



Urban Governance-Oriented Redesign for Old Urban District Streets—Taking Dongsì Street in Beijing as an Example

Chen Zhong, Guo Yibo

China Academy of Urban Planning and Design, Beijing, China

Email address:

airzhong52@163.com (Chen Zhong)

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Abstract: The planning and design system for the renewal and governance of old urban areas in China is not yet mature, and traditional road traffic design urgently needs transformation in terms of system and methods. Taking the comprehensive renewal and improvement of Dongsì Street in Beijing as an example, this paper summarizes the difficulties in implementing the governance planning functions of old urban streets, multiple management of facilities, and integration of diverse demands. It proposes to use traffic design as a platform to coordinate all elements of the streets and establish a technical system for the renewal design of old urban streets oriented towards urban governance. This paper elaborates on the methods and work focus of the renewal design of old urban streets from four aspects: system framework, value orientation, design methods, and construction patterns. By strengthening the coordinating role of street design, the systematization of urban governance can be enhanced; by clarifying the value orientation of urban governance, the allocation of street space resources can be tilted towards green transportation and public spaces; through refined and comprehensive design methods, the intelligentization of facility construction can be promoted, and the quality of street space can be comprehensively improved.

Keywords: Traffic Design, Urban Renewal, Urban Governance, Street Renewal Design, Green Transportation, Public Spaces

1. Introduction

After the global financial crisis in 2018, China's economic development entered a new normal, and urban development shifted from traditional "quantitative expansion" to "quality improvement". Improving the quality of the urban living environment and the quality of life is not only to meet the growing needs of the people for a better life, but also the focus of future urban renewal and urban governance. The Third Plenum of the Eighteenth National Congress explicitly proposed to promote the modernization of the national governance system and governance capacity, and the Nineteenth National Congress report also put forward the development concept centered on the people. These provide guidance for the development path and ideas of cities in China.

As the most important public space in cities, streets are the places where most public facilities are located. The

proportion of traffic space in street space often exceeds 90%, intertwining with various other facilities, and is the main spatial carrier of urban governance. In the process of transforming urban development from "quantity" to "quality", urban transportation is a key limiting factor and one of the primary issues faced by urban governance. Research and practice on urban governance and urban renewal in China have just begun, especially in terms of implementation frameworks and technical approaches, consensus has yet to be reached, and it is urgent to establish and deepen the coordination between street governance and urban transportation. [1] Whether street governance strategies fully reflect the idea of people-centeredness and that the city belongs to the people, whether they can properly address urban transportation problems, and how to construct a street governance system to improve urban

governance capacity and level are currently the focal issues. [2].

This study is based on research originally published in Urban Transportation of China, 2022. [3] Through two years of practice, lots of valuable feedback gave us a chance to improve our study further. Beijing's Dongsi Street is an important transportation corridor in Dongcheng District. Based on traffic design theory and principle, this study takes Dongsi Street as an example to establish an urban governance-oriented street renewal method and system. On the one hand, the proposed method aims to connect and coordinate all kinds of upper-level planning, such as urban comprehensive transportation planning, and urban green space system planning. On the other hand, the method is able to guide road engineering design directly by considering different public facility space requirements. [4]

During the practice process, we build a close relationship between street renewal design and urban public space governance. More importantly, from a governance perspective, we can give more consideration to humanized and refined street design elements and thus improve urban governance more targeted and effective.

2. Characteristics of Street Governance in Old Urban Areas

Urban governance refers to the process in which urban managers, residents, and various social organizations, among other relevant stakeholders, reach decisions on urban public affairs through open participation, equal consultation, and division of work to maximize urban public interests. [5] Its core connotation mainly has two points: 1) Diverse governance subjects. Urban governance emphasizes cooperation, coordination, and participation rather than command, regulation, and accountability. The purpose is to transform the management model of a single subject, the urban manager, into a diverse governance subject composed of managers, businesses, social organizations, and residents, making the city more inclusive; [6] 2) Refined governance. It changes from the traditional extensive management mode and "one-size-fits-all" management standards to a refined governance mode and "customized" management standards, providing targeted services and more refined management means, making the "stitches" of urban governance more meticulous and making urban life better. Like other old areas in cities, Beijing's Dongsi Street has distinctive characteristics in terms of governance. [7, 8]

2.1. The Current Situation Pattern Is Established, and the Planning Function Is Difficult to Implement

The spatial pattern and street network of the old city are established, and the cost of demolition and relocation of buildings and various facilities on both sides is very high, resulting in weak guidance in terms of governance at the planning level. Dongsi Street is a typical old city street, with

historic and cultural districts on both sides, connecting many urban functional nodes such as Yonghe Temple, government buildings, schools, and hospitals.

In the upper-level planning, Dongsi Street is designated as a major urban arterial road, with a planning road boundary of 40 to 60 meters, serving as a strong north-south connection function. At the same time, it is also a major public transportation corridor, pedestrian and bicycle traffic corridor in the city, with rich functions planned for it. However, in reality, the narrowest distance between buildings on this street is only about 20 meters and cannot be further widened. In such limited space, the intended planning ideas and concepts are difficult to fully implement, and some facilities conflict spatially, severely restricting established functions and posing governance challenges.

2.2. Multiple Management at the Facility Level, Difficult to Coordinate

With the continuous development of the city, various facilities in street space continue to be added, intensifying the tension in space resource utilization.

Starting from the old city streets and residential buildings on both sides, tramways, streetlights, and other facilities were introduced in the 1960s to 1980s, and with the development of motorization and informatization in the 21st century, facilities such as traffic monitoring, signal light management, and communication equipment have been constantly added. In recent years, market-oriented facilities such as shared bicycles, electric bicycles, and three-wheeled delivery vehicles have further occupied the limited space of the streets, severely encroaching on the normal passage of residents and daily public activities, gradually reducing the overall quality of the streets.

Due to different supervisory departments and industry characteristics, the design work of street space is divided into blocks, lacking overall coordination. Traffic, landscape, architecture, communication, electric power, and other related facilities are all independently laid out within their own boundaries, and there is a lack of coordinated mechanisms and platforms in terms of construction timing and spatial dimensions, resulting in inconvenient facility connection and mutual space occupation. This has led to the repeated excavation of roads, frequent occurrence of "road zippers", and increased difficulty in the following use and governance of streets. Urban governance urgently needs to integrate and coordinate at the street design level to ensure the organic integration of various facilities within the street space.

2.3. Diversified Integration of Demand and Imbalanced Focus

Dongsi is a typical functional composite street, with a large number of small businesses along the street and large residential and tourist attractions behind it. It has strong functions in carrying daily activities of residents and recreational activities for foreign tourists. At the same time, it

is also a transportation corridor in the city, with strong transportation functions, and various modes of transportation have a large demand for north-south traffic. The imbalance in the focus of urban governance on Dongsi Street is manifested in two aspects:

On the one hand, the demands of residents along the street for public spaces cannot be fulfilled. The survey found that residents have a particularly strong response to the following issues (see Figure 1): 1) Insufficient public space, including spaces for residents to rest along the street, stop and wait across the street, space for customers to stop at shops along the street, waiting for bus passengers, etc; 2) Difficulty in ensuring safety, including numerous obstacles on the sidewalk, uneven pavement, and non-motorized vehicle occupation of the sidewalk; 3) Insufficient comfort, and the quality of greenery, night lighting, and urban furniture needs to be improved. Urban governance needs to undergo a transformation in policy orientation, taking into account

people's emotions and actual demands, in order to adapt to the growing demand for a better life and improve people's recognition and satisfaction.

On the other hand, the increasing amount of vehicle space, low traffic efficiency, and uneven allocation of street space resources. The focus on the efficiency of private car traffic is constantly increasing, while the space for public transportation, pedestrian and bicycle traffic is constantly being squeezed. In the previous round of street renewal of 2012 bicycle lanes were moved to sidewalks in order to increase the number of motor vehicle lanes, resulting in missing sidewalks in some sections and seriously deteriorating pedestrian safety. In addition, parking has always been the most severe problem faced by streets in old urban areas, including the demand for motor vehicle parking and bicycle parking. In recent years, there has been a lack of clear spatial guidance for parking spaces such as electric bicycles and logistics delivery three-wheel vehicles.



Figure 1. Situation of Dongsi Street before renovation.

3. Technical Methods and Practice of Street Renewal Design in Old Urban Areas

In recent years, numerous studies have focused on the street design method, from theoretical research [9-12] to practical application [13, 14]. In response to the current situation where there is no corresponding specialized design or mechanism platform at the street design level to coordinate the work of various departments, the comprehensive renewal and improvement work of Dongsi Street proposes to use street space as a carrier to coordinate various facilities in the old urban area

and improve urban governance capacity. Traffic space is the main body of street space, with a coordinated foundation. At the same time, traffic space is a place where all dynamic and static traffic on the street is intertwined, with the need for overall coordination. One of the primary issues in street renewal design for urban governance is the governance of street traffic. On this basis, it is possible to coordinate various facilities to build a comprehensive system optimization plan for urban governance.

3.1. System Framework: Strengthen the Overall Coordination Role of Street Design and Enhance the Systematic Nature of Urban Governance

To enhance the systematic nature of urban governance, the

framework of street design should break through professional limitations. Based on street space, coordinate specialized planning for various professions, and strengthen the coordination of land use, space, and urban functions in surrounding areas. In terms of workflow, we build a "four-step" approach (see Figure 2):

1) Plan as a whole. By sorting out various upper level and special planning requirements, clarify the leading functions of streets (roads) and future governance directions, for example, to enhance traffic function or daily living function of the street;

2) System optimization. Starting from the optimization of transportation space, the proposed framework tries to make a feasible path to implement upper-level planning. Traffic

governance and improvement have the characteristics that a slight change may cause a whole reaction. As a result, traffic facilities layout, traffic organization, and traffic management all should be taken into consideration in order to achieve a comprehensive improvement;

3) Element coordination. Coordinate various elements along the street, optimize the spatial layout and connection methods of transportation, architecture, landscape, municipal, public services, and other elements;

4) Refined design. Refine the design of important sites and facilities such as hospitals, schools, accessible facilities, and comprehensive poles, reflecting the people-oriented concept of urban governance.

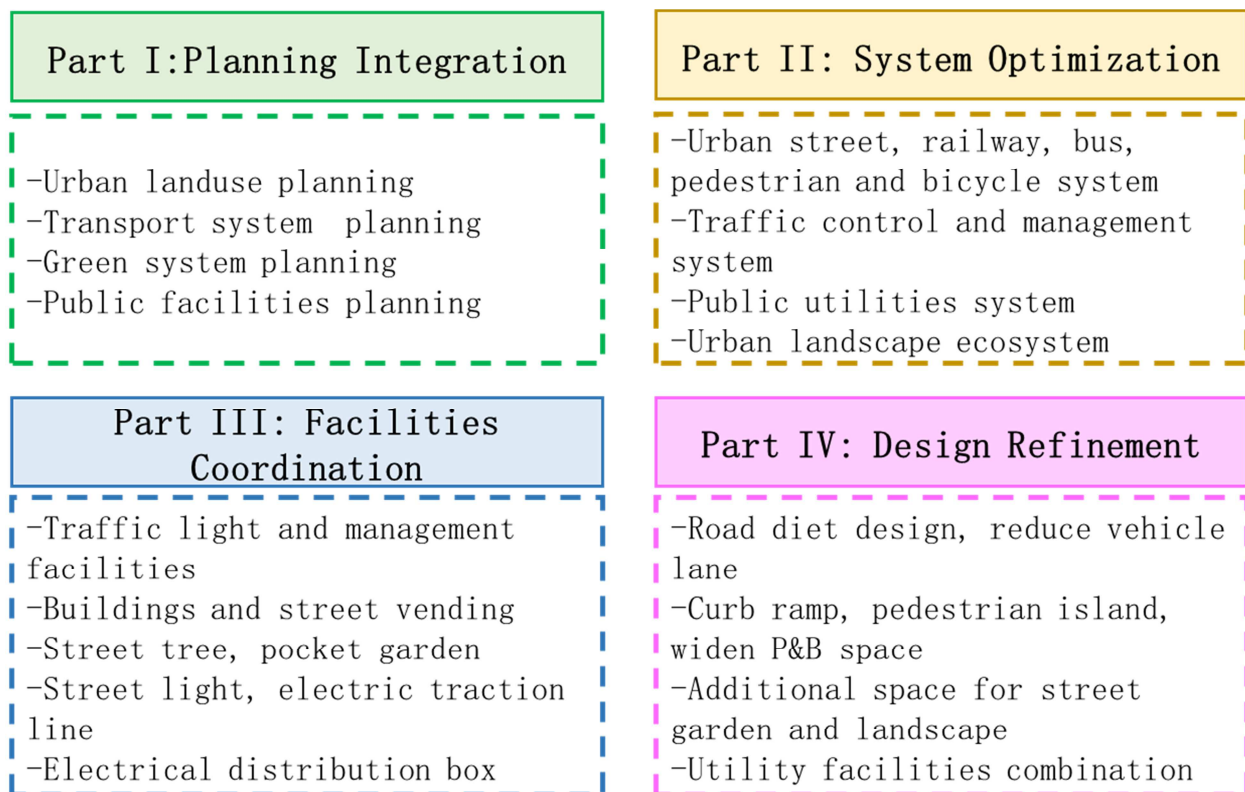


Figure 2. The entire work flow of Urban Street Renewal Design.

3.2. Value Orientation: Resource Allocation Is Inclined Towards Green Transportation and Public Space, and Policy Guidance for Governance is Clarified

Prioritizing the allocation of street space resources to green transportation and public spaces, improving street environment quality, and clarifying the value orientation of urban governance for public resource allocation is the focus of urban governance work in the context of stock updating.

As the "Regulatory Detailed Plan for the Capital Functional Core Area (Block Level) (2018-2035)" proposed, the main function of Dongsi Street is "transforming from traditional private car corridor to massive green

transportation corridor, reducing private car through traffic function in the old city, optimizing road cross-sections". [15] During the renewal process, adhering to the idea of "returning the space occupied by motor vehicles in the past to pedestrians and public activities along the street", we give the highest priority to green transportation in allocating street space resources. In order to ensure pedestrian and bicycle traffic space and right, two motor vehicle lanes were changed to bicycle lanes and the cross-section was optimized from local two-way 5 lanes to two-way 3 lanes (see Figure 3). As a result, the width of sidewalks is optimized significantly meanwhile (see Figure 4).

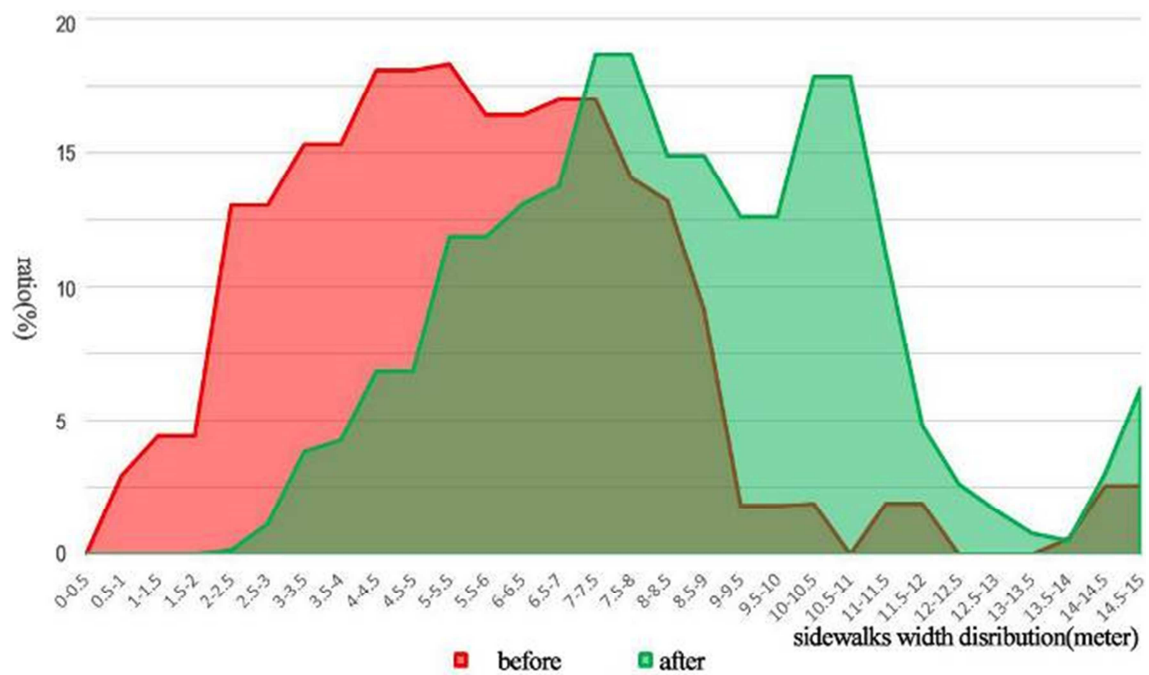
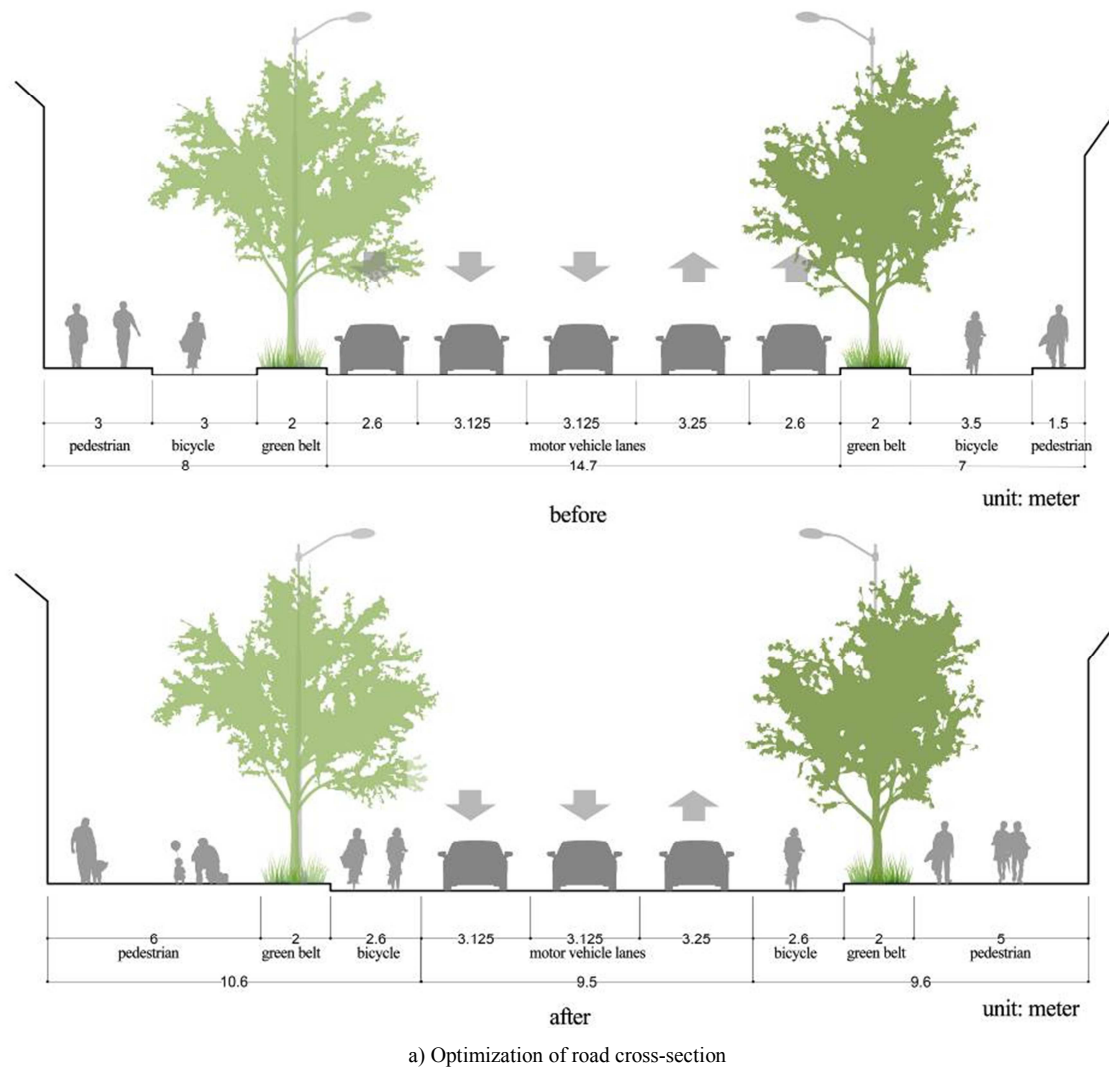


Figure 3. Comparison of cross section and Sidewalk width reconstruction of Dongsu Street.

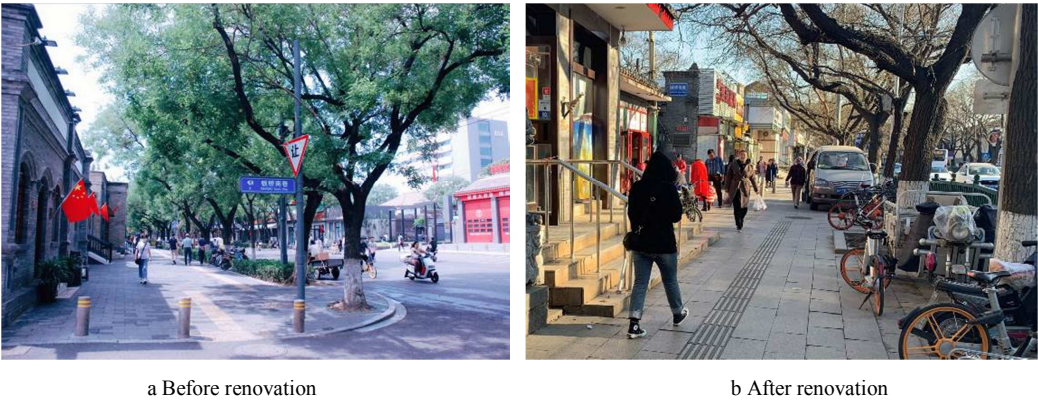


Figure 4. Dongsi Street before and after renovation.

Compressing the width of motor vehicle lanes can release a large amount of public space, providing a foundation for the implementation of planning concepts, but it also changes the existing traffic organization pattern. It is necessary to carefully demonstrate and scientifically analyze its impact during the design process. This is not only the focus of street renewal design for urban governance but also puts forward higher requirements for traditional street design methods and data support. It is necessary to consider the overall transportation system and regional coordination from the perspective of scientific development of design methods.

3.3. Design Method: Refined Design, Comprehensive Integration of All Elements, Enhancing the Comprehensiveness and Comprehensiveness of Governance

In terms of technical methods, Dongsi Street follows the technical logic of the Regional-Street-Site (see Figure 5).

1) At the regional level: The proposed method expands the design scope from a one-dimensional linear road to a two-dimensional area, and from motor vehicle traffic

speed-oriented to comprehensive transportation efficiency-oriented, including urban rail transit, bus, pedestrian, and bicycle transportation (see Figure 5a). Furthermore, we clarify the street function as a green transportation corridor and the corresponding regional transport network improvement strategies are defined correspondingly (see Figure 5b).

2) At the street level: By closely combining the pattern of land use along the street and the activity characteristics of all traffic participants, the method identifies road segmentation features and corresponding planning principles and design strategies and coordinates the spatial needs of all elements of linear spatial streets. Meanwhile, the method coordinates the travel elements of residents along the road, including tourist attractions, primary and secondary schools, parking lots, parks and green spaces, and subway entrances and exits, and strengthens the connection(see Figure 5c);

3) At the site level: The method conducts specific scheme argumentation for design nodes and detailed transportation scheme design.

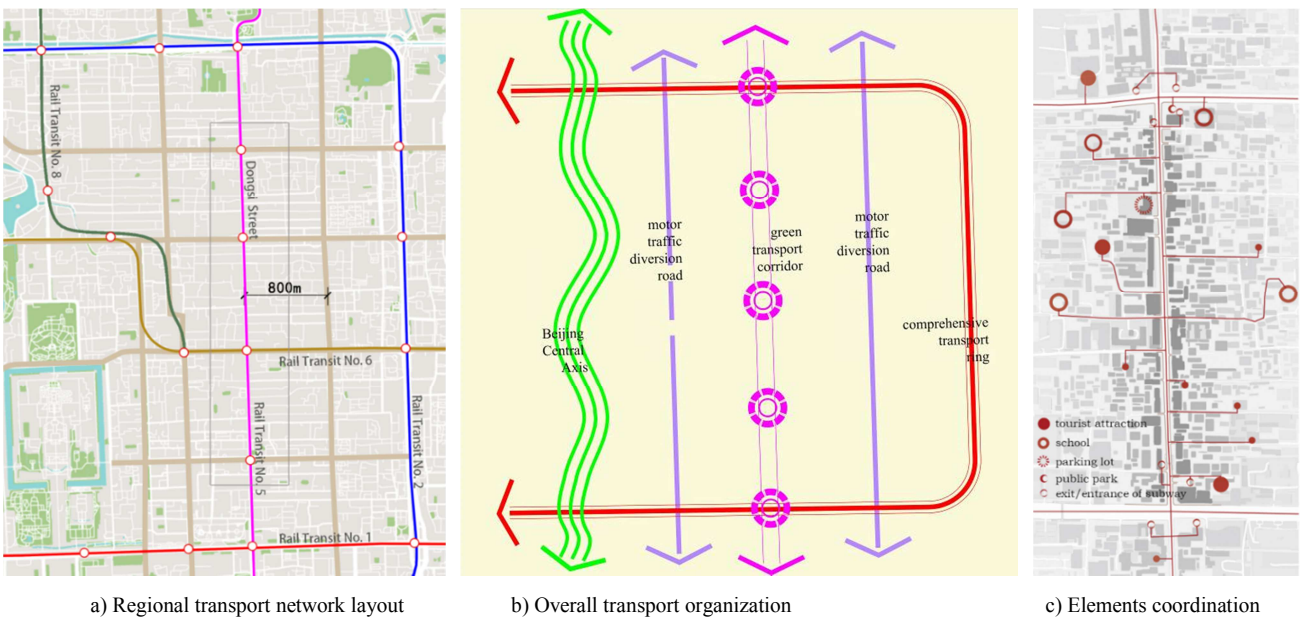


Figure 5. Technical Logic of Dongsi Street.

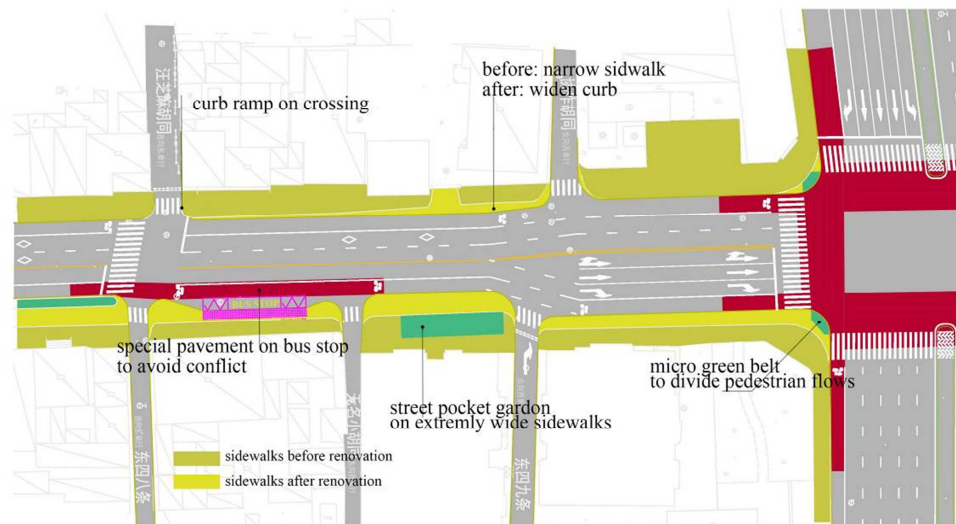


Figure 6. Exquisite design of Dongsi Street.

Adhere to the idea of integrated street space, by breaking through the separation caused by road red lines, green lines, and building front areas, the method coordinates multiple specialties and considers the refined design of various facilities (see Figure 6).

1) Activate the vitality of the street.

On the basis of increasing green transportation and public space, we update the architectural style along the street, demolish illegal buildings, repair building facades, and improve the quality of street space. Cultivate cultural and lifestyle formats such as cultural stores, creative bookstores, and old Beijing tea houses, while continuing the traditional commercial atmosphere, inheriting and showcasing the traditional culture of Dongsi Area. From a comprehensive perspective of urban design, architecture, transportation, landscape, cultural tourism, and historical protection, we aim to enhance the vitality of street space.

2) Ensure the priority of green transport and public activity space.

The main strategies are increasing waiting areas at the intersections and bus stops and providing enough parking lots for no-motorized vehicles, including shared bikes and three-wheel logistics delivery vehicles. For those sections with insufficient space, we further reduce the width of the motor vehicle lanes and extend the curb; for those sections that are too wide (greater than 5 meters), micro pocket gardens and public activity sites are advised to be set on the streetside.

3) Implement the Barrier-free access concept.

With the complete street design principles, our practice strengthens the functionality of the street for all travelers and improves the level of service for the elderly, children, and people with mobility difficulties. For sites with significant height differences such as sidewalks, alleyways, and public building entrances and exits, we strengthen the design of pedestrian ramps to meet the traffic needs of residents' wheelchairs, strollers, and daily grocery carts to build a smooth, anti-skid, and continuous travel system.

4) Integrate various facilities.

In conjunction with street facility belts, it is advised that small and medium-sized facilities and all kinds of transportation and municipal poles are located along street trees. As a result, the sidewalks can be used for pedestrian passing conveniently. For large and medium-sized facilities (such as large boxes, signal boxes at road intersections, etc.), the pocket gardens and surrounding alleys are more suitable.

3.4. Construction Patterns: Intelligent Facility Construction to Enhance the Intelligence and Long-Term Effectiveness of Urban Governance

Intelligent infrastructure is a manifestation of the wisdom and long-term nature of urban governance. Firstly, it is a trend that urban residents' travel, vehicle parking, and other traffic management have to be transferred from rigid prohibition modes to flexible guidance modes. Secondly, synthesizing the poles, boxes, and pipelines of public equipment such as streetlights and traffic signs is important not only for adding new equipment in the future but also for avoiding repeated excavation phenomena such as "city zippers".

In terms of intelligent traffic management, the focus is on optimizing detailed traffic design for pedestrian crossing and bicycle passing. Rather than the current pedestrian isolation guardrail, we connect the street tree pool discontinuously and set bicycle parking strips to act as a separation belt of the street. In this way, we separate different kinds of traffic flow effectively while reducing the visual isolation of the hard guardrail on the street landscape. In response to the current situation of mass pedestrian flows concentrated in intersections, micro green spaces belts are set to separate pedestrian flow in different directions. At key sites where bicycle paths change, such as turning at the entrance of buildings and bus stops, continuous colored pavement is used on the ground and sidewalks to ensure traffic safety and clarify passing right for pedestrians and bicycles (see Figure 7).

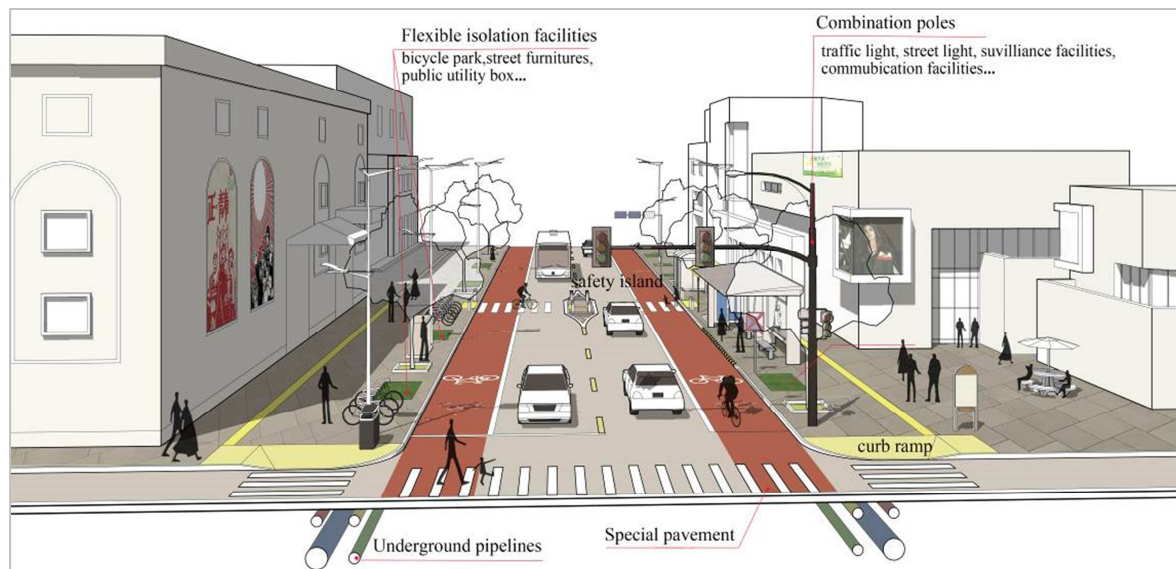


Figure 7. Elements design of Dongsi Street.

4. Conclusion

The development of Chinese cities is facing a new situation of transitioning from quantity to quality. The contradiction between the growing needs of people for a better life and imbalanced and insufficient development will drive the continuous improvement of urban governance capabilities and levels. This study and practice have preliminarily explored the establishment of a street renewal design system for urban governance. In the future, with the enrichment and improvement of relevant theoretical research and engineering practice, the street renewal design of old urban areas will become more diversified, refined, humanized, and intelligent.

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Biography

Chen Zhong (1986-), male, born in Huadian, Jilin, holds a master's degree and is a senior engineer. His main research interests include urban transportation planning, green and low-carbon transportation, and transportation design.

Guo Yibo (1993-), female, born in Lanzhou, holds a master's degree and is an engineer. Her main research interests include urban transportation planning and transportation design.