

# Trend of Public Service Facilities Construction in Counties under Local Urbanization: Establishment of a Life Circle System Based on the Spatial Distance of Travel Time

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Aiming at the current lack of public service facilities allocation standards for urban-rural integration in counties, and in the context of local urbanization, in this paper, we analyze the new demands for public service facilities, such as education, medical care, culture, and elderly care facilities, in the urbanization of returning migrant workers in counties, as well as the new requirements for public service facilities in the high-quality development of counties. We then propose the construction of a four-level life circle system based on the spatial distance with different modes of travel, including “guaranteeing life circle, basic life circle, expanding life circle, and quality life circle”, and put forward the key points for the construction of life circle at all levels.

## 1. Introduction

With the development of new urbanization and the implementation of the rural revitalization strategy, the social structure, demographic structure, and lifestyles of rural villages have shown significant changes in counties.

First, the citizenship of rural migrant workers has been given high priority, and the expansion of basic public service provision in counties has become a consensus. According to the data of the Seven-Population Survey, 75% of the 490 million people who will move around the country in 2020 will do so within the provinces. The proportion of migrant workers moving across provinces has been declining, from 32.4% in 2009 to 22.7% in 2023. Therefore, strengthening the construction of public service facilities in counties and adapting to the increasing demand for the citizenship of rural migrant workers to work and settle down in county and central towns will be conducive to driving the development of villages and the modernization of agriculture and rural areas.

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Second, local governments are using county towns as important carriers to promote urbanization and the comprehensive revitalization of the countryside. By promoting the concentration of population and industries in county towns and building stronger county towns, the quality and level of local urbanization will be improved. At the end of 2021, the resident population of China's cities and towns stood at 910 million, of which the population of county towns and urban areas of county-level cities stood at 250 million, accounting for nearly 30% of the country's resident urban population. County cities are not only an important part of China's urban system, but also a key support for urban-rural integration, and their public service capacity needs to be accelerated.

The Chinese government has repeatedly proposed "taking the county as the basic unit to promote the integrated development of urban and rural areas, and establishing a mechanism for the balanced allocation of urban and rural public resources", but there is still a lack of standards for the allocation of public service facilities under the perspective of the integration of urban and rural areas in the county and in a manner oriented to changes in demand, and it is urgent to develop methods that can guide the division of life circles in counties.

## **2. New Demands for Public Service Facilities in the Urbanization of Returning Migrant Workers**

Most of the entrepreneurs returning home are migrant workers born in the 1970s and 1980s, who face multiple pressures of employment, marriage, housing, old age, children's education, and so forth. They not only need to work in the city to increase their income, but also need urban public services and even "settlement" into the city. For them, finding employment, entrepreneurship, and living in the county are rational choices.

In the context of new urbanization, the shortcomings in the type and quality of public service facilities in the county have become increasingly apparent, and the mismatch between the new demand for public service facilities from the citizenship of rural migrant workers and the supply of such facilities has become increasingly prominent, with the new demands of these new citizens for public service facilities in the county for education, healthcare, culture, elderly care, and human settlements not yet being effectively met.

### **2.1 Demand for educational facilities has shifted from "having a school" to "receiving a good education."**

The demand of urban and rural residents for various types of educational facilities is no longer simply "having a school to attend", but is a rational choice after a comprehensive assessment of various factors, such as the distance to school, the quality of schooling, and the cost of education, which has led to a new demand for kindergartens, primary schools, secondary schools, and other educational facilities in the county in terms of total quantity, quality, spatial layout, and so on. When the population gathers to the county towns, the contradiction between the supply and demand of educational resources in counties is prominent. We learned from our research in Mayang County, Hunan Province, that the number of compulsory education places in

the county has increased by 8000 in the past four years, but still fails to meet the demand for the enrolment of the children of migrant workers who have been relocated to the county.

Overall, the numbers of boarding students among junior high school students in small towns and high school students in county towns are growing rapidly, gradually becoming the main way for rural students to receive secondary-level education. The trend of secondary-level students clustering in counties has become more pronounced, as shown by statistics; 94% of high school students in rural areas across the country were concentrated in towns and cities, with only 6% completing their high school education in villages in 2019. Starting from 2019, the number of high school students in urban areas exceeded that in county towns, accounting for 49 and 48%, respectively (see Fig. 1).

## 2.2 Demand for medical facilities has changed from “getting medicines” to “keeping minor illnesses in villages and serious illnesses in counties.”

Village-level medical institutions are the primary means for villagers to obtain basic medical services, and more than 90% of administrative villages have village health offices. Township and county-level medical institutions are supplementary options, but the role played by township health centers in the “county-town-village” three-tier medical service network is unclear, and they are in the awkward position of being unable to treat serious illnesses and unable to see minor illnesses. When villagers choose a health-care institution, they tend to go to both ends of the spectrum, to the county-level or higher hospitals for serious illnesses and to the village doctors for minor illnesses.

The number of county medical institutions has grown steadily from 2010 to 2020, and the number of consultations has also nearly doubled. However, the increase in the number of county medical institutions still can barely meet the medical needs of urban and rural residents in the region, and there is a general shortage of beds and extra beds in the corridors. According to a questionnaire survey of farmers in 20 counties across the country, when suffering from a serious illness, 46.2% of villagers chose to go to county hospitals, while 48.6% chose to go to provincial

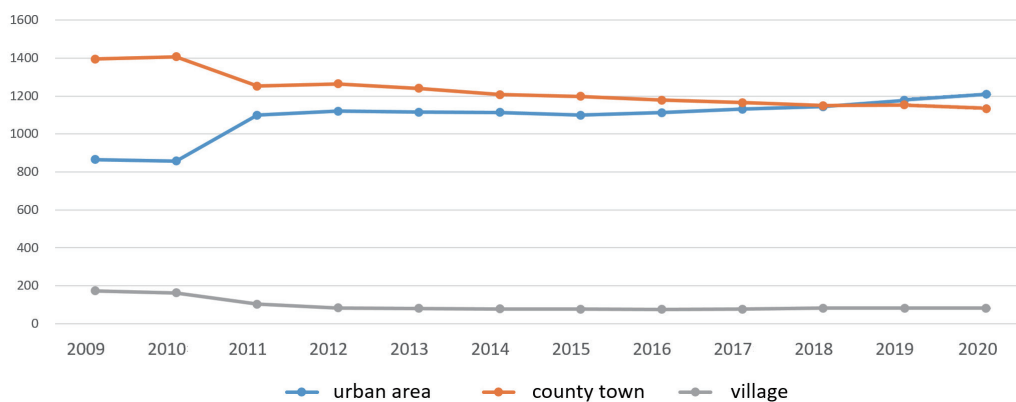


Fig. 1. (Color online) Changes in the number of students in regular high schools from 2009 to 2020.

or municipal hospitals, with farmers' demand for high-quality healthcare services becoming stronger (see Fig. 2).

### 2.3 Demand for cultural and recreational facilities has changed from “building venues” to “entertaining residents.”

The coverage rate of village-level comprehensive cultural facilities is high, and township cultural stations have achieved full coverage. As lifestyles change markedly, the needs of new citizens for public cultural facilities are not limited to activity and resting places, but are moving towards diversification. The questionnaire survey shows that 57% want cinemas in their villages, 42% want cultural activity stations, and 41% want stadiums; however, at present, village-level cultural facilities are single in content, fixed in form, and underutilized, making it difficult for them to appeal to rural youth groups.

In addition to county towns, cultural and recreational facilities at the township and village levels also suffer from poor maintenance at a later stage, which tends to result in a waste of resources. In addition, with the popularity of smartphones, WeChat, Tiktok, and other social media apps are increasingly becoming the main way for residents to obtain information, entertainment, and recreation, and attractive forms of cultural activities are yet to be innovated (see Fig. 3).

### 2.4 Demand for elderly-care facilities has changed from “basic” to “enjoyment.”

In 2020, China's elderly population aged over 60 reached 264 million, and the number of new 60-year-olds in 2021 was about 11.23 million, which officially ushered in the peak of growth of the elderly population in China. In addition, changes in consumption power have led to higher demand for elderly services and quality of life among the “post-60s.” With the increase in the

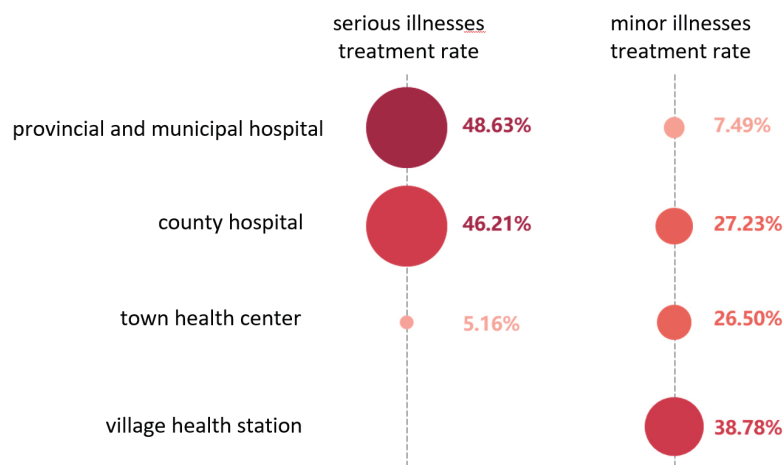


Fig. 2. (Color online) Survey and statistics on villagers' medical choice questionnaire.

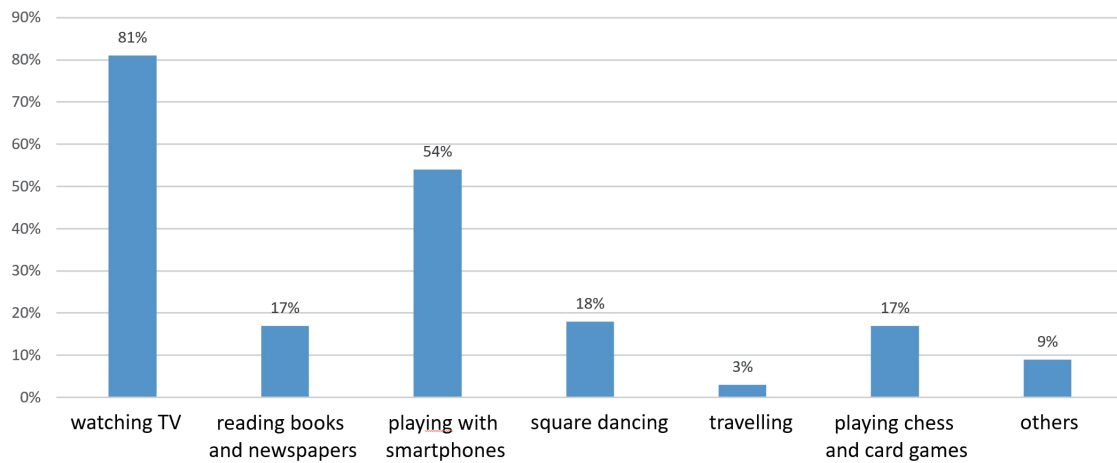


Fig. 3. (Color online) Choice of recreational activities for residents in small towns.

size of the elderly population and the acceleration of aging, the construction of elderly care facilities has become an important component of basic public service facilities in counties and an important lever for achieving local urbanization.<sup>(1)</sup>

The construction and development of elderly care facilities in counties generally suffer from a lack of a total number of facilities, an unbalanced distribution between urban and rural areas, and structural imbalances. There is an insufficient supply of public elderly care facilities in county cities and towns and a shortage of caregivers and other practitioners, while there is a general lack of elderly care facilities in rural areas, with marked differences in the levels of elderly care services enjoyed by the elderly.

## 2.5 Demand for living environment has shifted from “acceptable” to “satisfied.”

With the development of rural areas and the increase in residents’ income level, the requirements for the quality of the living environment are constantly increasing. The human environment should not only be able to meet the basic needs of life, but also fulfill the requirements of being clean, beautiful, and ecologically livable. However, at present, some counties are still facing problems such as uneven levels of improvement of the human habitat environment and weak environmental infrastructure, with some areas still experiencing insufficient rubbish disposal and sewage treatment facilities, and some pits and ponds in rural areas are black with lack of governance.

At the same time, to enhance the coverage of one-stop government service facilities in counties, the focus is on integrating and utilizing existing facilities and improving village-level integrated service sites. The survey demonstrated that 50.63% of those living in township locations need to go to county towns to apply for certificates and documents, and 44.43% of those living in rural areas need to go to county towns to do so.

### **3. New Requirements for Public Service Facilities in High-Quality Development of Counties**

By the end of 2021, the GDP volume of counties and county-level cities was about 5.2 trillion US dollars, accounting for about 2/5 of the national GDP. The resident population of county towns and county-level cities in China is about 250 million, and together with the rural population, the total population of counties is close to 700 million, accounting for half of the national population. With the acceleration of the new urbanization process and the promotion of high-quality development in counties, some new features and trends have emerged in county space, which also affect the allocation of public service facilities in urban and rural areas.

#### **3.1 County towns have become an important carrier for adapting to population return and promoting local urbanization.**

Currently, with the increasing pressure of urban life, the trend of migrant workers returning to their original place of residence is accelerating, and the trend of urbanization with county towns as important carriers is becoming increasingly clear. Data from the National Bureau of Statistics show that the proportion of migrant workers under 40 years of age returning in 2019 was 22%, and the proportion between 40 and 45 years of age was 67%. The accelerated trend of migrant workers returning is driving faster population growth in some counties, which have become an important carrier of local urbanization.

#### **3.2 County towns have become important spaces for providing high-quality public services and ensuring the well-being of half of the Chinese people.**

County towns are not only the political, economic, and cultural centers of counties, but also the public service and population centers of counties. Villagers need to go shopping and seek medical treatment in the county towns. After their children attend school in the county towns, they also need to buy houses there. Promoting the construction of county towns and strengthening the weak points to make up for the shortcomings are conducive to providing high-quality living space for about 700 million residents, meeting the people's growing needs for a better life, and effectively enhancing people's sense of well-being and sense of security.

#### **3.3 With the prevalence of returning home economy, there is also a demand for high-quality and diversified public services in rural areas.**

With a large population base and a huge consumer market to be tapped in the county, more and more social capital has started to go to the countryside, including traditional agricultural enterprises, information, e-business, financial services, and other enterprises. With the strong support of the government for migrant workers, entrepreneurs, college students, and other groups returning home to start their own businesses and employment, capital to the countryside has not only driven the development of county-level economy, but also put forward new demands for the types and quality of public service facilities in rural areas.

### **3.4 With the construction of roads and information networks, urban-rural life circles have been formed, covering county towns, small towns, and villages.**

With the construction of county-level roads and the popularization of small cars, the accessibility between towns and villages within the county has considerably improved, reducing the time for villagers to obtain public services. The users of public service facilities are no longer limited to residents within a certain range, and the allocation of public service facilities is gradually breaking through geographical limitations. A high-quality life circle system centered around the county town and extending to towns and villages, capable of meeting the needs of residents for a better life, is taking shape.

## **4. Establishment of Public Service Facility Construction System Based on the Concept of Life Circle**

### **4.1 Construction of urban and rural life circle system in counties**

In the context of local urbanization, the allocation and layout of public service facilities in counties should be based on the needs of urban and rural residents, and facility management needs to be refined to meet the new demands of returning personnel. In recent years, the theory of “life circle”, as a hotspot in the research field of public service facilities allocation, has gradually expanded from urban living circle to rural living circle. Current research mostly takes a certain county as a complete unit and proposes to construct “primary life circle, fundamental life circle, basic life circle, and daily life circle”,<sup>(2)</sup> “basic life circle, primary life circle, secondary life circle, and tertiary life circle”, “self-sufficient life circle, basic life circle, commuting life circle, expanding life circle”,<sup>(3)</sup> and other models.

The theory of life circle is essentially a bottom-up reorganization of social relationships centered on public services, which is a geographical unit where people share a set of public service facilities. In this paper, the integrated urban-rural life circle system is constructed on the basis of “accessibility as the basis of division, and service population as the modification”, and establishes life circle geographic units around various levels of allocation centers, rather than individual activity ranges.

#### **4.1.1 Transforming spatial distance into temporal distance and classifying life circles in terms of travel time**

Rural areas have significant variabilities and complexities in terms of size, population, geographical conditions, and the distribution of residential areas, resulting in varying sizes of life circles in different regions. Converting the spatial distance of access to public services into a temporal distance, taking the distance of people’s commuting time as the boundary, breaking through the boundaries of administrative boundaries, and redefining the scope of the living circle can theoretically ensure the accessibility of facilities.



#### 4.1.2 Changing from “administrative district” to “life circle” with a certain population size for the layout of facilities

In response to the accelerated population mobility within the county and the overall contraction of the rural population, as well as the trend of fragmentation and hollowing out of the countryside, we propose to use the boundaries of the life circles as the boundaries of different levels of service units. The provision of public services on the basis of the life circle as a unit has generally led to an increase in the standard of allocation and an improvement in service quality compared with using administrative districts as a unit.

#### 4.1.3 Classification of urban and rural life circle system

The life circle system is divided into levels based on the distances that can be reached in 5–10, 15, 30, and 60 min of travel time. The county urban and rural life circle is divided into four levels, namely, “guaranteeing life circle, basic life circle, expanding life circle, and quality life circle”, and planning flexibility and facility utilization are enhanced by guiding the sharing of villages and villages, villages and towns, and towns and towns, as shown in Table 1.

- (1) The guaranteeing life circle is centered on natural or general villages, with a walking distance of 5–10 min from the settlements and an accessible distance of 0.5–1.5 km, and the public service facilities within the circle mainly serve the residents of their own villages, and the size of the population served is about 10000 people or less.
- (2) The basic life circle is a 15-min walking distance from the center villages or general towns, with an accessible distance of 1.5–2.5 km from the settlements, and public service facilities can serve residents of the villages and the surrounding villages with a population of about 10000–30000 people.
- (3) The expanding life circle is a 30-min driving distance from the center of the towns, with an accessible distance of 2.5–4 km from the settlements. The public service facilities can serve all residents in the towns, and the size of the population served is about 30000–100000 people.
- (4) The quality life circle is a 60-min driving distance from the county town or subcounty towns with an accessible distance of 4–20 km from the settlements, public service facilities serving the entire county, and a population of 100000–500000 people.

Table 1  
Classification of urban and rural life circles in counties.

Life circle level	Corresponding time distance	Accessible distance (km)	Service area (km <sup>2</sup> )	Service population (thousand people)	Allocation center
Guaranteeing life circle	5–10 min by walking	0–1.5	0.1–0.5	1–10	natural village general village
Basic life circle	15 min by walking	1.5–2.5	0.5–2	10–30	center village general town
Expanding life circle	30 min by car	2.5–4	2–50	30–100	center town general town
Quality life circle	60 min by car	4–20	50–100	100–500	county town subcounty town



## **4.2 Demand-driven allocation of public service facilities in the life circle**

After delineating the levels of life circles in the county, we need to determine the key points of the allocation of public service facilities at different levels of life circles, and further clarify, for example, the types of facilities, the scale of land occupied by the facilities, or the scale of the buildings under different levels of life circles and in different towns and villages that contain public facilities.

### **4.2.1 Guaranteeing life circle—Mending the shortcomings, protecting the basics, equalization, and universal accessibility**

The centers of the public service facilities construction in the guaranteeing life circle are located in natural or general villages. The guaranteeing life circle is mainly for “one old, one young” social security policy, and the accessibility of facilities is ensured within the walking scale, covering all village settlements. It is mainly equipped with basic early childhood education and basic medical and elderly care facilities, including rural affairs centers, village health offices, convenience stores, and outdoor fitness venues, with special features to meet the needs of agriculture, culture, and tourism.

### **4.2.2 Basic life circle—Advocating facilities co-construction, increasing diversified supply, and improving service quality**

The centers of the public service facilities construction in the basic life circle are located in central villages or general towns. First, the infrastructure of various types of public service spaces in villages should be set up centrally as far as possible, focusing on multifunctional aggregation and convenience, and preferably, the villages where committees are located should be configured with comprehensive service facilities. Secondly, the construction standards of the facilities that will be idle in the future can be moderately reduced under the premise of safeguarding basic needs, such as kindergartens and primary schools. Third, villages with tourism and leisure services and ecological products should be guided to lay out outdoor activity venues to attract urban residents and strengthen village services to undertake urban overflow functions.

### **4.2.3 Expanding life circle—Expanding capacity, strengthening features, standardization, and systematization**

The centers of the public service facilities construction in the expanding life circle are located in the central or general town. The expanding life circle is the key area for county public services. First, in line with the general trend of local urbanization, we need to focus on improving the level of basic public services in areas where the population concentrates, moderately merging some of the facilities, expanding the scale of some facilities, and advancing the provision of high-quality service facilities in central towns. Second, we need to strengthen the provision of

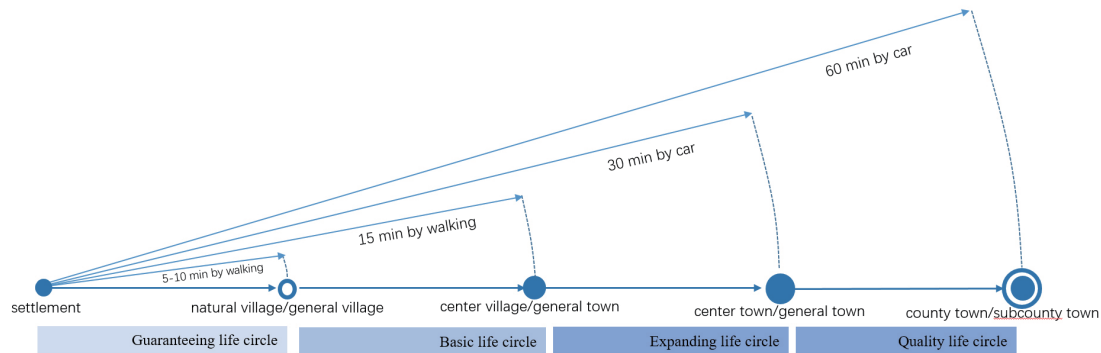


Fig. 4. (Color online) Relationship diagram between life circle and facility allocation center.

specialized facilities in industrial-, agricultural-, and cultural-tourism-type towns, with the implementation of the “one town, one product” policy. Third, we also need to strengthen the construction of standardized facilities, such as boarding schools, health centers, cultural service stations, and agricultural markets, in the center of the towns.

#### 4.2.4 Quality life circle—Increasing demand, improving standards, enhancing quality, and promoting connectivity

The center of the public service facilities construction in the quality life circle is located in the county or subcounty town, and is the core of attracting rural returnees and talent for rural revitalization. First, the construction of public service facilities should adhere to urban standards as much as possible, focusing on the scale efficiency and construction quality of the facilities. Second, for facilities such as senior high schools, vocational schools, second- and higher-class hospitals, and libraries, the construction standards should be raised as much as possible to serve as county-level public service centers. Third, by strengthening the connection between important public service facilities and major transportation facilities such as passenger stations and highways, the collaboration ability between facilities and surrounding towns can be improved.

## 5. Conclusion

In this paper, we proposed to delineate the life circle level with 5–10, 15, 30, and 60 min as the time limit, and to construct a four-level urban and rural life circle system of “guaranteeing life circle, basic life circle, expanding life circle, and quality life circle”, where the allocation centers at all levels correspond to natural village, general village, center village, general town, center town, and county town (see Fig. 4). Combined with the changes in population distribution, traveling mode, and public service demand, the system can be adjusted within a specific county unit to build an urban-rural life circle system that meets the local characteristics. This is not only a limitation of this study, but also a direction for further research, among which determining the specific scope of each level of life circle is crucial.

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