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On the Paradigm Shift of the Overall Urban Design in China

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***Abstract*—**Facing a period of major change that is rarely seen in a century, China formulates the 14th Five-Year Plan and places emphasis on promoting high-quality development. In this context, the overall urban design has become a crucial and systematic tool for high-quality urban development. However, there are bottlenecks in the cognition of nature, content scope and transmission mechanisms of the current overall urban design in China. The paper interprets the emerging demands of the 14th Five-Year Plan on urban design in terms of new value-quality priority, new dynamic-space performance, new target-region coordination and new path-refined governance. Based on the new trend and appeal, the multi-dimensional thinking integrated with the major tasks of urban design are proposed accordingly, which is the biomass thinking in ecological, production and living element, the strategic thinking in spatial structure, the systematic thinking in the cityscape, the low-carbon thinking in urban form, the governance thinking in public space, the user thinking in design implementation. The paper explores the possibility of transforming the value thinking and technical system of urban design in China and provides a breakthrough path for the urban planning and design industry to better respond to the propositions of the country's 14th Five-Year Plan.

***Keywords*—**China's 14th five-year plan, overall urban design, urban design thinking, transformation of urban design.

I. Introduction

THE pandemic is accelerating the increase of the entropy across the world. Exponential change will be the norm, and volatility, uncertainty, complexity and ambiguity will be with us long into the future. We can learn from the past that crises tend to breed opportunity. Therefore, the accurate recognition of change, scientific response and active change are the core tasks of the 14th Five-Year Plan. Compared with the 13th Five-Year Plan, the new five-year plan with stronger planning guidance and strategic coordination is of great significance for China to grasp the direction and set the foundation for the second Centenary Goal. The 14th Five-Year Plan for the national economic and social development of the people's Republic of China and the outline of long-term objectives for 2035 (hereinafter referred to as the Outline) pay particular attention to the Territorial Space. Similarly, there are seven chapters on "Improving the Spatial Layout of Urbanization", "Comprehensively Improving Urban Quality" and "Optimizing the Development and Protection Pattern of the National Land Space ", etc. For cities, the 14th Five-Year Plan is a critical window period for rectifying mistakes, making improvements, promoting high quality development, high quality of life and high level of governance. In this context, the overall urban design should also be actively expanded and transformed in terms of values, objects and approaches, taking into account the new situation. The Guidelines for the Preparation of Municipal Territorial Spatial Plans (for Trial Implementation) promulgated in 2020 clearly put forward the general requirement of "carrying out the overall urban design studies and integrating urban design throughout the planning process" [1]. The Urban Design Guidelines for Territorial Spatial Planning, issued in the same year, guides and regulates the use of urban design methods in the preparation and management of territorial spatial planning. Driven by both national concerns and local aspirations, the overall urban design has undergone a series of explorations: from landscape creation to blueprinting, to guiding the framework of urban pattern and form. In the new era, the overall urban design should take the initiative to adapt to the attitude, observe the opportunity, grasp the direction, break through the dilemma, organize the technical system scientifically and iterate the value logic comprehensively with the guidance of the 14th Five-Year Plan.

II. The Current Bottleneck of Overall Urban Design

The holistic and systemic view of urban design has a long history. Firstly, the city itself is holistic in nature. All urban units are organically derived from the original structure under the control of a continuous inner law [2]. Therefore "we must learn to understand the laws that produce urban holism." [3] Secondly, urban spatial form as a medium conveys the value of the interaction between volume and space. Urban design, as a collective language with engineering properties, follows cybernetics, operations theory and systems theory, materializing and concretizing the philosophical thinking of human will and the natural world in a particular era. The various disciplines and domains of development are spatially integrated as a logical starting point for horizontal connections and multi-level configuration, resulting in a complex system of urban design elements. Then again, human life depends on physical space and resources. As the capacity to 'govern' nature increases, the spatial boundaries of human society continue to expand. Bacon [4] advocates urban design as a decision-support methodology oriented towards the morphological change of geographical objects and land development at all territorial scales, encompassing six levels, from the national area to the architectural detail. This also responds to the integrity and continuity of spatial assemblages. The concept of 'man and nature as a community of life', as proposed in the report of the

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19th National Congress of Communist Party of China (CPCs) [5], also indicates the inevitable trend of integrating holistic thinking into urban design.

As a comprehensive, systematic, holistic and guiding urban design, the overall urban design broadly covers the following aspects: to study the relationship between the human and natural environment in city, to explore and refine the city's unique resources, and to organize them into an urban development strategy to create distinctive urban characteristics; to grasp the spatial pattern and spatial structure of the city from a macro perspective and propose overall control measures for system elements; to organize a system of meaningful places of behavior and to create an overall and social cultural atmosphere in the city.

Currently, the overall urban design has the following limitations:

A. The Deviation of the Cognition of Nature

If the master planning focuses on rational spatial layout that maps out the value of land, and the territorial spatial planning suggests high-quality spatial coordination that optimizes the allocation of resources across the region, then the overall urban design pursues organic spatial shaping that responds to human-centered development aspirations. The overall urban design aims to translate the natural and human genes of the region on the basis of the two-dimensional territorial elements, and build a regional geographic landscape and human settlement picture. In practice, however, the overall urban design is prone to fall into the misconception of pursuing numerical criteria such as meeting ecological carrying capacity, sensitivity and unit volume in the process of interfacing with territorial spatial planning. While the bottom-line thinking and the design thinking share common orientations such as territorial coverage, ecological priority, human-centeredness and smart development, the bridging point between the instrumental rationality of the former and the value creation of the latter is still unclear. As a result, the core skills of urban design, such as the aesthetic design and organic organization of space, are difficult to integrate with the core features of territorial spatial planning, such as quantitative interpretation, index manipulation and rigidity.

B. The Generalization of Content Scope

The urban construction in China is constantly self-correcting between speed and quality. The overall urban design that accompanies large-scale engineering developments is often increasing in workload and expanding in its boundaries. Inevitably, urban design does not exist from a single perspective [6], but responds to the socio-economic demands of the times by shaping the aesthetics of form, pursuing systemic rationality and extending the human spirit. Nevertheless, while this broad perspective and pluralistic values, which are beyond the scope of material space, bring the connotations and extensions up to date, they also tend to introduce too many dimensions of concern, leading to unfocused conflicts, scattered targets, duplication of issues and a complicated engineering system. The core intellectual achievements in design are often covered by numerous redundant information, which is easy to bring misunderstanding and confusion to the planners. In addition, although policy studies are being conducted on the use of urban design in territorial spatial planning, due to the non-statutory nature of the overall urban design, the actual preparation of the plan often has a weak role in controlling the study of this important component of the overall urban design, and the framing of its work is not precise enough to guide the standardization of technical process.

C. The Weakness of the Transmission Mechanism

Urban design is carried out across different spatial scales, and countries have different implementation management methods for implementing its regulatory attributes [7]. China's Measures for the Administration of Urban Design, promulgated in 2017, gives urban design certain legal safeguards and technical specifications. Various cities have explored the implementation path mainly in the form of additional plans (such as "Guidelines for River Planning and Design in Shanghai", "Guidelines for Urban Design of Street Renewal and Governance in Beijing", etc.), but it is still difficult to achieve the universal sense of legalization and institutionalization. In practice, the planning tends to focus more on the urban design of the central city in the later stages of planning, and lacks integrated thinking about the overall urban design in the early stages, resulting in a more discrete overall spatial pattern of the city, which lacks character and is not strong in its integrity. This is reflected in the lack of consistency between macro-indicators and micro-strategies, the lack of coherence between planning concepts and design implementation, and the lack of consistency between ideal blueprints and human-centered scenarios. On the other hand, the urban evolution is not a back-and-forth process of innovation and removal of the old, but rather a superimposition and co-mingling of the old and the new. The overall urban design of Paul Vientiane is inadequate in terms of temporal coherence and dynamism. In the face of an uncertain external environment there is a time lag in the advancement of work, difficulties in reconciling the identification of current conflicts with the control of future risks, and a failure to synchronize the organization of the spatial system with the path of temporal development.

III. The Requirements of the 14th Five-Year Plan for Urban Planning and Design

The five-year plan for national economic and social development occupies a leading position in China's planning system, and is one of the most important and comprehensive national governance tools in in the country. It plays an important guiding role in clarifying the value orientation, strategic direction and layout direction of planning and design. Therefore, it is crucial to study the new features and requirements of the 14th Five-Year Plan and build a planning design system that is compatible with it, in order to enhance the effectiveness of China's planning management.

A. The New Value: Quality Priority

China's urbanization exceeded 60% in 2019, marking the

country's entry into the late stage of urbanization. As per the experience of developed countries such as the UK, US and Japan, the growth rate of urbanization will gradually slow down during this period, and the incremental development driven by economic benefits will turn towards quality improvement. Since the 19th National Congress of the Communist Party of China, the Development of an Ecological Civilization has become the core means of quality improvement. The Outline clarifies this shift in values and states that in the 14th Five-Year Plan period [8], cities should improve the coordination mechanism in the field of ecological civilization, build an ecological civilization system, and promote a comprehensive green transformation of economic and social development, thereby achieving high-quality economic and social development. The specific paths can be categorized as policy-led paths, regional demonstration paths and target control paths. The 14th Five-Year Plan shows that the value orientation of China's urban construction in the new era, which has clarified the direction, key points and objectives for the preparation of planning and design.

B. The New Dynamic: Space Performance

Land resources are the core driver of China's rapid economic growth during the rapid urbanization phase. Over the past 20 years, the economic value of land has become increasingly prominent, creating a huge land bonus. According to statistics [9], the land sale revenue in 285 cities in China increased from 0.84 trillion yuan in 2004 to 7.12 trillion yuan in 2016, with an average annual growth of 7.23%, and the proportion of land sale revenue in local government revenue has been continuously rising, and has become the "second finance". Thus, in the current late stage of urbanization where massive incremental expansion is slowing down, the economic driving function of land is gradually diminishing. The land-based economy that relies on fixed investment must begin to transform in search of a more sustainable growth model.

In the high-quality urban development phase, the urban economic growth model will shift from capital-based growth to cash-flow-based growth. Improving spatial performance through spatial optimization and urban operations is an important path to achieve this transformation. Urban spatial performance refers to the comprehensive effectiveness and effect of urban space in terms of resource allocation, vitality creation, governance structure and institutional environment, and is an important indicator of the quality of urban space and development potential. In the current context, improving the spatial performance per unit of land stock is a new incentive to trigger urban economic development.

C. The New Target: Region Coordination

China's planning system has undergone a gradual reform from urban planning to urban-rural planning, to coordinated urban-rural planning, to integration of multiple plans, and then to territorial spatial planning. The evolution reflects the change in the research subjects of China's planning system from urban-rural duality to urban-rural integration, and then to region-wide spatial synergy under the current planning system. It can be found that optimizing the core functional space of national economic and social development and breaking down the unitary barriers to national economic and social development are the main driving mechanisms for the transformation of the object of planning research.

In accordance with the Outline, urban agglomerations will be the leading spatial form of China's new urbanization, urban-rural integration will be an important channel for the construction of a modern socialist country, and the comprehensive territorial spatial improvement of all kinds of natural resources will be an important guarantee for sustainable socio-economic development. This demonstrates that region-wide synergy is to be achieved in three dimensions: regional synergy and cooperation, integrated urban-rural development, and balanced development of the national territory. Therefore, the research object of future China's planning system should focus on the core functional space of urban agglomerations and the two core strategic spaces of urban and rural areas and ecology that affect the goals of economic and social development.

D. The New Path: Refined Governance

Planning is an important tool for modern social management and governance. The Outline proposes that in the new period "the modernization of the national governance system and the ability to govern should be accelerated, the scientific, refined and intelligent level of urban governance should be improved, and the effectiveness of governance should be enhanced" [10], which brings new requirements for planning management.

Traditional urban and rural planning systems emphasize a sense of top-down governmental or official authority, with cities following the rules and standards set by their managers to maintain a kind of 'perfect' order. In the context of China entering a new period of urbanization, the top-down planning intervention and guidance based on government power can hardly cope with the new urban environment and development needs in the face of a complex built-up environment, multiple interests and a people-oriented development philosophy. A dynamic, refined, personalized and intelligent planning and management system that adapts to the complexity of the city's giant system is urgently needed [11], and a multi-disciplinary decision-making system comprising government, experts, investors and citizens requires to be established. Focusing on specific spatial elements that exist naturally or are related to human, and applying intelligent technologies such as the Internet and the IoT for refined elemental governance is the inevitable path to improve the effectiveness of planning and management in the new era.

IV. The Transformation of Overall Urban Design Responding to the 14th Five-Year Plan

A. The Biomass Thinking in Production-Living-Ecological

The great change will lead to a high incidence of 'black swan' events. The disaster and epidemic situations will continue to threaten the health and safety of cities in the future, posing a critical test of the resilience and governance of urban spaces.

Through scientific assessment of spatial risks and careful construction of the human habitat, the overall urban design should build an immune process of urban life based on the natural process of crisis identification - disaster absorption - propagation interruption - functional recovery - resilience upgrading. This global spatial security system guides uncertain decisions for health, green and sustainable development. By means of urban pathology diagnosis and life-cycle projection, the blueprint is designed to provide disaster triggers, disaster control lines and buffer surfaces for potential security issues such as climate extremes, energy supply, disease and war. The foundational ecological base should be reinforced by an ecological network framework, the structural geographic space should be restored by blue-green infrastructure, and the key urban sites should be protected by resilient white-space areas. The natural areas and development cores, ecological corridors and transport axes, landscape chains and urban agglomerations should be organically and naturally integrated at different scales.

B. The Strategic Thinking in Spatial Structure

The territorial space emphasizes the integration of natural endowments and human activities under specific tenure and location, and has both ecological-natural and economic-social attributes. Therefore, the overall urban design should also properly grasp and reflect the major issues of medium and long-term socio-economic development of cities. The overall urban design should strengthen the spatial coordination across regions and play a strategic leading and pioneering role. Therefore, the anchoring of the spatial development framework should first shift from urban built-up areas to territorial areas [12]. The research and design should be conducted on the entire territorial area, including mountains, rivers, arable land, industrial and mining and large-scale infrastructure. Secondly, the use of historical thinking and regional perspectives is needed. Clarifying the internal mechanisms and external dynamics that have influenced the spatial development of cities will help to make strategic judgements about the core values of space and its future pattern change. The spatial system of point-axis-net should be arranged to match the hierarchical scale structure and industrial function structure of the surrounding cities, so as to take up the value gradient transfer with high-energy space and empower the overflow of regional resources with a high-quality environment. Finally, it is necessary to integrate urban and rural areas into the same spatial framework, promote the adjustment, optimization and scientific reorganization of urban and rural resources and elements, co-ordinate spatial transition areas such as urban fringe areas and distant suburban villages, and build an interactive urban-rural pattern.

C. The Systematic Thinking in Cityscape

To some extent, the origin of overall urban design comes from the crisis of urban features [13]. The decoding of the feature is generally the premise, the basis, the entry path and the clue for the overall urban design. The overall urban design abstracts the connotation of natural landscape, spatial pattern and humanistic style by urban characteristics, which is the characteristic of a city that distinguishes it from other cities. Controlling the core character of a city can help to fundamentally avoid the same imagines of the city. Urban character can therefore also be considered a useful complement to the nature of the city. By combining urban characteristics with urban properties, the future development vision of the city can be described more comprehensively and clearly. In the past, linear thinking emphasized clear relationships and structural thinking emphasized comprehensive hierarchical logic, while systemic thinking emphasized the overall function of the system, requiring the sorting of local landscapes and the construction of characteristic patterns to follow a systematic and recursive approach. The systemic nature of urban design requires, first of all, the selection of the city's historical, human and physical geographical features, and to sort out the core of the landscape that truly reflects the city's identity. The recurrence focuses on the common patterns and continuous characteristics of the city over time. The crucial step in the process is to clarify the intertwined roles of institutional change, production development, humanistic consensus and geological and celestial events in the spatial history of the city, and to identify the core lines in the floating evolution of the city's character.

D. The Low-Carbon Thinking in Urban Form

Research indicates that urban spatial form and structure has a locking effect on urban carbon emissions [14]. As an applied technology for optimizing the urban spatial environment, the overall urban design should provide spatial support for a benign and sustainable energy allocation on the basis of reasonable control of total and per capita energy consumption in cities and towns. In terms of morphology, the attention should be focused on the central system of coupling public transport hub, the road network organization advocating green and slow traffic, the building texture promoting ventilation and heat dissipation, the construction intensity adapting to density and harmony, the land use of complex and diverse scenes and the blue-green network maximizing ecological service value. The experimentation of a "point-to-plane" approach normalizes the value of low-carbon form decisions and gradually explores the decoupling of high-quality urban spatial development from carbon emissions. In the meantime, the carbon intensity assessment should be introduced as a basis for morphological zoning and control, and different low carbon design principles and approaches should be adopted at different levels. It is proposed to apply real-time sensing and massive computing to monitor and simulate the physical urban environment, to finely assess the health and efficiency of the city's major ventilation corridors, blue-green carbon sinks and ecological cooling sources, and to realize a synergistic and compatible physical environmental control strategy for carbon control and blue-green.

E. The Governance Thinking in Public Space

Urban design, with the shaping and organization of public space as its core task, is destined to become one of the key instruments for the future production of public value in space. Therefore, the overall urban design needs to concern more

about the city from the concrete "human" experience thinking and the "soft" perspective, emphasizing the inheritance and development of human experience and humanistic connotation, so as to make the city more dynamic and charming. On the one hand, the city is energized by enhancing the human experience. On the other hand, the city's charm is highlighted through humanistic means such as refining its characteristics and exploring its culture. The public space is used as a carrier of public values and a common path for the whole society to realize the quality improvement of the stocked urban area is explored. In addition, the overall urban design does not only play a role in the planning and construction stages, but also in the management, operation and maintenance, incorporating professional design support and focusing on the details. In this way, the quality of the urban environment can really be improved in many dimensions and a higher level of refined urban governance can be achieved.

F. The User Thinking in Design Implementation

Urban design can be classified as 'engineering-product', 'policy-process' and 'research-concept' [15]. Although each of these three categories has its own focus in terms of implementation, control and conception, they all highlight the supply side of the design activity and to some extent weaken the actual needs of the user. This results in that they are easily shelved and remain on the shelf for a long time. Although each of these three categories has its own focus in terms of implementation, control and conceptualization, they all highlight the supply side of the design activity and to some extent weaken the user needs. As a result, the actual effect of achievements tends to be weakened, or the designs just become decorations. In addition, the current market-driven urban development environment dictates a diverse composition of urban design actors, with investment, decision-making, management and audiences all having their own expectations of the picture of the city. The overall urban design under user thinking should therefore break away from the traditional client-based product delivery model with a single objective of final drawing and text. A diversified product ecosystem should be explored to provide synergistic co-located services, long-term accompanying intellectual support and innovative and dynamic demand feedback. Only in this way can we adapt to the new administrative directives and market rules, and achieve a real realization of the value of urban design services. At the same time, it is advised to support the professional training of local managers through the establishment of a chief designer-in-residence command, to participate in the evaluation of various urban planning and design projects, and to have complete control over the entire urban design process.

V. Concluding Remarks

At this critical juncture of China's profound economic and social transformation and in-depth territorial space management, the early intervention of urban design is increasingly becoming the consensus for national strategic action, enhancing its social impact and industry recognition. The overall urban design should also radically reform, harnessing the art of design and creation with the way of urban development, seeking to synchronize with the urban process to remove its own contingency and subjectivity, and coupling with the ecological environment, political economy, social culture and industrial technology to maximize its usefulness and vitality [16]. It should return to the essence of things, the audience's feelings and the creation of the city with a simple technical approach. Its value thinking and technical system iteration should match the development needs of the times, and it should be able to take advantage of the new dynamics and technologies of the moment, as well as actively adapt to new changes and new situations, so as to better respond to the propositions of the 14th Five-Year Plan on the basis of an accurate comprehension of the key tasks of urban design at this stage.

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