for further urban development.

Rural public spaces have completely different characteristics from urban public spaces. Compared with the rich public activities in the city as well as the large population and limited space. Rural areas have a small population and a single type of composition, which is consistent with the characteristics of a vast land and sparsely populated areas. This makes the public space in the countryside have a simpler publicity and commonality. A single demographic makes what happens in any public space heard and seen by all. The low mobility and family inheritance of the rural population make them more group-conscious than the urban population, so the interaction and sharing of villagers is more emphasized than the privacy of individuals. Lefebvre believed that space is social and is filled with social relations. It is not only supported by social relations, but also produces and is produced by social relations. [22]The emergence of rural public space is a reflection of rural social relations and is also based on public needs.

2.1 Spatial planning issues in suburban villages of big cities

· Space lacks vitality：

After the 1950s, China issued different targeted policies for urban and rural populations, gradually forming the characteristics of an urban-rural dual structure[1]. Differences in economic income and living standards attract the rural working population to move to cities or non-rural areas, accompanied by certain population transfers and family migration. The family members of the migrant population are often not within the scope of influence of population migration. As a result, the number of elderly people and children left behind in rural areas has gradually increased, constituting a hollowing problem, making the elderly, children, and women the mainstay of rural areas. Most of the life focus of the left-behind population is on how to support and take care of their families. Their lifestyle is relatively simple, they lack enthusiasm for the construction of rural public spaces and participation in public activities, and they lack motivation to use public spaces. Rural activities lack internal driving force. Rural life has fallen into an endless cycle, making it difficult to generate or maintain public activities, which increases the cost of using public space and reduces the frequency of use.

· Cultural characteristics are not outstanding：

In traditional Chinese villages, the villagers' emotions for the countryside come from the little things they have accumulated in their lives. The four years of their hometown are also stored in the unique cultural characteristics of the countryside. The public space in the countryside is where villagers participate in public activities. most frequent areas. After the release of the urban-rural integration policy[2], rural construction has entered into a blind pursuit of similarity with the city, ignoring the unique cultural background of each village and the needs of villagers. The similar standardized building models between different villages, coupled with the use of urban public space construction techniques, etc., have weakened the unique characteristics of each village, destroyed the original style of the village, and made the countryside more and more stereotyped. The lagging nature of rural development has, to a certain extent, prompted villagers to pay more attention to rural economic development rather than cultural protection and traditional inheritance. At the same time, villagers and village committees have weak awareness of local cultural protection and lack relevant knowledge.

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[1]*The urban-rural dual structure system is a serious obstacle to China's economic and social development. It is mainly manifested in the household registration barrier between urban and rural areas, two different resource allocation systems, and other problems based on the urban-rural household registration barrier.*

[2]*Urban-rural integration is a stage of urban-rural transformation. Its basic characteristics are population integration with two-way population flow between urban and rural areas, spatial integration with mixed and diverse land use, non-agriculturalization of the rural economy, and economic integration with the homogenization of urban and rural industrial structures. Source:[1]刘守英,龙婷玉.城乡融合理论：阶段、特征与启示[J].经济学动态,2022(03):21-34.*

· Lost in the concept of space development：

Rural public spaces have gradually shifted from focusing on the practicality of space to focusing on the political and economic functions of space. They blindly pursue the aesthetic and visual value of space, thus ignoring the living needs and public needs of villagers. As the political management unit of the countryside, the village committee's excessive propaganda of political ideology has caused the public space to no longer belong entirely to the villagers, but to assume most of the political propaganda role. After the promulgation of the rural revitalization policy, rural areas have become an emerging economic growth entity. The development of business formats is not based on the actual needs of villagers, but puts economic value first. This kind of long-term construction that is out of touch with actual needs makes it relatively difficult to generate public activities, leading to a reduction in the utilization of public space.

2.2 Space governance methods

· Improve public space layout：

The space is divided into open, semi-open and private according to the degree of openness to distinguish the spaces used by tourists and villagers. Through diversified public space forms, we can stimulate the shared vitality of different areas of the countryside. Reduce mutual interference between tourists and villagers. Use open spaces such as village entrances and roads to increase the unique cultural characteristics of the village and improve the villagers' sense of cultural identity and belonging. In view of the uncertainty of crowd activities, open spaces of different sizes are designed and planned to guide the flow of people and meet the differentiated needs of people for different activities. A semi-open space is built in the middle, and a partial rest area is added. By increasing the time people stay in the space, the frequency of people's communication is increased and the loneliness of left-behind villagers is reduced.

· Diversification of accessibility：

Improve the physical accessibility of rural public spaces and improve the village's public transportation network. Reasonable road planning can increase people's frequency of use and expand the area involved in daily life, increasing the possibility of daily interactions. Extends the service scope of rural public spaces. To a certain extent, it also leaves a certain space for the development of other industries in the future, ensuring that the villagers' living areas and industrial development areas have reasonable road separation.

It is necessary to emphasize the difference in visual accessibility to create a different sense of space use. Different shades of visual accessibility will divide the space into small spaces with different levels of privacy, increasing the possibility and diversity of space use.

· Reorganization of functions and innovation of form：

Jane Jacobs once said that "diversity is the nature of a city" and also emphasized the benefits of "functional complexity" in bringing vitality to the city. [23]While following diversity, we should also pay attention to whether the existing functions are still suitable for the needs of villagers at this stage. After eliminating unnecessary old functions, redesign and integrate

functions that adapt to modern rural development, implant dynamic functional bodies, and form a new functional complex. In order to meet people's functional needs, enhance the spontaneity of public activities, enhance the popularity of space use, and activate public spaces(Fig. 1) .

Different dimensions of public space are reshaped through different degrees of spatial openness. It enriches the space's accommodation for different functions, makes the integration of functions and space more reasonable, and also improves the efficiency of space utilization.
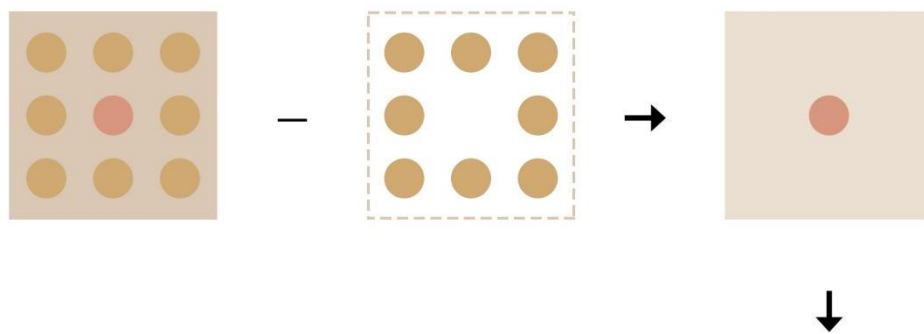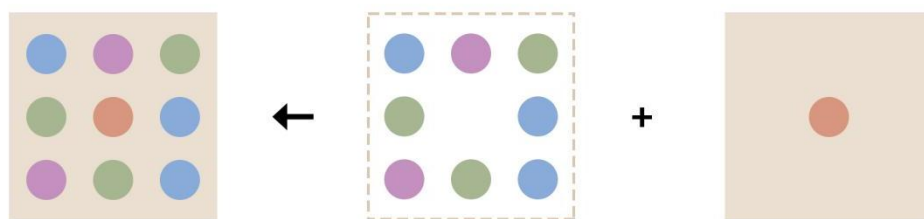
（*Fig 1：Updated and reorganization of functions*   *Source: Author's self-drawing*）

2.3 Space composition method

There are many types of rural areas in China, such as urban suburban villages, mountain villages, and minority villages in southwestern provinces. Different rural types have relatively obvious differences in construction planning and spatial composition based on different geographical and cultural needs. A large proportion of them are suburban villages around the city, which is also the type of research this article focuses on. The suburbs of large cities are an objectively complex regional complex between cities and rural areas. They are an important part of the urban regional structure and a transition zone from urban environment to rural environment. Common characteristics and special geographical locations drive the spatial composition of suburban villages to be relatively similar.

Functionally divided into agricultural spaces (farmland, cultivated land(Fig. 2), forestland, mountainous land) , it is a relatively basic industrial space for all suburban villages, but it is not a production space that can sustain survival. Construction space (industrial land(Fig. 3), residential land, social service land, transportation land, public activity land), this type of

space often serves the large-scale production space relocated from the city. Although it occupies a relatively small area, once the large-scale production space moves in, it will It will take up a lot of space to maintain operation. The largest proportion is the living space used by villagers themselves, residential areas, commercial areas and political service areas.

（Fig. 2：cultivated field   Source: Internet）

（Fig.3：Industrial field   Source: Internet）

From the composition form, it can be divided into point space (village entrance, square(Fig. 4), ancient temple(Fig. 5)), linear space (road system such as streets) and planar space (overall distribution of public space). However, the spatial planning of points, lines and planes in urban suburban villages is not reasonable, and it is usually difficult to connect fragmented point-like spaces and low-use planar spaces through linear space.

（Fig. 4：Square of the Village   Source: Internet）

（Fig. 5：Ancient Temple of the Village   Source: Internet）

3.Problems in rural streets

The first small space that people come into contact with in an open space is usually the street space. As Kevin Lynch put forward: "The road is the dominant spatial element."[26] Streets and cities are in a symbiotic relationship, relying on each other and influencing each other. . In the same way, streets are also important and irreplaceable influencing factors on a rural scale. Streets are like human blood vessels and nerves to the countryside. They can dredge and guide spaces of different scales, thereby effectively connecting spaces in different areas.

The special way of existence forces people to interact with the street space while switching between public space and private space. Complex interaction frequencies and methods make people's requirements for street space highly uncertain. For example, children's first

requirement for street space is safety, while office workers' first requirement for street space tends to be fast passage. The classification and use level of streets can meet the needs of different user groups to a certain extent, and provide a more reasonable way of spatial connectivity through their own negative space[1] characteristics.

3.1 Confusion of street privacy and accessibility

Compared with urban space, rural space is smaller in scale and simpler in spatial type. But rural life is more like a small community. There is less isolation between the villagers' living space and activity space, and most of them are unplanned. Simple street space requirements will hinder the later integration of tourism to a certain extent. It is also urgent to upgrade the level and way of using streets. Street-level upgrades will be clearly planned to differentiate user groups and frequency of use, creating different street accessibility and privacy.

Different street privacy and accessibility can effectively distinguish the areas used by tourists and villagers, ensuring the relative independence of the two. Better privacy can effectively reduce the sense of intrusion brought by tourism to villagers and maintain the coexistence between the original rural lifestyle and new tourism. If the privacy and publicity of space are the goals of the overall planning, then road accessibility can be regarded as the most basic and effective way to balance the two.

Street privacy and road accessibility often interact with each other, with lower integration, choice and connectivity, and depth of entrances leading to reduced accessibility for visitors. In contrast, the lower depth and higher curvature of one's own house results in more privacy.[27] And street accessibility is an important element that effectively promotes social interaction and affects pedestrian preferences. Residents require a certain degree of privacy in their daily lives, but social activities and use of public areas require relatively optimistic road accessibility. This requires an effective balance between privacy and accessibility to reduce the cost of community use and the impact of tourism on the lives of indigenous people, thereby improving the efficiency of public space use and visitor interaction.

Due to the relatively intensive renewal period of rural residences in the early stages of rural revitalization, most areas were re-planned and constructed based on the existing road network after preliminary road planning, prompting most rural residences to be built along the roads. And after the new housing was built, there was no continued planning and construction of the road network. Some houses with inner courtyards do not have any isolation area between them and the road, forming a phenomenon where the door opens directly onto the road. Street privacy is next to zero.

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[1]*Negative space refers to the open space left after construction, while positive space is the shape of the space that is intentionally designed under pre-planning.Vincent Scully noted that in the Middle Ages, space was thought of as negative space, which was the interval between two buildings, or the void within it (such as squares and streets).*

According to space syntax theory[1], pedestrians tend to cluster around their main destinations and adjacent streets, with higher integration and selectivity.[28] The residential buildings built after the initial stage of rural revitalization and the open spaces between roads naturally formed new social spaces, which are used more frequently and at lower costs. Although it has increased the social frequency of villagers, the construction method close to the road will give villagers a strong sense of invasion after the tourism industry is integrated into the countryside, that is, the privacy is low. At the same time, the high use of new social spaces has led to the scattered activities and spaces of villagers, which to a certain extent has dispersed the appeal of public spaces.

The construction of public space in rural areas is obviously political. As the government service department that handles various businesses in the village, the village committee is more representative of the village than other service units. There is a trend of centering on the village committee and decreasing to the surrounding areas. The farther away from the village committee, the less public space and commercial services, but the proportion of residential space is increasing. This leads to a disconnect between living space and service space. This, combined with a disorganized road network and lower accessibility, results in lower use of public services and public spaces in the village centre. In order to enhance general social activities, more open spaces should be planned near intermediate spaces and spaces connected to less accessible paths to reduce the cost of use for the population, [29] thereby increasing the effectiveness of public spaces.

The level of rural road construction is not high, and the construction speed of transportation infrastructure cannot meet the development of demand. At the same time, rural roads are affected by historical problems, the road network grading is uncoordinated, and the road grades in suburban villages cannot be well connected with the city, seriously affecting the traffic in suburban villages.

Most rural roads are poorly planned and the phenomenon of "dead-end roads" is frequent, which makes the road network level low and chaotic, with insufficient access depth, low coverage and the inability to form the necessary network system.

At the same time, the mode of transportation has changed from mostly bicycles to mostly motor vehicles, which exceeds the maximum load-bearing capacity of the road. The overall road surface is seriously damaged and the economic situation in the countryside makes it impossible to repair the damaged road surface, thus forming a vicious cycle and affecting the quality of the road. Poor. It is not conducive for villagers to walk to different areas on a daily basis. British Marshall stated in "Street and Form" that the ideal street form has identifying characteristics, a clear system and continuous sequence, and a clear accessibility path

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[1]Space syntax is a series of theories and technologies about space and society. Its core point is that space is not the background of social and economic activities, but a part of the development of social and economic activities. The theory serves as a new language for describing architectural and urban spatial patterns.

structure, coherence, and readability.[30] Chaotic road accessibility will seriously affect the frequency of use of public spaces and the effective range of residents' daily activities.

3.2. Street functions are chaotic

In the context of rural revitalization, the integration of urban and rural transportation and the renovation of internal rural roads have become one of the key issues in urban and rural planning in the new era. The obvious difference between urban and rural road levels and the complexity of rural roads make planning more difficult. At the same time, with the rapid economic development, traffic pressure has increased sharply and time is tight, resulting in unreasonable road alignment design and unscientific connection between roads. At this stage, most rural areas cannot and cannot abandon agriculture and breeding, which to a certain extent determines the complexity of vehicle types in rural areas and increases the uncertainty and danger of roads. Street quality includes three important aspects: street accessibility, building construction intensity and form, and mix of functions.[31] New planning of rural streets often only pursues integration with urban transportation connections, ignoring the differences in urban and rural use, resulting in the "appearance" upgrade of the original rural roads rather than planning based on specific needs and problems.

The physical conditions of rural streets are not friendly to pedestrians. The relatively limited traffic volume and limited development funds indirectly lead to the fact that rural roads are often mainly one-way roads, and the roads that are not open to traffic are relatively chaotic and narrow. (Fig. 1)Highly wide streets with more lanes, facilities, and crosswalks are positively associated with greater walking volume.[32] However, rural areas pursue hardening of road surfaces to increase vehicle speeds, and the limited road width makes pedestrians less safe.

（Fig.1：Road in Village   Source: Internet）

Ideal rural tourism should meet the daily needs of villagers while dividing areas used by vehicles and pedestrians. Clearly guide people to their destination. Pedestrians prefer streets with dense destinations and more frequent pedestrian traffic.[33]Lack of planning and management of roads has resulted in more deserted remote roads, making main roads and effective roads less guiding. It is difficult for pedestrians to choose important and well-defined paths among the many unstructured streets. During the agricultural harvest period, the phenomenon of crops encroaching on the streets also disrupts pedestrians' choice of destinations to a certain extent, causing the flow of people at the destination to be dispersed and making it difficult for pedestrians to gather to form frequently used streets.

The Danish scholar Jan Gale proposed the theory of "boundary effect" from the perspective of the relationship between human behavior and spatial environment in "Communication and Space". The appropriate walking distance is not only related to the length of the street, but also to the quality of the street, including how well the road is protected and how the road feels. [34] Rural roads are often busy with construction but neglect the quality of streets. The long-term lack of important signs such as sidewalks and two-way lanes has confused the level of road use. Especially in rural areas, there is a long-term lack of standardized traffic signs and a strong degree of freedom, which makes motor vehicles and pedestrians of different types and speeds use the same road surface. This greatly reduces the safety and experience of pedestrians. British Marshall stated in "Street and Form" that the ideal street form is one with identifying characteristics, clear system and continuous sequence, clear accessibility path structure, coherence and readability [35]. Due to the functions of the original rural road There are gaps in many road traffic facilities. The guardrails of bridges along the river do not have any anti-collision and anti-fall functions. There is an extreme lack of lighting facilities. There are misunderstandings in judging road alignment when there is insufficient light, which cannot meet the requirements for safe traffic.

3.3 Street performance type is single

Rural streets are often planned by the government and constructed under the supervision of the village committee. Economic backwardness and modular construction in the context of rural revitalization have resulted in rural roads being uniform and lacking necessary cultural characteristics and uniqueness. The type of street expression is not only a matter of road surface material and width, but also a spatial issue. Street space can be divided into vehicle space, pedestrian space, building facades and commercial forms, etc. The street is also a special emotional space. Streets provide places for people to spend time outdoors in the most basic way. The structure, form, scale, color of street space, its combination and degree of closure, as well as different regional cultures, historical landscapes and other humanistic and social factors, bring people direct subjective experience and feelings, and derive convenience and comfort. , privacy, security, intimacy and other cognitions and emotions.[36] If the streets, surrounding environment and building facades are treated as a whole and renovated, it will greatly deepen the cultural identity of villagers and the experience of tourists.

In 1979, the Japanese architect Mr. Ashihara Yoshinobu proposed the specific composition of the side interface and the bottom interface that constitute the street space in "The Aesthetics of Streets", and applied the visual graphics and background theory to the analysis and research of street landscape. The side interface of graphics in morphological vision is defined as an important component of the overall visual image of the street.[37] This study puts more emphasis on the spatial form of the street and focuses on the visual experience that has a certain influence on the street space. Most of the roads that were built too early and lack maintenance are made of asphalt. Complex driving patterns cause the asphalt to fall off in some parts of the road. Uniform street lights and similar facades make the street space straightforward and unmemorable.

3.4 Overview of street problems

As a complex and complex issue, street space planning requires not only the complete planning of the most basic transportation functions of the street, but also the need to pay attention to the relationship between the street and the surrounding space. Utilize the influence of composite space to create a linear space with layers and different functions.

After the rural road planning process began to accelerate in 2006, roads between urban and rural areas and roads within rural areas were rapidly constructed. However, the too-rapid construction process has caused the road network planning to be superficial. Although the roads between important cities and towns are relatively complete, the planning of internal roads in rural areas with lower administrative levels generally only has one or two main roads. Road planning is poor and confusing. After rural revitalization began in an all-round way, the rest of the low-level road network was planned simultaneously with the re-planning of the overall rural space. However, based on the formulaic rural renovation model, the construction of auxiliary roads also has the problem of copying and pasting main roads. As a result, all roads in the countryside have no primary and secondary hierarchical distinctions, and all streets have equal privacy, lacking the sense of security that small-scale streets have.

After most rural planning was completed, there was no reasonable reservation for later construction areas of public facilities, resulting in low accessibility of some streets to some rural areas. Moreover, the strong political guidance of China's rural areas has caused the villages to invest major construction resources near the village committee (political service center). The villagers' living and production areas are separated from the public activity space, and they cannot navigate the chaotic road network. Arrival in ease. This increases the cost of participation in public activities and reduces the frequency of use of public spaces.

In 2017, hardened pavement covered almost the entire rural internal road network. Accelerating the iteration of transportation vehicles and the increase in transportation volume. Although villagers' travel methods have become very convenient, the rapid changes in transportation and incomplete road infrastructure have created chaotic road use. The particularity of rural industries means that villagers' transportation is not only small vehicles used for private travel, but also large-scale work vehicles related to agricultural production and other industries. The complex vehicle types make the roads less safe, and the lack of road dividing lines makes pedestrian walking areas almost non-existent, while greatly increasing the problem of crops and livestock occupying the roads.

The modular way of updating rural space leads to boring expressions of street space and accelerates the disappearance of rural culture. The core cohesion of the countryside is dissipated in the featureless and monotonous roads, and the villagers' memories and cultural pride of the village are not preserved in the spatial planning. Highly hardened roads and uniform housing types are not conducive to the maintenance and protection of the unique rural culture, nor are they conducive to the integration of tourism in the future. At the same time, it will also reduce the villagers' responsibility for the protection of cultural monuments and weaken important cultural protection points.

4. Case studies of linear street space

As a linear element of urban public space, there are many definitions of the quality of public space. American scholar Vikas Mehta defines sociability as the basic responsibility of public space. Based on summarizing literature and empirical research, he divides the quality of public space into four dimensions, including meaning, safety, comfort and pleasure. At the same time, Jan Gale also defined the quality evaluation criteria of public space as protection, comfort and pleasure from the perspective of environmental behavior in his book "Public Life Research Methods". He believed that comfort includes walking, staying, and watching, communication, play and sports activities and other comfort. The research of both scholars has proved that street space needs to be shaped into a three-dimensional space full of comfort and functionality through the integration of other spaces in addition to meeting the basic functions of traffic accessibility.

Street space generally consists of vehicle space, pedestrian space, building facades and surrounding commercial forms. These four spatial forms can enhance the participation of different types of people by interspersing different transitional stay spaces in the space. At the same time, different scenic spots will be added according to the conditions of the site to enhance the possibility of using the space. Diverse activities and events will be used as media to enhance the integration of users. While ensuring that pedestrians have a relatively high sense of identification with the street space, the harmonious and win-win relationship between vehicles and pedestrians that are independent but mutually influencing will greatly increase the comfort of using the two different types of streets.

4.1 The combination of transitional stagnant space and linear street space

The so-called transitional stay space refers to an inserted space between the inside and the outside, which enables the street to accommodate not only driving behaviors such as walking or shopping, but also people's short-term stay behaviors. [38] For example, small public rest areas in front of shops and pocket spaces in the street can be used as stagnant spaces.

(Fig. 1 Station square in Sloterdijk.
Source: https://archello.com)

(Fig. 2 Picnurbia in Vancouver,Canada.
Source: https://www.pps.org/places/picnurbia)

Types of stagnant spaces can have many different forms and functional components. The new Sloterdijk station square (Fig. 1) is surrounded by circular pocket spaces, and these stagnant spaces are given functions such as mini parks, sports facilities, viewing platforms, small cafes, etc. While enriching the street space, it also has a certain guiding effect on pedestrians. At the same time, the stasis space can be used as a linear leisure place. Picnurbia is an artificial turf seating area along Robson Street in Vancouver. (Fig. 2) Compared with ordinary seats, the wider area not only provides pedestrians with much-needed stagnant space in the city center, but also provides a safe and reliable play area for children. Mobility installations can also provide stagnant spaces for pedestrians in narrow street spaces. ParkedBench is a small pocket park on the streets of London. (Fig. 3) Overlapping planting areas and small public spaces encourage passers-by to stop and gather.

*(Fig.3   Parked Bench in London.   Source: https://inhabitat.com)*

The resulting interweaving of seating and planting provides a buffer from the busy road and creates an organic extension of the walkway. Parklets can be easily scaled and modified to fit different spaces, providing more options for different dimensions of street space.

A relatively small space can spread emotions through a unique appearance or a different atmosphere, thereby attracting pedestrians to stay. Although the public space in front of small shops is generally limited by street space and cannot be extended, by enhancing its connectivity and perception, it can expand the psychological cognition level of pedestrians to a certain extent. [39] For example, the light from the transparent display windows, the unique decoration styles at the entrances of different shops, and the lawn areas in the rest space that are different from the road paving. Pocket space uses the streets and surrounding trivial and idle areas to establish small public spaces as a connection between the building space and the street space. Its informal, flexible and highly plastic characteristics give it a high social interaction index. There are many different types of behaviors that people can do in it.

Yabashi Architects has designed cafes and pocket parks between buildings in Kyushu, Japan. (Fig. 4) The building's roof consists of four timber-lined platforms that rise staggered towards the rear of the site. The empty space between the two buildings is filled with small shops as new stagnant spaces. At the same time, the pocket garden on the roof also provides a rest space similar to a pocket park. From here, visitors can overlook the passing shopping crowds, or sit down and interact with each other. Chatting with friends, it has also become a "public space within a private space" where locals can gather and interact (Fig. 5).

(Fig. 4 Café Kyushu in Japan
Source: https://www.dezeen.com/)
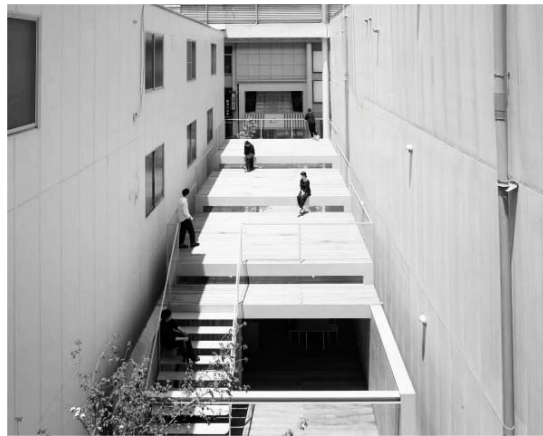
(Fig. 5 .Pocket space on the roof of Café Kyushu
Source:https://www.dezeen.com/)

The increase in the number of stagnant spaces is also a beneficial way to increase the participation of different types of people in public spaces. Higher street quality needs to be inclusive and meet diverse needs in terms of function and scale, especially those of special groups. In rural China, left-behind elderly people and children account for the majority of the population, and designs for the elderly are not taken into consideration in street space. Therefore, improving the walking accessibility of streets for different types of people. For children and the elderly, appropriate walking distances will greatly increase their frequency of use of different public spaces.

4.2 Landscape sketches in linear space

4.2.1 Five elements of landscape planning

The street space in the countryside consists of five major elements: building facades, road surfaces and paving, street green spaces, landscape nodes, and vestibule spaces. The landscape form of the street space reflects the overall visual image of the city. The street landscape image is quantified through the plane outline and the hierarchy of the facade landscape, while retaining the original style of the rural streets.

· Street facade

Architecture is a core element of the streetscape, reflecting the underlying soul of a city. People can experience a sense of beauty from its balance, symmetry, layout and other forms. The facade can determine the overall style of the street space through a clear style. In the

renovation of a Beijing fashion factory, a large amount of glass and a curve similar to a textile drape were used as the shell (Fig. 6), which not only echoes the theme of the fashion factory, but also basically The industrial minimalist style of the site streets was determined. If the original street facade is chaotic and lacks unified planning and style. It is possible to keep the original street spatial structure frame unchanged, and only carry out detailed design of materials, colors and sizes for the paving of the bottom interface and the building facade (Fig. 7). The street space at night is different from that during the day. In addition to the basic lighting system, the light transmitted through the facade also has a significant impact on the atmosphere of the street. Therefore, the size of the facade windows has become the main element to control the impact of lighting elements on the street. (Fig. 8)

(Fig. 6 Facade of fashion factory in Beijing.
Source: https://www.archdaily.com)

(Fig. 8 Facade of Long guiliang Institute in Guangdong
Source: http://www.crnews.net)
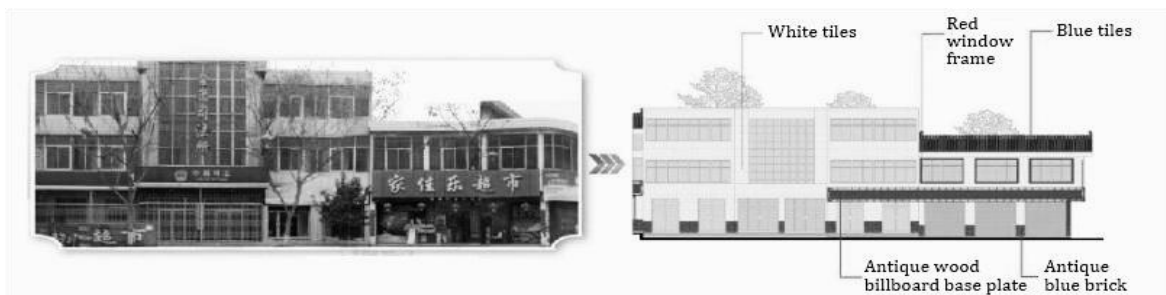
(Fig. 7 Design of interface transformation street side.   Source: Author's self-drawing)

(Fig.9 Facade of Feng Menglong Village Folk Song Cultural Center in Suzhou
Source: http://www.crnews.net/xf/y/943619_20220109103041.html)

On the basis of adhering to the principles of historical preservation and integrity, street landscape design should grasp the style, historical background, status and spatial location of historical buildings, and reasonably consider the shape, scale, proportion, style, height, Color and other factors not only protect the overall landscape of the historical district, but also integrate the spirit of modern architecture into the landscape. Whether the shape of the facade is coordinated with the street space will have a direct impact on the overall image of the space. The facades along the street are carefully designed, controlled, and guided in terms of shape, color, height, and materials to create a street landscape that is cultural, distinctive, and continues the context.(Fig. 9)

· Pavement paving

The traffic and activity environment composed of the ground and people is an important part of the street space and environmental system. From a plan view, pavement is the base map of a rural road, which needs to be coordinated with the building facade and guide pedestrians through different materials and textures to create different perceptions. Its patterns and colors are the most intuitive expressions of street space, thus creating an overall spatial atmosphere. The main function of the pavement area is to provide a hard, dry, dust-proof, hardened surface that is not easy to slip, and to serve the overall landscape environment of the street with its guiding and decorative properties. As traffic changes, so does the surface pavement. Therefore, the ground paving on the street is mainly to provide a convenient, safe and fast passage for people to travel. It also plays an auxiliary role in enriching people's lives, maintaining the street ecology and beautifying the street space.

· Green landscape

Compared with the hard paving of roads, greening is a means of organizing street landscape space. Using ecological principles for planning and plant landscaping is a very important concept. Taking advantage of people's proximity to natural landscapes, different vegetation Combine them to achieve a variety of street style features.

(Fig.10 View of Sunac Group"s new office building in Tianjin, China.
Source: https://www.pinterest.it)

(Fig.11.ANU Kambri Public Domain in Australia.
Source:https://www.archdaily.com)

(Fig.12 Arkadia apartment in Sydney.
Source:https://worldlandscapearchitec t.com)

The green landscape can be easily composed of point, line and surface green areas through different vegetation, which can be used as street decoration (Fig. 10), dividing lines of different roads (Fig. 11), or boundary lines of street space (Fig. 12).

If the "point" and "surface" green areas in rural streets are connected, a relatively complete rural green space system can be formed. Different from green spaces with planting functions such as farmland, landscape green spaces have a linking function and can be reasonably configured according to the seasonal phases of plants to enrich the landscape of street spaces, maximize the green period of plants, and enrich the experience in street spaces. , and at the same time use ecological methods to cut the space to a certain extent.

· Landscape nodes

Landscape nodes in street space mainly include recreational squares, small gardens, landmark buildings or structures, street wedge-shaped green spaces, etc. These nodes are usually the combination points or control points of different spaces. They are the key charm of people's image memory and are also condensed windows of rural landscape and cultural characteristics. Stones (Fig.13) or archways,etc.(Fig.14) are usually used at the entrance of the village exist as landscape landmarks.

*(Fig.13 Road sign at the entrance to town
Source:https://www.sohu.com)*

*(Fig.14 Chinatown Gate in Washington.
Source: https://pin.it/37ERScE)*

The design of street landscape nodes is often based on regional differences, starting from the local natural environment, location conditions, economic development level, cultural background, etc., seeking materials with urban street landscape characteristics, and exploring those potential and unique features from the regional background. Characteristic elements of development value. For example, by setting up historical celebrities at nodes, reproducing intangible cultural heritage, and depicting traces of historical sites, the characteristics of the street space can be displayed.

· Vestibule space

In the urban scale, the vestibule space is located in front of the entrance of a high-rise building. It is an intermediary space between the high-rise building and the city. It is also the most commonly used method in the overall layout of high-rise buildings. The vestibule space can be used as an expansion area for shops and as a stagnant space in the street space to increase the dwell time of pedestrians. (Fig.15) It can also be used as a space for villagers to carry out daily activities, enhance neighborhood relations and add vitality to the street space (Fig. 16) Villager Activity Room in Majiagong Village, Jiangsu Province by Meath Architects.

(Fig. 15 Starbucks outside sitting area
Source: Internet)

(Fig.16 Villager activity room in Majiagong village
Source:
http://www.crnews.net/xf/y/943619_20220109103041.html)

The vestibule space is also an important public space in the countryside. It is the middle area connecting the streets and buildings. They are both open to the rural streets, so they are more public. It is different from the vestibule space in the city. The vestibule space in the countryside is mainly formed by re-planning the rural residential space. It is a space planned by the city in the construction of traditional rural houses, and serves as an isolation area from the outside to the inside of the house. This space is called "grey space" by some scholars and is a buffer zone between buildings and streets.

4.2.2 Case studies of landscape activating street space

In the past cases of rural re-planning and development in various parts of the world, Gamcheon-dong Culture and Art Village in South Korea were comprehensively planned from all angles of the landscape. All landscape spaces do not conflict with the original style of the village, and are constructed according to local conditions while retaining the original rural context.

Gamcheon Cultural Village, located in Saxia District, Busan City, South Korea, was once called "the most artistic village in Asia" by foreign media. Gamcheon Village, full of murals, graffiti and installation art, is Busan's most popular emerging attraction, with more than 300,000 tourists visiting every year. Previously, this area was a representative slum area in Busan. Through architectural murals, graffiti art and public landscapes, walking trails, open spaces, community entrances, mountain villages, etc. have been comprehensively transformed (Fig. 17). Introducing art groups to work with local villagers to carry out renovations, and began

to focus on roads to expand the space inside the roads, mainly achieving two renovations of "empty houses" and "alleys". During this period, artistic and cultural creations were realized in 6 empty houses in the area. At the same time, rich artistic works were installed throughout the alleys, such as arrows and road signs painted on the walls of the alleys, creating an active and special regional atmosphere. The exterior facade of the building uses the "face" feature to use the extended areas on both sides of the main road as display space for stores, achieving a dense "point" landscape sketch. (Fig. 18) The sloping topography makes dense architectural forms and public facilities mostly appear as vertical landscape sketches due to spatial conditions. Potted vegetation is designed to be placed in the buffer zone between the street and the mountain, distributed in a "point" shape. Ease the psychological pressure caused by dense space, create a street atmosphere, and encourage residents or tourists to yearn for public space.

(Fig. 17 Landmark installation at the village entrance Source: Internet)

(Fig.18 Renovation of building facades Source: Internet)

4.3 Pedestrian-friendly streets space

There are different levels of pedestrian-friendliness for different road grades. Therefore, a street in Ningbo City, China, set up wider sidewalks at the entrances and exits of alleys, residential areas and main driveways, and divided the pedestrian space into different functions, which can ensure pedestrian safety to a greater extent and increase street space. of fun. (Fig. 19) In order to meet the high intensity of pedestrian activities and the large demand for parking along the street, the curbs can be widened and used as street benches to increase the area of rest space and pedestrian areas.sing widened street seating to separate motor vehicle lanes (Fig. 20) At the same time, the pedestrian space can be used as a link between the community and Linear street park on main street. By adding interactive leisure facilities, it becomes a vibrant space and connects different functional spaces. (Fig. 21)

Pedestrian-friendly streets will provide a safe and convenient environment for people to commute, walk, participate in activities and other daily activities in the street space. Principles of sustainable urban development include mixed use of land, providing diverse transportation options and ensuring connectivity between walking, cycling and public transportation [40]. Rural street space needs to be based on a complete road network, with clear signs and environmental facilities to separate motor vehicle lanes and sidewalks, while

using landscape or bicycle lanes as transition zones in the middle. (Fig. 22) Poor pedestrian facilities, such as narrow pedestrian lanes, motor vehicle lanes, obstacles, lack of traffic markings and signage, etc. will affect the pedestrian friendliness of the street and reduce people's willingness to walk.

(Fig. 19 The renovation of Fuye Street in Ningbo,China
Source: https://mooool.com/)

(Fig. 20 Using widened street seating to separate
motor vehicle lanes　　　　Source: Internet)

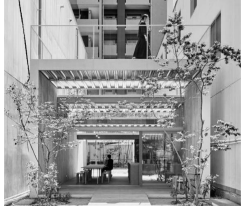*(Fig. 21 Linear street park in*
Guiyang,China.
Source:https://mooool.com/)

(Fig. 22 Avenues Mermoz Et in Lyon,France.
Source: https://divisare.com/projects/205986-)

4.4 Important case studies overview table

4.4.1 Case studies **in transitional stagnant space**

1	**Omoken Park**		- Time: 2019 - Land area: 67 m^2 - Location: **Kumamoto, Japan** **-**Designed by: Yabashi Architects	**Featured：** -Narrow site **-Small buildings and multifunctional plazas** -Increase daily activities of people

4.4.2 Case studies **in five elements of landscape planning**

1	**Street facade:** shape the street atmosphere through different styles.		- Designed by: Ni Yang Studio - Time: 2020 - Land area: 4756 m^2 - Location:**Guangdong, China**	**Featured：** Feel the interior space atmosphere through floor-to-ceiling windows or hollow brick walls.
2	**Vestibule space:** Buffer spaces for streets and buildings that can be used to increase street vitality.		- Designed by: MiSi Architects - Time:2019 - Built area: 102 m^2 - Location: **Nanjing，China**	**Featured：** -Emphasis on the indicative and public nature of the building entrance. -Extended the internal and external space, making the building open.
3	**landscape activating street space**		- Time:2021.02-2021.10 - Land area: 300,000 m^2 - Built area: 29,000 m^2 - Location: **Folk Village, Giheung-gu,South Korea**	**Featured：** Cultural murals and public landscapes become the core of village cultural tourism.

4.4.3 Case studies **in pedestrian-friendly streets space**

1	**Urban street block activation:** Pedestrian priority street order		- Designed by: MYP - Time: 2020 - Location: **Ningbo, China**	**Featured:** Clear the ownership of public facilities and commercial spaces, reduce mutual interference between functions, and greatly improve the walking experience.

Part V. Case studies on spatial regeneration of villages

1. Current status of domestic research

1.1 Current status of space

Villages facing the process of renewal appear a lot of new buildings built by residents themselves, but there is no planning, the building location and use of new and old residential housing are unreasonable, most of them are built on both sides of the road linking the two natural villages, sporadic, at the same time, the construction of rural housing occupies a large area of arable land, the village committee will be allocated arable land as a residential base, and the chaotic state of affairs; the construction of rural space is not scientifically, uniformly and rationally planned and designed. The whole village will appear to be subdivided and look both chaotic and unorganized. Hollow villages" and "empty-shell villages" are common in rural areas; buildings in a township or even in the same village are of very different styles, and buildings are not connected. All these show that in the process of urbanization, the spatial planning of rural areas has become chaotic and unreasonable. [41]

To address these spatial problems, we have chosen to analyse and study the characteristic case with a clear road route plan of a comparable scale.

1.2 Rural spatial planning case studies

1.2.1 The second phase of "Wuxi Tianyuan Dongfang"[1] - the regrowth of China's first rural complex

"An integral pastoral complex (Fig. 1) is an ideal in itself, the form in which agriculture and cultural tourism can be better integrated." ——Zou Yingxi

(Fig. 1 Aerial view of the field complex and its surroundings Source: https://www.gooood. cn)

· Project overview

With the accelerated pace of new urbanisation driven by culture and tourism, the first idyllic complex in China, "Wuxi Tianyuan Dongfang", has been completed, and this case is the second phase of the project as a geographically expanded functional area after the first phase of the construction and operation of the industry. The second phase is located in Yangshan Township, Wuxi, the "Hometown of Chinese Peach", about two kilometres away from the first phase, connected through the water system, with a construction area of about 440 hectares, which is a process of perfection of the whole project. At the same time amplifying the industry and content, the two areas will be linked as much as possible(Fig. 2), digesting more people and social capital, promoting consumption and driving the development of the region.
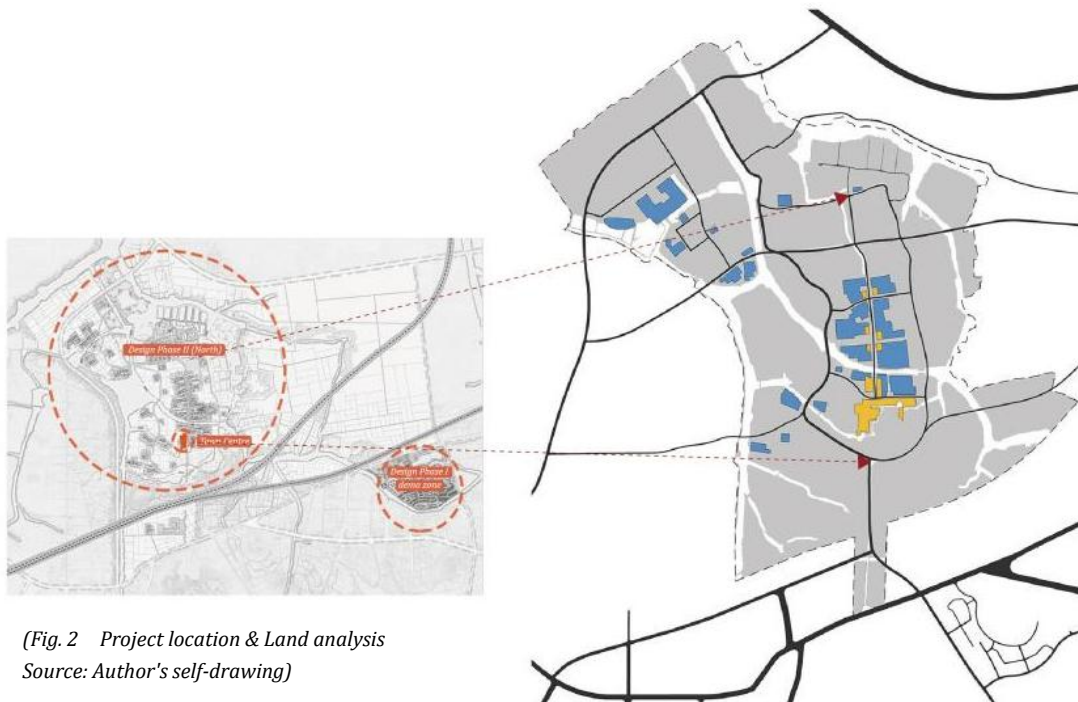

(Fig. 2   Project location & Land analysis
Source: Author's self-drawing)

· Analytical learning

The construction of the second phase pays more attention to the matching of the infrastructure to Yangshan Town and synergises with the commercial development. On the original site texture of Hongqiao Village, the second phase is organized according to the modern cultural tourism and commercial space organization dynamic line, to build a new form of idyllic cultural tourism town centre containing two field paradises and a theme shopping street integrating entertainment experience and leisure consumption.(Fig. 3) The planning and design help to break down barriers in terms of space and function, so that people in urban and rural areas can form interactions.

The overall planning and architectural design is to explore the ideal model and methodology of rural revitalization by building an oriental idyll with physical business implantation. The idyllic town focuses on emotional design, building the relevance and emotional relationship of the building cluster through scene creation:
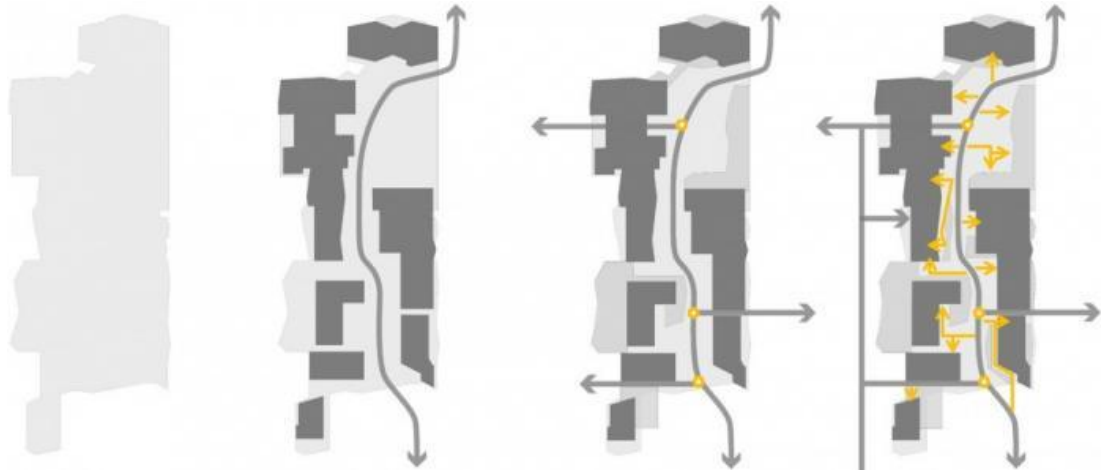
(Fig. 3   Commercial street flow analysis   Source: https://www.gooood.cn)

The main pedestrian street is located in the middle of the building cluster, which is connected to the entrance building and guides visitors into the idyllic town. The small bridge at the entrance of the village, the village square at the node and other contents support rural emotion, the landscape and commercial surface on the east and west sides, the centre line and the area near the paradise on the west side, as well as the area close to the farmland are all equipped with correlation channels, forming many sub-entrances and small integrated spaces, making the emotional integration with dynamic wiring, enriching the street space and reaching the attraction of "people". The dynamic wiring allows emotional integration, enriches the street space and achieves the attraction of "people".(Fig. 4)

First layer plane

(Fig. 4   The town centre of Field East II consists of a core shopping street and two themed field parks
Source: https://www.gooood.cn)

· **Entrance building and square**
The Peach Story Gallery (Fig. 5) at the southern entrance of the town is the representative building of the whole neighbourhood, presented in the shape of a peach on the front side,

and is the only purely modern heteromorphic building in the complex, which is an expression of the prominence of the local peach industry, as well as an expression of the fact that Tien Yuan Dongfang takes the local primary production as the featured theme, and combines it deeply with cultural and tourism innovations to mobilise the industrial innovations. The market square(Fig. 6)space is grouped through a steel and bamboo structure shed-like structure as the core and forms a sense of aggregation and outdoor theatre through the treatment of small sunken space.

(Fig. 5 Peach story gallery at the entrance Source: https://www.gooood.cn)

(Fig. 6 Overhead view of market square Source: https://www.gooood.cn)

· Use of materials

The facade of the building facing the shopping street (Fig. 7) has chosen timber finishes (Fig. 8) to blend in with the overall visual integration of the street. Another landmark building, the Rural Revitalisation Workshop, features a glass curtain wall within a frame made of bamboo and wood, facing the water and reflecting the peach forest, with one side of the two-storey through-roofed huge glass curtain wall (Fig. 9) facing the core landscape of the locality, the Dayang Mountain.

(Fig. 7 Detail of commercial street building elevation Source: https://www.gooood.cn)

(Fig. 8 Timber facade Source: https://www.gooood.cn)

(Fig. 9 Café inside the workshop Source: https://www.gooood.cn))

· Summary

The programme provides comprehensive supporting facilities to attract new farmers who love the rural scene and rural construction to buy properties and settle down in the countryside. Through the creation and integration of space and culture, the programme provides them with corresponding property space, employment opportunities and other supporting services, solves the obstacles they need to face when returning to the countryside, helps them "come in, live, work and have a future", and ultimately achieves harmonious and healthy growth in the idyllic countryside.

1.2.2 Songjiagou Rural Renovation Project[1]

· Project overview
Songjiagou Township is located in the southeast of Kelan County. Songjiagou Village, where the township government is located, is a central market town backed by mountains and lying on the Lanyi River. The village is close to the highway and is an important entrance for local tourism in the Great Wall Valley of the Song Dynasty. The villages are arranged from east to west, with new and old villages arranged in sequence. Villagers in the village have obvious boundary awareness and lack of public activity space. In 2017, they faced the important task of resettling villagers from surrounding natural villages. At the same time, it was difficult to assume the important functions of tourism distribution and entrance nodes.

The new village and the old village are divided into two parts by the river, resulting in very little communication and integration between the villagers on both sides. The traditional old village space has become a "shy" space, and public activities and places have been divided. Faced with the complexity of this spatial language, the spiritual confrontation of the villagers, and the potential resistance of the newly relocated villagers, the designer reorganized the space and implanted, softened, and transitioned the boundaries. After integrating the architectural styles of the new village and the old village, the street space, public landmarks and public spaces were re-planned.

· Transformation of street space
The original roads in the village had no unified plan and were in a state of disrepair for many years. Streets lack necessary lighting and uniform pavement, and the quality of roads in new and old villages varies. The overly old residential facades and the additional wires and signal receivers added later due to daily needs make the streets look less chaotic(Fig. 10). Unhardened dirt roads will form puddles and muddy road conditions after rainy days, and the roads lack adequate lighting systems, all of which affect villagers' daily travel. The streets are too small and do not reserve any leisure areas for the villagers. The elderly in the village can only lean under the outer walls and use the same road surface as motor vehicles(Fig. 11).

(Fig. 10/Fig.11 The main street before renovation
Source: https://www.gooood.cn)

Based on the integration needs of cultural tourism, the street is divided into pedestrian areas and vehicle areas according to different road levels and functional requirements. Special pavement and scale treatments are given to different functions (Fig.12). In order to better integrate businesses and villagers' daily activities, the scale of pedestrian streets is relatively large. Rest and flexible areas are reserved for shops and pedestrians on both sides. Added systematic lighting to villages. At the same time, the street facades in the commercial area and residential area are managed in a unified style, and the original cultural characteristics of Songjiagou Village are clearly conveyed to pedestrians through the facade materials and overall colors, while retaining the tradition of its brick and tile houses. Architectural style (Fig. 13).

(Fig. 12 The main street after renovation
Source: https://www.gooood.cn)

(Fig.13 The street after renovation
Source: https://www.gooood.cn)

· **Repositioning and design of village landmarks**

The village is located close to highways and mountains, making it easy to overlook. A village landmark landscape node of appropriate scale and obviousness can create a sense of entry into the site and clarify the space and orientation of the village. At the same time, the historical context of Songjiagou Village and local cultural monuments are blended and refined. Using the collection of old bricks and tiles in the village, the design of the village logo
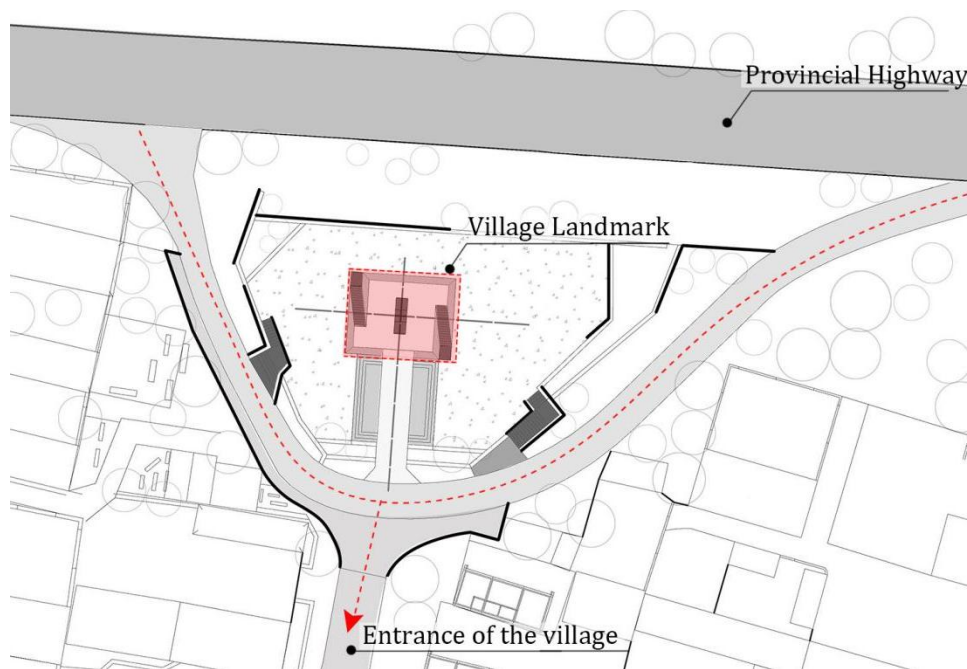
(Fig. 14 The plan of the village landmark   Source: Author's self-drawing)

infiltrates from the inside of the village, responding to the entire region, showing the characteristics, culture, history, etc. of the village, and creating a unique image and atmosphere for the village.

The integration and intimacy of local materials are used to form the space of public places, and at the same time, it also generates interactive relationships between people. The simple and unified treatment is more direct and highlights the role of the village entrance landmark. A certain range of public space has been expanded around the landmark, providing tourists and villagers with a clear route into the village at the entrance of the village(Fig. 14). The distribution square where the landmark is located is the first open space in the entire village. The small installations in the square have also become a place for daily rest and entertainment for villagers and children(Fig. 15).

(Fig.15 The elevation of the village landmark   Source: https://www.gooood.cn)

· Restoration of historic public spaces

The people's commune in the village witnesses the historical memory of the village and the youth of the current elderly. As a witness to the historical changes of the village and the memory of the older generation in the village, the designer changed it into a village history museum and village committee. While maintaining its original appearance, the original wooden structure was reinforced. The inner courtyard of the commune was remodeled to provide an effective space for subsequent public activities (Fig.16). The originally closed place has also been transformed into an open space, so that the main street outside the commune and the inner courtyard are interconnected, forming a flowing public space (Fig. 17).

(Fig. 16 The courtyard after remodeled
Source: https://www.gooood.cn)

(Fig.17 The street view of People's Commune

Source: https://www.gooood.cn)

· Summary

In addition to performing basic transportation functions, the streets in the village should also reserve business ports for pedestrians to rest and shops. The unified street style is conducive to promoting the overall culture of the village. Different road surface treatment methods should be used for different levels of road types to provide clear guidance for pedestrians and vehicles.Landmark buildings are very important in building the cultural tone of a village, and the distribution center at the entrance of the village should serve as the first memorable landscape node of the village, and should be equipped with a clear road network to guide pedestrians to further explore the internal space. explore. The shared memory locations in the countryside are worthy of being utilized and transformed into public open spaces. On the basis of assuming certain functions, street spaces and courtyard spaces should be combined to form a fluid public space.

1.2.3 "Xifuli" cultural and art village[1]

After the overall renovation and upgrade of the street scale and street space, Xifuli Art Village uses unified street space(Fig. 18) and iconic landmark buildings(Fig. 19) to provide a high-quality place for the tertiary industry to integrate into the countryside. The space has become a classic case of the perfect integration of cultural tourism in the countryside.

(Fig. 18 New Commercial street Source: https://www.gooood.cn)

(Fig.19 New Landmark at entrance Source: https://www.gooood.cn)

(Fig.20 Location of commercial sstreets and landmark building Source: https://www.gooood.cn)

· Transformation of street space

After the rural revitalization policy began in Shengli Village, a number of identical residences were built, which laid the foundation for the basic layout of the "Xifuli" village. The planning is in a horizontal layout, and the street scale is too large, and there are no clear road dividing lines and sidewalk divisions, causing two-way vehicles and pedestrians to mix on the same road, making the space uncomfortable. After briefly sorting out the space, the design team decided to maintain the original street context and only carry out large-scale spatial renovations on key commercial streets(Fig. 20).

The location of the commercial street is surrounded by modular building clusters and overly wide streets, making the entire block look too rigid. In order to change this problem, the

[1]*All information about the project comes from the website:*
https://www.gooood.cn/xifu-native-town-culture-and-art-village-chengdu-senna-landscape-design-consulting-co-ltd.htm
Design: Chengdu Senna Landscape Design Consulting Co., Ltd. ; Design & Completion Year: 2018-2021
Project Location: Shengli Village, Jintai District, Baoji City ; Gross Built Area: 30 acres

design team expanded the courtyard on the north side of the courtyard-style building, making the courtyard walls uneven, and protruded the store entrances on the south side to create a commercial port. Under the premise of maximizing the courtyard area, the street size is reduced to about 3.5 to 5 meters, and pedestrian and vehicle traffic diversion and landscape greening are planned to make the overall street space comfortable and orderly (Fig. 21).
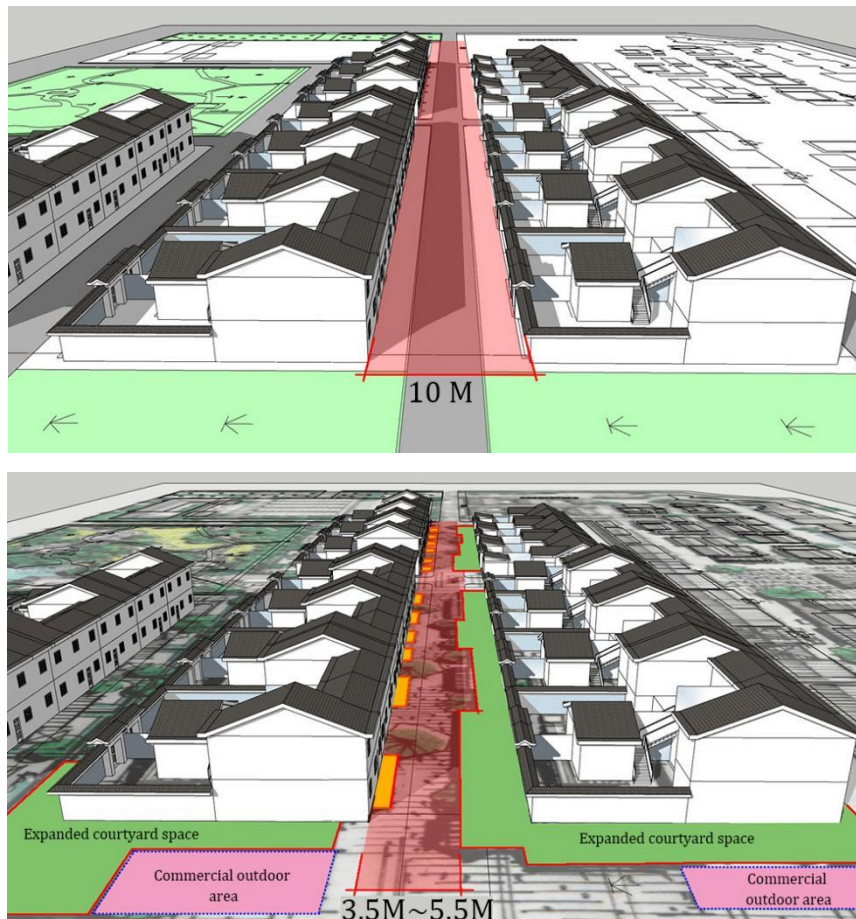
(Fig. 21 Rebuilt of Commercial street   Source: https://www.gooood.cn)

The village committee requested that while maintaining the chaotic style of the original building, it should not only meet the needs of sustainable commercial space, but also meet the residential attribute needs of residents. In order to change the original street facade, the straight back street was "added", the south courtyard was partially expanded, and the street scale was reduced to achieve a suitable space for people. Part of the wall was opened to create a transparent design. to meet business needs. The overall style adopts the style of white walls and black tiles, and retains the geographical features of the area(Fig. 22).

(Fig. 22   Rebuilt of Commercial street   Source: https://www.gooood.cn)

· Establishment of landmark corridors

The gable wall that originally faced the main street was designed into a landmark corridor and serves as the new entrance to Xifuli Village. It not only satisfies the visibility of the commercial area, but also softens the rigid horizontal layout. This landmark building is different from the smaller guidance devices in other villages. It spans the three newly planned main roads(Fig. 23) and forms a linear viewing space between the pool and the gable. People can go to different main roads in the corridor and look into the village through the holes in the wall(Fig. 24). The rich materials and hollow facade leave rich light and shadow under the sunlight, giving pedestrians a rich visual experience.

(Fig. 23 External view of the Corridor
Source: https://www.gooood.cn)

(Fig.24 Internal view of the Corridor
Source: https://www.gooood.cn)

· Summary

Reasonable street space does not mean blindly pursuing too large a scale, but determines whether the street is a mixed-use street for people and vehicles or a pedestrian street based on the functions of the street itself. Then create a suitable scale according to different needs, add appropriate green landscapes, and use the excess street space to expand the main building on both sides externally, while creating an outward commercial port for shops.A landmark building is not necessarily just a representative installation, it can also serve as an introduction space. The synthesis of spatial patterns and landmark buildings softly connects the external area to the inner village to a certain extent.

1.2.4 Design of new rural community in Mugou Village, Yancheng [1]

· Project overview

Mugou Village is located in the middle of the Lixiahe Plain, located in Yilin Town, Yancheng City, Jiangsu Province. The Mugou New Village project is based on improving farmers' living conditions, solving the phenomenon of rural hollowing, and establishing the relationship between urban and rural integration in the new era. Continuing the landform characteristics, style characteristics, spatial characteristics, and scale characteristics of traditional settlements, the new village can be better integrated into the old village and nature (Fig. 25).

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[1]*All information about the project comes from the website:*

https://www.gooood.cn/the-design-practice-of-yancheng-mugou-new-rural-community-by-atelier-zhou-ling.htm
Project location: Mugou Village, Yancheng City, Jiangsu Province ; Design unit: Zhou Ling Studio, NTU Design Institute
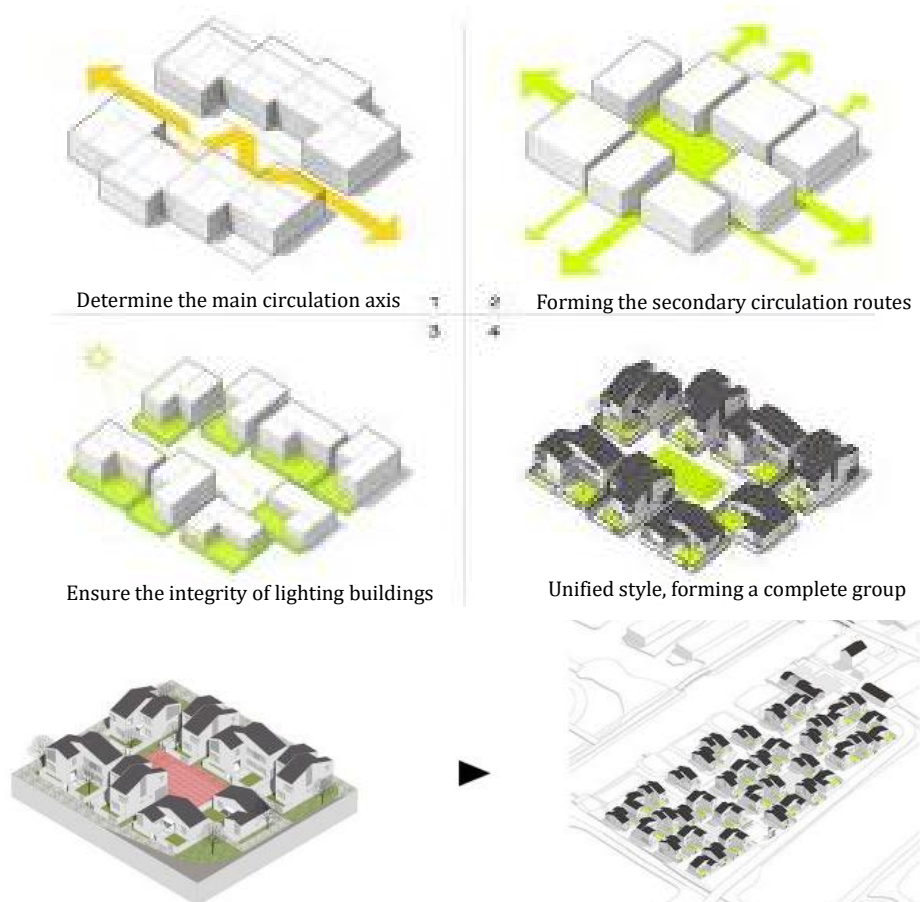*Construction time: February 2021 - October 2021 ; Land area: 18369.98 ㎡*

(Fig. 25　Location of new village　Source: Author's self-drawing)

· New forms of public space

Mugou New Village adopts a typed spatial combination model, with the public courtyard as the center of the layout, allowing it to grow naturally in a group-like form, forming a growth pattern from "single-courtyard combination-group-settlement" (Fig.26). The new village achieves a modern translation of the local formal language through abstract geometry. It uses dark gray tile roofs and whitened blue brick walls to form a strong contrast in the geometry of lines, surfaces and volumes, depicting the charm and artistic conception of traditional northern Jiangsu water town dwellings.

Determine the main circulation axis

Forming the secondary circulation routes

Ensure the integrity of lighting buildings

Unified style, forming a complete group

(Fig. 26 Generation of The New Village＇s settlement morphology　Source: https://www.gooood.cn)

The public space uses the same wall surface and the same roof profile as the group, perfectly hiding the open space under the roof. A small, private public space belonging to the group is formed (Fig.27). It can be effectively distinguished from the open-air open space in the center of the group. The open space in the central area can be a good solution for more public activities and gathering spaces (Fig. 28). Giving residents more options.

(Fig. 27 New public area under roof
Source: https://www.gooood.cn)

(Fig.28 New public area in the center
Source: https://www.gooood.cn)

· **Summary**

Public spaces can be divided into different levels of privacy according to different needs, when there is already a large distribution space that can bear public activities. Small public spaces with a certain degree of privacy will provide people with more choices, resulting in richer public activities and ways to use public space. And the open space does not necessarily have to be completely open-air. By using a shielding system that has a unified language with the surrounding buildings, it can reduce the damage to the original architectural style and architectural context, and improve the space requirements in a small area.

2. Foreign research theory and practice

2.1 Current status of space

The planning and road network of various spaces in European villages are relatively complete, as well as the construction of villages and the improvement of infrastructure. The village has a beautiful environment, convenient transportation, and complete infrastructure. Compared with the urban environment, the countryside is not much different. At the same time, the countryside also attaches great importance to the protection of the internal historical spatial pattern and has outstanding cultural characteristics.

Due to the obvious phenomenon of counter-urbanization, individual villages have become people's residences, and the overall spatial form has changed from focusing on industry to giving priority to the residential environment. Roads have changed from simply carrying transportation duties to providing a better walking environment for pedestrians to a certain extent. As the scale becomes larger, the addition of green landscapes and the interspersion of public spaces become a new spatial layout.

2.2 Rural spatial planning case studies

2.2.1 Renovation of Fairfax avenue, USA[1]

• Project overview

Fairfax Avenue is one of the most visible and economically significant thoroughfares in the Washington, D.C., metropolitan area. Located in the city of Fairfax, the avenue is home to numerous retail, office and automotive-related spaces and is the city's main commercial core. The thoroughfare has few services beyond automobiles, and its unique land uses and haphazard distribution of commercial buildings are geared only to automobiles. But the rapid growth of residential construction along the avenue has led the city to recognize that the avenue is critical to maintaining a high quality of life for Fairfax residents and that Fairfax avenue needs to be transformed into a vibrant and lively space. It is a public space and assumes the responsibility of the main traffic artery connecting the traffic nodes on the left and right sides. (Fig.1)

(Fig.1 General planning   Source: https://www.doverkohl.com/fairfax-boulevard)

(Fig.2 Existing conditions
Source: " Street Design : The Secret to Great Cities and Towns ")

(Fig.3 New planning
Source:"Street Design : The Secret to Great Cities and Towns")

[1]*Location: Fairfax , USA   Status: Constructed 2007*
*Designer: Dover, Kohl&Partners   Size: 3.5 miles*

 • **Transportation nodes**

The original traffic nodes did not have any planning, and there were no clear road plans and signal lights. As a result, roads originally responsible for urban traffic arteries can only attract high-speed vehicles, without any protection for pedestrians' walking experience and safety (Fig. 2). Therefore, the design team expanded the original landmark-like roundabout in the middle of the road and assumed a certain role in public space and greening. The overall route and guidance signs are planned in a unified manner, and efforts are made to provide a good environment for the future development of residential buildings (Fig. 3).

 • **Pedestrian friendly main road renovation**

Fairfax Avenue was transformed from a traditional suburban commercial corridor into a "Great Street." Creating a new boulevard that balances traffic capacity, safety, placenta-making and local character can turn it into a great street - a destination. [42]

The extension begins with a slow lane running parallel to the boulevard, forming the framework of a true boulevard. There is a wide sidewalk adjacent to the slow lane. Side passages with parallel parking spaces will provide a pedestrian-friendly boulevard, helping to slow traffic and provide the basis for street-facing buildings and a pedestrian-friendly environment. Street trees in the middle of the street are effective separation zones between traffic lanes and pedestrian paths (Fig. 4). Two on-street parking lanes on the side lanes will buffer traffic from the sidewalk and provide easy access to shops. New public space, wide sidewalks, multiple transportation options, and consistent tree lines will make Fairfax Avenue a more productive and pleasant place (Fig. 5).
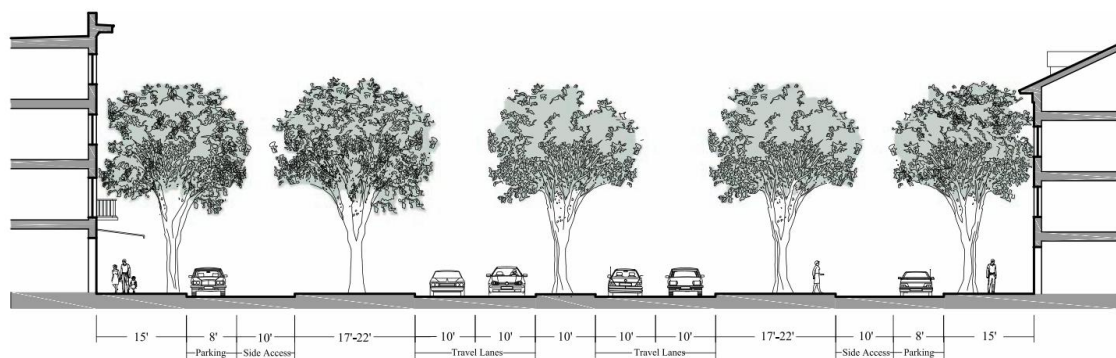
(Fig.4 Proposed section   Source: " Street Design : The Secret to Great Cities and Towns ")
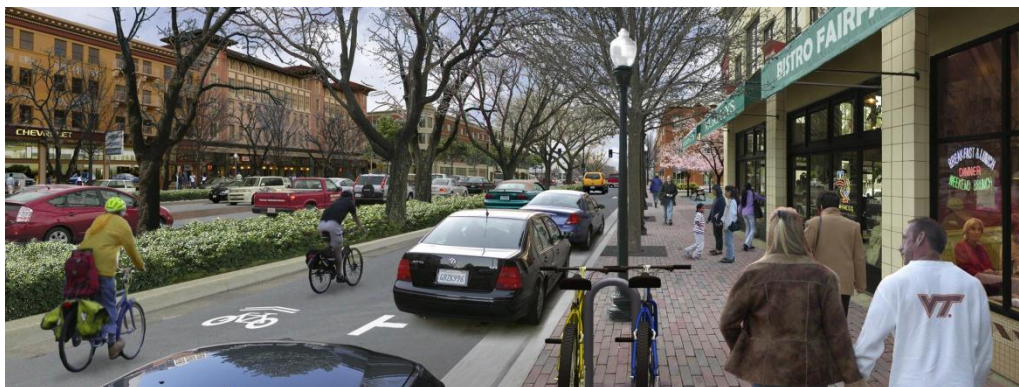
(Fig.5 Computer simulation   Source: " Street Design : The Secret to Great Cities and Towns ")

· Summary

The reconstruction of the main road needs to be based on the specific needs of the buildings on both sides of the street, while ensuring that it serves as the main traffic road. Landscaping and slow lanes and parking areas can be used to buffer sidewalk traffic. In addition to its basic transportation functions, traffic circles can also serve as new public spaces and green spaces, providing rest islands for pedestrians in large intersections. It can beneficially improve the safety and comfort of pedestrians.

2.2.2 Street development of El-Moaz street Fatimid Cairo[1]

• Project overview

(Fig.6 Location of EI-Moaz street Source:: Sustainable urban street design: evaluation of el-moaz street in Cairo, Egypt)

(Fig.7 Development area of EI-Moaz street Source:: Sustainable urban street design: evaluation of el-moaz street in Cairo, Egypt)

The development of environmental
Economic development
The development of social

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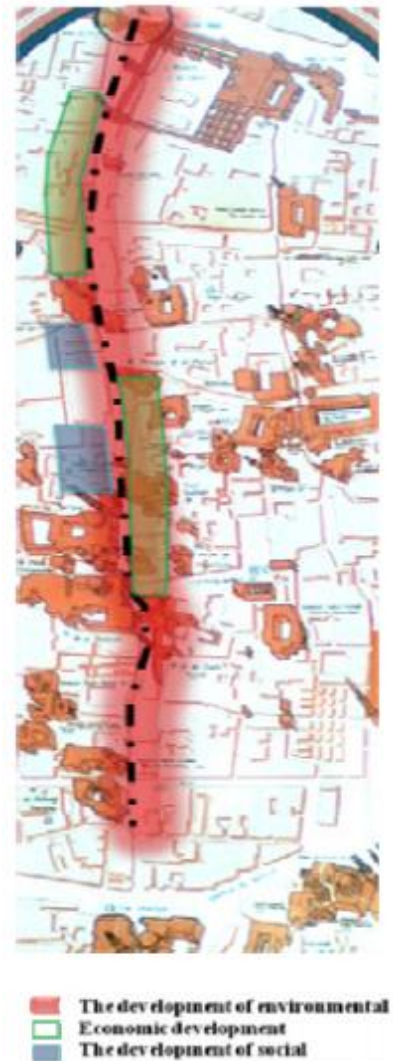
[1]*All information about the project comes from the paper :*

El-Shimy, H. G., & Ragheb, R. A. (2017). Sustainable urban street design: evaluation of el-moaz street in Cairo, Egypt. Procedia Environmental Sciences, 37, 689-698.

El-Moaz Street is located in the historic downtown Cairo area (Fig.6), with a length of about 1200 metres, it is the main street of the city. It extends from Fotouh gate to the north to Zuweila gate to the south and also Alkasserine Fatimid to the east and west [43]. As the oldest street in Islamic Cairo, this road has many relics of the Slavonic Fatimid era, such as Qur'anic schools mosques and public fountains, and is a point of human interest that can be described as an "open-air museum", as well as a bustling commercial neighbourhood (Fig.7).

However, due to excessive development, consumption and inappropriate use, this old neighbourhood has been damaged by pollution in terms of roads and buildings, and the environment. Because of its importance in terms of architectural, archaeological, heritage, tourism and economic value, in March 2009 the government developed a comprehensive plan to upgrade El-Moaz Street in the hope of revitalising the area's historical and cultural preservation while preserving the road's historic character.
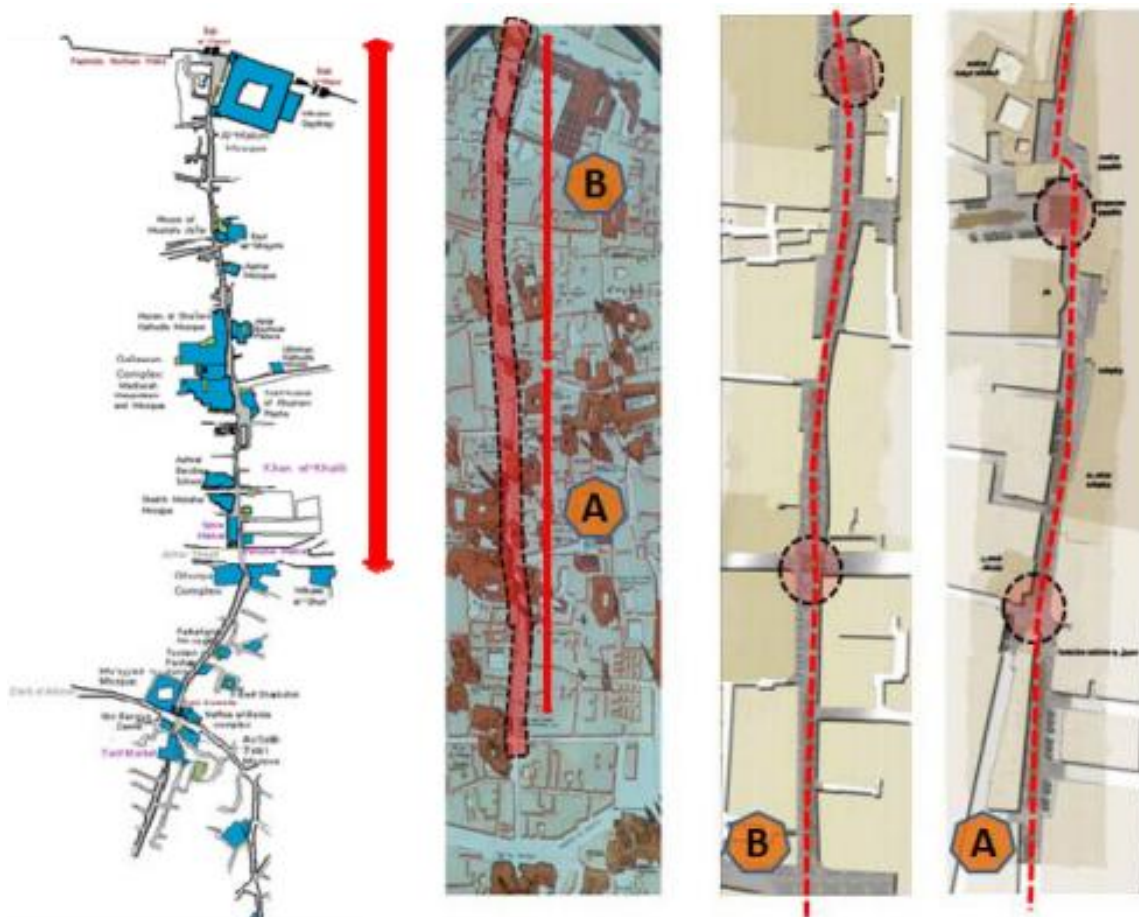
(Fig.8 Heritage buildings and open spaces for cultural and commercial activities
Source: Sustainable urban street design: evaluation of el-moaz street in Cairo, Egypt)

· **Analytical learning**
The design phase began at the Fotouh Gate and Al-Azhar intersection, targeting the road:

· Focusing on developing all facades of houses and shops on both sides of the street, paving the street and square with local black granite to achieve visual and material unity.

· Re-plan the buildings on both sides of the street according to the nature of the locality, adding catering and restaurants to serve visitors.

· Provide tourists with a variety of routes to choose from, and different shops are also equipped with different open spaces, using the open space to create a bridge between the closed space of the building and the road. (Fig.8)

· In the streetscape design, the site elements are used to develop and renovate the historical buildings and Islamic fusion architectural style, adding some street elements such as public art, street furniture, road lighting, landscape signage, etc.

· Division of roads, some streets are restricted to vehicle traffic or regulate traffic by restricting the opening of periods, and more use of pavements to attract tourists to visit the site, and pavements are also divided into foot, bicycle, and handicapped lanes (Fig.9), to fully adapt to the needs of all types of people.
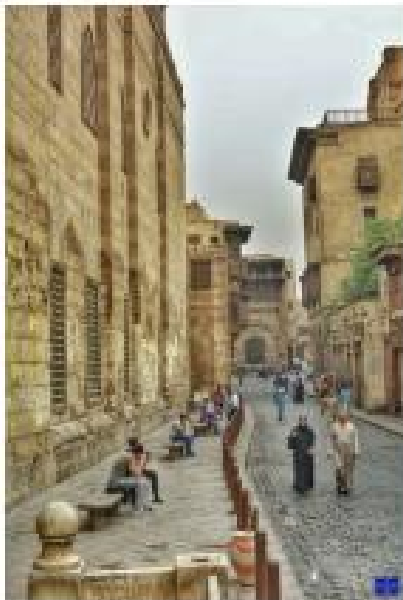
(Fig.9   EI-Moaz street
Source:: Sustainable urban street design: evaluation of el-moaz street in Cairo, Egypt)

· **Summary**

The El-Moaz Street development is a good example of learning from the development of the Egyptian heritage area features, which sees the street as a tool to promote the intimacy of the residents, encouraging outdoor activities with open neighbourhoods and a variety of connector life, and advocating the public to walk and congregate, play, and talk, which not only enhances the experience of the tourists but also develops the vibrancy of the city. At the same time, the designers use local natural materials to design well-ventilated spaces for buildings and neighbourhoods, aiming to integrate the principles of sustainable street network development with the design criteria.

2.2.3 Reactivation of Lancaster avenue[1]

• **Project overview**

Lancaster is a rapidly growing city with a population of just over 150,000 people located in northern Los Angeles County, approximately 10 miles from downtown Los Angeles. By the late 1980s, the city's historic downtown was in serious decline. Most retailers and business services have long since moved to business centers and shopping malls in other parts of the city, and after a century of suburbanization, Lancaster has lost its traditional downtown character (Fig. 10). Lancaster Avenue needs to be redesigned to spur redevelopment of its historic core.

• **Multifunctional use of streets**

The original five-lane thoroughfare was redesigned into an expanded urban park. Inspired by Barcelona's famous boulevards, a 30-foot-wide shaded central "La Rambla" was added, a multi-functional public space. The entire avenue has changed the common situation of having a traffic lane in the middle and traffic lanes on both sides. Transform the central area of the street into a multi-functional stopping area. Las Ramblas can host a range of public events, including farmers markets, street fairs and parade seating. When not in use, the central space provides daily diagonal parking spaces (Fig.11).

(Fig.10 Original Situation.   Source "Street Design : The Secret to Great Cities and Towns")

(Fig.11 Multiple uses.   Source:" Street Design : The Secret to Great Cities and Towns")

(Fig.12 Activity held on the avenue.   Source:" Street Design : The Secret to Great Cities and Towns")

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[1]*Location: Lancaster, California   Status: Constructed 2010*

Designer: Moule & Polyzoides   Size: 150 Acre District, 2/3 Mile Corridor

It's also a great example of how to improve our suburban communities. This bold redesign gives the city something to build on and sets an example for similarly situated communities, while reusing infrastructure and reducing vehicle emissions, taking advantage of a central location to shorten driving distances and encourage walking (Fig. 12). [44]

· Summary

Streets, as an important part of the area that undertakes transportation functions, are the spaces that residents are most familiar with and use most every day. Therefore, the combination of streets and public spaces can maximize space utilization and at the same time highlight local culture and local characteristics. The central area of the street serves as an open space, which also reduces vehicle speeds to a certain extent, making the entire block a pedestrian-friendly street. At the same time, the surrounding narrow streets will be converted into pedestrian paths to facilitate the diversion and guidance of crowds when public events are held on the avenue.

3. Comparison and summary

The unique characteristics of China's suburban villages mean that compared with local cases in China, most of the street space design cases in other parts of the world can only extract detailed planning for learning. In terms of overall rural re-planning and industrial upgrading, the "Xifuli" Cultural Village is the most similar to the design concept and goals of Beijing Chechang Village. Its analysis and re-planning and utilization of the street scale and the overall road network are all based on maintaining the original village spatial texture and cultural characteristics(Fig,1). The formal design must not only take care of the chaotic style of the original building, but also be innovative to meet the needs of sustainable commercial space and the residential attribute needs of local residents. This kind of planning method can integrate cultural tourism into the village to the greatest extent, thereby achieving the goal of rural revitalization.

The entire project re-sizes the streets according to the functions they serve. Public streets and private streets used by residents are distinguished by road levels. While clarifying the viewing routes for tourists, it also protects the privacy needs of local residents. The street facade designed in a unified classical style is the best way to express the overall village culture. A connected landmark entrance landmark corridor is designed on the gable facing the main street, which not only satisfies the visibility of the commercial area, but also softens the rigid original layout.

(Fig.1 Overall aerial view of the project after renovation.
Source: https://www.gooood.cn)

4. Overall case studies overview table

Rural spatial planning case studies **in China**

1	**"Wuxi Tianyuan Dongfang"** - the regrowth of China's first rural complex		- Designed by: Suran architectural design office - Time: 2018 - Land area: 440 hectares - Location: ,Wuxi City, **Jiangsu Province, China**	**Featured：** In the original texture, to create a modern cultural tourism and commercial space organization lines.
2	**Songjiagou Rural Renovation Project**		- Designed by: China Township Institute - Time:2017.04-2017.07 - Location: Xinzhou City, **Shanxi Province, China**	**Featured：** Space reorganized; Boundaries have been implanted, softened and transitioned.
3	**"Xifuli" Cultural and Art Village**		- Designed by: Senna - Time:2018-2021 - Built area: 30 acres - Location: Shengli Village, **Jintai District, Baoji City**	**Featured：** Adjusting the street scale, planning for the separation of pedestrian and vehicular traffic, rezoning yards.
4	**New rural community** in Mugou Village, Yancheng		- Time:2021.02-2021.10 - Land area:18,369.98 m² - Built area: 5356.065m² - Location: **Yancheng City, Jiangsu Province**	**Featured：** Typological spatial assembl--age patterns;monolithic -courtyard assemblage-group -colony growth patterns.

Rural spatial planning case studies **in other countries**

1	**Renovation of Fairfax Avenue**, USA		- Designed by:Dover, Kohl&Partners - Time: 2007 - Land area:3.5 miles - Location:**USA**	**Featured:** Reshape the street scale to create pedestrian-friendly streets. the traffic circle is used as an open green space.
2	Street development of **El-Moaz street Fatimid Cairo**		- Street length:1200m - Time:Planned in 2009 - Location: historic downtown Cairo area	**Featured：** Renewal of the restoration of old streets under sustainable development: replacement of façades; use local materials...
3	Reactivation of **Lancaster Avenue**		- Designed by:Moule & Polyzoides - Time: Constructed 2010 - Land area:150 Acre - Location:**Lancaster**	**Featured：** Neighborhood reactivation, mixed-use block planning. The combination of streets and public spaces.

Part VI. Spatial planning strategies for Chechang village in the context of agro-tourism

1. Reasons for site selection

· Positioning as a marginal village in a big city

As a typical peripheral suburban village, Chechang Village is located in Beijing Zhoukou Town, close to the "Beijing Source" cultural and leisure tourism board and the unique advantages of the Fangshan World Geological Park tourism board.Fangshan World Geological Park is the next key development area of Beijing's urban and rural planning. Beijing is the cultural and political centre of China, and it is the area that best represents the rapid development of Chinese cities and the fastest penetration of policies, culture and economy, so choosing suburban villages in Beijing allows us to carry out the research with the advantages of clear policies and better space and road convenience.

· Typical Chinese villages

China's villages are facing nearly the same problems, such as population loss, depletion of rural industries, and environmental degradation. This is also the problem that Chechang Village is facing. The construction of the countryside has been practised for many years, but there are still various contradictions: insufficient support for the primary and secondary industries, the need for tertiary industry support, the need to combine the countryside with the landscape and cultural background, revitalisation of the tourism industry, the development of peripheral industries, and drive the rural economy to achieve the purpose of rural revitalisation.

· Historical and cultural value

There are two national cultural heritage protection units in China within the village area of Chechang Village, namely the Jinling Ruins and the Cross Temple Ruins. Both national cultural protection units have high historical, scientific research and social and cultural dissemination value, but due to the lack of management, there are only a small number of introductory plaques, the lack of reasonable spatial organisation, service support and tour design, not in-depth discovery of the cultural value, the formation of a rich cultural connotation experience. However, the cultural lineage of the Chechang village is relatively clear, which is conducive to the design study from the perspective of road planning.

2. Chechang village：location & planning background

2.1 Location and geographic environment

The study area is located in the southwestern part of Beijing, belonging to Zhoukoudian Town of Fangshan District, in the first circle of the Beijing-Tianjin-Hebei metropolitan circle, about 46km away from the centre of Beijing (Fig. 1), and the village belongs to the grass-roots village level of the hierarchical scale of the township-village system. The

household population of 1,181 in the 2017 data statistics belongs to the extra-large villages, with the number of a labour force of 725 people. The village has a forested area of 2.34 square kilometres, with a vegetation cover of over 60%. With a beautiful natural landscape, rich human resources and a convenient transport network, Chechang Village is the location of the World Heritage Site- Zhoukoudian Peking Man Site and is a comprehensive town around Fangshan New Town, which develops with culture and tourism industry as the leading industry.
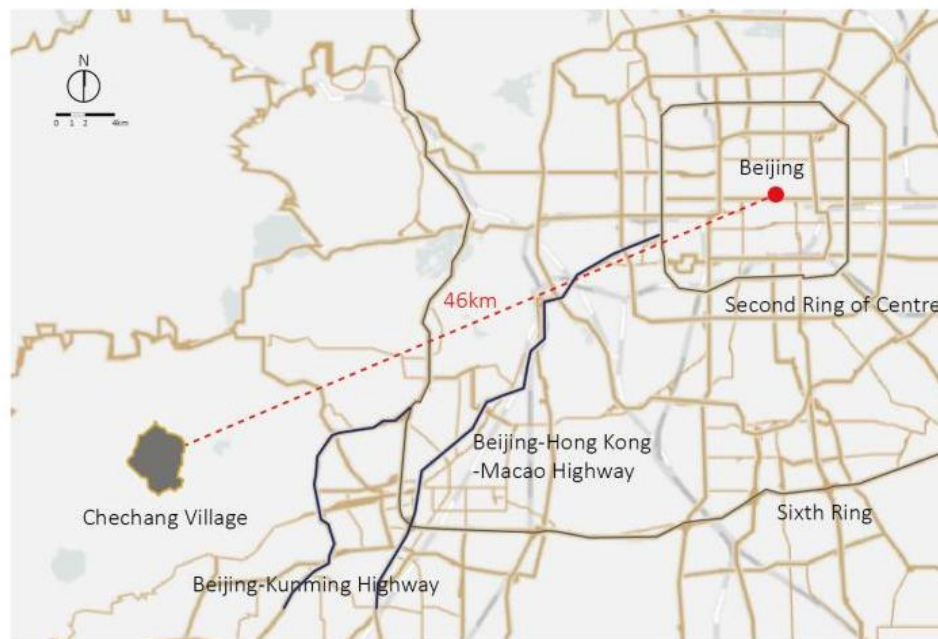
（*Fig 1：The location of Chechang village   Source: Author's self-drawing*）

The villages have completed basic human environment improvement, including road hardening and public toilet renovation; most of the houses are of good quality and the overall environment is relatively clean. The villages are now facing problems such as weak industrial development, lack of rational development of ecological and cultural resources, insufficient endogenous impetus in the villages, imperfect facilities for improving living conditions, and the overall appearance of the villages needs to be upgraded.

2.2 Natural resources

Chechang Village is rich in ecological resources, with diverse forest resources and species in the village area, with nearly 1,000 species of plants and dozens of species of wild animals and insects; the farmland is mainly dry land, the forest vegetation mainly consists of mixed coniferous and broad forests and shrub forests (Fig. 2), and the grassland type is mainly subalpine meadows, with a small number of other water systems. Diverse ecosystems are highly valuable for the regulation of climate environment and water conservation, as well as the support of soil and biodiversity [45].

Chechang Village is in the transition zone between plains and mountains, with rich topography and geomorphology constructing a beautiful landscape pattern, a high proportion of mountainous areas and forest coverage combined with the latitude, forming a

distinct four-seasonal landscape; the surrounding mountains are continuous, with pleasant scenery and fresh air; some of the existing mountainous areas are damaged due to coal mining, and the vegetation of the mountains has been damaged, which has resulted in the loss of water and soil, and environmental pollution and other problems.

（*Fig 2：Natural landscape of the Village   Source: Internet*）

（*Fig 3：Shizi temple ruin   Source: Internet*）
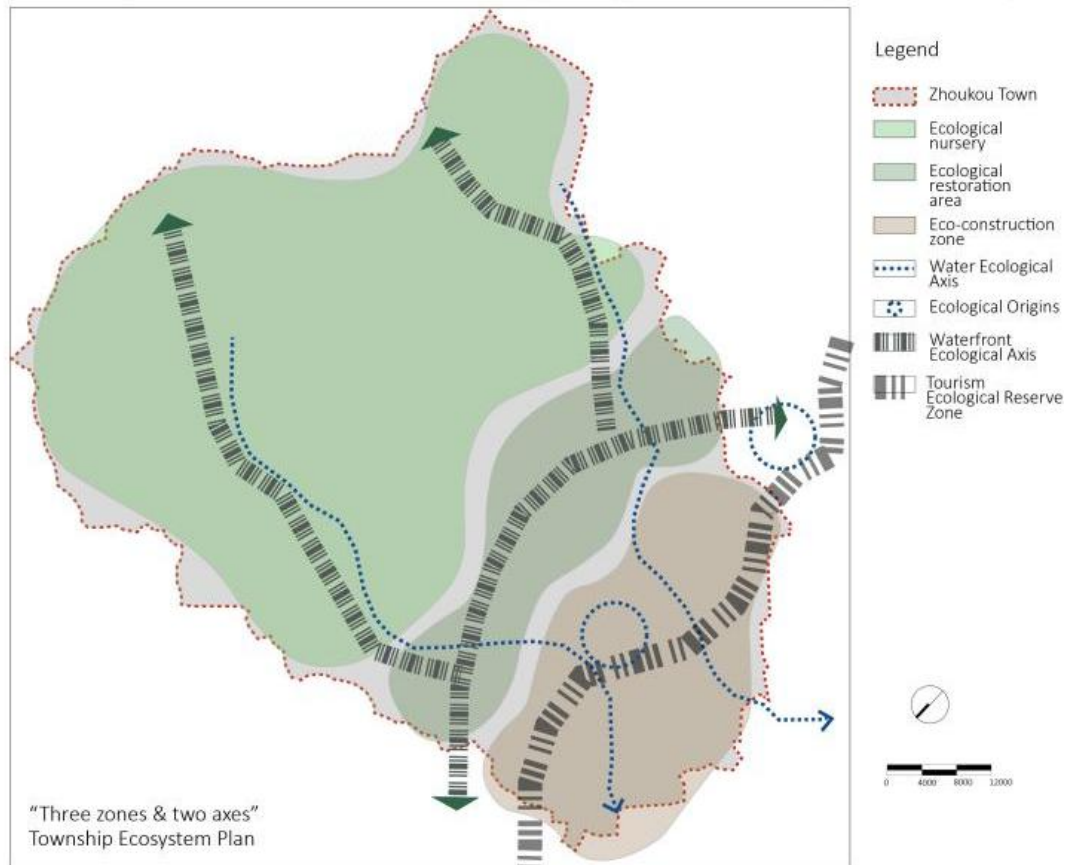
2.3 Industrial development - Tourism

In the industrial development layout plan of Chechang Village, the primary industry is based on fruit planting, mainly planting walnuts and peaches, and in the blooming season, peach blossom festivals will be held for ornamental purposes, and the planting is done on a family basis, but most of the village is mountainous, with a lack of water and exploitable land, a small planting scale, a lack of labour, and incomplete agricultural equipment, leading to the slow development of the primary industry. The secondary industry is mainly based on coal mining and related enterprises.

The tertiary industry is based on tourism, and the income mainly relies on the collection of scenic spot tickets, with the sale of some handicraft products, which is the most important industrial plan of the Chechang village:

There are three eco-tourism, tourism and leisure development belts within Zhoukoudian Town (Fig. 4), and Chechang Village is classified as an ecological conservation area, located in the northern eco-tourism belt formed by relying on the former residence of Jiajia Island, the Jinling and the Cross Temple(Fig. 3). Chechang Village became a village during the Jin Dynasty to the Yuan Dynasty. Because it belongs to the mausoleum area of the Jin Dynasty, for the Jin Dynasty royal family to visit the mausoleum to stop the storage of the moped, so the name of the car factory (field) [46]. It has a rich cultural heritage, there are two national key cultural relics protection units: the Jinling site and the Cross Temple site.

Chechang Village has rich historical and cultural resources and natural resources, but the village is affected by the topography, and the development of all industries is greatly restricted. It is not suitable for the development of large-scale industries and is difficult to

（*Fig 4：Masterplan of Zhoukoudian Town in Fanshan district   Source: Author's self-drawing*）

expand. On the other hand, the tertiary industry in the village is not yet systematic, and the original small number of B&Bs have been closed down, requiring further planning and integration. Therefore, the government proposes the development mode of tertiary industry (tourism) to drive the primary and secondary industries, so as to create a unique cultural card of the Chechang village.

## 3. Administrative framework & local policy support

The development of rural tourism in China has been in a period of accelerated development in the past decade. The State Council upgraded rural tourism development from industry development to a national strategy in 2018. According to the new plan in the "Beijing Urban Master Plan (2016-2035)" document, Fangshan District City has been identified as an important area for the joint development of the Beijing-Baoding-Shijiazhuang Development Axis[1] and an important area linking the ecological area in southwest Beijing and the central city. Due to its special geographical location and location advantages, efforts to develop

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[1]*The Beijing-Baoding-Shijiazhuang Development Axis is one of the three major development axes of the Beijing-Tianjin-Hebei urban agglomeration, including Beijing, Baoding, and Shijiazhuang.*
Beijing-Tianjin-Hebei Urban Agglomeration is China's "Capital Economic Circle". The Beijing-Tianjin-Hebei urban agglomeration includes the two municipalities of Beijing and Tianjin, as well as individual cities in surrounding provinces.

tourism and leisure areas that integrate history, culture and relics have become the next key development direction. In response to the functional positioning of "Three Districts and One Node"[1] in Fangshan District, the "Fangshan Zoning Planning (Land and Space Planning) (2017-2035)" was promulgated in 2019. The state will strengthen the protection and utilization of relics such as the Peking Man Site and Jinling Site in Zhoukoudian Town, actively promote the protection and construction of cultural belts, create an international tourism and leisure area, and cultivate an influential tourist destination.[47] At the same time, Zhoukoudian Town, which is affiliated to the Chechang Village, is one of the most important heritage scenic spots and is a key development and key policy support area in the policies mentioned later.

3.1. "Three districts & Three axes, Three groups & Multiplepoints"
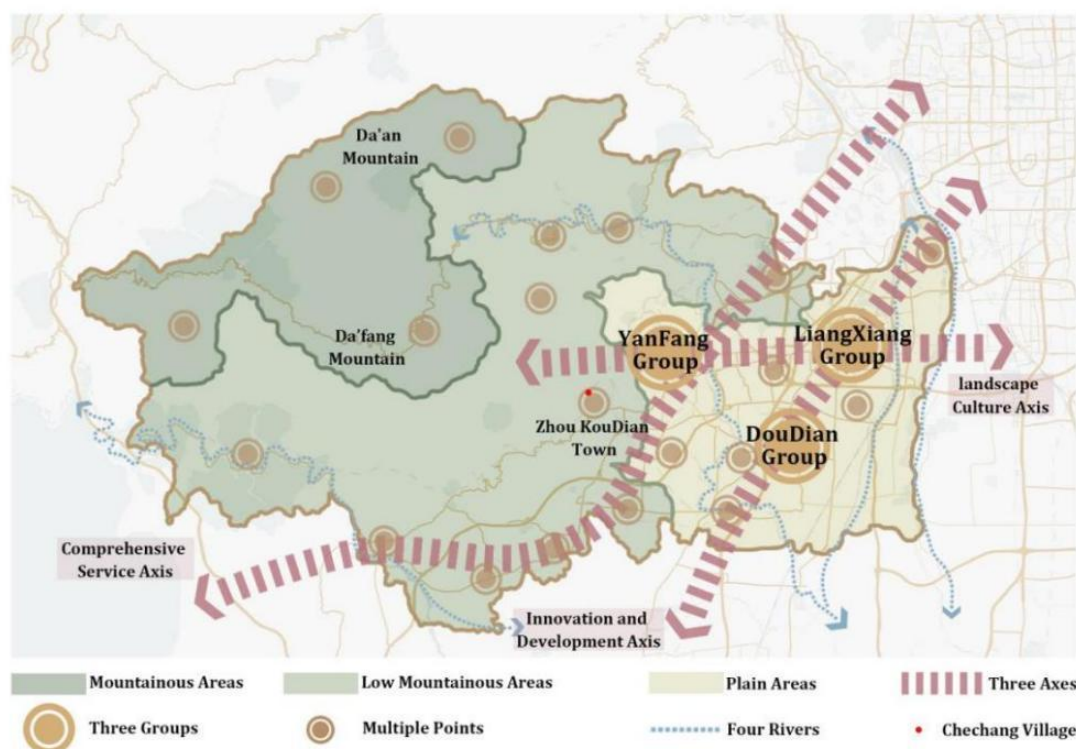
（*Fig 1：Spatial layout planning diagram   Source: Author's self-drawing*）

In the "Fangshan Zoning Plan", the government divided Fangshan District into plain areas, low mountainous areas and mountainous areas based on natural resources and geographical environment, and connected the three axes to form three axes based on the three concentrated development areas. In order to configure comprehensive services, scientific and technological innovation development and ecological cultural tourism are given three axes: the comprehensive service axis, the innovative development axis and the landscape

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[1]*Three Districts: Key ecological conservation and regional ecological governance collaboration area in the southwest of the capital, science and technology and financial innovation transformation and development demonstration area, and international tourism and leisure area integrating historical culture and geological heritage.. One Node: an important node on the development axis of Beijing-Tianjin-Hebei region;*

cultural axis. It forms a spatial structure of "two mountains and four rivers[1] , three districts and three axes, and three groups and multiple points"(Fig. 1). Ensure ecological, production and living space, ensure the construction of public service facilities and infrastructure, achieve complementary development in mountainous and plain areas, and build a harmonious and symbiotic urban-rural relationship.[48]

On the basis of the "three zones", the Beijing Municipal Planning Institute refined the style and construction types of Fangshan District based on the original relics and natural resources of each township, and classified Zhoukoudian Town as a cultural, tourism and leisure style area. Zhoukoudian Town, as one of the "Three Groups and Multiple Points", is geographically close to the Yanfangzhu Group among the "Three Groups", which is conducive to relying on the radiation effect of its development to transform the results into the driving force for later development and introduce related industries. Utilize the horizontally developed "comprehensive service axis" to strengthen infrastructure construction, and combine it with the development of the "landscape cultural axis" to upgrade and refine tourism-related services.

3.2 "Three tours, Three routes and Multiple areas"

（*Fig 2：Cultural inheritance structure planning diagram   Source: Author's self-drawing*）

The development of rural tourism is an important industry sector in Fangshan District's future. On the basis of a good ecological foundation, combined with historical and cultural resources, the internal industries of the tourist area will be activated. Relying on Beijing as the main cultural line, we build a new cultural tourism pattern in Fangshan with " three

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[1]*Two mountains and four rivers: Da'an Mountain, Dafang Mountain, Yongding River, Juma River, Dashi River and Xiaoqing River;Three districts and three axes: plain area, shallow mountainous area, mountainous area, comprehensive service axis, innovative development axis, and landscape culture axis; Three groups with multiple points: Liangxiang Group, Yanfang Group, Doudian Group and 20 towns.*

groups, three roads, and multiple areas"[1] (Fig. 2), with full coverage of multiple systems to support the protection and construction of the cultural belt, integrate three major cultural groups such as Zhoukoudian, and shape the cultural tourism brand. Create the second international high-quality tourism line in the capital to promote the upgrading of tourism in the entire region.[49]

3.3 Related developments of tourist passenger transport lines

Since the scenic spots in the ecological mountainous area are relatively scattered, the tourist road facilities in Fangshan District are not complete. And due to the terrain of the two mountains, most of them are mountainous roads, which cannot form a complete road network to serve the tourism industry. In the "Transportation Development and Construction Plan for Fangshan District during the 14th Five-Year Plan" released in June 2022, the government will promote the planning of a complete tourism transportation network. Promote the construction of suburban railways to serve international tourism and leisure areas, and strengthen road transportation planning and construction. Based on the main traffic arteries, we will strengthen road communication and connection between tourist attractions in Fangshan District. With the significant increase in the proportion of private cars, Fangshan District has comprehensively planned and developed related road networks for self-driving tours. All road designs are based on existing highways and main traffic arteries, with additional services such as rest areas and camping areas. Facility (Fig. 3).
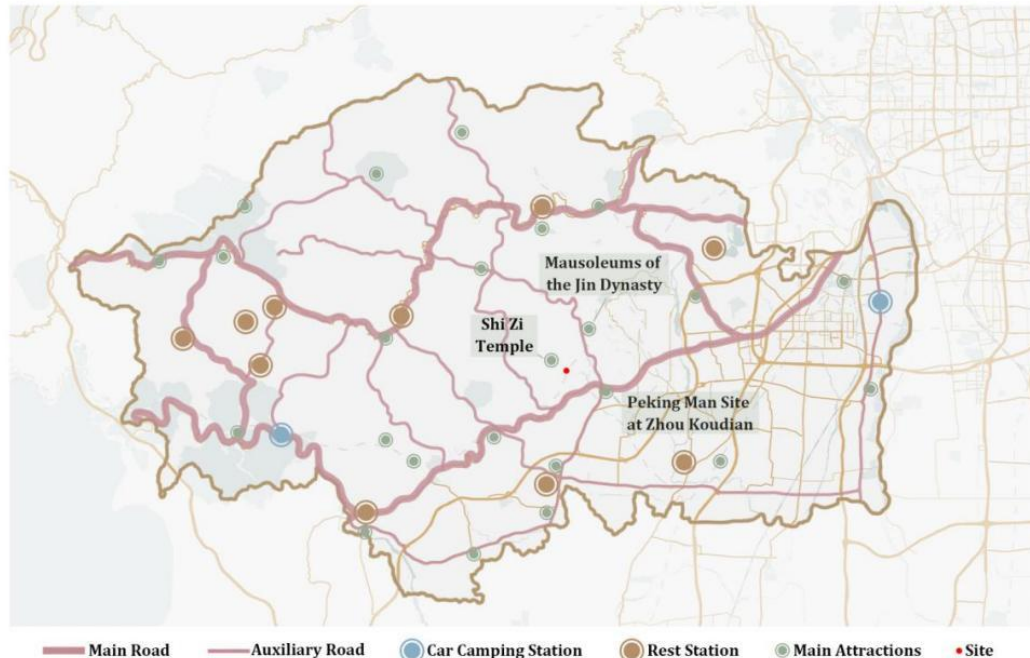
（*Fig 3:Scenic self-driving route planning map   Source: Author's self-drawing*）

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[1]*The three groups include Zhoukoudian Group, Liulihe Group and Yunju Temple Group, which are the core components of Beijing's source culture; The three roads are the ancient royal road in the plains, the ancient battle road in the mountain front, and the ancient business road in the mountainous area, connecting the essence of Fangshan culture; Multiple areas include multiple cultural parks, which are an important component of the cultural essence of mountainous areas.*

Connecting all important scenic spots into a film strengthens the interconnection between the scenic spots. Guided by tourist attractions such as the Zhoukoudian ruins, we will upgrade and improve tourist transportation service facilities. Combine idle vacant land and unused land to lay out tourist parking facilities to improve tourist traffic reception capacity.

Public transportation around Zhoukoudian Town will also focus on development, and new subway lines will be added to connect the city and Zhoukoudian Town. Increase the frequency of bus supply in urban areas and major tourist directions, and increase the proportion of public transport trips in the area. Accelerate the innovation of bus service models and improve the coverage and services of regional bus network.

4. Current problems and dilemmas of Chechang community

4.1 Industrial development issues

The construction of Chechang Village was developed earlier, but it did not find suitable industrial upgrading methods to follow the rapid development of the national economy. At the same time, multiple levels of industries are mixed without development focus and priority, resulting in many internal problems within the industry, a vicious cycle, and the development of all industries is almost at a standstill.

4.2 Policy issues

Although rural revitalization and rural cultural tourism development have become China's strategic development policies, all policies are relatively macro-level. The geographical scope and industrial scale of focus are too large compared to Chechang Village, and no specific policy support has been issued for it.

Zhoukoudian Town, where Chechang Village is located, is the cultural tourism protection circle that will be the next focus of development in Fangshan District, Beijing. However, since the cultural tourism area to be developed in Fangshan District is relatively large, the development order of small-scale villages like Chechang Village will be relatively dependent. back. At present, we can only use the radiation effect of Zhoukoudian Town's policy welfare to drive the development of related industries.

4.3 Spatial issues

Due to the different spatial blocks developed in Chechang Village, the distribution of public space is relatively scattered, and there is no corresponding road network to support it, which increases the cost of using public space. The texture of the space is not prominent and it is difficult to carry a certain degree of tourism development, which limits the industrial upgrading and development of the village. In addition, the existing public spaces are few in number and small in scale and cannot bear larger public activities.

The excessive construction speed in the early stage resulted in an incomplete and low-level

planned road network. There is no distinction between roads of different levels and functions, and there is a lack of corresponding connections between various types of spaces. The entire village shares one main road. Although the street scale is large, the demand for vehicles in production and life makes the use of the road complex and the movement lines confusing. The lack of road signs and road dividers allows motor vehicles and pedestrians to share the same traffic, reducing the level of road safety. The uniform hardening of roads weakens the characteristics of the cultural village and is not conducive to later tourism integration.

5. Preliminary analysis

5.1 Location analysis

Chechang Village has a superior geographical location (Fig. 1), located in the northernmost part of Zhoukoudian town, Fangshan district, Beijing, belonging to the interface area between the shallow mountainous area and the plain area of Fangshan Ddistrict, the location of the source of the Zhoukoudian river, the retained and developed villages in the upper planning "Zhoukoudian Town Town Master Plan", rich in historical resources, belonging to the Zhoukoudian cultural cluster.

Zhoukoudian town has a good landscape pattern (Fig. 2): a transition area between shallow mountains and plains, with beautiful scenery of Cat's Ear Mountain, Sanbanshan mountain and Jiulong mountain within the village area, and at the same time the source of Zhoukoudian river.
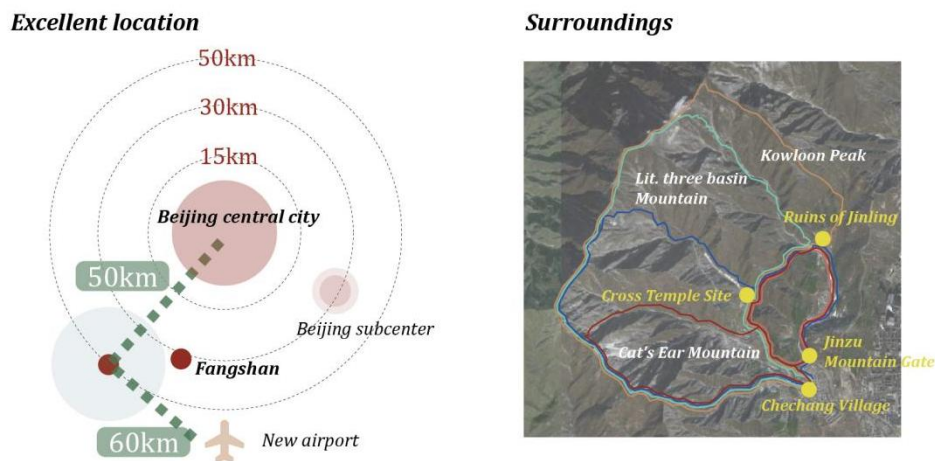
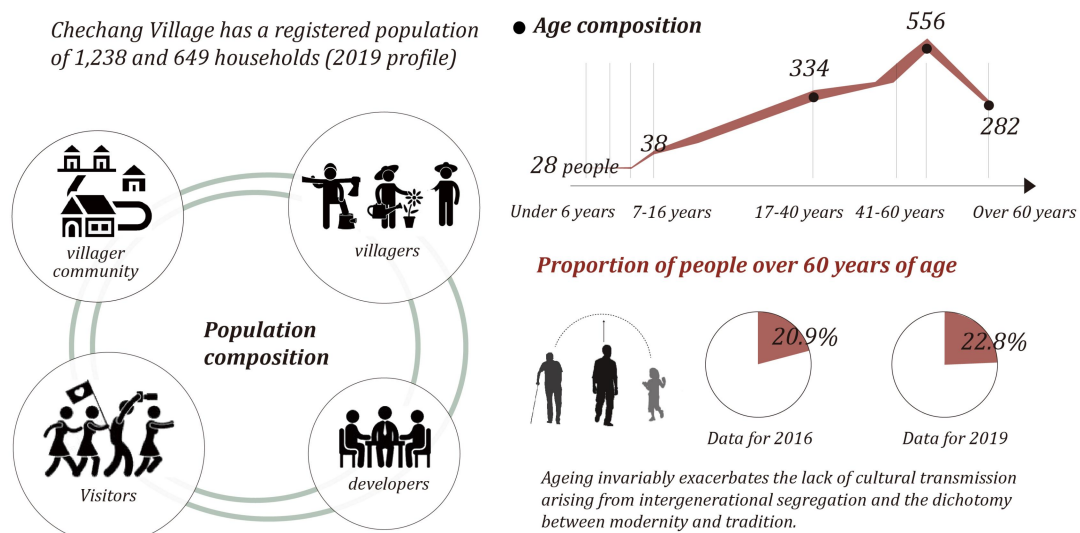（Fig 1&2： *Location and surroundings of Chechang village   Source: Author's self-drawing* ）

In the Beijing Fangshan Sub-area Planning, the town of Zhoukoudian is positioned as an international cultural tourism town represented by the Beijing source culture; in the village planning, relying on the Jinling Cross Temple, tapping into the cultural connotation of the village to develop rural cultural tourism villages.

5.2 Crowd analysis

The crowd is the initiator of all spatial behaviours and the most dynamic element in the village, and the analysis of the crowd in Chechang Village is the basis for spatial planning. Through the research survey (Fig. 3), in 2019, the registered population of Chechang Village is 1238 with 649 households, which can be roughly divided into village collectives, villagers, tourists, and some developers and entrepreneurs according to the types, in which the problem of the ageing population is particularly obvious. With more than 65% of the population over the age of 40, the village suffers from a lack of care for the elderly and a lack of space for basic recreation and activities; at the same time, due to a lack of infrastructure and educational facilities, children and young people are flocking to the cities for a better environment and job opportunities, which will lead to a reduction in the labour force and vitality of the entire village in the long run, and the creativity and stability of the village will be affected as well.

Chechang Village has a registered population of 1,238 and 649 households (2019 profile)

villager community

villagers

Population composition

Visitors

developers

● *Age composition*

556

334

38

28 people

282

Under 6 years   *7-16 years*   *17-40 years*   *41-60 years*   *Over 60 years*

Proportion of people over 60 years of age

20.9%

22.8%

Data for 2016

Data for 2019

Ageing invariably exacerbates the lack of cultural transmission arising from intergenerational segregation and the dichotomy between modernity and tradition.

（*Fig 3*： *Composition of the population   Source: Author's self-drawing*）

Different groups of people have different demands for village development.

· Workers in agriculture or self-employed villagers will face fewer job opportunities, the problem of unstable industrial development, the village collective representative that "planning and investment have done a lot, but not on the ground, I hope the village will be transformed into a co-operative villagers and the main management of the village committee management and operation, to promote the participation of villagers", the villagers believe that "village There are many scenic spots, but not many people in our village to stay a few days" "live at the foot of the mountains, not much arable land, tourism companies to develop the downturn, there has been no development" ...

· Tourism companies and some entrepreneurs believe that "there are cultural relics and landscapes and have planned and carried out some cyclical projects, but there is not much progress". For tourists, high-quality natural historical and cultural landscapes attract them to

come, to the attractions and the surrounding villages but due to their development disorders and backwardness and can not feed back the tourists a good tourist experience. "It feels good to come from the city on weekends to climb and hike and get some exercise", "Climbing the mountains is OK, just no more attractive activities" ...

Behavioural model
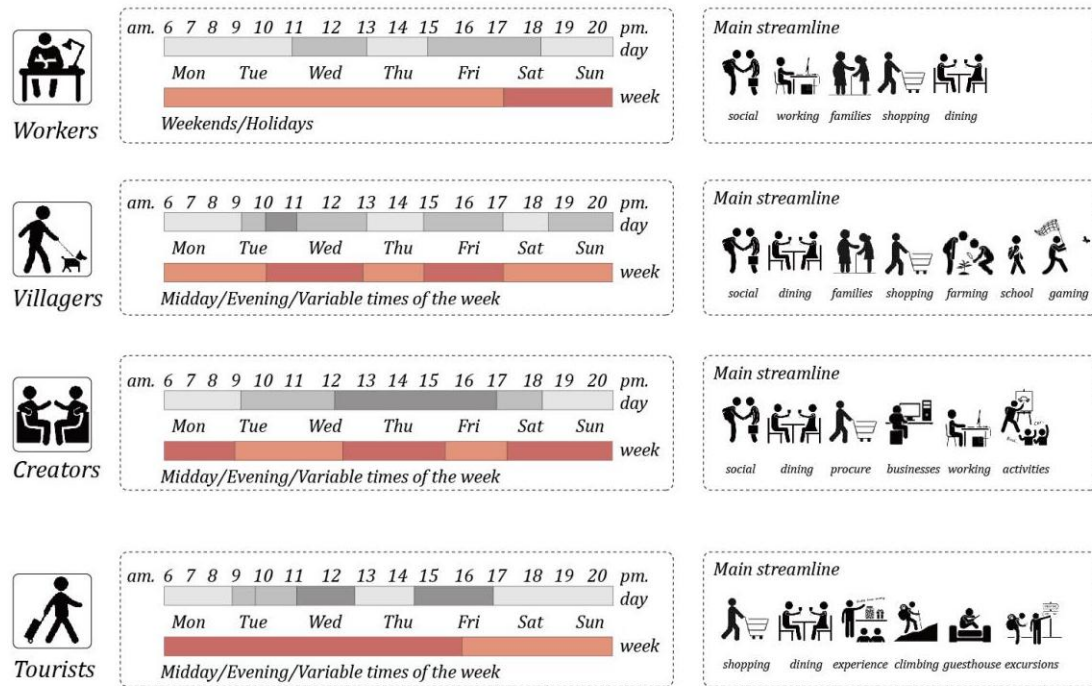
（*Fig 4*： *Activity analysis of time and frequency of road use   Source: Author's self-drawing*）

By designing the activities and time for different groups of people (Fig. 4), the behavioural analysis of travel time and road usage frequency of residents, foreign tourists, and commuters (including business people and entrepreneurial teams) are discussed separately, and based on the results, it is possible not only to separate the tourists from the main areas where the residents live but also to separate the tour routes from the resident's daily life and business areas, to reduce the impacts that the tourism industry has brought to the lives of the residents.

5.3 Streetscape analysis

Due to the lack of infrastructure and road management in Chechang village, there were no accurately recognizable street photographs in the network research, and only basic pictures of the three square meeting points along the main road were obtained. (Fig. 5) From north to south, they are the entrance square of Jinzu mountain tourist attraction, the party branch of Chechang village, and the Sinopec petrol station. As can be seen through the live photos, these three small gathering points face the same problem:

The gathering plaza has a large space but without any planning, without any public facilities and resting seats, and the entrance to the tourist attraction is not designed for guided tours

and tourists' passages, which is mixed with the land for citizens' living. Meanwhile, for the main road, no planning and road is marking for pedestrian and vehicle traffic, the greening on both sides of the road is not designed, which is not beautiful and can't isolate the noise well, there is no planning for car parks, and the vehicles are randomly parked on the roadside and in the plaza. The whole village is cold and has no vitality.

（*Fig 5： Actual photos along the main road   Source: Author's self-drawing*）

6. Planning ideas

6.1 Planning objectives

After synthesising all the problems and preliminary analyses of the Chechang Village, from the road, the villagers' living area and the visitors' use area are roughly divided into two parts by the main road, and a new pedestrian street is added to the visitors' area to separate the vehicles from the pedestrian area. The overall space is vertically divided into residential, commercial and ecological areas. By modifying the space at the entrance and the end of the village, the two main service spaces for villagers and visitors are clarified.

The original buildings on both sides of the street are relatively chaotic and do not form a complete street facade, so the scale of the road is changed by inserting similar modules, and the road is modified and regularised. While ensuring that the original living space of the villagers is not destroyed, the integrity of the street facade of the pedestrian street is ensured. On this basis, different groups are inserted to improve the services for residents, tourism development and ecological needs.

6.2 Planning concept

The whole design revolves around the street, which connects the whole site, (Fig. 1)and at the same time, the two main roads of the original site also separate the whole village in the east-west direction. The design connects the whole village groups by constructing two roads with different functional areas, enriching the spatial changes, with a clear pedestrian-vehicle flow, and providing opportunities for the revitalisation of the Chechang Village under the mode of combining agriculture and tourism in a spatial point of view.

Guiding role: retaining the function and location of the original vehicular main road running through the village, setting up an ancient street, villagers' activity centre, living square, village theatre and car park along the main road, connecting a series of service facility clusters through the road.

Separation function: the site has two main roads, the model road and pedestrian commercial pedestrian street area, around the car road, is the residential group of residents and service facilities group; a new pedestrian street is introduced from the entrance, the tourist commercial development area, the resort area and the residential area to isolate, the flow does not conflict. Widening of this pedestrian commercial road serves as an emphasis and allows for the setting up of access and activities such as events and catering. Nodes of varying sizes are set up along the pedestrian road, and the design is seen as an activation point for the village, used to attract and retain tourists for events or breaks, as well as to bring crowds to the eco-farms, maximising the potential for regeneration by taking advantage of the existing industries in the Chechang Village.
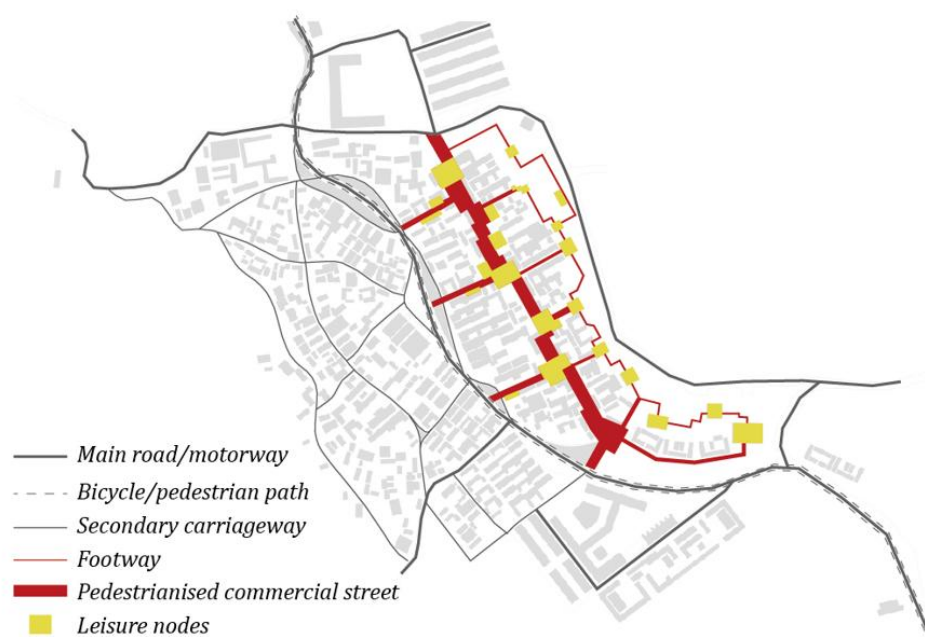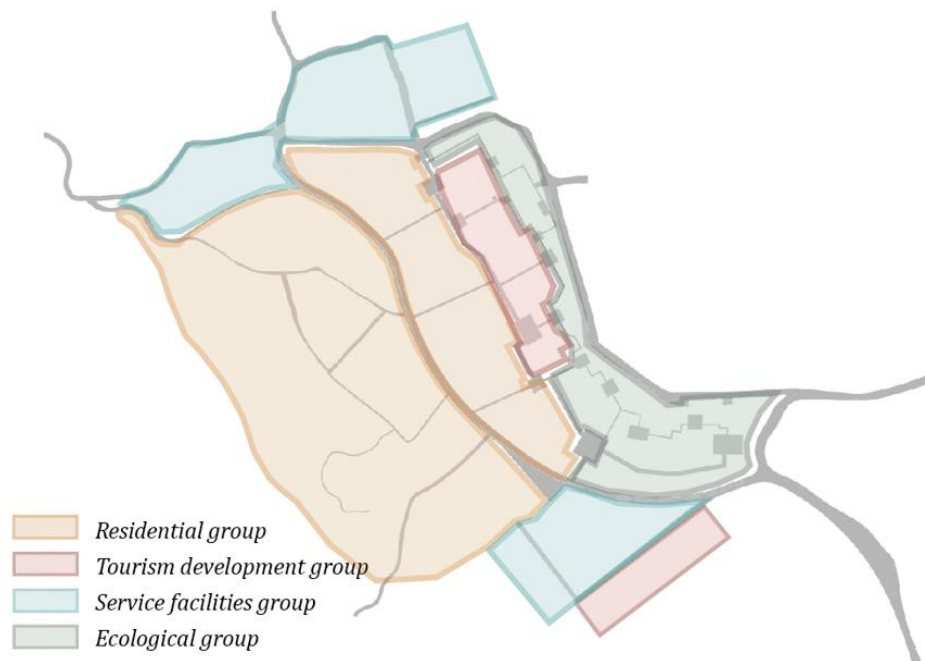

（Fig 1： Road design   Source: Author's self-drawing）

Most of the original buildings and functions of the village are retained, (Fig. 2)the original residential areas are retained in the south along both sides of the road, and only a small number of commercial areas supermarkets and shops are changed near both sides of the road, to provide supplies for passing tourists and pedestrians, and to meet the daily needs of the residents. The buildings near the east side of the village, because of the good natural landscape and natural farmland planting, are set up as an ecological zone, with farms and experience farms to provide tourists with viewing points and stopovers; at the same time, resorts in the form of village villas are set up to provide perfect facilities to safeguard the tourism industry of the village.

Most importantly, to attract tourists to enter and feel the positioning and historical and cultural connotations of the whole village at the beginning of their entry, activity centres with plazas and iconic sculptures have been set up at the entrance areas of both villages. As a village with a long history and culture, if we want to make use of the traditional culture to promote the characteristics of the village, we need to set up a civic activity centre, a historical and cultural exhibition hall, a village theatre and other cultural buildings at the entrance of the village, to attract tourists and at the same time, let people recall the historical glory belonging to Chechang village.

Functional analysis

Residential group
Tourism development group
Service facilities group
Ecological group

（Fig 2： Cluster design   Source: Author's self-drawing）

There will be many small spatial compounds and core element points in the large clusters divided according to functional areas. Figure 3 and 4 show the design's natural, cultural and industrial core elements focus and some thematic grouping possibilities. The small centres formed in the site will become the place and reactor of the rural story, with aggregation of people, activities and even space.

Core elements analysis

- Natural elements
- Cultural elements
- Industry elements

（*Fig 3：Core elements analysis　Source: Author's self-drawing*）

Cluster theme analysis

（*Fig 4：Cluster theme analysis　Source: Author's self-drawing*）

7. Design presentation

7.1 Overall design planning of Chechang village

Since the industry in most suburban villages in China is no longer dominated by agriculture, it is replaced by the addition and development of the secondary and tertiary industries. As the main development trend of Chechang Village, cultural tourism needs to be integrated

into it while ensuring that the daily life of the indigenous people is not disturbed. After comprehensively analyzing all the problems in Chechang Village, the villagers' living area and the tourist area were roughly divided into two parts by the main road. New pedestrian streets were added to the tourist area and transformed into a commercial pedestrian area, and the vehicle and pedestrian areas were separated. isolation. It forms an east-west layout with residential areas, commercial areas and ecological areas as its components. By modifying the space at the village entrance and the end of the village, two major service spaces for villagers and tourists were clarified, and the basic needs of villagers and tourists were further divided(Fig.1).

（Fig 1：Plan of the designed Chechang village   Source: Author's self-drawing）

The original texture layout of the entire village is very chaotic, and there is no complete and systematic transportation network. Moreover, due to the small number of young people in the village and lack of potential for industrial development, many buildings are abandoned and the residential areas are in disrepair. After deleting redundant and cluttered abandoned buildings, the road scale was changed by inserting similar groups, and modified and organized. For the increasing number of vehicles and congestion problems, traditional traffic specification design can no longer solve the growing demand. In modern China's urban road design, in addition to functional satisfaction, we are also thinking about how to fundamentally change the traffic pattern. From the perspective of people and environmental protection, it is necessary to break the dependence on automobile use and instead consider non-car driving and non-transportation needs.[50] Therefore, the overall visitor experience area connects multiple functional blocks through different paths, extending the radius of people's activities and increasing the variety of interaction possibilities for different groups

of people and activities. While activating the vitality of the overall commercial pedestrian street, a "green travel" method is adopted.

7.2 Detailed planning of pedestrian streets

Urban architecture is an important part of the urban landscape. The history of the city forms a unique urban culture, interacts with the urban landscape, and produces a unique urban image. It plays a positive role in realizing the local identity of urban residents and continuing the local historical context.[51] In order to highlight the original Beijing-style culture of Chechang Village, the overall pedestrian street uses the traditional Beijing courtyard house as the basis, and uses the characteristics of the new Chinese style on this basis to adopt different enclosures on the basis of updating the traditional colors and facades. form. (Fig.2) Different enclosed masses are connected through streets, breaking the linear street space in the traditional sense, connecting from points to lines, and then widening to surfaces. The entire pedestrian street has activity spaces and stagnant spaces of different sizes, which are enough to host and generate commercial experience spaces that attract tourists and local villagers.

（*Fig 2：Plan of the designed pedestrian street   Source: Author's self-drawing*）

8. Spatial planning strategy for Chechang community

8.1 Spatial layout planning

The spatial planning of the entire Chechang Village can be summarized from south to north, transitioning from tourists to villagers. From west to east, from mainly architecture to mainly ecology. It can be seen from this that the pedestrian street in the middle is the transition

between the residential area and the planting experience area. To a certain extent, the privacy of villagers' lives is protected. As a pedestrian commercial street in the middle transition area, it is necessary to increase public open space to guide the crowds brought by cultural tourism to the east side of Chechang Village and separate it from the residential areas.

As mentioned above, abundant stagnant spaces can guide pedestrians to a certain extent. Through such guidance, placing stagnant spaces with different functions in the street can effectively improve the different types of behavior of tourists on the pedestrian street. The vestibular space is, to some extent, the most susceptible area to be used as a stagnant space. Whether it is the expanded space of shops along the street or the space generated by different enclosure methods, it can increase the participation of different types of people in public space. This further expands the scope and function of the street space, and stagnant spaces of different sizes will also give people different feelings. This design technique is mainly used in the design of pedestrian streets. (Fig.1)

（*Fig 1：Perspective   view   of   pedestrian   street   Source: Author's self-drawing*）

The stagnant space needs to be separated from the movement space, otherwise the role of the stagnant space will be greatly reduced. Because the movement space gives people the feeling of flow and continuity, while the stagnant space gives people the feeling of stagnation and security. Therefore, all spaces in pedestrian streets where people are expected to gather and stay should be separated from the street itself. In some cases, stagnant space and movement space can be completely separated or directly adjacent. This article advocates the design method of "pedestrian corridor & pedestrian node", which distinguishes the linear space where people mainly flow through heights different from the street level and rest seats. After the basic stagnation block distribution is completed, different activity areas are filled in according to different groups of people. For example, handicraft experience area, children's play area, external dining area, and performance area. Without complete separation, in

addition to feeling safe and private in the stagnant space, people can also observe other activities taking place on the pedestrian street. The overall space is fluid and open, which is conducive to pedestrians' mutual observation and the mutual penetration of activities.

The stagnant space in the street space can, to a certain extent, increase the folding of tourists' sightlines on the pedestrian street, and a certain degree of occlusion can draw the crowd's attention to the activities and things around them.

8.2 Rural residential construction

There are problems with the existing housing in Chechang Village. The existing rural housing construction is in a messy manner. The housing is built by rural residents themselves without professional planning such as structure, layout, lighting, energy saving, etc. It only meets the basic living needs. However, due to the residents' economic problems The level and aesthetics are different, and the style of the entire village is not uniform; at the same time, the vacancy rate of houses is relatively high. The population loss in villages is serious, with most of the population moving to larger cities and even Beijing. Judging from population data, only less than 60% of the population are permanent residents in rural areas, which results in many irregularly restricted or vacant residences and a waste of resources; At the same time, some villagers have illegally designated land near their residences as their own planting land or living yards. These are all unreasonable housing problems faced by Chechang Village today.

The renovation of the house is roughly divided into two parts. Most of the original residences will be retained, and only the greenery and public spaces around the building will be changed, retaining the original architectural pattern and functions; changing parts of the building, such as based on the historical atmosphere of the ancient building complex and the development of the entire village's tourism industry, will emphasize business and The public-function residences were renovated, and the roof style of the building was changed, unifying it into the ancient Chinese style. According to the different functions of the new residence, the special space suitable for receiving guests, selling goods, experiencing folk customs, and exhibiting history and culture is redesigned to meet the basic needs of staff and tourists to the greatest extent. This is shown in the drawings attached to this article. What deserves more attention is the renovation and construction of the original residence:

In order to visually unify the village and improve residential comfort, the village collective can plan and update the residences in Chechang Village, and design different internal house types according to different family situations to meet the diverse needs of the aging population. At the same time, sustainable design principles must be followed during reconstruction, such as green ecological principles, thermal insulation and energy saving principles, comfort principles, etc. On this basis, specific functional design can truly improve the living standards of residents.[52]

8.3 Public service facilities configuration

In this scheme design, in response to the updated spatial layout, public infrastructure facilities that are sufficient to meet the daily life of residents and tourists are also set up. Public services are very important in the development of towns and villages and are related to the vital interests of residents and organizations. People's growing material needs have also increased their dependence on public services. If you want to build a vibrant community, you also need to make a spatial layout of public service facilities and consider the accessibility of public facilities based on population composition and supply and demand. and development optimization. In response to the current problems of insufficient public service supply in many villages, low quality, and inability to fully meet demand, this design is carried out in many fields such as education, medical and health care, elderly care, culture and sports, and social welfare. Build an age-friendly community space [53].

This design uses two streets as the design theme, and the remaining building groups surround the streets. Residential residences and living places are on both sides of the main road. On both sides of the arbitrary commercial block are tourism industrial parks, with commercial shops and resorts as the main body. After comprehensive consideration, first of all, there is a basis for setting public service allocation standards. It is necessary to consider the elasticity and flexibility of spatial organization and adopt the "15-minute living circle" method for design. "15-minute living circle" is a multi-complex urban design concept with its core connotation. It recognizes, transforms and renews the community from a human scale and perspective, emphasizing the interactive relationship between residents' actual lives and community space.It is the basic unit for configuring life services and public activities [54]. It is a series of concentric circles extending outward according to different cores of life, with radii of 5 minutes, 10 minutes, and 15 minutes of walking distance respectively. During this period, different urban infrastructures are evenly placed near the residences, and no other types of buildings intersect with surrounding squares. Serve. For example, in a neighborhood living circle that is a 5-minute walk away, daily services need to be provided for residents, such as convenience stores, kindergartens, street green spaces with fitness facilities, etc.; in a neighborhood living circle that is a 10-minute walk away, there are usually small Open service neighborhood centers such as parks, primary schools, and health service stations form a livable and slow-living neighborhood circle; while the center of a community living circle that is a 15-minute walk tends to provide residents with relatively larger and comprehensive service facilities. For example, large-scale sports and entertainment facility centers, art and cultural facility centers, etc.

Chechang Village has convenient transportation, flat land, and a relatively concentrated population. Starting from the entrance of the town and along the main road, there are village committee centers, clinics, cultural activity stations, sports facilities, etc.; in terms of transportation, public transportation and non-motorized travel are popularized , there are separated bicycle lanes on both sides of the road, separated by pedestrians and vehicles; at the same time, it greatly meets the daily use needs of residents, and a large number of seats and viewing platforms are set up on the roads and in the public spaces of the village, as well as an activity center. , a small activity space with village characteristics that meets the needs

of chatting, catering and snacks, holding activities, and experiencing handicrafts.

8.4 Road and car parking planning

The original street system of Chechang Village was in poor condition. There was only one main road running from north to south in the entire village, and there was no clear distinction between lanes. Due to the more regular building planning, the secondary arterial roads have clear textures, but lack corresponding road maintenance and supporting infrastructure. The overall road scale is relatively chaotic, and a new road network needs to be planned as a whole.

（*Fig 2：Perspective view of villager square Source: Author's self-drawing*）

China now particularly promotes green travel in street planning. The term "green transportation" also appears frequently in various publications and reports, and Chinese cities have a positive attitude towards green transportation modes.[55] Most of the thinking on updating transportation methods is very unified: encourage walking and cycling, increase the planning of non-vehicle roads on both sides of the road, encourage low-carbon travel, and improve public transportation. Regarding non-vehicle roads, narrow public roads can be set up to give priority to the convenience of pedestrian travel roads and public services, and the adoption of bicycle & public transportation methods, including the implementation of shared bicycle networks, are actively and fundamentally changing the transportation network and reducing the number of vehicles. Traffic pressure also improves residents' living experience. Therefore, on the main roads, the road construction method is adopted to separate motor vehicles and non-motor vehicles to create a pedestrian- and vehicle-friendly street space. (Fig.2) In order to re-plan the road without disturbing both parties, it is necessary to first clarify the functional distinction of the street. The main road in the middle mainly serves motor vehicles, while the pedestrian-friendly streets on the east side mainly serve pedestrians, increasing people's sense of security and experience on the street, and reducing traffic safety hazards. Street trees are further used to separate purely pedestrian

areas from traffic roads to improve people's safety. They not only play a soft isolation role but also ensure the smoothness of walking routes.

In order to further ensure that tourists can enter the pedestrian commercial street as quickly as possible, the first parking lot and pedestrian street entrance are set up at the visitor center at the entrance of the village. Ensure that the crowds are diverted as soon as they enter the village, and the walking crowds are separated at the beginning. It reduces the traffic pressure and traffic flow behind, while ensuring the operation of the tourism industry, it will not squeeze the original traffic space of the villages. The second parking lot is set up on the north side of Chechang Village near historical sites and farmland to facilitate the parking of agricultural and other industrial vehicles. It is also divided into parking areas for small private cars.

8.5 Greenland landscape planning

The most basic form of landscape is greening. Among the large areas of hardened road, Chechang Village has almost no greenery inside the village except for farmland and plantations. This has greatly reduced the living environment and quality of life of the villagers. After planning the Maru Basic Road, a large number of green areas were created in the blank areas between buildings. At the same time, greening is used as a soft separation, and the main road and the surrounding activity squares and pedestrian areas are softly divided. It also blocks the private buildings behind the commercial area to a certain extent, isolating and distinguishing private space from public space. This ensures that the land penetration area is maximized and a sustainable green corridor is created without affecting the road system.

The activation of street space by landscape is not limited to greening. As mentioned earlier, the new neighborhood not only positions the traditional Beijing courtyard house as its basic style, but also combines the construction characteristics of the new Chinese style. The windows along the street in the pedestrian block have been changed from small windows with traditional patterns to large windows, increasing their proportion in the building facade. Infiltrating the indoor atmosphere and activities into the street space enriches the single functional presentation of the street space. At the same time, in order to effectively guide and divide the flow of people, many green blocks, light strips, exhibition boards, etc. are used in the center of the pedestrian street to slightly divide the space. (Fig.3) While increasing the richness of the pedestrian street space, it also implicitly plans the walking route of tourists to ensure the integrity of the experience. On the planned walking route, different landscape pieces are used to increase the layering of the space.

（Fig 3：Section of pedestrian streets　　Source: Author's self-drawing）

Conclusion

Conclusion 1: Theoretical research on street space in suburban villages

1.1 Background and importance of street space development in suburban villages

China's rural road construction has passed the period of rapid expansion and entered a stage of stable development. In the context of accelerating urbanization, the government has begun to expand the main arterial roads between urban and rural areas in order to balance the gap between urban and rural areas and promote the common development of rural areas in the next step. Around 2017, the construction of rural road infrastructure with the city as the core and radiating to the surrounding areas was completed, and the road network and road quality within the suburban villages began to be optimized.

Street space is a gathering place for social activities and a social place for people to live. The quality and environment of the space affect the behavior of the people inside, and the behavior is adapted to the surrounding environment, so the quality of the street space needs to be focused on. At the same time, the street is the first space that different groups of people can come into contact with in the same area, and it is also the necessary space for transition between different places. As a symbol and epitome of a region, street space also plays an important role in attracting and guiding crowds. Driven by the background of creating characteristic villages and rural revitalization, more and more managers are aware of the importance of street systems and street spaces.

1.2 Current problems in suburban village streets

There is no systematic road network and different road levels. The internal road network of most villages has only one main road, and the rest of the road network is chaotic and of poor quality. Road maintenance work is not in place, resulting in many abandoned dead-end roads. The road network with poor accessibility and the residential clusters with poor privacy after initial reforms have reduced the guidance of main roads and effective roads, making it difficult for people to gather and form frequently used streets.

The physical conditions of rural roads are not friendly enough for pedestrians. The simultaneous development of different industries has resulted in people, vehicles, and livestock using the same road surface. This phenomenon is exacerbated by the lack of infrastructure and lighting systems in street spaces. The lack of traffic signs and road dividing lines greatly reduces the crowd's experience and sense of security and shortens their stay time on the street.

The expression of street space is too single and boring. The excessive speed of construction and modular construction have caused rural culture to be submerged in the same rural roads. Although the proportion of hardened pavement is very high, most of them do not have any design. They just use basic materials such as asphalt or cement as the pavement without any memory points.

1.3 Street space activation method

As a coherent space that runs through the entire city or countryside, the responsibility of sustainability cannot be ignored. It is crucial to transform and upgrade the way street space is presented, from mainly motor vehicle lanes to pedestrian-friendly street spaces, so that people can have a safe and convenient environment during daily activities such as commuting, walking, and participating in activities in street spaces.

The daily living radius of residents is around residential and commercial buildings. A 15-minute walk is the area that best covers daily habits. Therefore, it is necessary to combine transitional stagnant space with linear street space to extend people's living radius and activity range and increase people's resting points in the street. This will improve the participation of different types of people in street public spaces. At the same time, it is necessary to regard the street space as a three-dimensional overall space, and regard the building facade and pavement as the surface of the space to create a unique street atmosphere. Insert small stagnant spaces and landscape greening to bring vitality to the street space and increase the dwell time and experience of people in the public street space. Use green landscapes as soft isolation to increase soil permeability and create sustainable street spaces with clear styles without affecting traffic and economy.

Conclusion 2: Industrial development and community building in Beijing's Chechang village: A spatial planning strategy of "separating people and vehicles into two roads, multiple centres and multiple districts".

This thesis chooses the Chechang village in the Fangshan District of Beijing as the research object.

2.1 Current situation and problems

Beijing is the capital of China, and the representative of rapid economic and cultural development, Chechang Village is adjacent to Beijing's cultural and leisure tourism services belt and is the key area of urban development radiation. As a suburban village of Beijing, Chechang Village belongs to the middle grass-roots villages in China's hierarchical scale, with a population of more than a thousand people, and belongs to the large villages, which have the advantages of rich natural resources, convenient transport, and rich humanistic architecture and traditional culture, and it is a representative of the fringe space of the big city chosen in this thesis.

Pre-analysis of Chechang Village reveals that it belongs to a typical Chinese village: it has the disadvantages of facing population loss, industrial depletion and underdevelopment, as well as an excellent agricultural foundation and the cultural value of national cultural relics. The village is rich in ecological resources, with 60% of forest vegetation and a small amount of water system. The diverse ecosystems and rich topography make the village a beautiful landscape pattern and four-season scenery. However, irrational mining and land use have

polluted the environment. At the same time, Chechang Village is facing problems regarding policies and spatial organisation: weak industrial development, no reasonable use of natural resources, lack of rational planning of spatial functions, inadequate infrastructure, and no reflection of traditional culture.

2.2 Design approach

As the leader and experiencer of all activities, production and life, people are the first consideration in this design. Through the crowd and behavioral analysis of the villagers in Chechang Village, it was found that most of the villagers are elderly and need enough leisure and recuperation space and more attractive spaces to attract tourists and talents.

Explore the unique cultural and industrial advantages of the village and adapt measures to local conditions. Awakening the historical memory of Jinling Ancient Street in the village, on the premise of improving the living conditions of the indigenous people, combined with reconstructing the space and industrial model, and with the support of policies, improve the happiness of the villagers. By designing a rich and free ideal village form, we can stimulate the urban vitality of the whole village and even the whole region, and radiate to more similar villages.

The roads on the site are re-divided through the paths of the people, one main road is retained, and the other is changed into a multi-functional commercial pedestrian block; the space is divided into residential areas, commercial areas, and agricultural ecological areas, and groups are connected through paths. Set up spatial courtyards and core elements to become a reactor for rural stories and tourist experience; without disturbing the original living space of the villagers, set up resorts and agricultural experience parks in areas close to farmland to maximize the industrial and cultural advantages of Chechang Village , carry out village revitalization.

2.3 Discussion and outlook on update issues

In response to similar problems faced by suburban villages, this paper advocates design priority through research and analysis, starting from the perspective of human needs and behavioral possibilities, and reconstructing it through the renewal of spatial structure and functions, the transformation and re-planning of road systems The production and lifestyle of the entire village. From the perspective of small and medium-sized suburban villages, urban fringe areas contain rich and complex resources. The most significant feature that differs from simple rural areas is their high degree of non-agriculturalization. The advantage of low-priced land can bring about larger enterprises. In order to improve operating efficiency, the secondary industry occupies most of the position [56]. At the same time, people began to value the richness of spiritual culture, which greatly promoted the development of the tertiary industry.

Therefore, if you want to redevelop an area, you need to: a) predict the development demand for public transportation based on the needs of the government and residents, redefine the

network context, and draft urban public transportation corridors; b) place a variety of functions along linear streets areas and divided according to functions. Such as traditional commercial areas, business and trade areas, tourist shopping areas, administrative central areas and landscape functional divisions; focus on functional complementarity and the connection between various divisions, use activity centers to gather people and express the emotional orientation of the design; c) During construction At the same time, a multi-level landscape ecology is created. Different landscape nodes are set up according to different functional areas, which can be used for separation, guidance or gathering, so that residents can enjoy visual enjoyment and be guided by the landscape, clearly expressing the context of the planning; d) Respect traditional culture and awaken the profound historical heritage. It is not limited to the development of the physical environment, but seizes the cultural advantages of the region and gives it new functions, focusing on the reproduction of historical culture, functions, and landscapes [57]; e) Sustainable development plan. Under the construction of basically complete infrastructure, vigorously promote energy-saving facilities and the transposition of land use structure and urban functions to achieve flexibility and operability [58].

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[1]*Oral history investigation method: Oral history refers to the use of language and scientific and technological equipment to collate audio recordings into transcripts, which are then researched and collated, and ultimately all kinds of documents are written. It is based on interviews with the parties involved by the investigator, through field research and visits, to reveal facts that are lacking in the literature but have a high degree of credibility, so as to understand some historical truths.*
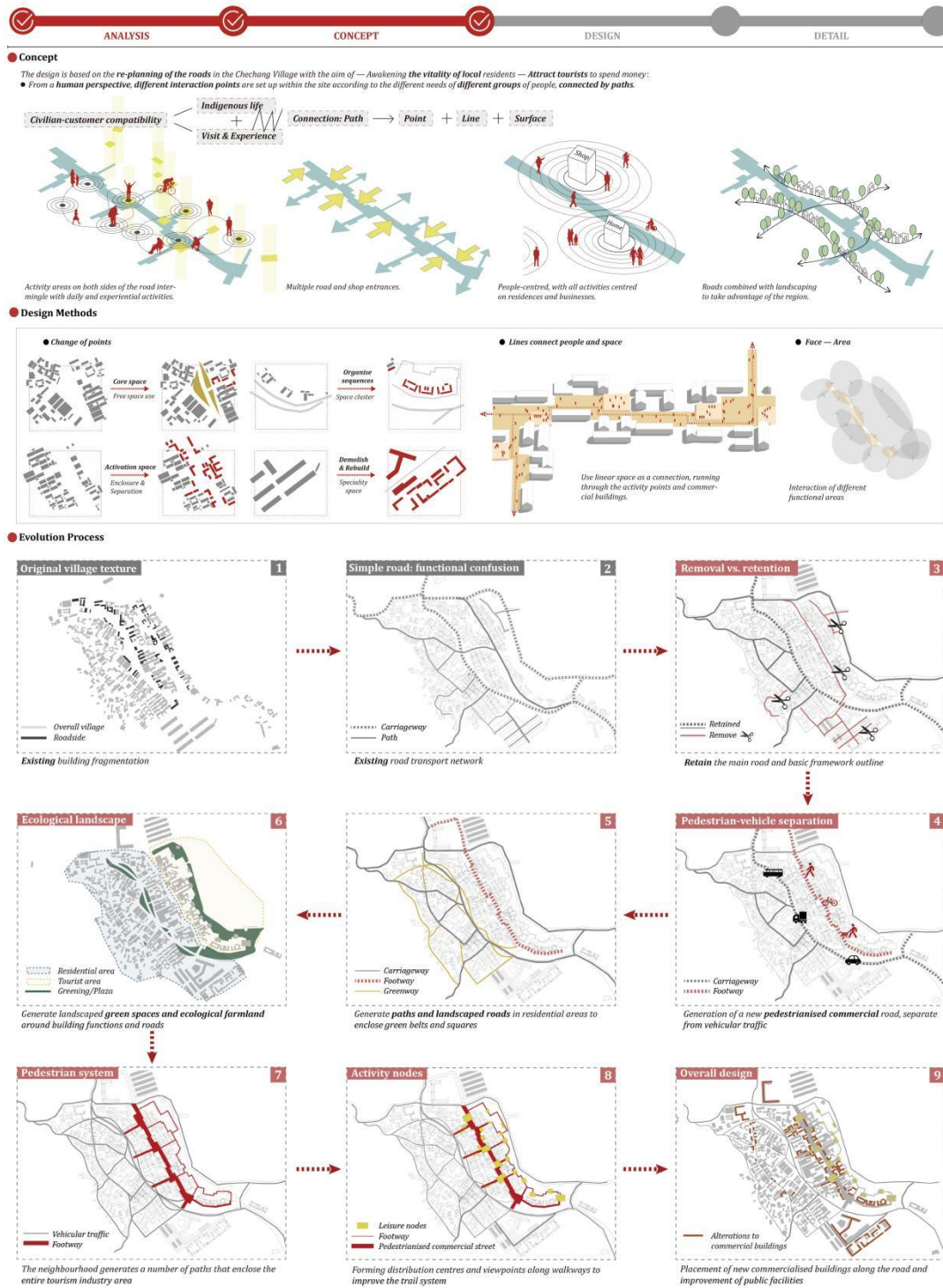
Annexe

The actual size for all the boards are scaling in A1, these are for display only.

Board 1: Current situation analysis
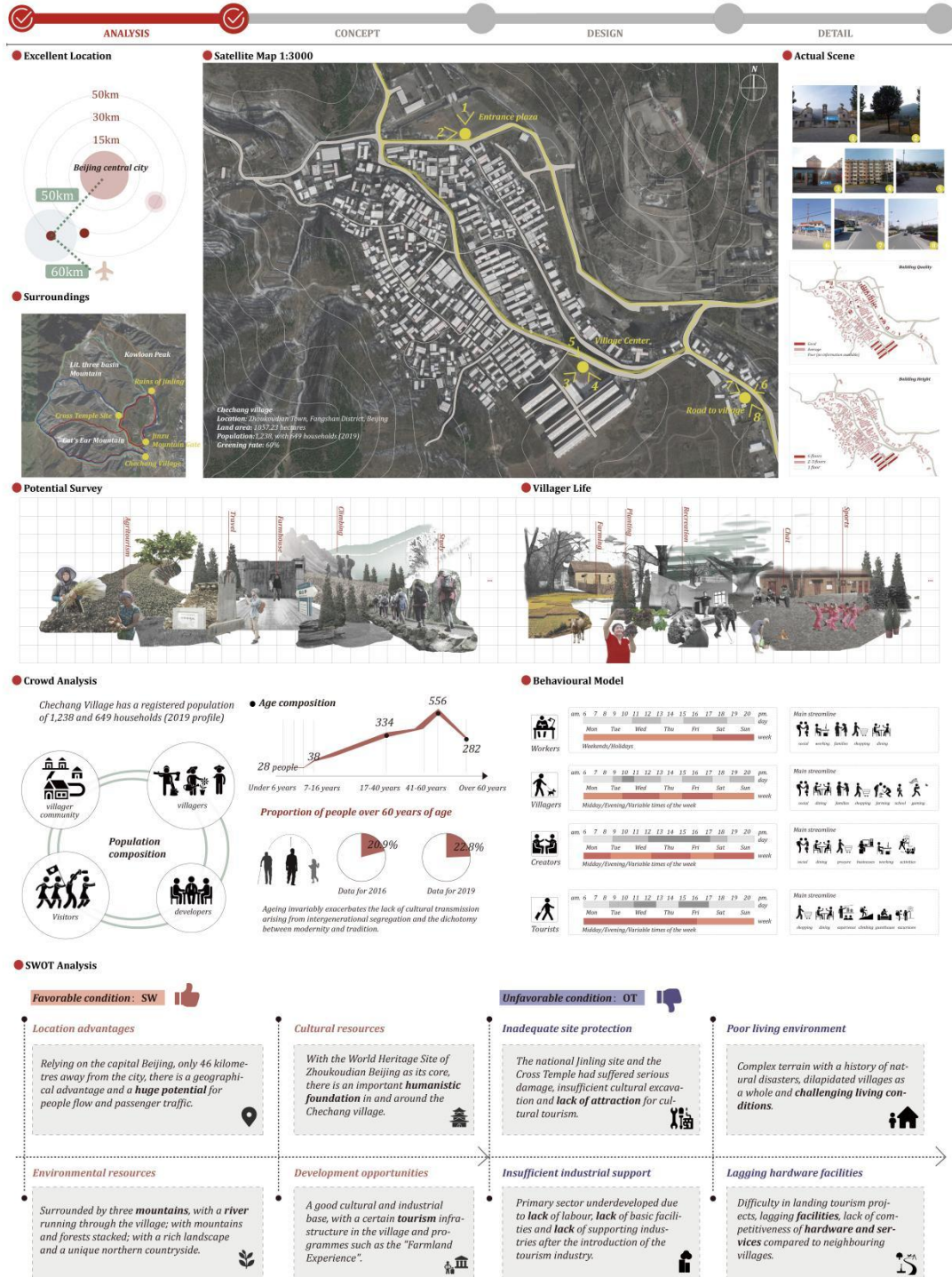
Board 2: Conceptual analysis

ANALYSIS   CONCEPT   DESIGN   DETAIL

● **Concept**

The design is based on the **re-planning of the roads** in the Chechang Village with the aim of — Awakening **the vitality of local** residents — **Attract tourists** to spend money:
● From a **human perspective, different interaction points** are set up within the site according to the different needs of **different groups of people, connected by paths.**

Civilian-customer compatibility + Indigenous life / Visit & Experience   **Connection: Path** ⟶ Point + Line + Surface

Activity areas on both sides of the road inter-mingle with daily and experiential activities.

Multiple road and shop entrances.

People-centred, with all activities centred on residences and businesses.

Roads combined with landscaping to take advantage of the region.

● **Design Methods**

● Change of points — Core space / Free space use — Organise sequences / Space cluster — Activation space / Enclosure & Separation — Demolish & Rebuild / Speciality space

● Lines connect people and space — Use linear space as a connection, running through the activity points and commercial buildings.

● Face — Area — Interaction of different functional areas

● **Evolution Process**

Original village texture   1
Overall village / Roadside
Existing building fragmentation

Simple road: functional confusion   2
Carriageway / Path
Existing road transport network

Removal vs. retention   3
Retained / Remove
Retain the main road and basic framework outline

Pedestrian-vehicle separation   4
Carriageway / Footway
Generation of a new **pedestrianised commercial** road, separate from vehicular traffic

5
Carriageway / Footway / Greenway
Generate **paths and landscaped roads** in residential areas to enclose green belts and squares

Ecological landscape   6
Residential area / Tourist area / Greening/Plaza
Generate landscaped **green spaces and ecological farmland** around building functions and roads

Pedestrian system   7
Vehicular traffic / Footway
The neighbourhood generates a number of paths that enclose the entire tourism industry area

Activity nodes   8
Leisure nodes / Footway / Pedestrianised commercial street
Forming distribution centres and viewpoints along walkways to improve the trail system

Overall design   9
Alterations to commercial buildings
Placement of new commercialised buildings along the road and improvement of public facilities

Spatial planning of linear streets based on the concept of agro-tourism - Taking the Village of Beijing,China as an example
Master of Science Program in Architecture for Sustainability Design | Degree Thesis | February 2024
Supervisors: Prof. Mario Artuso & Prof. Bonino Michele
Students: Cheng Feng & Wang Nan

02

Board 3: Masterplan Design

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03

Board 4: Detail Deisgn

ANALYSIS   CONCEPT   DESIGN   DETAIL

● **Detail Plan 1:400**

1 Food Service
2 Specialty Products Area
3 Playground
4 Handicraft Experience Area
5 Activity Stage
6 Resting Area
7 Snack Street
8 Villagers Leisure Area
9 Cultural Display Area

● **Detail Section AA' 1:250**

● **Exploded View**

Renovate the old roof
Built new structure as a support according to the Beijing-style courtyard house

Girder Structure
Purlin Strucutre

Shading Plank
Sliding Track

Use the same paving as the pedestrian street

Reuse the old walls

Blue Brick   Red Wood   Clay Brick   Grey Brick

● **Perspectvie View**

Main Street of Pedestrian Area

Secondary Street of Pedestrian Area

Villager Square

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04

Figure lists

Part VI.
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