

# Studies on the Space Matching Relationship between Self-Service Banking Outlets and Tourism Supporting Factors in Tourist Cities-Taking Central Downtown of Hohhot City as an Example

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**Abstract:** With the central downtown of Hohhot, a tourist city, as an example, kernel density estimation method and the buffer analysis method were used to inspect the space matching relationship between service scope of self-service banking outlets and the tourist reception facilities. Analysis results show that there exists a certain gap between the service scope of self-service banking outlets and the matching with tourist reception facilities, and tourists' economic behaviors during travelling are limited. Therefore, it is necessary to build a tourist demand oriented urban tourism consumption service supply system with the participation and collaboration of multiple subjects including government, market, and enterprises.

## 1. Introduction

With the development of urban tourism, self-service banking outlets have started to extend their service objects. Tourists as an important component of tourism city have injected new vigor into the development of urban financial industry. In 2018, Hohhot with permanent resident population of 3 million received a total of 30.574 million tourists, which is far higher than that of the number of local residents. According to the author's investigation in Hohhot, despite of the convenience of the development of electronic payment for tourists' tourism consumption, tourists have small and fast banking financial activities of varying degrees during travelling. Particularly, the proportion of consumer financial services required will increase accordingly in the process of tourism consumption. In addition, middle aged and elderly people as an important component of tourists lag behind in understanding and operating e-payment. Therefore, self-service banking outlets will play a role for a while in the future. Banks should pay attention to tourists' consumer financial services, and list tourists as a group of financial activities in tourist cities.

## 2. Data Sources

### 2.1 Study Area

Hohhot as the capital of Inner Mongolia Autonomous Region, the political, economic and cultural center of Inner Mongolia, as well as the tourist distributing center of the central and western areas of Inner Mongolia, was listed as one of the fourth batch of China's excellent tourism cities in 2003. In this paper, the central downtown of Hohhot was selected as the study area, including the area within and along the Second Ring Road, Ruyi Development Zone and Jinqiao Development Zone. This space range covering two areas, the historical city of Hohhot and the main new urban area, is the area with intensive distribution of the city's population, economy, hotels and scenic spots. There are 553 self-service banking outlets, 829 various types of hotels and 13 scenic spot in the study area with the most intensive distribution of tourists.

## 2.2 Data Sources

Self-service banking is a modern banking service mode by which customers complete banking business processes independently with computer technology. At present, ATM and CDT are the main operating modes for self-service banking. The self-service banks involved in the study area include totally 16 banks and 553 outlets of four major categories: large-scale commercial banks, joint-stock commercial banks, city commercial banks and postal savings banks. The outlet data comes from the official websites of banks. The space distribution of tourists is mainly reflected by the spatial data of hotels and scenic spots in the study area. Ctrip.com and Elong.com containing nearly 1,000 types of hotel information in the study area are search tools commonly used by tourists for hotel booking. The research data obtained from Ctrip.com and eLong.com as the hotel data retrieval platform was comprehensive and representative. Through searching on travel network and duplicate checking by EXCEL, a total of 829 economy hotels and medium and high-star hotels were selected and distributed in various areas in the central downtown of Hohhot. Furthermore, in December 2018, the author conducted a 30-day field research on Hohhot, mainly to collect information of the scenic spots in the study area, and to conduct on-site investigation and verification of the data of self-service banking outlets and hotels.

2018 Hohhot City Map (scale 1:150,000) was used as the base map for ArcGIS analysis. ArcGIS10.0 software was used for vectorization processing of urban map of Hohhot (Xi'an 1980 geodetic coordinate system projection). The main traffic line layer and administrative division of Hohhot City constitute the hierarchical information of the base map.

## 3. Research Methods

### 3.1 Kernel Density Analysis

Kernel density analysis is the most widely used nonparametric estimation technology in spatial analysis mainly because kernel density analysis can solve two key problems compared with quadrat density method and V map density method, i.e., the uniformity of internal density in unit space and the non-continuity of density change in the joint of unit spaces<sup>[1]</sup>. The principle of kernel density estimation is: define a search radius first to determine the range of threshold and count the number of internal events; secondly, define the grid area according to density accuracy requirement; thirdly, calculate the contribution value of each event to grid density in the range of threshold through kernel function; fourthly, assign value to the density of each grid, which is the accumulation of contribution value of grid density to all events in threshold range of the grid; lastly, output the density value of all the grids.

### 3.2 Buffer Analysis

In the process of buffer analysis, a self-defined distance based on spatial elements such as points, lines, and polygons can be used to generate one or more region for analyzing the influence or service scope of various spatial elements<sup>[3]</sup>. From mathematical perspective, spatial elements such as points, lines, and surfaces can be obtained in buffer analysis field whose area is determined by the conditions established in the buffer.

## 4. Analysis of Results

### 4.1 Kernel Density Analysis of Self-Service Banking Outlets and Tourist Reception Facilities

During the process of kernel density analysis, the calculation results under the direct influence of the selection of distance attenuation threshold value (h) needs to be verified after multiple verifications<sup>[4]</sup>. After many experiments, it was found by comparing the threshold values of different distance attenuations that when h value is 1000 meters, the center of self-banking outlets and hotels can be identified, and the process of continuous change of self-service bank outlets and hotel

distribution density from high to low can be reflected. (Figure 1, Figure 2).

As can be seen from Figure 1, the distribution of self-service banks presents a “single-core” spatial form. A high-density area is located in self-service bank outlet 1 with a density value of 38.11 to 42.86, specifically located near the New Century Plaza on the southeast side of the Hulun Buir Road and Xinhua Street intersection. The area, 1.5 kilometers away from the core area of CBD, has excellent geographical position and convenient traffic. Various government offices are aggregated nearby with intensive flow of people. At the same time, this area gathers branches of major banks. The self-service banking outlets of relatively high level mostly combine with manual banking outlets. The other three relatively high-density areas are located on the east and west sides of the crossroad of Exhibition East Road and Xinhua Street, nearby Inner Mongolia Exhibition Hall and the Unity Community. The self-service banking outlets in rest area of central downtown show a large dispersive pattern. The density of self-service banking outlets in the areas such as Hohhot railways bureau, the Military District guesthouse, and Wanda Plaza are relatively low, ranging from 9.53 to 14.29. In the meantime, the density of self-service banking outlets in large areas in south of Chengxi and Yuquan, Jinqiao Development Zone is lower than 5, with far distance between outlets, which is not good for tourists to carry out economic activities.

The kernel density map of hotel distribution can be obtained through superposition of kernel density map of economy hotels, medium and high-star hotels. Figure 2 shows “three-kernel linkage” spatial form in the distribution of economy hotels and medium- and high-star hotels. The three kernels are located in the vicinity of New Century Plaza, Hohhot railways bureau and Wanda Plaza, with density values ranging from 33.50 to 43.06. The distance from New Century Plaza and Wanda Plaza is 7 kilometers. Gathering main shopping, leisure and entertainment elements of Hohhot City, providing necessary conditions for the aggregated distribution of various economy hotels and medium and high-star hotels, this area has become the main place for tourists to enjoy cityscape and carry out necessary economic activities. The area where Hohhot railways bureau is located is the main portal connecting the inside and outside, as well as the tourists’ first choice to enter and leave the city. Some tourists not familiar with the city’ space pattern will prefer hotels near the train station for rest so that it is convenient to leave by train after the end of travel.

Furthermore, it can be found by comparing Fig. 1 and Fig. 2 that area nearby New Century Plaza is co-aggregated with self-service bank outlets and hotels, and the matching of the spatial distribution of both is realized. However, in the locality of Wanda Plaza and Hohhot railways bureau, despite of the aggregated hotels showing a “kernel” situation, the density of self-service banking outlets in these two areas is low, not matching the density of hotel distribution. In the meantime, various hotels are distributed in the southwestern part of Yuquan District and the northeastern part of new urban district, density ranging from 14.36 to 19.14. But distribution density of self-service banking outlets in these two areas is low, with a density value of below 4.76 in most areas, indicating the mismatching between self-service bank outlets and hotel distribution in these two areas. In summary, there is a certain gap between the self-service bank outlets in central downtown of Hohhot and the spatial distribution of tourists' economic behavior. Both have not reached a matching level visually.



Fig.1 Distribution of Kernel Density of Self-Service Banks in Hohhot Central Urban Area

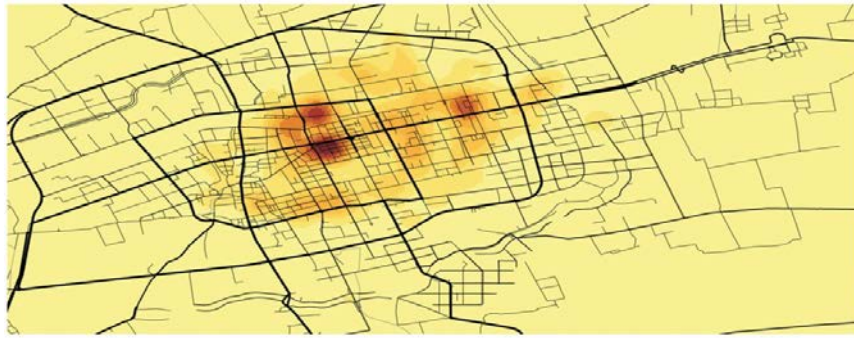


Fig.2 Distribution of Kernel Density of Hotels in Hohhot Central Urban Area

#### 4.2 The Matching Relationship between the Service Scope of Self-Service Banking Outlets and the Tourist Reception Facilities

For further meticulous analysis of the matching relationship between each self-service bank outlet in the study area and its surrounding hotels and scenic spots, this paper introduces buffer analysis method based on kernel density analysis method. During buffer analysis process, the most important is to determine the service radius of the self-service bank outlets. Generally speaking, tourists prefer to walk to the self-service banking outlets nearby for economic activities. According to new urbanism concept of “5-minute pedestrian district”, the best radius of resident activity space is 400-500m. Therefore, 500m is selected as the radius of self-service bank dot buffer.

*The matching relationship between the service scope of self-service banking outlets and hotel distribution*

It can be clarified through buffer analysis method that the buffer of self-service bank outlets intensively covers the east of the road, and the buffer coverage rate shows a rule of diminishing from the center of the city to the periphery. 51.67% of economy hotels are concentrated inside the area of the first ring line formed by Bayannur Road, Ordos Avenue, Xing'an Road and Hailar Avenue. Most hotels are located within the service scope of self-service banking outlets. The matching ratio of economy hotels with the self-service banking outlets in the area to the east of the west channel of Bayannur Road, the vicinity of the First Affiliated Hospital of Inner Mongolia Medical College, and the vicinity of the water park is unnational. Outside the area of the city's ring road, the imbalance between the buffer coverage of self-service banking outlets and the spatial distribution of economy hotels further expands. In the northeastern part of the new city, the Ruyi Development Zone, the Jinqiao Development Zone, and the southwestern part of Yuquan District In the northwestern part of the Huimin District, some economy hotels are not in the service scope of self-service banking outlets. In addition, the buffer coverage of self-service bank outlets in medium and high-star hotels is higher than that for economy hotels. 89.36% of medium and high-star hotels in the study area are within the service scope of self-service banking outlets. But self-service banking outlets covers only 71.18% of economy hotels.

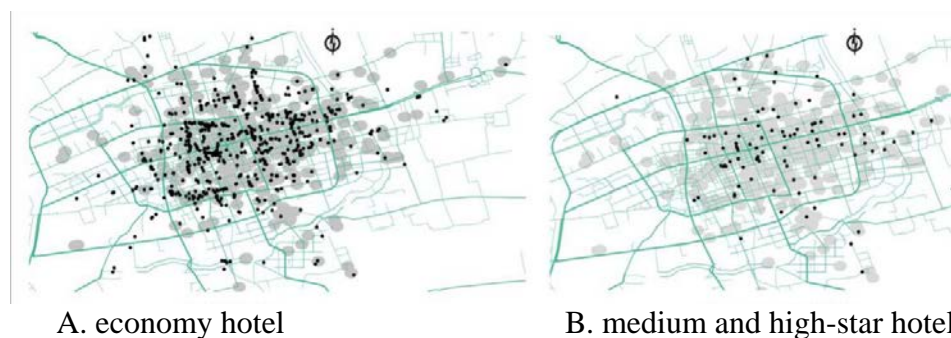


Fig.3 the Matching Relationship between the Service Scope of Self-Service Banking Outlets and the Spatial Distribution of Various Hotels

*The matching relationship between the service scope of self-service banking outlets and the distribution of scenic spots*

The scenic spots inside the central downtown are another important area where the economic behavior of tourists occur. Considering few scenic spots in the study area not suitable for kernel density analysis, this paper just analyzed the matching of the service scope of self-service banking outlets in scenic spots. There are 13 scenic spots in the study area, and there is certain distance between the spatial distribution of 12 scenic spots and high-density area of self-service banking outlets. And 6 scenic spots are not in the service scope of self-service banking outlets, 4 scenic spots are on the edge of the self-service banking outlets, suggesting that 76.92% of total scenic spots are not equipped with good self-service banking service conditions. Compared with the hotel, the matching degree between the scenic spots and the self-service banking outlets in the study area and is low, thus not beneficial for tourists to carry out certain bank related economic activities during travelling.



Fig.4 Relationship between the Service Scope of Self-Service Banking Outlets and the Space Distribution of Scenic Spots

## 5. Summary

After analyzing the matching of the spatial distribution of self-service bank outlets, hotels and scenic spots in central downtown of Hohhot, we can find the characteristic of self-service bank outlets in one high-density area in the study area, and hotels in three high-density areas. There is a gap in the aggregation matching degree between both. At the same time, the service scope of self-service banking services includes 71.18% of economy hotels and 89.36% of medium and high-star hotels, while more than 70% of the scenic spots are not equipped with good conditions of self-service banking service, suggesting that there is a certain gap between the service scope of the self-service bank outlets and the tourist reception facilities in the study area, and tourists' economic behaviors during travelling are restricted.

The spatial distribution pattern of self-service banking outlets is an important guarantee for tourists to carry out economic behaviors. Unmatched distribution between both will affect tourist satisfaction with urban tourism consumer financial services, thus impacting the development of urban tourism. It is of great significance to improve the function of tourism consumer financial services for Hohhot City which is a famous tourist city in China and an important tourist distribution center in the central and western regions of Inner Mongolia. It requires to further improve the spatial distribution of self-service banking outlets and the matching of hotel and scenic space distribution for enhancing tourism consumption financial service function in Hohhot. Specifically, add more self-service banking outlets in the two areas in the locality of Hutie Bureau and Wanda Plaza; improve the matching between self-service bank outlets and tourist distribution in the area to the east of the west of the Bayannur Road, the neighboring area of the First Affiliated Hospital of Inner Mongolia Medical College, and in the vicinity of the water park, change the situation that tourists are not distributed in the service scope of the self-service banking outlets in northeastern part of the new urban area, the Ruyi Development Zone, the Jinqiao Development Zone, the southwestern part of Yuquan District and the northwestern part of the Huimin District, and achieve full coverage of self-service banking outlets in the central downtown.



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