

Research on the Reconstruction and Reuse of Historic Blocks From the Perspective of Urban Catalysts Taking a Historical District of Foshan as an Example

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ABSTRACT

The transformation and reuse of historical blocks in the process of urbanization need to focus on the continuity of their culture on the basis of authenticity and coordinate with modern urban blocks to bring positive effects to the surroundings and even the entire city. Involving the urban catalyst perspective in the reconstruction and reuse of historical neighborhoods, taking a historical district in Foshan as an example, this paper summarizes the current problems, conducts research on the status quo from the perspective of catalysts, and proposes optimization strategies in order to activate the historical space, reasonably guide the development of historical blocks, and explore possible paths for the sustainable development of historical blocks against the same background.

Keywords: urban catalyst, historic blocks, transformation

I. INTRODUCTION

Most historical blocks have relatively complete historical features and high historical and cultural values, and they are also an important part of urban cultural heritage. The reconstruction and reuse of historical blocks involve social, economic, cultural, environmental and other issues. The transformation from its own perspective cannot meet the needs of regional and urban sustainable development. On the basis of protecting the space texture, architectural form and the spirit of the place, how to highlight the historical and cultural characteristics and the coordinated development of the city based on the protection of the space texture, the architectural form and the spirit of the place, has become the focus of today's historical block protection, transformation and reuse. This article takes a historical block in Foshan as the research object, and analyzes the operating mode and constituent elements of the catalyst to explore the transformation and reuse of historical blocks from the perspective of urban catalysts, so as to provide a new perspective and perspective for the reconstruction and reuse of historical blocks.

II. URBAN CATALYST THEORY AND HISTORICAL BLOCKS

A. Overview of urban catalyst theory

Catalysts originally meant that a small amount of substance was added to accelerate the original chemical

reaction without increasing the original quality and properties while improving the effect. In the late 1980s, American architects Wayne Otto and Don Logan first proposed the concept of urban catalysts in their book "American Urban Architecture — Catalysts for Urban Design." This theory has provided effective guidance for the decline of traditional industries and central urban areas in the United States due to rapid urbanization [1]. The current urban catalyst theory, as an important method for sustainable development, pays more attention to the dynamic development of the city, emphasizes the flexibility of strategy implementation through artificial judgment and guidance of catalyst elements, and proposes an idealized path from the goal to the result, thereby generating the comprehensive urban effect of region-overall related [2]. The urban catalyst not only pays attention to specific practical measures, but also pays more attention to the linkage effect produced after the transformation. Therefore, this method can be applied to the various stages of historical street reconstruction and reuse.

B. Characteristics of catalysts in historic blocks

The historic blocks of a city are the reflection of the architectural history, cultural features, and regional personalities of a particular period in the urbanization process of the urban area. They have high historical and cultural values and rich historical and cultural relics. In the construction of modern cities, more emphasis is placed on the connection between traditional elements and modern cities, reflecting the city's unique memories. As an important part of the city, historic

blocks bring a series of elements with unique values to buildings, landscapes and humanities. They are the nodes of the city's memory and therefore have the characteristics of catalysts. In addition, the characteristics of the catalysts in the historic blocks are also reflected in the spirit of the place. The spirit of the place, that is, the characteristics and connotation of the place, is the meaning of the place to people.

III. URBAN CATALYSTS IN HISTORIC BLOCKS

A. The operating mode of urban catalysts in historic blocks

As a means of vitality regeneration after transformation, urban catalysts can realize the cultural and material revitalization of historic blocks. The operating mode of catalyst theory in historic blocks generally includes three steps: determining the catalyst elements, activating the catalyst elements, and guiding the catalyst effects ("Fig. 1").

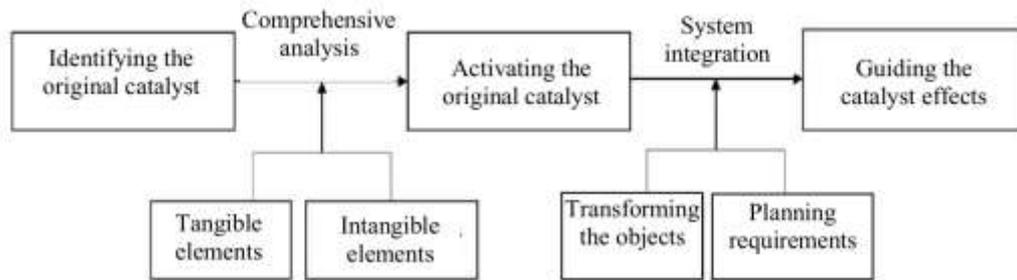


Fig. 1. The operating mode of the urban catalyst effect in historic blocks.

Urban catalysts are used in the reconstruction and reuse of historical blocks. First of all, the elements with higher vitality in the historic blocks should be comprehensively evaluated to select suitable original catalysts. According to the reconstruction goal of the historic blocks, new catalyst elements should be appropriately placed. In historic blocks, the selected catalysts often have both tangible and intangible elements. In the selection process, they should be reasonably judged and taken into consideration to make a good foundation for the subsequent activation and guidance of the catalysts. Secondly, the catalyst elements need to be further improved according to the current situation and problems of the block, so that it can adapt to the transformation of local functions or spatial structures while maintaining the authenticity of history and culture. Finally, the historic blocks after the transformation is controlled and guided to further

enhance the vitality of the area, promote the linkage effect of the area, and promote the progressive development of the city.

B. The shaping of urban catalyst elements

The shaping of catalyst elements is the basis for triggering urban catalyst effects. According to the causes of the catalyst effect, it can be divided into space catalysts, functional catalysts and humanistic catalysts ("Table I"). In specific practice, the same catalyst element often contains different types, which need to be considered in combination with different characteristics, and the tangible and intangible in the catalyst elements in the historic blocks are combined to work together to produce the expected catalyst effect.

TABLE I. CLASSIFICATION AND SHAPING STRATEGIES OF URBAN CATALYST ELEMENTS (SELF-MADE)

Type	Focus of transformation	Classification	Characteristics
Spacial catalyst	Proceeding from the existing space composition of the historical block, this need to emphasize its existence form, and actively take advantage of the characteristics of the historic blocks, with a view to generating an overall spatial effect	Punctiform catalyst	It can generate radiation effect to the surroundings in the form of points
		Linear catalyst	Linear distribution, it can have the function of series connection
		Planar catalyst	Regional coverage, agglomeration effect
Functional catalyst	Starting from the business format, the causes of the effects are mainly divided into the effects of inherent functions in historic blocks and the follow-up effects of functional replacement	Inherent function	Addressing aboriginal needs
		Functional replacement	Meeting tourist formats
Humanistic catalyst	Combining the cultural resources and memory needs in the reconstruction and reuse of historical blocks, the physical entities and human elements of the blocks are connected.	Tangible culture	Combining tangible element existence
		Intangible culture	Existing in intangible form

IV. CASE STUDY

A. Regional overview

The research case is located in Donghuali historic and cultural block, the ancestral temple of Chancheng District, Foshan City, Guangdong Province, which is called as Foshan's "World of South of the Five Ridges"

("Fig. 2") The region is rich in cultural resources. The west side is the ancestral temple built in the Northern Song Dynasty, and the east side is the most complete Qing Dynasty manor-house style building complex. The cultural protection units in this area are concentrated, and there are many types of ancient buildings, which have important historical and cultural values.



Fig. 2. Location map of the study case (self-drawn).

B. Status and problems of reconstruction and reuse

Since the block was built in the Ming Dynasty, the years of renovation have formed a dense and spontaneous complex of buildings, which is difficult to reconstruct. The project adopts the combination mode of "Rui'an Real Estate Company and SOM Company", which continues the original historic blocks and streets as a whole, repairs the ancient building complex, restores the original format while retaining the original memory, and introduces contemporary event scenes and public spaces, which fully reflects the characteristics of south of the Five Ridges. The transformation of the case has brought vitality to the blocks, and at the same time it has brought some problems in terms of historical protection.

1) *Ignoring historicity and culture:* Historicity and culture are the soul of historic blocks. In this case, it was "repaired as original as possible" during the reconstruction, and the original block texture and shape are restored. In the daily operation of this historic blocks, most of its historical and cultural parts are mainly based on physical display. Historical elements and cultural symbols are integrated into the partial construction. Excessive architectural decoration and construction are slightly cumbersome and deliberate,

making the block lose its original spacial atmosphere. As a block with historical life characteristics of south of the Five Ridges, it is not enough to display daily culture. The current cultural industry form is not strongly related to the block as a whole, which has gradually weakened the attributes of historic blocks.

2) *Negative impact of business structure:* The introduction of development capital in the reconstruction of historic blocks can bring vitality to historic blocks to a certain extent. This case study is mainly focused on catering operations, with both entertainment and cultural industries ("Table II"). With the frequent tourist activities, the proportion of tourists who use the space continues to increase. More people are attracted by commercial spaces with collage and reminiscence elements, while the characteristics of historic blocks are constantly weakened, which is not conducive to the protection and development of historic blocks.

TABLE II. CLASSIFICATION AND PROPORTION OF SHOPS IN THE CASE (SELF-MADE BASED ON SURVEY DATA)

Project	Culture	Restaurant		Shopping		Entertainment	Total
		Food	Drink	Specialty	Others		
Amount	11	33	30	10	35	19	138
Total	11	63		45		19	
Rate	8%	46%		33%		13%	100%

3) *Ignoring the protection of historic buildings:* The renovation project combines part of the historic space with modern needs. In recent years, due to the excessive commercial propaganda attached to the benefits of the block, the numerous commercial advertisements in the block have neglected the repair and maintenance of historic buildings, resulting in the phenomenon of local dilapidation in the block, thus making the historic block authentic being threatened, which has a certain impact on the protection and reuse of historic buildings.

V. APPLICATION OF URBAN CATALYSTS IN CASE

A. Selection and shaping of catalyst elements in historic blocks

From the perspective of urban catalysts, the reconstruction and reuse of this case should start from space. As an important catalyst component in the historic blocks, the spatial catalyst has a decisive influence on the overall performance of the space, and plays a role of catalyst in conjunction with the surrounding historic space. The punctiform, linear, and planar elements in the space catalyst can start from the existing space composition of the historical block in the picture and combine the characteristics of the historic block to generate an overall spatial effect ("Fig. 3").

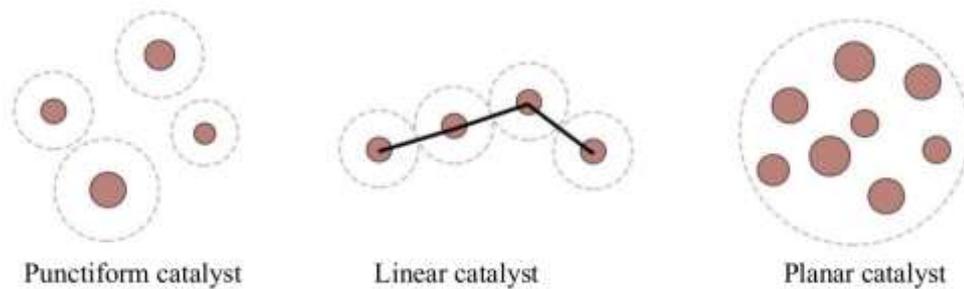


Fig. 3. Schematic diagram of catalyst elements (self-made by the author).

1) Selection and shaping of punctiform catalyst elements

a) *Historical buildings:* This case is located in the heart of Foshan's old city, with many ancient buildings and century-old shops ("Fig. 4"). Among them, Huang Xianghua Ruyiyou Ancient Shop, which was founded in the Xianfeng Period of Qing Dynasty (1851-1861), and the main building of Jian's Villa, which emulates the Roman style of the Italian Renaissance, are all valuable historical buildings in this

area. It is necessary to select the historical building to form a point catalyst, and focus on embodying its authenticity when shaping. While retaining the original style while taking into account modern needs, combining contemporary needs in the use of space, it is necessary to appropriately select meaningful new buildings, and the shaping of the new building should respect the overall style of the traditional block and integrate it into the texture of the original historic blocks to produce an overall effect.

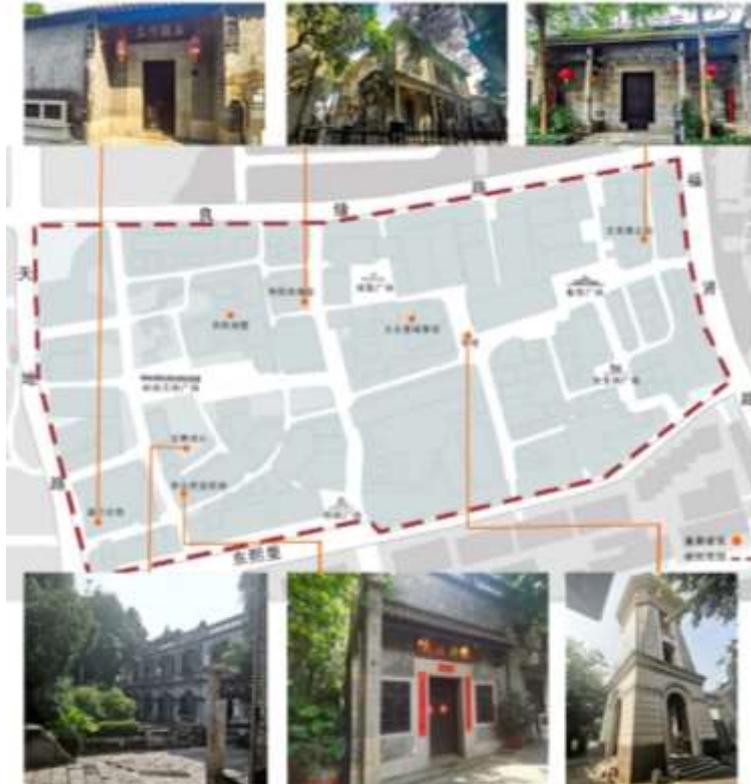


Fig. 4. Distribution of catalyst buildings in the case (self-made).

b) Green nodes: In the directory of ancient and famous trees published by the Chancheng District Government in August 2018, the Longtang Poetry Society in the case contained four longan ancient trees that were over a hundred years old. Natural resources are undoubtedly important nodes in the historic blocks, providing the region with a superior natural foundation and historical conditions, so it is chosen as the original node of the catalyst. In terms of feature modeling, in addition to listing it, it can be used as the central landscape, and a series of spatial arrangements can be developed as the center to further strengthen the spatial importance of natural historical landscapes.

2) Selection and shaping of linear catalyst elements: The streets and lanes of different scales form the transportation network in the historic blocks. It takes this as a linear element and forms a spatial network, and cooperates with other catalyst elements to work together to produce a chain effect. The shaping of streets and lanes should pay attention to the scale of the primary and secondary streets and their relationship with the surrounding environment. The color or material should reflect the characteristics of the streets

and lanes. The streets are used as linear elements to form a spatial skeleton. Elements such as display walls and decorative materials in the block combine cultural symbols of south of the Five Ridges to convey its historical information, control the excessive spread of commercial advertisements along the street, and ensure the accessibility of transportation space.

3) Selection and shaping of planar catalyst elements: The square in the case has a catalytic effect in the form of a plane. Based on the original space of the block, various squares are set up and combined with the surrounding environment to form a resting place. During shaping, more active surface-shaped spaces can be extracted, including Lingnan Tiandi Square, Hanpen Square, etc. ("Fig. 5"). The square-shaped planar catalyst elements combine with the landscape to generate different public event spaces, and at the same time set a series of cultural activities to enhance public participation in conjunction with festivals, which activate traditional spaces while conducting the cultural exchanges.



Fig. 5. Lingnan Tiandi Square and Hanpen Square (self-photographed).

B. Local adjustment of function mode

In view of the current format structure problem in this case, it is recommended to adjust the format ratio. It is necessary to properly increase the cultural industry, consider replacing some commercial functions and brands, properly consider the local residents' living habits, and reduce low-quality tourism consumer goods to a certain extent. It is also necessary to pay attention to the consumption and activity habits of residents in surrounding neighborhoods, try to introduce traditional commerce, and retain and use time-honored shops. At the same time, it is important to protect and repair historical residential buildings and strengthen their use of space. Combined with the overall needs of the block, some historical buildings can be replaced with places for visits and cultural creations, strengthening the historical and cultural atmosphere in the block, recreating the historical scene of the old city block, and completing the modern transformation of historical space. In terms of overall business positioning, it is important to strengthen the characteristics of the case and emphasize its unique cultural attributes. It can also increase the proportion of creative cultural services and achieve the integration of cultural heritage and contemporary industries.

C. Enhancement of humanistic catalyst elements

The preservation of memories in historical neighborhoods is the human needs of urban catalysts. In terms of shaping humanistic elements, it is necessary to consider it in all directions, and divide it into tangible and intangible for characteristic shaping. In terms of material and humanities, by inheriting and continuing Lingnan's urban characteristics through physical creation, it fully retains a series of cultural symbols such as time-honored buildings, riding towers, Guoer gables, paper-cut decorations, stone roads, and plaques. It takes advantage of historic blocks to form humanistic surroundings with regional characteristics. Foshan culture is influenced by folk traditional religions and has a prominent regional character. It contains not only many traditional handmade arts, but also its commercial spirit and folk culture, etc., all of which are important components in urban memory. Through the establishment of rich cultural activities and skills inheritance experience, the combination of dynamic and

static remodeling of spatial memory, the realization of the diversity of humanistic elements, so as to attract people to generate emotional resonance and cultural identity. In addition, in order to cope with the current development, it can be integrated into the needs of the contemporary industry, part of the history and culture can be marketized, its cultural resources can be effectively integrated, and it can be integrated into the overall urban cultural construction to strengthen the catalytic effect of urban humanities.

D. System integration of catalyst elements

The reconstruction and reuse of historical blocks based on urban catalyst theory is essentially a bottom-up development model of local areas. The new catalysts in the historical districts have a huge impact in a certain range, and there is also huge market activism in itself. Therefore, the overall urban development plan should be integrated. Considering the relevance to the surrounding environment, it will be very important to rationally arrange the proportion of new types of business and historical sites, strengthen the integration between catalyst elements, and build a catalyst system with multi-level synergy. The current emphasis on the transformation of historic blocks has shifted from space transformation to value reconstruction, with more emphasis on the revival of intangible culture. In this respect, it can strengthen the reproduction of historical scenes, guide folk culture, traditional craftsmanship, and other modern forms of display-based modern space to reproduce historical lifestyles, in order to achieve the purpose of continuing historical memory.

VI. CONTROL AND OPTIMIZATION OF SUBSEQUENT EFFECTS

A. Improving the function of historical and cultural display

In order to have a good catalytic effect in historic blocks, it is necessary to make optimizations and adjustments according to the development of historic blocks and changes in the surrounding cultural environment at different times. This case is located in the historic area of the old city. It plays an important role in the city's historical and cultural heritage. It continuously supplements humanities activities adapted

to different periods and ages according to the needs of the times, and strengthens the education and dissemination of its historical culture in accordance with local folk customs and development models. Also, it uses the block construction and decoration to strengthen the public's memory of its historical culture, constantly improve the cultural display function, allow more public participation in the spread of historical culture, and jointly protect the authenticity of the historic blocks, so that the historical culture can be continued. Secondly, the selection of business formats and the scope of business must be strictly controlled to avoid the formation of a space with a strong commercial atmosphere without personalization. At the same time, it should also focus on the sustainable development of the blocks, fully reflect the regional characteristics and organically combine history with modernity.

B. Comprehensive guidance from "top to bottom" and "bottom-up"

The future historic blocks need to meet the rapid development of modernization with a dynamic, diversified, and flexible state. Therefore, its control and guidance should have both aspects. Guided by government policies, the historic blocks can be flexibly adapted to urban development planning and regional planning, or to introduce various activities and events "from top to bottom" to attract people and private capital. At the same time, the "bottom-up" guides surrounding residents or institutions to participate in the maintenance of historic blocks and promote the common development of urban blocks.

VII. CONCLUSION

The application of urban catalysts in historic blocks can be taken into account both protection and development, meet the development of historical blocks and urban systems, and adapt to the overall urban planning, providing new ideas for solving the current status of historic blocks. This article focuses on the development of the historic blocks after the transformation, and focuses on the application attempts of re-interpretation from the perspective of urban catalysts on its current status. In terms of quantitative analysis, further research is needed.

References

- [1] Wayne Otto, Don Logan, *American Urban Architecture — The Catalyst for Urban Design* [M]. Wang Shaofang, trans. Taipei Chong Hing Publishing House, 1994, P6, P82. (in Chinese)
- [2] Jin Guangjun, Chen Yang, *On the Impact of Urban Design Projects under "Catalyst Effects" on the Surrounding Environment* [J]. *Planners*, 2006, 22(11): 8-12. (in Chinese)
- [3] Steffen Lehmann, *Urban Regeneration*[M]. Springer Nature Switzerland AG, Switzerland, 2019.
- [4] GRODACHC. *Beyond Bilbao: Rethinking Flagship Cultural Development and Planning in Three California Cities* [J]. *Journal of Planning Education and Research*, 2010, 29(3): 353-366.
- [5] Juliet Davis, *Urban catalysts in theory and practice* [J]. *Architectural Research Quarterly*, 2009, 13(3-4): 295-306.
- [6] Li Xingxi, Chang Jiang, Gao Xiangguan, *TRANSFORMATION AND REUSE OF INDUSTRIAL HERITAGE FOR YONGCHENG CEMENT FACTORY BASED ON URBAN CATALYST* [J]. *Industrial Construction*, 2018, 48(11): 60-64, 148. (in Chinese)
- [7] Fang Danqing, Chen Keshi, Chen Nan, *An Urban Regeneration Mode of Using Cultural Mega-events as a Catalyst: Practices and Inspirations of "European Capital of Culture"* [J]. *Urban Planning International*, 2017, 02: 101-107, 120. (in Chinese)
- [8] Wen Yueming, Li Hequn, *Integrative Urban Design of Historic City in the Perspective of Urban Catalysts: The Case of Kaifeng Old City* [J]. *Huazhong Architecture*, 2017, 11: 50-53. (in Chinese)