

Publication Date: 30 June 2024

Archs Sci. (2024) Volume 74, Issue 3 Pages 108-113, Paper ID 2024318.
<https://doi.org/10.62227/as/74318>

Design Principles for External Spaces in Neighborhood Commercial Complexes: Case Studies from Shenzhen

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Abstract As urbanization accelerates and the scale and density of urban population grows rapidly, there is a contradiction between the increasing shortage of urban land resources and the significant reduction in the area of public space per capita in cities, and the increasing demand for a high quality of life and public interaction. Therefore, in an increasingly crowded urban environment, the creation of a commercial external space that is shared with the city and has the attributes of an urban public space becomes the key to this study. Through a comprehensive survey of the current situation of commercial complexes in Shenzhen, four different typical cases of spatial organization, namely Shenzhen Wan Xiang Tian Di, Shenzhen One Square City, Shenzhen COCO park and Shenzhen Happy Coast (East), are selected as the main objects of this study, and three major design principles (the principle of integration, the principle of compounding and the principle of sharing) are summarized for the external space of a neighborhood-based commercial complex based on urban sharing, and four (interaction and continuity of urban space, integration and optimization of urban texture, three-dimensional connection to urban traffic, and continuity and echo of urban culture) and three design strategies for the use of external space (openness to the city at all times, enhancement of spatial accessibility, and accommodation of various urban activities). The study concludes that the external space of a neighborhood commercial complex should become part of the public space of the city and take on the two-way function of urban and architectural space to achieve the integration and interpenetration of urban and architectural space in order to realize the maximum value of the external space.

Index Terms neighborhood commercial complex, external space, urban public space, urban sharing

I. Introduction

With the rapid development of the Internet, people's consumption methods are shifting from traditional physical consumption to online consumption, and convenient and efficient online shopping is becoming more and more popular [1]. With the improvement of economic level and quality of life, people's leisure time is gradually increasing. Daily pastimes have also become more diverse, no longer only satisfying material needs, but focusing more on the spiritual dimension of the consumer experience [2]. This open and flexible spatial model can meet the needs of consumers, attract a large amount of consumer traffic and increase commercial value [3]. As a result, neighborhood-style commercial complexes are highly sought after by the real estate industry to promote their development.

Shenzhen has developed rapidly over the past 40 years of reform and opening up and has become a mega-city housing tens of millions of people. By the end of 2022, Shenzhen's resident population had reached 13,026,600, with a population density of 6,484 people per square kilometre, ranking first in the country (Figure 1) [4]. Shenzhen's topography is mountainous and by the sea, which leads to a certain statistical

equalization of population density, which is actually much higher than what the statistics show [5]. At the same time, Shenzhen is also a city of polycentric development, with the development intensity of each central district increasing. According to the land density zoning guidelines map in the Shenzhen Urban Planning Standards and Guidelines issued by the Shenzhen Planning and Land Resources Committee (Figure 2), it can be seen that the land development density in Shenzhen is very high, with most areas in high and medium density development [6].

With the massive growth of urban population and the high intensity of development, the problems of uneven distribution of urban resources and the decline of urban public space per capita have become increasingly prominent [7]. In addition, many planned and constructed public open spaces lack effective management mechanisms and reasonable design, resulting in poor accessibility of public spaces, which do not actually meet the attributes of "public" and cannot meet the public activities of residents. These problems are common in the urbanization process, and the root cause is that the traditional spatial model of urban architecture has failed to address the challenges of real life [8]. Therefore, the design

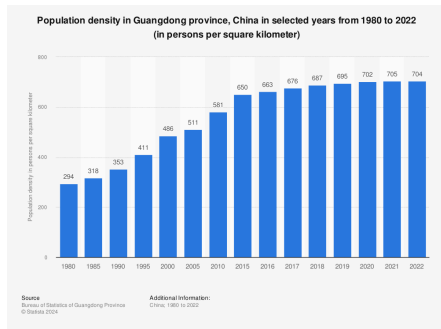


Figure 1: Population density and number of permanent residents in North, Guangzhou and Shenzhen

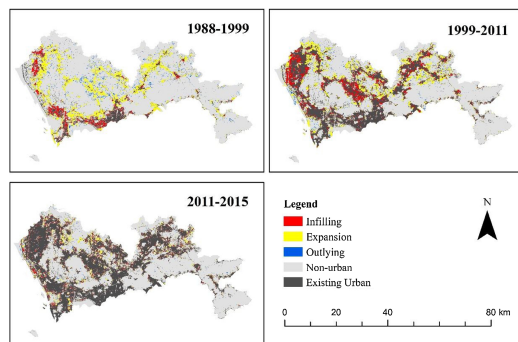


Figure 2: Shenzhen construction land density zoning guidelines map

of the external space of neighborhood commercial complexes needs to break away from the traditional design model from the perspective of urban sharing.

The neighborhood-style commercial complex has many advantages over the traditional centralized commercial complex. It breaks away from the original single closed commercial form and evolves into a multi-faceted dynamic open form that incorporates more urban functions. Its physical characteristics are reflected in the open neighborhood space [9]. The neighborhood commercial complex has greater advantages in many respects: in terms of function, the external space is interconnected and integrated with the surrounding buildings [10]. In terms of transport, the external spaces are connected to urban transport in three dimensions, with a high degree of connectivity to the metro and bus system, creating traversable neighborhood spaces and continuing the urban pedestrian system. In terms of space, the external spaces orderly link and permeate the urban space, avoiding large buildings from fragmenting the urban fabric. In terms of regional culture, the external space becomes an important place to showcase the city's culture, continuing and responding to the city's distinctive culture. In terms of landscape, the external space creates a comfortable and harmonious psychological feeling for the consumer and the surrounding environment [11].

However, the development of neighborhood commercial complexes is still in its early stages in China, and although there are some excellent examples of both reputation and

effectiveness, such as Wan Xiang tian di in Shenzhen, Taikoo Li San li tun in Beijing and Tai Yang Taikoo Li in Chengdu, theoretical research is still relatively scarce and incomplete, especially from the perspective of the external space of neighborhood commercial complexes as part of the urban public space [12]. At the same time, neighborhood commercial complexes often occupy privileged locations in the city and are "private property" within the building red line, so there are problems with management and operation, which limit the extent to which they can be shared with urban space and affect the value of the space (see Figure 3, 4, and 5).



Figure 3: Wan Xiang tian di, Shenzhen



Figure 4: Taikoo Li, San li tun, Beijing(<http://uee.me/cQkyw>)



Figure 5: Tai yang Taikoo Li, Chengdu

The city should be constructed as an open system in which space is permeable, without pre-determined narratives or complete architectural forms. Such a city would become a highly

shared space at all levels of space [13], [14]. Therefore, from the perspective of urban sharing, the external space of the commercial district is integrated into the category of urban public space and assumes the two-way function of urban space and architectural space. This will greatly alleviate the problem of insufficient urban public space per capita, improve the quality of urban public space, and maximize the value of space. Such an approach will achieve mutual benefits for the city, citizens and developers [15]. Research on the design of external spaces for neighborhood-based commercial complexes based on urban sharing is imperative.

II. Research case

Based on the guidance of urban sharing, the design strategy of the external space of the neighborhood-style commercial complex is explored. Starting from the macro perspective of the city and the micro perspective of the building, the spatial characteristics are analyzed, and the behavioral patterns of statistical space users and the flow of people are observed [16]–[18]. The study aims to explore the design principles of external spaces according to the productive life characteristics of urban residents. Therefore, when selecting the research cases, mainly neighborhood commercial complexes with rich spatial elements, good operation and high pedestrian flow were considered in order to obtain more reliable research data and reduce research observation errors.

Based on the above selection principles, this study investigated neighborhood commercial complexes in seven first-tier cities and new first-tier cities, including Shenzhen, Guangzhou, Hong Kong, Beijing, Shanghai, Chengdu and Chongqing [19]. According to the Global Shopping Centre Development Report released by the US in 2017, Shenzhen ranked first in the world with 4.58 million square metres of shopping centres under construction. At the same time, Shenzhen's neighborhood commercial complexes are developing rapidly in terms of number and scale, and there are many cases of complexes with representative reputation and operation, which have high research value and reference significance [20]. Therefore, four typical neighborhood commercial complexes in Shenzhen were selected as the focus of this study. These complexes include Shenzhen Wan Xiang Tian di, Shenzhen Happy Coast, Shenzhen One Square City and Shenzhen COCO park (Figure 6).

The four key projects selected for study are representative and of high research value, as they have performed well in terms of industry reputation and operation since their completion, and include many exemplary models in the industry that have a strong appeal to users. The four cases represent four types of spatial organization, namely: grid type - Shenzhen Wan Xiang Tian di, series type - Shenzhen One Square City, enclosed type - Shenzhen COCO park, and free dispersed type - Shenzhen Happy Coast East [21]. The four cases have both similarities and differences in terms of location, spatial composition, volume and business format, and are suitable for comparative analysis and research (Table 1).

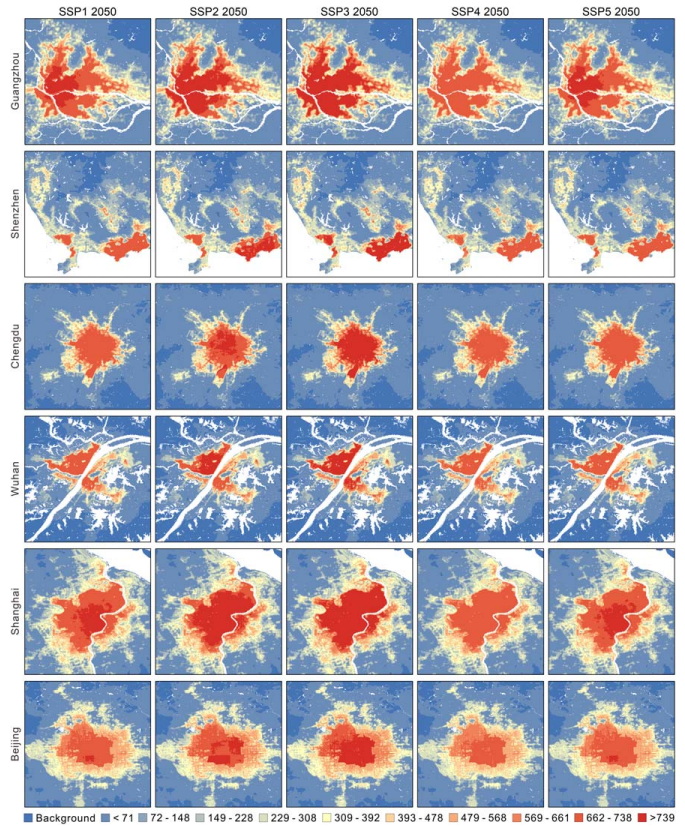


Figure 6: Distribution of research cases on block style commercial complex in Shenzhen Area

III. Design of the exterior space of the complex

A. Street space

According to Figure 7, the street space of Vientiane is the core part of the commercial complex, connecting the various commercial spaces and landscape nodes, and is necessary to create a strolling experience space. The scale of the street space can be adjusted to suit different needs. Central High Street and North City Lane are the two key street spaces, with High Street being approximately 19-23m wide and 370m long, and Lane being approximately 9-14m wide and 240m long. The secondary streets in the north-south direction are approximately 10-12m in width and 60-100m in length. The profile H:D analysis of the street space of Vientiane Shenzhen is shown in Figure 8. With the exception of the single flagship shop on the south-west side, the second and upper floors are partially connected to the different commercial units by sky corridors, creating a 'double first floor' commercial platform that is freely connected by air.

Figure 9 illustrates the grid-like layout of Vientiane, with a multi-street layout of five verticals and three horizontals, with street intersections at approximately 50m intervals. Strolling through this environment allows for a rich, varied and anticipatory walking experience without fatigue. A number of amplified nodal spaces have also been introduced in the movement lines to make the consumer's walking experience full

Project	Shenzhen Wan Xiang Tian di	Shenzhen Yi fang Cheng	Shenzhen Coco Park	Shenzhen OCT Har bour (East District)
Location	Yue hai Street, Nanshan District 9668 Shennan Avenue	No. 99 Xin lu Road, Bao an District	268 Fuhua 3rd Road, Futian District	208 Binhai Avenue, Nanshan District
Located in the business district	Gao xin yuan Business District	Bao an Central Business District	Futian CBD Business District	Overseas Chinese Town Business District
Developer	China Resources Land	Hong Rong Yuan	Xing he Group	Overseas Chinese Town Enterprises
Designer	Foster+ Partners	Kerrison and LLA in the United States	URBAN, Melbourne, USA	USA LLA+ Shenzhen Institute
Opening time	2017	2017	2006	2013
Building area (10000 square meters)	280	88	8.5	30
Commercial area (10000 square meters)	23	36	8.5	14.3
Floor area (10000 square meters)	63	11.5	3.1	125
Number of layers	-3rd to 7th floors	-2nd to 5th floors	-1st to 4th floors	1st to 2nd floor
Functional groups	Commercial, office, residential, apartment, hotel	Commercial, office, residential	Leisure, Culture, Entertainment, Catering	Business, entertainment, office, apartment, hotel, culture, tourism
Rail transit	Adjacent to Hi-Tech Park station of Line 1	1.5Seamless connection of Bao an Center station of Line 1	Seamless connection of shopping parks on Line 1	Adjacent to Line 9 Shenzhen Bay Park station

Table 1: Comparison Table of Four Key Research Case Data Projects

of surprises. The different spatial themes will stimulate and accommodate different consumer behaviors, thus providing a rich variety of commercial experience activities. The multi-street, dense grid layout of Vientiane maintains maximum spatial openness and a close connection with the urban space, while maintaining a strong commercial vibrancy.

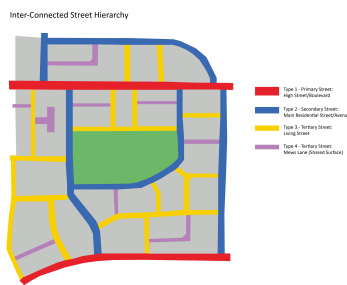


Figure 7: Spatial organization of Shenzhen Vientiane Tian Di street

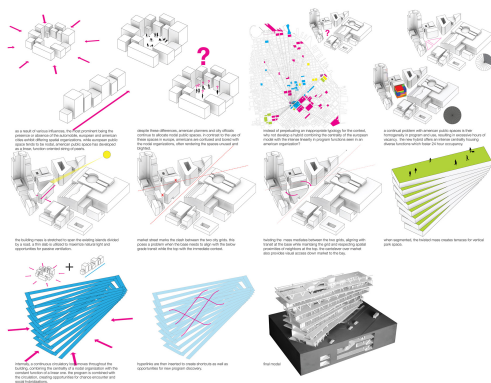


Figure 8: H:D analysis of the street space profile of Wan Xiang Tian Di, Shenzhen

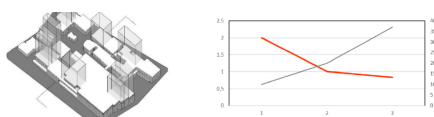


Figure 9: Rhythm analysis of the street sequence scale at Vientiane Shenzhen

B. Street space in One Square City, Shenzhen

According to the information shown in Figure 10 and 11, the street space organization of One Square City includes internal commercial streets and external commercial streets of open blocks, and this paper focuses on the external space streets, i.e. external commercial streets of open blocks. Due to the single-line organization, the street space scale of One Square City is relatively monotonous, but through the integration of multiple nodal spaces and the step-like treatment of the street interface, the street space becomes intimate and comfortable, greatly reducing the feeling of monotony and tedium. The plan of the pedestrian street is curved, allowing pedestrians to maintain a sense of anticipation and surprise as they move along, avoiding the fatigue associated with linear spaces [11].

The width of the street varies between 11 and 26 metres, and the plan texture shows that the width of the street space varies from narrow to wide and then narrow again, providing a diverse spatial experience for the pedestrian. Every 50 metres the street space has a plaza or transition space, which can be used both as a space for vertical traffic and as an activity space to extend the length of stay. In terms of vertical height, by sampling two different street profiles for observation, Street 1 is the core plaza space with a street height to width ratio of approximately 1:3. The space has good sight lines and is suitable for displaying commercial activities and small performance stages, and is also enclosed by curved walls with a strong sense of spatial flow. Street 2 is located at the southern end of the street, its street height to width ratio is about 1:1, the space is relatively uniform and the street interface treatment is more monotonous. The actual survey shows that the space is mainly dominated by fast traversing pedestrian flows, with poor habitability.

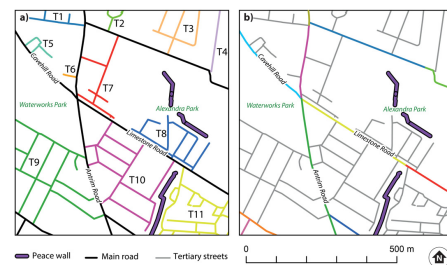


Figure 10: One square city street space organisation

According to the illustration in Figure 12, the form of the neighborhood commercial space can increase the length of the external business surface by 2-3 times compared to the traditional commercial space. Through the organization of

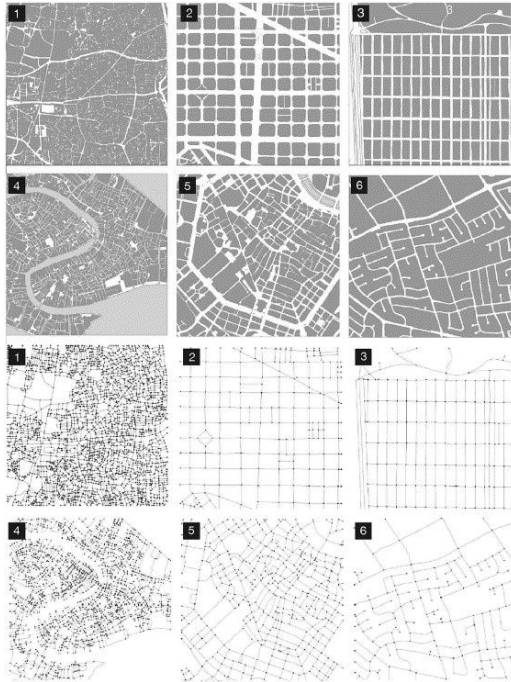


Figure 11: H:D analysis of the street space profile of One Square City Shenzhen

sky-linked corridors and podiums, the space above the first floor of commercial shops also further increases the external business area. At the same time, in combination with an efficient vertical transport system, the accessibility of the shops above the first floor is increased and the business atmosphere is enhanced. The neighborhood style allows for a more diverse and dynamic commercial interface, with each shop having its own strengths and stage to showcase, and to communicate to consumers through a variety of commercial messages, architectural language and high-tech displays. Shops can design their façade according to their product positioning and enhance their brand identity through materials, colors and symbols to further attract a targeted potential customer base. For example, Huawei’s global flagship shop features a fully transparent, frameless floor-to-ceiling glass curtain wall, making it easy for consumers to find what they need quickly. The streamlined exterior design combined with the sophisticated lighting ceiling always conveys a high-tech and futuristic design concept.

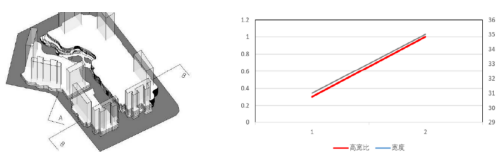


Figure 12: One Square City Shenzhen street sequence scale rhythm analysis

According to Figure 13, the commercial interface of Wan Xiang tian di in Shenzhen demonstrates the design charac-

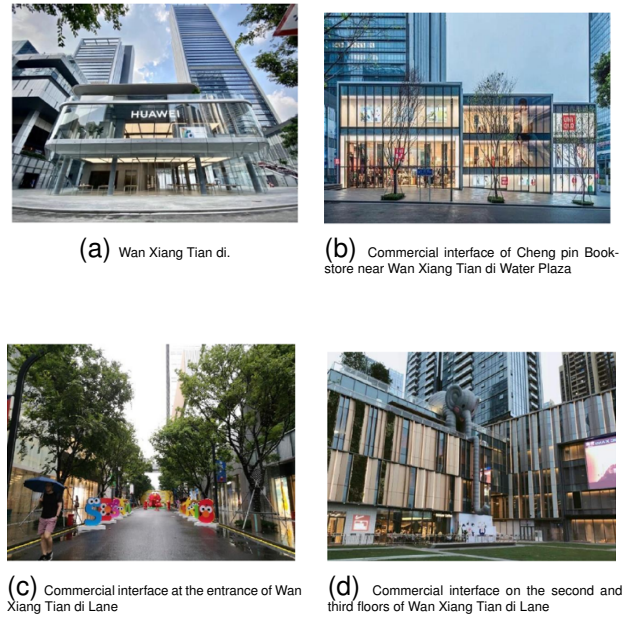


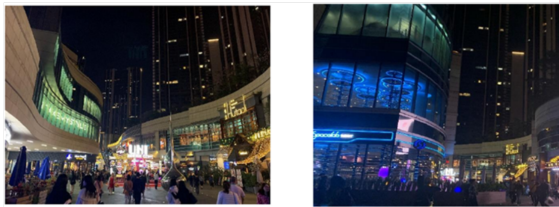
Figure 13: Wan Xiang tian di commercial interface in Shenzhen

teristics of different shops. The entrance of Uniqlo’s flagship shop has a jagged entrance space, which is divided into three sections on the façade, using vertical transparent glass as a window to showcase the internal shopping scene and products, with warm lighting design to attract consumers into the shopping area. The IT flagship shop next to it is designed with a façade of fully transparent glass and ‘invisible’ LED advertising panels, highlighting the brand’s individuality while not obscuring the display of products inside. The façade design of the Sincere Bookstore combines vertical greenery, vertical glass and vertical louvers with a falling light effect at night to give consumers a dream-like experience.

C. Commercial Interface of One City Shenzhen

According to Figure 14, the commercial interface of the exterior space of One Square City uses curved design elements to guide consumers towards the interior of the commercial area and unifies the overall façade effect through the light yellow warm lighting. However, the linear block design allows each shop to have only one display interface, which leads to a confusing mix of advertising signs for each shop and leaves a poor first impression of the quality of the space to consumers. The developer can develop an overall unified design theme at the beginning of the design phase to balance the design of each shop’s display interface and to enhance the aesthetic level of space quality while maintaining the individuality of the shops to the greatest extent possible. This will enhance the quality of the space in an orderly manner, while maintaining the recognizability of the commercial interface. The weightless restaurant at the main entrance features a fully transparent floor-to-ceiling glass structure, with an interior designed to

incorporate the brand's character with a delivery rail that drops from the sky and light blue lighting, creating a strong sense of futuristic technology. It stands out among the many outlets, offering visitors and consumers a visual treat with clear appeal [16].



a Commercial Interface at the Entrance of One Square City Open Block

b Yifang cheng weightlessness restaurant business interface

Figure 14: Commercial interface of Shenzhen Yifang Cheng open block

IV. Conclusion

Through the study of theories on neighborhood commercial complexes, external space and urban sharing, as well as the research and analysis of excellent cases at home and abroad, the form and components of the external space of neighborhood commercial complexes have been discussed in detail. On this basis, three major design principles, seven design strategies and corresponding design approaches for the external space of neighborhood commercial complexes based on urban sharing have been proposed. These principles and strategies provide useful guidance and references for the design and research of the increasingly popular external spaces of neighborhood commercial complexes in China, and have important practical implications.

Funding

This work was supported by 1. Natural Science Foundation of Xinjiang Autonomous Region(China)– Youth Fund "Research on the Design Strategy of Public Cultural Service Function Based on the Synergistic Effect Theory – Taking Xinjiang Commercial Complex as an Example" (No. 2020D01C059). 2.National Natural Science Foundation of China"Study on the Public Cultural Service Function of Xinjiang Bazaar Based on the Theory of Synergistic Effect" (No. 52068065).

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