Characteristics of Public Space and Place-making Orientation in Tourism-oriented Cities: A Case Study of Xiahe County, Gannan Tibetan Autonomous Prefecture (Postprint)

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Abstract

In recent years, the rapid development of urbanization and tourism has accelerated the renewal and construction of urban public spaces in Xiahe County, yet it has also engendered a series of issues including the erosion of place spirit and diminished recognizability. Based on social surveys and road network topology modeling of Xiahe County, this study employs methods such as fuzzy comprehensive evaluation, space syntax, and kernel density analysis to systematically investigate place spatial quality and spatial vitality. Consequently, specific construction and development strategies are proposed for five public place clusters, including place units and Congla commercial-cultural places. Furthermore, it is advocated that place system creation should proceed from perspectives such as constructing systematic places, adhering to a multi-cluster and multi-strategy creation principle, implementing multi-stakeholder place-making, developing highly accessible places, and utilizing hotspot place units to catalyze the creation of place clusters and place systems, thereby fostering a high-quality, high-vitality place system. Simultaneously, this research aspires to provide a referenceable framework of public space evaluation methods and creation strategies for place-making in tourism-oriented cities.

Full Text

2. Study Area and Methods

This study employs a combination of fuzzy comprehensive evaluation, spatial syntax analysis, and nuclear density analysis to assess the spatial quality and vitality of public spaces in the research area. The perceived objects are divided into two categories: tourists and local residents. First, we evaluate the spatial quality of public places within the study area. Then, we measure the

spatial accessibility of these places using spatial syntax methodology and explore the intrinsic relationship between place activity and accessibility through cross-sectional road traffic evaluation. Finally, specific construction strategies are proposed at the micro, medium, and macro scales for public place units, place groups, and place systems.

The spatial quality evaluation of public spaces is based on the establishment of an evaluation index system. The selection of indicators follows principles of representativeness, independence, and operability. The evaluation system comprises four primary dimensions: spatial functionality, spatial environment, spatial culture, and spatial vitality, with each dimension further broken down into specific secondary indicators. The weight determination uses the analytic hierarchy process (AHP), constructing a judgment matrix through expert consultation and calculating the weight values of each indicator layer. The fuzzy comprehensive evaluation method is then applied to conduct a multi-level fuzzy evaluation of the spatial quality of public places.

For spatial accessibility analysis, spatial syntax theory is utilized to quantify the spatial structure characteristics of the road network. Depthmap software is employed to calculate syntactic parameters including integration 度, choice 度, and intelligibility. The study selects key public spaces as research samples and analyzes their spatial accessibility characteristics through axial map analysis. Concurrently, the relationship between spatial accessibility and actual human activity is verified through field observation and questionnaire survey data.

Nuclear density analysis is used to identify spatial distribution patterns of public activities. By collecting GPS trajectory data and activity time information from both tourists and residents, the study analyzes the spatial agglomeration characteristics of different activity types. This method effectively reveals the distribution hotspots of public activities and their relationship with spatial environmental characteristics.

4. Results Analysis

4.1.3 Spatial Quality Evaluation Results

The evaluation results indicate significant spatial quality variations among different types of public spaces in the research area. Commercial and cultural spaces generally exhibit higher spatial quality scores, particularly in terms of spatial vitality and cultural characteristics. Religious and cultural spaces demonstrate unique advantages in cultural dimension indicators but relatively lower performance in functional diversity. Residential area public spaces show balanced performance across all dimensions but lack distinctive features.

The fuzzy comprehensive evaluation yields overall spatial quality scores for different place types: commercial and cultural places average 3.81, religious and cultural places 2.50, residential area public spaces 2.84, and transportation hub

spaces 2.28. These results reflect the combined effects of spatial functional configuration, environmental quality, cultural connotation, and activity level.

4.2 Analysis of Spatial Accessibility and Activity

4.2.1 Spatial Accessibility Characteristics Spatial syntax analysis reveals that commercial and cultural places in the Plexla area and religious and cultural places in the Labuha area possess high spatial recognition and good connectivity, classifying them as high-accessibility spaces. These locations typically exhibit high integration 度 values and choice 度 values, indicating their important positions within the overall road network structure.

The integration 度 analysis shows that the global integration 度 of the research area ranges between 0.5 and 1.5, with core public spaces generally above 1.2. The local integration 度 (radius 3) distribution demonstrates clear clustering characteristics, forming several high-value centers that basically coincide with commercial and religious activity hotspots.

4.2.2 Correlation Analysis Between Accessibility and Activity Regression analysis between spatial syntax parameters and actual activity intensity reveals a significant positive correlation. The correlation coefficient between integration 度 and pedestrian flow reaches 0.68 ($p < 0.01$), confirming that spatial configuration significantly influences human activity distribution.

Cross-sectional traffic surveys at typical locations show that high-accessibility spaces maintain relatively stable pedestrian flow throughout the day, with average hourly flows exceeding 800 persons. In contrast, low-accessibility spaces exhibit significant temporal fluctuations, with average hourly flows below 200 persons. The correlation analysis yields $R^2 = 0.477$, indicating that spatial accessibility explains approximately 47.7% of the variation in activity intensity.

4.2.3 Staying Behavior Analysis The study identifies differences in staying behavior patterns between tourists and residents. Tourists' staying activities concentrate primarily in commercial and cultural areas with high accessibility, showing clear destination orientation and relatively short average staying durations (approximately 25-40 minutes). Residents' staying activities distribute more evenly across community public spaces, with longer average staying durations (approximately 45-90 minutes) and stronger temporal regularity.

Nuclear density analysis of staying points reveals that tourist hotspots concentrate in areas with integration 度 values above 1.0 and choice 度 values above 0.8, while resident activity hotspots show relatively dispersed distribution patterns, correlating more strongly with local integration 度 (radius 3).

5. Discussion

5.1 Summary of Findings

This research demonstrates that spatial quality evaluation, spatial syntax analysis, and nuclear density analysis constitute effective methodologies for studying public spaces in tourist-oriented cities. The findings reveal significant cognitive differences between tourists and local residents regarding spatial quality, attributable to variations in cultural identity and behavioral patterns.

The spatial accessibility analysis identifies commercial and cultural places in Plexla and religious and cultural places in Labuha as high-accessibility spaces with strong spatial recognition and connectivity. The staying behavior analysis uncovers distinct patterns between tourist and resident activities, providing crucial foundations for targeted spatial optimization strategies.

5.2 Construction Strategies

5.2.1 Micro-Scale: Place Unit Construction At the place unit scale, optimization should focus on enhancing spatial functionality and environmental quality. For commercial and cultural places, strategies include improving commercial facilities, optimizing pedestrian environments, and strengthening cultural element integration. For religious and cultural places, emphasis should be placed on protecting cultural authenticity while improving accessibility and service facilities.

Specific measures comprise: (1) optimizing spatial layout to improve functional diversity; (2) enhancing environmental quality to increase comfort and safety; (3) strengthening cultural expression to highlight local characteristics; and (4) improving service facilities to meet diverse user needs.

5.2.2 Medium-Scale: Place Group Organization At the place group scale, the focus shifts to establishing organic connections between different place units and forming synergistic effects. The research area can be divided into five major place groups: commercial and cultural, religious and cultural, residential living, transportation hub, and landscape leisure.

Each place group should develop differentiated construction strategies based on its functional positioning and spatial characteristics. Commercial and cultural place groups should emphasize vitality enhancement and brand building; religious and cultural place groups should focus on cultural protection and experience optimization; residential living place groups should prioritize service improvement and community participation.

5.2.3 Macro-Scale: Place System Planning At the place system scale, the overall spatial structure and functional coordination of the entire research area should be considered. The construction of a complete place system should

adhere to the principles of multi-group coordination and multi-strategy integration.

Key strategies include: (1) constructing systematic places through multi-group coordination to ensure balanced development of different functional areas; (2) creating multi-subject places through high-accessibility design to promote spatial justice and social inclusion; and (3) building group and place systems based on hotspot units to form efficient and orderly spatial networks.

The implementation of these strategies should fully consider the dual needs of tourism development and local residents' livelihoods, achieving a balance between spatial quality improvement and vitality enhancement. Through systematic construction at the three scales, the research area can ultimately form a high-quality, high-vitality public space system that meets the needs of diverse user groups.

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Note: Figure translations are in progress. See original paper for figures.