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A STUDY ON THE PERCEPTION AND EVALUATION OF URBAN HERITAGE VALUE AND ITS PRACTICAL CONDUCTION PATH BASED ON HUL THEORY--TAKING THE OLD TOWN OF MAANSHAN AS AN EXAMPLE

基于 HUL 理论的城市遗产价值认知、评价及其实践传导路径研究——以马鞍山老城区为例

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A STUDY ON THE PERCEPTION AND EVALUATION OF URBAN HERITAGE VALUE AND ITS PRACTICAL CONDUCTION PATH BASED ON HUL THEORY--TAKING THE OLD TOWN OF MAANSHAN AS AN EXAMPLE

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CONSTRUCTION CITY

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Abstract

Resource-based industrial cities have formed urban heritage deeply coupled with resource endowment in the course of evolution, which plays an irreplaceable role in maintaining the integrity of urban landscape and cultural continuity. At the stage when China's urban development has shifted from incremental expansion to stock tapping, how to scientifically assess the diversified values of urban heritage, to solve the real conflicts such as “lack of protection, dissolution of characteristics, and faulty memories”, and to balance the relationship between heritage protection and urban development have become the focus of attention for the sustainable development of resource-based industrial cities.

The Historic Townscape (HUL) approach regards urban development as a whole, and considers that the dynamic superposition of history and current development, and continuous changes are important parts of urban tradition. This paper takes the old city of Maanshan as the research object, uses the HUL theory to analyze the current situation of urban evolution and development, assesses the value elements, and proposes a path for the transmission of urban heritage value to provide a sample for the practical application of the HUL theory in the conservation of resource-based industrial cities.

The thesis is divided into six chapters. Chapter 1 introduces the research background and related concepts, and establishes the research framework based on the literature review of domestic and international research status. The second chapter elaborates the connotation, development history and methodology of HUL theory, and summarizes its practical experience in urban heritage conservation and inheritance. Then we take the old city of Maanshan as an object, introduce HUL theory, and construct the research framework of “cognition-evaluation-conduction”. In Chapter 3, the dynamic layering process of the old urban area is systematically sorted out, and the three core carriers of natural environment elements, intangible elements and material elements are identified. Chapter 4 establishes an evaluation system for the value of Maanshan's urban heritage, and quantitatively evaluates the value elements through questionnaire research, field visits and public data acquisition. Based on the evaluation results, Chapter 5 proposes a living urban heritage practice conduction path: restoration and manifestation of landscape landscape, inheritance and display of history and culture, and renewal of land parcels under the premise of both protection and development.

The paper studies the urban value evaluation and conduction path based on HUL theory, establishes a quantitative evaluation system, and provides an exploration of heritage protection and conduction in resource-based industrial cities.

Keywords: historic townscape, value perception and evaluation of urban heritage, protection and transmission, resource-based industrial city, Ma anshan

Catalogue

Chapter I: The Historic Urban Landscape (HUL) Theory and the Perception and Evaluation System for Urban Heritage

1.1 Research Background

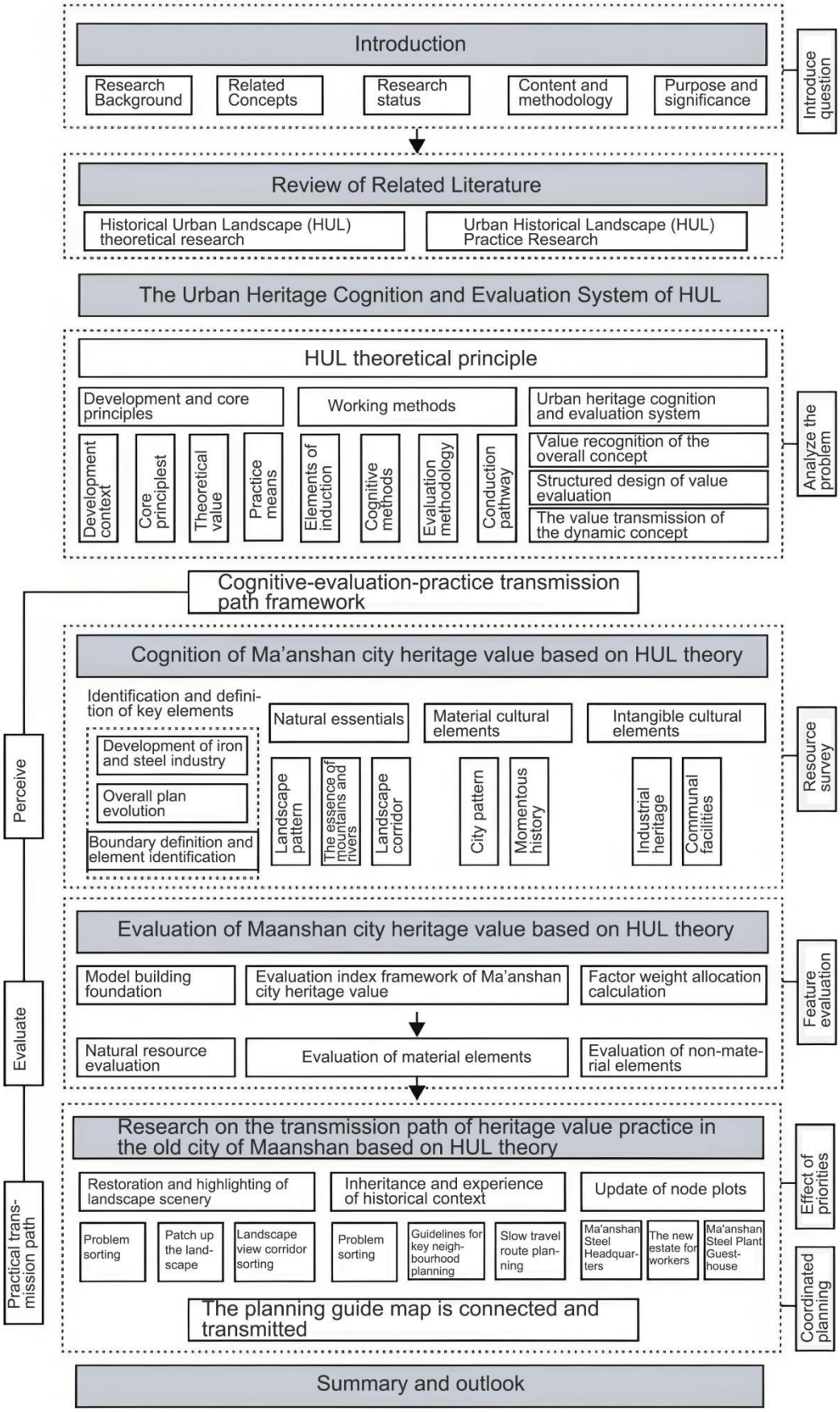
The integration of urban transformation and heritage conservation has become a global consensus. Against the backdrop of rapid urbanization, balancing the demands of modernization with heritage protection has become a crucial issue for the sustainable development of resource-based industrial cities.

In November 2011, UNESCO formally released the international document on historical urban conservation titled _Recommendation on the Historic Urban Landscape_ (hereinafter referred to as the _Recommendation_). This document regards the city as a dynamic accumulation of history and contemporary development, considering continuous change as an essential component of urban cultural traditions. It signifies a paradigm shift in urban heritage conservation from object to method [1]. As an innovative approach to urban heritage conservation and management, the Historic Urban Landscape (HUL) theory surpasses traditional concepts such as the "historic center" or "integrity," viewing the urban built-up area as a multi-layered environment with cultural and natural values and characteristics, formed over time. It is a broader urban context and geographical environment that meets the needs of contemporary urban heritage conservation and the scientific and efficient development of cities.

The Historic Urban Landscape (HUL) theory provides a new perspective for the perception of urban heritage value. This theoretical perspective helps to comprehensively assess the value of urban heritage from an holistic and dynamic viewpoint, breaking through the limitations of traditional protection methods and better coordinating the relationship between urban renewal and heritage conservation.

[1] Wu Fugang, Mo Fujiang. Research on the Design of Industrial Heritage Renewal in the City Center from the Perspective of the Historic Urban Landscape (HUL): A Case Study of the Xinyang Road Area in Nanning City [J]. Industrial Design , 2024, (02):136-139

1.2 Research Framework



[Figure 1-1: Research Framework (Illustrated by the Author)]

1.3 Perception, Evaluation, and Transmission Methodology Based on the HUL Theory

The theoretical innovation of the Historic Urban Landscape can be summarized into three core concepts: the theory of integrity, the theory of accretion, and the theory of liveliness. It emphasizes the spatial correlation between heritage sites and their surrounding natural and built environment, incorporating both tangible (buildings, environment) and intangible (culture, economy, social functions) elements into a unified framework to achieve multidimensional linkage through comprehensive value assessment[2]. It advocates injecting adaptive functions into heritage sites while preserving historical traces, balancing the real needs of protection and development[3].

The innovation of the HUL theory marks a fundamental shift in the paradigm of urban heritage conservation. By analyzing the accretive characteristics of historical urban landscapes, it can more comprehensively explore the value of historical cities. The HUL theory emphasizes the correlation and systematic nature between value elements. Through the reconstruction of these associations, it is possible to achieve the living conservation and sustainable development of historical urban landscapes. This reconstruction of associations includes not only the protection of tangible elements but also the transmission and innovation of intangible elements.

The HUL theory classifies urban heritage elements into three major categories: natural environmental elements, intangible elements, and tangible elements. These elements jointly shape the physical form, cultural characteristics, and functional structure of the city, and drive its evolution and development through mutual interactions.

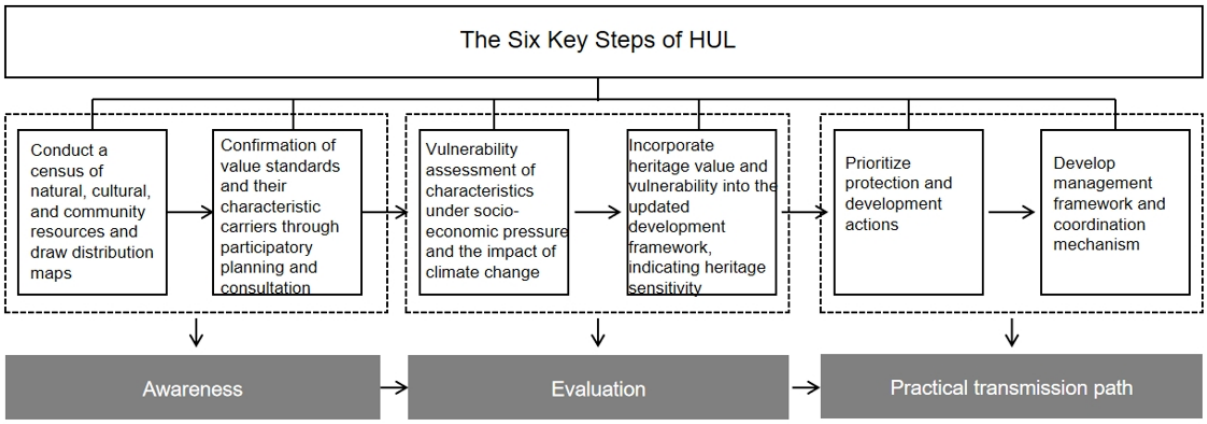
Natural environmental elements are the physical basis for the formation of cities. Intangible elements are the soul of urban development. By shaping urban structures, influencing spatial perception, and promoting economic development, they become important sources of urban vitality. Tangible elements, such as historic buildings and traditional neighborhoods, reflect

[2] Song Feng, Zhu Jiajie, Li Yanfei. Reconsidering the World Heritage "Integrity" Principle—Based on the Analysis of Four Concepts in the Operational Guidelines for the Implementation of the World Heritage Convention [J]. Chinese Landscape Architecture , 2009, 25(05):14-18

[3] Cao Xin. A Collection of Relevant Documents on the Protection of Natural and Cultural Heritage [M]. Beijing: China Forestry Press, 2021

the city's past and cultural accumulation. Together with the natural and intangible elements, they constitute the overall characteristics and uniqueness of the city.

The core of the urban heritage conservation framework proposed by the HUL system is to dynamically integrate cultural heritage with urban development needs to build a sustainable conservation and management mechanism.



[Figure 1-2: Relationship Diagram of the Perception-Evaluation-Transmission System (Illustrated by the Author)]

The six operational steps proposed by the HUL theory can be summarized into three key components: perception, evaluation, and transmission of urban heritage value. Specifically, they correspond to the holistic perception of heritage objects, the value assessment based on accretive characteristics, and the value transmission guided by the principle of liveliness.

Perception: Based on the "holism" and "diversity" of the HUL theory, this stage involves multidimensional identification of both tangible and intangible carriers of heritage value.

Evaluation: Relying on the "sustainability" and "accretion" concepts of the HUL theory, this stage involves systematic and dynamic evaluation of value elements, identifying threats to heritage sites.

Transmission: Guided by the "liveliness" and "community participation" principles of the HUL theory, this stage aims to integrate heritage into contemporary urban development. The closed loop of "accretive perception → dynamic evaluation → lively transmission" achieves a synergy between heritage conservation and urban development.

1.4 Perception and Evaluation System for Urban Heritage Based on the HUL Theory

The essence of urban heritage conservation and transmission work lies in the protection and innovation of value. Therefore, the perception of the value of urban heritage itself is the prerequisite for this work.

The HUL theory's holistic perception of urban heritage emphasizes the symbiotic relationship between individual heritage sites and their surrounding environment, taking into account the overall pattern of the area in which they are located. It breaks through the spatial limitations of tangible entities[4]. It emphasizes the continuous and associative relationship in time and history, identifying the overlapping traces of heritage from different historical periods and focusing on contemporary heritage. It also pays attention to the overall connection with intangible elements, closely combining the material and intangible aspects. Through the multidimensional association of "nature - material - intangibility," it comprehensively understands the value of urban heritage.

Based on previous research, this study constructs a three-tier evaluation system for urban heritage value.

[Table 1-1: Value Evaluation System (Illustrated by the Author)]

Level	Criterion	Indicator
A: Urban Historic Landscape Value Evaluation System	B1: Conservation Status	C1: Scale C2: Integrity C3: Authenticity C4: Boundary Clarity C5: Function
	B2: Intrinsic Value	C6: Historical Span C7: Historical Value C8: Cultural Value C9: Social Value
	B3: Urban Integration	C10: Ecological Correlation C11: Perceptual Significance C12: Connectivity C13: Public Participation C14: Sustainable Potential

[4] Liu Hongru. Research on the Conservation and Continuation of the Ancient City Landscape of Zhaoqing from the Perspective of the Historic Urban Landscape [D]. South China University of Technology, 2023

This system comprises three levels: A (Target Level), B (First-tier Evaluation Indicators) with 3 indicators, and C (Second-tier Evaluation Indicators) with 14 indicators. Specifically:

(1)A: Target Level

The objective is the value of urban heritage. Establishing this system can effectively guide the continuous optimization of subsequent designs, thereby promoting the protection and development of urban heritage.

(2)B: Criterion Level

The criterion level is divided into three parts: the conservation status of cultural heritage (B1), intrinsic value (B2), and urban integration (B3), aiming to comprehensively cover the preservation state of the heritage, its intrinsic value, and its interaction with urban development.

Conservation Status (B1): Ensuring the sustainability of heritage, this evaluates the physical preservation state of cultural heritage, the effectiveness of management, and the adaptability of functions, ensuring that it is not destroyed and maintains its authenticity.

Intrinsic Value (B2): Uncovering the core value of heritage, this reveals the historical, cultural, technological, and social significance of heritage, highlighting its irreplaceability.

Urban Integration (B3): Promoting the coordinated development of heritage and cities, this evaluates the integration of heritage with the city's ecology, space, economy, and society, promoting sustainable development.

Conservation status (B1) is the foundation, ensuring the physical existence and effective management of heritage, providing a basis for value exploration and utilization. Intrinsic value (B2) is the core, revealing the unique significance of heritage, guiding the protection priority and revitalization direction. Urban integration (B3) is the extension, promoting the integration of heritage into urban development, achieving functional iteration and social and economic benefits.

(3)C: Indicator Level

The first-tier evaluation indicators are the key components to achieve the target level and are the core elements of the entire evaluation system.

For Conservation Status (B1), focusing on the assessment of the current state of heritage, the indicators include:

C1 Scale: The area of natural environmental heritage; the scope of influence of intangible heritage; the scale of tangible heritage. These reflect the spatial impact of the heritage and its prioritization for conservation.

C2 Integrity: The ecosystem completeness of natural environmental heritage; the practice completeness of intangible heritage; the physical integrity of tangible heritage. These measure whether the heritage has been damaged by natural or human factors.

C3 Authenticity: The retention of the original environment for natural environmental heritage; the degree of transmission of intangible heritage; the retention rate of historical information in tangible heritage. These aim to prevent the loss of historical information.

C4 Boundary Clarity: The ease of identification of the heritage; this prevents development activities from eroding the heritage itself.

C5 Functional Adaptability: Whether the buildings continue to retain their original functions; this balances conservation and utilization, avoiding functional conflicts.

B2: Intrinsic Value, focusing on the assessment of the value inherent in the heritage itself, includes:

C6 Historical Span: The geological age value of natural environmental heritage; the length of transmission history of intangible heritage; the construction age of tangible heritage. These reflect their representativeness in the temporal dimension.

C7 Historical Value: This refers to the overall existing layout and the ancientness of the heritage. Considering the unique historical background and significant historical significance of Ma'anshan's urban heritage, this paper includes major historical events and historical figures in the evaluation index system. This helps better inherit the urban spirit, tell the story of Ma'anshan well, and reflect the process of industrial development.

C8 Cultural Value: The cultural connotations and cultural identification of the heritage, which reinforces its cultural identity and symbolic significance.

C9 Social Value: The contribution of natural environmental heritage to ecological well-being; the social influence of intangible heritage; the public service capacity of tangible heritage. These reflect the social functions and emotional bonds of the heritage.

B3: Urban Integration, focusing on the assessment of the relationship between heritage and urban development, includes:

C10 Ecological Correlation: The presence of good landscape resources around the heritage site, the visibility of mountain-water sightlines, and the integrity of spatial texture. This maintains the integrity of the urban ecological network.

C11 Perceptual Significance: The visibility at key landscape nodes, the number of landscape types, and the degree of visual obstruction. These enhance the urban cultural image.

C12 Connectivity: The convenience of transportation to the heritage site, and the promotion of tourism and cultural resource integration and public participation by intangible heritage.

C13 Public Participation: The degree of association between the heritage and the daily lives of residents, ensuring the fairness and sustainability of heritage governance.

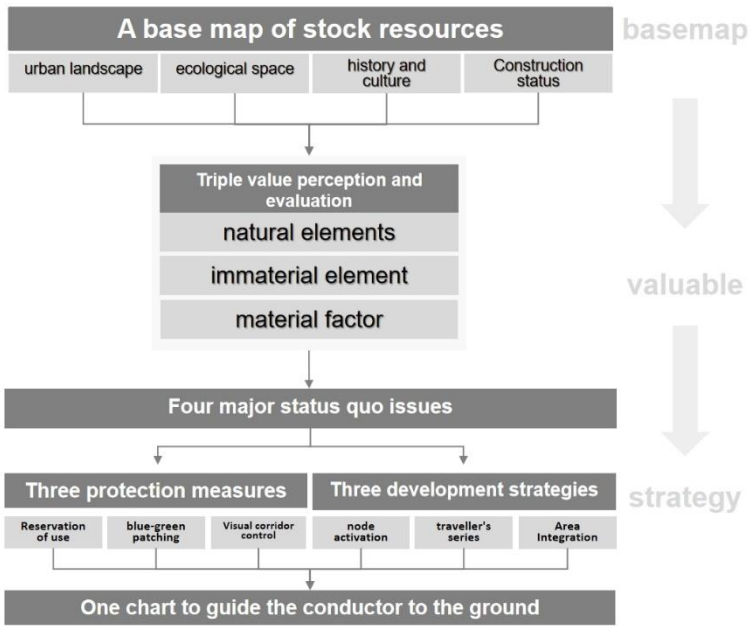
C14 Sustainable Potential: The potential for future development and utilization of the heritage and the economic value it may create. This measures the feasibility of long-term revitalization.

1.5 Value Transmission of the Liveliness Concept

The concept of liveliness is one of the core dimensions of the Historic Urban Landscape (HUL) theory, emphasizing the dynamism, functional continuity, and social participation of heritage. Its value transmission mechanism aims to integrate the historical, cultural, and social values of heritage into contemporary urban development, balancing conservation and development goals.

Heritage is not a static "museum exhibit" but a living organism that continues to evolve with the city. Based on a balanced relationship between adaptive reuse, stakeholder needs, and authenticity, adaptive reuse endows heritage with new social functions, making it serve contemporary life. This also encourages multiple parties to participate, continues community life, and introduces functional industries. These efforts improve the community environment, retain the original residents and their way of life, sustain social relationships, and maintain the emotional connection between heritage and people.

At the operational level, urban heritage conservation should be integrated into the macro framework of local urban planning to promote sustainable development of both the heritage area and the city as a whole. This is achieved through the pathway of "value analysis - renewal strategy - guideline planning," deeply integrating the perception, evaluation, and planning work of urban heritage value.



[Figure 1-3: Value Transmission Pathway for Urban Heritage (Illustrated by the Author)]

1.6 Summary of This Chapter

This chapter, as the theoretical foundation, reviews the core principles and key elements of the HUL theory and proposes a method for constructing an urban heritage conservation model. This includes the holistic perception of value, the evaluation of value based on the accretive concept, and the transmission of value based on the liveliness concept. The "perception - evaluation - transmission" model aims to provide scientific evidence for urban heritage conservation practice and promote a more integrated, dynamic, and sustainable direction for urban heritage conservation.

Chapter II: Perception of Ma'anshan's Urban Heritage Value Based on the HUL Theory

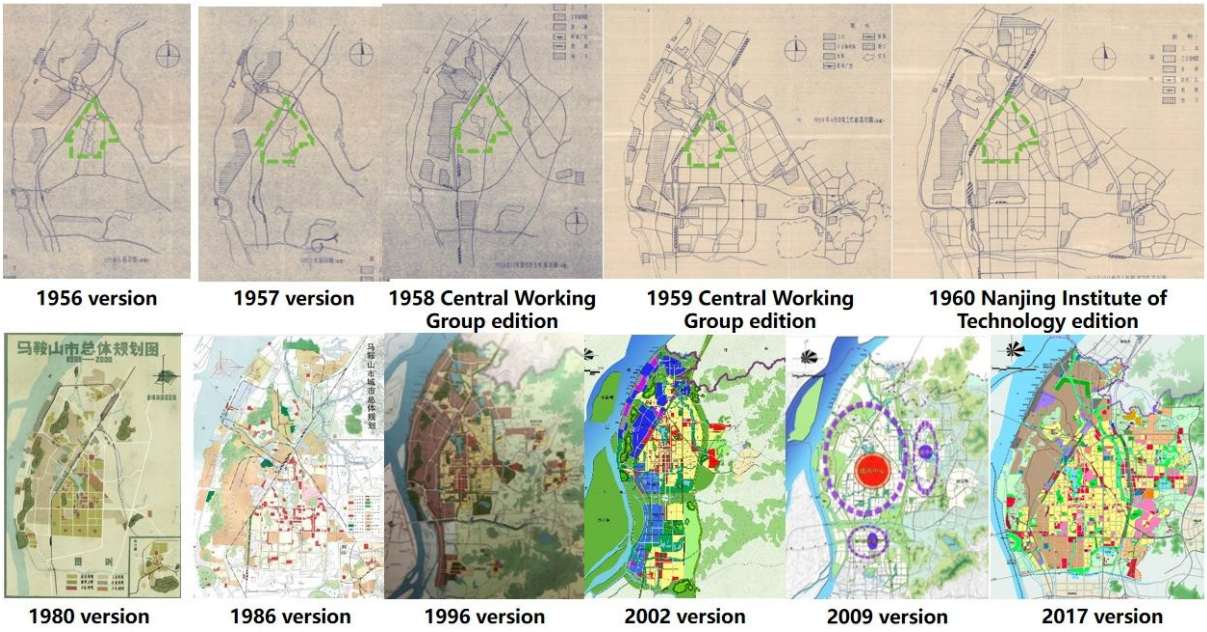
2.1 Identification and Definition of HUL Urban Heritage Value Elements

2.1.1 Development Background of the Steel Industry

Ma'anshan is located in the eastern part of Anhui Province, in the lower reaches of the Yangtze River, and borders Nanjing City to the east. The city's history dates back over two thousand years to the Western Zhou Dynasty. Historical records indicate that during the Qin and Han dynasties, the Ma'anshan area was already famous for its abundant iron ore, with thousands of people engaged in iron smelting. During the Three Kingdoms period, iron smelting was used to cast weapons. In 1912, the Aoshan iron mine was discovered and began operation in 1917. After the founding of the People's Republic of China, large-scale surveys and geological exploration identified more than 60 iron ore deposits, with proven reserves of 16.35 billion tons, accounting for 57.32% of Anhui Province's total iron ore reserves. The Aoshan mine, which operated from 1917 to its official closure in 2017, extracted over 200 million tons of ore and is the deepest open-pit mine in Asia at 255 meters. The steel industry has long accounted for over 60% of the city's total industrial output value. The Ma'anshan Iron and Steel Group (MAG), the city's economic lifeline, produced over 20 million tons of crude steel in 2023, directly employing more than 100,000 people.

Ma'anshan's urban layout is centered around the mining areas and steel mills. Its modern development has followed a main thread of "mining breakthrough — industrial establishment—cross-river integration," which not only continues the historical genes of ancient counties like Liyang and Dangtu but also, through resource integration and ecological reconstruction, has shaped a modern urban framework where industrial heritage and cross-river ecology coexist.

2.1.2 Evolution of Ma'anshan's Master Plan



[Figure 2-1: 12 Rounds of Planning History (Source: Ma'anshan Urban Construction Archives)]

For resource-based cities, their development often follows a unique pattern of "mining first, city second," where the master plan plays a crucial role in urban development[5]. For more detailed historical maps, see Appendix 3.

[Table 2-1: Representative Heritage of Ma'anshan's Urban Planning (Illustrated by the Author)]

Heritage Content	Significance and Impact
Multiple master plans	The 1956 plan for city establishment, and subsequent plans in 1957, 1958, 1959, 1960, and 1974, continuously inherited and innovated in various aspects
Soviet experts' opinions	"Speech Record of Soviet Experts on Ma'anshan's Urban Planning," November 1, 1958
Representative urban planning areas	Residential area organization and commune division in the 1960s, central urban area construction plots in the 1970s, 1960 Xiangshan Town Master Plan, detailed planning of Cihu Living Area, detailed planning of city center area, Liberation Road planning, Xiangshan Town Center Street and neighborhood planning (September 1960), Dahexi Neighborhood Planning (west side of Yushan Lake, August 1963), Jiashan Town detailed planning, Jiashan Sanzhuang Neighborhood Planning
Compilation and approval opinions on	"Opinions on the Compilation and Approval of Urban Planning," May 1974

[5] Liu Zhanting. Research on the Characteristic Style of Ma'anshan's Central Urban Area from the Perspective of Natural Ecology and Urban Culture [D]. Hefei University of Technology, 2017

urban planning	

(1) Initial Development Phase: Industrial Priority and Soviet-Style Planning

In the early days of the People's Republic of China, Ma'anshan's built-up area was only 0.7 square kilometers, with a permanent population of 56,500 and relatively scarce infrastructure. Between 1956 and 1978, the local government organized six rounds of master plan compilation, incorporating the experiences of German and Soviet experts. This established a block-like spatial framework with "industry along the river to the west and residential areas to the southeast." Led by industry, the Ningwu Railway divided functional areas. The urban space was organized between the east-west mountain ranges, with a triangular development structure bounded by the Yangtze River, Ningwu Railway, and highways to the north and south. Major transportation arteries were critical for resource transportation and urban development.

The 1959 plan proposed southward expansion and dispersion of industrial land, laying the foundation for the "single center + multiple groups" pattern, which became the cornerstone of Ma'anshan's modern development.

(2) Steady Growth Phase: Gradual Adjustment towards Functional Complexity

The 1980 plan explicitly defined Ma'anshan as a "steel industrial city," organizing residential, ecological, and industrial functions around Yushan Lake to form a "half-factory, half-city" layout. The 1986 Master Plan of Ma'anshan City adopted Gournay's "industrial city" theory, strengthening the spatial synergy between industry and daily life, while preserving natural characteristics through a "mountain-encircling lake" layout[6].

In 1996, the plan shifted to a "one city, four groups" structure, using farmland and green spaces to separate the main city from the groups and systematically introduced ecological protection concepts for the first time. The "small concentration, large dispersion" layout controlled urban scale, continuing the logic of industrial drive while laying the groundwork for future ecologically prioritized transformation.

(3) Rapid Leap Period: Regional Coordination and Ecological Awakening

[6] Urban Construction Committee of Ma'anshan City, Urban Planning Administration. Master Plan of Ma'anshan City (1986-2000) [Z]

The "Master Plan of Ma'anshan City (2002-2020)" compiled in 2001 [7]proposed a linear group development pattern, forming a spatial structure of "one main, one sub, two belts." Relying on a layout structure of "two centers, two axes, three circles," the city's green space system was developed with Yushan Lake and Jinshan Lake as two core green spaces to drive coordinated development of the entire area.

(4) Rebirth and Transformation Period: Smart Growth and Regional Integration

The 2009 master plan revision adjusted the development direction to "primarily eastward," incorporating the eastern university town area and forming a "one main city, two areas" structure. The 2017 plan positioned the city as "three bases, two centers," strengthening high-end steel, advanced manufacturing, and cultural tourism functions, and constructing a four-level public service center system. By continuing historical axes (such as the Ningwu Railway), revitalizing industrial heritage (workers' village texture), and integrating diverse style areas for scientific research and business, the plan achieved a dynamic balance between industrial memory and modern functions, highlighting the accumulative value of planning heritage in cultural rejuvenation and sustainable development.

[Table 2-2: Comparison of Core Content of Ma'anshan's Urban Planning in Different Phases (Illustrated by the Author)]

Development Stage	Development Strategy	Urban Layout	Key Events	Theoretical Basis	Issues Identified
Initial Development Period	Establish the framework of an industrial city and solve the "mine-city" spatial layout problem	Clump-like form: Industrial area (west of Ningwu Railway), residential area (southeast of the railway); Xiangshan mining area develops in a sporadic manner	In 1958, Soviet (Sarichev) and German (Skibermann) experts were introduced to optimize functional zoning. In 1959, the idea of dispersed industrial layout was	Soviet industrial city theory: Emphasizes the coupling of production and living units	Excessive concentration of industrial land Insufficient traffic dispersion Lagging public service facilities

[7] Ma'anshan Urban Planning and Design Institute, Anhui Provincial Urban and Rural Planning and Design Institute. Master Plan Text of Ma'anshan City (2002-2020) [Z]

			proposed		
Steady Growth Period	Consolidate the positioning of the steel industry and explore functional diversification	Semi-factory, semi-city pattern: Industrial and residential areas develop in parallel on both sides of Ningwu Railway; The core area around Yushan Lake takes shape	In 1980, the "small concentration, large dispersion" model was proposed. In 1986, the characteristic of relying on mountains and lakes was strengthened, and the Caishi Ridge riverside green corridor was launched	Gournay's "industrial city" theory: Functional zoning coordinated with the natural environment	Spatial fragmentation caused by railway cutting The urban-rural dual structure has not been broken through
Rapid Leap Period	Regional coordination and ecological protection driven by market economy	Belt-like group development: "One axis, two lines" urban system; "One city, four groups" central urban area structure	In 1996, the development axis of National Highway 205 was constructed. In 2002, the idea of a riverside industrial belt and a living belt was proposed. In 2009, the strategy of expanding eastward and southward was introduced	Regional planning theory: Emphasizes urban-rural integration and ecological isolation	Insufficient integration of industry and city Lagging development of secondary towns
Regeneration and	Transformatio n driven by	"Three zones"	In 2017, the positioning of	Smart growth	The mechanism

Transformation Period	national strategy (Yangtze River Economic Belt, integrated development of the Yangtze River Delta)	structure: Main urban area, western industrial zone, eastern new city	"three bases, two centers" was established. The old site of Ma'anshan Iron and Steel was transformed into a cultural and creative park. The national territorial space planning (2021) has an ecological proportion of 38%	theory: Stock renewal and smart regulation	for revitalizing industrial heritage needs to be perfected Cross-regional coordination needs to be deepened

2.1.3 Definition of Research Scope and Identification of Value Elements

During my graduate studies, I participated in the "Ma'anshan Huan Yushan Lake Urban Renewal Research" project team. Relying on this practical project, the research scope covers two key areas (Figure 2-2):

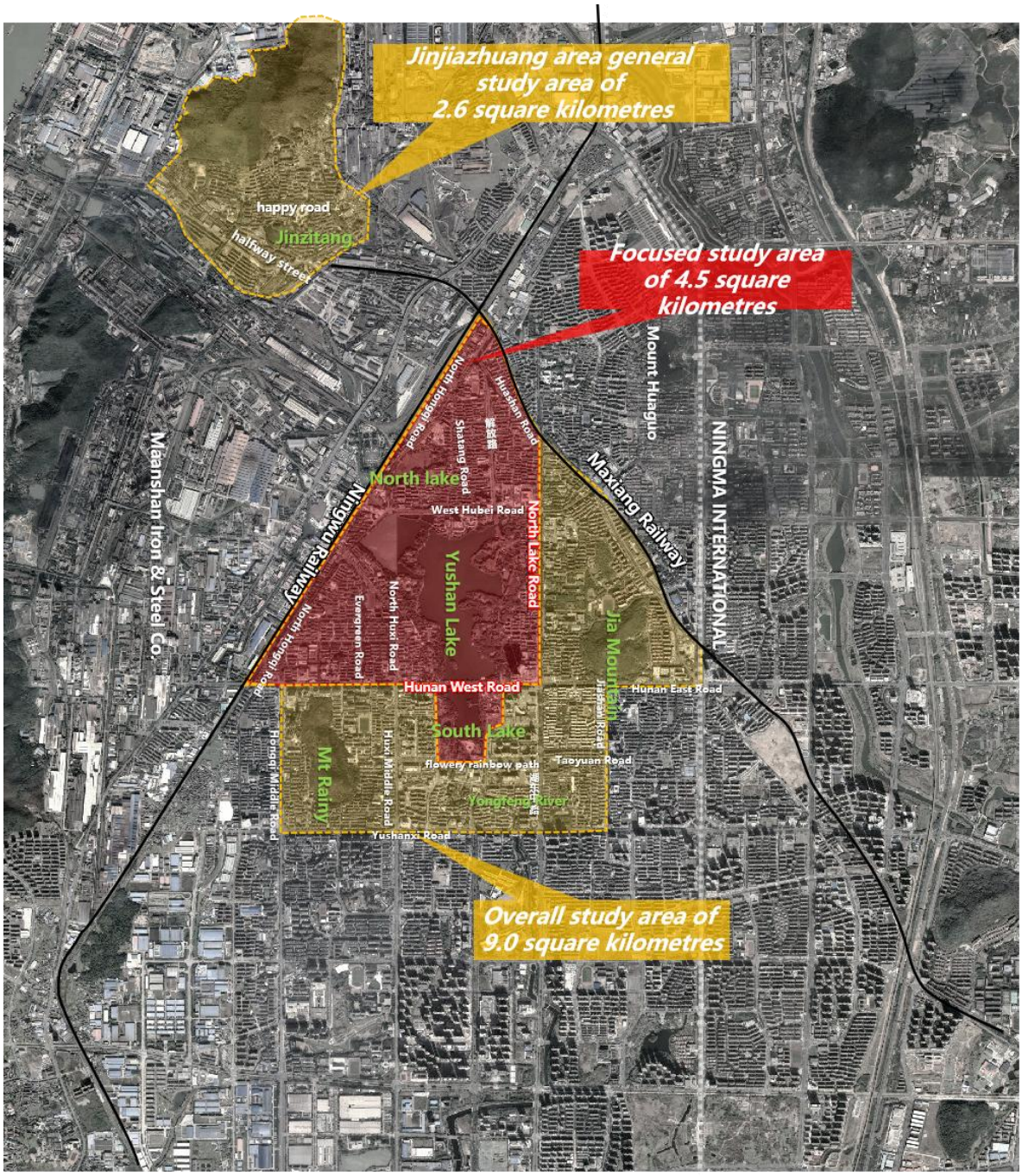


Figure 2-2 Location Map of the Study Area (redrawn based on Baidu Satellite Map)

Jinjiazhuang Area (2.6 km²): It includes industrial remains such as the Ma'anshan Iron and Steel Company's First Iron Plant site, the railway marshalling yard from the Soviet aid construction period, and the river ore terminal, focusing on the spatial correlation analysis of "mine-factory-port" ;

Huan Yushan Lake Area (13.5 km²): It comprises 12 historical residential areas built between 1958 and the 1980s, such as Hongqi Village and Huhu Road Workers' New Village, as well as the Yushan Lake Park and the surrounding cultural facilities cluster, with a focus on the evolution of residential space and the configuration patterns of public service facilities.

This spatial sample selection fully presents the spatial evolution of Ma'anshan from the planned economy period of "production first, living later" (1953-1978) to the integration of industry and city in the market economy period (1979-2000), and then to the green development in the era of ecological civilization (2001 to present). It provides a typical cross-section for analyzing the stratification laws of resource-based city heritage. The time span completely maps the full cycle of Ma'anshan's transformation from an industrial foundation established by steel ("a city built on steel") to an "ecological blessing land", deeply fitting the key historical stages of China's industrialization and urbanization. From the industrial foundation to urban transformation, its development process spans several important stages, including the early years of the founding of the People's Republic of China and the reform and opening up, with distinct characteristics of the times.

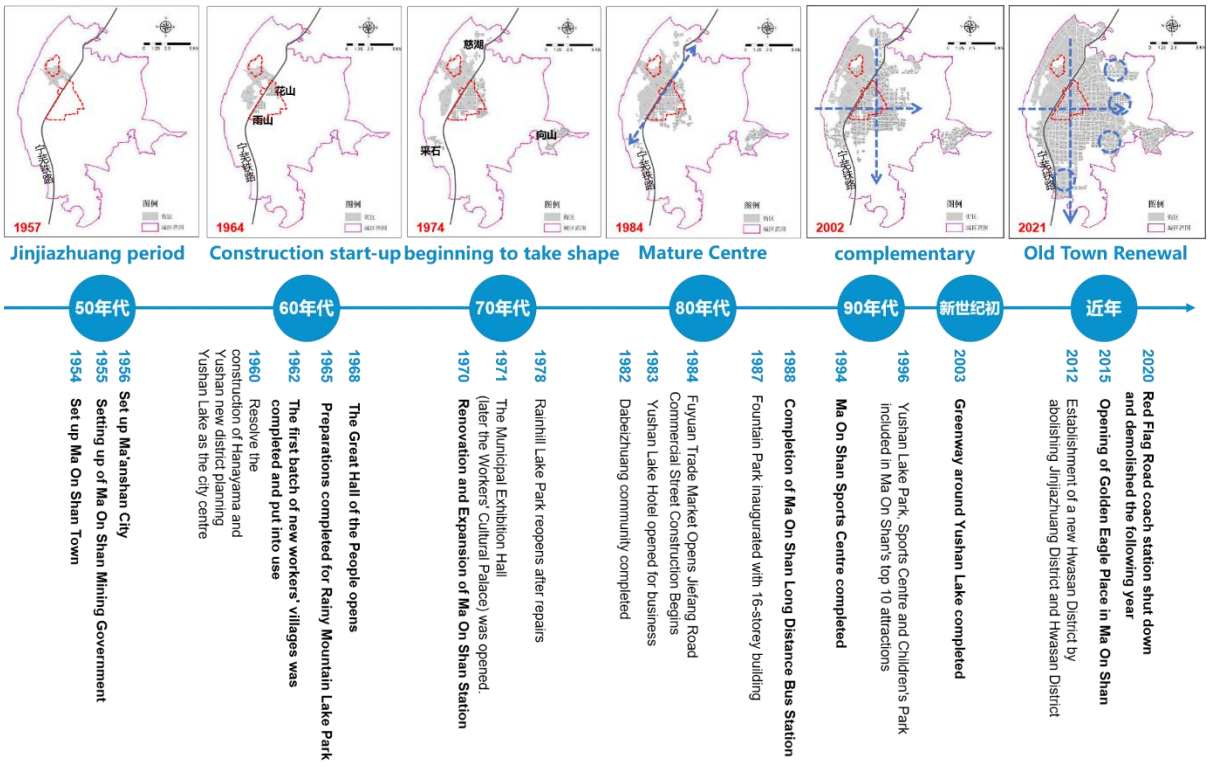


Figure 2-3 Spatial Evolution Map of the Study Area (Drawn by the Project Team)

The project team conducted detailed surveys of Hudong Road Subdistrict, Shatang Road Subdistrict, Pinghu Subdistrict, Yushan Subdistrict, and others in the preliminary research. The surveys were carried out through both online questionnaires and offline visits. The questionnaires, which are detailed in the appendix, collected a total of 86 valid responses, covering residents of various age groups.

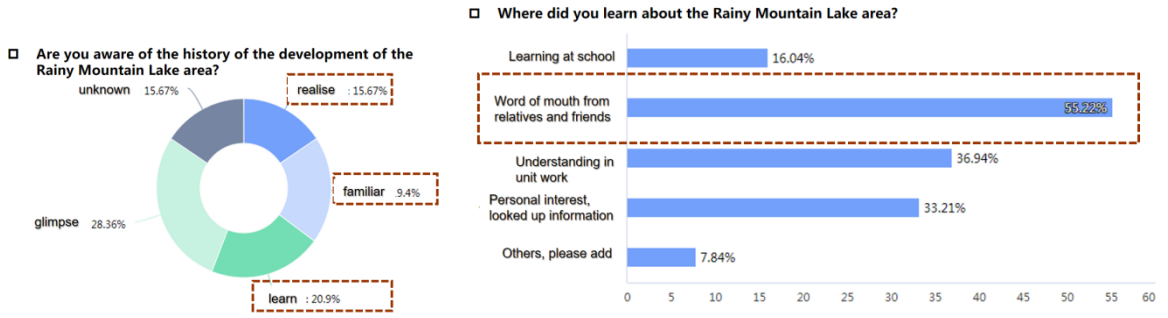


Figure 2-4 Statistical chart of questionnaire results (drawn by the project team)

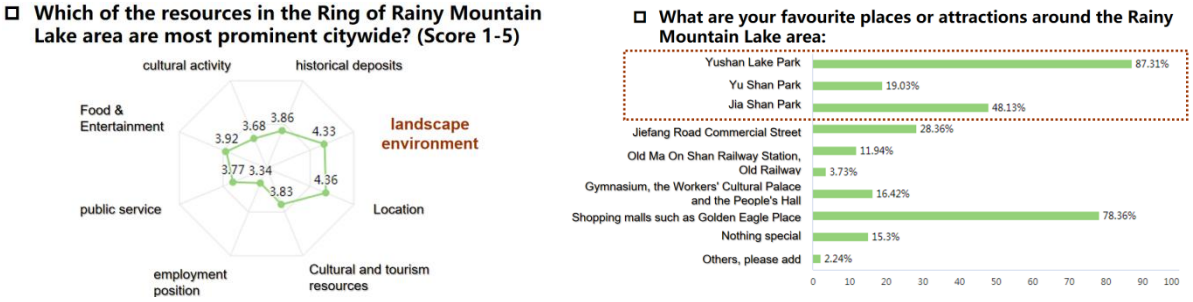


Figure 2-5 Chart analysing the results of the sub-survey questionnaire (authors' own drawing)

During the year-long project, extensive research was conducted by consulting historical archives and planning documents from previous years. Multiple interviews were carried out with individuals from various social strata, including government officials, Planning Bureau leaders, design institute experts, and members of the public, to gain a preliminary understanding of the key components of Ma On Shan's urban heritage. A public questionnaire was designed based on these interviews and data review (see Detailed Appendix 2). Distributed offline, 100 questionnaires were handed out, with 83 valid responses retrieved. Despite the relatively high number of valid responses, the cooperation of many respondents was limited due to the questionnaire's excessive length, resulting in incomplete submissions. Future research will focus on refining the questionnaire. Nonetheless, the feedback obtained was instrumental for subsequent value element classification and fieldwork. Additionally, an attempt was made to analyze popular online content related to Yushan Lake in Maanshan through self-media platforms. While the results were not fully satisfactory, this effort provided valuable insights into public perception of Maanshan from a self-media perspective.

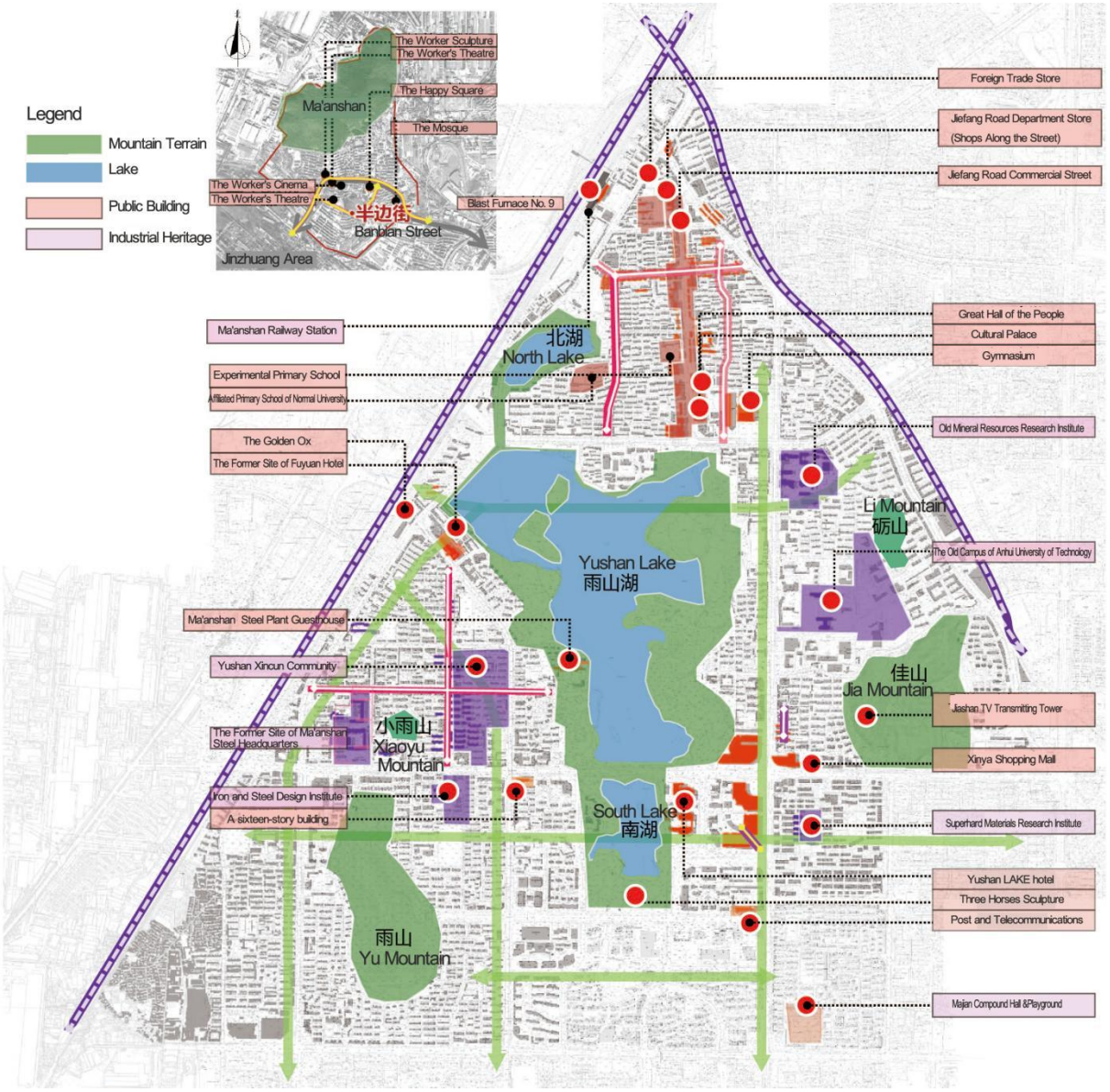
The identification of Maanshan's urban heritage value elements was achieved through three primary methods: (1) reviewing planning documents and heritage conservation materials, (2) conducting interviews and questionnaire surveys, and (3) analyzing internet data. These efforts collectively established a comprehensive system of value elements for Maanshan's urban heritage.

Table 2-3 Composition of Urban Heritage Elements in Ma'anshan Old Urban Area (Drawn by the Author)

Dimension	Content
Natural Elements	**Landscape Pattern**: The core elements of the landscape and water city.
	Landscape Bodies: Mountain bodies and lakes.
	Scenic Corridors: Tree-shaded road networks.
Physical Elements	**Industrial Heritage**: Production facilities, transportation systems, institutional courtyards, and workers' communities.
	Human Settlements: Public buildings, roads, squares, and landscape sculptures.
	Urban Spatial Structure: Historical master plans, workers' new village plans, and central area plans.
Intangible Elements	**Major Historical Events**: Visits by party and state leaders to Ma Steel.

The distribution of these elements, as shown below:

Figure 2-6 Distribution of value elements (developed by the project team)


Legend
Mountain Terrain
Lake
Public Building
Industrial Heritage
Ma'anshan
Jinzhuang Area
The Worker Sculpture
The Worker's Theatre
The Happy Square
The Mosque
The Worker's Cinema
The Worker's Theatre
半边街
Banbian Street
Blast Furnace No. 9
Foreign Trade Store
Jiefang Road Department Store
(Shops Along the Street)
Jiefang Road Commercial Street
Ma'anshan Railway Station
北湖
North Lake
Great Hall of the People
Cultural Palace
Gymnasium
Experimental Primary School
Affiliated Primary School of Normal University
The Golden Ox
The Former Site of Fuyuan Hotel
Old Mineral Resources Research Institute
Li Mountain
砺山
The Old Campus of Anhui University of Technology
Yushan Lake
雨山湖
Ma'anshan Steel Plant Guesthouse
Yushan Xincun Community
佳山
Jia Mountain
Jiashan TV Transmitting Tower
The Former Site of Ma'anshan Steel Headquarters
小雨山
Xiaoyu Mountain
Xinya Shopping Mall
Iron and Steel Design Institute
A sixteen-story building
South Lake
南湖
Superhard Materials Research Institute
Yushan LAKE hotel
Three Horses Sculpture
Post and Telecommunications
雨山
Yu Mountain
Majian Compound Hall &Playground

2.2 Perception of the Value of Natural Environmental Elements

2.2.1 Landscape Pattern

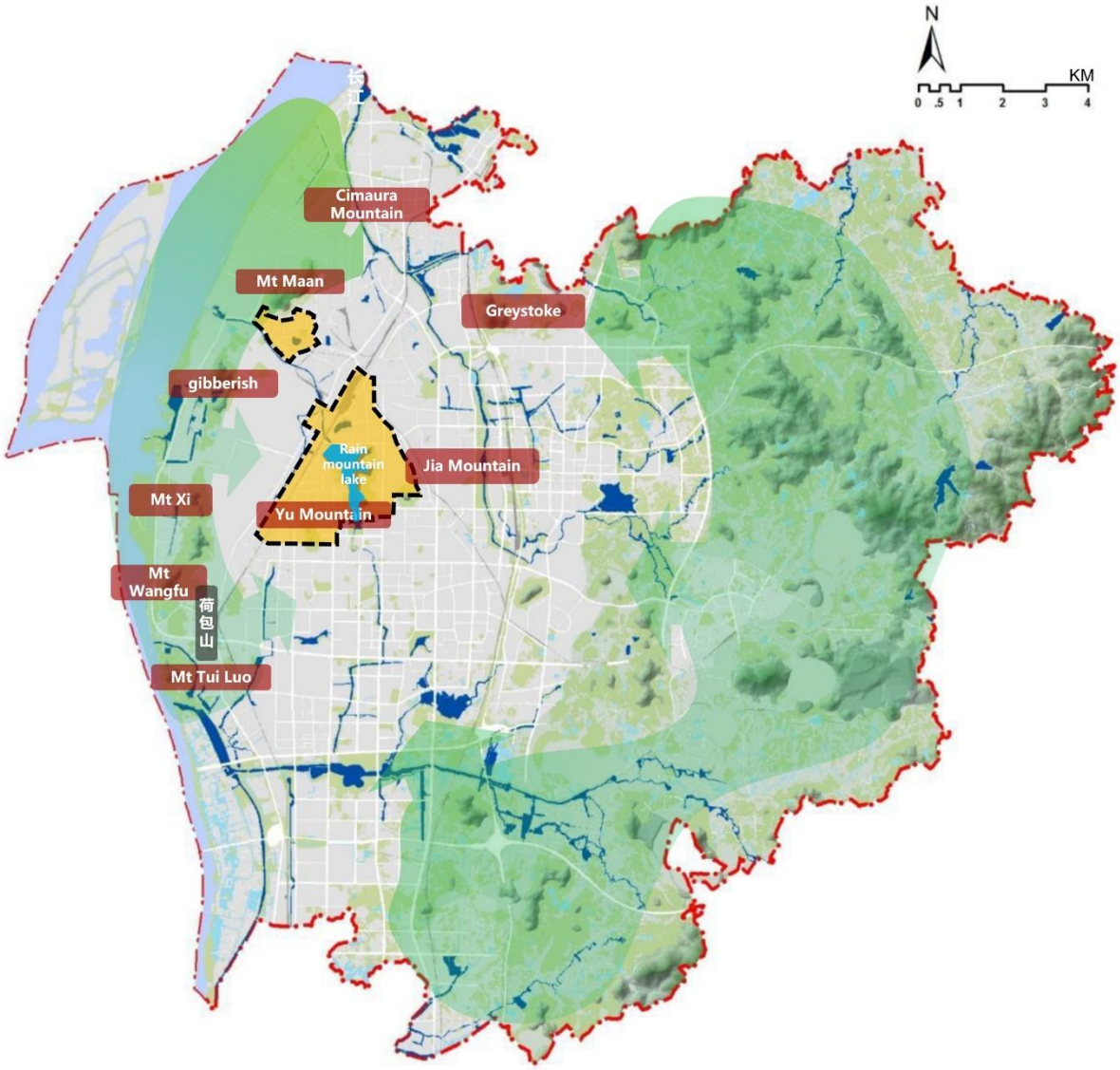


Figure 2-7: Schematic Diagram of Ma'anshan's "Nine Mountains Surrounding One Lake" Landscape Pattern (drawn by the author)

Ma'anshan is a city that is backed by mountains and faces water. Professor Chen Congzhou summarized its landscape pattern as "nine mountains surrounding one lake, with the green snail emerging from the great river." This pattern is the result of the combined effects of natural evolution and cultural accumulation.

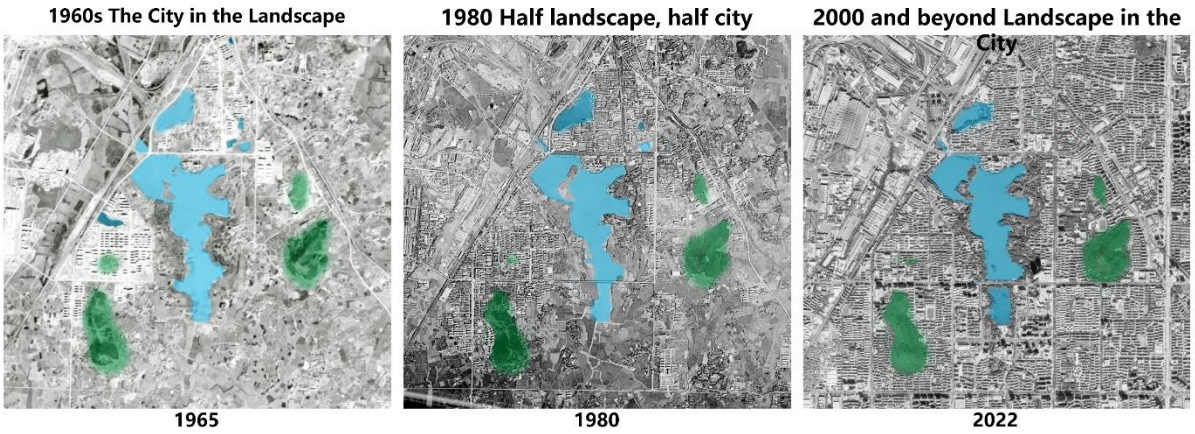
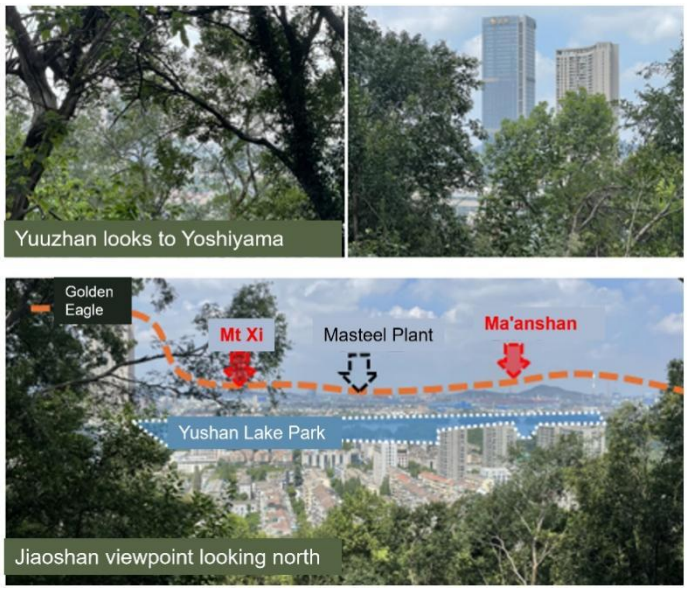


Figure 2-8: Evolution of Ma'anshan's Landscape Pattern (drawn by the project team)

During the process of urban development, the urban layout of Ma'anshan has been largely constrained by its landscape environment. With the growth of the city, the relationship between "mountains, water, and city" has also changed. In the 1960s, the city was small and nestled within the mountains and water. As the city expanded, by the 1980s, half of the area was mountains and water, while the other half was urban. After 2000, the mountains and water were fully integrated into the city, and the landscape city pattern of Ma'anshan has essentially stabilized.

Within the scope of this study, Yushan and Jiashan, together with Yushan Lake, form the core landscape of "two mountains and one lake." Green spaces and parks are embedded in the landscape network, creating the unique natural environment of the city. However, due to urban expansion and construction, the connections between the mountains and water, as well as between the mountains and the city, have gradually weakened. The integration of "two mountains and one lake" with urban life is not close enough, and there is an urgent need to enhance the accessibility and participation of the landscape pattern through strategies such as "opening windows to reveal greenery."



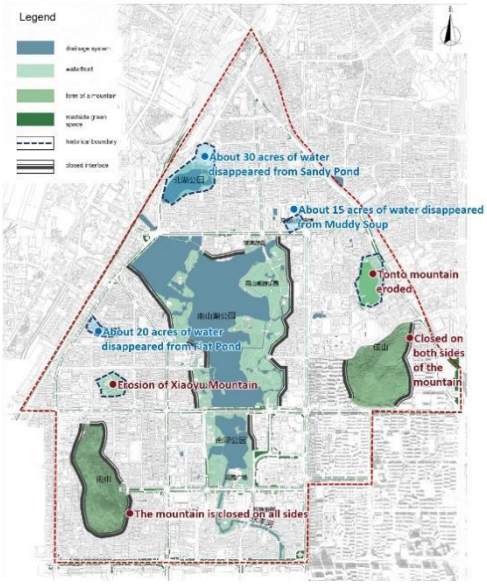


Figure 2-9: Characteristics of Ma'anshan's Landscape Pattern (drawn by the project team)

2.2.2 Landscape Entities

(1) Lakes

Yushan Lake is the core water body in the center of Ma'anshan. Yushan and Jiashan parks are located on the east and west sides, respectively, forming a "one core, two screens" landscape pattern. Yushan Lake has also been a "catalyst" for the evolution of the urban layout, and its ecological restoration has driven the city's transformation. Through facilities such as the lakeside walkway and sponge greenway network, residential areas, commercial areas, and ecological areas are connected, optimizing the urban functional zoning.

Since the 1980s, the lake has suffered from eutrophication. In addition, land reclamation by filling in the lake has fragmented the water surface and reduced its area. In the survey questionnaire, problems frequently mentioned in the Yushan Lake area include "old park buildings and idle functions" and "chaotic traffic order along the lake and low space utilization efficiency." These issues reflect the challenges faced by Yushan Lake in urban development and the citizens' strong expectations for its renovation and improvement.

(2) Mountains

Yushan is located to the west of Yushan Lake, with a main peak height of 103.4 meters. Jiashan, which is 176 meters high, is located to the east of Yushan Lake and faces Yushan from a distance. There is a signal transmission tower on the mountain. Yushan and Jiashan, together with the mountains along the river, form a "river-mountain-lake-city" landscape axis, which is the visual focus of the city's skyline. As important natural mountains and geographical landmarks of Ma'anshan, they form a natural geographical boundary and ecological barrier, influencing the city expansion's, functional layout, and transportation. Jiashan and Yushan are surrounded by developed plots and are not open enough to the city. Majiashan, located in the western part of the Jinjiawan area, together with other hills along the river, forms a series of small hills in the northeast-southwest direction along the river. Smaller mountains such as Xiaoyushan and Lishan have monotonous landscape greening and are gradually being eroded by construction.

Table 2-4: Summary of the Value Perception of Natural Environmental Elements (drawn by the author)

Category	**Name**	**Overall Perception**
Lakes	Yushan Lake	Urban ecological green core (regulates microclimate,

		provides habitat for biodiversity)
	Beihu(North Lake)	Core for citizens' leisure (gathering area for morning exercises and water-related activities)
Mountains	Jiashan	Western barrier of the city skyline (ecological protection, scenic vantage point)
	Yushan	Eastern barrier of the city skyline (cultural landmark, mountain trail system)
	Xiaoyushan	Community leisure green hill (daily fitness for citizens, children's nature education)
	Lishan	Geological education base (unique rock strata, research and practice venue)
	Majiashan	Symbol of urban spirit (source of mining culture, main scenic spot of urban image)

2.2.3 Scenic Corridors

As the core skeleton of the urban ecosystem, scenic corridors connect fragmented natural spaces, regulate ecological functions, and reorganize urban elements, thereby reconstructing the spatial form and development logic of the city.

Yushan Lake, Nanhu (South Lake), and Beihu are interconnected, forming an important part of the city's major north-south scenic green corridor [Wang Fang. Ma'anshan Urban Landscape System Design - Integration of Greening System and Metropolitan Circle [J]. Planner, 2003, (10): 66-68]. By removing hard embankments, restoring wetland vegetation, and optimizing water, quality the aquatic ecological environment has been effectively improved, enriching the city's biodiversity and becoming an important place for citizens' leisure and entertainment. The urban old district of Ma'anshan has a dense network of shaded roads, forming a green corridor system that runs through the entire city.

Figure 2-10: Distribution of Scenic Corridors in Ma'anshan (from Ma'anshan Urban Park System Plan (2022-2035))

The current status of scenic corridors in Ma'anshan is unevenly distributed. The Jinjiawan area, which is densely populated with industrial land, has fewer scenic corridors, resulting in weak ecological functions in this area. The scenic corridors around Yushan Lake Park are relatively well-developed but are not effectively connected to the overall city, lacking a systematic network.

2.3 Perception of the Value of Intangible Elements

Intangible cultural heritage includes spatial structure of the urban area, milestone events in urban development, and the Ma'anshan Iron and Steel Spirit, which reflects the development of China's steel industry in the new era.

2.3.1 Evolution of Spatial Structure

Planning heritage is a cultural product that reflects the historical combination of material space form and planning technology system. It is the key to interpreting the universal value of modern urban heritage and an important way to understand the uniqueness of modern urban heritage[8]. The planning evolution of Ma'anshan is essentially a process of value reconstruction through the collision of industrial civilization and modernity. From the functional zoning of Soviet experts to the "track" of the Ningma Intercity Railway, from the Yushan Lake green core to the Yangtze River ecological corridor, its planning heritage is both the "spatial code" of

[8] [Wang Zhugen, Li Baihao. Identification of the Common Planning Value of Modern Urban Heritage: Lessons from World Heritage Sites [J/OL]. International Urban Planning, 1-17 [2025-04-04]. https://doi.org/10.19830/j.upi.2023.379]

historical layers and the "gene bank" for future innovation.

Planning heritage is mainly manifested in the spatial structure of the city. The following is a review of the evolution of the spatial structure of the old urban area:

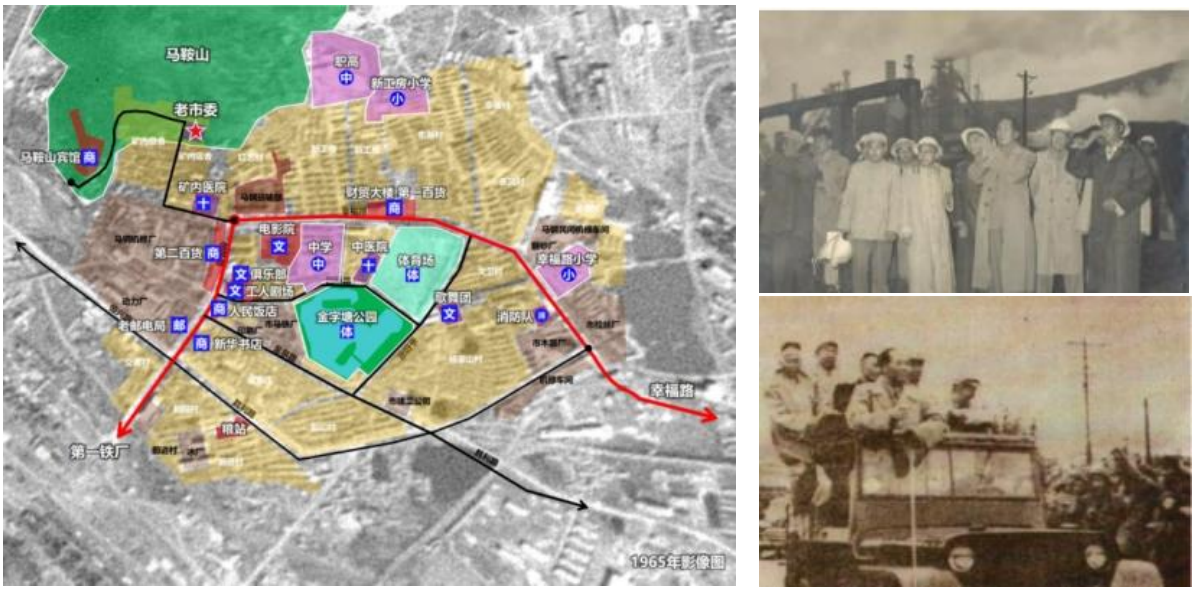


Figure 2-11: Aerial Image of Jinjiawan Area in 1965 (drawn by the project team)

The Jinjiawan area is the earliest living support area for the steel plant in Ma'anshan, integrating administrative, cultural and recreational, and sports and medical functions. It is built against the mountain (Majiashan) and surrounded by water (Jinjiatang), with public facilities laid out along Xingfu Road.

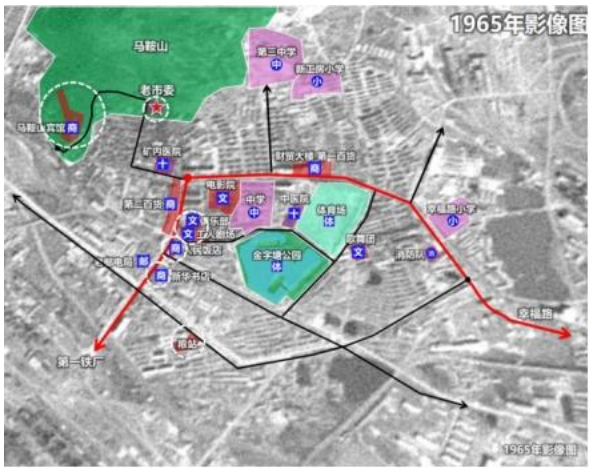


Figure 2-12: Aerial Image in 1965 (drawn by the project team)

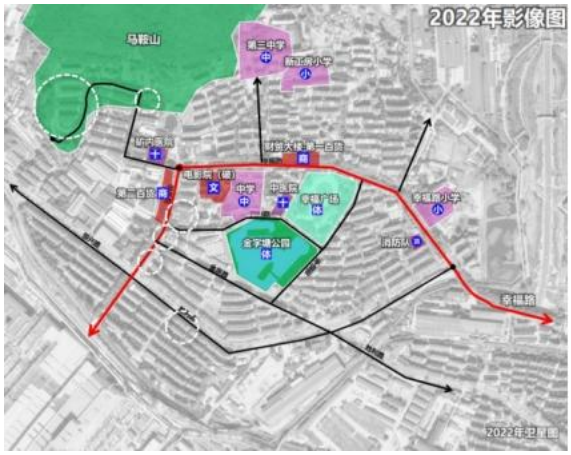


Figure 2-13: Aerial Image in 2022 (drawn by the project team)

Since 1970, the original pattern and urban texture of the Jinjiawan area have remained largely unchanged. After the 1990s, most of the residential areas and old factory buildings were demolished and rebuilt. The road network, parks, squares, and basic public services such as medical and educational facilities have been basically retained.

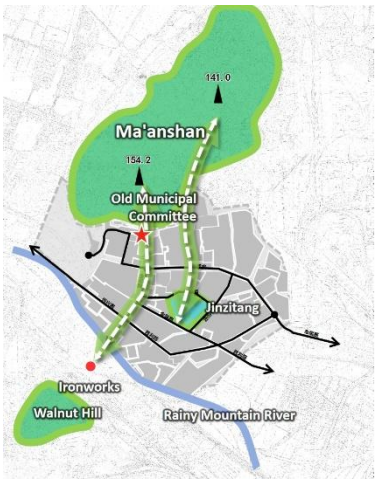


Figure 2-14: Tongshan Axis Diagram (drawn by the project team)

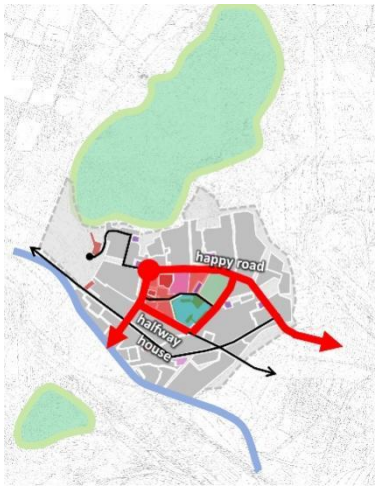


Figure 2-15: Ring Pond Agglomeration Diagram (drawn by the project team)

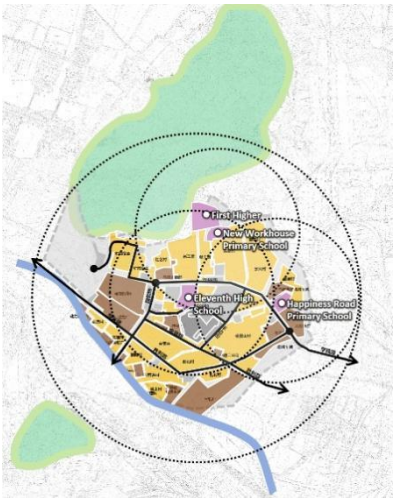


Figure 2-16: Work-Live Balance Relationship Diagram (drawn by the project team)

The spatial structure of the Yushan Lake area has evolved. In the 1960s, it was characterized by two areas with multiple points. In the 1970s, it became a core agglomeration on the north side of the lake. In 1962, the first workers' village in Yushan was completed and put into use. In 1965, the construction of Yushan Lake Park was basically prepared. In 1968, the Ma'anshan People's Hall was completed and opened to the public. In 1971, the Ma'anshan City Exhibition Hall was completed and opened (later became the Workers' Cultural Palace).

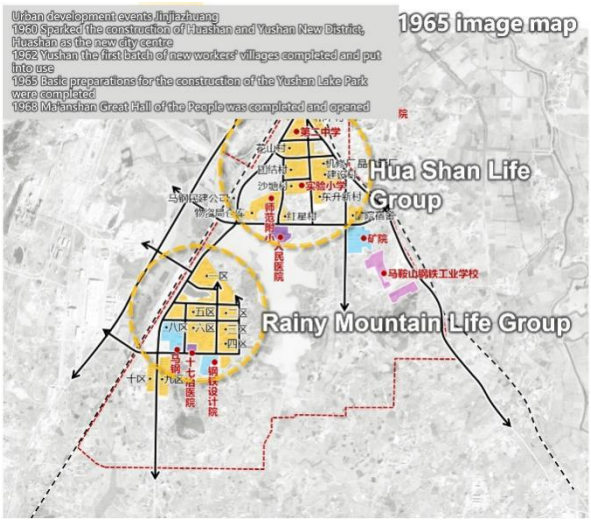


Figure 2-17: Planning Analysis Diagram of Two Areas with Multiple Points in the 1960s (drawn by the project team)

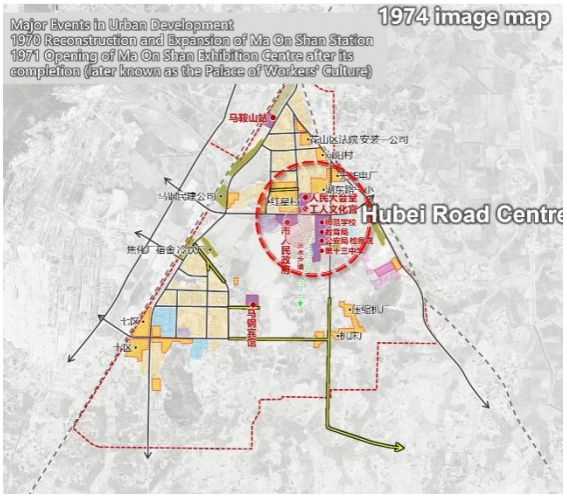


Figure 2-18: Planning Analysis Diagram of Core Agglomeration on the North Side of the Lake in the 1970s (drawn by the project team)

In the 1980s, the area to the southeast of the lake was expanded, and construction and renewal on the east side of the lake accelerated. In 1983, the first state-owned hotel, Yushan Lake Hotel, was completed and began operations. In 1984, the Fuyuan Trade Market opened,

and the construction of Jiefang Road Commercial Street began. In 1986, the greening project on the west bank of Yushan Lake started. In 1987, a 16-story building was completed. In 1988, the Ma'anshan Long-Distance Bus Station was completed. In 1994, the Ma'anshan City Gymnasium was completed.

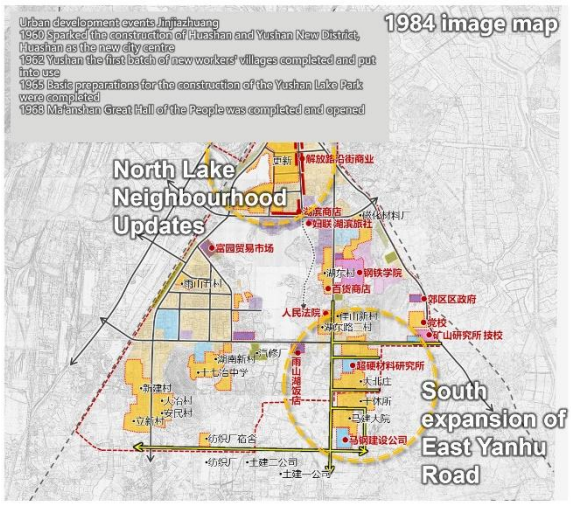


Figure 2-19: Planning Analysis Diagram of Expansion to the Southeast of the Lake in the 1980s (drawn by the project team)

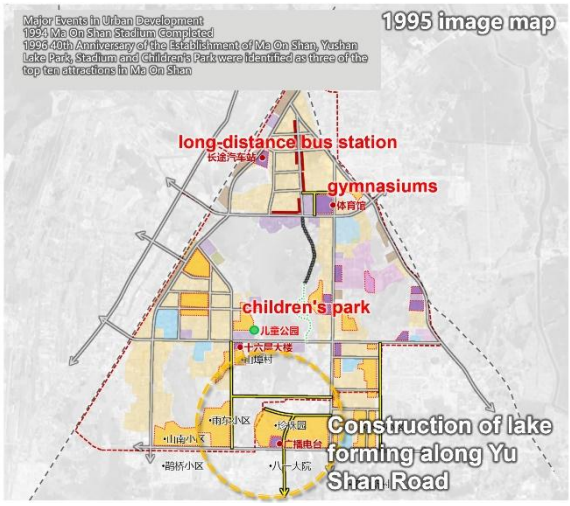


Figure 2-20: Planning Analysis Diagram of Ring Lake Formation in the 1990s (drawn by the project team)

In the 2000s, plots of land were filled in and supplemented, and the area around South Lake was developed. In 2003, the Yushan Lake Greenway was completed and put into use. In 2004, the Yushan Lake Comprehensive Environmental Project was launched. After 2009, partial updates were carried out. In 2017, the Maker+ Cultural and Creative Industrial Park, transformed from the old mining institute, opened.

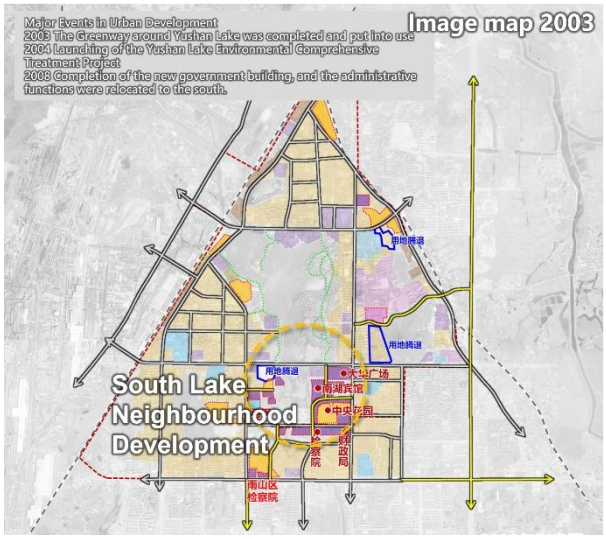


Figure 2-21: Planning Analysis Diagram of Filling and Supplementing in the 2000s (drawn by the project team)

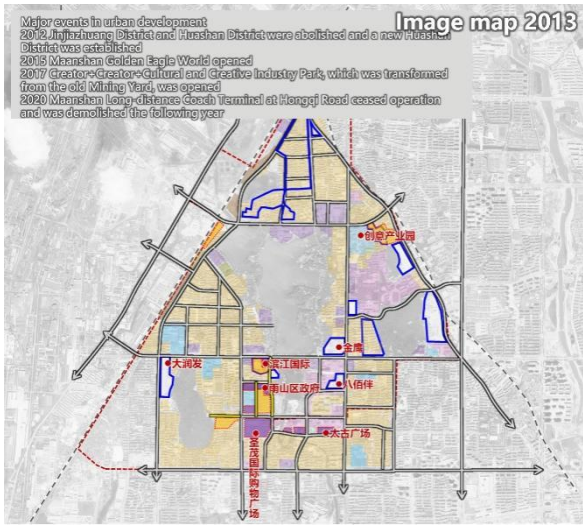


Figure 2-22: Planning Analysis Diagram of Partial Updates After 2009 (drawn by the project team)

The spatial pattern of the Yushan Lake area shows a distinct chronological evolution. Its

historical layers are complete and continuous, and its era characteristics are distinct. The northwest to southeast chronological distribution pattern not only reflects the dynamic trajectory of urban spatial evolution but also constitutes a unique urban section with both historical depth and functional complexity. Ultimately, it has formed a city pattern centered on the urban development axis of Jiefang Road-Taibai Avenue, with four major areas (north of the lake, west of the lake, east of the lake, and south of the lake) surrounding it.

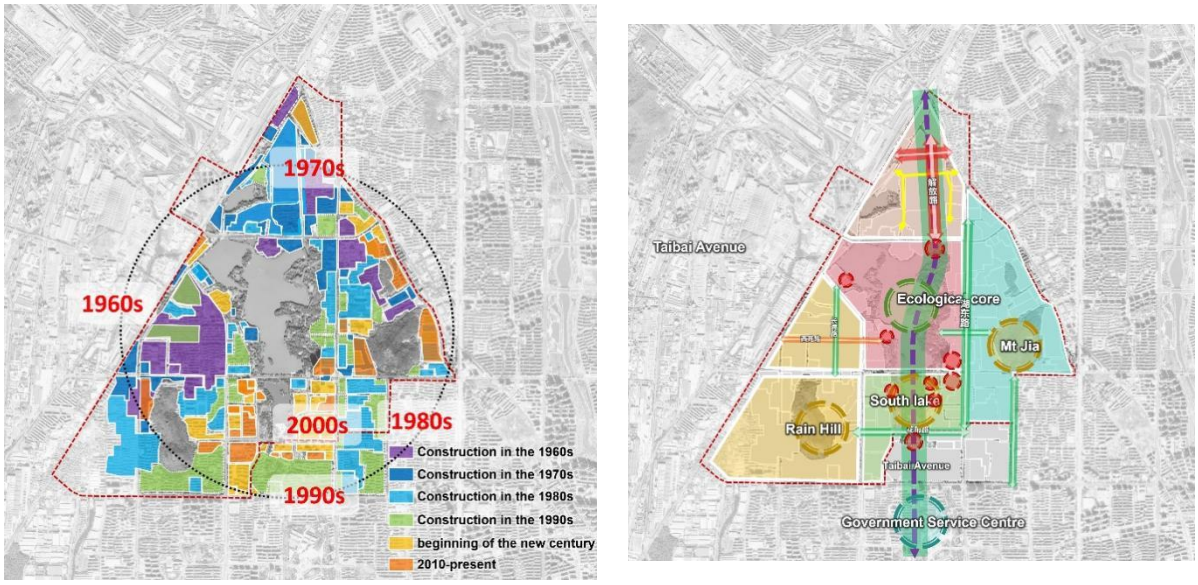


Figure 2-23: Spatial Pattern Structure Diagram of the Yushan Lake Area (drawn by the project team)

2.3.2 Significant Historical Events

In the development process of Ma'anshan's steel industry, historical figures and significant events have had a profound impact on its spatial evolution. These events not only constitute an important part of the city's memory but are also reflected through changes in the physical space.

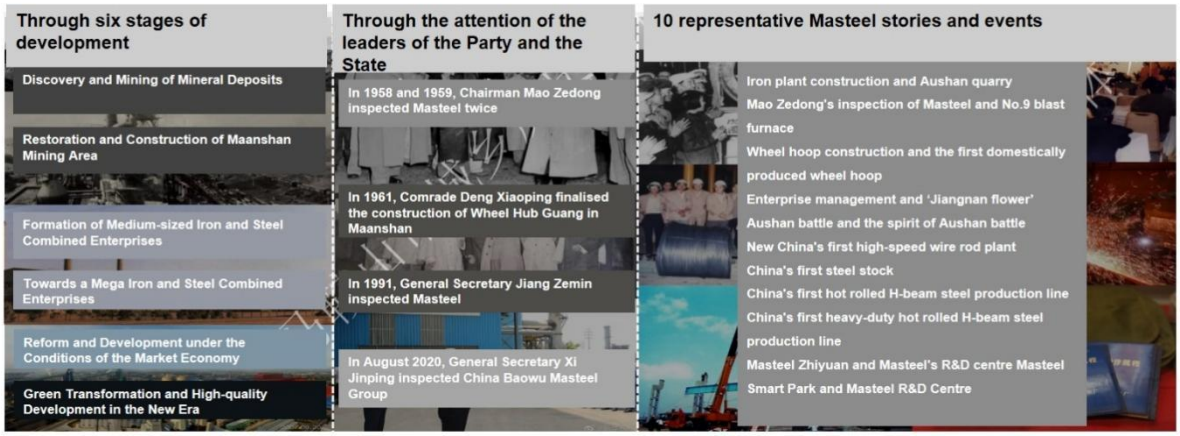


Figure 2-24:Major Historical Events Timeline Chart (Drawn by the Project Team)

In 1953, the reconstruction of the Maanshan Iron and Steel Factory marked the beginning of

industrialization in Maanshan. From 1958 to 1959, Chairman Mao Zedong inspected Maanshan Steel twice and proposed to develop Maanshan Steel into a medium-sized integrated steel enterprise. In 1961, Comrade Deng Xiaoping indicated that the wheel hub factory should be located in Maanshan. In 1991, General Secretary Jiang Zemin inspected Maanshan Steel, injecting new connotations into the spirit of Maanshan Steel. From 1993 to 1994, Maanshan Steel was listed in Hong Kong and Shanghai, becoming the "China Steel First Share."

These significant events are not only important milestones in the development of Ma'anshan's steel industry, but also crucial carriers of the city's memory.

Figure 2-25: September 20, 1958, Mao Zedong inspected the No. 1 Iron Plant of Ma Steel (quoted from the "Annals of Ma'anshan City").

Figure 2-26: On October 29, 1959, Mao Zedong inspected the Maanshan Iron and Steel Company's coking plant (quoted from "The Annals of Maanshan City").

Figure 2-27: Comrade Jiang Zemin visited the Second Steelmaking Plant of Shougang.

The survey data shows that the historical awareness of residents in the area around Yu Mountain Lake is only 55.97%, revealing the harsh reality of a generational disconnection in industrial memory. The elderly generally experienced the industrial construction boom at that time, while the younger generation lives in an entirely different era. This has led to a significant age-related gap in the city's memory[^Zhang Wenzhuo, Han Feng. Evaluation and Strategy Generation System Construction of Industrial Heritage in Old Industrial Areas from the Perspective of Historic Urban Landscape (HUL)[J]. Chinese Historic Cities, 2018(03): 16-26^].

2.4 Cognitive Value of Material Elements

Twenty-five buildings and structures with historical value and high public recognition, as well as 12 old campuses, research institutes, and workers' villages that can truly reflect the development styles and social life of different eras, were selected as material elements. Among

them, eight sites, including the Ma'anshan Steel Company Hall, have been recommended as historical buildings, and six areas, including the historical district around Xingfu Road, have been recommended as historical quarters.

Based on the "function-oriented" heritage identification principle, this study defines the core elements that directly participate in the value production chain of the steel industry as industrial heritage. These elements are categorized into four types according to their functional attributes and spatial characteristics: production facilities, transportation facilities, scientific research institutions, and living facilities.

General public buildings in the city are classified by building type into commercial buildings, office buildings, medical buildings, cultural buildings, sports buildings, and infrastructure, etc. The distribution of material elements is shown in Figure 2-28.

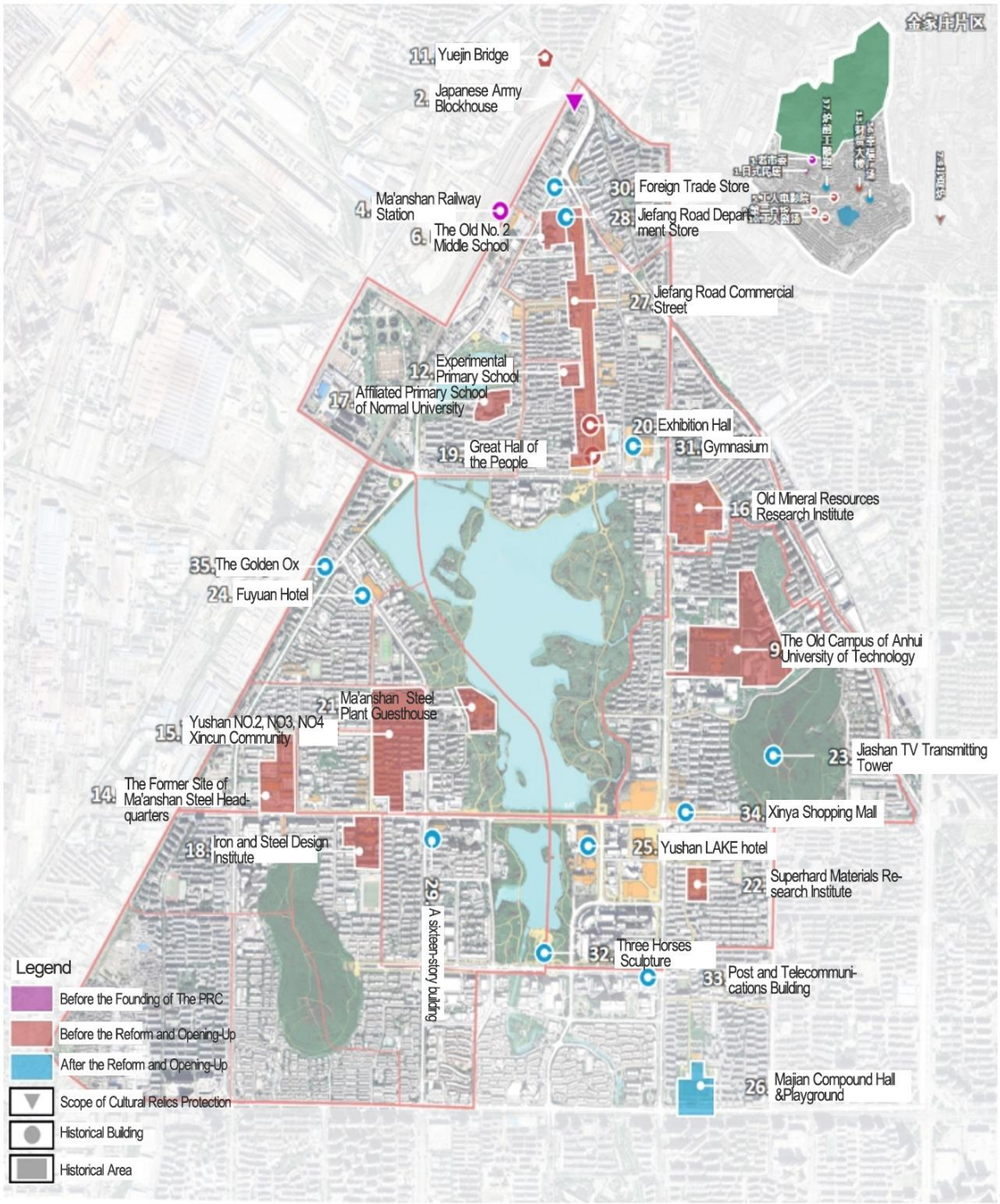


Figure 2-28: Distribution Map of Material Elements (Drawn by the Author)

2.4.1 Industrial Heritage

(1) Production Facilities

Figure 2-29: No. 9 Blast Furnace (from "Ma'anshan Local Chronicles")

Figure 2-30: In 1958, Chairman Mao inspected (source: internet)

Figure 2-31: Reconstruction Plan for No. 9 Blast Furnace (Source: Internet)

Production Facilities: These are the physical facilities covering the entire process of mining, smelting, and processing, including mining faces (such as the Aoshan Iron Mine), smelting workshops (Ma'anshan Steel No. 9 Blast Furnace Group), and auxiliary workshops (the former Ma'anshan Steel Machinery Repair Factory) as material carriers.

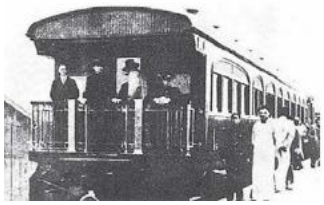
On September 8, 1958, Ma'anshan Steel's No. 9 Blast Furnace was completed and put into operation, becoming the first modern blast furnace with a capacity of over 200 cubic meters in Anhui Province and the East China region. In the same month, Chairman Mao Zedong personally visited and inspected the site, endowing it with special historical significance. As the first medium-sized blast furnace designed, manufactured, and installed by New China itself, No. 9 Blast Furnace witnessed the beginning and development of China's steel industry and is an important symbol of the steel industry in Ma'anshan and the East China region[^Ke Chunshan. Research on the Construction of Collective Memory Space in Industrial Cities [D]. Anhui University of Technology, 2021^].

The blast furnace was officially shut down on April 23, 2018, and was announced as a municipal-level cultural relic protection unit in Ma'anshan in September of the same year. In 2024, the Ma'anshan Municipal Government approved the reconstruction of No. 9 Blast Furnace on the plot north of Ma'anshan Intelligent Park. However, since the main body of the industrial heritage is located within the production enterprise, most non-factory personnel have relatively limited knowledge of "No. 9 Blast Furnace" and its industrial development background.

（2）Transport facilities

Table 2-6:Value recognition table of material elements (transportation facilities) in Ma 'anshan (drawn by the author）

Name	old photographs	present situation	zone bit	cognize

Ningwu Railway (formerly known as Jiangnan Railway)			699 West Hunan Road	Founded in 1933 and still in operation, it has historical and industrial heritage value. It was once the commercial railway with the shortest construction period and the least investment per kilometer in China.
Maanshan Station			No.103 North Red Flag Road	Built in 1943 (during the Japanese invasion of China, Ningwu Railway station), it is a municipal cultural protection unit and still undertakes passenger transport function. It has certain historical preservation value as the same source as the Japanese-style station at the same time.
The maxiang railway			500 Hubei Road, Hunan	Built in 1918, this railway line connects the urban area with the mining area and is about 2 kilometers long. It is the earliest railway

				built in the Ma'anshan mining area. The current appearance on both sides of the railway is poor and has been included in the renovation plan. With the reduced demand for railway transportation, the space along the railway can be explored for various uses, such as internet-famous coffee shops.

（3）Research institutes

Table 2-7:Value cognition table of material elements (research institutes) in Maanshan (drawn by the author)

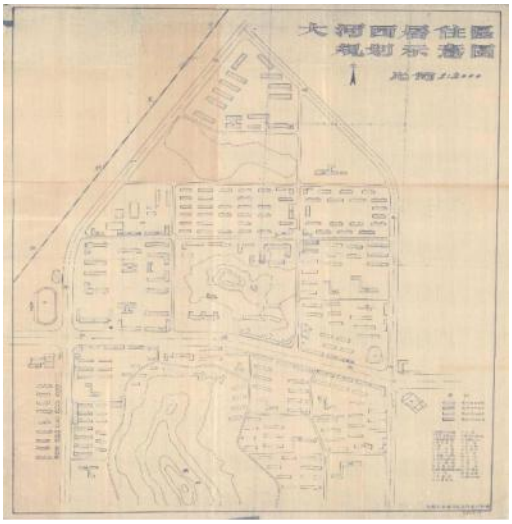
name	old photographs	present situation	zone bit	cognize
Steel Design Institute (now Zhongye Huatian)			699 West Hunan Road	Built in 1964 as one of the nine institutes of the Ministry of Metallurgy, its Soviet-style office building and historical archives are physical witnesses to the integration of industrial technology. The building is well preserved and most of the carriers are still in normal use.

Maanshan Mining Research Institute (now Maker + Science and Technology Cultural and Creative Park)			666 Xitang Road	Founded in 1963, it was originally a scientific research institution directly under the Ministry of Metallurgy. After transformation, it uses the renovated industrial plant as the carrier to create a joint office space and an industrial exhibition hall, realizing the functional transition from traditional scientific research to innovation incubation.
Maanshan Iron and Steel Institute (later renamed East China Metallurgical Institute, now known as Anhui University of Technology)			500 Hubei Road, Hunan	Built in 1958, it was once the only undergraduate institution in the steel industry in East China. The campus layout of the 1950s has been completely preserved, and the Soviet-style teaching buildings have been retained. The historical features are still there, but the image of the buildings along the street is not good.

East Metallurgical Geological Machinery Factory (now known as the Superhard Materials Research Institute)			195 Southeast Lake Road	The Superhard Materials Research Institute, the experimental building group retains the red brick facade and heavy equipment base in the 1980s. At present, it rents out idle factories, introduces sports and cultural industries, and activates idle assets to supplement service functions.
Ma Steel headquarters			No.8, Red Flag Road	Built in 1965, this building features a Soviet architectural style and served as the core hub for industrial management during the planned economy era. Some of its structures have been repurposed. The Ma Steel Hall, completed in 1958, was a significant physical symbol of industrial culture during the planned economy era. However, the current building's appearance is

disorganized, and the original courtyard's service facilities are outdated and in poor condition, giving it an unimpressive image.

(4)Living Facilities



Planning of the Dahexi Residential District

1965

1974

1980

2022

Figure 2-32: Evolution of the Planning of the Residential Area in the West of the River (The left image is sourced from the Ma'anshan Urban Construction Archives, and the right image is redrawn from Baidu Satellite Map)

The construction of the Workers' New Village began in 1962. Initially, it was modeled on the Soviet neighborhood unit theory and combined with local practices to form a unique texture of axial symmetrical layout and red-brick apartment buildings. The buildings were mainly 2- to 3-story red-brick houses. The residential area was divided into smaller neighborhoods by a grid-like road network. Supporting facilities such as canteens, bathhouses, and childcare centers were embedded between the main living roads, creating a self-sufficient community with a 500-meter service radius (Figure 3-34). By 1969, the construction area expanded to the south, with a total land area of 55.5 hectares. A complete residential neighborhood system was formed, with commercial facilities laid out along the streets and educational institutions occupying independent plots of land, reflecting the planning concept of "production-life integration" in the planned economy era.

Figure 2-33: Current status photos of Workers' New Village (taken by the author)

The planning hierarchy of the Workers' New Village is clear, and its road network structure has remained almost unchanged. The historical spatial pattern has been relatively intact and continuous, making it an important testament and example of the planning and construction of workers' new villages after the founding of the People's Republic of China.

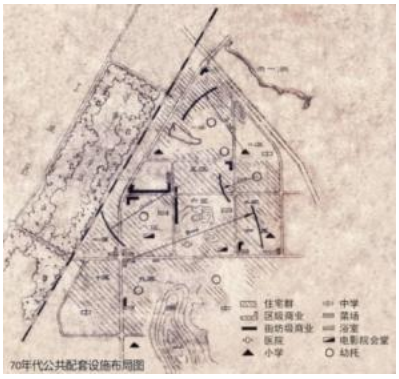


Figure 2-34:Layout Map of Public Supporting Facilities in the 1970s (Source: Ma'anshan Urban Construction Archives)

Figure 2-35:Proposed Public Supporting Facilities Feasible Format Diagram (Drawn by Project Team)

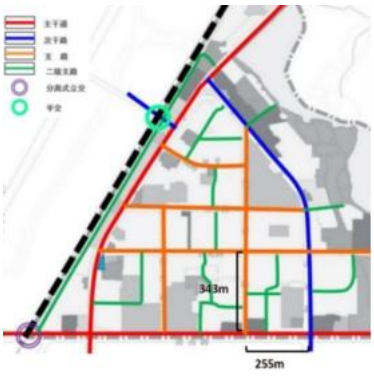


Figure 2-36:Road System Diagram of Workers' New Village (Drawn by the Project Team)

However, by the 1990s, the original natural pattern of "mountain-water-village" was disrupted. The introduction of high-rise residential buildings not only altered the traditional skyline of two to three stories but also caused a rupture in the material narrative through the renovation method of covering the red-brick facades with tiles.

2.4.2 Other Public Facilities in the City

(1) Public Buildings

Since the implementation of the reform and opening-up policy, with the rapid economic growth and the continuous advancement of urbanization, a large number of modern public buildings have been constructed. The types of urban public buildings are diverse and their distribution is scattered [Ke Weixia. Research on the Classification and Shaping of Urban Landmarks [D]. Nanjing University of Technology, 2016.]. The research and survey results are shown in the table below.

Table 2-8:Value cognition table of material elements (public buildings) in Maanshan (drawn by the author)

Type name	old photographs	present situation	zone bitcognize
Commercial buildings	Liberation Road Department Store		No. 71 Jiefang Road	Constructed in the 1950s as a planned economy commodity supply center; converted into street-facing shops in the 1990s, reflecting the transition from "unified purchase and sales" to individual economy.
	Fuyuan Hotel		436 Hubei West Road	A high-end reception facility built in the 1980s, which was renovated into a senior living apartment in the 2010s to address the needs of an aging population.
	Ma Steel Hotel		No. 2 Xiyuan Road	Originally established in 1972, its predecessor was the Ma'anshan Foreign Trainee Training Office. It was later renovated and upgraded to meet the standards of a three-star foreign-related hotel. Currently, part of it is open as a business hotel.
	Yushan Lake Hotel		No. 79 West Hunan Road	Built in 1982, it was Ma'anshan's first large-scale state-owned hotel, blending Soviet-style and modern architectural elements, witnessing the upgrading of the service

				industry.
	Sixteen-story building			No. 15 Hunan Road	Completed in 1987, it was the first high-rise building constructed after the reform and opening-up policy. Currently serving as a commercial office building, its exterior facade has been renovated.
	Xinya Shopping Mall			26 Hunan East Road	Commercial complex representative of the 1990s, currently in use with outdated business formats
	The Second Middle School			18 Station Road	This school, established in 1957, is the first model high school in Anhui Province and has cultivated a large number of outstanding talents for society. As an educational heritage, it is now a successful institution requiring functional optimization.
Educational buildings	Jiankang Road Primary School			No. 15, Shatang Road, Huashan District, Ma'anshan City, Anhui	The traditional educational site is still used by primary schools.

				Province	
Medical architecture	The Seventeen Metallurgical Construction Hospital			828 Hunan West Road	Built in 1965, originally serving as a free medical facility for enterprise employees, it has now been transformed into a comprehensive public hospital while preserving some of its historical buildings.
	Ma'anshan People's Hospital			Lakeside of Yushan lake	Built in 1958 to serve industrial immigrants and urban expansion, it is now a grade A hospital, with some of its old buildings listed as protected buildings.
	Ma'anshan Exhibition Hall			No. 2 Jiefang Road	Built in 1971, it was a workers' cultural center during the planned economy. Now some of its space is used for community exhibitions.
cultural building	People's Hall			No.2 Liberation Road	Built in 1968, it is a landmark public building in the 1960s with socialist realism style. It is a municipal cultural protection unit and once served as an important gathering place. It is the

				core node of the Liberation Road historical axis. It has been renovated several times and is still in use.
Workers' cinema			No.45 Happiness Road	Founded in 1956, it was the first cinema in Maanshan. The cinema was rebuilt in 1984 but ceased operations in the mid-1990s. Some areas have been converted into community cultural activity centers.
sports building,sports architecture	The old gymnasium			204, Hubei Road	Built in 1994, it undertakes national sports events and promotes national fitness. The carrier still exists and its style is well preserved, but the operation is poor and the follow-up operation and maintenance cannot keep up.

(2)Road square

Table 2-9:Value cognition table of material elements (road and square) in Maanshan (drawn by the author)

name	old photographs	present situation	zone bit	cognize
Jiefang Road			Jiefang Road	As the first commercial street in Maanshan, Jiefang Road was born in the planned economy period. After renovation in 1985, it became a core business district with diversified businesses. Now, it has been reborn as a pedestrian street, which not only retains its historical features but also

			continues to be a bustling market, becoming a cultural landmark that connects the city's history and contemporary culture.
Road to Happiness		 Road to Happiness	Happiness Road is one of the main commercial streets in Maanshan in the 1990s. It runs through Jinjiazhuang Street. Because Chairman MAO Zedong passed through this place twice during his inspection in 1958 and 1959, it was endowed with unique political and cultural connotation and became a symbol of the city's glorious history.
Happy Square		 No.61 Happiness Road	As an important landmark of Happiness Road, it maintains the community life atmosphere with the function of citizen leisure gathering. It is the bearing place of fire and smoke memory of Jinjiazhuang Street and continues the daily vitality of the city.

(3）landscape sculpture

The Three Horses Sculpture (1995) is located in Huayu Square and stands as a landmark of Ma 'anshan City. The Big Golden Ox Sculpture (1997), situated at the intersection of Lake West Road and Hongqi Road in the city center, is the largest ox sculpture in Ma' anshan City. The Furnace Front Worker Sculpture (2011) recreates the scene of Ma 'anshan Steel workers working in front of the blast furnace. The sculpture is surrounded by a rich atmosphere of steel culture and humanistic environment, making it an important symbol of Ma' anshan's industrial culture.

Figure 2-37:Three horse sculptures (self-portrait by the author)

Figure 2-38:Daikin Niu sculpture (self-shot by the author)

Figure 2-39:Sculpture of furnace workers (self-portrait by the author)

2.5 Summary of This Chapter

This chapter, grounded in the HUL theory, provides a comprehensive understanding and systematic analysis of the value of Ma 'anshan's urban heritage. It begins by tracing the development of Ma 'anshan through the lens of the steel industry, exploring its historical development across different periods. This process clarifies the spatial and temporal scope of value identification and identifies key factors influencing the value of urban heritage through element extraction. The site is evaluated from three dimensions—natural, material culture, and intangible cultural elements—to establish an overall understanding and preliminary value assessment, summarizing the current issues. From the perspective of natural environmental elements, it examines Ma' anshan's mountain-water layout, the mountain-water entity, and ecological corridors, analyzing how these natural elements interact with urban heritage to form a unique urban landscape. In terms of intangible elements, it focuses on planning heritage and significant historical events, highlighting their crucial role in shaping the city's identity and cultural heritage. The analysis of material elements includes industrial heritage and urban public facilities, deepening the understanding of Ma 'anshan's urban heritage value through detailed examination of these physical carriers. This chapter's multi-dimensional understanding of Ma' anshan's urban heritage value lays a solid foundation for subsequent value assessment and protection strategies.

Chapter III: Evaluation of Ma'anshan Urban Heritage Value Based on HUL Theory

3.1 Construction of a Hierarchical Evaluation System

3.1.1 Evaluation Method

This study primarily employs the Analytic Hierarchy Process (AHP) to quantify experts' judgments on the weights of indicators such as historical and cultural value and the current state of buildings. This is achieved through a hierarchical structure (goal layer - criterion layer - indicator layer). Consistency checks (CR < 0.1) are also conducted to ensure logical rigor, reduce subjective bias, and enhance the reliability of the evaluation results.

For data collection, a social survey method is used, combining in-depth interviews with structured questionnaires. The survey targets seven respondents, including urban planning experts, local residents of Ma'anshan, and veteran workers from the Ma'anshan Iron and Steel Company. The respondents are assigned different weights based on their professional backgrounds, as shown in Table 3-1.

Table 3-1: Respondents and Weights (Drawn by the Author)

Occupation	**Disciplinary Background**	**Number of People**	**Weight**
Urban Planning Bureau Staff	Urban Planning	2	1.2
Local Planning Experts from Ma'anshan	Urban Planning	2	1.0
Local Ordinary Residents of Ma'anshan	-	2	0.8
Veteran Workers from Ma'anshan Iron and Steel Company	-	1	0.8

Through an in-depth analysis of the components of Ma'anshan's urban heritage value and repeated comparisons of potential evaluation indicators, this study has established the core elements of the Ma'anshan urban heritage value evaluation system. These elements include scale, integrity, authenticity, clear boundaries, functional continuity, construction date, historical value, cultural value, social value, integration with the ecological environment, visual advantage, transportation connectivity, relevance to people's lives, and development

and utilization value. The hierarchical structure of the Ma'anshan urban heritage value evaluation system is ultimately clarified.

Based on the characteristics of natural and intangible elements, a five-point scale evaluation method is adopted. For tangible elements, which are more easily quantified precisely, a hundred-point scale evaluation method is used.

3.1.2 Evaluation Indicators

The determination of indicator weights is an essential part of constructing a comprehensive value evaluation system and a crucial step in the application of the Analytic Hierarchy Process (AHP) [Fu Yubing. Research on the Value Evaluation System of Sanxian Industrial Heritage in Sichuan [D]. Southwest University of Science and Technology, 2019.].

According to the evaluation model shown in Figure 4-1 and the standards set by the AHP, the importance of each indicator is scored by experts to assign values.

(1) Construction of the Judgment Matrix

This study first invited five industry experts to judge the importance of the evaluation indicators. The indicators were compared pairwise, and similar data provided by the experts were adopted to derive a judgment matrix that is unanimously recognized by the expert group.

Table 3-2: Judgment Matrix of the Criterion Layer Relative to the Goal Layer (Drawn by the Author)

	B1	**B2**	**B3**
B1	1	1/3	1/2
B2	3	1	2
B3	2	1/2	1

(2) Consistency Check

Based on the AHP calculation process, the values of the judgment matrix of the criterion layer relative to the goal layer are calculated as shown in the table below:

Table 3-3: Weights of the Criterion Layer (Drawn by the Author)

A	**Eigenvalue**	**Weight Value**	**Maximum Eigenvalue**	**CI Value**	**CR Value**
B1	0.491	0.164	3.009	0.005	0.009
B2	1.617	0.539			

B3	0.892	0.297			

Generally, the lower the CR value, the better the consistency of the judgment matrix. When the CR value is less than 0.1, the judgment matrix is considered to have passed the consistency check. Conversely, if the CR value is greater than 0.1, it indicates a lack of consistency in the matrix, and appropriate adjustments and re-analysis are required.

In this study, the CI value calculated for the 3rd-order judgment matrix is 0.005. The RI value obtained from the table is 0.520, resulting in a CR value of 0.009, which satisfies CR < 0.1. This indicates that the judgment matrix has passed the consistency check and the calculated weights are consistent.

The judgment matrix of the indicator layer relative to the criterion layer is shown in the table below:

Table 3-4: Judgment Matrix of Indicator Layer B1 Relative to the Criterion Layer (Drawn by the Author)

B1	**C1**	**C2**	**C3**	**C4**	**C5**
C1	1	2	1/2	3	4
C2	1/2	1	1/3	2	3
C3	2	3	1	4	5
C4	1/3	1/2	1/4	1	2
C5	1/4	1/3	1/5	1/2	1

Table 3-5: Weights of Indicator Layer B1 (Drawn by the Author)

B1	**Eigenvalue**	**Weight Value**	**Maximum Eigenvalue**	**CI Value**	**CR Value**
C1	1.309	0.262	5.068	0.017	0.015
C2	0.805	0.161			
C3	2.081	0.416			
C4	0.493	0.099			

C5	0.312	0.062			

In this study, the CI value calculated for the 5th-order judgment matrix is 0.017. The RI value obtained from the table is 1.120, resulting in a CR value of 0.015, which satisfies CR < 0.1. This indicates that the judgment matrix has passed the consistency check and the calculated weights are consistent.

Table 3-6: Judgment Matrix of Indicator Layer B2 Relative to the Criterion Layer (Drawn by the Author)

B2	**C6**	**C7**	**C8**	**C9**
C6	1	1/2	2	3
C7	2	1	3	4
C8	1/2	1/3	1	2
C9	1/3	1/4	1/2	1

Table 3-7: Weights of Indicator Layer B2 (Drawn by the Author)

B2	**Eigenvalue**	**Weight Value**	**Maximum Eigenvalue**	**CI Value**	**CR Value**
C6	1.109	0.277	4.031	0.010	0.012
C7	1.863	0.466			
C8	0.644	0.161			
C9	0.384	0.096			

In this study, the CI value calculated for the 4th-order judgment matrix is 0.010. The RI value obtained from the table is 0.890, resulting in a CR value of 0.01.

Table 3-8: Judgment Matrix of Indicator Layer B3 Relative to the Criterion Layer (Drawn by the Author)

B3	**C10**	**C11**	**C12**	**C13**	**C14**
C10	1	2	3	4	1
C11	1/2	1	2	3	1/2

C12	1/3	1/2	1	2	1/3
C13	1/4	1/3	1/2	1	1/4
C14	1	2	3	4	1

Table 3-9: Weights of Indicator Layer B3 (Drawn by the Author)

B3	Eigenvalue	Weight Value	Maximum Eigenvalue	CI Value	CR Value
C10	1.593	0.319	5.036	0.009	0.008
C11	0.921	0.184			
C12	0.550	0.110			
C13	0.343	0.069			
C14	1.593	0.319			

In this study, the CI value calculated for the 5th-order judgment matrix is 0.009. The RI value obtained from the table is 1.120, resulting in a CR value of 0.008, which satisfies CR < 0.1. This indicates that the judgment matrix has passed the consistency check and the calculated weights are consistent.

(3) Calculation Results

Based on the calculation results, the comprehensive evaluation system and weights for Ma'anshan's urban heritage are shown in Table 4-9:

Table 3-10: Comprehensive Evaluation System and Weights of Ma'anshan Urban Heritage (Drawn by the Author)

Goal Layer	Criterion Layer	Weight	Indicator Layer	Weight	Overall Weight	Ranking
A. Urban Historical Landscape Value Evaluation System	B1. Protection Status	0.164	C1. Scale	0.262	0.043	9
			C2. Integrity	0.161	0.026	11
			C3. Authenticity	0.416	0.068	6

			C4. Clear Boundaries	0.099	0.016	13
			C5. Function	0.062	0.010	14
	B2. Intrinsic Value	0.539	C6. Historical Span	0.277	0.149	2
			C7. Historical Value	0.466	0.251	1
			C8. Cultural Value	0.161	0.087	5
			C9. Social Value	0.096	0.052	8
	B3. Urban Integration	0.297	C10. Ecological Connection	0.319	0.094	4
			C11. Visual Advantage	0.184	0.055	7
			C12. Connectivity	0.110	0.033	10
			C13. Public Participation	0.069	0.020	12
			C14. Sustainable Potential	0.319	0.095	3

3.1.3 Evaluation Process

After determining the weights of each factor in the Ma'anshan urban heritage evaluation index system using the Analytic Hierarchy Process (AHP) and the Delphi method, the next step is to assign values to the evaluation objects. This study employs a combined evaluation method of expert scoring and fuzzy integral, aiming to comprehensively consider the views of multiple experts and community representatives. During the evaluation process, each expert and representative will score each heritage resource on the checklist of Ma'anshan's old urban area. By combining the weights to calculate the average value, a relatively accurate evaluation result can be obtained. This method can comprehensively assess the value of heritage sites and fully consider the importance of each factor in the evaluation process. The Fishbein-Rosenberg mathematical model is used to calculate the scores of each heritage site to derive the final evaluation results. The formula for calculating the comprehensive score is:

$$E = \sum_{i=1}^{n} Q_i P_i \#(i)$$

In the formula, \(E \) represents the comprehensive score of the heritage site; \(Q_i \) is the weight coefficient, ranging from 0 to 1, reflecting the relative importance of the evaluation factor; \(P \) represents the value of the evaluation factor, ranging from 0 to 100, reflecting the specific performance of the factor; \(n \) is the total number of evaluation factors, which is 14 in this study (\(n = 14 \)). By multiplying the weight coefficient of each evaluation factor by its value and summing them up, the comprehensive score \(E \) of the heritage site can be calculated.

3.2 Evaluation of Natural Environmental Elements

3.2.1 Selection of Evaluation Elements

Since the urban landscape pattern of mountains and waters has essentially taken shape, the natural environmental elements involved in the evaluation include the core natural elements that influence the urban landscape pattern of Ma'anshan, such as the Yu Mountain Lake, Yu Mountain, and Jia Mountain. These elements collectively constitute the unique urban landscape of Ma'anshan.

Yu Mountain Lake, located in the city center, communicates with the Yangtze River through the Yu Mountain River. With a water area of 1,087 acres, it is a core component of Ma'anshan's landscape of mountains and waters. Together with the North Lake, it forms the urban central water system network. Yu Mountain and Jia Mountain are located on the east and west sides of Yu Mountain Lake, respectively, creating a unique feature that integrates natural and urban landscapes. Ma'anshan is a small mountain along the river in the Jinjiazhuang area and is one

of the birthplaces of Ma'anshan's mining and smelting culture.

Therefore, this paper selects Yu Mountain Lake, Yu Mountain, Jia Mountain, Ma'anshan, and the "Yu Mountain Lake - North Lake" landscape corridor as the evaluation objects.

3.2.2 Natural Elements

Yu Mountain Lake Evaluation:

Table 3-11: Evaluation of Yu Mountain Lake (Drawn by the Author)

Evaluation Indicator		Score	Key Issues
Protection Status B1	C1. Scale	5	The lake is vast and serves as the "urban green heart" of Ma'anshan.
	C2. Integrity	4	The water body is intact, but there are local siltation issues.
	C3. Authenticity	3	Historical sculptures are preserved, but some traditional landscape elements are weakened.
	C4. Boundary Clarity	4	The legal protection zone is clear, but there are conflicts between surrounding commercial development and ecological protection.
	C5. Function	5	It is the core for citizens' leisure, with high usage frequency and strong functional compatibility.
Intrinsic Value B2	C6. Historical Span	4	It has witnessed over 60 years of urban development.
	C7. Historical Value	3	It carries the collective memory of citizens but is not directly related to major historical events.
	C8. Cultural Value	4	Rich intangible cultural heritage, but underdeveloped.

Urban Integration B3	C9. Social Value	5	It is a "city living room" shared by generations, with high citizen recognition.
	C10. Ecological Connection	4	It connects to the Yangtze River water system, but the green space network is fragmented.
	C11. Perceptual Significance	5	The landmark landscape formed by the lakeside smoke willows and sculpture groups has a prominent visual corridor effect.
	C12. Connectivity	4	The internal trails are connected, but the external transportation linkage with emerging cultural and tourism areas is weak.
	C13. Public Participation	5	High citizen participation.
	C14. Sustainable Potential	4	An important natural landscape and ecological resource with great potential for sustainable development.

Yu Mountain Evaluation:

Table 3-12: Evaluation of Yu Mountain (Drawn by the Author)

Evaluation Indicator		**Score**	**Key Issues**
Protection Status B1	C1. Scale	4	It covers a large area and serves as the core ecological barrier of the city, but there are sporadic construction sites on the eastern foothills.
	C2. Integrity	4	High forest coverage, but local ecosystems are fragmented.
	C3. Authenticity	5	The core area retains the original secondary forest and intact habitats for endemic species.

Intrinsic Value B2	C4. Boundary Clarity	3	There are private vegetable plots at the boundary with residential areas on the southern foothills.
	C5. Function	4	It functions for water conservation, citizen leisure, and scientific monitoring.
	C6. Historical Span	4	Its cultural history can be traced back to the legends of the Southern Dynasties.
	C7. Historical Value	3	It was a military lookout point in the Ming and Qing dynasties and a guerrilla base during the War of Resistance against Japan, but it is not included in the core narrative of major historical events.
	C8. Cultural Value	5	"Yu Mountain Red Leaves" is one of the ten scenic spots of Ma'anshan.
	C9. Social Value	5	High citizen recognition and a landmark for public health.
	C10. Ecological Connection	4	It connects to Yu Mountain Lake through greenways, but the ecological corridor is not fully connected to the Yangtze River.
Urban Integration B3	C11. Perceptual Significance	4	The main peak observation deck offers panoramic views of the city, but the mountain skyline is cut by new high-rise buildings.
	C12. Connectivity	3	The main entrance has convenient public transportation, but the connection with the urban slow traffic system is insufficient.
	C13. Public Participation	5	Annual public welfare activities are held.
	C14.	4	Significant carbon sequestration capacity and

	Sustainable Potential		great potential for sustainable development.

From the evaluation results, Yu Mountain, as one of the core urban ecological and cultural elements, has superior ecological conditions, high cultural value, and active public participation.

Jia Mountain Evaluation:

Table 3-13: Evaluation of Jia Mountain (Drawn by the Author)

Evaluation Indicator		**Score**	**Key Issues**
Protection Status B1	C1. Scale	4	Jia Mountain covers a large area, but there are sporadic development plots around.
	C2. Integrity	3	The vegetation on the main peak is in good condition, but early quarrying activities caused local ecological damage on the north side of the mountain.
	C3. Authenticity	4	The core area retains the original secondary forest and endemic species, but the trails are overly artificial.
	C4. Boundary Clarity	3	The protection zone boundary is unclear, with some areas interwoven with residential areas and illegal cultivation.
	C5. Function	4	It functions for ecological conservation, citizen leisure, and science popularization.
Intrinsic Value B2	C6. Historical Span	3	Cultural history can only be traced back to the Ming and Qing dynasties.
	C7. Historical Value	3	It was an ancient military lookout point but is not included in the narrative of major historical events.
	C8. Cultural Value	4	"Jia Mountain Clear Mist" is one of the eight ancient scenic spots of Ma'anshan, with rich

			poetry and stele inscriptions, but the intangible cultural heritage stories are not widely spread.
	C9. Social Value	5	High citizen recognition, frequent social group activities, and a landmark for public fitness.
	C10. Ecological Connection	4	It connects to Yu Mountain Lake through greenways.
	C11. Perceptual Significance	4	The main peak observation deck offers panoramic views of the city, but the mountain skyline is blocked by new high-rise buildings.
Urban Integration B3	C12. Connectivity	3	The main entrance has dense bus routes, but the west side lacks shuttle facilities and the connection with the urban slow traffic system is not smooth.
	C13. Public Participation	5	The annual "Jia Mountain Environmental Protection Mountain Climbing Competition" is held with high citizen participation.
	C14. Sustainable Potential	4	Rich natural resources and good potential for sustainable development.

From the evaluation results, Jia Mountain has a good ecological foundation and is an ecological core carrier of the city. It has prominent social value and high public participation, and there is a need to further explore its history.

3.2.3 Landscape Corridor

The Yu Mountain Lake - South Lake - North Lake landscape corridor is the most important landscape corridor within the scope of this study. The evaluation results are as follows:
Table 3-14: Evaluation of the Yu Mountain Lake - South Lake - North Lake Landscape Corridor (Drawn by the Author)

Evaluation Indicator		Score	Key Issues
Protection Status B1	C1. Scale	4	The corridor links Yu Mountain Lake, Nanjiadian Wetland, and Xuejiawa Ecological Park, covering a large area.
	C2. Integrity	4	An important ecological link, connecting multiple ecological patches.
	C3. Authenticity	3	Native wetland vegetation is preserved, but some trails are overly hardened, and artificial revetments are prevalent.
	C4. Boundary Clarity	5	Included in the municipal blue line control scope, with legally defined protection zones and clear development boundaries.
Intrinsic Value B2	C5. Function	4	It serves for biological migration, rainwater regulation, and citizen leisure.
	C6. Historical Span	4	It has witnessed the entire process of the city's transition from industrial expansion to ecological transformation.
	C7. Historical Value	3	It carries the collective memory of citizens but is not associated with major historical events.
	C8. Cultural Value	5	Rich in historical relics, it is an important witness to the city's development.
	C9. Social Value	5	An ideal venue for various cultural activities, with high citizen recognition.
Urban Integration B3	C10. Ecological Connection	4	It connects the Yangtze River with urban inland rivers.
	C11.	5	Rich in natural resources, with beautiful

Perceptual Significance		ecological landscapes.
C12. Connectivity	3	The slow traffic system is well-developed, but inter-district public transportation connections are insufficient, and linkage with the high-speed rail station is weak.
C13. Public Participation	5	Closely related to citizens' lives, with high public participation.
C14. Sustainable Potential	4	The ecosystem is healthy and stable, capable of driving economic growth in surrounding areas.

From the evaluation results, it can be seen that the Yu Mountain Lake - South Lake - North Lake landscape corridor has complete ecological functions and prominent cultural value, and is closely related to the lives of citizens.

3.3 Evaluation of Intangible Elements

3.3.1 Spatial Pattern of the District

The essence of planning heritage evaluation is to establish a dynamic balance between historical authenticity and contemporary applicability, examining the number of historical stages that planning heritage spans and their continuity, as well as the innovativeness and technological innovation of planning systems. The planning ideas of Ma'anshan and their evolution profoundly reflect the transformation of Chinese resource-based cities from industrial-driven to ecology-first and regional coordination. The accumulative characteristics of planning heritage become an important carrier for interpreting the logic of urban development. For the important component of planning heritage, the urban spatial pattern, the protection status in the evaluation system of Table 2-4 can be used for evaluation. Through the evaluation system, the multi-dimensional value of planning heritage can be systematically diagnosed.

As the birthplace of Ma'anshan's industrial civilization and a typical representative of workers' communities during the planned economy period, the protection practice of the Jinjiazhuang District faces multiple challenges of industrial heritage revitalization, historical memory inheritance, and community function renewal. The evaluation is as follows:

Table 3-15: Evaluation of the Protection of Planning Heritage in Jinjiazhuang District (Drawn by the Author)

Evaluation Indicator		**Score**	**Key Issues**
Protection Status B1	C1. Scale	4	The core area is well-preserved, reflecting the early appearance of the industrial city.
	C2. Integrity	4	The urban texture is basically retained.
	C3. Authenticity	3	Historical traces are preserved, but some modern renovations have taken place.
	C4. Boundary Clarity	4	The legal protection zone is clearly defined.
	C5. Function	4	Leisure functions are well-suited, but composite development is insufficient.
Intrinsic Value B2	C6. Historical Span	5	It fully reflects the 70-year history of industrial city development.
	C7. Historical Value	5	Birthplace of the steel industry + carrier of revolutionary culture.
	C8. Cultural Value	4	Industrial aesthetic symbols are clear, but intangible cultural heritage exploration is insufficient.
	C9. Social Value	4	High citizen recognition, but insufficient youth participation.
Urban Integration B3	C10. Ecological Connection	3	Partial linkage along the riverfront corridor, but internal fragmentation.
	C11. Perceptual Significance	4	Prominent landmark nodes, but low skyline recognizability.
	C12. Connectivity	3	Good internal accessibility, but weak

			external transportation connections.
	C13. Public Participation	4	Low participation in decision-making.
	C14. Sustainable Potential	4	Solid foundation but insufficient innovation.

The Yu Mountain Lake District, as the ecological core and urban cultural salon of Ma'anshan City, reflects the deep integration of ecological restoration, functional renewal, and cultural inheritance in its protection practice. In the future, it is necessary to further balance protection and development, strengthen the inheritance of cultural memory and technological empowerment, and promote the efficient transformation of ecological value into economic and social benefits. The evaluation is as follows:

Table 3-16: Evaluation of the Protection of Planning Heritage in Yu Mountain Lake District (Drawn by the Author)

Evaluation Indicator		**Score**	**Key Issues**
Protection Status B1	C1. Scale	5	Covers the historical urban area and Yu Mountain Lake, reflecting the characteristics of the industrial city.
	C2. Integrity	3	Good ecological restoration, but aging of historical buildings.
	C3. Authenticity	3	Some building renovations have led to a loss of authenticity.
	C4. Boundary Clarity	4	The legal protection zone is clearly defined.
	C5. Function	4	Strong composite functionality, but lack of cultural and tourism integration.
Intrinsic Value B2	C6. Historical Span	4	Witnesses industrial construction, urban development, and ecological transformation, but historical exploration is insufficient.

	C7. Historical Value	4	Carries the memory of the industrial city, but lacks association with major historical events.
	C8. Cultural Value	4	Historical architectural styles integrated with ecology, but insufficient intangible cultural heritage revitalization.
	C9. Social Value	5	High citizen participation and strong social recognition.
	C10. Ecological Connection	4	Rich in ecological resources, but the green space system is incomplete.
	C11. Perceptual Significance	3	Prominent park landmarks, but low urban appearance recognizability.
Urban Integration B3	C12. Connectivity	3	Park trails are connected, but walking connections between the city and facilities are inconvenient.
	C13. Public Participation	5	High adoption of public suggestions, mature self-governance mechanisms.
	C14. Sustainable Potential	5	Great potential for sustainable development.

3.3.2 Major Historical Events

The major historical events of Ma'anshan's steel industry constitute a core value dimension of the city's industrial heritage. Their evaluation needs to be conducted from three perspectives: material preservation, memory inheritance, and functional revitalization.

The value of major historical events has a significant spatiotemporal anchor effect. Between 1953 and 2023, 15 major milestones were formed, such as Chairman Mao's inspection in 1958, the breakthrough in wheel production in 1964, and the company's listing in 1993. On average, a milestone event occurred every 4.7 years, forming the "spatiotemporal annual rings" of industrial evolution. Meanwhile, six core relics, such as Blast Furnace No. 9 and the old site of the Wheel Rim Factory, have been completely preserved, becoming physical anchors of

industrial memory. However, there are local breaks in the narrative chain. Four event spaces, such as the site where Deng Xiaoping argued for the location of the Wheel Rim Factory and the listing bell-ringing hall in 1993, have been demolished, making some industrial decision-making logic invisible.

Table 3-17: Evaluation of Major Historical Events (Drawn by the Author)

Evaluation Indicator		**Score**	**Key Issues**
Protection Status B1	C1. Scale	5	Covers multiple key nodes over 70 years, but some events lack physical carriers.
	C2. Integrity	4	Six sites, including Mao Zedong's inspection of the blast furnace, are preserved, but the decision-making scene of the wheel rim factory by Deng Xiaoping has disappeared, breaking the narrative chain.
	C3. Authenticity	3	The original site of Blast Furnace No. 9 is well-protected, but some historical information has been lost during renovation.
	C4. Boundary Clarity	5	Only the route of Mao Zedong's inspection is designated as a protection zone; other event spaces are not legally defined.
Intrinsic Value B2	C5. Function	4	Low completion rate of themed corridors, insufficient transformation into cultural and tourism attractions.
	C6. Historical Span	5	Fully witnesses the 70-year development history.
	C7. Historical Value	5	Symbolizes the spirit of hard struggle and independent innovation.
	C8. Cultural Value	4	Forms a "steel aesthetic" symbol system.
	C9. Social	5	Citizen recognition rate of 93%, good

	Value		intergenerational transmission.
	C10. Ecological Connection	3	Major historical events can promote ecological protection.
	C11. Perceptual Significance	5	Significant social impact.
Urban Integration B3	C12. Connectivity	3	Lacks themed routes connecting to emerging cultural and tourism areas.
	C13. Public Participation	5	Active public participation in commemorative activities.
	C14. Sustainable Potential	3	Can play a certain role in promoting social sustainable development.

It can be seen that the value of major historical events (Chairman Mao's inspection of Ma'anshan Iron and Steel) can empower urban renewal, achieving the transformation from "historical memory" to "future momentum." However, there are limitations in cultural and tourism development. The existing themed corridor for Mao Zedong's inspection is short, and the proportion of young visitors is insufficient.

3.3.3 Ma'anshan Iron and Steel Spirit

The Ma'anshan Iron and Steel Spirit, as a core element of Ma'anshan's urban culture, needs to break through the traditional framework of material heritage evaluation and build a multi-dimensional assessment system covering the connotation of the spirit, inheritance efficiency, and social recognition. According to the evaluation system of this paper, each indicator is transformed into an assessment dimension suitable for intangible elements.

Scale (C1): The influence range of the Ma'anshan Iron and Steel Spirit, such as the covered population and the breadth of dissemination.

Integrity (C2): Whether the connotation of the Ma'anshan Iron and Steel Spirit is completely preserved, and whether there is any omission or misinterpretation.

Authenticity (C3): Whether the core value of the Ma'anshan Iron and Steel Spirit remains authentic and has not been overly commercialized or distorted.

Boundary Clarity (C4): Whether the dissemination scope and definition of the Ma'anshan Iron and Steel Spirit are clear, and whether there is any generalization or ambiguity.
unctional Continuity (C5): The actual application and inheritance effect of the Ma'anshan Iron and Steel Spirit in modern society.
The evaluation results are as follows:
Table 3-18: Evaluation of the Protection Status of the Ma'anshan Iron and Steel Spirit (Drawn by the Author)

Evaluation Indicator		**Score**	**Key Issues**
Protection Status B1	C1. Scale	5	Runs through the entire process of urban development.
	C2. Integrity	4	The core values are completely inherited, but there are generational differences in the cognition of the youth group.
	C3. Authenticity	4	Core rituals are preserved, but the integration of the spirit in the new era needs to be deepened.
	C4. Boundary Clarity	5	The government has clearly included it in the urban cultural strategy, with clear definitions in policy documents.
	C5. Function	4	Supports industrial transformation and social governance, but international dissemination needs to be enhanced.
Intrinsic Value B2	C6. Historical Span	5	Runs through the 70-year development history of the city.
	C7. Historical Value	5	Symbolizes the milestone of national industrial independent innovation.
	C8. Cultural Value	4	Forms a composite cultural symbol of "red gene + craftsmanship + ecological ethics."
	C9. Social Value	5	High citizen recognition.

Urban Integration B3	C10. Ecological Connection	4	Drives ecological restoration and carbon reduction actions in the factory area.
	C11. Perceptual Significance	5	The visualization of the spirit can become a cultural landmark of the city.
	C12. Connectivity	3	Deeply rooted in the urban historical development context, closely connected with the urban spirit.
	C13. Public Participation	5	Annual activities such as torch relay and skills competition are held, with high public participation.
	C14. Sustainable Potential	4	As the core of corporate culture, it leads the development direction of the enterprise.

This evaluation shows that the Ma'anshan Iron and Steel Spirit has been sublimated from industrial memory to urban genes. It has outstanding historical value, high citizen participation, and strong social mobilization power.

3.4 Evaluation of Tangible Elements

3.4.1 Evaluation Criteria

Experts in the relevant fields and community representatives scored the tangible elements of the heritage [Huang Wandie. Research on the Protection and Renewal of Sanxian Industrial Heritage in the Fujiang River Basin Based on GIS Technology [D]. Southwest University of Science and Technology, 2023.]. The scoring levels are divided into five grades: 0-20 points, 20-40 points, 40-60 points, 60-80 points, and 80-100 points. The scoring criteria for tangible element indicators are shown in Table 3-19.

Table 3-19: Scoring Criteria for the Value of Ma'anshan Urban Heritage (Drawn by the Author)

Indicator	**Scoring Criteria/Points**
Scale (C1)	0-20: Extremely small individual scale

	20-40: Small individual scale 40-60: General scale group 60-80: Large scale group 80-100: Macro-scale complete group
Integrity (C2)	0-20: Severe damage to buildings/structures 20-40: Partial damage to buildings/structures 40-60: Main structure basically intact 60-80: Few components missing 80-100: Complete preservation of original form
Authenticity (C3)	0-20: Complete change in materials and structure 20-40: Major changes in main components 40-60: Partial component replacement 60-80: Few non-structural components updated 80-100: Complete retention of original design
Boundary Clarity (C4)	0-20: No clear spatial boundary 20-40: Vague and unrecognizable boundary 40-60: Partially recognizable boundary 60-80: Basically clear boundary 80-100: Clear spatial definition
Functional Continuity (C5)	0-20: Complete change of original function 20-40: Only decorative function retained 40-60: Partial space retains old function 60-80: Main function continues 80-100: Complete retention of original function
Construction Date (C6)	0-20: Built after 1990 20-40: 1970s-1990s 40-60: 1950s-1970s 60-80: 1930s-1950s 80-100: Built before 1930
Historical Value (C7)	0-20: No historical association 20-40: Involves ordinary historical figures/events

	40-60: Witnesses industry development 60-80: Associated with important historical events 80-100: Carries significant historical process
Artistic and Technical Value (C8)	0-20: No special technical features 20-40: Ordinary technical features 40-60: Reflects regional technical characteristics 60-80: Displays unique construction techniques 80-100: Outstanding artistic innovation
Social Value (C9)	0-20: No social impact 20-40: Affects original unit staff 40-60: Affects specific industry groups 60-80: Impacts multiple urban development fields 80-100: Has national social impact
Ecological Integration (C10)	0-20: Conflicts with the natural environment 20-40: Minimal greening 40-60: Coordinates with surrounding landscapes 60-80: Forms characteristic landscape nodes 80-100: Constitutes part of the ecosystem
Visual Advantage (C11)	0-20: Completely obscured and invisible 20-40: Partially visible but no scenic value 40-60: Some features can be observed 60-80: Forms a regional visual focus 80-100: Constitutes an important element of the urban skyline
Transportation Connectivity (C12)	0-20: No accessibility 20-40: Accessible only by foot 40-60: Bus stops but far away 60-80: Convenient by subway/bus 80-100: Seamless connection with multiple transportation modes
Relevance to People's	0-20: Completely detached from residents' lives

Lives (C13)	20-40: Occasionally used by a minority group 40-60: Provides basic service functions 60-80: Becomes a daily activity venue 80-100: Constitutes a core element of residents' identity
Development and Utilization Value (C14)	0-20: No potential for renovation and utilization 20-40: Suitable for low-efficiency use such as storage 40-60: Suitable for cultural display functions 60-80: Has commercial development value 80-100: Has multidimensional composite development potential

Due to limitations of human and material resources, the study selected four projects that have been included in the renewal and transformation plan for evaluation: Ma'anshan Iron and Steel (Masteel) Headquarters, Workers' New Village, Ma'anshan Hotel, and the Old Gymnasium.

3.4.2 Industrial Heritage

Ma'anshan Iron and Steel (Masteel) Headquarters:

The Ma'anshan Iron and Steel (Masteel) Headquarters is the former location of the headquarters during the period when Ma'anshan Iron and Steel Company was advancing the construction of a joint steel enterprise. It is a key place that gathers the historical memories of the old Ma'anshan Iron and Steel workers. The evaluation results are as follows:

Table 3-20: Indicator Evaluation of Ma'anshan Iron and Steel Headquarters (Drawn by the Author)

Criterion Layer	**Indicator Layer**	**Score (0-100)**	**Weight**	**Weighted Score**	**Scoring Basis**
Protection Status (B1)	C1 Scale	82	0.043	3.53	The building complex covers an area of 1.2 hectares. The group is intact, but some parts are not included in the protection scope.

	C2 Integrity	85	0.026	2.21	The main structure is in good condition, but door and window repairs need to be strengthened.
	C3 Authenticity	88	0.068	6.00	The 1960s red brick exterior is preserved, and the restoration techniques comply with tradition.
	C4 Boundary Clarity	90	0.016	1.44	The walls are complete, and the historical factory boundary is clear.
	C5 Function	70	0.010	0.70	The function is single，and the potential for revitalization has not been released.
Intrinsic Value (B2)	C6 Historical Span	95	0.149	14.16	Built in 1963, it is a typical industrial building style of the planned economy period.
	C7 Historical Value	92	0.251	23.09	The decision-making center of Ma'anshan Iron and Steel Group, witnessing the development of China's steel industry.
	C8 Cultural	80	0.087	6.96	The building facade

	Value				reflects industrial aesthetics, but the details are not fully displayed.
	C9 Social Value	78	0.052	4.06	Citizens recognize its symbolic significance, but there is a lack of interactive space.
Urban Integration (B3)	C10 Ecological Connection	65	0.094	6.11	Insufficient landscape permeability with Yu Mountain.
	C11 Perceptual Significance	68	0.055	3.74	The building facade is visible from the main road, but there is a lack of iconic viewing nodes.
	C12 Connectivity	72	0.033	2.38	The subway station is 1.2 km away, and the shuttle transportation needs to be optimized.
	C13 Public Participation	60	0.020	1.20	Included in cultural tour routes, but not integrated into residents' daily activities.
	C14 Sustainable Potential	85	0.095	8.08	Potential for transformation into a cultural and creative complex, but slow progress in attracting investment.

Total Score	84.00

Table 3-21: Indicator Evaluation of Workers' New Village (Drawn by the Author)

Criterion Layer	**Indicator Layer**	**Score (0-100)**	**Weight**	**Weighted Score**	**Scoring Basis**
Protection Status (B1)	C1 Scale	70	0.043	3.01	It has a certain scale, and the group is intact, but some parts are not included in the protection scope.
	C2 Integrity	65	0.026	1.69	The spatial form of "bar buildings + public courtyard" is intact, but some areas are affected by surrounding construction.
	C3 Authenticity	60	0.068	4.08	Some architectural elements such as red brick structures are authentically preserved, but many building facades have been repainted and renovated, affecting historical authenticity.
	C4	68	0.016	1.09	The original

	Boundary Clarity				boundary has some remaining markers, but some blocks have been rebuilt and surrounding construction has made the boundary less clear.
	C5 Function	62	0.010	0.62	It is still a residential community, but the function isunitary，lacking vitality.
Intrinsic Value (B2)	C6 Historical Span	90	0.149	13.41	Built in the 1960s, it has typical characteristics of the era.
	C7 Historical Value	88	0.251	22.09	It is a representative of the first batch of workers' villages in New China, reflecting the living patterns and social forms of the time.
	C8 Cultural Value	75	0.087	6.53	The red brick structure, double-slope roof, and axisymmetric

					layout are characteristic, but the overall craftsmanship and artistic level are average, and some characteristic elements have been destroyed by later renovations.
	C9 Social Value	85	0.052	4.42	It is a carrier of workers' collective life memories, but there is a lack of effective publicity and promotion.
Urban Integration (B3)	C10 Ecological Connection	60	0.094	5.46	The community has little green space and is not closely connected to the surrounding natural ecology.
	C11 Perceptual Significance	60	0.055	3.30	The building facade is visible from the main road, but there is a lack of iconic viewing nodes.
	C12 Connectivity	65	0.033	2.15	Inconvenient public transportation

					connections, and the traffic accessibility needs to be improved.
	C13 Public Participation	78	0.020	6.65	As a residential community, it is closely related to residents' lives, but there is a lack of integration with modern urban commercial and recreational functions.
	C14 Sustainable Potential	70	0.095	8.08	It has certain potential for transformation, such as adding community services and cultural display functions.
Total Score				74.03	

3.4.3 Other Public Facilities in the City

The Ma'anshan Iron and Steel (Masteel) Hotel was originally established in 1972 as the office for training foreign interns in Ma'anshan City. It was later renovated and upgraded to a three-star foreign-related hotel. The hotel covers an area of 18,000 square meters. The evaluation results are as follows:

Table 3-22: Indicator Evaluation of Ma'anshan Iron and Steel Hotel (Drawn by the Author)

Criterion	**Indicator**	**Score**	**Weight**	**Weigh**	**Scoring Basis**

Layer	Layer	(0-100)		ted Score	
Protection Status (B1)	C1 Scale	80	0.043	3.44	The building is relatively large in scale, but there is inefficient use of surrounding plots.
	C2 Integrity	70	0.026	1.82	The main building is well-preserved, but the surrounding plots are used in a disorderly manner, which somewhat damages the overall appearance.
	C3 Authenticity	65	0.068	4.42	The building itself has a certain degree of historical authenticity, but subsequent renovations and changes in the surrounding environment have affected the original appearance.
	C4 Boundary Clarity	60	0.016	0.96	The boundary between the hotel and the surrounding areas is relatively clear, but the surrounding walls hinder the connection with the green space on the west bank of the lake.

	C5 Function	75	0.010	0.75	It still operates as a hotel, with good functional continuity, but lacks diversity and vitality.
Intrinsic Value (B2)	C6 Historical Span	85	0.149	12.67	Built in 1972, it has witnessed the historical stages of Ma'anshan's industrial development and foreign exchanges.
	C7 Historical Value	90	0.251	22.59	It is the site where Ma'anshan Iron and Steel received national leaders and other significant events.
	C8 Cultural Value	70	0.087	6.09	The overall building is relatively ordinary in artistic value, lacking uniqueness and prominent aesthetic features.
	C9 Social Value	80	0.052	4.60	It has certain social and emotional value for Ma'anshan Iron and Steel workers and local residents, but its influence on a broader social group is limited.
Urban Integration (B3)	C10 Ecological Connection	60	0.094	5.46	Adjacent to the west bank of the lake, it has certain ecological

					advantages, but the walls hinder the continuity of the green space on the lake's west bank.
	C11 Perceptual Significance	65	0.055	3.58	The overall appearance is not prominent, and its contribution to the urban landscape is limited.
	C12 Connectivity	60	0.033	1.98	It is close to the main road, but the presence of dead-end roads leads to poor traffic flow.
	C13 Public Participation	65	0.020	1.30	It mainly operates as a hotel, with limited impact on the lives of surrounding residents.
	C14 Sustainable Potential	75	0.095	7.13	It has certain potential for renovation and development, and can be transformed into a multi-functional complex integrating culture, tourism, and commerce.
Total Score				75.33	

3.5 Summary of This Chapter

Ma'anshan's urban heritage, as a crucial element in the modernization process, not only

carries a profound historical legacy but also encompasses rich cultural connotations and testimonies to technological development. Based on the Historic Urban Landscape (HUL) theory, this chapter constructs a systematic hierarchical evaluation system for the value of Ma'anshan's urban heritage. It thoroughly analyzes the value of natural environmental elements, including the landscape and corridor values of mountains and waters; the value of intangible elements, such as spatial patterns, major historical events, and the Ma'anshan Iron and Steel spirit; and the value of tangible elements, including industrial heritage and other public facilities. By employing diversified evaluation criteria and methods, the comprehensive value of Ma'anshan's urban heritage is systematically quantified and assessed. This evaluation system aims to provide a solid and reliable basis for subsequent protection and renewal strategies. The establishment of this evaluation system offers scientific theoretical support and practical guidance for the heritage protection work in Ma'anshan.

4.1 Restoration and Enhancement of Natural Landscape

4.1.1 Problem Identificatio

Figure 4-1: Current Landscape Pattern of Mountains and Waters (Co-Drawn by the Author)

Yu Mountain Lake, Jia Mountain, and Yu Mountain form the unique landscape pattern of Ma'anshan City. However, the urbanization process has caused damage to the natural landscape, resulting in a decline in spatial experience. The construction of enclosed residential areas has severed the connection with nature, weakening the connectivity and accessibility of the landscape. Insufficient integration of landscape resources, outdated park facilities, and incomplete lighting and signage systems have all had a negative impact on the experience of citizens. To address these issues, a series of measures are urgently needed, including but not limited to increasing open space, enhancing visual permeability, updating and improving supporting facilities, and optimizing transportation planning to improve the overall experience quality for citizens and tourists.

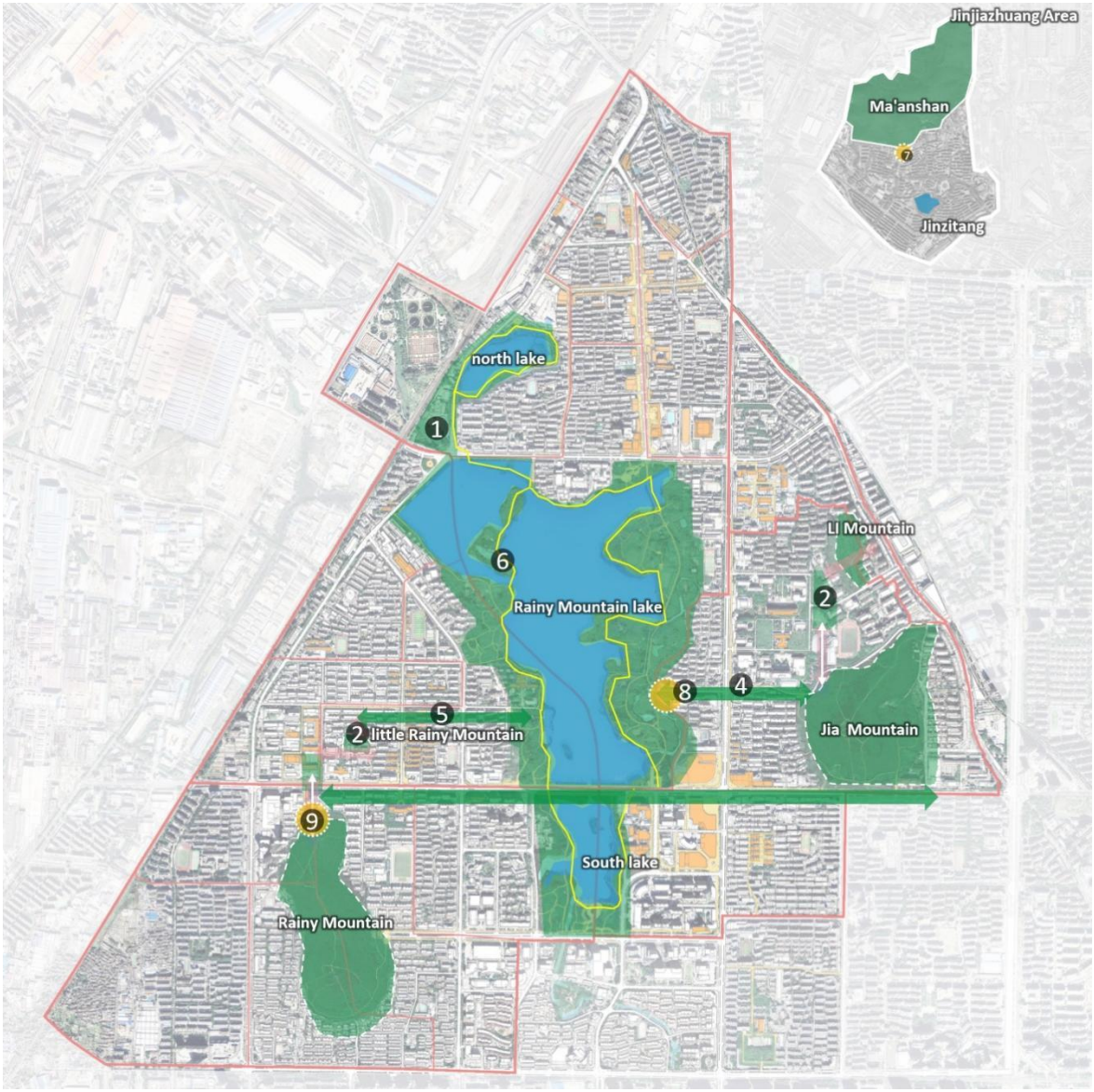


Figure 4-2: Spatial Diagram of the Overall Protection Structure of Mountains and Waters (Co-Drawn by the Author)

4.1.2 Blue-Green Weaving

The protection of natural environmental heritage in the Ma'anshan area should rely on its unique landscape pattern of mountains and waters, combined with an integrated protection concept, and implement targeted patch restoration strategies.

According to the initial research, citizens have a high sense of identity with the regional landscape environment, location, cultural and tourism resources, and historical accumulation, and have given high recognition to the environmental value of the "two mountains and one lake." Partial dredging of Yu Mountain Lake and optimization of the lakeside walking paths; removal of cyanobacteria pollution in South Lake and North Lake, and strengthening the connectivity of the water areas of Yu Mountain Lake, South Lake, and North Lake. Yu Mountain,

Jia Mountain, and Ma'anshan need to maintain ecological functions and avoid overdevelopment (C2). Lishan and Xiaoyushan should undergo ecological restoration, with Lishan being developed into an ecological park and Xiaoyushan into a pocket park.

Table 4-1: Protection and Inheritance Strategies for the Natural Landscape (Drawn by the Author)

Name		**Protection and Inheritance Strategies**
Lakes	Yu Mountain Lake	Open up visual corridors, control commercial density at the east gate to ≤30%, and add ecological buffer zones around the lake.
	North Lake	Include in the comprehensive water system management, strictly control pollution discharge, and add ecological walking paths and bus transfer points.
Mountains	Yu Mountain	Remove fences, set up mining culture viewing platforms, and optimize green walking paths to connect with communities.
	Jia Mountain	Develop into a stone carving themed park, add night-time light shows and study paths, and enhance cultural and tourism attractiveness.
	Xiaoyushan	Transform into a multifunctional pocket park, add children's facilities and rain gardens, and remove obstructing buildings.
	Lishan	Define ecological red lines, prohibit development, build ecological education centers, and launch vegetation restoration projects.
	Ma'anshan	Apply for national mining park status, build an industrial heritage gallery, and connect mining sites with communities.

Eliminate landscape boundaries, enhance openness, and make the entire area more colorful and vibrant, providing citizens with a more convenient and comfortable recreational experience (C13). Open up six nodes at the west gate of Yu Mountain Lake, Xiyuan Road, and the north side of the Ma'anshan Hotel, and enhance the commercial transformation on both sides of the park road at the east gate; set up node spaces at the north entrance of Yu Mountain

Park, build a pedestrian overpass linking the Ma'anshan Cultural Plaza and the north square of Yu Mountain, and strengthen the connection between the important historical node of the Ma'anshan Iron and Steel headquarters and Yu Mountain, enhancing the natural landscape value of the area (C12).

Table 4-2:Optimization of Ecological Corridor Nodes (Co-Drawn by the Author)

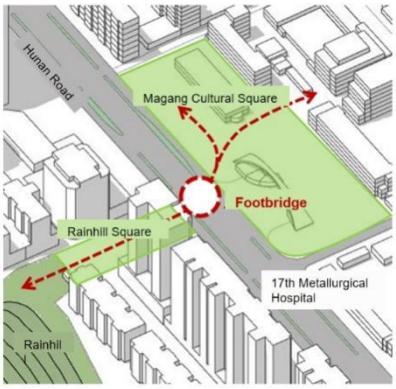


Figure 4-3: North entrance node of Huan Yu Mountain Park (drawn by project team)

Figure 4-4: Park Road Corridor (drawn by the project team）

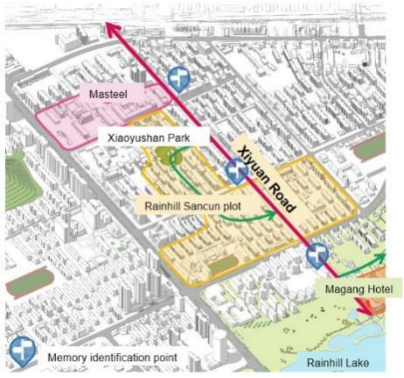


Figure 4-5: Xiyuan Road corridor (drawn by the project team）

Ma Steel-Yushan set up a bridge to connect Ma Steel Culture Square and Yushan North Square	The Yushan Lake-Jiashan corridor has been opened, and the space of the east gate of Yushan Lake Park has been improved by transforming and upgrading the commercial buildings on both sides of the park road	The landscape of Xiyuan Road will be improved, and the characteristics and historical information of workers' villages will be displayed along the road to create a cultural landscape exhibition gallery

To enhance the connectivity and visual experience of Ma'anshan's natural landscape, several key landscape corridors are optimized:

Yu Mountain Lake - Jia Mountain Corridor (C2): Enhance the connection between Yu Mountain Lake and Jia Mountain by optimizing the park road corridor. This will create a coherent green corridor that integrates the natural and cultural landscapes.

Yu Mountain Lake - Xiaoyushan Corridor: Strengthen the link between Yu Mountain Lake and Xiaoyushan by optimizing the Xiyuan Road corridor. This corridor will not only improve connectivity but also serve as a cultural display area.

Cultural Display Corridor along Xiyuan Road: Emphasize the historical and cultural significance of the Workers' New Village by creating a cultural display corridor along Xiyuan Road. This corridor will showcase the unique characteristics and historical information of the Workers' New Village, passing through key sites such as the Ma'anshan Iron and Steel headquarters, Xiaoyushan Park, and the Yu Mountain San Cun plot, extending to the

Ma'anshan Hotel and Yu Mountain Lake area. This cultural landscape corridor not only pays tribute to the historical culture of the Workers' New Village but also enriches and expands the city's cultural diversity (C7).

Ma'anshan West Corridor: Enhance the connection between Ma'anshan and Yu Mountain River.

Ma'anshan East Corridor: Strengthen the link between Ma'anshan and Jinjiazhuang.

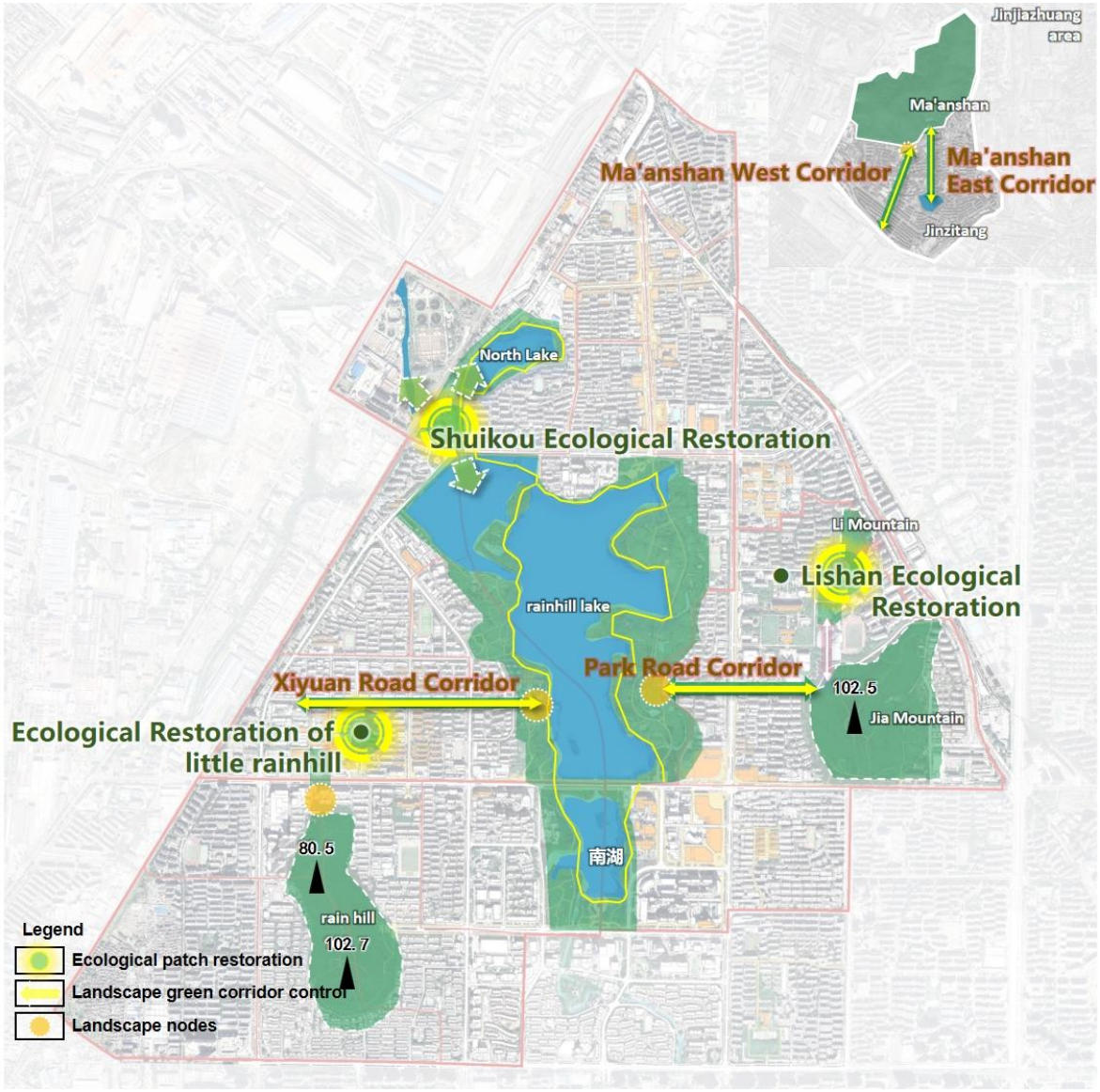


Figure 4-6: Optimization of Ecological Corridors (Co-Drawn by the Author)

4.1.3 View Corridor Management

To highlight the landscape pattern of Ma'anshan, multi-dimensional landscape analysis techniques are employed to manage view corridors effectively.

Based on viewing distance differences, landscape objects are categorized into three types:

Mid-Range Landscape Objects (Viewing Distance < 150m)**: Focus on public building nodes and carriers of historical memory.

Long-Distance View Objects (Viewing Distance 600-1400m)**: Highlight the natural mountain contours and urban skyline features.

Panoramic Areas (Viewing Distance > 3000m)**: Showcase the integrated spatial imagery of "mountain-water-city."

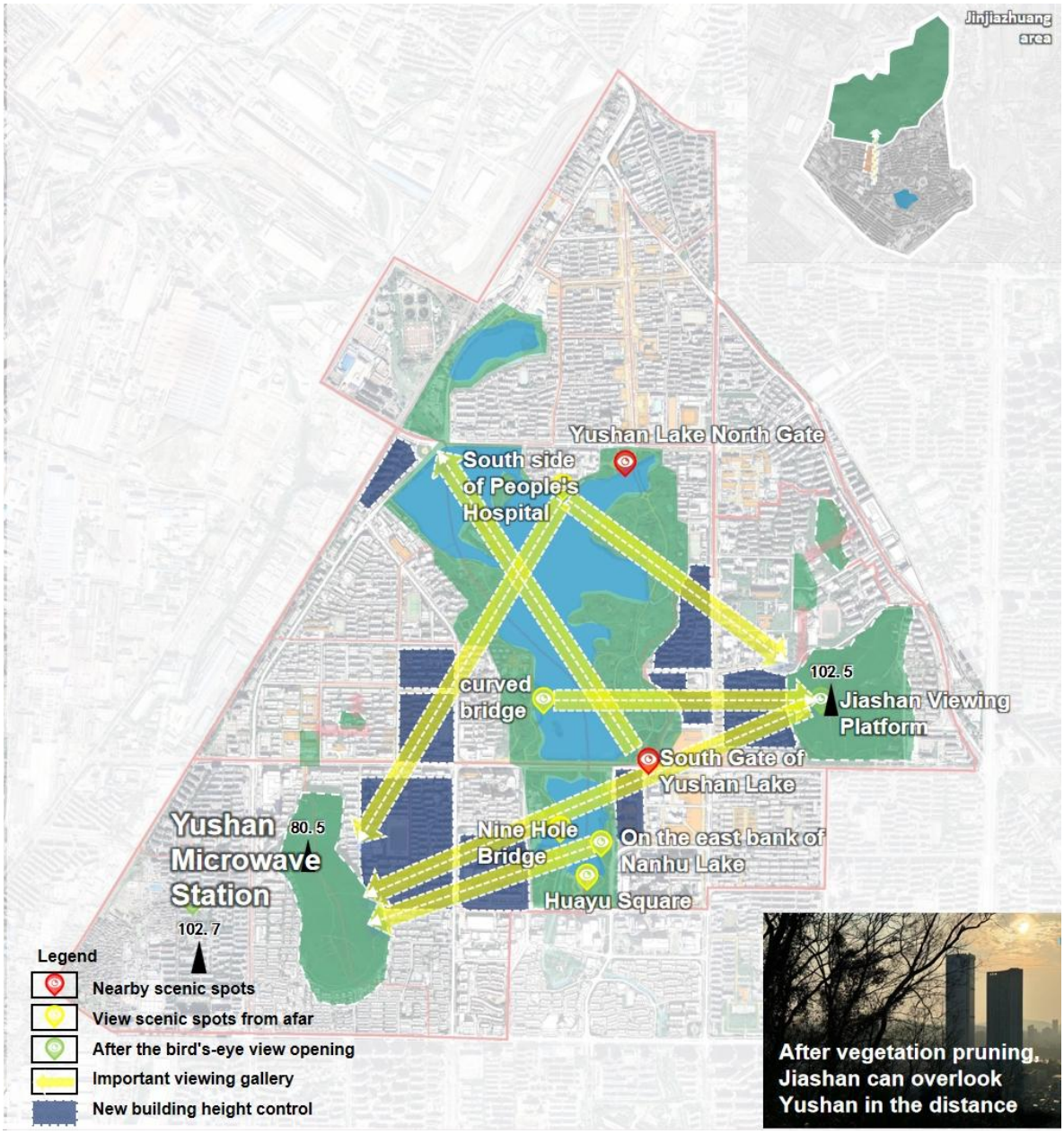


Figure 4-7: View Corridor Management Map (Co-Drawn by the Author)

The area around Yu Mountain Lake is a key perceptual zone for Ma'anshan's mountain-water city characteristics. This study selects viewpoints that are highly accessible, public, of high environmental quality, and offer multiple scenic views for view corridor control research.

Table 4-3: Viewpoint Inventory (Drawn by the Author)

Category	**Location**	**Accessibility**	**Publicness**	**Environmental**	**Number of**

				Quality	**Scenic Views**
Mid-Range Viewpoint	North Gate of Yu Mountain Lake Park	5	5	5	5
Mid-Range Viewpoint	South Gate of Yu Mountain Lake Park	5	5	5	5
Long-Distance Viewpoint	Lakefront of People's Hospital	3	5	5	5
Long-Distance Viewpoint	Curved Bridge	3	5	5	3
Long-Distance Viewpoint	Middle Section of Hunan Road	5	5	3	1
Long-Distance Viewpoint	Nine-Arch Bridge	5	5	5	3
Long-Distance Viewpoint	East Bank of South Lake	5	5	5	1
Long-Distance Viewpoint	Huayu Square	5	5	5	3
Panoramic Point	Yu Mountain Viewing Platform	5	5	5	3

Panoramic Point	Jia Mountain Viewing Platform	5	5	5	3

Particularly for the view corridors of Yu Mountain Lake, a comprehensive analysis is conducted using planar analysis and 3D modeling, combined with photos taken around Yu Mountain Lake, to verify the viewpoints and view corridors.

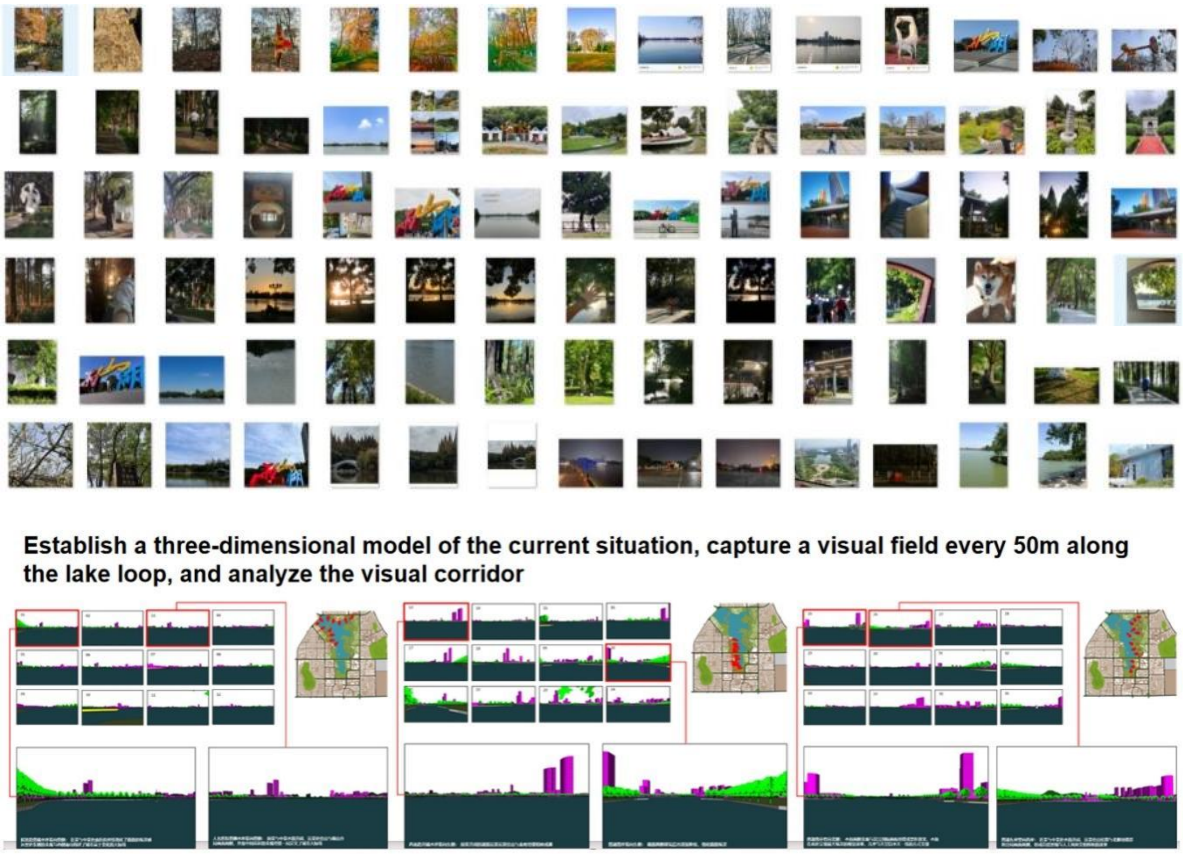


Figure 4-8: View Corridor Analysis Map (Co-Drawn by the Author)

Based on the evaluation results in Tables 4-10 and 4-11, there is a risk that the mountain skyline is gradually being obscured by buildings (C11). To enhance the visual prominence between Jia Mountain - Yu Mountain Lake and Xiaoyushan - Yu Mountain Lake, control measures such as vegetation trimming to manage the tree canopy line and height restrictions on new buildings are implemented. This results in six mountain-view corridors, improving the visibility of the mountains and achieving a landscape effect where "greenery can be seen through the window and scenery can be viewed with a few steps."

Table 4-4: Control Requirements for Six Mountain-View Corridors (Drawn by the Author)

Target Mountain	**Viewing Location**	**Control Measures**

Jia Mountain	Lakefront of People's Hospital	New building height ≤ 24m around Hudong Yicun
	South side of Xiyuan Road	New building height ≤ 24m in Yangmo Community and Jia Mountain New Village
	Lakefront of People's Hospital	New building height ≤ 24m in Yu Mountain Er, San, Si Cun, Metallurgical Huatian, and Metallurgical Design Institute
Yu Mountain	East Bank of South Lake	New building height ≤ 24m around Waiguo Waihe Zhu
	Jia Mountain TV Tower	Tree canopy line control facing Jia Mountain
Ma'anshan	South Gate Lakefront of Yu Mountain Road Park	New building height ≤ 24m in Hongqi Huayuan plot

4.2 The Inheritance and Experience of Historical Context

4.2.1 Problem Identification

Figure 4-9 Distribution Map of Key Historical Buildings (Photographed by the Project Team)

In urban planning and construction, the heritage protection system of Ma'anshan needs to be further improved. Within the research area, only four units have been formally designated for

protection, including the Japanese-style residential buildings in Jinjiazhuang, the Japanese military blockhouse, the exhibition hall, and the People's Hall. Several historically significant nodes have been demolished, and many historical buildings, left idle for a long time, have gradually become dilapidated. The industrial heritage value assessment system is not yet perfected, and the existing plans have not conducted an in-depth census of industrial buildings from various periods in Ma'anshan. As a result, many historically valuable industrial buildings have not been effectively protected or have been inappropriately renovated or even demolished.

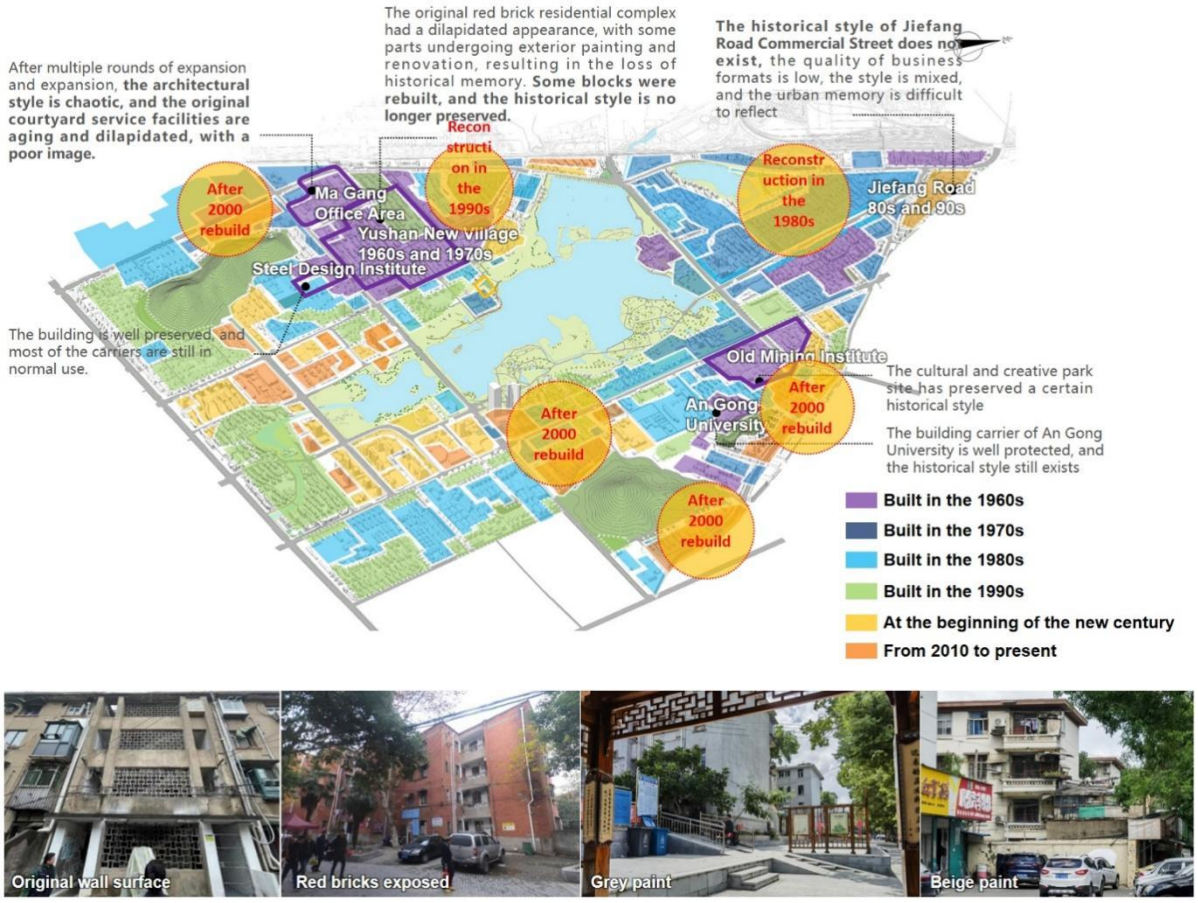


Figure 4-10 Urban Landscape Assessment Map (Drawn with the Author's Participation)

Ma'anshan's industrial heritage has a profound historical background, but its characteristics have not yet been fully highlighted. The exploration of the cultural connotations of industrial heritage is still relatively superficial, and many unique process flows and cultural elements such as the spirit of model workers have not been fully reflected. Some industrial heritage buildings lack distinctive styles, visual impact, and iconic features. In terms of revitalization and utilization, the existing development and utilization models are relatively 单一， and have not been deeply integrated with the unique elements of industrial heritage to create innovative and attractive projects. In the process of urban planning and renewal, the

preservation and creation of memory-related scenes associated with industrial heritage have been neglected, leading to the loss of urban characteristics and a rupture of cultural memory.

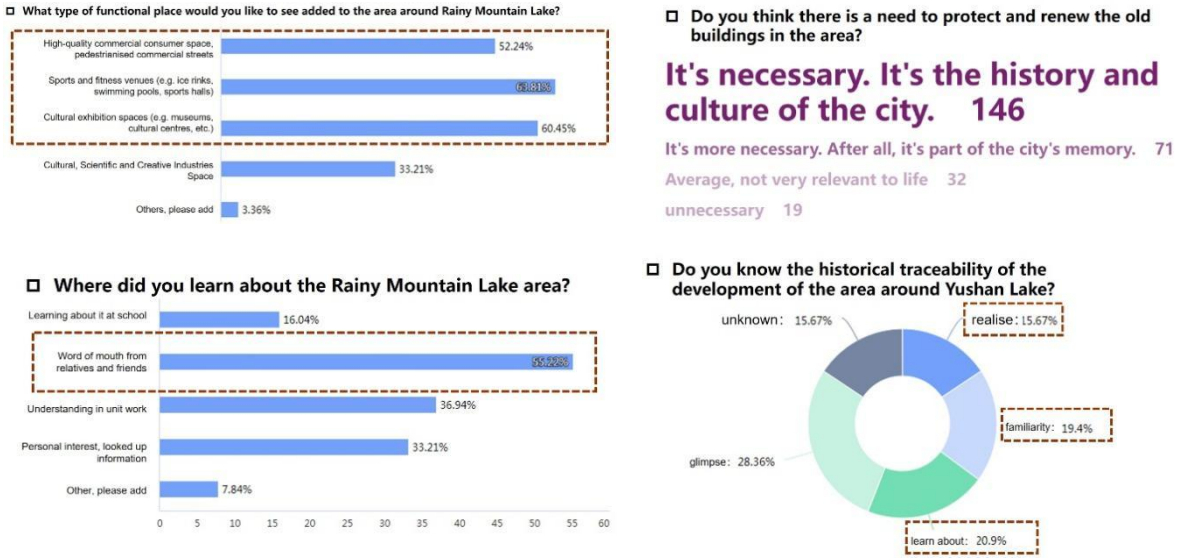


Figure 4-11 Public Awareness Survey Statistics (Drawn by the Author)

4.2.2 Planning Guidelines for Key Blocks

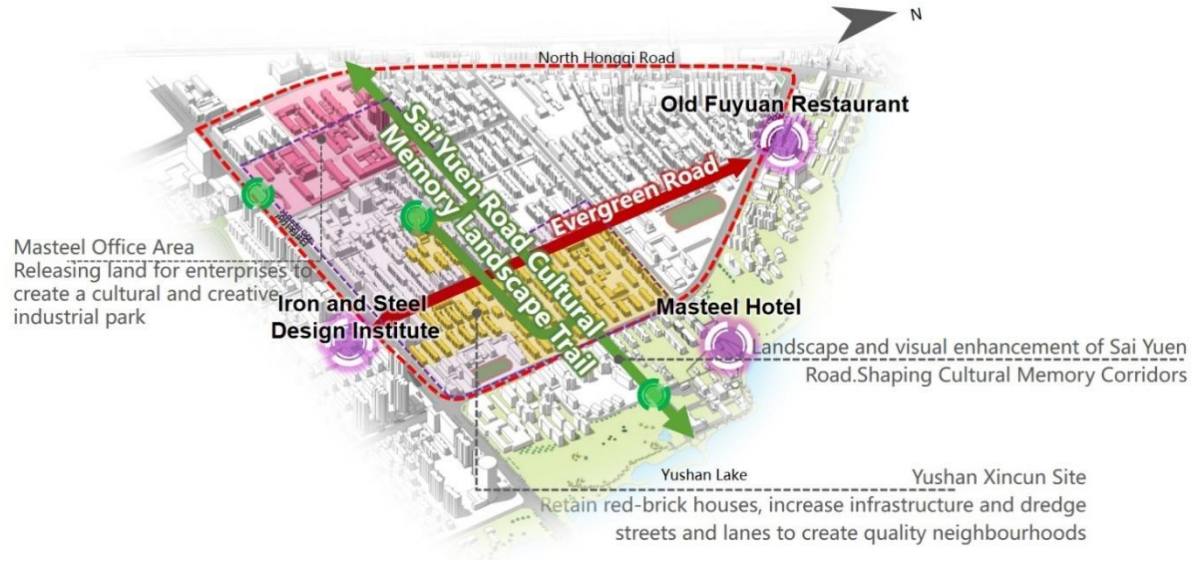


Figure 4-12 Planning Analysis Map of the West Lake Group (Drawn with the Author's Participation)

The West Lake Group in the Huan Yushan Lake area, as a typical representative of Ma'anshan's industrial heritage, carries the spatial memory of the industrial city during the planned economy period. Its planning for transformation and renewal from industrial relics to a vibrant urban district is highly representative. Based on the evaluation results in Table 4-15, the renewal strategies for the group are as follows:

1. Functional Activation and Enhancement

Upgrade the commercial, office, cultural, and community facilities in the area. The Ma'anshan

Iron and Steel (MaSteel) office area will retain its original historical style and be transformed into a creative cultural industry park (C5).

Improve infrastructure to shape a high-quality block (C14).

2. Anchoring of Historical Value

Protect core heritage sites such as the MaSteel headquarters, Yushan New Village, Iron and Steel Design Institute, and the Old Fuyuan Hotel to reinforce collective memory anchors (C8). Restore facilities such as the grain station, post office, and public bathhouse in the West Lake Courtyard New Village to reshape the industrial cultural memory corridor (C7).

3. Ecological Patch Restoration and Corridor Weaving

Restore the ecology of Xiaoyushan and develop it into an urban park to activate the southern entrance public node. Shape Xiyuan Road into a cultural and leisure corridor, connecting it with the lakeside space of Yushan Lake. Optimize the slow traffic system of Changqing Road's tree-lined avenue, retaining the existing terrain and road scale. Improve the connection between the northern entrance of Yushan Park and the MaSteel headquarters plot (C10).

4. Style Control

The facades and material colors along the two sides of Yushan Lake will continue the style of the 1980s and 1990s, while Yushan New Village and the old MaSteel area will retain the texture of the 1960s and 1970s red brick houses (C11).

4.2.3 Slow Traffic Tourist Route Planning

This tourist route system, through the organic integration of natural landscapes, in-depth exploration of historical narratives, and precise focus on themes, transforms Ma'anshan's industrial heritage, ecological resources, and community memories into sustainable cultural tourism assets. It aims to achieve the goal of strengthening urban identity through linear storytelling. This study adopts a "point-line" spatial integration strategy, using the existing historical style, cultural relics, and natural landscapes in the old urban area of Ma'anshan as the base points to construct a tourism development system for the old urban area. It forms an integrated tourism route pattern that combines points and lines, driving the coordinated development of commerce, cultural and creative industries, and community economy through the tourist routes and shaping a showcase for Ma'anshan's cultural charm.

Landscape Tourist Route　　Historical Loop　　Thematic Sub-routes

Figure 4-13 Experience Route Planning Map (Drawn by the Project Team)

(1) Landscape Tourist Route – Linear Integration of Natural Patterns

The landscape tourist route centers on a 5-kilometer lakeside loop, connecting the natural landscape elements of Yushan Lake, Jia Mountain, and Yushan to form an ecological framework of "two mountains and one lake" (Figure 5-15). The route design relies on three main roads – Park Road, Hunan Road, and Huayu Road – linking the Jia Mountain trail and Yushan trail to create a continuous experience transitioning from the urban boundary to the natural hinterland. Specific nodes include:

Jia Mountain South Garden: A transitional space between the mountain and lakeshore, featuring scenic platforms and rest nodes.

From the east gate of Yushan to Huayu Square: Enhancing landscape permeability through pocket parks and tree-lined avenues, connecting the vibrant urban area with the tranquil mountain.

This route integrates natural landscapes with urban functions seamlessly through the design of blue-green interwoven ecological corridors, creating an immersive experience of "coexistence of city and landscape."

(2) Historical Loop – Narrative Network of Planning Heritage and Temporal Layering

The construction of the historical loop aims to integrate historical continuity with contemporary development, preserving historical memory and showcasing the city's historical relics and cultural characteristics. The historical loop, based on a 6-kilometer urban wandering main loop, connects representative scenes from different historical periods of Ma'anshan. The core route includes the lakeside paths around Yushan Lake, from the workers' new villages of the 1960s and 1970s to the urban center of the 1980s and 1990s, then to the fashionable metropolis after the millennium, and finally to the picturesque Hunan Road in the south. By integrating industrial heritage, historical streets, and modern cultural facilities, the route forms a triple narrative layer of "industry-life-culture," intuitively presenting the spatial evolution logic of the city from a planned economy to diversified development.

(3) Thematic Sub-routes – Precise Design of Major Historical Event Scenarios

Thematic sub-routes focus on specific scenarios to build in-depth exploration paths:

Railway Memory Line: Following the railway site from Ma'anshan to Xiangyang, connecting Yuejin Bridge, Ma'anshan Station, and Beihu Park, this line revitalizes industrial scenes to represent the history of railway transportation.

Commercial and Leisure Line: Connecting the vibrant streets of Tuanjie Road, Shatang Road, and Chengjian Road with the railway café to form an industry-activated area, stimulating economic growth.

Old Factory Rebirth Line: Focusing on the transformation of the Ma'anshan Construction Courtyard and the Superhard Institute renovation area, this line showcases innovative practices of transforming industrial workshops into creative cultural industry parks and innovation spaces.

Workers' New Village Line: Centered on Yushan Villages No. 2, No. 3, and No. 4, this line retains the texture of red brick houses, adds community gardens and shared facilities, and connects with the MaSteel headquarters to reconstruct the "unit system" living scene.

4.3 Renewal of Demonstration Nodes

This paper selects representative projects that have been included in the urban renewal plan, such as the MaSteel headquarters, Workers' New Village, and MaSteel Hotel, to illustrate the pathways for the transmission of urban heritage value. These projects represent production facilities, living facilities, and general public buildings in the city, respectively.

4.3.1 MaSteel Headquarters

Figure 4-14 Conceptual Plan for the Industrial Upgrade and Transformation of the MaSteel Headquarters (Drawn with the Author's Participation)

The transformation of the MaSteel headquarters focuses on protection and revitalization, retaining the overall layout and historical buildings to promote the revival of the old industrial area. The goal is to create an urban center integrating culture, creativity, housing, and commerce.

Based on the evaluation results in Table 4-18, the following suggestions for value transmission pathways are proposed:

1. Protection First: Enhancing Historical Value and Craftsmanship Details

Historical Building Designation: Promote the application of the MaSteel Hall and other buildings for municipal-level cultural protection status to enhance their historical value (C7) and protection level.

Cultural and Artistic Display: Add an industrial component art gallery on the exterior facade of the retained buildings to enhance cultural value (C8).

Optimization of Functional Continuity: Retain some office functions and transform idle laboratories into an industrial heritage archive (C5).

2. Revitalization and Utilization: Diversified Industrial Integration and Public Enhancement

Revitalization of the MaSteel Hall: Design it as a "Steel Spirit" patriotism education base, incorporating immersive industrial history exhibitions and drama performances to enhance social value (C9).

Cultural Plaza and Pocket Parks: Demolish partial walls to add green landscape belts and scenic platforms, connecting the ecological corridor of Yushan Lake (C10).

Community Participation: Embed "Old Workers' Memory Wall" and interactive sculptures in the street space, and hold Steel Culture Festivals (C13).

Accelerated Industrial Landing: Prioritize the introduction of creative studios and industrial design companies, with supporting talent apartments (C5).

3. Transportation and Functional Optimization: Improving Accessibility and Service Facilities

Enhanced Shuttle Transportation: Add buses from the subway station to the park, optimize traffic flow lines, and redesign parking lots (C12).

Activation of Ground-Floor Commerce: Introduce convenience stores, coffee book bars, and other public services to the ground floor of retained buildings (C14).

4.3.2 Workers' New Village

Figure 4-15 Conceptual Plan for the Transformation of Workers' New Village (Drawn with the

Author's Participation)

The red-brick structure, double-sloped roofs, and axially symmetrical layout of Workers' New Village are not only evidence of the localization of Soviet technology but also carry collective living memories. However, the original red-brick collective housing has become dilapidated, with some undergoing facade renovations that have led to the loss of historical memory. Some blocks have been rebuilt, and the historical style no longer exists.

Based on the evaluation results in Table 4-19, the following suggestions for the transmission pathways of urban heritage value are proposed:

1. Protection of Historical Style and Cultural Heritage

Restoration of Facades: Restore the facades according to their historical appearance, using traditional craftsmanship and materials as much as possible to retain the architectural characteristics and historical traces of Workers' New Village (C8).

Preservation of Spatial Form: Fully retain the spatial form of "corridor buildings + public courtyard" as an important historical and cultural resource (C2).

Community History Museum: Transform some representative buildings into community history museums or cultural exhibition halls to display the construction process, living scenes, and important historical events of Workers' New Village, enhancing residents' cultural identity and sense of belonging (C9).

Revitalization of Memory Spaces: Moderately renovate and revitalize memory spaces such as open-air sports fields and public bathhouses to meet the needs of modern residents while continuing the community's emotional connection (C9).

2. Improvement of Infrastructure and Public Services

Optimization of Public Services: Update infrastructure and optimize public services to create an age-friendly community environment (C14).

Cultural Node Creation: Use Xiaoyushan Park as a carrier to create a distinctive cultural node and foster a livable community environment (C10).

3. Optimization of Community Functions and Spatial Layout

Road System Optimization: Improve the road system to enhance accessibility and safety (C12).

Introduction of New Functional Forms: Introduce new functional forms on the basis of preserving the historical style to provide convenient living services for residents (C13).

4.3.3 Ma'anshan Steel Hotel

Figure 4-16 Conceptual Renovation Plan for Ma'anshan Steel Hotel (Drawn by the Project Team)

The Ma Steel Hotel, where Jiang Zemin stayed during his inspection of Ma 'anshan in 1991, served as the front command and headquarters for Ma Steel's reform in 1993. It has been a witness to the hotel's role in hosting national leaders and facilitating external exchanges, as well as the decision-making center for Ma Steel's shareholding reform. Despite its historical significance, the hotel suffers from poor maintenance, chaotic space utilization, and low land use efficiency. Located near the lakeside, the hotel's walls disrupt the continuity of the green spaces.

Based on the scoring results in Table 4-20, the following suggestions are proposed for the transmission pathways of urban heritage value:

1. Demolish walls and connect green spaces

Demolish the walls adjacent to the lake and some buildings to connect the hotel's internal green spaces with the green spaces of Yushan Lake Park. (C10)

2. Optimize traffic organization

Replan and redesign the road system to eliminate dead-end roads and increase connection points with the urban traffic network to improve accessibility. (C12)

3. Enhance historical and cultural value

Establish a dedicated historical and cultural display area within the hotel to inherit and promote the historical culture of Ma'anshan Steel. (C9)

4. Expand functional formats

Convert the No. 30 courtyard on the north side into hotel land and integrate it with the Ma'anshan Steel Hotel for joint operation, expanding the hotel's business scale and enhancing its market competitiveness. (C1)

Introduce diversified formats to transform the Ma'anshan Steel Hotel into a comprehensive venue integrating accommodation, catering, meeting facilities, cultural experiences, and leisure and entertainment. (C14)

5. Repair the building façade

Restore the historical appearance of the Ma'anshan Steel Hotel's building façade. (C7)
Rehabilitate the surrounding plots to ensure their architectural styles are in harmony with the hotel, creating a unified style characteristic and enhancing the overall landscape quality of the area. (C11)

4.4 Integration and Transmission of Planning Guidelines

4.4.1 The Relationship Between Urban Heritage and Planning Formulation

Figure 4-17 Diagram of the Synergistic Relationship Between Value Analysis and Planning Work (Drawn by the Author)

Under the HUL (Historic Urban Landscape) theory, the transmission of urban heritage value is based on the core principle of adopting dynamic protection and inheritance strategies to ensure that conservation measures are coordinated with the overall urban development. The value analysis of urban heritage under HUL provides a cultural foundation and historical continuity for urban development, while a scientific planning framework offers systematic support for the identification, evaluation, and sustainable transmission of heritage value.

Urban heritage is spatial in nature. The natural environment and historical and cultural spaces that heritage highly depends on are important components of urban and rural territorial space and are significant characteristic elements of urban and rural regions. The "Guidelines for the Compilation of Historical and Cultural Heritage Protection Planning in Territorial Space," released on January 1, 2024, considers heritage protection as an indispensable part of modern urban planning and requires that heritage protection and management be integrated into the "one map" of territorial space planning compilation and implementation. HUL emphasizes treating historical heritage as a dynamic component of the urban system rather than as an isolated object of protection, which is highly consistent with the core concept of "integration of multiple plans" in territorial space planning.

The research on the value perception and evaluation of urban heritage in the old urban area of Ma'anshan should focus on value exploration in specific areas while following the requirements of higher-level planning and complementing the ongoing planning efforts.

Following the hierarchical relationship from the general plan → unit plan → plot regulations, the requirements for protection and utilization should be refined step by step. The 14th Five-Year Plan and the Territorial Space General Plan set overall development goals for heritage protection work, clarify basic concepts and the overall framework, and ensure that cultural heritage protection is incorporated into the overall urban spatial framework, defining the protection baseline.

The research systematically combs through the urban heritage of Ma'anshan, perfecting the heritage list for the ongoing special plan, the "Ma'anshan and Historical Cultural Protection and Inheritance System Plan," based on the integrity of the HUL theory. It also proposes protection and utilization measures and strategies for general urban heritage not included in the protection list and for historical and cultural nodes after the reform and opening up, based on their accumulative nature. This forms a complete historical thread from "mining area" to "steel new city" to "modern metropolis."

The ongoing "Unit Detailed Planning," while implementing higher-level planning, clarifies the specific content and planning requirements for heritage protection and utilization based on the findings of this research. It forms specific spatial plans and action plans.

4.4.2 Value Transmission Pathways in the Context of Spatial Planning

Heritage space is a special type of territorial space. Urban heritage conservation follows the progressive logic of "strategic guidance - value transmission - implementation control," deeply integrating into the entire process of urban planning. The value transmission logic for the urban heritage of the old urban area of Ma'anshan involves three stages: In the value perception stage, three major value elements are identified through field research and literature studies. In the value evaluation stage, four major issues in heritage protection and utilization are discovered through analysis and quantitative evaluation of heritage elements. Subsequently, two types of strategies and six specific measures are adopted to form the planning guidance map, as shown in Figure 4-19.

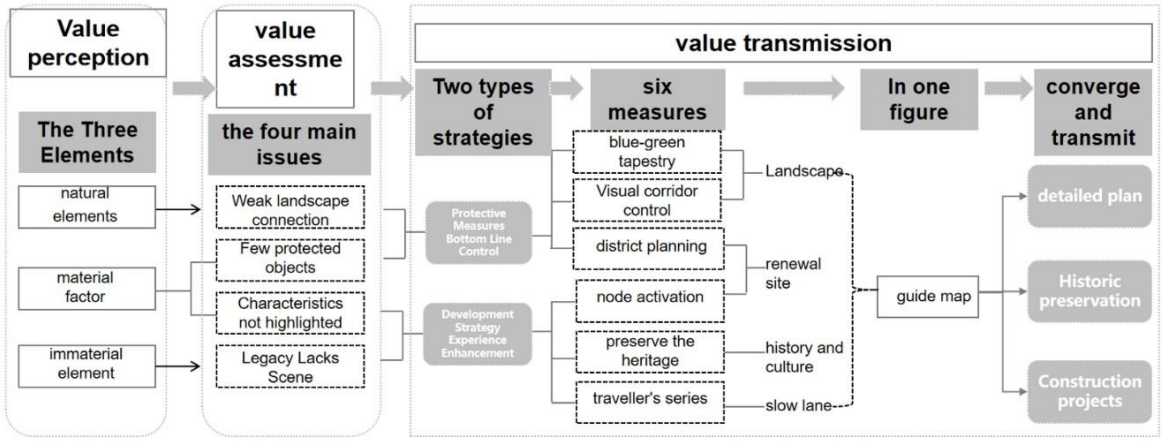


Figure 4-19 Value Transmission Pathway Diagram (Drawn by the Author)

Urban heritage conservation is a complex and systematic project that requires a dual-track

strategy of "control" and "enhancement" to achieve the sustainable existence and value regeneration of heritage. Control is the foundation of protection, preventing heritage destruction through rigid constraints, while enhancement is the core of development, unlocking the potential of heritage through flexible revitalization. The baseline control strategy involves delineating urban heritage protection red lines to strictly control development intensity and utilization models. Key measures include the blue-green restoration of the urban natural environment, visual corridor control, and the preservation and inheritance of material heritage. The optimization and enhancement strategy drives the transformation of heritage value through functional iteration and scene reconstruction, forming a sustainable development momentum. Key measures include the development of thematic areas, activation of spatial nodes, and the connection of cultural tourism routes.

4.4.3 The Role of Planning Guidance Maps

Planning guidance maps are a tool used in urban and rural planning, applied in control detailed planning or urban design. The compilation of these maps visualizes all core content to achieve strong readability and to connect with relevant plans, controlling and guiding the protection and utilization of urban heritage. As a core component of neighborhood-level planning, planning guidance maps can serve as a key tool for the protection and development of urban heritage. Through systematic and operational rule design, they transform the abstract value of urban heritage into concrete spatial control, functional allocation, and policy actions.

The research on the perception and evaluation of urban heritage in the old urban area of Ma'anshan proposes planning guidance for typical areas based on case studies of specific regions, serving as the theoretical basis for the compilation of statutory maps. The baseline control requirements of the updated planning guidance maps are integrated with the ongoing detailed planning to transmit regulatory content. This foundational research can also be connected with the renewal plan, sharing research findings to form project packages and promote implementation.

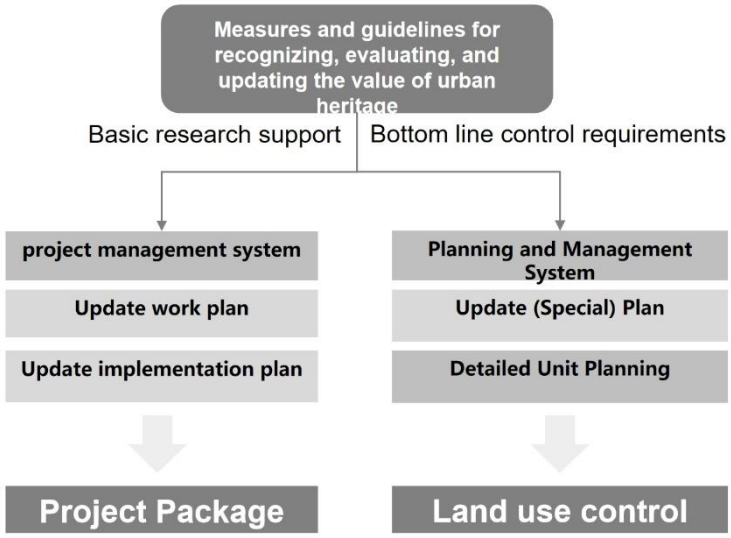


Figure 4-20 Value Transmission Framework Diagram (Drawn by the Author)

The planning guidance maps for the urban renewal blocks in Ma'anshan combine specific measures with inheritance strategies to balance the continuation of urban heritage value with contemporary needs across ecological, cultural, spatial, functional, and social dimensions, forming a complete path of "research - planning - plan - implementation." The main content of the planning guidance and the relationship between the value elements of urban heritage and the transmission pathways are shown in Table 4-5:

Landscape: Transmission of the value of natural environmental elements, strengthening the historical continuity of the natural landscape pattern, and enhancing landscape accessibility and cultural perception.

Historical Culture: Transmission of the value of intangible elements, protecting the spatial texture and living scenes of workers' new villages to continue the collective memory of industrial communities.

Slow Travel Routes: Inheritance of the spatial context of intangible elements, connecting historical nodes through pathways to reconstruct the urban cultural experience network.

Renewal Plots: Transmission of the value of material elements, continuing the functional value of urban heritage through adaptive reuse.

Public Services and Residential Quality: Improving social functions, enhancing the community's age-friendliness, and continuing the neighborhood social network.

Table 4-5 Logic of Value Transmission in Planning Guidance (Drawn by the Author)

Inheritance Dimension	**Transmission Pathway**	**Planning Guidance**
Natural Environmental Elements	Restoration and Highlighting of Landscape	Landscape

Intangible Elements	Inheritance and Experience of Historical Context	Historical Culture, Slow Travel Routes
Material Elements	Renewal of Demonstration Nodes	Renewal Plots, Public Services, Residential Quality

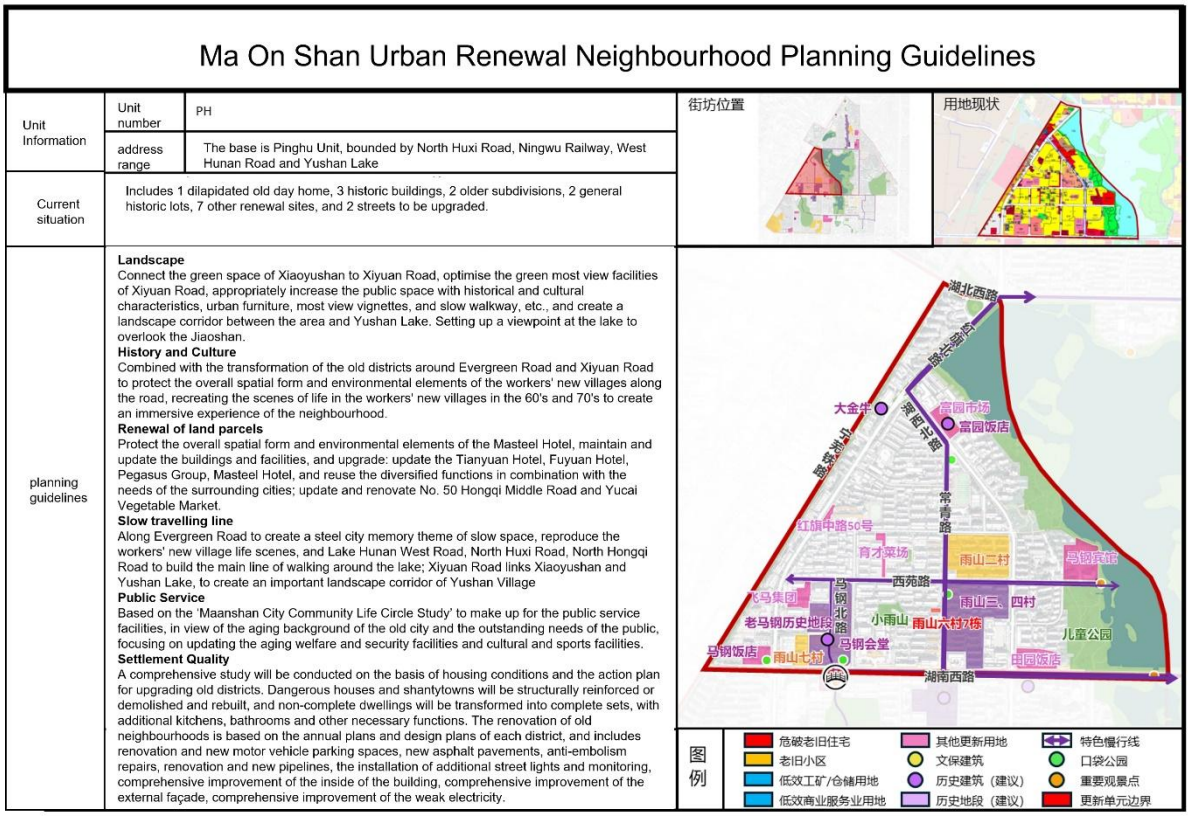


Figure 4-21 Planning Guidance Map (Drawn by the Project Team)

4.5 Summary of This Chapter

This chapter systematically combs through the numerous issues faced by Ma'anshan's urban heritage in terms of inheritance and protection. Based on these issues, it proposes pathways for the transmission of living value. At the macro level, it focuses on the highlighting and inheritance of the landscape pattern, delving into key topics such as the ecological restoration of the landscape itself, the optimization of ecological corridors, and the organization of landscape view corridors. At the meso level, it creates culturally profound and attractive urban spatial experiences from the perspective of planning layers and experience routes. At the micro level, it focuses on the renewal and transformation of architectural heritage, achieving the contemporary value transformation and reuse of historical buildings. Finally, through the formulation of planning guidance maps, it further clarifies the direction and focus of value transmission, ensuring that various strategies can be implemented.

Chapter V： Conclusion and Outlook

5.1 Research Conclusions

The HUL (Historic Urban Landscape) theory provides a comprehensive framework suitable for guiding the protection and revitalization of Ma'anshan's urban heritage. Its core principles, including integrity, stratification, and dynamic adaptability, offer a new perspective for understanding the complexity and dynamism of urban heritage. This study takes Ma'anshan as a case study and constructs an urban heritage protection model based on the HUL theory. It conducts systematic research on value perception, evaluation, and dynamic protection and inheritance, developing a "perception - evaluation - inheritance" protection framework applicable to resource-based industrial cities.

Ma'anshan, as a typical representative of industrialization during China's planned economy period, has urban heritage that is not only a material witness to the iteration of modern industrial technology but also a spatial carrier of collective urban memory and the process of ecological restoration. The old urban area of Ma'anshan has fallen into a dual dilemma of "one-sided value perception" and "fragmented renewal management" in the process of rapid urbanization: on the one hand, the protection targets are limited to individual protected objects, neglecting related elements such as railway lines and workers' villages; on the other hand, renewal practices mostly focus on commercial development at the plot level, lacking systematic coordination with urban industrial transformation and ecological governance.

The study identifies and defines the value elements of Ma'anshan's urban heritage, including natural environment, material, and intangible elements, deepening the understanding of its historical, cultural, and ecological values. In particular, the urban heritage under the background of steel industry highlights Ma'anshan's unique urban identity. The evaluation system constructed covers three criteria layers: current protection status, intrinsic value, and integration with the city, providing a tool for quantifying urban heritage value and offering scientific support for decision-making on priority protection projects. The proposed protection strategies cover macro, meso, and micro levels, emphasizing the protection of landscape patterns, ecological restoration, planning of tourism routes, and revitalization of industrial heritage and public facilities. These strategies aim to achieve the sustainable development of urban heritage in modern society and the continuation of cultural values.

Through an in-depth study of the value of Ma'anshan's urban heritage, this research demonstrates the effectiveness and practicality of the HUL theory in guiding the protection of heritage in resource-based industrial cities. It provides valuable references for Ma'anshan and other similar cities in terms of heritage protection and urban renewal. By integrating scientific perception evaluation,, and protection strategies into modern urban development, urban

heritage can be dynamically incorporated into contemporary urban development, achieving harmonious coexistence between history and modernity.

5.2 Innovations

1. Introduction of the Historic Urban Landscape Approach to Resource-Based Industrial Cities
Traditional urban heritage value identification often focuses on iconic buildings or major historical events, neglecting the universal landscape elements closely related to residents' daily lives. Taking the old urban area of Ma'anshan as an example, this study innovatively introduces the Historic Urban Landscape approach into the research of resource-based industrial cities' heritage. It emphasizes that in the process of value identification, elements with more universal historical significance should be prioritized, such as traditional street patterns, urban life spaces, industrial relics, and carriers of local folk culture. By deeply exploring the widely existing carriers of urban historical landscapes, this study extracts three guiding principles from the perspective of urban historical landscapes, offering a new direction for research on strategies for urban heritage protection and development. Specifically, this study proposes guiding the perception of urban historical landscapes with an integrity concept, assessing value based on a stratification concept, and guiding renewal strategies with a dynamic concept.
2. Establishment of a Comprehensive Evaluation System Based on the Historic Urban Landscape Approach
In response to the limitations of current research on the value of resource-based industrial cities' heritage, this study constructs a comprehensive evaluation system based on the principles of the Historic Urban Landscape approach, through in-depth analysis of value composition. This system innovatively introduces two dimensions—current preservation status and integration with the city—on top of the traditional intrinsic value dimension, achieving a comprehensive evaluation of heritage protection and urban development. Moreover, this study employs the Analytic Hierarchy Process (AHP) and fuzzy evaluation methods to quantitatively evaluate and analyze heritage value, aiming to provide more scientific support for heritage protection decision-making.

5.3 Research Limitations and Future Outlook

The identification and protection of urban heritage value involve the complex and challenging task of balancing the interests of various stakeholders. In the process of exploring the value of Ma'anshan's urban heritage, this study also faces numerous challenges and limitations. First, in terms of case study research, due to the limitations of the researcher's capabilities, the analysis of Ma'anshan's overall spatial stratification evolution, natural environment, and human environment has not reached a comprehensive and in-depth level. Although attempts have been made to identify values of different types and periods, the overall identification still has subjectivity and partiality, and it is inevitable to generalize from a limited perspective. Therefore, future research can attempt to introduce more objective and quantitative methods, such as big data analysis and social surveys, to improve the accuracy and objectivity of value assessment.

Second, in the field of development strategy research, the lack of in-depth surveys and data collection on relevant economic industries and social structures has led to a lack of basis for the formulation of development strategies. Future research should strengthen cooperation with experts in related fields, conduct more in-depth surveys and analyses, and improve the scientific and feasibility of development strategies. In addition, due to the complexity of the research object of Ma'anshan's urban heritage, the value of heritage involves multi-party interests, and the existing methods are still insufficient in analyzing micro-strategies (such as community participation mechanisms), resulting in more descriptive language in relevant parts. Future research can focus on more specific issues, such as a specific heritage site or a specific protection strategy, for more in-depth analysis and research.

Finally, a city is a constantly growing organism that must respect history while also creating the future. How to make value identification coalesce the consensus of stakeholders in the current historical period and flexibly adapt to future values, and how to make value assessment research more systematic and forward-looking, still need further in-depth exploration. Future research can explore the establishment of a dynamic value assessment system that can adjust and update the assessment criteria of heritage value in a timely manner according to the changes in social development and public demand. Moreover, this study is still in the initial stage of applying the Historic Urban Landscape (HUL) theory to the perception of urban heritage value, and there may be omissions in the sorting out of value and perception, which need further supplementation and modification. In terms of heritage value evaluation, this paper only takes the most important core nodes as examples to illustrate the evaluation process, which is difficult to cover all urban heritage resource points within the city. Therefore, future research should expand the scope of research and conduct a comprehensive assessment of all urban heritage resource points within Ma'anshan, providing

a more comprehensive basis for the overall protection of urban heritage.

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[3] Hu Ruotong,Liu Yuxuan, Song Yunzi , Hou Zhulin.Research on sustainable urban design based on small-scale and Progressive concept[C].International Journal of Sustainable Urban Planning and Architectural Design, 2024. (Adopted, to be published)

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