

# Research Progress and Comparative Analysis of Street Vitality in Small Towns at Home and Abroad from the Perspectives of Space Syntax and Social Ecology

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**Abstract:** As the core carrier of public life in small towns, the evolution of street vitality reflects the characteristics of urbanization and socio-cultural transitions across different regions. Stepping out of the conventional research stereotype that heavily focuses on metropolitan core areas, this paper systematically reviews domestic and international literature concerning street spaces in small towns. The study finds that: (1) In terms of theoretical origins, Western academia tends to introduce the Social-Ecological Model (SEM) and cultural diversity perspectives, whereas domestic research focuses more on the topological analysis of space syntax and environmental behavior under rapid urbanization. (2) Regarding the causes of vitality decline, domestic small towns face the dual pressures of motorization encroachment and rural "hollowing out", while foreign counterparts are mostly trapped by functional zoning segregation and barriers to social integration. (3) For reconstruction mechanisms, domestic practices emphasize the physical spatial "City Double Repair" (ecological restoration and urban repair) and the tourism-oriented empowerment of historical contexts, whereas the West leans towards bottom-up, inclusive community placemaking. Future research urgently needs to integrate the multidimensional evaluation system of the international social ecology into the local context, constructing dynamic monitoring and intervention paradigms suitable for the scale of small towns.

**Keywords:** Towns; Street Vitality; Social-Ecological Model (SEM); Space Syntax; Comparative Study

## 1. Introduction and Problem Statement

In the past two decades of research on spatial vitality, academia has devoted significant enthusiasm to the study of spatial vitality in metropolitan core areas, Central Business Districts (CBD) (Xu Yiwei, 2021) <sup>[1]</sup>, historical and cultural districts (Liu Qi, 2021) <sup>[2]</sup>, and traditional villages (Zhong Wei, 2023) <sup>[3]</sup>. However, as the crucial link between urban and rural areas, the street spaces of "small towns" are undergoing the most drastic morphological deconstruction and social reorganization. Compared to metropolises, streets in small towns often serve multiple composite functions, including transportation distribution, acquaintance social networking, and marketplace commerce (Chen Siqi, 2023) <sup>[4]</sup>.

Examining existing literature, domestic and international discussions on street vitality in small towns and similar-scale settlements present divergent research paradigms and focal points due to differences in urbanization stages, social structures, and governance models. Clarifying these differences not only helps to break through the reconstruction dilemma of "one thousand towns with the same face" in domestic small towns but also provides cross-cultural theoretical coordinates for street revival in the era of inventory planning.

## 2. Cognitive Divides in Theoretical Frameworks and Research Paradigms

In terms of the ontological understanding of street vitality, Chinese and international scholars demonstrate evolving paths originating from different theoretical foundations. This divergence is rooted in the asynchronicity of urban-rural development stages: Western research is largely based on the "post-

industrial" era, where the focus has shifted from material production to social reproduction. Consequently, Western academia tends to view streets as complex social-ecological systems. In this context, street vitality is deconstructed as the multidimensional coupling of individual behavior, social networks, and public policy within the physical built environment. International literature, by introducing the Social-Ecological Model (SEM), emphasizes that inclusive interaction across different ethnic groups and social strata is the root of the enduring vitality of public spaces.

In contrast, domestic (Chinese) theoretical explorations of street vitality in small towns are deeply embedded in the grand narrative of "rapid urbanization". Due to the long-term challenge of morphological deconstruction caused by rapid spatial expansion, domestic research exhibits a distinct "physical space restoration" orientation. Researchers prefer utilizing morphological tools such as Space Syntax to accurately quantify the topological structure of street networks, attempting to find the laws of social mobility within physical disorder.

Notably, as research deepens, the domestic perspective is gradually transcending pure "morphological determinism" and beginning to focus on the unique informal spatial logic of local "acquaintance societies". This paradigm shift reflects a re-examination by academia of the essence of vitality in small towns. It is no longer merely accessibility in a geometric sense, but rather the long-term coupling and dynamic balance of "human-place-society" relations within the context of the urban-rural dual transition. This leap from "static spatial description" to "dynamic social-ecological networks" constitutes the core tension of current Chinese and international academic dialogue.

### 2.1. International Perspectives Based on Social-Ecological Nesting and Cultural Inclusiveness

International literature possesses a strong interdisciplinary and sociological character when discussing public space vitality. Represented by the research of Zhang Danning et al. (2023) [2], Western academia is progressively introducing the Social-Ecological Model (SEM) into spatial evaluation systems, positing that street vitality is not the product of a single physical environment, but the result of the nested interaction of four layers: individual psychology, social networks, the physical built environment, and macro-level policies (Figure 1).

Concurrently, within the international context of frequent population mobility, "Diversity" has become a core metric for measuring street vitality. For instance, Shristi Shrestha (2011) pointed out that interaction across ethnic and class boundaries is the source of vitality [6]; case studies by Indonesian scholars evaluating Taman Nostalgia Park also indicate that a lack of inclusive definitions for diverse groups in a space is a deep-seated cause of vitality decline [7].

SOCIAL-ECOLOGICAL MODEL (SEM) FOR STREET VITALITY IN SMALL TOWNS

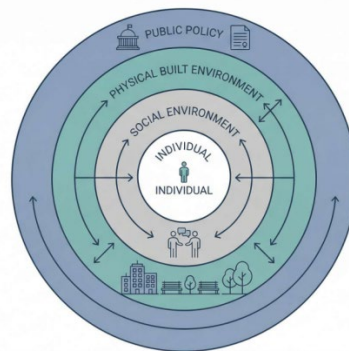


Figure 1: Layered conceptual diagram of the Social-Ecological Model (SEM) applied to street vitality.

### 2.2. Domestic Perspectives Based on Spatial Topology and Environmental-Behavioral Coupling

In comparison, the theoretical entry point for domestic research on small town street vitality is more rooted in the spatial disorder and physical environmental disintegration brought about by rapid urbanization. Domestic scholars exhibit a very strong orientation toward "physical space restoration and social activity reappearance".

For example, Chen Siqi (2023)[4] noted that in Liancheng, Western Fujian, the vitality of original pedestrian-oriented streets was eroded by "wide roads" and motorization during rapid urbanization [1], leading to the proposal of reconstructing spatial scales, street furniture, and interface order. The vitality

of small town streets depends not only on the continuity of the pedestrian system but also on the superposition of social networks under the characteristics of a local "acquaintance society". Liu Man (2017), based on empirical research in Xiaomiao Town, Hefei, innovatively introduced the concept of the "Four-Network Map" [5], deconstructing small town public space into a shopping network, activity network, social network, and cognitive network (Figure 2). This is not only a localized translation of environmental behavior but also provides a spatial evaluation system close to the characteristics of a local "acquaintance society," where the interweaving of social and cognitive networks constitutes the deep meaning of space.

The widespread application of the "City Double Repair" concept [9] and Space Syntax [10] in street network analysis signifies that domestic research is moving toward a precise topological quantification era. While international vision emphasizes "diversity" and interaction across groups, the domestic context focuses more on how to retain the social habits of original residents through spatial design to avoid the detachment of living spaces caused by excessive "touristification".

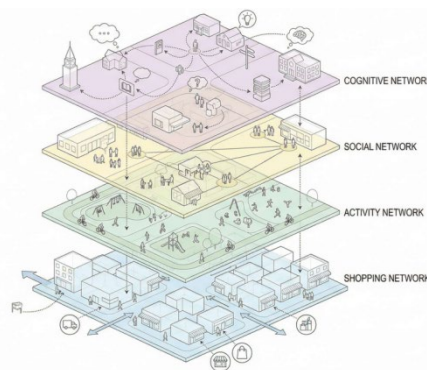


Figure 2: Conceptual diagram of the "Four-Network Map" overlay in small town street spaces.

### 3. Comparative Analysis of Causes and Mechanisms

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The dissolution of street vitality is particularly intense in small towns. In the comparison between domestic and international research, the mechanisms of decline show distinct regional imprints, resulting in what resembles a "vitality loss syndrome".

In the Western context, this syndrome primarily manifests as "socio-spatial detachment under late industrialization". Highly bureaucratic functional zoning forcibly dismantles the publicity and functionality of streets. Driven by capital logic, streets either become closed consumption containers through over-commercialization or lapse into safety vacuums (suburbanization) as the middle class moves to the suburbs. This decline is essentially a rupture of social networks in the spatial dimension.

In the Chinese context, the decline mechanism presents characteristics of "catch-up urbanization". The shrinking vitality of small towns often stems from the structural misalignment between land urbanization and population urbanization. To pursue administrative efficiency and motorization indicators, market streets that originally possessed flexible boundaries and blurred attributes have been physically dismembered by "wide roads and large squares" of alienated scales. This technical hegemony has dealt a devastating blow to the spatial mending capabilities of the traditional "acquaintance society". The loss of vitality in small town streets is not merely due to population outflow, but rather because the space itself has lost its capacity to accommodate informal economies, neighborhood interactions, and local context.

#### 3.1. Domestic: Motorization Severance and Homogenization Shock

The unique domestic urbanization model has rapidly expanded the framework of small towns, leading to the alienation of living scales. Lu Yue (2024), in an evaluation of the streets of Shanhaiguan Ancient City [8], pointed out that the intervention of tourism commercialization and its detachment from the daily lives of original residents triggered endogenous decline [8]. Research by Dong Shihao et al. (Yulong County, Yunnan) also revealed that blindly mimicking the "wide road, large square" model destroyed original small-scale interaction spaces, leading to streets becoming pure transit channels [14].

Additionally, the unidirectional outflow of population from rural areas to towns (Xiong Xueyuan, 2023)<sup>[13]</sup> and the uniformity of business formats brought by capital—such as identical snack streets and cultural gift shops—have triggered cultural identity crises despite short-term popularity.

### ***3.2. Functional Zoning Barriers and Social Capital Rupture***

Conversely, international cases of vitality crisis in small towns/suburbs often stem from the "modernist planning hangover"—time-space ruptures caused by strict functional zoning. When residential, commercial, and employment spaces are physically isolated, streets lose the "eyes on the street" and all-day mixed-use crowds advocated by Jane Jacobs. Tahmasebi et al. (2020), in their study on Valiasr Street in Tehran, found that due to the lack of common evaluation criteria for street vitality, preferences for vitality elements vary significantly across different social strata, making it difficult for the built environment to attract people to stay <sup>[11]</sup>.

### ***3.3. Research Trends from "Static Form" to "Dynamic Monitoring"***

Domestic research is moving from pure physical space description toward a precise topological quantification era using Space Syntax. Future research needs to integrate the international SEM model for nested analysis, which reflects evaluation accuracy and multidimensionality. For the scale of small towns, there is an urgent need to construct dynamic monitoring and intervention paradigms, utilizing big data like mobile signaling and social media heat maps to capture real-time feedback of population flow on street vitality.

## **4. Reconstruction of the Integration Path of Physical Repair and Social Reshaping**

Based on the aforementioned evaluation of origins, the response strategies in different contexts provide a dual perspective for reconstructing small town street vitality. Academically, both Chinese and international fields are undergoing a paradigm shift from physical interface repair to social relationship coupling. Western research focuses on Tactical Urbanism and bottom-up community empowerment to repair social cracks caused by ethnic conflict or aging.

Domestic logic is closely tied to the requirements of urban-rural integration and ecological civilization. The core is no longer simple visual landscape renovation, but seeking the long-term coupling of the "mountain-water-human-city" community of life within the macro framework of "comprehensive land improvement". The reconstruction essence is to retain the local "marketplace life" (fireworks) as core social capital through design, allowing streets to become hubs for value flow.

### ***4.1. Domestic Strategies: Spatially Catalyzed and Cultural Tourism Empowered***

China mostly adopts a top-down path of "spatial governance setting the stage, and business format renewal performing the play," emphasizing "micro-renewal" of the physical environment. For example, Zhao Yiqing (2020) advocated for a "mountain-water-city" public space pattern in Northern Shaanxi towns <sup>[12]</sup>, where street vitality serves as a catalyst for repairing the "ecological background". Furthermore, scholars like Chen Qiang et al. <sup>[15]</sup> propose returning to a "daily life orientation," using acupuncture node designs as spatial catalysts to combine marketplace life with tourism development.

### ***4.2. Conclusion and Future Prospects***

The international path focuses on remodeling the social function of the street as a "Public Sphere". Relying on PPS (Project for Public Spaces) principles, Western scholars advocate for Community Empowerment from the early planning stages. Through "Tactical Urbanism"—low-cost, high-frequency flexible interventions—they aim to weaken fixed spatial boundaries and enhance the psychological belonging of diverse groups, including the elderly, children, and migrants(*Figure 3*).

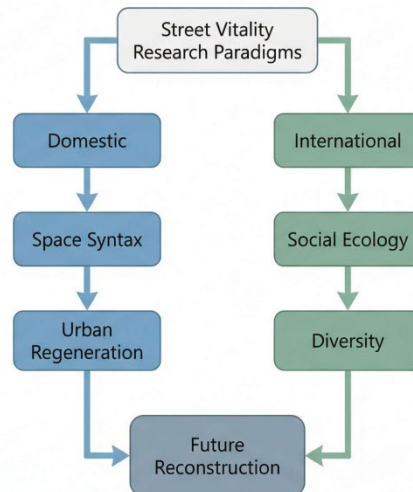


Figure 3: Flowchart of the comparative and integration framework for street vitality in Chinese and international small towns.

## 5. Conclusion and Future Outlook

Explorations of street spatial vitality in small towns at home and abroad have their respective focuses. Domestic research excels at achieving precise morphological quantification and macro-strategic responses using space syntax and big data. International research is adept at utilizing the SEM model to deeply analyze the psychological metaphors and social capital operations behind spaces.

What is highly enlightening is that the renewal of small town streets in China should not stop at the external superficial renewal of the physical appearance. There is an urgent need to introduce the multidimensional nested vision of social ecology, shifting from single "spatial transformation" to the long-term coupling of "human-land-social relations." Meanwhile, in response to the new demographic pattern of small towns characterized by intensifying aging and the return of migrant workers, constructing an inclusive street evaluation and intervention model with local adaptability will be a highly potential research depression in this field.

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