

A Typological Interpretation of Urban Design Method for Intensive Development Area

by Fang Rong, Wang Enqi & Han Dongqing
Southeast University

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Abstract: How we define and interpret the physical form of our cities impacts on the methods of urban design. According to urban morphology, a traditional city is defined as the combination of “streets, blocks and buildings”. However, with limited land resources and the increasing population, contemporary urban development breaks through the limitation of plots and blocks, and expands three-dimensionally, resulting in the growing complexity and diversity of the urban elements. In the circumstances, we find that the traditional ways of describing urban elements, as well as the corresponding urban design methods and guidelines, are inadequate for some areas in contemporary cities. This article explores compact development strategy for intensive development areas. Urban design is considered an effective way of coordinating different elements in the whole area and improving the land-use efficiency.

This article uses typo-morphology as a way of deciphering the main characteristics of the intensive development area and exploring its cognition and design strategy in several urban design projects in China, in order to optimize and supplement the traditional ways of interpreting the urban form. Specifically, we first classify the urban elements, and analyze the mutual contributing or constraining relations among them. Secondly, we define the basic development unit, basing on which we set up principles of development control. Thirdly, the three-dimensional model is built to optimize the spatial efficiency. The methods of constructing the system model and establishing the systematic rules are revealed.

The design and the description of the urban form influence and restrict each other. How we understand and describe the physical form of the city determines how we design the city. Nowadays, the urban elements are increasingly complex and diverse, and the urban space is more often utilized three-dimensionally. Faced with such situation, we find that the traditional ways of describing the urban elements and the corresponding urban design methods and guidelines are inadequate for some areas in contemporary cities. Instead, urban design that explores the compact development strategy in intensive development areas becomes the crucial method of improving the land-use efficiency. This article uses typo-morphology as a way of deciphering the main characteristics of the intensive development area and exploring its cognition and design strategy in a number of urban design projects in China, in order to optimize and supplement the traditional ways of interpreting the urban form.

1. Background

The clear block pattern used to be one of the basic characters of traditional towns. The basic components of a town plan are identified by the urban geographer M.R.C. Conzen as “the street pattern, the land use pattern, and the building fabric” . According to the American scholar Anne Vernez Mouton, “urban form is defined by three fundamental physical elements: buildings and their related open spaces, plots or lots, and streets”.¹ Divided by streets, blocks are independent urban units with few interconnections, within which buildings are built. Karl Kropf used multi-level diagrams² to define the urban elements and their hierarchical relationship more precisely. In China, the conventional urban design and guidelines based on the similar idea. The block was used as the basic unit in urban planning and management, and was assigned with related attribute index.

However, with limited land resources and the increasing population, contemporary urban development breaks through the limitation of plots and blocks, and expands three-dimensionally. We find that in some densely populated intensive development areas, the overground and underground spaces of urban public streets are largely occupied, making possible the joint-development among the connected blocks, and freeing the building construction from the limitation of block boundaries; the urban public space (streets, for example) expands into the building interior, and grows in it three-dimensionally; the property relations among the blocks can no longer be clearly defined in two-dimensional ways, and the relationship between the private space of buildings and the urban public space also becomes vague. Thus, the traditional ways of describing and regulating the urban form are no longer adequate. One of the key techniques to improve the land-use efficiency is urban design which coordinates the different elements in the whole area three-dimensionally, and integrates design with management and regulation, exploring the compact development strategy for intensive development areas.

This article used several urban design projects from recent years as examples, including the Urban Design of Fish Mouth District in Nanjing, the Urban Design of the Central Core Area of Singapore Nanjing Eco Hi-Tech Island, and the Urban Design of the CBD District in Jiangbei New Town in Nanjing, all of which are located in intensive development areas in Chinese new towns. Urban design here is both a creative process and an in-depth technical means, which has significant value in the conception and realization of intensive development in new towns. The main characters of this kind of projects include: 1) the re-definition of development units which break through the limitation of block boundaries; 2) the maximized using and sharing of cross-block overground and underground spaces (Figure 1); 3) the three-dimensional public pedestrian system and public space system; 4) the complex relations among developers and the complex issue of the right to use.

2. Methodology

In intensive development areas, the method to achieve compact and efficient space utilization is the key technique to improve the land-use efficiency. Responding to this, we build in urban design three-dimensional models of the city basing on spatial efficiency. City is no longer defined as the combination of separate blocks, but is organized as an integrity, in which the most compact development is encouraged.

2.1. Classifying the Element Types

Strong infrastructure is the basic guarantee for the well-function of intensive development areas. Figure 2 shows several common types of infrastructural elements and their elevation requirements in the Urban Design of Fish Mouth District in Nanjing.

These infrastructures often either promote or prevent the cross-block connections, therefore can be classified into these two categories. The cross-block connection promoting elements help the blocks connect with one another without being divided by streets. These elements usually include: subway station halls, underground pedestrian passageways, overground pedestrian passageways, etc. The cross-block connection preventing elements hinder the blocks from expanding three-dimensionally. Due to their existence, the blocks cannot grow in a certain direction. These elements usually include: subway rails, vehicle roadways, underground utility tunnels, municipal pipelines, river courses, etc.

2.2. Defining the Basic Development Unit

In traditional cities, being cut by streets, city blocks exist as independent cells (Figure 4, left). In modern cities, the growing status of motor vehicles causes the conflict between pedestrians and cars. To mitigate this problem, it is often seen that blocks or plots are connected by underground or overground passageways. Therefore, although separated by streets on the ground floor, the blocks are linked as an integrity on the underground or overground level (Figure 6, middle). In some intensive development areas with small blocks and dense streets, the land is extremely valuable. Separate blocks means a huge waste of space resource, since they would require separate pedestrian entrances and vehicle entrances. In these areas, developers tend to develop several adjacent blocks simultaneously, or to conduct joint-development with the developers of adjacent blocks. The overground and underground spaces of city streets would be largely utilized, and the small blocks would “cohere” to form large blocks. (Figure 4, right)

In order to improve the urban spatial efficiency, urban design anticipates the future basic development units and provides suggestions, basing on the division of the development area by large infrastructures. Figure 5 shows the joint-development units suggested by the Urban Design of Fish Mouth District in Nanjing. The urban design suggested cross-block connections, marked out the areas for the possible connections and the areas for the necessary connections. The overall principles are as follows. 1) The interconnections among the blocks are encouraged inside a joint-devel-



Figure 1. The cross-block use of underground and overground space in the Urban Design of the Central Area of Singapore Nanjing Eco Hi-Tech Island.

opment unit, in order to improve the land-use efficiency. As long as the connection-preventing elements are bypassed and the safe operation of communal facilities are guaranteed, the space can be developed three-dimensionally both overground and underground. 2) The connections are limited between joint-development units. Urban design suggests the necessary locations and the ways of connection, in order to minimize the connections in between. (Figure 6)

2.3. Building the System Model

Urban design of intensive development areas is a highly three-dimensional, complex, systematic work. Detailed three-dimensional models need to be built and adjusted in the urban design process according to actual conditions.

The basic method of the elevation design and the model construction can be interpreted as follows. Firstly, the elevation requirements of different elements should be clarified according to their attributes. Apart from the effective space and the structural space required by the elements, other

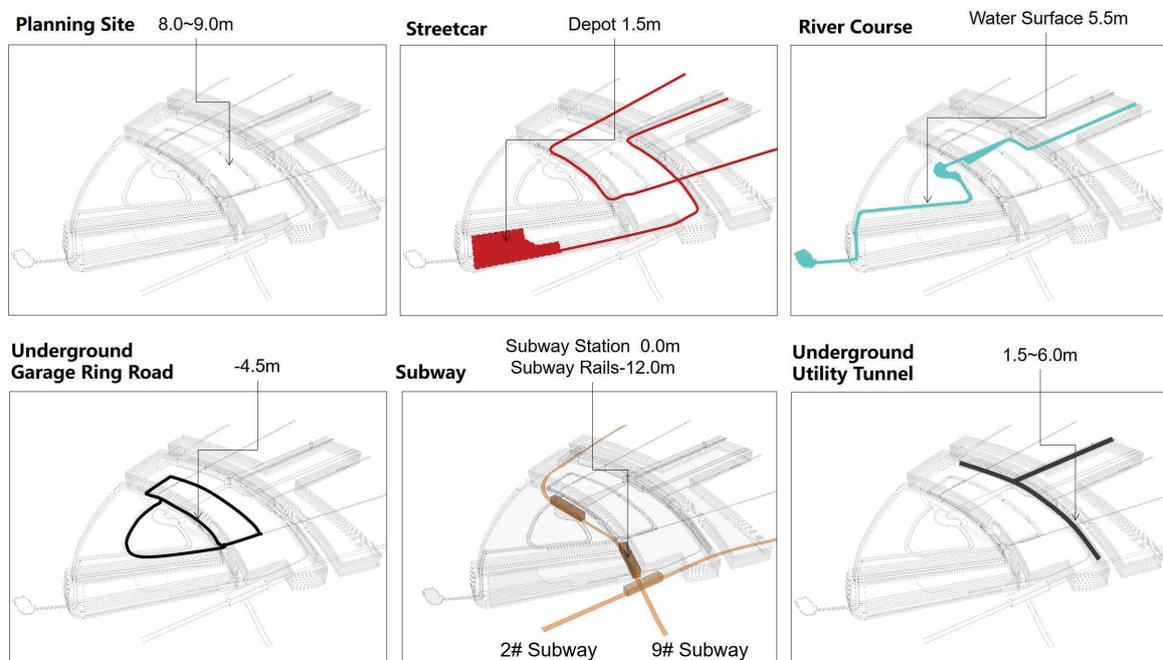


Figure 2. *Infrastructural Elements in the Urban Design of Fish Mouth District, Nanjing.*

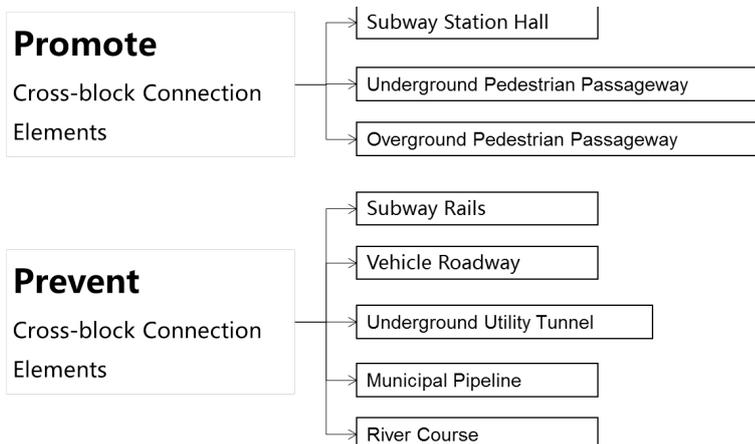


Figure 3. *Types of infrastructural elements.*

factors according to the engineering experiences should also be taken into consideration, including the safe distance in-between, and the construction limit that the elements might have for one another (Figure 7). Secondly, the concept of a “typical section” should be formed. Figure 8 shows a typical section of the underground construction area in the Urban Design of the CBD District in Jiangbei New Town in Nanjing. The first floor under the municipal road accommodates the municipal pipelines; the second floor underground is the pedestrian level, which accommodates commercial and cultural activities; the third floor underground is the driveway level, which serves as the arrival point of the cars to this intensive development area; the fourth and the lower floors underground accommodate the subway station halls and platforms. Thirdly, the conflicts among deferent elements should be subtly dealt with. Figure 9 illustrates an example of solving the conflict between the subway station and the river way in the Urban Design of Fish Mouth District in Nanjing. Since a staggered arrangement on the plan could not be achieved, the conflict was solved on the elevation, and the hierarchical relationship between the elements was taken into consideration.

3. Conclusion

Urban design with its guidelines which aims at compact and intensive development is the key technique to improve land-use efficiency. Concerning intensive development areas in new

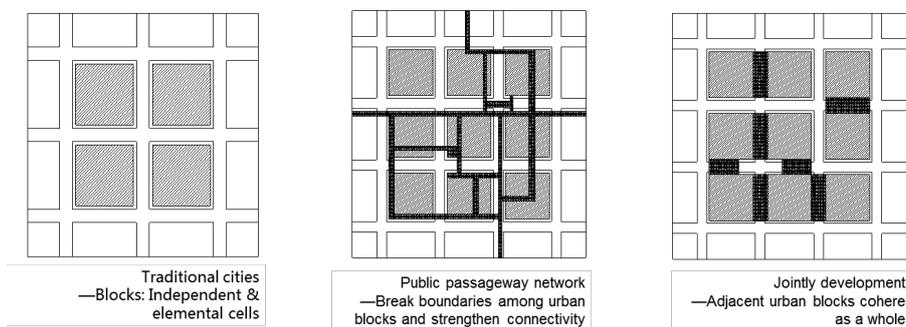


Figure 4. Different relationships among urban blocks.

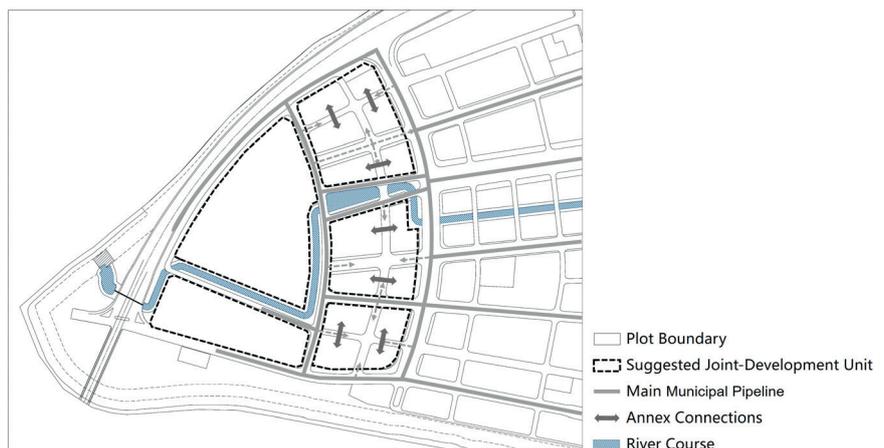


Figure 5. Suggested joint-development unit in the Urban Design of Fish Mouth District, Nanjing.

towns, this article argues for the leading role of the typo-morphological method, and elucidates the integrative design strategy in this kind of urban design, using several Chinese urban design projects as examples. Distinguished from the traditional ways of interpreting urban elements, this article classifies the elements of intensive development areas, defines the basic development unit, and explains the methods of constructing the system model and establishing the systematic rules. It should be noted that, a complete urban design includes the overall process from the concept design to the project implementation. Thus, basing on the ideal concept project, urban design guidelines should be made in order to translate the design concept into practical rules which would effectively manage and guide the urban development in the future.

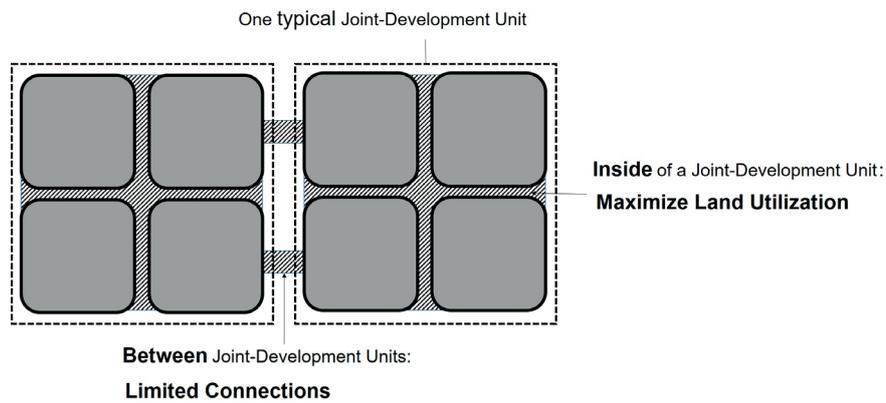


Figure 6. The development principals between urban blocks basing on the joint-development units.

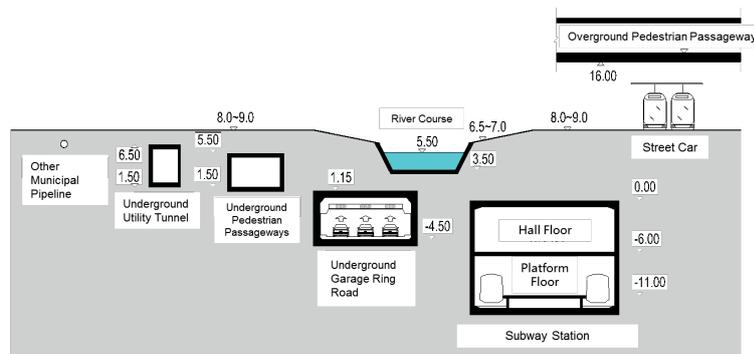


Figure 7. The elevation design of infrastructural elements in the Urban Design of Fish Mouth District, Nanjing.

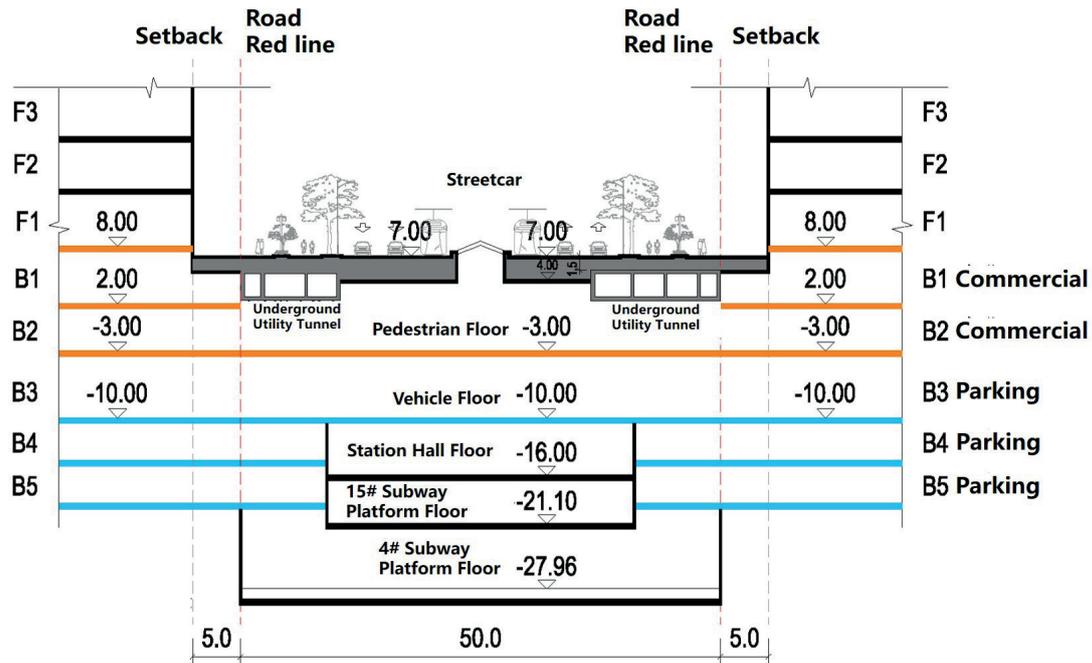


Figure 8. A typical section in the urban design of the CBD district in Jiangbei New Town, Nanjing.

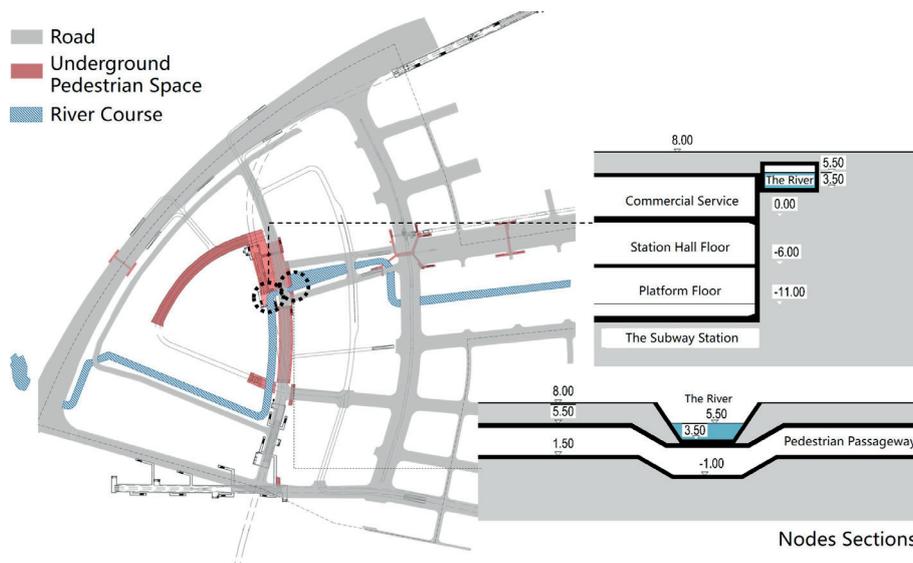


Figure 9. An example of solving the elevation conflict in the Urban Design of Fish Mouth District, Nanjing.

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