

URBAN PUBLIC SPACE IN NEW DISTRICT IN CHINA: WHAT URBAN DESIGN CAN DO

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ABSTRACT

Creating high-quality public space is one of the goals of urban design. There are many problems in the public space in China's new city: large scale, independent function, unfriendly to walking activities, and so on. As we all know, the form of urban space is the result of a series of effects such as urban regulation, urban planning, urban design, architectural design, and etc. How to make urban design play the right role in this process, is the key question. Based on the actual case in Nanjing, the paper discusses the precondition premises, roles and means of urban design in order to obtain a more suitable space for human activities. The paper finds that although the urban regulations provide a large number of setback space and green space in the streets, but people's activities concentrate in the places where have more appropriate scale, more convenient access, and more diverse functions alongside, mostly underground and inside the building, from the bottom up. Thus, urban design should optimize or actively create more such areas. Keywords: Urban Design, Public Space, Urban Regulation

INTRODUCTION

As we all know, the modern city has undergone radical changes in its physical form. Cities have become diffuse, loose and discontinuous (Levy, 1999). In the classical urban morphological hierarchy, streets/blocks/plots/buildings, streets are the main parts corresponding to public open spaces. For the traditional city, the street space carries the main traffic, walking activities. While with the popularity of automobiles, traffic needs to be more straight and wider non-barrier roads, traffic and pedestrian activities have an irreconcilable contradiction. In Chinese modern cities, we find that traffic and walking system gradually separated. The streets, in the traditional sense, that separate blocks are difficult to assume the role of the main public space, and more public activities occur in the public space inside the plot. This phenomenon poses a challenge to the structure of the urban form: the area inside the plot become an important part of the public space. As in the more detailed hierarchy reviewed by Kropf (Kropf, 2013), there are "areas" in the plot may also be part of the public space. Creating high-quality public pedestrian space is one of the goals of urban design. Based on the theory of urban morphology, urban design is to deal with the connected areas in the plots, beside the traditional street space.

On the other hand, a wealth of literature on quality of public space shows that the preferred space for pedestrian has many characteristics which are included in five aspects: inclusiveness, pleasurability, meaningful activities, safety, comfort (Mehta, 2014). From the physical

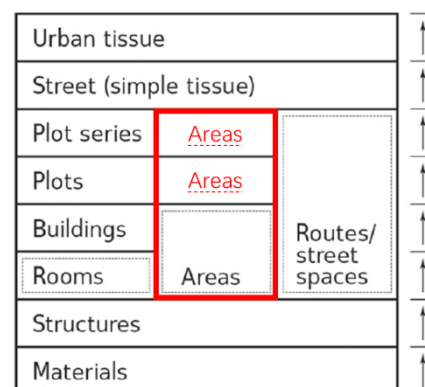


Figure 1. Multi-level diagram showing the position of the areas in the plot and its relationship to plot series to form the public pedestrian space in modern cities. (Redrawn from Kropf diagram)

morphological perspective, the main characteristics are: imageability, enclosure, human scale, transparency, complexity (Ewing & Handy, 2009). These literatures provide us with an objective way to evaluate the quality of public spaces.

By casing a real case located in Hexi New Town in Nanjing, China, the paper provides an in-depth introduction and analysis of the separation of public pedestrian spaces from the street spaces, as well as the contradiction between urban design objectives and the actual use of the space.

CASE STUDY

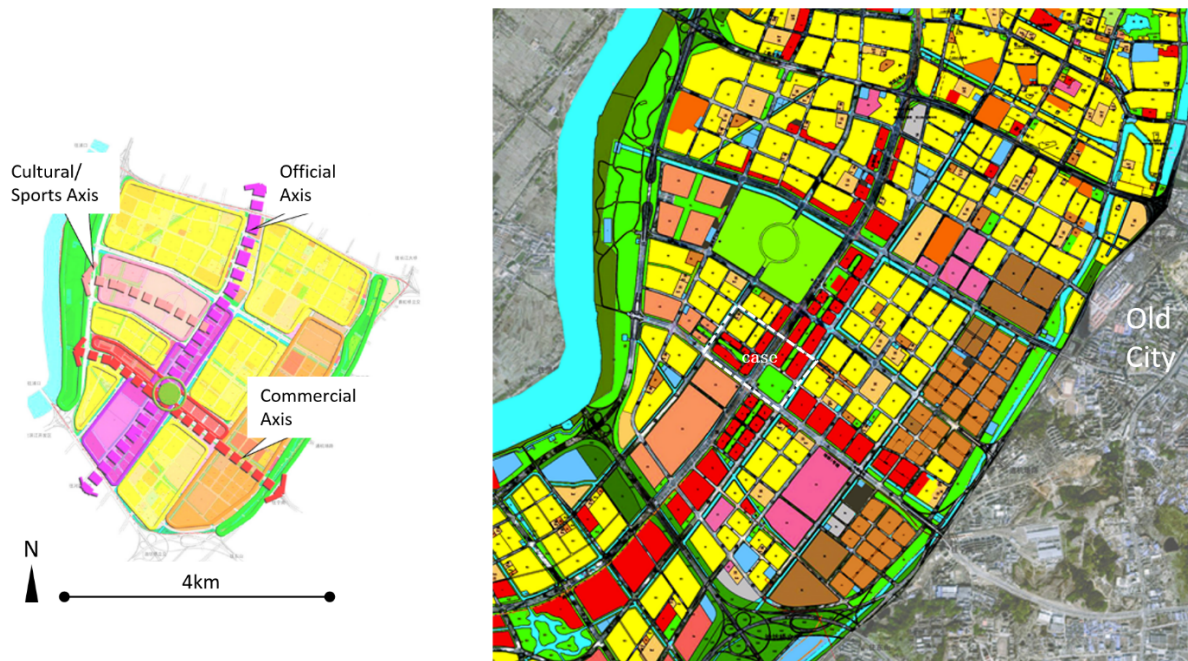


Figure 2. Landuse planning map of Hexi District

Nanjing Hexi District is located west to the Old City. Since 1990s, the area has been changed from farmlands to new urban zones, which is the result of urban planning in different scale, as well as several urban designs. The case selected in the paper is located in the business center area of Hexi District, including four blocks and 12 semi-blocks. Two key axes have been planned, one is business office axis and the other is commercial axis. Plots with commercial land use and high FAR are arranged along the axis. To strengthen the axis, the position of the axis is set to 50m wide green space belt, which are expected to be used as public space. Then the urban design follows the concept of urban planning. Through control of building volume, setback distance, position of the entrance, and etc., the urban design controls the streetscape and interface of the main streets. It can be found that after planning and urban design, there seems to be enough open space for public activities on both sides of the streets and the green spaces.

After the construction and operation of the plots, due to the control of the design and regulations, the building on the plot is quite loose, the space between the buildings is huge. The setback regulations in the new town is very strict. For example, if the building height is 24-100m, the road is wider than 30m, the setback distance of the building is no less than 12m. To understand the use of public space, we have mapped the location and boundaries of the spaces actually used as urban public activities. The study found that sidewalks and public green spaces were not used by many people. Large crowds were concentrated near the subway station, in the underground space of the mall connected to the subway station. And on the ground floor, people were concentrated in the

inner street of the mall. Although the central green space is very large, the surrounding residential area, office are not within the comfortable walking distance. There are not many people who use these spaces in daily life.

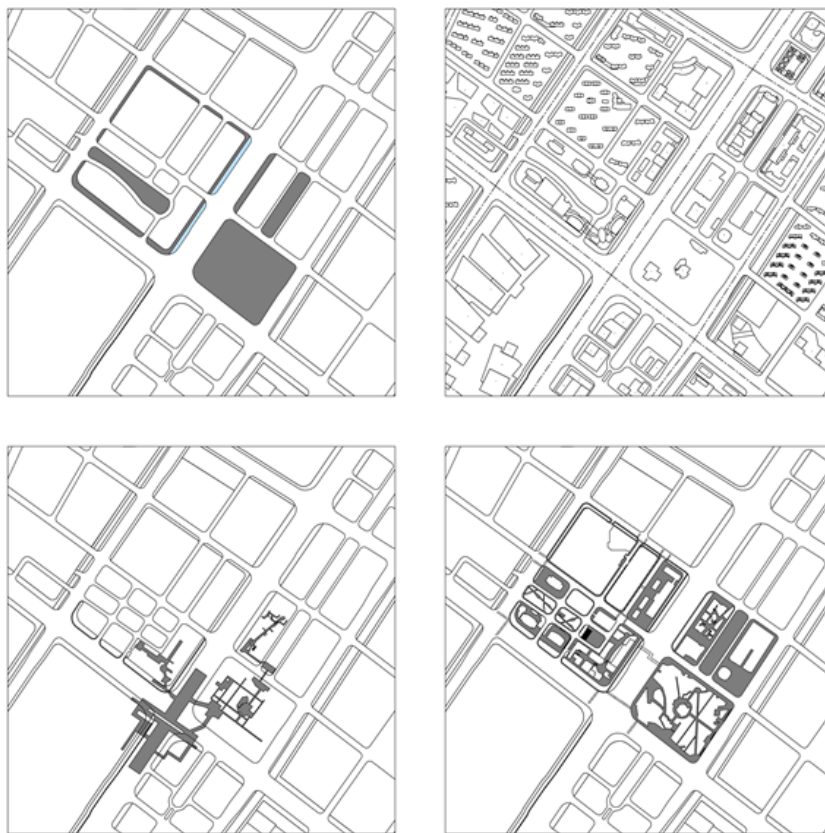


Figure 3.
TopLeft: planned public space
TopRight: blocks&plots&buildings
BottomLeft:
underground public space
BottomRight:
public space on the ground floor

EVALUATING THE QUALITY OF PUBLIC SPACE

The following study will take two main public paths as an example. Public spaces are drawn in detail, quality of the public spaces are evaluated, quantified and analyzed. Relationship between public space and the plots are discussed. In these two paths, one is connected to the inner street in two commercial buildings, subway station, underground space of public green space, etc. In the path there are high density of pedestrian activities. The total length of the route is about 1300 metres, along with 8 squares. The path involves three plots. The other path connects the centre green space, sidewalk space of the planned streets, etc.

Subsequently, a quantitative evaluation of the linear space and node space of these two paths are carried on. Comparisons of the properties, such as enclosure, complexity, linkage, visibility, etc. are done based on the streetscape of the space.

To compare the enclosure, physical features such as distance between buildings, proportion of street wall, proportion of sky across, proportion of sky ahead, etc. are considered. Then we set four levels, each level is corresponding to a score. To describe the transparency, entrance of the streetwall, proportion of first floor with windows, proportion of active uses, proportion of street wall are calculated. Considering the complexity, density of elements on sidewalk, density of trees, furniture, signs, people are recorded. To quantify the linkage, the integration value of the path is calculated via UCL depthmap. To compare the visibility, the signs such as special buildings, sculptures, etc. in the streetscape are marked and counted.

All indicators of the properties are marked into the corresponding space and aggregated in the table. By comparing the data, we find that the indicators of the first path are much higher. The space of the first path is not planned or designed by urban designer, it is the result of architects made for attractive commercial buildings. That is to say, space urban design gave, in the human use level, is a failure.

STATISTICS AND ANALYSIS

Statistics show that the value of enclosure of path 1 (used public space) is generally much higher. Not only because the distance between the buildings on both sides is relatively small, the average value is about 10 meters, the widest part is about 15m, and the narrowest part is about 5 meters. But also because of the roof in and between buildings, the sense of enclosure is also strengthened. The situation of path 2 (planned public space) is quite different. The distance between the buildings is up to 130m. The space is enclosed by one-side buildings and some landscape trees. Between the buildings, in addition to the sidewalk (about 6-10m wide), there are also wide roads and green landscape isolation belts. Even on the city branch road, the distance between the buildings has reached 42-48 meters (nodes P5, 11, 12). The reasons exist not only in the large width of the roadway, but also in the large distance of buildings setbacks (Tang & Ding, 2018).

From the perspective of the transparency of the building interface, the value of path 1 is much higher. Connecting to the exit of the subway, there are many shops on both sides of the path, all open to the street, most of which are accessible and can be seen the internal activities; except for a section of the subway entrance and exit, those sections strictly restrict commerce and serve as Channel usage (node R11, 12). The interface of Path 2 is not friendly to pedestrians. Most of them are closed glass surfaces or walls. Pedestrians can neither see the activities inside the building nor enter the building. There are also some parts, in which there is a large height difference between the sidewalk and the building's exterior space. The plot is inaccessible, and the public activities occurring at the boundary of the building are completely separated from the sidewalk (node P5).

From the perspective of the complexity of space, the complexity of Path 1 is mainly reflected in the commercial activities with a certain density, but there are not too many varieties of elements in the space, and there is no furniture, sculptures, man-made objects, etc. to increase experience in the space. Because most of the space is indoors, the landscape changes of the space are similar and single, and less light and shadow changes, that cannot bring more fun. The value of complexity of Path 2 is not high, the density and types of spatial elements are relatively small. There is often a 100-meter long path, with almost no changes in the elements beside the road, and the traveling process is relatively tedious. But Path 2 is mostly outdoors. The scene will change with the location, which increases the complexity of the space to a certain extent.

Considering the legibility of the space, the legibility is reflected in whether there are obvious visual features in the buildings and space, which leaves a deep impression on pedestrians. Most of the experience of Path 1 is indoors, and it is visually similar. Except in some special atriums, squares, etc., it is almost impossible to tell where you are at a certain point. During the journey of Path 2, tall buildings in the distance can often be seen, thus forming a certain recognition. Although nearby buildings may not have significant features, the legibility is obviously higher than that of Path 1.

In terms of spatial connectivity, because they are in the same location, the overall accessibility of the two paths is relatively similar. Due to the barrier of expressways, even commercial plots have limited connectivity with surrounding plots at the pedestrian level. In other words, residents living in

the surrounding areas may not be able to reach this plot if they need to walk more than 500 meters, so a large number of people arrive at the event venue via subway and car-parking, this also caused the lack of crowds on the urban pedestrian of path 2. Before the commercial building of plot, A was completed and used, the underground business of plot B, especially the catering, was particularly developed and popular. After the use of Plot, A, the business in Plot B quickly weakened due to its long distance to the subway.

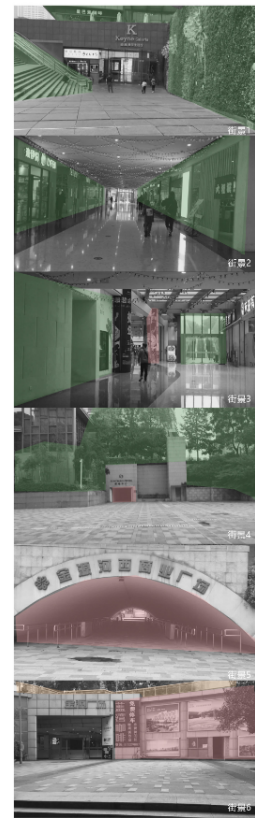
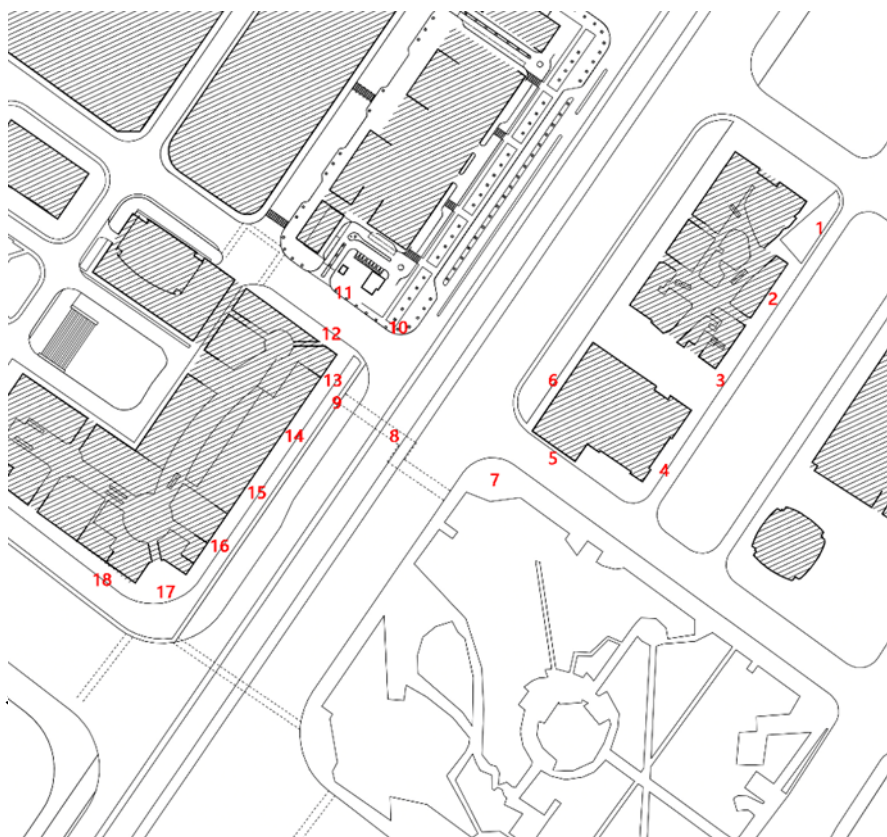


Figure 4. Public Spatial Quality Analysis_Path1 Real Used Public Space



No.	Imageability	Enclosure	Transparency	Complexity			Legibility	Linkage	
	Presence of memorable architectural or landscape features 0=none, 1=very few, 2=moderate, 3=several,	0=very poor sense of enclosure, 1=moderately well enclosed, 2=good sense of enclosure, 3=very good sense of enclosure	Permeability of building facades on the streetfront 0=not at all, 1=some parts somewhat permeable, 2=moderate permeability, 3=very permeable all along	Density of elements in space providing sensory complexity 0=none or very few, 1=few, 2=moderate, 3=high	Variety of elements in space providing sensory complexity 0=none, 1=very little, 2=moderate, 3=high	Other furniture and artifacts in the space 0=none, 1=few, 2=several in many parts of space	Personalization of the buildings on the streetfront 0=not at all, 1=some parts somewhat personalized, 2=moderate personalization	Visual and physical connection and openness to adjacent streets or spaces 0=almost none or very poor, 1=somewhat tentative, 2=moderately well connected, 3=very well connected	Design elements providing focal points 0=none, 1=one, 2=two, 3=several
Weighting	1	1	1	0.33	0.33	0.33	1	0.5	0.5
Real Public Space									
R1	2	2	1	2	1	0	1	3	2
R2	1	3	3	3	2	0	0	2	1
R3	1	3	3	2	2	0	0	2	1
R4	1	1	0	1	1	0	0	1	1
R5	2	2	0	0	0	0	1	1	1
R6	1	2	2	1	1	0	0	1	1
R7	1	3	3	2	2	0	0	1	1
R8	1	3	3	3	2	0	0	1	0
R9	1	3	3	3	2	0	0	2	0
R10	1	2	3	3	2	0	0	2	1
R11	1	2	3	2	2	0	0	1	1
R12	1	3	0	0	0	0	0	1	1
R13	1	3	0	0	0	0	0	1	1
R14	1	3	0	1	1	0	0	3	1
R15	1	3	3	2	2	1	1	3	1
R16	2	3	3	3	2	1	1	2	2
R17	1	3	3	2	2	1	1	3	2
R18	1	3	3	2	2	0	1	3	2
Planned Public Space									
P1	2	2	0	2	2	0	2	2	2
P2	2	2	0	2	2	2	2	1	2
P3	2	2	0	1	1	0	1	1	2
P4	2	2	0	1	2	1	2	1	1
P5	1	2	0	1	1	0	1	2	0
P6	1	1	1	1	1	0	2	1	0
P7	2	1	0	1	1	0	2	1	1
P8	2	1	0	1	1	0	2	1	0
P9	1	1	0	1	1	0	2	1	1
P10	1	1	0	1	1	1	2	2	1
P11	1	1	1	2	1	0	2	1	1
P12	1	2	2	2	1	1	2	2	1
P13	1	2	2	2	1	1	2	2	1
P14	1	2	2	2	1	1	2	1	1
P15	1	2	2	2	1	1	2	1	1
P16	1	2	2	2	1	1	2	1	1
P17	1	2	2	2	1	1	2	2	1
P18	1	2	2	2	1	1	2	2	1

Figure 6. Statistics of Quality of Public Space

DISCUSSION: URBAN DESIGN METHOD FOR GOOD PUBLIC SPACE

This makes it necessary to rethink the role of the urban design. We see a certain contradiction. Although the outdoor space has advantages in visual richness, due to the lack of spatial enclosure, the weak relationship between the pedestrian space and the building, and the low degree of

interface openness, it cannot attract too many activities. Of course, this is also because the population density of the entire region is not high. The indoor public space, because it has sufficient commercial functionality and is closely connected to the subway, is more attractive for people's activities, but the quality of the indoor public space is not particularly high, especially the complexity and legibility etc.

Research data is both the result and the cause. In modern cities in China, the area between the plots has been difficult to have the quality of high-quality public space (for pedestrian). The reason is because of the need of the wide roadway, because of the scale of the plot, because of the large setbacks, and so on. The bottom-up public space are transferred to the interior of the building, and are designed by the developers and architects of the plot for the purpose of building attractive activities. This reflects that the spatial attributes still need to be able to fit human scale and activity rules to be able to truly attract people. The scale and mode of people introduce the public activities that originally belonged to the urban space into the interior of the building. Does the urban design of this area need to intervene and how?

The main goal of urban design is to create a high-quality urban public space for pedestrian. From the perspective of urban morphology, the area between plots is no longer the main or only area that determines the quality of urban public spaces. Then, how to effectively restrict and control the public space in the plot in urban design to ensure quality? If it is not a commercial plot, how to maintain the vitality of these plots? These are issues worthy of future discussion.

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