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Transforming Urban Industrial Space and Cultural Memory in China's Medium-Small Industrial Cities

A Case Study of Pingdingshan City

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Abstract

This thesis discusses the transformation of urban historical industrial spaces in Pingdingshan, a medium-small industrial city in China, and studies its impact on urban culture, collective memory, and identity. These cities are typically resource-based and shaped by the *danwei* system of the planned economy era, with a population primarily composed of workers. They face numerous urban challenges in the era of industrial transformation, including overt issues such as resource depletion, economic decline, outdated urban spaces, and environmental degradation, as well as invisible problems like cultural disconnection, a loss of collective memory, and identity confusion. This thesis focuses on Pingdingshan, a major coal mining center in central China, exploring how to address these challenges under the pressures of urbanization and industrial transformation.

By analyzing the historical development of industrial cities in China and their spatial evolution, this thesis identifies key strategies for industrial space reuse. Six widely used approaches in Chinese cities—cultural facilities to ecological restoration—are evaluated through case studies and contextualized to Pingdingshan's socio-economic and urban conditions. Based on this discussion, the thesis proposes a methodology for transforming historical industrial spaces in medium-small industrial cities like Pingdingshan. This approach integrates policy frameworks and design strategies on cultural preservation and inheritance, ecological restoration, and community-centered planning, aiming to foster positive impacts on urban culture, collective memory, and identity while achieving sustainable transformation.

The conclusions emphasize the importance of reversing negative perceptions of industrial history and spaces and redefining them as a source of pride and positive identity. The proposed strategies balance economic development with cultural preservation, offering practical ideas for Pingdingshan and similar medium-small industrial cities to embrace their past while building a resilient and sustainable future.

Keywords:

Industrial Historical Spaces, Urban Transformation, Medium-Small Industrial Cities, Urban Culture, Collective Memory, Danwei System

Table of Contents

Chapter 6:

Proposed Solutions for Pingdingshan City, and Implications for All Medium-Small Industrial Cities 106

List of Figures

Introduction

This thesis studies the transformation of historical industrial spaces in China's medium-small industrial cities, focusing on how these spaces can address challenges of urban renewal, cultural preservation, collective memory, and identity reconstruction through a case study of Pingdingshan. The study provides a methodology that includes policy frameworks and actionable strategies, offering an approach to integrating economic, spatial, ecological, and cultural considerations for sustainable urban transformation.

Historical industrial spaces are a critical component of urban transformation, particularly in medium-small industrial cities in China. These cities, frequently resource-based and shaped by the *danwei* system under the planned economy, are now facing the challenges of industrial decline, urban renewal, and loss of cultural heritage, collective memory, and identity. These issues have created a complex interplay of visible and invisible problems. Addressing these challenges is important for achieving sustainable urban transformation.

This thesis focuses on Pingdingshan, a former coal mining hub, as a representative case to explore strategies for the aforementioned topic. The primary objective of this thesis is to develop a methodology for transforming historical industrial spaces in medium-small industrial cities, balancing economic growth, spatial quality, ecological restoration, and cultural preservation. By examining Pingdingshan's industrial history and current challenges, the thesis offers actionable strategies suitable for the city's conditions while offering broader insights for similar urban contexts in other medium-small industrial cities.

This thesis is organized into six chapters. Chapter 1 introduces China's urban planning system and the scope of the study, focusing on medium-small industrial cities. Chapter 2 reviews the historical development and current transformation of industrial cities in China. Chapter 3 reviews danwei spaces as a critical element shaping urban culture and memory. Chapter 4 presents Pingdingshan as a case study, detailing its industrial history, challenges, and planning context. Chapter 5 analyzes six transformation strategies using examples from Chinese cities. Finally, Chapter 6 proposes a comprehensive methodology and practical solutions for Pingdingshan and other medium-small industrial cities.

The methodology combines historical analysis, case studies, and spatial planning. This study analyzes six commonly employed strategies in Chinese cities to evaluate their effectiveness and applicability to Pingdingshan and other medium-small industrial cities. The results show that three of the six strategies are suitable for medium-small industrial cities, two require a certain level of foundation, and one is unsuitable. The common feature of the suitable strategies is their ability to transform urban culture and memory from negative and passive to positive and prideful. By exploring the above topics, this thesis contributes to the broader understanding of how medium-small industrial cities can navigate their past to build a sustainable and culturally enriched future.

This thesis reviews literature from academic journals, theses, government documents, and other public sources such as news. Translation software, which may have included generative AI, was used to enhance the translation of Chinese language materials. All analysis, findings, methodological frameworks, and other contents are the author's original contributions.

Chapter 1:
Chinese Urban Planning System and Medium-Small Cities

1.1 The Urban Planning System in China

China's urban planning system is characterized by a multi-tiered administrative structure and a highly centralized approach. This section outlines the key administrative divisions, from the provincial level down to subdistricts and discusses the major stakeholders involved in urban planning, including central and local governments, planning institutions, and the increasing role of public participation. Additionally, this section introduces the tools and methods used in urban planning, such as master plans and specialized plans, which guide the development and transformation of cities across China. The historical influence of the planned economy and the transition to a more people-centered approach are also examined.

1.1.1 Basic Administrative Divisions in China

China's administrative divisions form the foundation of its governance system. These divisions are organized into 4 hierarchical levels, including provincial, prefectural, county, and township levels. At the **provincial level**, there are provinces, autonomous regions, municipalities directly cities, and special administrative regions. These entities possess significant autonomy in policy-making and governance. The **prefectural level** includes prefecture-level cities, autonomous prefectures, and leagues, which are responsible for general planning and management in their regions. The **county-level** comprises counties, county-level cities, districts, and autonomous counties, playing a key role in executing urban planning at the local level. At the **township level**, towns, townships, and subdistricts manage rural and urban fringes. (Figure 1.1-1)

This multi-tiered administrative structure allows policies and urban planning to be implemented from the central government down to local governments. It also provides a framework for China's rapid urbanization, ensuring coordinated development across different regions.

1.1.2 Urban Planning System and Stakeholders

China's urban planning system is highly centralized, involving multiple levels of stakeholders. The **central government** plays a dominant role in formulating urban development strategies through national agencies such as the *National Development and Reform Commission (NDRC)* and the *Ministry of Housing*

and Urban-Rural Development (MOHURD). These agencies set nationwide policies and regulations that guide urban development, particularly in relation to large-scale urbanization and regional planning.

Many of China's urban development patterns were established during the era of the planned economy and still reflect that period's influence, particularly in third-tier cities and small-medium industrial cities discussed later. During the planned economy, urban planning, heavily influenced by Soviet models, was largely focused on serving industrial production. These cities were often designed as hubs for manufacturing, with little attention to services or public life. Today, however, China's urban planning practices have embraced a more people-centered approach, implementing the concept of "People's Cities", which emphasizes that cities are built by the people and for the people. As a result, public participation and the provision of public services are increasingly central to urban planning.

Local governments, including prefectural and county-level authorities, are responsible for the implementation and enforcement of urban planning at the local level. They translate the central government's strategies into local plans and projects. Planning and design institutions, such as national and local urban planning institutes, provide technical support for the development and implementation of urban plans, ensuring professional and scientific planning approaches.

Public participation, though still at an early stage in China's urban planning system, has been increasing as the country develops. While public involvement has traditionally been limited, it is becoming more significant, particularly in areas such as environmental protection and heritage conservation. As cities grow and evolve, public input is increasingly being incorporated into the planning process, reflecting a shift toward more inclusive urban governance.

<table>
<tr><th colspan="5">Administrative Divisions of the PRC</th></tr>
<tr><th>Provincial Level</th><th colspan="2">Prefectural Level</th><th>County Level</th><th>Township Level</th></tr>
<tr><td rowspan="4">Province
Autonomous Region</td><td colspan="2">Province-Directly Administered County</td><td rowspan="2">County (Banner)
Autonomous County
County-level City
Forestry District</td><td rowspan="5">Township (Sumu)
Ethnic Township (Ethnic Sumu)
Town
Subdistrict
District Office</td></tr>
<tr><td colspan="2">Prefecture
(League)</td></tr>
<tr><td colspan="2">Prefecture-level City</td><td>Municipal District
County (Banner)
Autonomous County (Banner)
County-level City
Special District</td></tr>
<tr><td>Autonomous Prefecture</td><td>(Prefecture-Directly Administered City)
Prefecture</td><td>County
Autonomous County
County-level City</td></tr>
<tr><td>Direct-administered Municipality</td><td colspan="3">Municipal District
County
Autonomous County</td></tr>
<tr><td>Special Administrative Regions</td><td colspan="4">(No Governmental Regional Organization)</td></tr>
</table>

Figure 1.1-1, Administrative Divisions of the PRC. Source: Created by the author.

Simplified Urban Planning System and Stakeholders			
	Stakeholder	Roles and Responsibilities	Key Focus Areas
1	Central Government	Sets national urban strategies, policies, and regulations.	Urban strategies, large-scale urbanization, regional planning.
2	Local Governments (Municipal, District, County-level)	Implements central plans at the local level.	Local plan implementation and project management.
3	National Agencies (NDRC, MOHURD)	Provides guidance on urbanization and planning.	Policy guidance for urbanization.
4	Planning and Design Institutions	Offers technical support and ensures scientific planning.	Technical support for planning.
5	Public	Participates in planning, focusing on environment and heritage.	Environment protection, heritage conservation, public involvement.

Figure 1.1-2, Simplified Urban Planning Sysytem and Stakeholders. Source: Created by the author.

1.1.3 Urban Planning Tools and Methods in China

Urban planning in China employs a range of tools and methods to ensure sustainable urban growth. The most fundamental tool is the **General Plan** as the master plan, which sets out the long-term vision for a city's development. It covers various aspects such as land use, transportation, and economic development, providing a strategic framework for the city's future. Another key tool is the **Regulatory Detailed Planning**, which provides specific guidelines for land use and construction standards, including building density, floor area ratios, and height limits. This type of planning ensures that individual projects conform to the overall urban layout and development goals.

For cities at the municipal and district levels, planning is often conducted on a multi-year timeline, with **five-year, ten-year, and fifteen-year plans** guiding future development. These plans include both comprehensive and specialized plans for different sectors like transportation, environmental protection, and infrastructure. Due to China's political system, urban plans are often implemented within the set timelines and are regularly adjusted and optimized based on ongoing assessments and changing conditions.

In addition to these, **Specialized Planning** targets specific sectors such as transportation, ecological protection, and energy. These specialized plans address the needs of particular functional areas within cities, ensuring that urban development is balanced across multiple dimensions. With China's rapid urbanization, the use of these planning tools has become increasingly sophisticated, helping to modernize and diversify its cities.

1.2 City and Classification

This section explores the classification of Chinese cities based on factors such as function, size, and administrative level. It covers the different city types, including industrial and other types, as well as the tier system, which categorizes cities from first-tier metropolises to smaller third-tier cities and below. Special attention is given to medium-small industrial cities, which are the core focus of this thesis. These cities, while often overlooked in broader urban studies, have played a crucial role in China's industrial development and are now facing challenges as the economy transitions towards more diversified and sustainable growth models.

1.2.1 Classification of City Types

Cities in China can be classified based on several criteria, including function, size, and industrial structure. Functionally, cities may serve as political, economic, cultural, or educational hubs. For example, Beijing is not only China's political capital but also a cultural and educational center, while Shanghai is the country's economic and financial hub. Economically, cities can be categorized as industrial cities, service-oriented cities, or innovation-driven cities. Most Chinese cities are industrial cities, as nearly all have an industrial sector that historically played a significant role in their economies. This is closely tied to China's early emphasis on industrial development. Many medium-small cities, especially in inland and northeastern regions, are primarily industrial cities, contributing significantly to the country's industrialization process. Figure 1.2-1 shows the major industrial cities in China, most of them are large or mega cities with a population over 100 million, which are the major industrial centers.

Figure 1.2-1, Major Industrial Cities in China. Source: map and data from MNRC and MIITC, edited by author.

1.2.2 Classification of City Levels and Tiers

China's cities are categorized by population, economic influence, and administrative status. First-tier cities like Beijing, Shanghai, and Shenzhen dominate politics, economics, and culture, with Beijing and Shanghai often labeled "super first-tier cities" for their global influence. Second-tier cities, including Chengdu, Nanjing, and Hangzhou, are known as "new first-tier cities" due to their rapid growth, regional influence, and ability to attract investment and talent. Third-tier and smaller cities, often located in less developed inland regions or resource-based industrial centers like Tangshan and Anshan, rely heavily on traditional industries and face challenges in transitioning to more sustainable economic models.

According to the 2014 *"Notice on Adjusting the Standards for City Size Classification"* by the State Council, cities in China are officially classified by their population size as follows:

Super Large Cities: Cities with an urban resident population exceeding 10 million.

Mega Cities: Cities with an urban resident population between 5 million and 10 million.

Type I Large Cities: Cities with an urban population between 3 million and 5 million.

Type II Large Cities: Cities with an urban population between 1 million and 3 million.

Medium Cities: Cities with an urban population between 500,000 and 1 million.

Small Cities: Cities with an urban population below 500,000.

In this thesis, terms like "First-tier Cities" are based on conventional usage in China. The primary focus on "Medium-small cities" follows the classification of "Medium" and "Small" as defined in the 2014 Classification, referring to populations under 1 million. Since this classification was established in 2014, some cities may now exceed that threshold. However, for this discussion, these cities are still categorized as "Medium Cities" based on 2014 data.

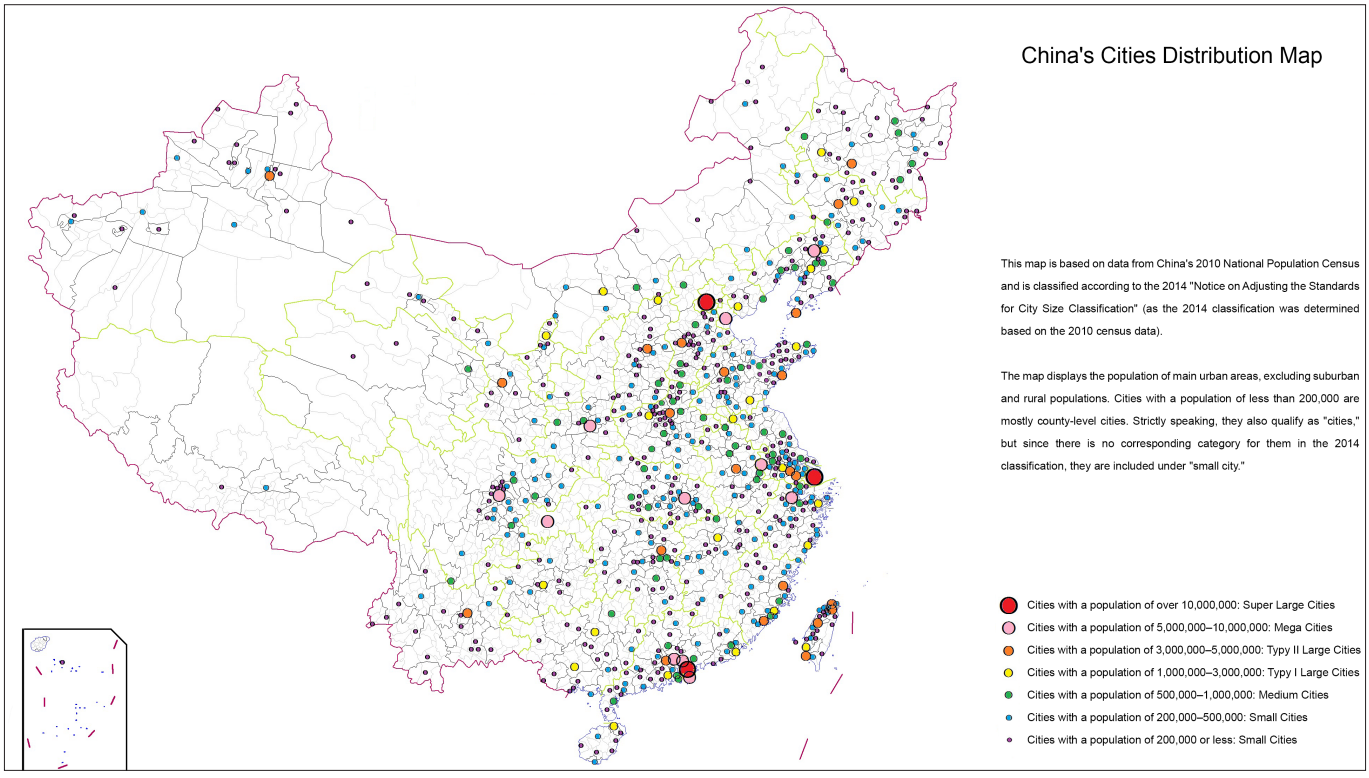


Figure 1.2-2, Medium and Small Cities in China. Source: data from NBS 2010 National Population Census, map created by author.

1.2.3 Medium-Small Industrial Cities

This thesis primarily focuses on these **medium-small industrial cities**, most of which are classified as third-tier or lower-tier cities, as mentioned above. Medium-small industrial cities have played a crucial role in China's industrialization. These cities, often located in the inland and **northeastern** China, such as Daqing, Tangshan, and Anshan, have long histories as centers of resource, heavy industry, and manufacturing. During the early phases of China's industrialization, these cities were pivotal in the development of the steel, coal, and machinery sectors. In addition to the northeastern region, most medium-small industrial cities are concentrated along the major railway lines established in the early years of the People's Republic of China, specifically the **Lanzhou-Lianyungang railways** and their branches, as well as t**he Yangtze River shipping corridor**. This strategic positioning provided important transportation links for resource distribution and industrial growth. The historical significance of these locations and their impact on cities like Pingdingshan will be explored in further detail in subsequent sections.

As China's economy shifts toward a more diversified and market-oriented structure, these cities are facing significant challenges. The reliance on traditional manufacturing and resource extraction has made it difficult for many medium-small industrial cities to adapt to the new economic realities of the globalized world. At the same time, the industrial culture and collective memory associated with these cities play an important role in their identity and transformation processes. Many of these cities are incorporating their historical industrial spaces into urban revitalization strategies, leveraging historical assets to attract tourism, investment, and talent. This transition reflects both a respect for the past and a forward-looking vision for sustainable development.

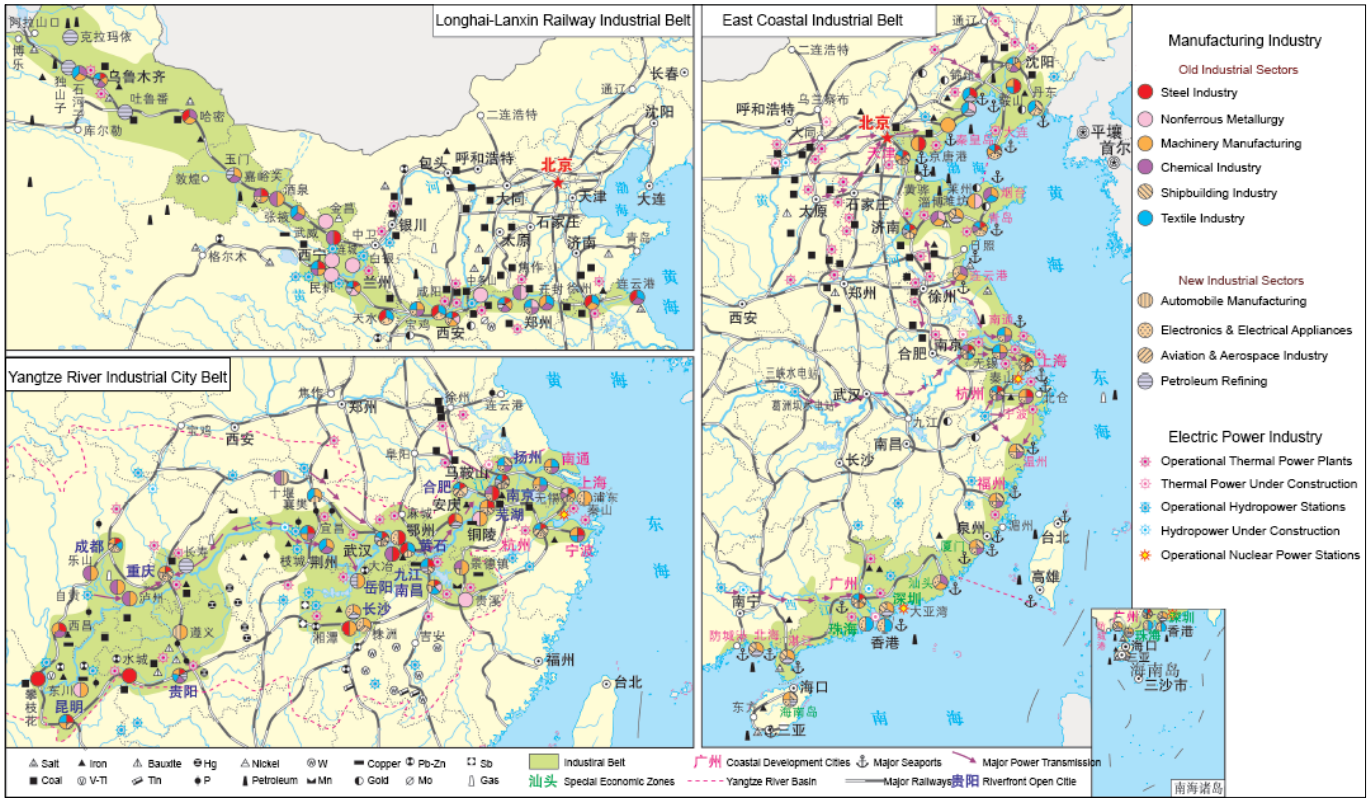


Figure 1.2-3, Major Industrial Belts in China. Provides a more detailed map of China's industrial cities, with medium-small industrial cities added (without names, only icons). Source: MNRC and MIITC, edited by author.

Chapter 2:
Medium-Small Industrial Cities in China and Their Urban Space

2.1 Chinese Industrial Cities and Their History

Unlike that of Western developed countries, China's industrialization began relatively late and was significantly influenced by foreign imperialism and semi-colonial influence. Modern industrial development in China was hindered during the late Qing Dynasty and the Republican Era, with rapid modernization only occurring after the founding of the People's Republic of China in 1949. Since the 1980s, the country's economic reforms, urbanization, and globalization have introduced new challenges for economic restructuring and industrial transformation in cities. Within this context of rapid development and transformation, historical industrial spaces have undergone phases of emergence, growth, decline, and, in many cases, relocation (Huang, 2018). At the same time, these spaces face societal demands for re-evaluation and reinterpretation of their value.

Before delving into the process of value reconstruction for historical industrial spaces, this study seeks to analyze their "historical and spatial characteristics" and explore their connection to social space. This analysis aims to link the spatial attributes of historical industrial spaces to urban memory. The discussion transitions from examining the "distinctive characteristics" of historical industrial spaces to analyzing their "universal characteristics." To structure this discussion, the paper focuses on two main aspects: the "historical development trajectory" of urban industrial spaces and their "spatial characteristics." The former emphasizes modern development of cities and the role of macro-level systems in shaping industrial urban development, while the latter analyzes the spatial features of industrial buildings within this historical context.

2.1.1 Development Path of Historical Industrial Spaces in Chinese Cities

The historical development trajectory of urban industrial spaces in China is intrinsically linked to the industrial history and its distinctive phases. This trajectory can broadly be divided into two periods, using 1949 as a dividing line: pre-1949 modern industrial spaces and post-1949 contemporary industrial spaces. The modern industrial era, spanning from the mid-19th century to the founding of the People's Republic, is further divided into several phases: the emergence of modern industry (1840–1894), the initial growth of modern industry (1895–1913), its rapid development (1914–1936), and eventual stagnation and decline during wartime (1937–1949). Each phase is characterized by varying levels of technological progress, production systems, and socio-political influences. Despite these distinctions, the industrial spaces of this era can generally be categorized into four types: traditional handicraft workshops, state-sup-

ported industrial facilities, foreign-invested enterprises, and private domestic factories (Chen, 2008).

In contrast, the post-1949 period saw a more detailed and rapid trajectory of development. This study focuses more on this period because the medium and small industrial cities under examination largely began their development after the founding of the People's Republic. The industrialization of this era can be divided into four stages (Liu, 2011): the recovery of the national economy and the *First Five-Year Plan* (1949–1957), the Great Leap Forward and subsequent economic adjustments (1958–1964), the *Third Front Construction* and the *Cultural Revolution* (1965–1977), and the *reform and opening-up* era to the present (1978–today). These divisions are based on several key factors. First, this period saw the establishment of a comprehensive industrial system and China's rise to become the "world's factory," resulting in an enormous inventory of industrial buildings. Second, these buildings, though relatively new, remain structurally viable and are increasingly viewed as critical resources for urban renewal. Third, the spatial and social integration of industrial and urban spaces during this period reflects the central role of the working class in the socialist state (Wang and Jiang, 2006). Finally, the transition from a planned economy to a market economy significantly altered the role of industrial spaces, necessitating a redefinition of their function within urban areas.

Figure 2.1-1 illustrates the changes in industrial distribution in China after 1949. It shows how, with the implementation of policies related to industrial growth, such as the *First Five-Year Plan*, China's industrial layout gradually shifted from the coastal and riverside treaty port cities of the pre-1949 era to the inland regions. This transition forms the historical background of China's industrial cities,

By examining the evolution of China's historical industrial spaces from 1840 to the present, this study aims to summarize the political, economic, military, cultural, and technological influences of each phase. This analysis provides a foundation for understanding the spatial characteristics of industrial spaces and their transformation over time, offering insights into their role as enduring elements of urban memory. Also, specific architectural spaces will be discussed less, while urban spaces will be discussed more.

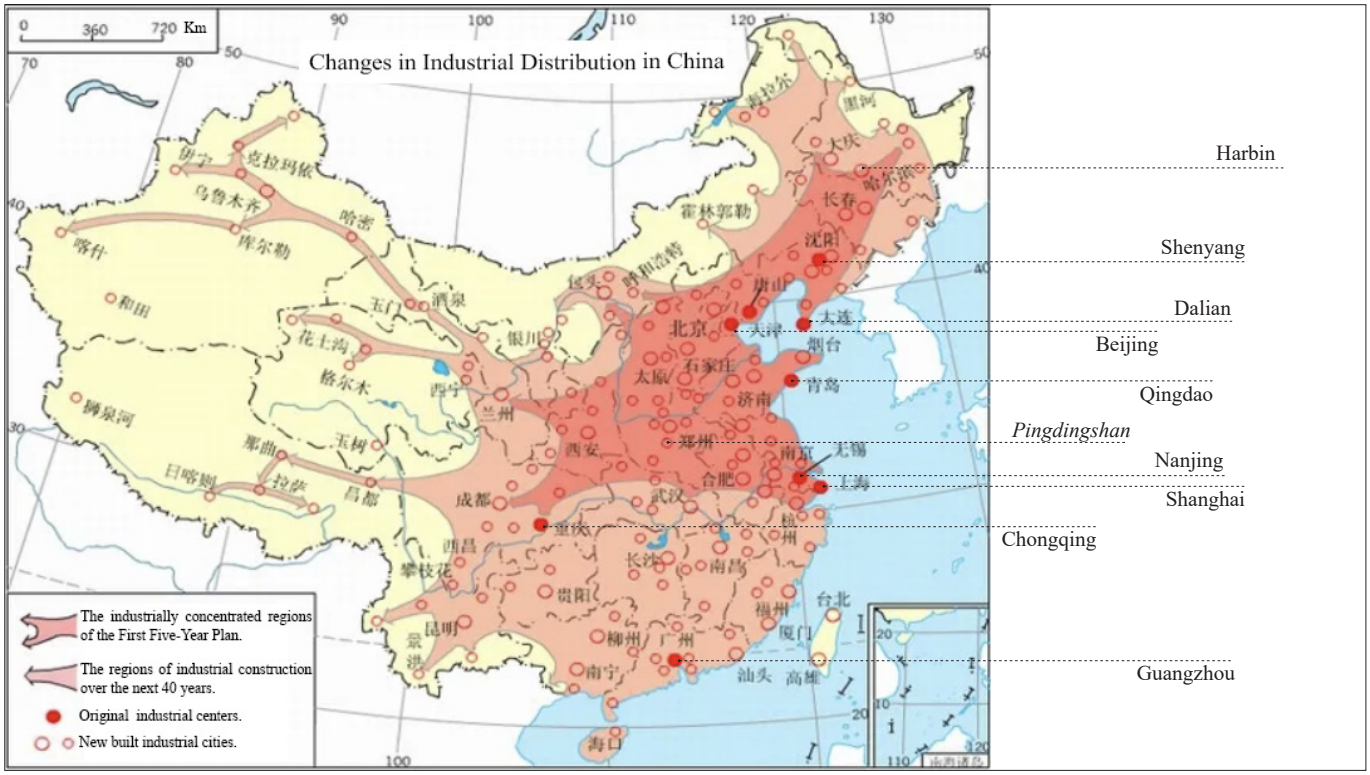


Figure 2.1-1, Changes of Industrial Layout of China. Source: MNRC and MIITC, edited by author.

2.1.2 Modern Industrial Urban Space (1840 - 1949)

Before industrialization, China's urban industrial spaces consisted of two main types: traditional handicraft spaces and modern industrial spaces, which emerged after the *Opium War* in 1840, due to the *Self-Strengthening Movement*, rising national capital, and foreign colonial investments.

Traditional handicraft spaces evolved naturally in cities like Beijing, Xi'an, and Nanjing, driven by urban population growth and daily needs. Organized as family workshops or guild-operated factories, they specialized in silk weaving, tea production, and papermaking (Li, 1996). These spaces typically featured small timber-framed structures limited to one or two stories due to technical constraints (Chen, 2008) and were often clustered near rivers to facilitate water transport (Shen, 1937).

Modern industrial spaces marked the start of China's industrial spaces development. These spaces emerged with the expansion of Western colonialism, the Self-Strengthening Movement, and the Republican Era (1912–1949), transitioning China from agrarian to industrial civilization. Urban planning introduced during this time fostered the integration of industrial and urban development, shaping city-building efforts. Industrial spaces from this period carried two characteristics: aspirations for national self-strengthening and colonial influence. Historical studies classify modern industry into three types: *Self-Strengthening Movement enterprises*, *semi-colonial and semi-feudal industrial spaces*, and *national industry* (Chen, 2008). While major cities at that time, like Shanghai and Tianjin, now metropolitan, are not the study's focus, their historical development offers important context.

During the *Self-Strengthening Movement*, China began importing Western industrial technologies and building state-run facilities for military production, including munitions, shipbuilding, and mining. Notable examples include the *Jiangnan Manufacturing Bureau* in Shanghai, established in 1865 by Li Hongzhang, and the *Jinling Arsenal* in Nanjing, later repurposed as the *"Morningside 1865 Creative Industry Park".* Factories were strategically located near resources and transportation routes (Chen, 2008).

In the *semi-colonial era*, foreign investors built industrial facilities within treaty ports and concessions, reflecting their home countries' styles and advanced layouts. Private industries also grew, focusing on light manufacturing like textiles and paper.

Meanwhile in the *Republican Era*, private industrial enterprises emerged, either state-supervised and merchant-operated or entirely privately funded. These focused on light industries like silk reeling, flour milling, textiles, match production, and paper manufacturing. The Republican Era witnessed a surge in national industry, with factories exhibiting distinct characteristics of site selection and unplanned clustering. The national industries were often located in treaty ports with early foreign presence, such as Shanghai, Wuhan, Tianjin, and Guangzhou. These cities, now major urban centers, offered access to advanced technology, capital, and management expertise. Unlike modern urban planning, site selection for private industrial enterprises was largely spontaneous, leading to their aggregation in informal industrial zones within cities (Li, 1996).

This complex historical trajectory laid the foundation for the development of China's modern industrial spaces, shaping not only their physical forms but also their roles within the broader urban and social landscapes.

2.1.3 The Common Contemporary Industrialization History of Chinese Cities (1949 -)

2.1.3.1 Foundation of Industrial Cities During the 1st Five-Year Plan Era, 1949-1957

Between 1949 and 1957, after the foundation of the PRC in 1949, during the period of national economic recovery and the implementation of the *First Five-Year Plan*, China's cities transitioned from prolonged warfare into a phase of orderly and stable development. Industrial growth became a cornerstone of economic progress and urban spatial planning. February 1949, during the *Second Plenary Session of the Seventh Central Committee of the CPC*, Mao Zedong emphasized, *"The Party's work focus must shift from the countryside to the cities,"* further stating, "*Only by restoring and developing urban production, transforming consumption-oriented cities into production-oriented ones, can the people's government be solidified."* This vision for "production-oriented cities" laid the foundational framework for postwar urban reconstruction in China, elevating industrial production spaces to a critical level and profoundly influencing the evolution of urban industrial spaces (Li, 2006).

During this period, the PRC implemented major reforms in urban enterprises and traditional handicrafts. Private industrial enterprises were transformed into publicly owned entities. Small workshops and factories scattered in residential areas were cleared and consolidated into planned industrial zones, creating larger and more efficient factories. War-damaged industrial and mining enterprises were repaired, modernized, or rebuilt entirely. Additionally, the state invested heavily in major industrial projects, using national resources and importing Western technology to accelerate modernization (Wu, 1990).

Starting in 1953, the *First Five-Year Plan* accelerated the process of industrialization, focusing on the development of heavy industries as its core priority. This strategy significantly shaped urban industrial spaces. Cities were planned with industrialization as the central goal of socialist urban development, with urban construction designed to support and prioritize industrial projects. *The 156 projects assisted by the Soviet Union* (Figure 2.1-2) also played a key role and were core projects for China's industrialization de-

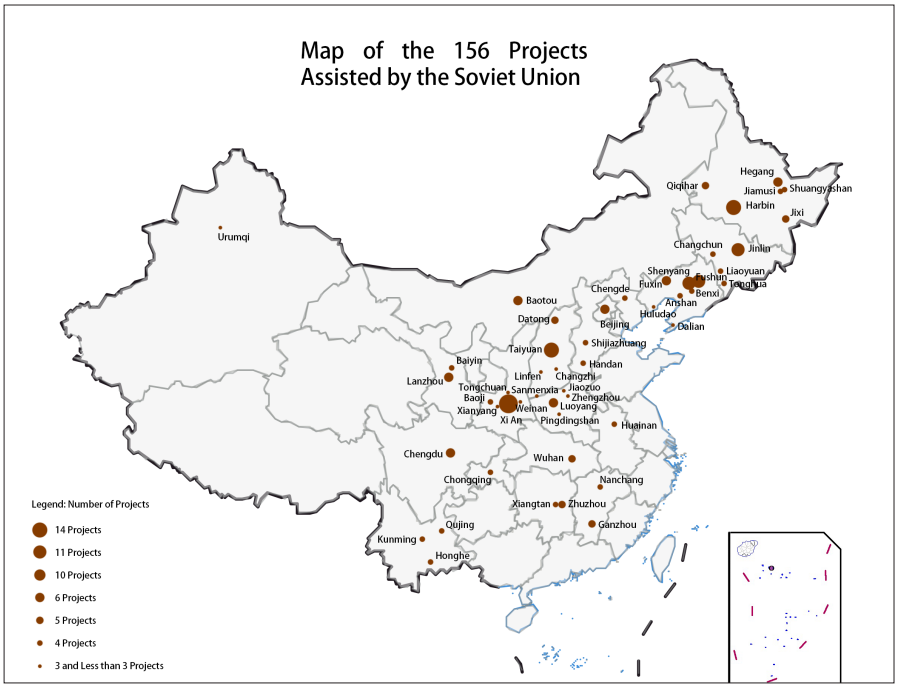


Figure 2.1-2 (Left), Map of the 156 Project Assisted by the Soviet Union.

Figure 2.1-3 (Right), Poster from the 156 Projects Period in China about Learning from Soviet Experience.

Source: Left: Created by the Author. Right: UC Berkeley Digital Collections.

velopment in the early days (Li, 2006). This collaboration enabled China to quickly modernize its heavy industries and led to the rise of new industrial cities, such as Pingdingshan, which was built from the ground up during this period (Yang and Yang, 2011).

The industrial development of this era prioritized national and local projects, allocating about 15-20% of national funds to industrial construction. Heavily influenced by Soviet practices, this model used standardized methods in design, construction, and organization. Industrial zones featured vast land use and large-scale projects, such as the *Changchun First Automobile Works* (750,000 square meters, completed in 1953) and the *Luoyang First Tractor Plant* (6.45 million square meters). Factories were monumental, often built with reinforced concrete and clean red brick facades. Their layouts were symmetrical, typically centered around a large square with prominent Mao Zedong statues. Office buildings were multi-story brick-and-concrete structures, aligned symmetrically along a central axis, and decorated with red flags, gears, five-pointed stars, and slogans (Xu, Sun, and Aoki, 2015). Factory interiors were utilitarian, with exposed concrete or minimally whitewashed walls. Supporting facilities, including residential, educational, and healthcare infrastructure, followed a uniform Soviet architectural style. Non-priority projects were also clustered to meet local needs (Figure 2.1-3).

As Lewis Mumford (1961) noted in *"The City in History"*, *"What truly influences city planning are profound political and economic transformations."* The industrial city planning initiated during China's early years, particularly through the the *First Five-Year Plan*, laid the foundational framework for China's contemporary cities. These efforts not only shaped the country's industrial landscape but also reflected the significant political and economic shifts occurring in the post-revolutionary period.

Pingdingshan exemplifies the transformative impact of this era's industrial policies. Emerging during the *First Five-Year Plan* as a key coal mining center, it transitioned from an uninhabited area into an industrial hub, showcasing the integration of urban planning with industrial development goals.

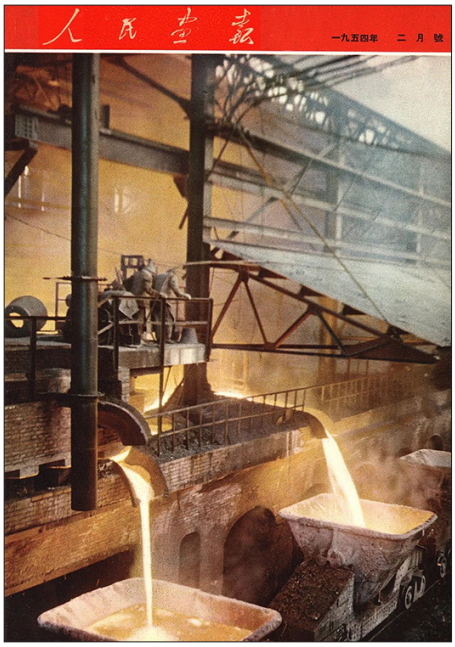


Figure 2.1-4 (Left), Photos of the Industrial Landscape During the *First Five-Year Plan* Period. Anshan Iron and Steel Company in 1953.

Figure 2.1-5 (Right): February 1954 Cover of *People's Pictorial*: Inside Anshan Iron and Steel Company.

Source: February 1954 of *People's Pictorial.*

2.1.3.2 The Great Leap Forward and Aftermath, 1958-1964

Note: This section seeks to objectively examine the evolution of industrial cities during this era by referencing official evaluations and historical data, without making subjective judgments on the political ideologies and movements of the time.

From the beginning of the *Second Five-Year Plan* in 1958 to the conclusion of the *National Economic Adjustment Period* in 1964, urban construction in China experienced significant fluctuations. During this period, a blind pursuit of *"high targets and high speed"* dominated the development of industrial spaces (Dong, 1996). While some researchers highlight the economic harm caused by such policies, they also underscore the profound impact on industrial spatial layouts and construction practices. For Pingdingshan, many coal mining and industrial projects finished its construction during this period.

Following the early completion of some *First Five-Year Plan* targets in 1956, including the socialist transformation of private industrial and commercial enterprises, a sense of haste and over-ambition emerged among the nation. In 1958, the *CPC's Eighth National Congress* adopted the principle of *"working hard, striving for excellence, and building socialism with more, faster, better, and cheaper results."* This approach launched the *Great Leap Forward*, initiating a nationwide wave of industrialization.

During this phase, urban industrial spaces exhibited rapid and chaotic changes:

1. Rapid Expansion of Urban Industrial Zones: Urban land area expanded dramatically, with large industrial zones spreading toward city peripheries, leading to a sharp increase in industrial spatial volume. **2. Emphasis on Quick Construction:** Fast-track design and construction practices increased the number of industrial buildings, but the *"surveying, designing, and building at the same time"* approach led to widespread quality issues. **3. Unplanned Inner-City Developments:** Small and medium-sized factories of varying quality were indiscriminately built within inner cities, encroaching on residential and green spaces. The quality of the *danwei* spaces built during the *First Five-year Plan* was severely reduced.

These strategies prioritized quantity over quality, often ignoring practical constraints, which led to unsustainable industrial and urban development models. For Pingdingshan, this period marked a phase of rapid expansion influenced by these factors. By the late 1960s, the excessive expansion of industrial projects, inefficient construction, and unrealistic urban development exceeded the nation's economic and material capacity. This resulted in severe resource depletion, forcing the government to urgently revise its development strategies (Huang, 2018).

During the following three-year adjustment period, the *Great Leap Forward* was critically reassessed, prompting significant changes in urban industrial development. New policies, such as the directive *"On Several Issues in Current Urban Work,"* focused on controlling urban population growth, particularly in large cities, and decentralizing new factories to smaller cities and towns (Dong, 1996).

With limited new construction, planning standards were further reduced. Factory layouts became more scattered, and expansions within industrial facilities grew unchecked. Temporary structures often disrupted original factory plans, while uncoordinated construction practices undermined urban spatial planning. In Pingdingshan, the foundational urban planning of its northern mining district largely took shape during this period, which to a certain extent, laid the foundation for the scattered distribution of mining sites in Pingdingshan City.

2.1.3.3 Third Front and the Cultural Revolution: Adjustments in Distribution, 1965-1977

From the initiation of the *Third Front Construction* in 1965 to the end of the *Cultural Revolution* in 1977, China experienced significant disruptions in its national economy and industrial development. The backdrop of international tensions, including the Vietnam War, deteriorating China-Soviet relations, and the China-Indian border conflict, coupled with domestic socio-political upheavals, shifted the country's construction priorities towards *"preparing for war and natural disasters."*

Starting in 1965, the national development strategy shifted focus to defense, science, industry, and transportation, leading to the large-scale relocation of industrial enterprises from coastal cities to inland regions under the framework of the *Third Front Construction* (Zhou and Li, 2003). This strategy exhibited several defining characteristics:

Many defense and industrial projects were relocated to mountainous and suburban areas in inland provinces, following principles of *"dispersion, concealment, and proximity to mountains"*. These locations were chosen for their strategic value and relative isolation. *Danwei* communities surrounding these enterprises were designed to be self-sufficient and isolated due to the nuclear war preparation of the time. Workers' residential areas were equipped with cultural, educational, and healthcare facilities, reducing

Figure 2.1-6, Cites and Projects Developed During the *Third-Front Construction*. Source: China Map Publishing Group. https://www.xuexi.cn/lgpage/detail/index.html?id=12974287864635520681&item_id=12974287864635520. edited by author, the original Chinese text has been retained in the translation.

reliance on external resources. Hidden transportation networks often connected these communities to the outside world (Huang, 2018). An example is the *Chongqing 816 Nuclear Factory*, where over 1.5 million cubic meters of rock were excavated to construct vast underground facilities in mountains.

Economic constraints of the period heavily influenced construction practices. Rapid and cost-effective building methods relied on locally sourced and cheap materials like brick, wood, and bamboo. This era's architecture was defined by its minimalist, functional style, often referred to as "de-decorated." Additionally, some provinces developed localized *"mini-Fronts"* projects, emphasizing industrial decentralization and combining industry with agriculture. Initiatives such as *"combining industry with agriculture"* and *"using factories to support rural communities"* became prominent, further integrating industry into local economies (Zhou, 2014).

China's western regions, including major cities like Chengdu, Chongqing, Kunming, and Lanzhou, underwent rapid industrialization during this period, solidifying their roles as industrial hubs. In contrast, most of China's resource-based cities completed their initial development and construction during this period to provide sufficient resources for the country's industrial migration and development (Figure 2.1-4). Pingdingshan, classified as a *"Third-Front"* city and also a *"mini-Fronts"* due to its location between the second and *Third Front*s and its unique coal resources, did not witness significant industrial relocations (Bai, 2019). As an important coal mining city supporting the construction of other *Third-Front* cities, especially the south of China, it still significantly increased the pace of new coal mines to support other industrial cities (Zhou, 2014).

While the *Third Front Construction* adjusted the geographical distribution of Chinese industries by moving them inland and prioritizing rural industrialization over urban centers, the subsequent *Cultural Revolution* further fragmented urban industrial spatial patterns.

Beginning in May 1966, the *Cultural Revolution's* ideology and anarchic tendencies severely disrupted urban planning. Existing plans were either halted or criticized, and project siting adopted a "filling gaps" approach, leading to several significant spatial impacts (Xu and Chen, 2015). Industrial sites became increasingly dispersed, often located on the urban periphery, far from established industrial zones and residential areas. This resulted in isolated, inefficient clusters with minimal integration into the broader urban fabric. Radical interpretation of *"combining agriculture with industry"* and *"integrating rural and urban areas"* policies emphasizing prioritized production over living conditions. Factories were often built without supporting residential or public services, reflecting a fragmented development philosophy, deviating from the intention of *danwei* system.

Unregulated construction further complicated urban areas. Improvised industrial developments led to mixed-use zones where residential courtyards were repurposed as warehouses or street factories. Housing projects expanded chaotically with additions like poorly planned additional structure disrupting urban layouts. The focus on production also caused the removal of landscaping and tree planting, which were dismissed as *"revisionist"*. This led to the degradation of green spaces, contributing to the decline of both factory and urban environments (Gellete, 2017). Many small industrial sites scattered throughout the city were built during this period. However, almost none of these industrial sites remain today because of their poor quality, and they were all used differently in the subsequent *land finance* and *market-oriented reforms*.

2.1.3.4 Reform and Opening Period: New Development Phase, 1978-

In 1978, the CPC's decision to prioritize economic development and initiate significant reforms catalyzed a transition from a centrally planned economy to a socialist market economy characterized by diverse ownership structures. The *Reform and Opening-Up* era marked a profound shift in national policy, focusing on economic development and correcting past missteps. With this political and economic realignment, Chinese cities entered a period of rapid transformation, ushering in new approaches to urban construction and industrial spatial development. This shift profoundly influenced urban development:

1. Various Forms of Investment: Urban construction transitioned from being dominated by state-planned projects to a diversified landscape that included self-financed projects, collective and private enterprises, as well as foreign and joint-venture investments (Huang, 2018).

2. Economic Develeopmtn Zones: China began integrating into the global trade network, leading to the establishment of numerous economic and technological development zones as the country pursued its goal of becoming the "world's factory."

3. Land Finance: The introduction of a paid land-use system transformed land into an economic lever, profoundly influencing urban spatial planning and development.

This transformation laid the groundwork for new perspectives on urban development, industrial space utilization, and planning strategies. Urban planning also transcended its former role as an extension of national economic planning. It was rethought as a comprehensive strategy, guiding land use, spatial organization, and construction projects to align with broader economic and social goals. The emphasis shifted toward balancing economic growth with effective urban governance, ensuring that economic pursuits did not override fundamental urban planning principles. Also, the urban development policy of *"controlling*

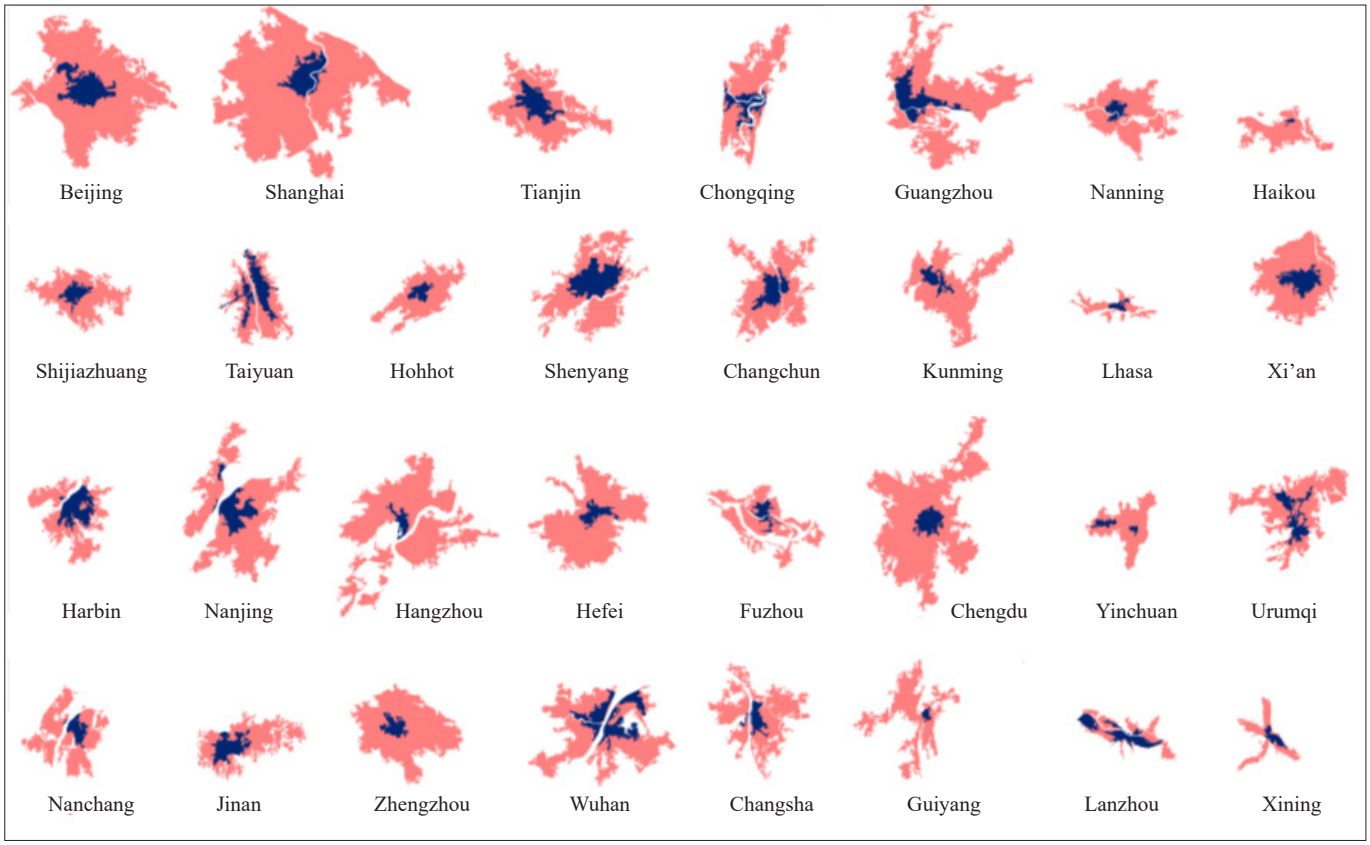


Figure 2.1-7, Built Area in Major China's Provincial Capital Cities, Before and After the *Reform and Opening-up,* Blue Shows 1972, Red 2020. Source: Aerospace Information Research Institute, Chinese Academy of Sciences, https://aircas.cas.cn/dtxw/kydt/202103/t20210304_5969166.html, edited by author.

the size of large cities, reasonably developing medium-sized cities, and actively promoting the growth of small cities." was proposed (Zhang, 2017).

The late 1970s saw accelerated residential construction and significant investment in public infrastructure. By the early 1980s, urban development expanded to include commercial services, financial systems, cultural activities, and tourism facilities. International urban planning concepts and methodologies also began influencing Chinese cities, leading to two major trends (Shen, 2010):

1. Urban Expansion: Large-scale developments and satellite towns flourished around major cities. The average area of provincial capital cities has expanded 7.46 times from 1972 to 2020 (CAS, 2010).

2. Inner-City Redevelopment: Urban renewal shifted from minor repairs to comprehensive redevelopment integrated with real estate projects, significantly modernizing public infrastructure.

By the 1990s, as the socialist market economy matured and China deepened its openness to global trade, urban construction faced new demands. Cities needed to innovate their development strategies, expand urban functions, and modernize their planning methodologies, marking a pivotal transition period. For medium-small cities like Pingdingshan, the post-reform policies—such as the emphasis on "actively developing small cities" and breaking away from the "productive city" model—spurred rapid urban expansion. Beyond mining and industrial production, Pingdingshan began incorporating functions traditionally associated with urban centers, including commercial, cultural, and recreational activities.

At that time, the reform of state-owned enterprises introduced sweeping changes to Pingdingshan's industrial base. The city's urban area grew significantly, and its economic structure began to diversify. These changes set the stage for Pingdingshan's ongoing transformation from a resource-dependent city to a multifaceted urban center with a broader array of economic and social functions.

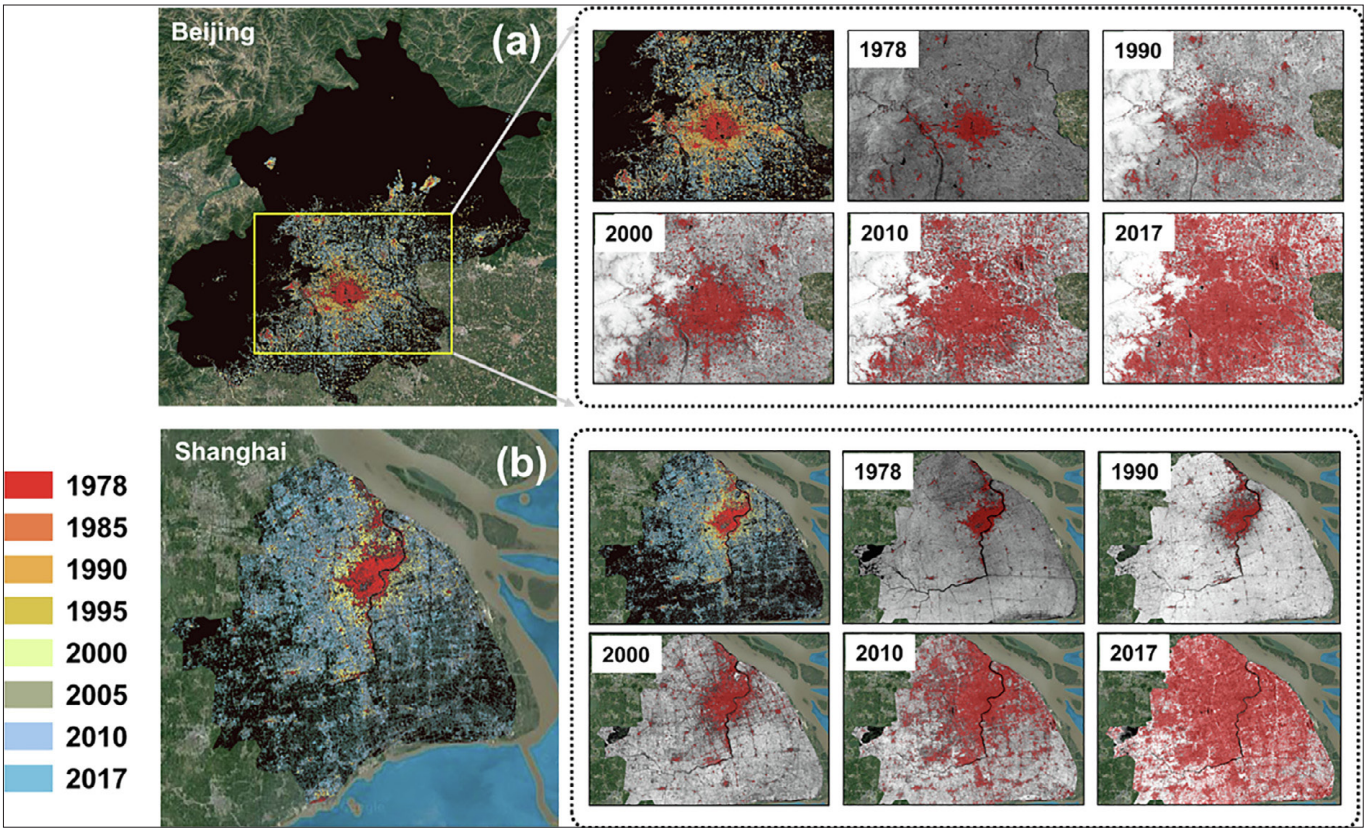


Figure 2.1-8, Satellite Remote Sensing of Beijing (a) and Shanghai (b) in 40 Years, illustrating rapid urban expansion. Source: Gong P,Li X,Zhang W.40-Year(1978–2017) human settlement changes in China reflected by impervious surfaces from satellite remote sensing[J].*Science Bulletin*,2019,64(11):756-763..

2.2 Characteristics of Industrial Spatial Layout in Chinese Cities

2.2.1 Uneven Geographic Distribution at the Macro Level

The extreme imbalance in the development of China's semi-colonial and semi-feudal economy led to an uneven distribution of early industrial buildings, with most industries concentrated in coastal provinces and cities. These coastal areas were the first to be divided and controlled by imperialist powers, marking the earliest beginnings of urban industrialization in China. Their "industrial first-mover advantage" also contributed to the most vigorous industrial construction and technological development in these regions, leaving them with a larger stock of industrial spaces compared to inland provinces. Although the industrial relocation during the *Anti-Japanese War* and the *Third Front Construction* period partially reshaped China's industrial layout and supported the development of inland cities, it did not fundamentally change the geographical imbalance in the distribution of historical industrial spaces (Chen, 2008):

1. Early treaty ports and cities with convenient water transport, such as Shanghai, Tianjin, Guangzhou, Nanjing, and Wuhan, saw the earliest industrial activities and most advanced economic development. These cities hosted a large number of industrial projects due to advantages in finance, transportation, export facilities, and labor. Their superior resources in finance, technology, talent, and management not only attracted foreign capital but also significantly supported the development of the Self-Strengthening Movement and national industries, concentrating industrial spaces in coastal provinces (Shen, 1937).

2. The bureaucratic nature of the Self-Strengthening Movement influenced the spatial distribution of factories, often determined by regional officials. This explains why some early modern industries appeared in inland areas such as Wuhan, Lanzhou, Kunming, and Chengdu. For instance, Zhang Zhidong, a leading figure of the Self-Strengthening Movement, initially ordered steel furnaces and machinery for the expansion of the Guangzhou Machinery Bureau. However, after being transferred to Hubei as Viceroy of Huguang, he redirected the equipment to Hanyang, where he established the Hanyang Iron Works on the banks of the Han River.

3. During the *Anti-Japanese War*, industrial enterprises relocated inland to escape wartime threats. Cities like Baoji, Yumen, Tianshui, Neijiang, Zigong, and Shaoyang experienced temporary industrial booms during this period.

4. In the early years of the People's Republic of China, the country's weak industrial foundation led to the establishment of *156 projects* with Soviet assistance (Peng, 2006). These projects were concentrated in cities with existing industrial bases or along strategic transportation routes, such as the Yangtze River and major railways. Many medium-small industrial cities emerged during this time.

5. During the *Third Front Construction*, industries in coastal areas were once again relocated inland. Numerous industrial towns and building complexes were constructed in remote regions, particularly in the southwest and northwest, significantly altering the national industrial layout.

Coastal cities, with their vibrant economic environments, were the first to face industrial spatial transformations. These first-mover industrial cities have an abundance of historical industrial spaces, often boasting the longest histories and highest technological value. Their experiences in industrial transformation provide valuable lessons for medium and small industrial cities mentioned in points 4 and 5 (Huang, 2018).

2.2.2 Site Selection and Urban Layout

The spatial patterns of historical industrial spaces in modern Chinese cities have been closely linked to government policies and industrial positioning. In cities dominated by traditional industries, large-scale industrial enterprises and clusters have shaped urban development, with their historical site selection and spatiotemporal distribution influenced by factors such as industrial history, transportation networks, labor availability, resource access, inter-industry collaboration, land requirements, and market scope. Based on the analysis of development trajectories and urban layouts, these spaces are generally categorized into three types: **Small-Scale Industries in Inner City Areas**, **Industrial Zones in Urban Edge Areas**, **Suburban Industrial Areas, Riverfront Industrial Belts**.

2.2.2.1 Small-Scale Industries in Inner City Areas

Small-scale industrial enterprises dispersed throughout inner-city areas are often numerous and diverse in nature, embedded within the urban fabric of historic city centers. These enterprises can generally be divided into two broad categories:

Traditional and Light Industries Embedded in Residential Streets: These small factories evolved from longstanding family-owned workshops and guild-operated craft industries. Deeply intertwined with the surrounding residential neighborhoods, they are typically scattered across traditional living quarters. While their integration into the urban fabric allows for close ties with the community, their location within densely populated areas restricts opportunities for expansion and modernization.

Street Factories Established During the *"Great Leap Forward"*: In response to national policies, many small factories were built within city spaces during this period. These factories were strategically located near markets and known for their flexible operations. However, their rapid development often prioritized speed over quality, resulting in substandard construction, inadequate facilities, and significant disruptions to the surrounding living environment. For example, in Shanghai, as of 1949, there were 10,079 factories citywide, with 7,816—accounting for 77.7%—scattered within urban residential areas. Many of these were "lane factories" situated within traditional alleys, a feature unique to Shanghai (Dong, 1996).

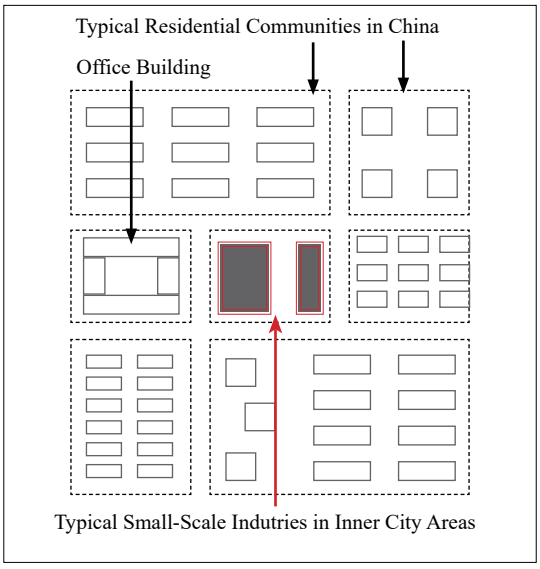


Figure 2.2-1 (Left), A Case Photo of Small-Scale Industries in Inner City Areas. Source: Original Design Studio, TJAD.

Figure 2.2-2 (Right), Diagram of Small-Scale Industries in Inner City Areas. Source: Drawn by author.

These small-scale industrial buildings, deeply interwoven with inner-city residential areas, are often prime candidates for adaptive reuse after their industrial functions are rendered obsolete. However, the redevelopment of such spaces faces several challenges, including disordered physical layouts, conflicting urban adjacency relationships, high land rental costs in inner-city areas, and complex ownership structures. Nevertheless, successful redevelopment of these small-scale industrial spaces can significantly enhance the spatial quality of micro-urban areas and communities.

Notably, these types of industrial spaces are typically found in cities with a history of private craft industries dating back to modern China (Li, 1996). In recent urban renewal projects, many of these former industrial sites have been repurposed into community service facilities, offering a relatively straightforward yet impactful opportunity for urban transformation and regeneration.

2.2.2.2 Industrial Zones in Urban Edge Areas

Industrial zones located on the edges of urban areas have been a primary feature of Chinese cities' industrialization process, particularly following the establishment of modern industrial enterprises. These zones were intentionally placed at the edge or periphery of urban areas to minimize the impact of industrial activities—such as noise, pollution, and heavy traffic—on residents in city centers. They typically house large-scale industries such as mining, smelting, machinery, electrical equipment, chemicals, light industry, and building materials (Li, 2006). Due to the high demand for transportation, these zones are often located near railways, highways, or waterways.

In major cities, examples of such zones include Yangshupu, Caijiadu, Zhizaoju Road, Riyuegang, and Lujiazui in Shanghai, which were developed after the founding of the People's Republic of China as peripheral industrial clusters. Similarly, in medium and small industrial cities, many industrial zones resemble or belong to this category. For instance, Pingdingshan's northern mining area, stretching from the No.1 to the No.12 mines and encompassing associated facilities such as coking plants, coal washing plants, and industrial railways, lies at the northern edge of the city's central area. These facilities are closely linked to convenient industrial railways and highways and are accompanied by the residential and

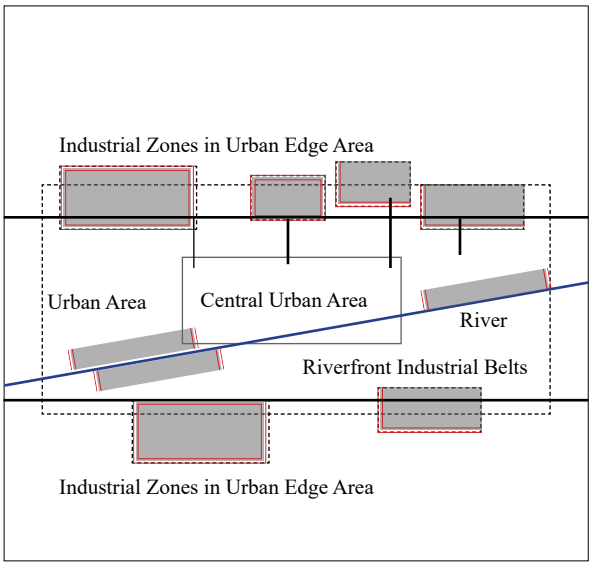


Figure 2.2-3 (Left), A Case Photo of Industrial Zones in Urban Edge Areas. Source: Pingmei Group, edited by author.
Figure 2.2-4 (Right), Diagram of Industrial Zones in Urban Edge Areas. Source: Drawn by author.

service units established under the former *danwei* system. However, with the expansion of urban boundaries, such industrial zones and their associated residential areas are gradually becoming part of the city's core (Huang, 2008).

The transformation of these industrial spaces is often driven by urban policies favoring "industrial restructuring", where cities transition from secondary to tertiary industry as their economic focus (Yu and Hong, 2013). Additionally, rapid urban expansion and the development of new urban districts further necessitate the regeneration of these industrial areas. Transforming these zones involves more than a simple functional repurposing of the physical space; it often requires large-scale urban regeneration strategies supported by comprehensive policies. These areas typically host diverse populations across different age and social identities, making their redevelopment a complex process that extends beyond spatial issues to include economic, social, and cultural considerations (Chen, 2013).

Such transformations demand coordinated efforts from a wide range of stakeholders and often prioritize economic and social revitalization over purely spatial concerns. The challenges and opportunities associated with these industrial zones make them a focal point for this study's exploration of the spatial evolution of historical industrial spaces.

In this category, a type of **Riverfront Industrial Belts** in Cities can also be referred to as Industrial Zones in Urban Edge Areas. This is because riverbanks with water transport access have always been ideal locations for factories, as docks along the river allow for easy import of raw materials and export of products. Some sections of these navigable rivers are located farther from the city's central residential areas, leading to the establishment of Riverfront Industrial Belts. However, with urban expansion and development, these areas have gradually been incorporated into the urban core.

However, with urban development and the improvement of land-based transportation, proximity to waterways is no longer the most important factor for factory locations. Many riverfront industrial belts have ceased operations and been repurposed for new uses. The most famous example is Shanghai's Huangpu River Industrial Belt, which was redeveloped into the World Expo site and later became a model for the adaptive reuse of historical industrial spaces in China.

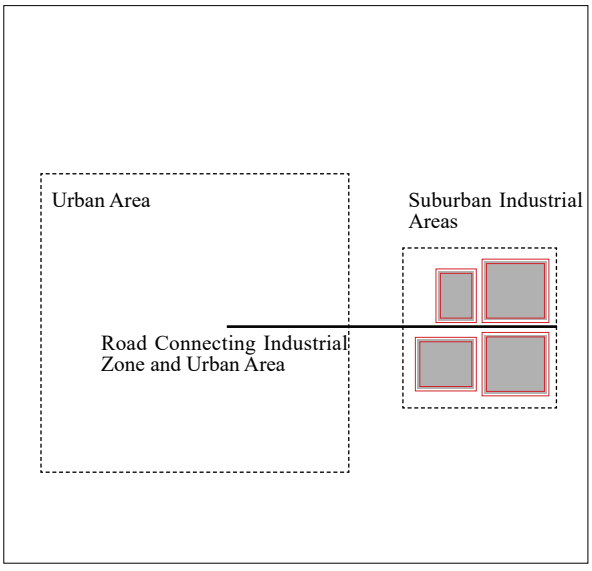


Figure 2.2-5 (Left), A Case Photo of Suburban Industrial Areas, Zhenhai Refining & Chemical Company. Source: Sinopec Group.
Figure 2.2-6 (Right), Diagram of Suburban Industrial Areas. Source: Drawn by author.

2.2.2.3 Suburban Industrial Areas

The third category consists of large-scale, single-industry enterprises, unique to major cities in China. Although fewer in number compared to the first two types, these enterprises are distinguished by their vast building scale, advanced construction standards, historical significance, and substantial contributions to urban development. Often funded directly by the central government, their rise and fall have had a profound impact on urban spatial structures. Starting from the early 1950s, projects such as the Soviet-assisted *156 projects*, the construction of industrial satellite cities in the late 1950s, and the *Third Front Construction* of the mid-to-late 1960s exemplify this type of industrial development. These projects involved immense facilities supported by dedicated railway networks and auxiliary industrial enterprises. Typically located 10 to 25 kilometers or more from city centers, these factories were connected to urban areas by railways or dedicated transit lines. Internally, they were self-contained industrial zones, featuring residential, commercial, cultural, and recreational facilities, and were often isolated and self-sufficient (Li, 2006). Common examples include large steel mills, shipyards, nuclear facilities, and automotive or aerospace manufacturers, such as *Baosteel* in Shanghai, *Shougang* in Beijing, and the *798 Art District*, which was originally the *718 Joint Factory*.

Given the high status, strategic importance, and complex ownership structures of these enterprises—ranging from national to provincial and municipal levels—their transformation often requires substantial external impetus. Their scale, historical significance, and architectural quality make them prominent urban industrial assets. However, due to the critical role they play in national pillar industries and the intricate web of stakeholders involved, their spatial redevelopment is rarely driven solely by market forces or civic initiatives. Instead, major shifts typically result from top-down directives or significant national projects.

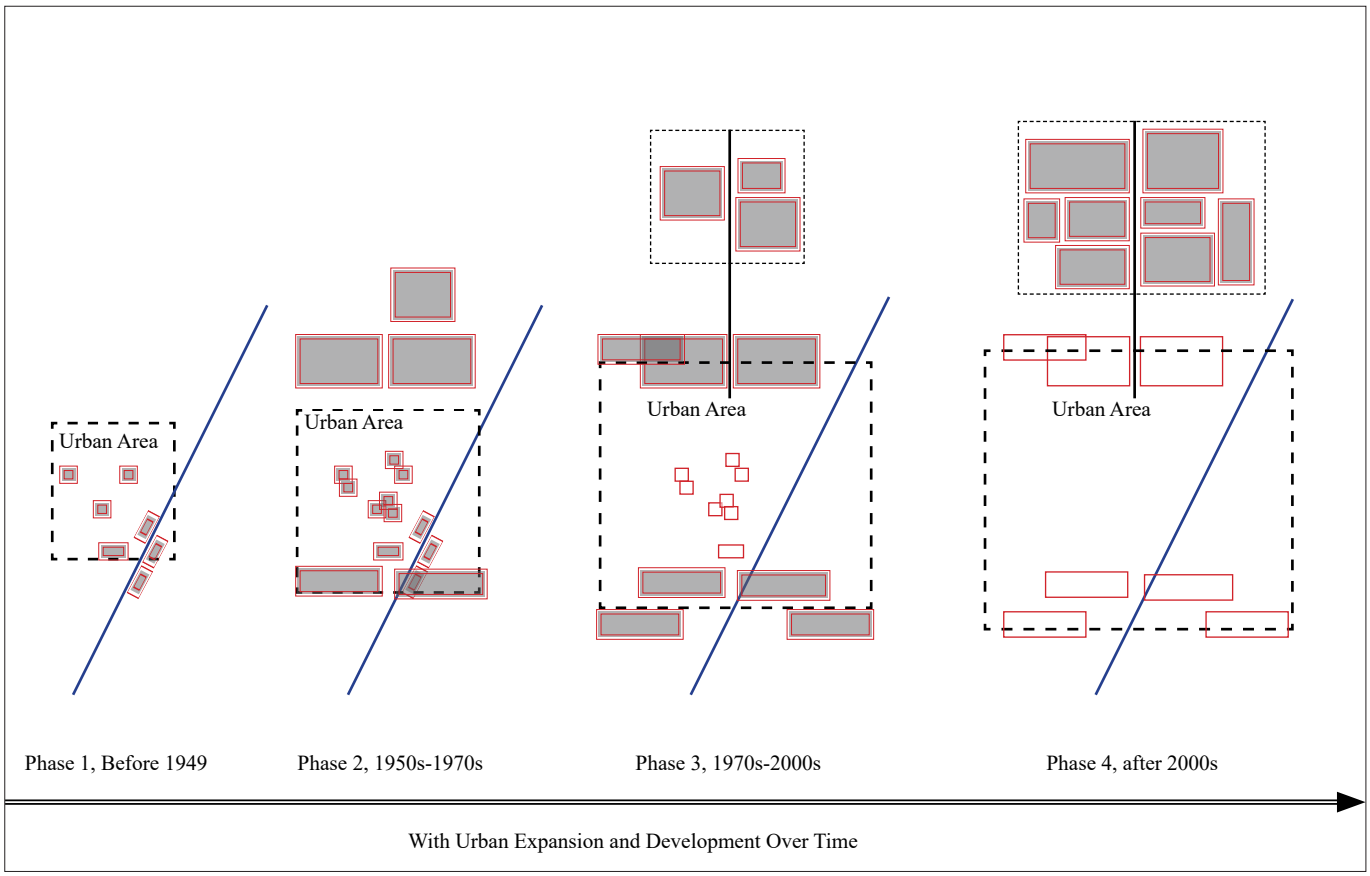


Figure 2.2-7, Diagram of Typical Changes of Industrial Areas in Chinese Cities. Source: Drawn by author.

2.2.3 Administrative Allocation, Stakeholders, and Land Ownership

Land, as a fundamental resource and strategic asset for urban and rural development, plays a central role in the processes of urban spatial reproduction. In the transformation of historical industrial spaces, addressing the administrative allocation of industrial land is inevitable, as it directly shapes the property rights relationships among various social actors. The existing land ownership arrangements for historical industrial spaces in cities have fundamentally influenced the modes of industrial building renewal.

China's system of administratively allocated urban land, established in the early years after the founding of the People's Republic, has left a lasting impact. Beginning in 1954, the country gradually implemented a public ownership system, dividing rural land into collective ownership and urban land into state ownership. Urban land management was governed by administrative approvals, free allocation, and prohibitions on land-use rights transfers. This shaped a system where urban land could be used freely and indefinitely. For state-planned industrial enterprises, this resulted in the widespread application of administratively allocated land-use rights, profoundly influencing land utilization within factory districts. The absence of economic costs for land use led to excessive land consumption by industrial enterprises, with some areas experiencing low space density and inefficient land use (Huang and Cao, 2011). Additionally, the closed management of industrial campuses allowed enterprises to bypass regulatory oversight, resulting in haphazard and informal expansions, creating chaotic internal spatial organization.

With the reforms of the late 20th century, this land-use system faced challenges from emerging market forces. However, the characteristics of administrative allocation—free use, indefinite tenure, and restricted transferability—also allowed many valuable industrial sites to survive market pressures. Notably, during the relaxed policies of the late 1990s, exemplified by the issuance of Order No.8 of 1998 *(Interim Provisions on the Management of Allocated Land-use Rights in State-Owned Enterprise Reform)*, many state-owned industrial enterprises in central urban areas collaborated with real estate developers to pay land-use transfer fees and convert industrial land into commercial leases (Huang and Cao, 2008). This often resulted in the demolition of original factories for real estate projects. However, when policies tightened again, the surrounding areas of such factories became more developed, presenting opportunities for redevelopment while also creating barriers due to the land's administrative allocation nature. The resulting conflicts between the government as the landowner and enterprises as land occupiers created a "lose-lose" scenario, highlighting the complexity of transitioning such lands for reuse.

Interestingly, these shifts also led to a unique urban pattern in many Chinese cities. Old industrial structures, such as factories and office buildings, now coexist within neighborhoods featuring modern shopping malls and residential developments—products of earlier industrial land conversions. This juxtaposition has partially preserved the legacy of the *danwei* system (Lu, 1989), contributing to contemporary urban features like "15-minute living circles" and "30-minute commuting zones."

Before the reforms, land allocation to industrial enterprises was based on factors like scale, industry importance, and category, resulting in varied sizes and locations of land grants. Enterprises operated within clearly defined land boundaries, organizing production and worker living spaces, which evolved into the *danwei* compounds. This administrative land allocation framework had a decisive impact on the development of industrial spaces, laying the foundation for their distinctive spatial characteristics—a topic that will be explored further in subsequent sections.

2.3 Transformation in Medium-Small Industrial Cities Urban Space

2.3.1 Medium-Small Industrial Cities, Resource-Based Cities, and Contemporary Cities

Medium-small industrial cities in China are predominantly **resource-based cities** and **contemporary industrial cities**, reflecting their historical role in the country's industrialization process. Industrialization and urbanization are interconnected, with industrial development driving urban expansion and urbanization fostering conditions for further industrial growth. This dynamic is particularly evident in China's distinct industrialization path, which was state-led and heavily reliant on planned investment post-1949, forming the backbone of its industrial system.

Resource-based cities are a defining feature of medium-small industrial urbanization. These cities often specialize in the extraction and processing of raw materials such as coal, steel, or non-ferrous metals. Their economies have historically depended on these industries, which also shaped their spatial and social structures. Examples include cities like Pingdingshan, Tangshan, and Anshan, which have grown around mining or steel production.

Contemporary industrial cities emerged primarily during the planned economy era after 1949. These cities were established or expanded under government policies such as the *First Five-Year Plan*, the *156 projects*, and the *Third Front Construction*. With a focus on heavy industry, many of these cities had little or no industrial base prior to these initiatives. Their development was characterized by large-scale state investment in industrial infrastructure and urban planning. Pingdingshan, for instance, is a representative new industrial city, developed around its coal mining sector during this period.

In contrast to modern industrial cities, which grew during the colonial and semi-colonial periods in coastal and northeastern regions, new industrial cities were often located in inland areas. These cities pri-

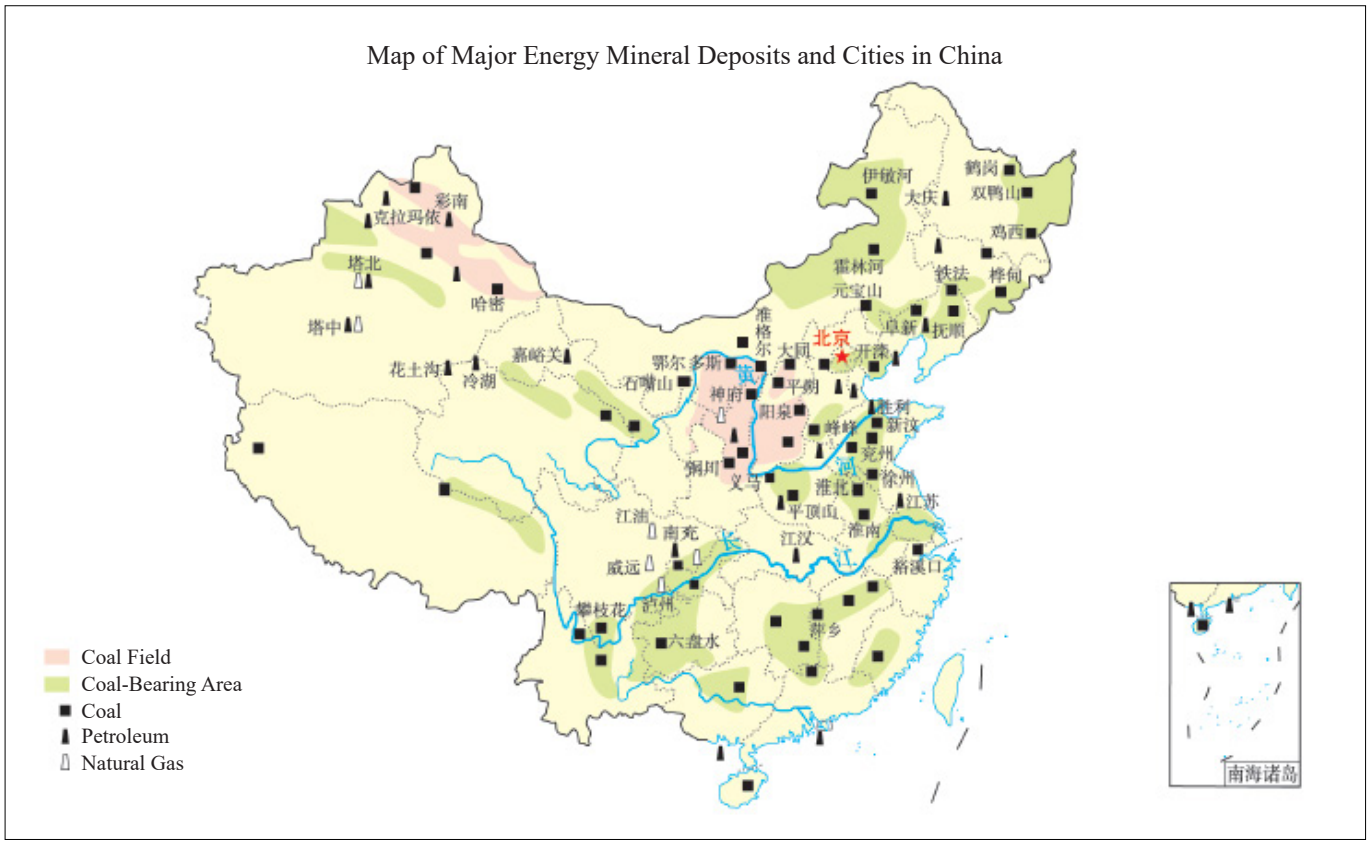


Figure 2.3-1, Map of Major Energy Mineral Deposits and Cities in China. Source: Edited by author, data from MNRC and MIITC open source data.

oritized industrialization as a means of fostering regional development and national self-reliance. While resource-based industries dominated their economies, recent decades have seen some transition efforts toward industrial diversification, high-end manufacturing, and urban service sectors, though challenges remain.

Medium-small industrial cities like Pingdingshan thus encapsulate the dual identity of resource-based cities and new industrial cities. They serve as critical nodes in China's industrial network while facing unique challenges in transitioning to sustainable and diversified economic models. This thesis focuses on their industrial history, spatial transformations, and the cultural and collective memory shaped by these industrial legacies.

2.3.2 Transformation and Common Challenges in Medium-Small Industrial Cities

Medium-small industrial cities in China, typically resource-based and reliant on single industries like coal, steel, or machinery, face significant challenges in transitioning toward more sustainable and diversified development. These cities, which were critical during the planned economy era, must now address economic, social, cultural, and spatial transformations to adapt to contemporary demands.

Economic Transformation: The shift from resource-based industries to diversified economies is a key focus for these cities. Many have promoted high-tech manufacturing, renewable energy, and modern services such as logistics and tourism to reduce reliance on traditional sectors. For instance, Pingdingshan is transitioning from coal mining to high-end manufacturing, while Tangshan has invested in environmental technologies and advanced manufacturing. However, economic diversification remains challenging due to limited investment, outdated infrastructure, and regional disparities, with more progress seen in cities closer to technological hubs like the Yangtze River Delta and Pearl River Delta.

Spatial Transformation: The physical landscape of these cities is undergoing significant change as old industrial sites become obsolete. Urban renewal projects aim to reclaim and repurpose industrial land, integrating modern infrastructure, improving public spaces, and creating mixed-use developments. For example, Pingdingshan, Zhoukou and Tangshan have invested in transforming former industrial sites into cultural landmarks, parks, and creative spaces, linking industrial history with contemporary urban needs. Environmental restoration is also a priority, with efforts to address pollution, land subsidence, and other legacies of industrial activity. However, these transformations require substantial investment, and financial constraints remain a significant obstacle for many cities.

Social and Cultural Transformation: Deindustrialization has significantly impacted the social and cultural fabric of these cities. The decline of traditional industries often leads to unemployment, population outflows, and the erosion of urban identity. Urban redevelopment and the adaptive reuse of historical industrial spaces sites have become important for preserving collective memory and fostering new cultural and economic activities. However, these efforts are uneven across cities. While some have leveraged historical industrial spaces to strengthen community identity, many others struggle with limited resources and shrinking populations, especially as younger, skilled workers migrate to larger cities. Protecting historical industrial spaces while fostering a new urban image is vital for maintaining residents' pride and sense of belonging.

Chapter 3:
Memory and *Danwei* Urban Space in Chinese Industrial Cities

3.1 Collective Memory, Urban Space and Urban Identity

The concept of collective memory was first introduced by the French sociologist Maurice Halbwachs, drawing upon the idea of "collective consciousness" put forth by another French sociologist, Durkheim. According to Halbwachs (1925), understanding an individual's or a group's memories of the past requires considering the social context of memory. In other words, familial relationships, communities, religions, political organizations, social classes, and ethnicities are all integral components of the overall process of memory construction. Some perspectives on collective memory argue that memory is truly collective only when it is shared among members of a social community (Hunt 2002).

Lewis Mumford (1961) proposed the viewpoint that cities exist through memory. Aldo Rossi (1984) views the city as a place of collective memory, suggesting that urban memory is a collection of people's collective spatial memories. He advocated for designers to imbue urban spaces with spirit and human atmosphere through collective memory, allowing individuals to experience a connection with history when present in these spaces. In the city, the reference points for each person's memories are fixed, including various material forms such as urban geographical landscapes, artificial structures, as well as non-material activities like linguistic interactions. All these serve as carriers for preserving and transmitting the collective memory of the city (Zhu 2005). Such prototype imagery inherent in cities, referred to as built heritage, constitutes an indelible source of value. It should be recognized as a distinctive driving force for economic and social development, as well as cultural revival (Chang 2018). The form and memory of a city evolve over time, with each era having its unique urban collective memory (Zhu 2006). The complex and diverse architectural spaces formed across different periods and cultural backgrounds represent spatial collective memory shaped over time (Huang, Wang and Liu 2019).

Social Identity posits that groups form the foundation of identity, and individuals' psychological processes are intertwined with the power of social groups (Tajfel and Turner 1979). Simultaneously, personal and role identities constitute crucial components of identification, recognizing self-worth within the group as a key force connecting social structure and individual actions (Stryker 1980). This provides a foundation for two important components of urban identity and collective memory – the collective and individual aspects. One of the vitality factors of a city is derived from the collective memory of people who share a common vision and have similar or even shared experiences with each other (Wang 2019). For example, for the older generation in the city, collective memory is a crucial source for them to explore and establish their urban identity, especially in an era of rapid change and development (Yan and Ye 2019).

3.2 *Danwei* Era: Shaped Individual and Collective Memory in Chinese Cites

In the previous sections, we reviewed the development trajectory of historical industrial spaces in Chinese cities. Although historical industrial buildings in China boast over a century of development, the socialist industrialization and public ownership reforms of New China have profoundly shaped their spatial organization. These spaces were typically structured around the operational needs of industrial production, often taking the form of enclosed factory compounds. This "*danwei*" (work-unit) system profoundly influenced spatial forms, many of which persist to this day, significantly impacting contemporary spatial renewal efforts. In the following sections, we will delve into the spatial organization characteristics of historical industrial spaces shaped by the independent parceling and management inherent to the *danwei* system.

The *danwei* system is a unique urban development model in China (Bray 2005). It represents an institutional arrangement concerning resource allocation, employment, and social welfare during the planned economy era in Chinese cities, characterized by distinctive spatial and social features (Liu and Chai 2012). Specifically, *danwei* refers to various entities, including state-owned enterprises, institutions, government and public organizations, which provided employment opportunities for urban residents (Chai 1996). This includes factories, stores (not referred to as such during that period), schools, hospitals, research institutes, cultural groups, and party and government agencies (Lu 1989). Since the establishment in 1949, the P.R China has developed its unique *danwei* system, drawing guidance from the Soviet Union and its own exploration. Serving as the fundamental social management and organizational form in Chinese cities (Bjorkloud 1986), *danwei* played a pivotal role in shaping the urbanization process during the socialist planned economy period in China.

3.2.1 Spatial Patterns Serve as The Foundation

From the establishment of the People's Republic of China to the *Reform and opening-up*, spanning three decades, *danwei* compounds serves as the primary way of urban spatial expansion. The periphery of the old city areas is composed of various types of *danwei* compounds, forming the newly developed areas of the city. The typical spatial form of *danwei* system, known as the *danwei* compound, in essence, is the physical form of *danwei* and its spatial carrier (Zhang, Chai, and Zhou 2009).

Under this concept, *danwei* often enclosed their spaces with walls and gates, creating a sense of enclosure, and completeness, organizing workplaces, living places, and various welfare facilities in a compound-like form (Zhang, Chai, and Zhou 2009). Despite variations in scale and facilities, each *danwei* compound exhibits common features: walls and access control, spatial differentiation of facilities and activity areas, proximity between workplaces and residential areas, comprehensive social infrastructure and services, efficient and rational architectural layouts, and the presence of key architectural elements (such as sculptures of Mao Zedong, workers' auditoriums, etc.) forming axial arrangements (Bjorklund 1986; Lu 2006). During China's industrialization in the last century, residents and builders of industrial cities had profound memories of their work and life. These personal memories coexisted with the collective narrative of industrialization and were often linked to the city's factories (Zhou 2020), squares, sculptures, and *danwei* compounds. This connection fostered a sense of identity centered around the *danwei* (Tao 2011).

Due to the enclosed and multifunctional nature of *danwei* compounds, coupled with the low employment mobility under China's planned economic system, residents within *danwei* compounds rarely

need to leave. Their daily lives heavily overlap within the *danwei* compound (Lu 2006). Residents lead a linear life pattern of "work - living - residential areas," and they may visit entertainment and service places when needed. *Danwei* members not only work and study together but also live together, fostering closer social interactions within the *danwei* compound. Simultaneously, the spatial and organizational isolation caused by walled barriers limits the potential for social interaction between people from different *danweis*. Consequently, *danwei* compounds form the basic living circle for residents, where frequent social interactions lead to the development of a quasi-local culture (Chai 1996; Tana, Chai, and Liu 2012) and a strong attachment to the locality (Bjorklund 1986). This form of space and organization, coupled with residents' lifestyles which production-centered and completely dependent on the *danwei*, shaped a collective memory of the *danwei* system.

3.2.2 Danwei-based Cities, Danwei and Danwei Individuals

In the *danwei* era, most Chinese cities, especially industrial cities, were constructed by people from all over the country, building from nothing and growing from small to large. Simultaneously, a relatively complete *danwei* welfare system, an egalitarian and friendly atmosphere, worker-led politics, and a rich and diverse culture also contributed to the social identity and memories of the *danwei* era (Tao 2011). In 1978, nearly 95% of the urban labor force were *danwei* employees (Bray 2005), and most of them lived in *danwei* compounds, shaping their daily living environments.

With so many people sharing similar experiences, they not only have a voice but also tightly intertwine their personal lives with the nation's pursuit of modernity (Rofel 1999). They collectively participated in significant historical events related to *danwei*, and this accumulation of similar experiences formed class and urban identities, ultimately transforming into a collective memory of *danwei* (Tao 2011), and based on physical space, in the first two decades of *danwei*, over at least a generation's time, a nationwide collective memory about *danwei* was formed.

Danwei system, as a top-down institutional arrangement, was implemented and internalized into people's lives and psyches under the influence of communist and collectivist ideologies. The strong objective existence of *danwei* and its internalization determined people's strong *danwei* consciousness (Wang 2006). Over time, this kind of consciousness inevitably internalized into people's behavior, becoming their behavioral tendencies and norms (Li and Qu 2005). This construction process mainly occurred in the first two decades of the *danwei* era and was consolidated during the ten years of the *"Cultural Revolution."* Some sociologists have explored how the *Cultural Revolution* shaped the collective memory of ordinary people in urban areas, especially workers, who constitute the majority of the urban population. In a study (Tao 2011) of residents of a factory *danwei* in Northeast China, some factory workers emphasized how they were organized through *danwei* production and life during this period, further strengthening their identification with it. It was consolidated through the identification with and practice of "striving to surpass and compete".

In summary, in various aspects such as production, life, urban space, and social relationships, individuals within the *danwei*, the *danwei* compounds, and the *danwei*-based city mutually shaped each other. The *danwei* system has almost carried the collective memory of a significant portion of urban residents in China before the *reform and opening-up*. The collective memory formed based on *danwei* work and life will have a profound and lasting impact.

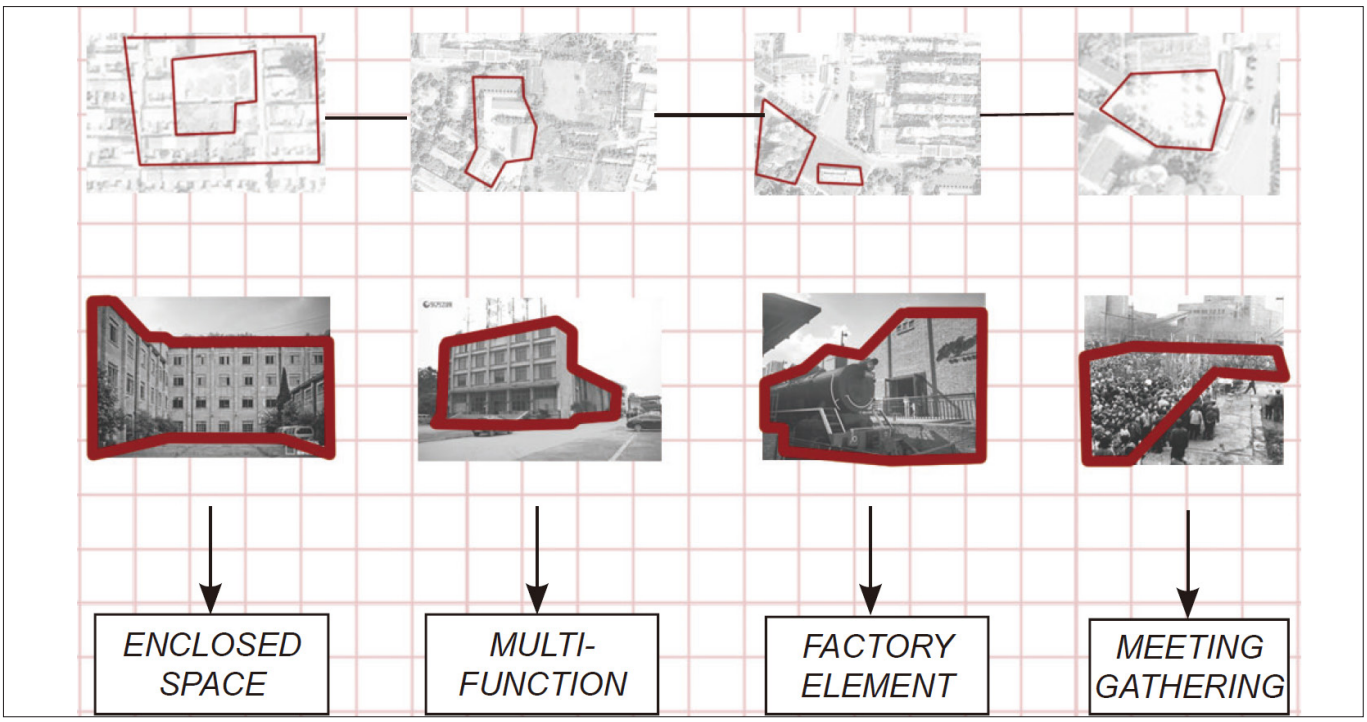
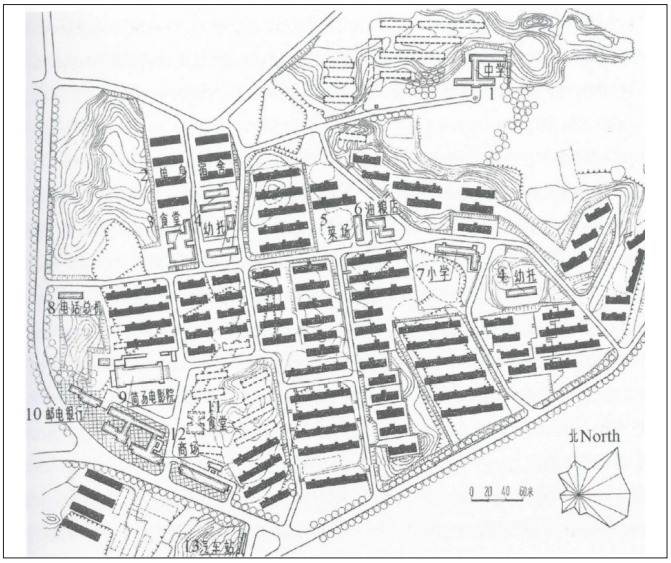


Figure 3.2-1, Diagram of Typical Building and Spatial form of a Danwei Compound. Source: Drawn by the author.



Left: Site Plan of the Meishan Ironworks living quarters, Nanjing (1969-1971). The Floor Space of the living quarter constructed in Phase 1 was 160,000 square meters.

1 Middle school, 2 Dormitory for single workers, 3 Canteen, 4 Nursery and kindergarten, 5 Market, 6 Grocery shops, 7 Primary school, 8 Telephone center, 9 Simple-built film theater, 10 Post office and bank, 11 shops. The rest of the structures were apartment buildings.

Figure 3.2-2, Site Plan of Meishan Iron Works living quarters, Nanjing (1969-1971). Source: Bonino M, Pieri F D. *Beijing danwei: industrial heritage in the contemporary city.*

Figure 3.2-3, Lanzhou Petroleum Machinery Factory. Source: *Lanzhou City Chronicles.*

Figure 3.2-4, The Present Entrance of Luoyang First Tractor Plant and the Statue of Mao, Still Retain as the 1950s. Source: DIIT of Henan Province.

3.3 'De-*danwei*-ization': From *Danwei*-based to Community-oriented"

In 1978, with the advent and continuous promotion of *reform and opening-up*, the initiation of marketization propelled Chinese society into a complex and dynamic period of social transformation (Wang 2017). As a symbol of planned economy, the *danwei* system embarked on a prolonged and replicable process of dissolution and transformation (Tao 2011). In pursuit of market-oriented reforms, China initiated reforms in state-owned enterprises, compensated transfer of land-use rights, housing reforms, and community development. These reforms resulted in the abolition of political and social functions of *danwei* (Chai 2014). The decline of the *danwei* system has profoundly altered China's urban spatial patterns and city life, constituting a crucial component of the broader urban transformation in recent years (Liu and Chai 2012).

3.3.1 The Transformation of Space and The Aging of The Population

For *danwei*, the change is multifaceted. First is the establishment of the urban land-use rights trading system, triggering a market-oriented urban land-use replacement based on land prices. The original *danwei* land in the inner city, which was primarily industrial and residential, is continuously replaced by commercial service function, leading to suburbanization due to the redevelopment of the old city and the relocation of industries (Feng 2004), Some factories moved to the suburbs, while others, due to various reasons, went bankrupt and ceased all production activities (Qiao 2004). Additionally, with the end of the housing welfare system led by *danwei*, the residential areas of *danwei* compounds underwent market-oriented housing reforms (Tolley 1991). This led to an increasing marketization of housing (Chai and Liu 2000; Feng and Zhou 2004), causing the breakdown of the spatial pattern where work and residence were closely integrated in *danwei* compounds (Chai 2002).

In terms of space, the main changes in *danwei* compounds include the weakening of spatial integrity and changes in land use. Some *danwei* compounds have experienced a continuous reduction in land area, while others have seen ongoing expansion. Some *danwei*s are only undergoing renovation and updates within the existing land scope, while others have relocated (Wang and Liang 2010). Due to the replacement of many brick walls with fences, green belts, or commercial outlets, the clearly defined courtyards have become ambiguous (Chai 2014). The land of some reformed *danwei*s no longer include work and living spaces but have been replaced by commercial service spaces, while the proportion of residential land within some *danwei* compounds has significantly increased. Important life service facilities within the compounds during the planned economy era, such as auditoriums, canteens, and public baths, have gradually been dismantled and replaced by new residential or commercial buildings. The internal building density of *danwei* compounds has continuously increased, and public activity spaces such as squares and green areas have been gradually encroached upon (Zhang, Chai and Zhou 2009).

From an individual perspective, in the market-oriented reforms of state-owned enterprises, many *danwei*s were dissolved, and numerous workers became laid-off. Even though they still live in the *danwei* place, many are no longer working there. In their narratives, even if they find new employment, they often retain the label of "laid-off workers," and their collective sense of identity shifts from being workers of a specific *danwei* to being "laid-off workers" (Gillette 2017). The *danwei* system ingrains itself in people's minds through an informal routine (Wang 2006).

In 1978, nearly 95% of the urban labor population were *danwei* employees (Bray 2005), and the majority resided in *danwei* compounds. Even in 2004, after two decades of urban transformation, approx-

imately 65% of urban residents continued to live in *danwei*-based communities (Feng et al. 2004). Since the dissolution of the *danwei* system began in 1978, those who still reside in the remaining *danwei* compounds, known as "*danwei* people," have entered middle and old age.

The space and resident population of *danwei* compounds face dual challenges of external forces encroaching and the original residents relocating. On one hand, the aging of both the physical space and the population is evident. On the other hand, as the idea of private property gains prominence, public spaces tend to decay. Residences become the focal point of daily life, and social relationships and interactions tend toward flattening and anonymization. Consequently, the meaning of *danwei* compounds diminishes both spatially and socially (Xiao and Chai, 2014). Expanding from Oswalt's (2005) concept of Shrinking City, *danwei* has given rise to the concept of Shrinking *Danwei* (Xiao and Chai, 2014).

3.3.2 Market-Driven Community Transformation

Once symbiotic with the planned economy, *danwei* has gradually transitioned to a more "community-oriented" approach in the market-oriented reforms. Market-driven policies require *danwei*s to cease providing public housing and gradually convert all existing and new housing into private ownership. This transformation not only leads to residential mobility among high-income groups, who often purchase high-quality commercial housing outside the original *danwei* compounds, but also introduces non-*danwei* members (Tana, Chai and Liu 2012). Communities and residential neighborhoods have become new forms of *danwei* (Li 2016). In some cases, when the original factories cease operation and change their functions, residents within their compounds no longer have any connection with the original factory and are entirely new residents. This situation can be found in some artist communities in Beijing that have been transformed from *danwei* compounds (Bonino and Pieri 2015). These lead to the loss of original residents, fragmentation of memories in old *danwei*s, and a lack of resonance in memories among different age groups (Yan 2022).

The advantages and disadvantages brought about by marketization are evident. Spatial transformation has led to changes in residents' daily lives and economic development. With the relaxation of previously strict spatial constraints, the rise of consumer culture, and the increase in leisure and entertainment opportunities (Wang 1995; Chen 2005), residents begin to enjoy an expanding individual autonomous space (Friedmann 2005). Residents' activity spaces extend beyond the *danwei* compounds, becoming more personalized and diversified. Due to the market-oriented reforms in land use, competitive mechanisms, and urban planning, new business spaces rase (Ma and Wu 2004). On the other hand, the separation of work and residential places has drove rapid urban expansion and suburbanization, similar to what many American cities have experienced. Moreover, market-driven housing reforms contribute to residential segregation (Huang 2005). Issues such as urban poverty and unequal access to public services start to emerge (Wang 2004).

3.3.3 The Absence of 'Community Memory'

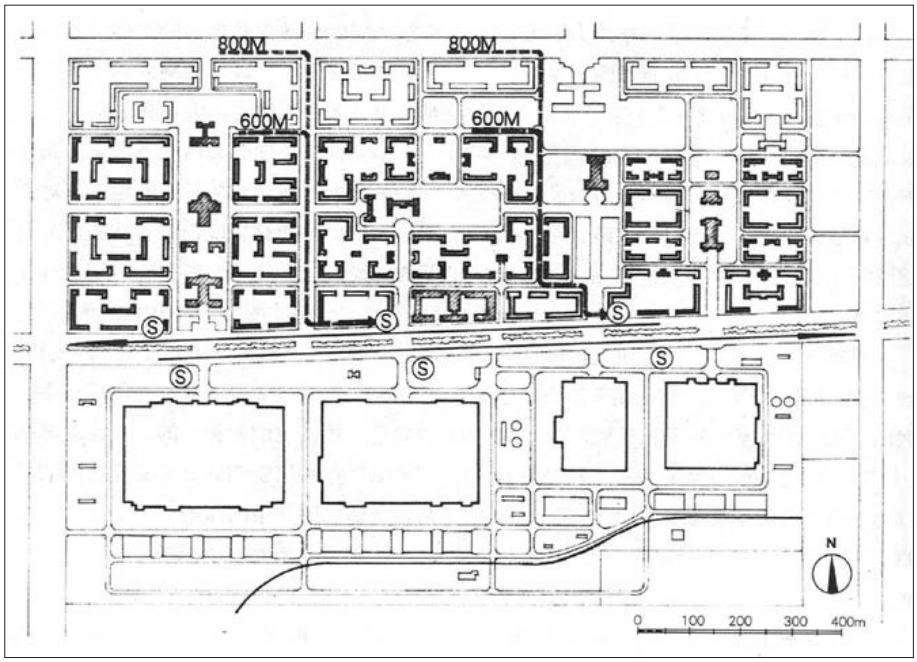
In "*Danwei* China" (Liu 2000), the urban structure is characterized by the *danwei*-ization of social life, highly intersected and overlapped between communities and *danwei*s. The community becomes *danwei*-ized, and the *danwei* becomes communitized. The so-called community has been replaced by the *danwei*. It can be said that within the community, daily life has been encroached upon by political and organizational activities, and a strictly defined community simply does not exist. The concept of "community"

seems to have left no "memory trace" in people's minds (Wang 2006).

The Collective memory of *danwei* system continues to hold a significant place in people's minds even after the shift towards a "community-oriented" approach. Therefore, the transformation of the *danwei* system is not simply a manifestation of a gradual weakening trend; instead, it exhibits a strong characteristic of "path dependence" (Wang 2006). For instance, in the industrial cities of Northeast China such as Shenyang, with their unique historical background, the *danwei* system developed earliest and most maturely, leading to a slower and more complex process of transformation (Wang 2017). The pace of economic system reform far exceeds people's adaptability, and the "de-*danwei*-ization" creates a contradiction in their identification with the "working class"—the previously core collective memory and urban identity around *danwei* have completely collapsed. Such a transformation has left society with profound and challenging consequences (Tao 2011).

The consequence is the continuation of "*danwei* memory" and the absence of "community memory." For example, during the *danwei* era, tasks such as entertainment activities and utility maintenance, which could have been handled by the market and community service organizations, were taken care of by the *danwei*, leaving the "community" in a state of absence in people's lives. It can be said that the community system is a product of China accepting foreign experiences without sufficient historical preparation for market-oriented reforms (Wang 2006).

Another aspect is the understanding of the "community." In Chinese, the word "community " (She Qu) translates literally to "social area," leaning more towards a physical space rather than the sense of "common feeling" as in the original meaning (Tonnies and Loomis 1887). This can lead residents to view the community more as a purely physical living space. The minimal communication and interaction among people, scarce social resources in the community, a lack of identity similar to the *danwei* era, and the community's self-governing organization being more symbolic than functional, make it difficult to engage in collective activities, form social groups, foster urban identity, and develop collective consciousness (Wang 2006), contributing to the absence of community collective memory.



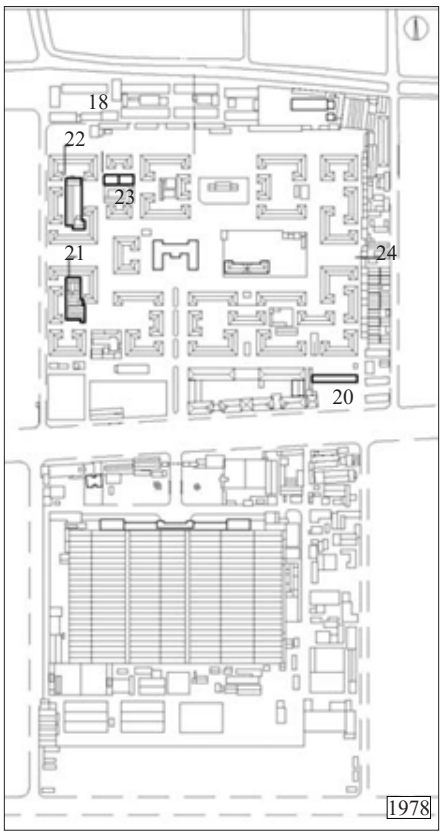
In the lower half of the image, from right to left, are Beijing 1st Cotton Textile Factory, Beijing Printing and Dyeing Mill, Beijing 2nd Cotton Textile Factory, and Beijing 3rd Cotton Textile Factory.

The upper half consists of the danwei residential and public services area.

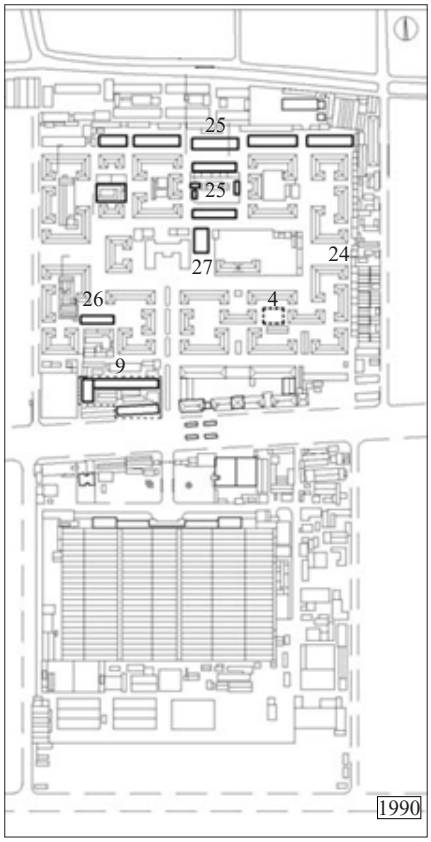
Figure 3.3-1, Planing Map of a Cluster of Danwei Space in Beijing, Shows a Typical Danwei Space Cluster in Chinese Industrial Cities.

Source: Zhang Y, Chai Y. Interpreting the Cultural Connotation of Beijing′s Modern Industrial Heritages: from the Perspectives of Danwei in Urban China[J]. *Urban Development Studies*, 2013, 20(02): 23-28.

1 Auditorium and Canteen
2 Primary School
3 Kindergarten
4 Greenhouse
5 Single Dormitory, Hospital and Canteen
6 Cooperative
7 Housing in 1950s
8 Textile School
9 Commercial Services
10 Post Office
11 Sport Field
12 Middle School
13 Nursery
14 Bathhouse
15 Garage
16 Office Building
17 Factory
18 Undeveloped Plot
19 Housing in 1950s



18 House for other danwei
20 New Housing in 1970s
21 Dormitory for mothers
22 Subdistrict Factory
23 New Bathhouse
24 New built small houses



4 Demolished Greenhouse
9 New Commercial Service
24 Small House in 1970s
25, 26 Housing in 1980s
27 Workers' Park

1 Two new high-rise residential building on the site of demolished auditorium, canteen and workers' park
6 Xueyin Cooperate Building
11 Residential buildings newly built on the original site after the demolition of the sports field in the 1980s
14 New hospital on the site of demolition of the bathhouse and garage
24 Demolished House
27 New residential buildings on the site of demolished 1950s Housing
28 New Multi-story residential buildings added to the vacant land
29 New small playground on the site of demolished 1950s housing

Figure 3.3-2, Using Beijing 2nd Cotton Textile Factory as an Example. This illustrates the spatial changes of Chinese danwei. It is evident that building density has increased, and large-scale buildings and plazas have been demolished.

Source: Edited by author, map from Zhang Y, Chai Y. Interpreting the Cultural Connotation of Beijing′s Modern Industrial Heritages: from the Perspectives of Danwei in Urban China[J]. *Urban Development Studies*, 2013, 20(02): 23-28.

Chapter 4:
The Specific Situation and Problems of Pingdingshan City

4.1 Introduction and History of Pingdingshan City

4.1.1 Brief History of Establishment and Development

Pingdingshan, located in central Henan Province, is renowned for its abundant coal resources and has a development history deeply rooted in the industrialization of the PRC. As one of China's key energy bases, Pingdingshan played a critical role in the nation's economic growth, driven by coal as a fundamental energy source. In the 1950s, when PRC embarked on its industrialization journey, Pingdingshan was incorporated into the national energy strategy with the support of the Soviet Union's *156 projects* and the *First Five-Year Plan*, establishing it as a major coal development base. Large-scale coal resource exploitation began in 1953, progressively building a comprehensive coal extraction and industrial infrastructure. By 1955, Pingdingshan's first mine was operational, and by 1960, ten mines had officially been put into production. With the concentrated investment and technical support from the state, Pingdingshan quickly developed into a coal industry hub, once designated as the "Pingdingshan Special Zone" in a status comparable to that of today's Shenzhen Special Economic Zone. In 1957, Pingdingshan was officially recognized as a city, becoming a key coal production center nationwide.

By the 1960s, Pingdingshan had developed a relatively complete coal industry chain, with facilities for coal extraction, washing, and transportation. The city's importance further rose with the implementation of China's *Third Front Construction* strategy, which aimed to relocate critical industries and energy bases from the northeast and eastern coastal areas to the interior regions, strengthening national security against potential external threats. Due to its coal resource advantages, Pingdingshan was designated as a key city within the *Third Front Construction*. During this period, the city expanded its coal production capacity by constructing additional mines and supporting factories to meet the country's energy demands. At its peak in the 1970s and 1980s, Pingdingshan's annual coal production reached nearly 50 million tons, accounting for over 40% of Henan's total coal output and forming a crucial link in the national energy supply chain.

This era of industrial expansion drove Pingdingshan's economic growth and rapid infrastructure development, attracting a large labor force. To meet the growing needs of its workers, the city accelerated the development of public infrastructure, including workers' dormitories, schools, and hospitals, creating the foundational layout of Pingdingshan. With significant government support, Pingdingshan's population grew rapidly from less than 100,000 at its establishment to over a million today, making it a major city.

The urban area expanded dramatically from 5 km² to over 90 km², an 18-fold increase since its founding. The main urban area includes *Xinhua*, *Zhanhe*, and *Weidong* districts, while *Shilong* District, though physically connected to the main urban area, is considered an enclave and is excluded from the primary research scope of this thesis.

Pingdingshan's spatial layout was profoundly shaped by its coal industry structure, developing a compact layout centered around the mining areas. Industrial facilities, mines, residential areas, and service amenities for workers were closely integrated, forming a typical resource-based industrial city under the *danwei* system. The city's spatial organization, originating from the planned economy, reflects a strong *Danwei* structure, with workers' dormitories, schools, and hospitals clustered around the mining zones. This setup created numerous independent work units, meeting the needs of a large workforce. At the peak of the coal industry, more than 30% of the city's labor force was directly involved in coal mining, and nearly 70% worked within industries under the jurisdiction of the mining bureau. The *Danwei* also encompassed public hospitals and schools—many of today's middle and elementary schools in Pingdingshan originated from the "Mining Area Schools" of the planned economy era. This organization not only integrated work and daily life for the workers but also shaped Pingdingshan's unique urban form and social structure.

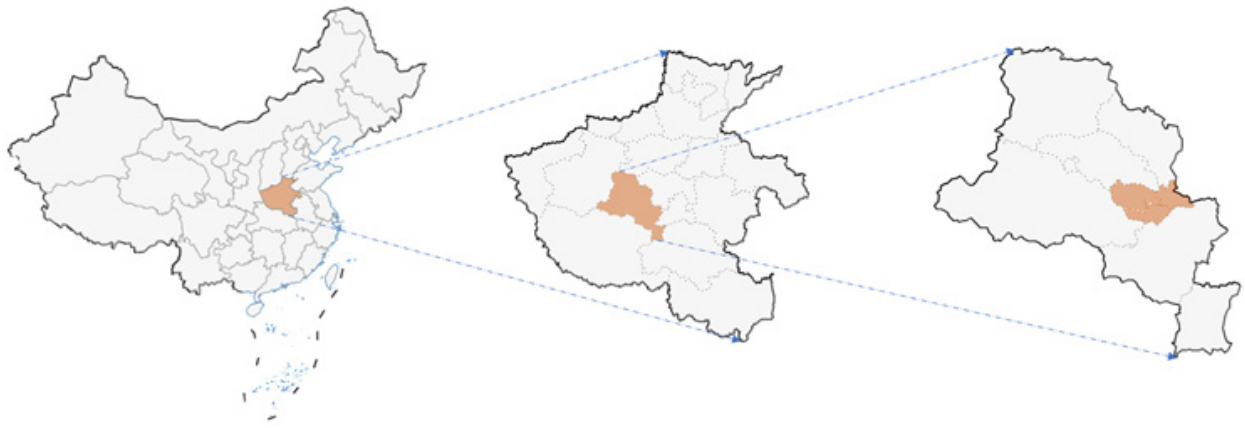


Figure 4.1-1, The Location of Henan Provicne, Pingdingshan, and Main Urban Area of Pingdingshan. Source: Drawn by author.

4.1.2 From Maturity to Decline

Resource-based cities like Pingdingshan rely heavily on the extraction and processing of natural resources to support their economies. Although the city's modern development as a coal hub began in the 1950s, historical records suggest that coal mining in the area dates back to the Tang and Song dynasties. Today, much of Pingdingshan's historical industrial spaces stems from the intensive development period of the mid-20th century. Despite its historical and economic significance, the city now faces challenges from resource depletion and the need for economic diversification, laying the groundwork for the discussion on its transition from maturity to potential decline.

In recent years, as coal resources have become increasingly scarce, Pingdingshan has transitioned into the category of resource-based cities. Most mining areas have a remaining operational lifespan of only 20 to 30 years, with some, like the No.3 Mine, having ceased production entirely for some years.

Similarly, the No.7 Mine has halted coal extraction, retaining only its coal washing plant, which is now slated for redevelopment into a specialized jade processing town. This decline in coal production has significantly affected related industries. Numerous enterprises established from the city's inception through the pre-reform era, such as the *Pingdingshan Cement Plant*, *Leather Factory*, *First Plastic Factory*, and *Towel Factory*, have either closed down or relocated. Consequently, over 260 hectares of former industrial land have been repurposed for residential and tertiary sector uses as part of urban renewal projects. Unfortunately, this transformation has also led to the neglect or demolition of many historically significant historical industrial spaces sites.

The Chinese government classified Pingdingshan as a "mature" resource-based city. This designation indicates that the city has surpassed its period of rapid growth and now faces the critical challenge of transitioning to a new economic model. Like many resource-based cities, Pingdingshan must navigate the delicate balance between maturity, decline, and transformation. This challenge has been exacerbated in recent years by falling coal prices and the gradual depletion of coal reserves, leading to the closure of several large mines and an urgent need for economic diversification.

Despite some progress in urban transformation, the overall pace of economic transition in Pingdingshan has been sluggish, revealing signs of insufficient momentum. The city's economic structure remains heavily reliant on coal, hindering its ability to foster new industries. This over-reliance has contributed to the outflow of both capital and talent, further complicating the city's efforts to adapt to a more diversified economic landscape. Additionally, prolonged coal mining has created significant subsidence areas in the northern and western parts of the city, posing serious risks to urban development and further complicating the transition process.

Pingdingshan's recent policy directions emphasize continuous industrial restructuring and optimization. As one of the earliest resource-based cities, Pingdingshan is actively seeking to break free from its dependence on resource-centric industries. The city's new economic objectives focus on fostering industrial transformation through intelligent, green, and technological upgrades. By integrating into the Zhengzhou metropolitan region, Pingdingshan aims to expand into modern logistics, tourism, and cultural services, striving to move beyond its traditional reliance on coal.

In terms of urban space and social dynamics—central themes of this thesis—the post-reform era has introduced profound changes. The shift from a *danwei*-based model to a community-oriented structure represents a significant aspect of this transformation. This process of "de-*danwei*-ization" involves the dismantling of the tightly knit *danwei* communities that once defined the city's spatial and social organization. The dissolution of *danwei* compounds has led to greater population mobility across the city, exacerbated by declining industries and shrinking job opportunities. These changes have resulted in decreased incomes, higher unemployment rates, and an exodus of younger residents to larger cities. The deterioration of industrial sites and the erosion of worker culture have further challenged the city's collective identity, which had long been anchored in its coal mining heritage.

Pingdingshan now faces the dual challenge of preserving its historical and cultural identity while reinventing itself in a post-industrial economy. The city's decades-long reliance on coal has deeply embedded its industrial legacy into its collective memory, but as it confronts these transformation pressures, it must find ways to retain and adapt this identity to foster a sustainable and vibrant future.

4.2 History of Urban Space

4.2.1 Urban Spatial Development in Pingdingshan

Pingdingshan's urban development has always been closely tied to its coal industry. The city's growth and spatial planning have evolved through four key stages: "Mining Industrial Zone," "Single Coal Mining City," "Resource-Based Integrated Industrial City," and "Prefecture-Level Administrative Zone." Each stage reflects shifts in the city's functional role and administrative status, driven initially by natural and mineral resource distribution and later by a combination of administrative, economic, and industrial factors.

(1) Starting from Scratch: Only Mining Industrial *Danweis* (1956-1966):

Pingdingshan's early urban layout was shaped by the distribution of coal resources and mining enterprises. In the 1950s, before coalfield development began, the city had no prior urban infrastructure. Starting in 1953, geological exploration and surveying for coal resources began in the Pingdingshan area. By 1955, a unified plan for the construction of Pingdingshan's coal mines was essentially completed.

On February 5, 1955, a Soviet expert team arrived in Pingdingshan to assist in selecting mining sites, planning mining areas and researching development strategies. In September of the same year, construction began on Pingdingshan's first coal mine (No. 2 Mine). Worker housing was built near the mines, the construction of Pingdingshan as a city began. In January 1956, Henan Province sent urban planners to form a Pingdingshan Mining Area Planning Team. By November 1956, they completed the city's first urban plan *1956 Preliminary Plan for the Workers' City of Pingdingshan*.

With the mining operations, industrial and residential areas were built in the northern part. To meet the needs of coal workers, two residential districts were built on either side of the city, and public facilities for housing, education, healthcare, and recreation were gradually improved (Li and Huang, 2023). The city's development during this period centered around the northern key mining areas, with built-up areas concentrated along *Kuanggong Road* and *Chengping Road*. According to the *1956 Preliminary Plan for the Workers' City of Pingdingshan*, early urban construction aimed to provide important living facilities for employees of the *Pingdingshan Mining Bureau* and other resident, including basic facilities like retail, healthcare education (Ma et al, 2015).

(2) Urban Formation: Single Coal Mining City (1966-1976):

By 1966, after a decade of development, Pingdingshan's mining industry had taken shape, and the city's land area expanded to 9 square kilometers. The completion of the *Jiaozhi Railway* in 1969 further

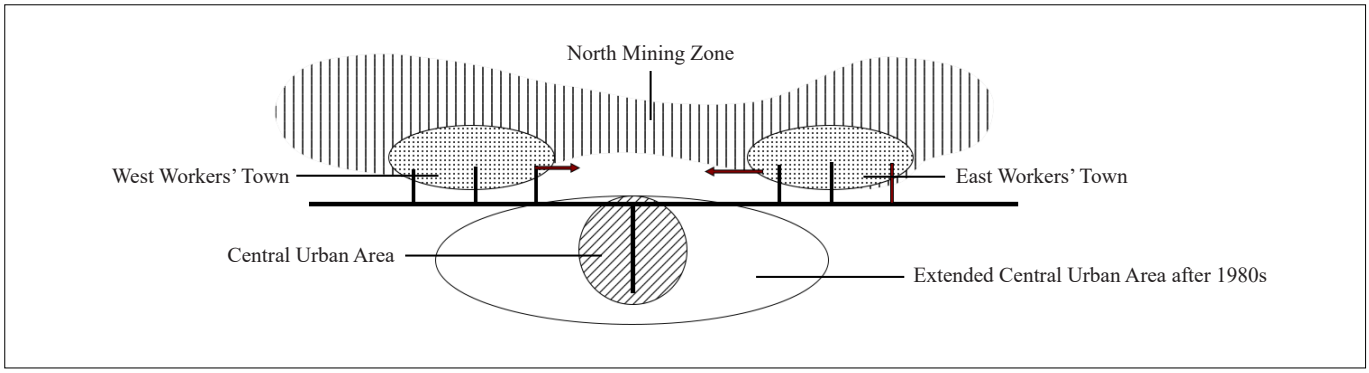


Figure 4.2-1, Diagram of Pingdingshan's Layout of *One City and Two Twons* in 1950s. Source: Drawn by author, Based on the *1956 Preliminary Plan for the Workers' City of Pingdingshan*

solidified its industrial foundation. During this period, the city followed a government-enterprise integrated model under the *Pingdingshan Mining Bureau*, with scattered industrial facilities linked by dedicated railways. Development was mainly concentrated north of the *Zhanhe River*, with initial expansions toward the southern railway station area (Xie, 2019) .

Early 1970s, the city had expanded to about 14 km², reaching south of the *Zhanhe* River. The urban layout remained loosely organized, with industrial and residential areas intermingled, and no clear spatial core. Planning mainly involved adjusting existing land use along the railway, with industrial and residential zones placed alongside. During this time, related industries such as coal-fired power, metallurgy, and chemicals also began developing, typically on the city's surburban. Continuing the urban planning approach of the *First Five-Year Plan*, Pingdingshan adopted a *"one city, two towns"* layout. The central urban area served core functions such as government offices, economic departments, major hospitals, and large schools. To the east and west, two worker towns were fully established in the northern coal mining zones, functioning as major *danwei* spaces, particularly clusters of worker housing and public service facilities. *Kuanggong* Road acted as the dividing line between the northern coal mining areas and the southern non-mining areas (Ma et al, 2015).

(3) Urban Growth: Resource-Based Comprehensive Industrial City (1976-1990s):

The 1976 *Master Plan for Pingdingshan City* (1976–1985) recorded a population of 385,000 and an urban area of 17.7 km² at the time. The plan emphasized strengthening the construction of north-south roads such as *Kaiyuan Road* and *Zhongxing Road*, prompting the city's spatial expansion southward.

The 1980s saw rapid development, with an increasingly diversified industrial system. Industrial land use continued to grow, primarily concentrated north of the *Zhanhe* River (Xie, 2019). The area between *Xinhua* Road and *Guangming* Road became the city's development focus, with major public buildings along *Zhongxing* Road, providing commercial trade, science, education, culture, healthcare, and other urban services. However, the spatial structure remained fragmented, with mixed residential, educational, and industrial areas, primarily located north of the railway.

(4) Rapid Expansion to Maturity, Followed by Decline (1990s-present):

By the 1990s, the core urban area of Pingdingshan had expanded to over 31 square kilometers, with mining zones accounting for nearly one-quarter of the total. According to the 1990 *Pingdingshan Mas-*

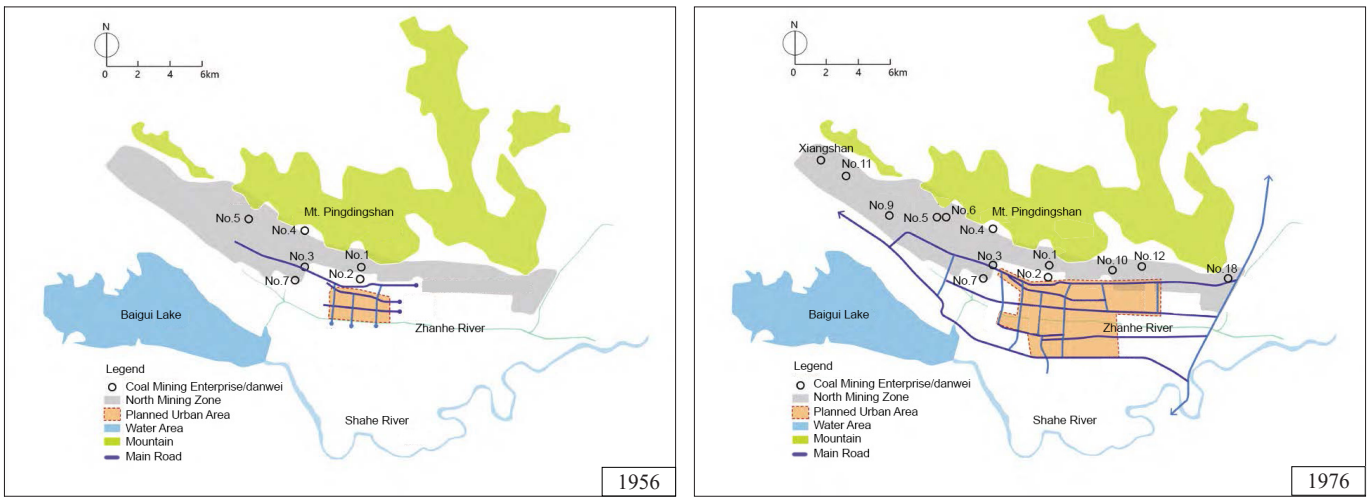


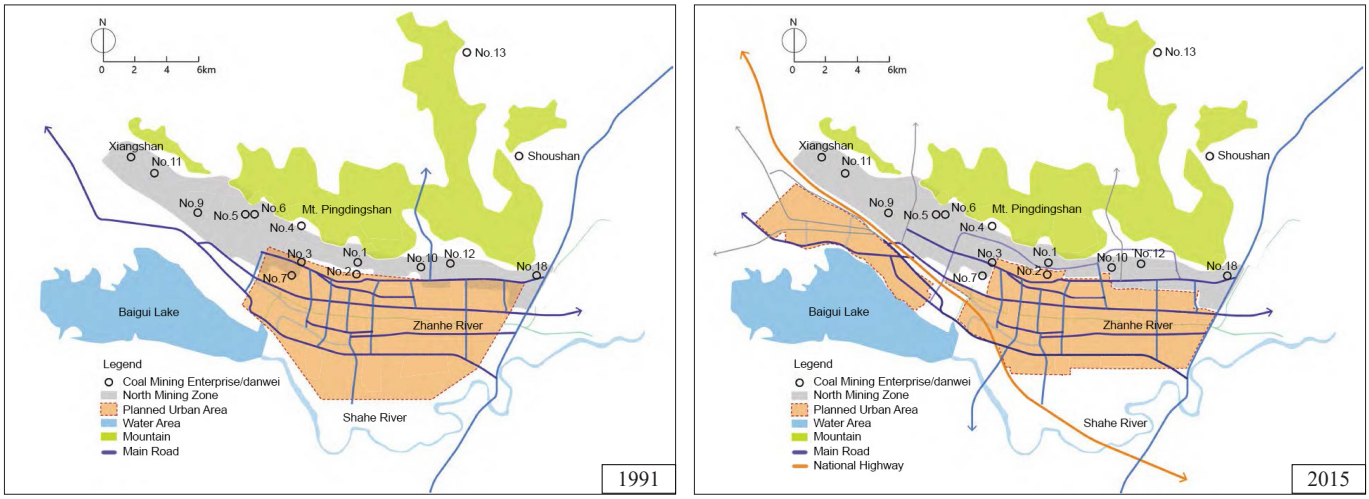
Figure 4.2-2, Diagram of Spatial Planning Boundaries of Pingdingshan. In the 1950s, 1970s, 1990s, and 2015. Source: Edited by author, based on the *1956 Preliminary Pla*
2020)..

ter Plan (1991–2010), the planned urban population was set at 800,000, and the jurisdictional land area reached 81.3 km². Urban functions were further enhanced, and the city expanded southward across the *Zhanhe River*. The completion of the *Pingdingshan Passenger Terminal*, combined with the *Pingdingshan Railway Station*, drove the continued southward growth of the city's core. The latest master plan extended the southern urban boundary to the *Shahe River Basin*.

Since 2000, urban planning has become more refined, creating a more structured spatial layout. The northern area serves as an industrial complex, while residential areas and *Danwei* spaces are concentrated along *Jianshe Road*. During this time, the city achieved leapfrog development, bridging the old and new urban areas, and adopted a dual-core model, with two urban centers functioning in parallel. Urban development placed a strong emphasis on improving residents' quality of life through the construction of large riverfront green spaces, urban parks, and an improved road network. This included alleviating congestion, extending major arterial roads, and enhancing connectivity between highways and high-speed rail stations for more efficient transportation.

Entering the 21st century, the 2015 edited *Pingdingshan Master Plan (2011–2020)* outlined further urban expansion to the east and west. In the east, the plan established a *"High-Tech Industrial Development Zone"* to foster emerging industries, while the west saw the construction of a *"New Urban Area,"* intended as a pilot zone for industrial transformation and an administrative, educational, and technological hub. However, a 5-kilometer-long coal subsidence zone between the old and new urban areas created a spatial disconnect and limited high-density urban development (Li and Huang, 2023). Although administrative offices and some universities relocated to the new urban area more than a decade ago, the new area struggles with low occupancy rates due to insufficient commercial, educational, and healthcare facilities. Despite its transition to a comprehensive urban center, Pingdingshan's long-term reliance on coal has left a mixed-use urban structure. Mining activities have caused severe environmental issues, particularly subsidence zones that continue to hinder urban development (Li and Huang, 2021).

The urban expansion of Pingdingshan City has followed a road-centered development pattern. Kuanggong Road, one of the earliest roads, played a key role in the city's initial layout as the main east-west axis. In the 1980s, Jianshe Road became the primary artery, driving southward expansion and horizontal growth. Since the 1970s, Kaiyuan Road has served as the main north-south axis, connecting the city's core and facilitating southern expansion. Later, with the city's east-west growth, Xinhua Road to the east and Guangming Road to the west began sharing this function. These main roads have shaped Ping-



n for the Workers' City of Pingdingshan, Master Plan for Pingdingshan City (1976–1985), Pingdingshan Master Plan (1991–2010), and Pingdingshan Master Plan (2011–

dingshan's urban expansion, extending its space southward, eastward, and westward (Ma et al, 2015).

Pingdingshan's urban growth faced two primary constraints: the need for rapid development versus the limitations of its internal spatial resources. As the city evolved, its growth became influenced by various socio-economic and policy factors, necessitating a balanced approach to sustainable development. Pingdingshan's urban renewal has been closely tied to its industrial base and coal resource distribution. Early residential areas were built adjacent to production sites, creating an east-west spatial pattern along Kuanggong Road and Chengping Road. Over time, mining subsidence zones influenced land use changes, shaping the city's spatial evolution and leading to the abandonment or destruction of early historical industrial spaces sites.

According to spatial syntax analysis (Ma et al., 2015). In the 1960s-1970s, the city had a cross-shaped core around *Kuanggong* Road and *Tiyu* Road, linking the east and west workers' towns with the central urban area. By the 1990s, the core expanded into a grid pattern, as northern subsidence issues pushed residents moved to newly built areas around the center urban area, from workers' towns. In the 2000s, after the *danwei* spaces disintegrated, and large spaces were subdivided due to real estate development, making the grid denser. At the same time, some previously enclosed danwei spaces have opened their internal roads to the entire city. By the 2010s, the city expanded westward into new urban districts, while its core remained denser, with ongoing growth toward the west and south.

As the city expanded south and west, the distribution of historical industrial spaces became increasingly detached from the city's renewal efforts. This spatial disconnect, coupled with neglect by local authorities and the public before 2010s, led to the degradation of important industrial spaces, buildings and machines, including obsolete mining equipment and 1960s Soviet-style buildings. These heritage sites, once integral to the city's identity, have failed to serve as anchors for collective memory or drivers for urban revitalization however.

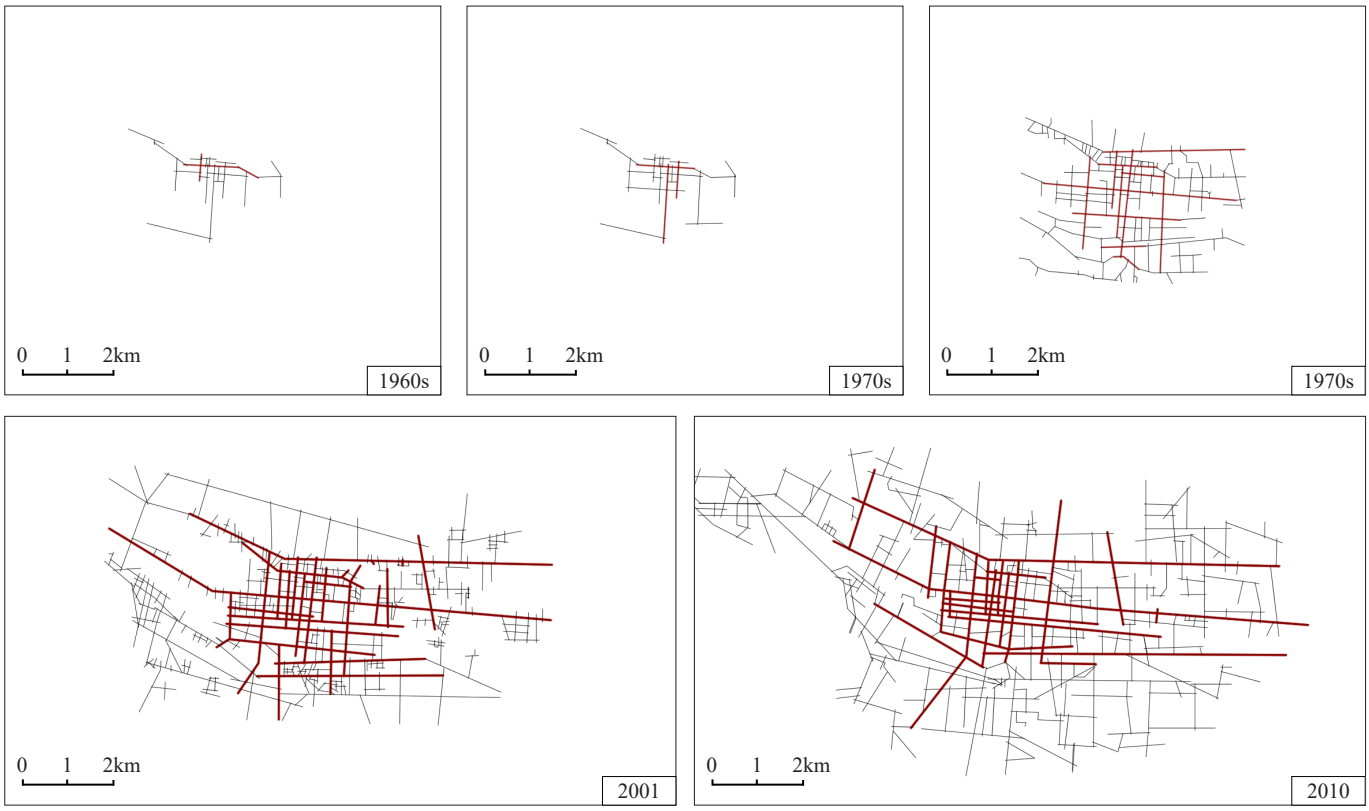


Figure 4.2-3, Diagram of Urban Changes from the Perspective of Streets. Red is integrators in spatial syntax, means roads are the top rank in importance within the city's road network. Source: Created By Author, based on the data in the research of Ma Z, Li J and Chu C. Urban Spatial Morphology Evolution Characteristics of Coal-oriented City Based on Space Syntax[J]. *Journal of Anhui Normal University(Natural Science),* 2015,38(02).

4.2.2 Key Influencing Factors

The spatial evolution of Pingdingshan has been influenced by 4 main factors:

(1) Coal Mining Zones:

Unlike cities in typical plains regions, the site selection and layout of coal resource-based cities are heavily influenced by topography and landforms. The city's spatial structure has been shaped by the distribution and extraction of coal resources. Mining activities, along with associated facilities and subsidence zones, have dictated land use patterns and constrained urban development in certain areas, particularly in the northernparts. Mining areas are primarily concentrated on the southern side of the mountains, which has long restricted urban development to the area between the northern mountains and the southern *Zhanhe River* (Li and Huang, 2023). This has resulted in a narrow, elongated east-west urban spatial pattern, significantly increasing traffic pressure on the city's main east-west thoroughfares.

The urban form of resource-based cities is also significantly influenced by mining subsidence areas. In Pingdingshan, mining near core urban areas has caused ground subsidence and other hazards, making these areas unsuitable for large-scale development and leading to fragmented urban spaces. This is a common challenge for coal resource-based cities in China (Yang, Jiao and Xu, 2015).

During Pingdingshan's transition from a single-center to a dual-core urban structure, the *New City District* was developed at a considerable distance from the old city. This spatial separation has created challenges for daily commuting, reduced foot traffic in the *New City District*, and hindered the sharing of well-established services in the old city.

(2) Mining Transportation Network:

Coal mining and transportation primarily rely on railways, which can fragment urban spaces (Yang, Jiao and Xu, 2015). In Pingdingshan, coal mines are concentrated in the northern part of the city, connected by an east-west freight railway. Over decades of urban development, this railway has divided the city into northern and southern sections, with limited connections such as tunnels and bridges. This has restricted the development of the urban road network, preventing northern areas from integrating with the city center and creating a noticeable gap in urban vitality (Li and Huang, 2023).

(3) Industrial *Danwei* Distribution:

Industry has always played a crucial role in Pingdingshan's economy, with coal, power, textiles, and metallurgy serving as the city's pillar industries. The leading *danweis* (now enterprises) in these sectors, established mainly in the 1960s to 1980s, occupy significant urban spaces. Surrounding these large-scale enterprises are residential areas and small commercial streets. Their dispersed locations in the eastern, southern, and western parts of the city have significantly influenced the expansion and evolution of Pingdingshan's urban spatial layout.

(4) Government Policy:

Government decisions have been the driving force behind urban renewal and spatial restructuring. Recent planning initiatives have focused on urban village redevelopment, functional reorganization, and ecological restoration, significantly influencing the city's spatial layout and development trajectory.

4.3 The Current Urban Status and Future Planning

4.3.1 Current Population, Economic, Cultural, and Social Situation

Pingdingshan is located in central-southern Henan Province, spanning between latitudes 33°08′ to 34°20′ N and longitudes 112°14′ to 113°45′ E. The administrative area of the city spans 150 kilometers east to west and 140 kilometers north to south, with an extensive railway network covering approximately 700 kilometers, positioned between the J*ingguang (Beijing to Guangzhou)* and *Jiaozhi (Jiaozuo to Liuzhou)* railway lines, which are the two most important strategic north-south railways in China, also there are two high-speed train railways. Pingdingshan is about 150 kilometers from Zhengzhou City, which is the captital city of Henan Province, and one of the largest transportation hub in China, making it accessible for regional and international connectivity.

Covering a total area of 7,882 square kilometers, Pingdingshan administers 4 districts (*Xinhua, Weidong, Shilong,* and *Zhanhe*), four counties (*Baofeng, Ye, Lushan,* and *Jia*), and two county-level cities (*Wugang* and *Ruzhou*). However, in common discussions, "Pingdingshan City" refers to the main urban area, consisting of the 3 districts—*Xinhua, Weidong,* and *Zhanhe*—excluding those two county-level cities and the more distant enclave of *Shilong* District.

4.3.1.1 Population

According to the *Pingdingshan Yearbook (2023)*, *Pingdingshan Statistical Yearbook (2023 and 2016)* , compiled by *Pingdingshan Municipal Bureau of Statistics*, as of the end of 2022, Pingdingshan had a total resident population of 4.961 million, 3.988 million if Ruzhou excluded (Ruzhou was included in Pingdingshan City's statistics in 2018). The urban population, including the main urban area, counties, and county-level cities, accounted for 2.733 million, while the rural population was 2.228 million, giving the city an urbanization rate of 55.08%. The main urban area (Xinhua, Weidong, and *Zhanhe*) had a population of 1.1027 million, with an urban population of 1.0441 million, the urbanization rate of the central urban area was 94.6%. In 2015, under China's city classification system we mentioned before, the central urban area population was 1.0624 million, with an urban population of 925,700, classifying it as a medium-sized city. It is worth noting that, although Xinhua, Weidong, and *Zhanhe* are called central urban areas, there are still some rural areas far away from the urban areas within their administration, which will be included in the total population of these three areas in statistics.

Basic Population and Employee Data (Ruzhou Excluded)										
	Polulation (k)		Employed Population (k)		Employed in Industrial Sector (k)		Employed in Coal Mining and Washing Industries (k)		Employed in Coal Mining and Washing and Relates (k)	
Year	2015	2022	2015	2022	2015	2022	2015	2022	2015	2022
Total City	3897.9	3988.2	1925.3	1747.9	/	208.9	111.2	91.1	/	143.7
3 Districts	1062.4	1103.0	538.4	502.2	177.9	189.3	105.0	87.0	/	138.8

Figure 4.3-1, Table of Basic Population Data of Pingdingshan City. Source: Created by author, data from *Pingdingshan Yearbook (2023), Pingdingshan Statistical Yearbook (2023 and 2016)* .

*Please note:

In 2015, *Ruzhou City* was not under Pingdingshan's administration, so the total data reflects adjustments in the *Pingdingshan Statistical Yearbook (2023)*, *Ruzhou* Excluded.

Data for the three main urban districts in 2015 comes from the *Pingdingshan Statistical Yearbook (2016)*, which lacks the detailed industry classification found in the 2023 edition, so there is no breakdown for "employed in coal mining and washing and related industries."

The 2015 statistics for "employed in industrial sector" cover all industrial enterprises, while in 2022, the scope was limited to "large-scale industrial enterprises," which theoretically account for over 95% of industrial employment.

Of the 2022 resident urban population, Pingdingshan City's central districts had a total employed population of about 502,200. Of this, about 189,300 people were employed in large-scale industrial enterprises—defined in China as industrial enterprises with an annual primary business income exceeding 20 million CNY. In Pingdingshan City, 87,000 of these individuals were directly engaged in coal mining and washing industries. When accounting for the entire coal mining supply chain and derivative industries, the employment figure rises to 138,800, excluding people work on the mining transportation departments, demonstrating the city's deep industrial ties to coal. The largest state-owned industrial enterprise in the city, China PingMei ShenMa Group—primarily engaged in energy and chemical industries, including most of Pingdingshan's coal mining, washing, and downstream industries—employed approximately 120,000 people. Consequently, in 2022, 17.4% of the city's workforce was directly involved in coal mining and processing, while mining and relates accounted for 27.6% of total employment.

The coal industry remains a fundamental pillar for Pingdingshan's employment landscape, nearly a third of the city's workforce. This high dependency on coal-related industries highlights the sector's critical role in supporting livelihoods across the city.

Although the statistical scope and methods differed between 2015 and 2022, with employees in coal mining and related industries still comprising one-quarter of total employment and three-quarters of industrial employment, the data shows a clear decline in the number of people working in these sectors. The reasons behind this trend—such as resource depletion, mine closures, and industrial transformation—will be discussed in the following sections. This shift has, to some extent, led to a loss of the city's original cultural identity.

Like many medium-small industrial cities in China, Pingdingshan is facing an aging population challenge. While the city's total population has grown from 3.85 million in 1984 to 4.964 million in 2022, the birth rate has been steadily declining. Since the introduction of China's family planning policy, the birth rate reached a peak of 26.44‰ in 1989, but by 2022, even after the introduction of the "three-child" policy, it had dropped significantly to 7.77‰. Meanwhile, the death rate has shown a gradual increase, reaching 7.56‰ in 2022. Consequently, the natural population growth rate has declined sharply from a peak of 20.8‰ in 1989 to just 0.21‰ in 2022.

Comparing the results of China's national censuses in 2000, 2010, and 2020, the effects of demographic shifts in Pingdingshan are apparent. Although the total resident population has remained relatively stable, the labor force (men aged 16-59 and women aged 16-54) has decreased from 3 million to 2.5 million, marking a reduction of roughly one-sixth. At the same time, the elderly population (men aged 55, women aged 60 and above) has surged by 500,000, doubling from 580,000 to 1.08 million. By the end of 2022, the elderly dependency ratio had reached 34.01% (based on the Chinese standard for those aged 60 and above) or 22.94% (based on the international standard for those aged 65 and above).

The decline in young people, driven by low birth rates and outward migration to larger cities, plus the increase in the proportion of elderly residents, many of these older adults witnessed Pingdingshan's growth from its beginnings and have a deep connection to the city's coal mining heritage and industrial culture. As this generation gradually passes on, the city faces a potential erosion of its cultural identity and collective memory tied to its coal industry origins. The combined effects of a shrinking young population and an aging society present Pingdingshan with challenges in preserving its cultural heritage and maintaining a sense of urban identity.

4.3.1.2 Economy

Based on data from the Pingdingshan Statistical Yearbook (2023), Pingdingshan's economy has experienced significant growth over recent decades, particularly between 2018 and 2023. During this period, the government's policies aimed for "stable progress with notable economic growth," with the region's GDP growing at an average annual rate of 6.2%, outperforming national and provincial growth rates by 0.6 and 0.7 percentage points, respectively. GDP crossed the thresholds of 200 billion and 250 billion CNY in consecutive years, reaching 283.9 billion CNY in 2022. This reflects a dramatic increase from 1988, when the GDP was only 4.4 billion CNY, and even from 2008, when it crossed the 100 billion CNY mark.

Pingdingshan's economic structure has also shown signs of transformation. In 1988, industry contributed 49.6% of GDP, maintaining a similar proportion until around 2003, after which industrial output began to increase, peaking in 2008 amid the global financial crisis. China's large-scale investment in real estate, infrastructure, and industrial development mitigated the crisis's impact, temporarily boosting industrial output. However, from 2008 onward, as the city's high-quality coal resources were gradually depleted and production began to slow, the industrial share of GDP began to decline, falling to 38.6% by 2022. In contrast, the tertiary sector, including real estate and other service industries, expanded to 46.5% of GDP, reflecting the gradual shift toward a more diversified economic structure.

Pingdingshan's major industrial outputs have also undergone fluctuations. For example, raw coal production peaked in 2010 at 52.7 million tons, after rising from 34.1 million tons in 1995. However, over the next five years, coal production plummeted, reaching 36.9 million tons, nearly equivalent to the 1995 output, and stabilizing at around 31.8 million tons by 2022. Similar trends are observed in the production of clean coal, coke, and resins. High-voltage switchgear, a core product in Pingdingshan's manufacturing, experienced a sharp increase in 2019 due to the national "West-to-East Electricity Transmission" initiative, peaking at eight times the previous year's output before stabilizing at lower levels. In contrast, basic industrial products such as steel, cement, caustic soda, and textiles have shown steady production levels since 2008, following rapid growth during the industrial boom. Notably, Pingdingshan's pharmaceutical manufacturing sector has seen significant growth in recent years, with its value-added index reaching an impressive 209.6% in 2022, marking it as the fastest-growing industrial subsector.

Overall, Pingdingshan's coal industry, once the backbone of its economy, has stabilized at a level roughly half of its peak production. While traditional industries face decline, the city has shown resilience by shifting focus toward high-growth sectors like pharmaceuticals. This transformation reflects Pingdingshan's gradual adaptation to the changing economic landscape, where diversification and sustainable growth are becoming increasingly critical.

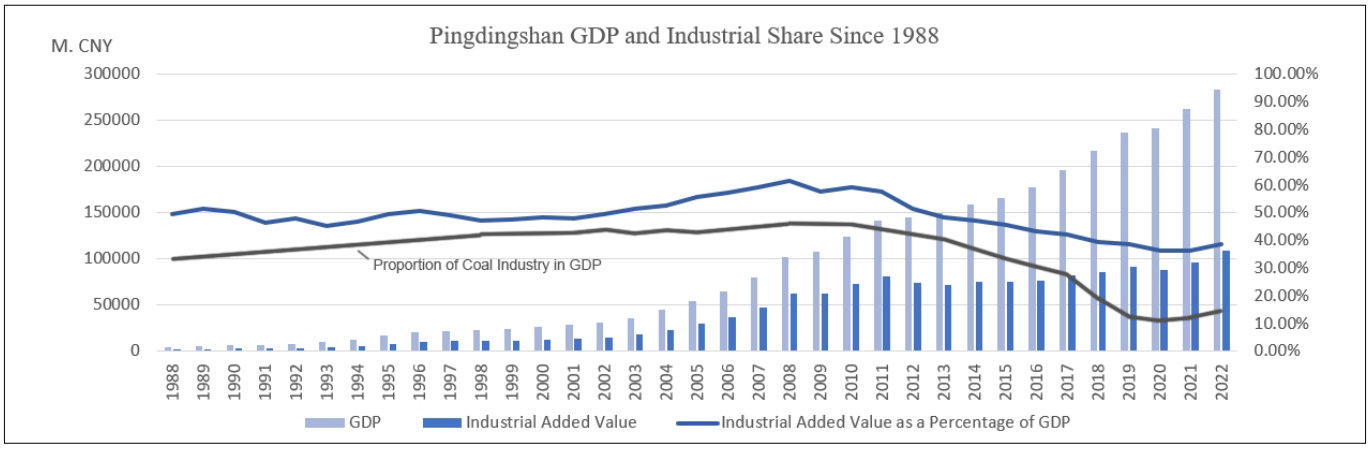


Figure 4.3-2, Table of Basic Economy Data of Pingdingshan. Source: Created by author, data from *Pingdingshan Statistical Yearbook (2023 and 2016)*.

4.3.1.3 Culture and Society

Pingdingshan's cultural history is shaped by two primary themes: the ancient history of its surrounding counties and its identity as a "coal city." The city's history can be traced back 5,000 to 6,000 years, with the area belonging to the Ying State during the Shang and Zhou dynasties. Historically, nearby counties such as Jia County, Ye County, and Lushan County were significant in ancient China. However, within the modern urban area of Pingdingshan, most cultural sites tied to ancient history are located far from the central urban area. Consequently, the primary cultural identity of Pingdingshan City itself is rooted in its coal mining heritage and industrial culture.

The development of Pingdingshan's coal mining culture can be divided into distinct phases, each reflecting broader societal and economic changes:

The Founding and Struggle Period (1953-1966): The modern coal mining culture began in 1953, when geologists discovered vast coal reserves. Starting in 1955, workers from across China came to develop the mines under challenging conditions, as captured in a local ballad: *"Wind and stones abound, grass huts on the hill, Workers share beds for three or four still."* This period is remembered as a time of struggle and resilience, laying the foundation for the city's coal mining culture.

The Political Turmoil Period (1966-1976): The *Cultural Revolution* brought some disruption to the city's coal mining operations. However, with workers occupying a central role in society, production continued to advance despite the upheaval, albeit with difficulties and setbacks.

The High-Growth Period (1976-1990): Called the *"New Historical Period"* in the *Pingdingshan Yearbook (2017)*, this era saw a return to national focus on production and economic development. Coal output repeatedly broke records, fostering a sense of pride among coal miners and solidifying their cultural identity, as a positive and important collective memory.

Reform and Transformation (1990-Present): With the deepening of market reforms in the 1990s, state-owned enterprise reforms broke the "enterprise-led society" model, leading to widespread layoffs. Formerly proud coal miners found their identities and roles in society undermined, leading to a period of cultural dislocation and the emergence of what could be termed *"scar culture",* a phenomenon reflecting both pride and pain. Simultaneously, as coal resources depleted, the cultural identity tied to coal mining began to fade, leaving behind a legacy of both proud achievements and lingering challenges.

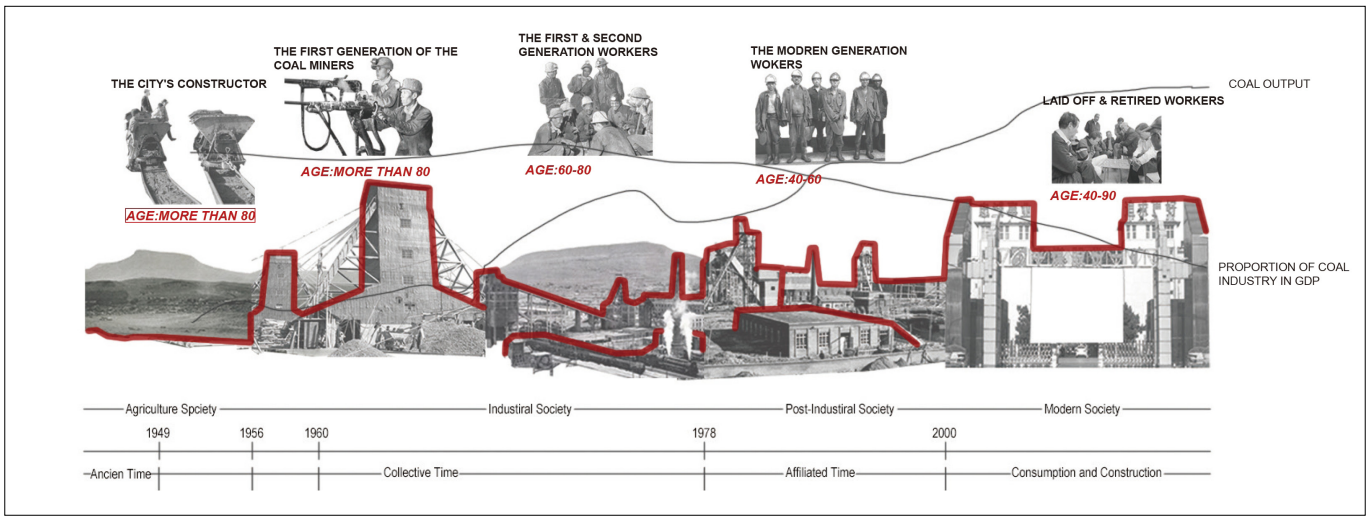


Figure 4.3-3, Diagram of the Age of Different Generation of Workers and Society Changes. Source: Drawn by author, edited from the author's design project for the transformation of old coking plant buildings into a community center and collective housing.

4.3.2 Current Urban Space Situation

4.3.2.1 Urban Spatial Function and Division:

The spatial layout of Pingdingshan City reflects its evolution as a typical mining and industrial city. Over the decades, Pingdingshan has transitioned through distinct stages of development—from a mining area to a coal city, then to an industrial city, and eventually to a regional administrative center. Early changes in the city's spatial structure were heavily influenced by natural conditions, particularly the distribution of coal resources. In later stages, urban planning played a more prominent role in shaping the city's spatial organization. Notably, in Pingdingshan's 2021-2035 land use plan, industrial land accounts for 21.55%, which is near to residential land at 27.05%.

Today, Pingdingshan's urban space is divided into four distinct functional zones, each carrying historical and developmental significance:

(1) Northern Mining and Industrial Zone: This zone, located along the northern foothills and stretching approximately 20 kilometers east to west along *Kuanggong* Road (Miner Road), is the heart of Pingdingshan's mining and industrial activities. It houses most of the city's coal mines, from Mine No.1 to Mine No.12, as well as coal washing plants, processing facilities, and railway stations for mining transport. These facilities are connected by a mining railway network, symbolizing the city's historical industrial spaces. Surrounding each mining site are worker housing complexes and small-scale commercial areas, remnants of the planned economy era's *Danwei* system. Historically, this area was the primary functional zone of the city, accommodating most of the workforce and their families. Although industrial reforms and marketization have transformed the region, the northern zone remains a significant marker of Pingdingshan's industrial identity.

(2) Central Urban Area (Old City Center): South of Miner Road and spanning both banks of the *Zhanhe* River, the central urban area forms the traditional core of Pingdingshan. This old city center encompasses parts of Xinhua District, *Zhanhe* District, and Weidong District. Key streets such as *Kaiyuan* Road (Increase Road), Tiyu Road (Sports Road), *Jianshe* Road (Construction Road), and *Kuanggong* Road define the area, which historically (from 1970s to 2010s) served as the city's political, commercial, cultural, and administrative hub. It hosted most municipal government offices, commercial establishments, cultural venues, and business centers. However, the central urban area faces challenges such as heavy traffic congestion, fragmented spaces due to multiple railway lines, and subsidence caused by coal mining. Additionally, industrial waste heaps, such as gangue hills near the old city, limit further development in the region. Over time, many political and cultural functions, including major government institutions and educational facilities, have shifted westward to the newly developed western urban area. Today, the central urban area primarily serves residential and commercial purposes, with reduced pressure on population density and traffic flow.

(3) Western New Urban Area: Located to the west of the old city and north of Baigui Lake, the western new urban area emerged after 2000 to address the city's rapid economic growth and land shortages. As mining activities expanded in the north of *Kuanggong* Road, existing land became insufficient for residential and industrial development. This prompted the city to plan and develop a new urban zone in

the west, which now houses key government offices, large high schools, colleges and State-owned enterprise headquarters. The area has also benefited from commercial and residential real estate projects, aligning with China's land finance policies. Baigui Lake, a natural reserve, offers a favorable environment, further supporting the westward shift of population and urban functions.

(4) Eastern New Industrial Zone: In the 21st century, Pingdingshan's urban structure expanded significantly, particularly with the development of an industrial zone along the eastern section of *Jianshe* Road, north of the *Zhanhe* River. Known as the high-tech development zone, this area spans approximately 5 kilometers and is home to factories and enterprises such as the Nylon 6/6 Plant. These industries play a vital role in Pingdingshan's industrial transformation, focusing on high-value manufacturing and technological innovation. The zone represents the city's efforts to modernize its economy and reduce dependence on traditional coal mining.

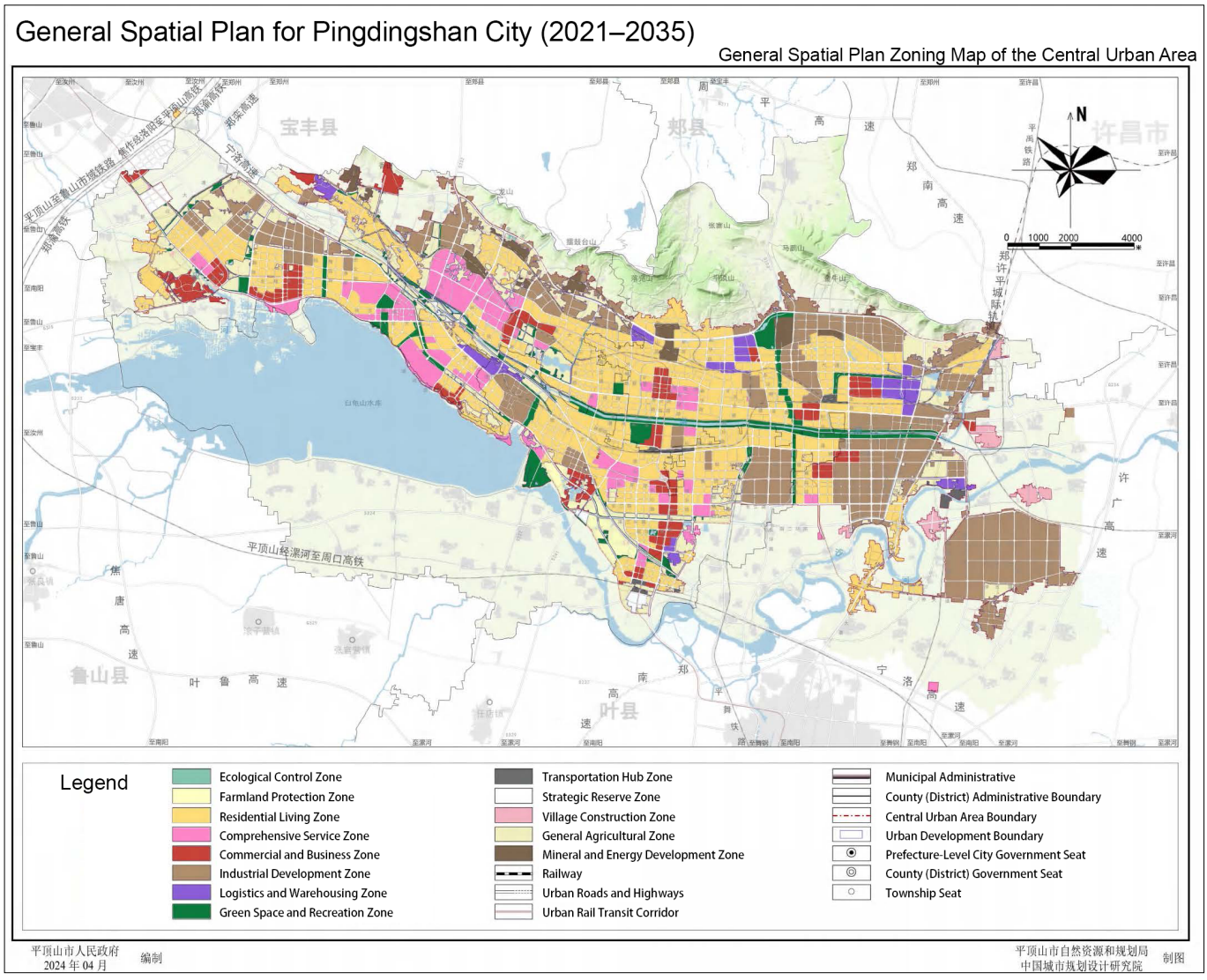


Figure 4.3-4, 2021-2035 Landuse Map of Urban Area of Pingdingshan City. Source: Pingdingshan Municipal People's Government, Pingdingshan Natural Resources and Planning Bureau, China Academy of Urban Planning and Design, 2024.04, *General Spatial Plan for Pingdingshan City (2021–2035),* translated and edited by author.

4.3.2.2 Spatial Distribution of Key Industrial Historical and Cultural Spaces:

Pingdingshan's historical industrial spaces can be categorized into 3 functional types:

1. Mining and Production: Structures and facilities tied to coal extraction and processing.

2. Transportation Support: Infrastructure supporting the industry, such as railways and depots.

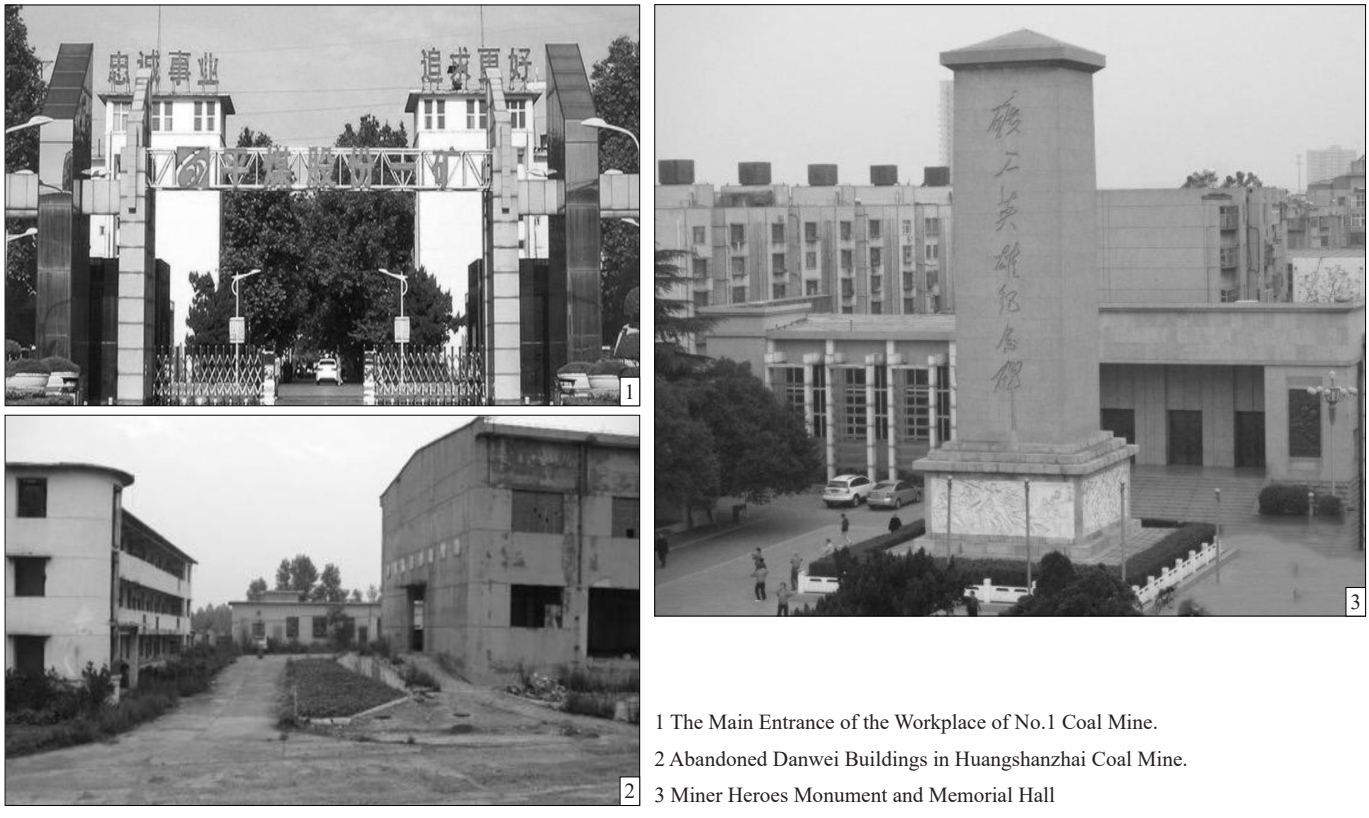
3. Worker Livelihood: Housing, schools, and hospitals built for workers under the planned economy's *danwei* system.

To better understand the current state of Pingdingshan's urban transformation and its connection to culture and collective memory, a thorough investigation of key heritage sites was conducted. The study included field visits to coal mining sites from Mine No.1, No.2, No.7 and No.8. These visits encompassed mining areas (accessible sections), residential zones, and associated tertiary sectors. Data on production status, economic structure, industrial transitions, and the preservation of historical industrial spaces were gathered from archives, researches and interviews with local residents, including former workers, family members, and local experts. This thesis provides a comprehensive picture of Pingdingshan's industrial and cultural heritage.

Pingdingshan's key industrial and cultural heritage sites can be categorized as follows, with distinct characteristics based on their locations:

(1) Mining-Related Historical Industrial Spaces in the Northern Mining Zone:

Most of Pingdingshan's mining-related historical industrial spaces is located in the northern mining zone, showcasing the city's origins and development as a major coal mining hub.



1 The Main Entrance of the Workplace of No.1 Coal Mine.

2 Abandoned Danwei Buildings in Huangshanzhai Coal Mine.

3 Miner Heroes Monument and Memorial Hall

Figure 4.3-5, Photos of Some Historical Industrial Sites. Source: edited by author, from Xie M. *Study on Industrial Heritage Protection and Reuse in Coal Mine Waste Land from the Perspective of Urban Renewal--A Case Study of Pingdingshan City*[D]. Hefei University of Technology, 2019.. and Pingdingshan Mining Bureau, *Pingdingshan Mining Bureau Chronicle,* 1995, Coal Industry Press. .

No.1 and No.2 Coalfield Exploration Drilling Sites: The first and second drilling sites mark the origins of coal mining in Pingdingshan, where the city's vast coal reserves were first discovered. These locations symbolize the start of Pingdingshan's journey as a major industrial city.

Mining Facilities from Mine No.1 to Mine No.12: Several mines hold significant historical value. Constructed during the *First Five-Year Plan* and as part of the Soviet-supported *156 Projects*, Mine No.1 was one of China's first modernized mines. It housed advanced equipment, such as a Soviet-built 1350kw coal hoist, which operated for over half a century. Although retired in 2006, much of this equipment remains abandoned in the factory yard and warehouses, lacking adequate preservation.

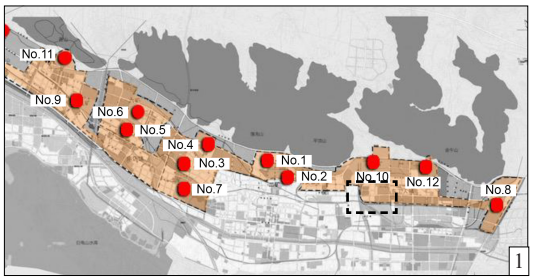
Mining *Danwei* Architecture: Many original structures from the 1950s, such as Soviet-style gates at Mine No.1 and office buildings at Mine No.2, have unfortunately been demolished due to aging and redevelopment. Only a few buildings remain, and their historical importance is difficult to identify.

Mine No.7 Park (Egret Island City Wetland Park): As one of the earliest decommissioned mines of the city, Mine No. 7 underwent significant environmental restoration. 90 hectares subsidence area and gangue hill were transformed into an ecological park featuring an artificial lake formed naturally through subsidence. Now a national-level wetland park, it serves as a stopover for migratory egrets and stands as a model for ecological restoration of mining sites in China.

Other Spaces: The northern zone also retains remnants of related industries, such as textiles, transportation, cooking plant, and machinery manufacturing, developed during the *First Five-Year Plan*. Associated facilities, such as hospitals, cinemas, railway stations, and markets, highlight the interconnected growth of industrial and community infrastructure.

1, The distribution of the northern mining area of Pingdingshan from No. 1 Mine to No. 12 Mine, detailed diagram in Figure 4.4-1. This map is only used to indicate the location of Diagram 2.

2, Zoomed into the Eastern Central Urban Area, Centered on the Coking Plant. The layout of the Coking Plant illustrates the typical spaces and surroundings of Pingdingshan's coal mining industrial danwei spaces, built in 1950s and 1960s. Based on Satellite data from Baidu Maps.



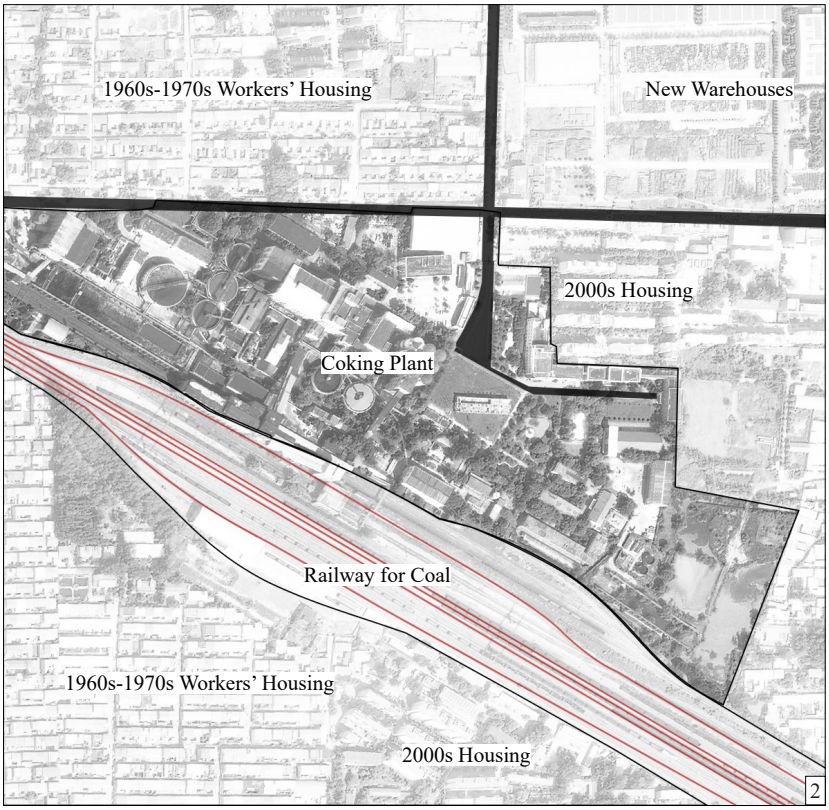


Figure 4.3-6, Diagrams of a Typical Pingdingshan's Coal Industrial Space. Source: Drawn by author, edited from the author's design project for the transformation of old coking plant buildings into a community center and collective housing.

(2) Historical Industrial and Cultural Spaces in the Central Urban Area:

In the city center, non-historical industrial spaces sites play a significant role in preserving the collective memory of Pingdingshan's mining identity. These sites are well-maintained and integrated into public life, often as parks or monuments:

Miner Heroes Monument and Memorial Hall: Located at the boundary between the northern mining zone and the city center, these were built in 1976 to honor Li Eryin, a CPC's party secretary as well as a worker at Mine No.2 who died heroically during a mining accident. This site, now part of a public park, serves both as a historical monument and a recreational space for local residents.

Geological Heroes Memorial and Park: Situated near *Zhanhe Park*, this site features a monument with an inscription by former chairman Jiang Zemin. It commemorates generations of geologists who contributed to Pingdingshan's development. Today, the surrounding park serves as a popular leisure area for families and seniors.

"Entrepreneurship" Sculpture: This prominent city landmark, located at the former city center, the intersection of *Xinhua Road* and *Jianshe Road*, was designed in 1984 and completed in 1990. The 33-meter-tall sculpture features four figures—a coal miner, a textile worker, a steelworker, and a scientist—representing Pingdingshan's industrial workers and broader community.

Other Cultural Sites: Some locations, such as the Pingdingshan Shopping Mall (a planned economy-era rationing center) and the People's Shopping Mall (one of the city's first state-owned malls after reform), reflect distinct historical periods but suffer from neglect. These sites, while rich in cultural value, are underutilized and in poor condition. But at the same time, the miner sculptures in *Zhanhe* Riverside Park and the pedestrian street in the city center are well-preserved and highly utilized cultural sites.

1, Geological Heroes Memorial and Sculpture, Inscribed with a Dedication by Former President Jiang.

2, Geological Heroes Sculpture in the Geological Heroes Memorial Park.

3, "Entrepreneurship" Sculpture.

4, Sculptures and Revolutionary Slogans on the Facade of Pingdingshan People's Shopping Mall.

Figure 4.3-7, Photos of Some Historical Industrial and Cultural Spcaces in the Central Urban Area. Source: Edited by author, photographs by the author's friend Tian in Pingdingshan.

4.3.3 Ongoing and Future Planning

Pingdingshan's ongoing urban construction and future planning are guided by several key policy documents, including the master plan document *General Spatial Plan for Pingdingshan City (2021–2035)*, the *General Plan for Mineral Resources (2021–2025)*, and the *14th Five-Year Plan* for *Ecological Restoration of Land and Space (2021–2025)*,. These plans, issued by the Pingdingshan Municipal Government and related departments, lay out ambitious goals for urban transformation while addressing the city's historical industrial spaces and collective memory, albeit to a limited extent. It is important to note that the management of mining areas involves multiple stakeholders, including state-owned enterprises and local authorities, meaning that the municipal government does not have sole authority over these spaces.

4.3.3.1 Urban Planning and Transformation Goals

The General Spatial Plan for Pingdingshan City (2021–2035) sets a long-term vision for Pingdingshan to return to Henan Province's "first tier" in economic and overall development by 2035. The plan emphasizes optimizing urban spatial resource allocation and outlines a vision for Pingdingshan as a hub of new materials and renewable energy, a southwestern Henan innovation demonstration zone, and a modern ecological and tourism-friendly city. By 2035, the city aims to transform into a model for resource-based urban renewal, focusing on livability and ecological restoration. This includes strict implementation of minimum mining scale requirements and prioritization of tasks such as restoring mining subsidence and voided areas. The *General Plan* also highlights goals related to improving the layout of the central urban area, enhancing urban quality, and preserving and inheriting historical culture, emphasizing the quality of historical industrial spaces, former *danwei* spaces, and industrial culture, which highlights a clear focus on urgent environmental and living condition issues over cultural and memory-related aspects.

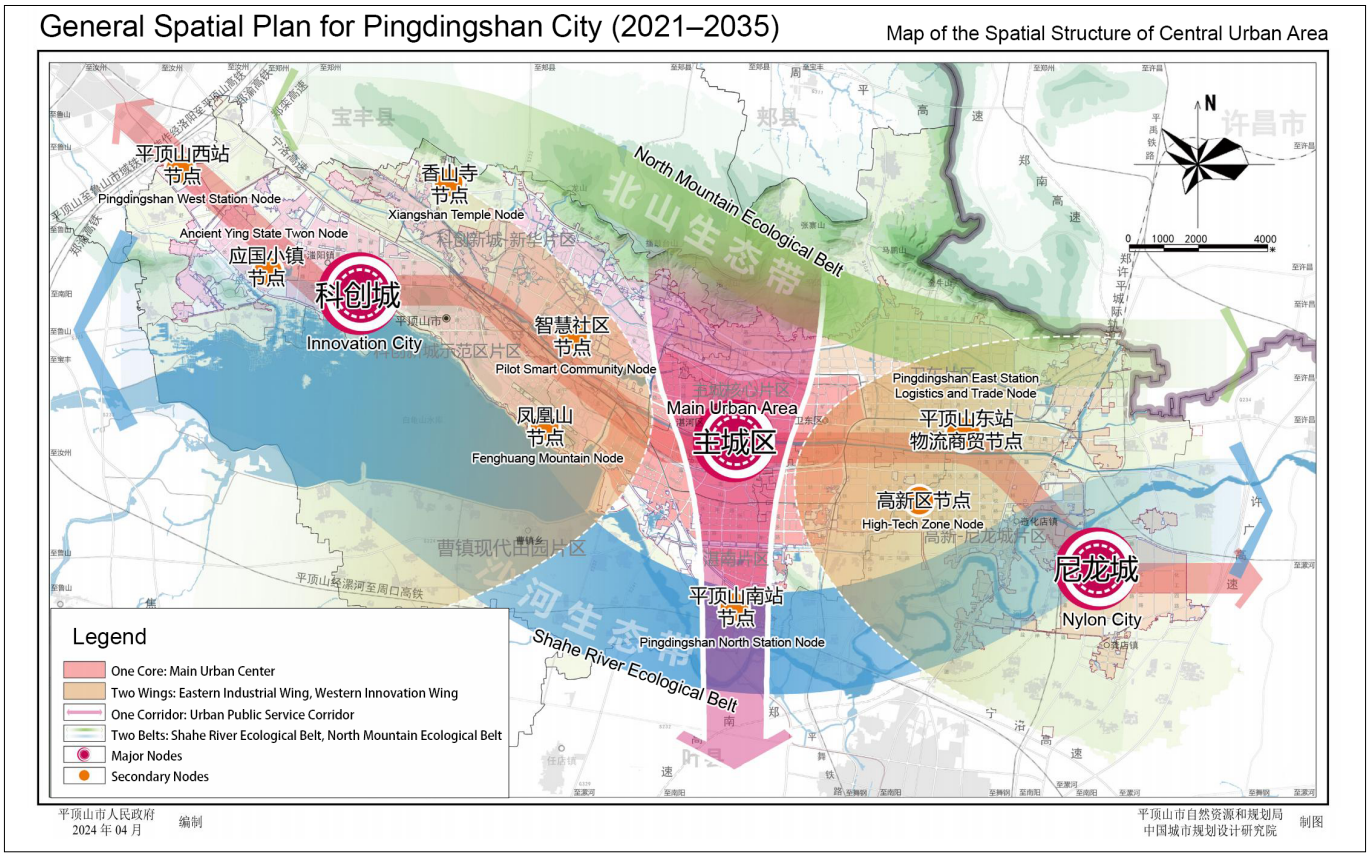


Figure 4.3-8, Map of the Spatial Structure of Central Urban Area. Source: Pingdingshan Municipal People's Government, Pingdingshan Natural Resources and Planning Bureau, China Academy of Urban Planning and Design, 2024.04, *General Spatial Plan for Pingdingshan City (2021–2035),* translated and edited by author.

4.3.3.2 Focus on Urban Space Renewal

Consistent with broader national urban renewal strategies, Pingdingshan's planning prioritizes enhancing residential spaces, renovating old neighborhoods, providing affordable housing, and improving 15-minute community service networks. These objectives emphasize improving residents' quality of life while aligning with national standards for public services and urban livability.

Pingdingshan's plans for "blue-green grid spaces" include ecological restoration of northern mountain areas and comprehensive management of mining zones. Significant projects such as the *"Three Horizontal, Six Vertical" Green Corridors* overlap with areas of decommissioned mines, incorporating designs for *"Mining Ecological Park"*, the No.8 Mine Suburban Park, the *Egret Island City Wetland Park* (transformed from Mine No. 7), and the proposed *City Memory Park* along the *Zhanhe* River. While these projects aim to integrate ecological and recreational functions, only a few explicitly address cultural and memory-related themes, as seen with the *"City Memory Park"*.

4.3.3.3 Addressing Industrial Heritage and Urban Memory

The *General Spatial Plan* for Pingdingshan acknowledges the significance of historical industrial spaces and urban memory but focuses primarily on broader urban renewal objectives. While the plan includes provisions for protecting historical and cultural landmarks, its emphasis lies largely on nationally, provincially, and municipally recognized sites. This approach leaves many abandoned industrial facilities and mining-related structures—key carriers of Pingdingshan's urban identity and mining industrial history—outside the immediate scope of protection.

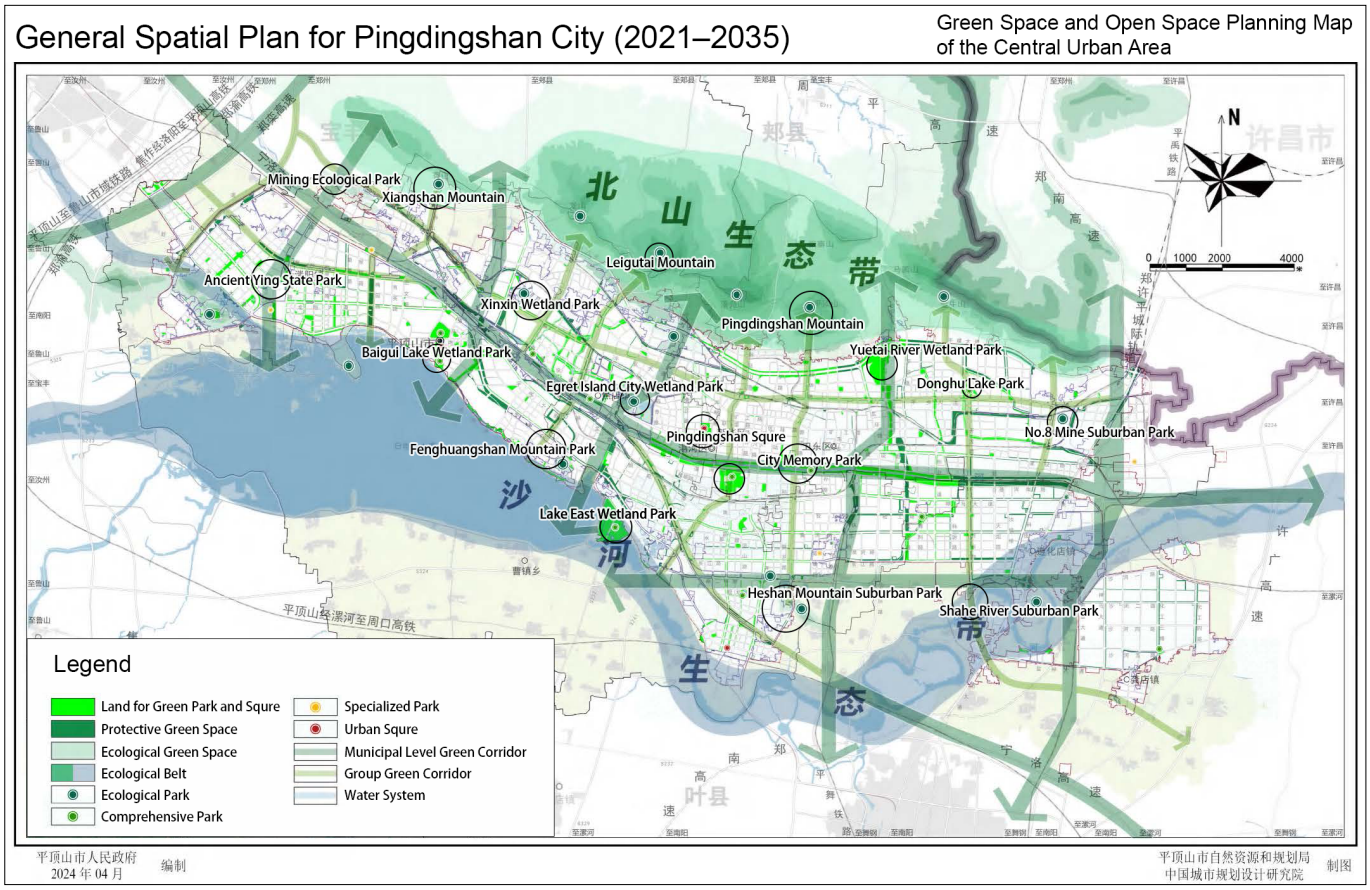


Figure 4.3-9, *"Three Horizontal, Six Vertical" Green Corridors*. Source: Pingdingshan Municipal People's Government, Pingdingshan Natural Resources and Planning Bureau, China Academy of Urban Planning and Design, 2024.04, *General Spatial Plan for Pingdingshan City (2021–2035),* translated and edited by author..

However, the plan does recognize the potential value of adaptive reuse for industrial sites. It proposes transforming disused industrial areas into spaces for new industries, public services, recreational facilities, and ecological restoration. For example, decommissioned mines and factories could be repurposed as cultural venues, community hubs, or even innovation parks. This approach aims to balance historical preservation with practical urban development, linking the city's industrial past to its future trajectory.

Specific references in the plan highlight the goal of integrating historical industrial spaces into the urban fabric. Suggestions include establishing standards for identifying and preserving industrial relics, updating these sites to include cultural or creative functions. These initiatives encourage collaboration among local government, design agencies, and other stakeholders to explore innovative solutions for preserving the city's unique identity. While such proposals remain exploratory, there are clear indications of intent to maintain Pingdingshan's historical narrative. Projects like the *"City Memory Park"* along the *Zhanhe* River provide a chance into how cultural and historical elements can be preserved in urban planning. The proposed park aims to commemorate the city's coal mining history, based on *Geological Heroes Monumental Park*, serving as a space where residents can reconnect with their collective memory while enjoying recreational amenities.

Nevertheless, the implementation of these ideas is in its early stages. Most planning efforts prioritize ecological restoration, economic diversification, and improving living conditions, with cultural memory often treated as a secondary consideration. The challenge lies in ensuring that the legacy of Pingdingshan's coal mining era is not only preserved but also actively integrated into the city's transformation. By doing so, Pingdingshan could establish itself as a model for resource-based cities seeking to balance historical preservation with modern development.

4.3.3.4 Balancing Ecology, Economy, and Memory

Pingdingshan's future planning shows a multi-dimensional approach, balancing ecological restoration, economic diversification, and urban cultural preservation. Projects like the ecological parks demonstrate success in transforming environmental liabilities into assets, serving as a benchmark for integrating ecological restoration with urban memory. At the same time, the proposed *"City Memory Park"* signals an opportunity to preserve and celebrate the city's coal mining history. However, the lack of explicit and detailed plans for systematically preserving industrial and cultural heritage raises questions about the prioritization of urban memory in the city's development agenda. Future planning efforts must address this gap by better integrating cultural identity and collective memory into broader urban renewal strategies.

Pingdingshan's planning documents showcase a clear commitment to addressing pressing environmental and livability challenges while laying the groundwork for industrial and cultural transformation. However, the extent to which urban memory and historical industrial spaces are preserved and integrated into the city's future development will depend on the effective collaboration of various stakeholders and the successful implementation of exploratory projects. This ongoing balancing act offers valuable insights into the complexities of resource-based urban renewal and the opportunities for aligning ecological, economic, and cultural goals.

4.4 Challenges Pingdingshan is Facing

In recent years, as coal resources have become increasingly scarce in this city, Pingdingshan has entered the category of resource-exhausted cities. A 2019 survey showed that by 2024, the remaining extraction periods for most mining areas would be around 20 years, with some mines already facing closure. For instance, Mine No.3 ceased production seven years ago, and Mine No.7 has been repurposed into a wetland park. Of the remaining mines, Mine No. 5 and Xiangshan Mine have less than ten years of extraction capacity, requiring resolution by 2035. Meanwhile, Mines No. 2, 4, 6, 9, and 12 are expected to cease production within 20 years (Xie, 2019). These mines, along with their associated *Danwei*'s residential and facilities, face challenges in transformation, redevelopment, and upgrading. Fortunately, many of these spaces remain underdeveloped commercially, leaving room for future planning and intervention.

4.4.1 Spatial and Environmental Challenges

Pingdingshan's coal mining heritage faces significant spatial challenges. As noted in earlier chapters, the city's coal resources are predominantly located at the foothills of the northern mountain range, forming a distinct linear distribution. Due to differences in exploration and development timelines, the industrial historical sites are scattered along the city's northern belt area, stretching over 30 kilometers. Interspersed among these sites are various land use types and urban infrastructure, resulting in fragmented historical industrial spaces. However, when considering the original area of the *danwei* spaces—encompassing coal mines, residential areas, supporting facilities, and waste industrial lands—these northern coal mining areas collectively occupy nearly half of the city's urban area.

The challenges within these spaces according to their scale, condition, and current state of use. Some mining sites, such as Mine No.8, has large area and complete *danwei* spaces, including industrial facilities, *danwei* residential neighborhoods, and associated amenities like hospitals and worker activity centers. Others, like Mine No.7, have undergone significant environmental remediation, transforming industrial landscapes into a wetland park.

Additionally, different sites are facing different degree of commercialization. Certain areas, such as surroundings of Mine No.7, have seen extensive market-driven redevelopment. Its former *danwei* spaces,

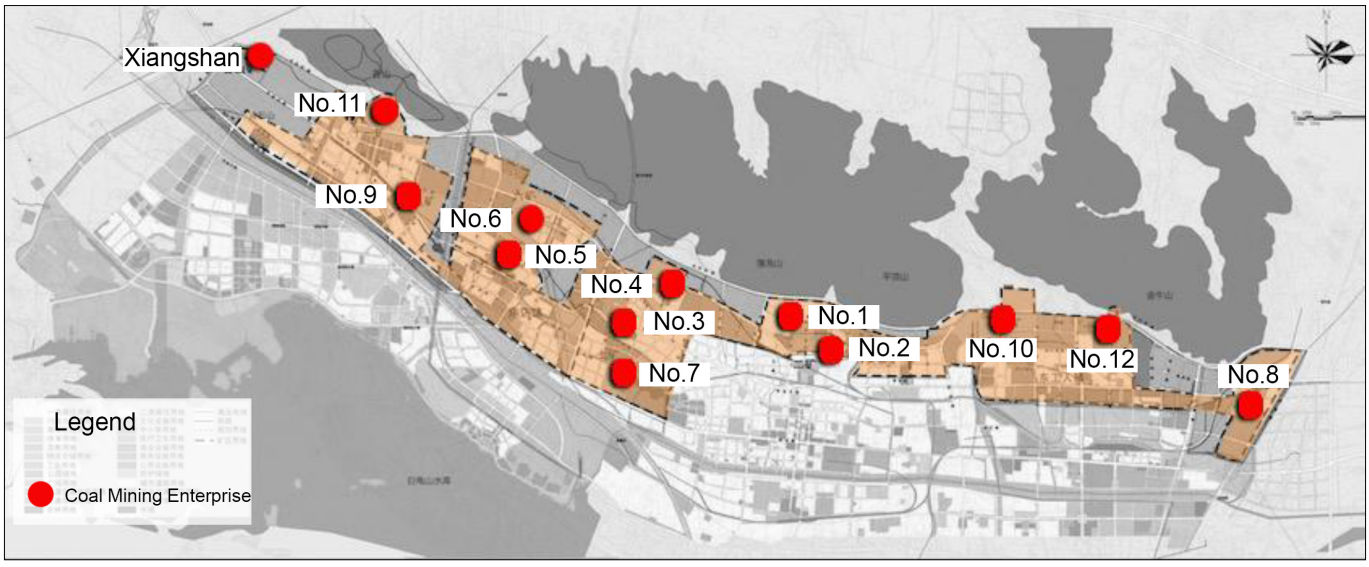


Figure 4.4-1, Important Mining Places in Pingdingshan City. Source: Edited by author, based on *General Spatial Plan for Pingdingshan City (2021–2035)*.

including residential and living facilities, have been reclassified as commercial housing and commercial land, subsequently undergoing real estate development. In contrast, sites like Mine No.12, located on the city's edge, remain largely untouched by commercial real estate developments. These spaces still retain the traditional *danwei* layout of industrial production zones with large area of multi-story residential blocks, though they have aged considerably and are in poor condition. This uneven development and fragmented spatial distribution present significant challenges for coordinating conservation and adaptive reuse efforts. However, these diverse conditions also offer opportunities for interventions, which will be explored in the following chapters.

Like all resource-based industrial cities, Pingdingshan faces numerous environmental challenges, particularly issues related to coal mine subsidence and gangue accumulation. According to a 2010 report by the Pingdingshan Land and Resources Bureau, the top six coal-producing mines (No. 1, 2, 5, 6, 8, 10) had 11 gangue hills scattered across them, with a total accumulated volume exceeding 1,540 cubic meters. Among the 13 coal mining sites in the urban area, 23 gangue accumulation sites covered 810 hectares, with the largest, Mine No.8, occupying 240 hectares. These sites consume vast land resources, pose serious health risks to nearby residents—leading to higher respiratory disease rates—and cause severe ecological pollution (Pingdingshan Land and Resources Bureau, 2010).

A 2015 report by the Henan Geological Survey Institute estimated that 11,363 hectares of vegetation and farmland had been damaged in the Pingdingshan mining area (Henan Geological Survey Institute 2015). This figure reflects decades of land reclamation efforts since the 1980s, including the ecological restoration of Mine No.7, completed in 2010. After 2015, global economic conditions and China's coal power energy-saving and emission reduction policies placed heavier financial burdens on coal enterprises, leaving fewer resources for environmental management.Today, after years of rehabilitation, the northern mining area has begun to take shape ecologically, laying the foundation for future urban development.

4.4.2 Cultural and Memory Challenges: Lack of Awareness, Negative Identity, and Limited Strategies

The city's historical industrial space plays a pivotal role in its cultural identity, with over three-quarters of Pingdingshan residents associating "coal mining" as the defining characteristic of their city, according to surveys by Xie (2019) and additional interviews conducted for this study. Middle and older generations, particularly those aged 41 and above, express strong connections to the coal mining industry, with 64.7% to 82.8% emphasizing its profound impact on their lives. However, for those under 40, the influence of coal mining culture is decreasing, and youth under 20 struggle to identify any defining feature of the city beyond its association with "coal mining".

Public perceptions of historical industrial space value primarily focus on emotional, historical, memory and economic aspects. Older residents tend to prioritize emotional connections, while younger individuals value interactive and artistically distinctive redevelopment projects that would be attraction. However, the city's current strategies for heritage preservation are primarily limited to superficial displays rather than integrating cultural and memory elements into the city's everyday life. Mothed such as worker-themed statues on Heping Road evoke nostalgia but fail to embed coal mining culture into the broader economic and cultural fabric of the city.

A major obstacle is the lack of awareness about the importance of historical industrial space among both government and the public, particularly younger generations. Over half of surveyed residents were

unaware of preservation efforts, with most information coming passively through television or the internet. This lack of active action has resulted in low public interest and participation.

In urban renewal projects, economic development has often been prioritized over the preservation of social and cultural values connected to historical industrial spaces. Important historical structures, like the Soviet-style gate at Mine No.1 and the *Zhugemiao* mine shaft at Mine No.2, have already been demolished. While some efforts, such as transforming Mine No.7 into a wetland park, demonstrate the potential for adaptive reuse, many sites remain poorly maintained. The loss of these spaces threatens to erase the city's collective memory and identity.

Moreover, the adaptive reuse of historical industrial spaces has been limited and uninspired. Although these sites occupy substantial urban areas and include significant historical buildings, the lack of theoretical understanding and practical strategies has hindered their transformation. The city's 2035 land use plan provides little clear guidance for their conservation or innovative reuse.

4.4.3 Summary of Challenges

Pingdingshan is facing significant challenges in addressing the future transition of its coal mining historical industrial spaces, shaped by fragmented spatial distribution and layout, severe environmental issues, generational differences in memory and cultural recognition, and limited public awareness. The characteristics of space complicates strategy and planning for transformation. The younger generations have minimal connection to the coal mining culture and memory that defines much of the city's identity.

Furthermore, today, the city's historical industrial spaces transitional efforts primarily focus on static display and ecological restoration, instead of integrating these in to the daily lives of citizens, and bring more positive effects to culture and memory. Without more diverse approaches that balance economic development with cultural preservation, Pingdingshan risks losing not only the benefits that these industrial spaces could bring, but also the culture and memories that have shaped its urban identity. Addressing these challenges requires careful planning and appropriate strategies, as well as consider both the economy and intangible cultures.

Chapter 5:
Six Strategies, Their Impacts and Case Studies

Based on the foundational research from earlier chapters, this chapter applies those findings to different types of practices, strategies and policies, conducting a categorized study of the spatial evolution and transformation of historical industrial spaces.

The transformation and evolution of historical industrial spaces show different characteristics under different driving forces. Various policies, stakeholders, users, and interests have diverse impacts on the transformation process, which leads to different cultural outcomes and influences how urban memory is preserved and displayed.

This chapter focuses on six commonly used modes and strategies for transformation of historical industrial spaces in China: 1. Urban Event Opportunity and Marketing; 2. Transformation into Cultural Facilities; 3. Ecological Restoration and Green Infrastructure; 4. Introduction of Creative and Innovative Industries; 5. Consumption and Symbolism; and 6. Integration of Living and Other Functions. These strategies are analyzed based on the extent and manner of involvement by three key forces: government, market, and social entities.

For each strategy, the chapter begins by explaining its mechanisms within the historical and classification framework established earlier. It then presents 2-3 case studies of completed projects from Chinese cities, analyzing their processes regardless of whether the outcomes were entirely successful. Each case is examined through four dimensions: spatial organization, functional repurposing, integration with urban spaces, and impact on urban culture and memory.

Notably, most successful and well-documented examples of these strategies are concentrated in economically advanced regions such as the *Pearl River Delta* and *Yangtze River Delta*, particularly in cities like Shanghai, Shenzhen, and Hangzhou. This underscores the critical role of economic capacity in determining the feasibility and success of implementing these strategies. By comparing these cases, the chapter aims to identify shared patterns and distinct differences, providing practical insights for the study of Pingdingshan City.

5.1 Government-Led and Funded: Urban Event Opportunity and Marketing

This model refers to the government-driven development strategies of large industrial sites, particularly focusing on their late-stage development. It can be categorized into two types:

Opportunities from Global Events, such as the Shanghai World Expo or the Beijing Winter Olympics. This approach is rare and primarily available to major cities with significant global influence.

City Marketing, which is often employed in cities that lack access to globally significant events or focus on promoting other historical industrial spaces after such events. Examples include the Shenzhen-Hong Kong Biennale and the Chengdu Biennale.

The primary goal of city governments using these strategies is to enhance their global image amid intense globalization, attract foreign investment and talent, stimulate economic growth, and create jobs. These methods are typical of wealthier cities with abundant resources for design, policy-making, and capital investment. Importantly, this approach can be seen as an extension of the government's role in managing a city, treating it as a product. In this context, the government acts as the main producer, while the "product" is marketed to citizens, tourists, investors, and other competing cities.

The following sections will detail the characteristics of these two strategies. However, since Opportunities from Global Events are highly specific, uncopiable and hold little relevance for medium-small industrial cities, the focus will be placed on City Marketing, which provides more practical insights for such cities.

5.1.1 Opportunities from Global Events, Culture as a Catalyst: Shougang's "Steel Memory"

A noteworthy example of this strategy is the transformation of *Beijing's Shougang Steel Plant* for the *Beijing Winter Olympics*. In 2005, *the State Council* approved the relocation plan for *Shougang*, and by 2010, the Beijing site had ceased operations. In 2011, the Beijing municipal government approved the Detailed Planning for the *New Shougang High-End Industry Comprehensive Service Zone*, aiming to redevelop the site into a globally significant industrial regeneration area, a hub for sustainable urban functions, a talent aggregation center, a post-industrial cultural and creative base, and an eco-friendly demonstration zone (Liu et al., 2014). The redevelopment plan covered approximately 10.6 million square meters but initially lacked residential development, making it difficult for the former *Shougang* enterprise to generate sufficient revenue through land sales to offset its debts.

In 2014, *Shougang* became the first national pilot project for relocating and redeveloping old industrial zones. That same year, the Beijing government introduced policies supporting the redevelopment of *Shougang*. In 2015, the *Winter Olympics Organizing Committee* selected *Shougang* as its headquarters, marking the start of a new chapter for the site, with the *Winter Olympics* serving as a catalyst for *Shougang*'s transformation. *Shougang* summarized its redevelopment approach as being driven by three key elements: major events, cultural orientation, and community integration.

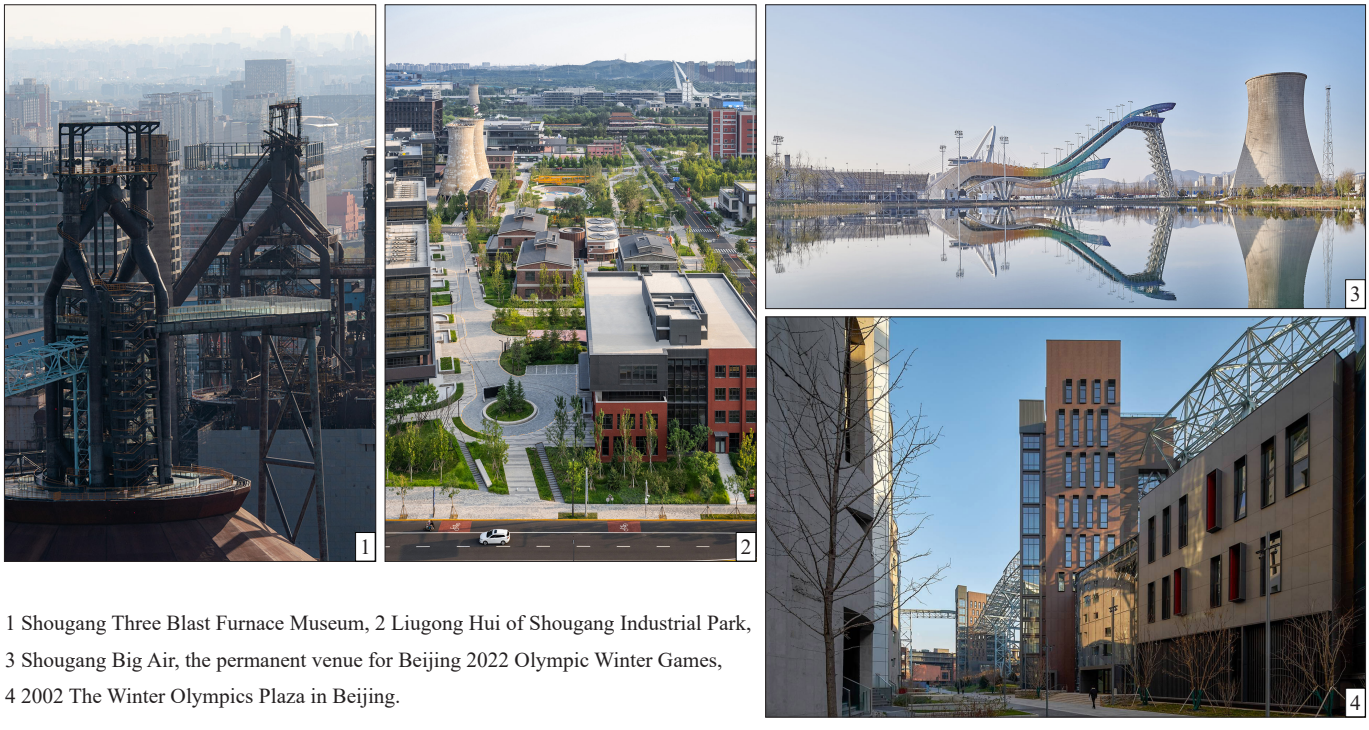
The transformation of *Shougang* into a Winter Olympics venue was not just a response to the site's deindustrialization but a proactive effort to inject new industries and foster regional renewal. National-level events such as the Olympics provided the motivation for this transformation, enhancing the site's importance in Beijing's geographic and cultural map, and showing a century-old industrial zone to the public.

Hosting the Winter Olympics at *Shougang* served multiple purposes. From a national perspective, the site's location on the suburban of Beijing made it a transportation hub between competition venues in Yanqing and Zhangjiakou, reusing the former steel industrial highway. Regionally, *Shougang*'s proximity to these areas facilitated collaboration between Beijing and its neighboring regions, promoting coordinated economic and cultural development. This collaboration supported initiatives in non-capital function redistribution, industrial park cooperation, and environmental protection, all contributing to the broader *Winter Olympics Economic Zone* strategy (Beijing Municipal Government, 2019). The repurposing of *Shougang* as a Winter Olympics sites thus aligned with both national and regional strategic objectives.

In the realm of culture, *Shougang*'s transformation highlights the use of culture as a catalyst for renewal. The *"Ten-Mile Steel City"* industrial landscape embodies diverse meanings: for steelworkers, it is a collective memory and a sense of home; for Beijing residents, a site of industrial curiosity; for China's steel industry, a symbol of self-reliance; and for international visitors, a resonant example of post-industrial regeneration. This "steel memory" forms the site's unique cultural essence, serving as the core of its external cultural identity.

Shougang's cultural transformation into a phenomenon-level cultural consumption symbol is exemplified by the *No.3 Blast Furnace Museum*. This monumental structure integrates multiple narratives: the visual culture of steel production, the collective memory of the *Shougang* community, and the experiential culture of industrial heritage within the urban landscape. Stretching hundreds of meters, it stands as a unique industrial landmark in Beijing.

The transformation, driven by the Winter Olympics, showcases how global events can catalyze urban renewal. While medium-small industrial cities like Pingdingshan lack comparable opportunities, *Shougang*'s innovative approach to cultural and industrial heritage provides valuable lessons for fostering urban identity and cultural regeneration.



1 Shougang Three Blast Furnace Museum, 2 Liugong Hui of Shougang Industrial Park,
3 Shougang Big Air, the permanent venue for Beijing 2022 Olympic Winter Games,
4 2002 The Winter Olympics Plaza in Beijing.

Figure 5.1-1, Photos of *New Shougang*. Source: 1, 2 and 4, CCTN Design. 3, Architectual Design and Research Institute of Tsinghua University.

5.1.2 Urban Marketing

In the process of globalization, technological advancements have increased mobility, granting circulating capital and talent greater dominance. Intensified competition among cities for global resources has given rise to "urban marketing." City governments prioritize enhancing their city's international image, attracting capital and talent, stimulating economic growth, and creating jobs, making urban marketing a key competitive strategy (Tang and Chen, 2006). Importantly, urban marketing treats the city as a product led by public authorities, with residents, tourists, investors, and external cities as its "consumers". Applying urban marketing strategies to long-declined industrial areas is a pragmatic choice. Limited investment within a short period introduces "events" or "themes" into historical industrial spaces, constructing a new urban image while experimenting with new functions. This approach integrates short-term event marketing with long-term area transformation, driven by external and internal motivations.

Economically, such strategies aim to rapidly transform outdated industrial buildings and districts that hinder urban development. By revitalizing a single historical industrial space, city managers promote the broader revitalization of surrounding areas. Flagship projects improve local infrastructure, raise land values, attract investment, and instill confidence in long-term development. These projects also align with urban cultural development goals by preserving and integrating historical spaces, stimulating cultural industries, tourism, and related services (Jiang, Xiao and Li, 2023).

For the purposes of this thesis, the most significant aspect is that such approaches to building local culture foster social solidarity, civic pride, and loyalty to place (Harvey, 1989). When viewed through the lens of urban memory, these concepts are integral to the city's collective sense of identity and recognition.

5.1.3 Case Studies

5.1.3.1 Shenzhen, 2022 Bi-City Biennale of Shenzhen and Hong Kong

Shenzhen, a young special economic city with a history of only about 40 years, has undergone a significant industrial transformation over the past two decades, transitioning from a *"processing trade hub"* to a *"City of Design."* The *Bi-City Biennale of Shenzhen and Hong Kong (UABB)* has reached its ninth edition, reflecting this evolution. From its inaugural edition in 2005, themed *"City, Open Door!"*, through *"City of Expiration and Regeneration"* (2007), *"City Mobilization"* (2009), *"Architecture creates cities. Cities create architecture."* (2011), *"Urban Border"* (2013), *"Re-Living the City"* (2015), *"Cities, Grow in Difference"* (2017), *"Urban Interaction"* (2019), to the latest 2022 theme *"Urban Cosmologies"*, the focus of the Biennale has gradually shifted. It began with an emphasis on urban construction and development, progressed to exploring urban life and creativity, and now highlights urban culture and co-existence. The 2022 theme, *"Urban Cosmologies"*, reflects a vision that integrates spatial diversity and temporal rhythms, embodying both a forward-looking cosmological perspective and the traditional wisdom of Chinese civilization. It portrays a "living city" as a symbiotic space, part of the "community of life between humans and nature."

Since its inception in 2005, the *Bi-City Biennale* has actively engaged in the adaptive reuse of historical industrial spaces, and the 2022 edition was no exception. The main exhibition venue was located at the former *Kingway Brewery* site in Shenzhen. This transformation was led by the architectural studio *URBANUS*, which spearheaded the planning and redesign of the brewery's revitalization, turning it into both the exhibition space for the Biennale and the *"No.0 Exhibit"* of the event itself.

Located in *Luohu* District, one of Shenzhen's earliest developed areas, *Kingway Brewery* holds a special place in the collective memory of Shenzhen residents. The brewery accompanied the city's first wave of builders, who came from all over China to pursue dreams in the forefront of China's *reform and opening-up*. As Shenzhen transitioned from "made in Shenzhen" to "intelligent manufactured in Shenzhen" and underwent large-scale urban renewal, most of the brewery was demolished. However, the remaining industrial heritage, covering approximately 11,600 square meters, stands as a vital imprint of Shenzhen's history, encapsulating its struggles, achievements, and entrepreneurial spirit.

According to *URBANUS*'s designers Meng Yan (2023), *"We believe that the preservation and transformation of industrial heritage can reshape a place and a spirit. Industrial heritage should not merely become a mass-consumed product of the post-industrial era. Its condensed urban memory should be uncovered, highlighted, and amplified, regaining vitality through the continuous creation of new ideas and possibilities for the future."* With this vision, the team proposed the theme of "On-site Manufacturing", aiming to retain the site's architectural aesthetic value and the memory of its era while transforming it into a showcase of urban spirit.

On December 10, 2022, the ninth edition of the *Bi-City Biennale* opened at the renovated *Kingway Brewery*. The exhibition space itself became the Biennale's *"No.0 Exhibit."* With Shenzhen's city center shifting westward, *Luohu* District, primarily dominated by commercial services, seeks new avenues for growth. The organizers and designers hope that the adaptive reuse of this industrial heritage will not only preserve the city's memory but also transform the factory area into a cultural and artistic landmark, fostering a vibrant, multifaceted urban community.

1 South aerial view of renovated Kingway Brewery, the site of 2022 Bi-City Biennale of Shenzhen and Hong Kong.

2 After the Bi-City Biennale, some factory buildings were used as museums. 3 The building reused as a beer bar.

4 Some industrial structures were used as exhibition venues for the Bi-City Biennale and later repurposed as public activity spaces for the nearby community.

5 Site plan, it is evident that the Kingway Brewery site is located in a residential area with well-developed living facilities.

Figure 5.1-2, Photos and Map of 2022 Bi-City Biennale of Shenzhen and Hong Kong. Source: Right Angle Image, TAL, Zhang Chao, URBANUS.

5.1.3.2 Chengdu, 2011 Chengdu Biennale

The 2011 Chengdu Biennale marked a significant starting point for the adaptive reuse of historical industrial spaces in Chengdu, an inland city shaped by the *Third Front Construction*. Held from September 29 to October 30, 2011, the event took place at the *Chengdu Museum of Industrial Civilization* and the *Eastern Suburb Memory Music Park*, under the auspices of the Chengdu Municipal Government. The Biennale aimed to establish Chengdu's cultural brand, enhance its cultural influence and competitiveness, and represented a milestone in Chengdu's exploration of its *"Modern Garden City"* development model.

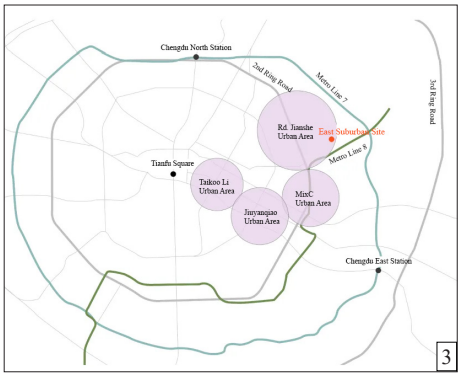
The 2011 Chengdu Biennale was hosted in two distinct venues, both in East Suburban area:

The Chengdu Museum of Industrial Civilization: Transformed in 2005, this site preserved an extensive collection of industrial heritage, including large-span trusses, rail tracks and trains, machine tools, and factory buildings. Before the Biennale, it had already been transformed into a professional exhibition space with clear functional zoning, making it highly suitable for hosting large-scale exhibitions.

The Eastern Suburb Memory Music Park: This site, not far from the museum, was repurposed from the former *Hongguang Electronics Tube Factory* into a creative industry park. The Biennale's opening ceremony coincided with the grand opening of the music park, showcasing careful planning and synergy between art and space.

Reflecting on the *2011 Chengdu Biennale*, focusing solely on the introduction of art exhibitions in the industrial museum or the physical development of cultural and creative spaces within the music park does not fully capture the event's impact. This Biennale was a well-orchestrated example of urban marketing. The scale of the event speaks volumes: it featured over 200 artists from more than 20 countries and attracted 280,000 visitors (Zhao, 2011), setting records for attendance and participation in the history of the *Chengdu Biennale*.

From a citywide perspective, the Biennale not only established cultural landmarks but also spurred the spatial transformation of Chengdu's old industrial eastern district. This transformation radiated outward from the two repurposed industrial sites along two primary spatial axes: The *Shahe River Waterfront*: Public space development along the riverfront revitalized the area into an engaging urban landscape. The *Chengdu Second Ring Road Corridor*: Urban development along this corridor, adjacent to the industrial district, was energized by the event. Ultimately, the *2011 Chengdu Biennale* leveraged cultural heritage, creative reuse, and urban marketing to achieve more than artistic display. It fostered urban renewal, reinvigorated the city's industrial legacy, and underscored the potential of integrating cultural events with industrial history to enhance city branding and competitiveness.



1 and 2, Photos of the site in East Suburban area. 2 The location of the site in Chengdu City.

Figure 5.1-3, Photos and Map of 2011 Chengdu Biennale Site. Source: 1 and 2, *Chengdu Business Daily.* 3 Drawn by author.

5.1.4 Spatial Features

Based on the case studies introduced earlier and a summary of similar "urban marketing"-oriented art exhibitions in China over the years—such as the *Hangzhou China Academy of Painting Biennale*, the *Beijing International Art Biennale*, and the *Shanghai West Bund Biennale*—we can identify some shared spatial features among these events.

Beyond the shared use of historical industrial spaces, a key commonality is their location in large-scale or elongated, non-central, but concentrated industrial zones repurposed into exhibition sites. These sites are typically situated within what were once expansive industrial areas of the city. For instance, the main venue for the *2022 Shenzhen-Hong Kong Biennale* was the *Kingway Brewery*, which itself forms part of an industrial belt nearly a kilometer long. Similarly, the *2013 Shenzhen-Hong Kong Biennale* utilized factory and warehouse spaces in an industrial belt stretching 2.1 kilometers. The *2011 Chengdu Biennale*, on the other hand, took place far from the city center in the *Chengdu Industrial Civilization Museum*. This museum was repurposed from a cluster of interconnected industrial buildings in the eastern suburbs, an area that once served as Chengdu's largest industrial zone. As previously discussed in the "Suburban Industrial Areas" section, which has been redeveloped into a large-scale cultural facility and park.

These examples suggest a shared spatial strategy: multiple times in different places, or multi-center layout (with at least two venues, often expanding to additional sites in subsequent years) and large-scale, area-based development. Such spatial settings ensure sufficient scale to accommodate the demands of festival-style urban marketing, providing a unique experience for each event, and to reinforce the impact of these cultural events. It also reinforces the long-term role of these events in the city's historical industrial spaces and the city's new culture.

5.1.5 Urban Marketing as a Transition and Its Subsequent Cultural Impacts

As a major method of urban marketing, art exhibitions in China's first- and second-tier cities serve dual purposes: cultural production and strategic urban development. These events focus on creating, disseminating, and consuming cultural ideas while utilizing industrial historical sites as cost-effective venues. Unlike large-scale global events like the Olympics or World Expo, regional exhibitions demonstrate autonomy and leverage historical industrial spaces as valuable cultural resources embedded in collective memory (Dong and Hou, 2012).

Art exhibitions reawaken urban memory by highlighting the cultural and historical significance of industrial sites. Locations like the *Chengdu Redlight Electronics Factory* and *Shenzhen Kingway Brewery* evoke memories of past industrial pride. By hosting exhibitions in these spaces, organizers bridge the industrial past with an evolving cultural identity, enhancing civic pride and a sense of belonging. These exhibitions also serve transitional purposes, preparing industrial buildings for adaptive reuse in cultural and community functions. Temporary events introduce new narratives to these spaces, redefining them as hybrids of "historical industrial space" and "exhibition venue." This layering of memories transforms once-obsolete spaces into symbols of cultural renewal.

From a cultural perspective, exhibitions and historical industrial spaces mutually reinforce each other. Exhibitions highlight the artistic and historical value of historical industrial spaces, while the unique atmosphere of these spaces enhances exhibition appeal. This interplay fosters public appreciation of historical industrial spaces as part of the city's living memory and identity. Art exhibitions reshape public

perceptions by integrating interactive, egalitarian relationships into these spaces, revitalizing regions historically tied to industrial production.

Ultimately, sustaining the cultural impact of exhibitions requires strong urban cultural ecosystems. Major cities with robust economies and vibrant cultural environments capitalize better on the momentum of these events. While exhibitions activate industrial spaces and reshape their image, continued cultural investment is important to preserving historical industrial spaces as a vital part of urban identity and collective memory (Feng, 2008). More importantly, these exhibitions ensure that historical industrial spaces does not fade into oblivion but remains a vital part of the city's evolving identity and collective memory. If long-term, continuous investment in these urban events can be ensured, along with their sustainable operation, it means that urban culture, historical industrial spaces, and city events can support and interact with each other. This would play a crucial role in shaping a new urban culture while preserving and inheriting the city's industrial culture and memory.

5.1.6 Implications for Medium-Small Industrial Cities

As mentioned, we must acknowledge that in first- and second-tier cities, where such exhibitions are financially feasible, industrial memory often constitutes only a small fraction of the broader urban memory, identity, and cultural fabric. These cities have access to a wider range of resources and strategies, even the best in the country, for addressing issues of memory and cultural identity. Urban event and marketing like art exhibitions in historical industrial spaces contribute to layering new memories onto these spaces, they simultaneously help preserve and extend existing memories. For the large population of migrants in these cities, like Beijing, Shanghai and Shenzhen, the exhibitions often foster a sense of "participation and belonging" to the modern new urban culture, more than their connection to historical industrial spaces and the industrial culture and collective memories in older worker generation.

However, at the same time, this model of utilizing urban event or marketing like art exhibitions for historical industrial spaces' transformation may not suit medium-small industrial cities very well. As we know, unlike major cities with strong fiscal revenue, political power, and cultural resources, medium-small industrial cities are often third-or-forth-tier cities, lacking the financial capacity and cultural ecosystem to host such large-scale events, and similarly struggle to sustain their long-term successful operation. These cities also lack sufficient appeal to attract enough artists and tourists—their attractiveness is often limited to the provincial level. Even some second-tier cities, such as Zhengzhou, face similar challenges, as evidenced by attempts to organize such events.

For these cities, industrial memory typically plays a more dominant role in shaping urban identity, and their resources are often insufficient for the type of artistic and cultural experimentation seen in larger cities. However, what can be learned from these cases is that medium-small industrial cities might explore scaled-down, localized versions of cultural events, aligned with their economic and social contexts, to achieve similar revitalization effects and foster community engagement.

5.2 Government-Led and Funded: Transformation into Cultural Facilities

Public cultural facilities are a vital part of urban spaces, including libraries, museums, art galleries, theaters, children's palaces, and workers' cultural palaces. These facilities serve as spaces for large-scale cultural activities and important venues for residents' daily leisure and entertainment (Lyu et al., 2012). Moreover, public cultural facilities are considered "public goods" or "public services" shared by the entire society. Their provision cannot be achieved through market competition alone, which makes it a key responsibility of city governments to ensure their adequate supply.

In the **Transformation into Cultural Facilities** model, the repurposing of historical industrial spaces into cultural facilities is predominantly government-led (or fully controlled). This approach follows a top-down process, with policies leading the transformation efforts. It reflects a structured and policy-driven way to manage and adapt urban industrial spaces for cultural purposes, demonstrating the government's critical role in such urban development strategies.

5.2.1 Government-Led, Cultural Facilities as "Point-to-Surface" Strategies

Cities often repurpose historical industrial spaces into cultural facilities to address three main needs:

1. Supporting Comprehensive Urban Development: Reusing historical industrial spaces into public cultural facilities aligns with China's unique urban development context. Over decades, with significant urban growth, city managers have used large-scale, centralized, and clustered projects to meet the expanding cultural needs of residents in many cities. However, focus on historical industrial spaces is recent, driven by urban expansion into industrial zones in city's edge and the need to address imbalanced urban development. City managers often aim to upgrade old industrial areas in the city's edge. This approach stimulates development by improving infrastructure.

2. Quickly Transforming City's Image: While investments by governments in infrastructure in old industrial areas are large, they often lack quick recognition and fail to alter public impressions of these areas swiftly. Changing large, iconic historical industrial buildings into cultural facilities meets the this need. Such projects are highly visible, capable of reshaping public impressions of entire areas (Jiang, Xiao and Li, 2023). As concentrated hubs for urban cultural activities, cultural facilities have distinctive functions, serving both the local people's cultural needs and as landmarks. This transformation helps redirect the narrative of industrial memory from the "pain of deindustrialization" to a "source of pride in industrial culture."

3. Economic Stimulus: Beyond fulfilling public service obligations, cultural facilities also act as economic drivers. As cities transition and renewal, the tertiary sector increasingly influences urbanization, culture playing a critical role in economic growth. City planners have shifted the ideas from passively providing cultural facilities to actively using them as pillars for cultural industry development (Peng, 2000). This strategy, learnt from the old industrial cities in the UK (Dong and Dai, 2007), uses culture as an economic tool to create jobs, revive old industrial areas, and address industrial decline (Li, 2009).

In the process of practice, city governments take the lead in reshaping the industrial spaces, leveraging their ownership over these assets. Through existing property rights frameworks, governments reclaim allocated land without compensation and provide industrial enterprises for operational rights. This makes the city government as the "super manager" of these industrial spaces, enabling it to use these government-led "points" to drive broader urban development in surrounding areas—the "surface."

5.2.2 Case Studies

5.2.2.1 Shanghai, Power Station of Art

As a key project following the *2010 Shanghai World Expo*, the *Power Station of Art* was transformed from the *Expo's Pavilion of Future* into China's first state-owned contemporary art museum. Originally established in 1897 as the *Nanshi Electric Light Plant* by the *Shanghai Municipal Engineering Bureau* to supply power for 30 streetlights along the *Huangpu River*, it evolved over the decades into the *Nanshi Power Station* in 1955. The facility witnessed Shanghai's industrial transformations for over a century (Huang, 2008). After a comprehensive renovation, this historic power station has been reborn as a vibrant cultural and artistic platform.

The *Nanshi Power Station* concluded its industrial mission in a historic narrative, transitioning from a cultural and artistic hub. Its transformation reshaped Shanghai's art landscape, complementing the *Shanghai Museum*'s ancient art collection and the *China Art Palace*'s modern art exhibitions, creating a comprehensive artistic network in the city. The design approach emphasized minimal intervention, preserving the building's external form and internal order while showcasing its industrial relics. The deliberate retention of time marks highlighted the coexistence of old and new, blending seamlessly into the city's cultural life. Its extended spatial design blurred the boundaries between public and exhibition spaces, fostering dynamic interactions and integrating everyday urban life with artistic experiences (TJAD, 2012).

The 165-meter-high chimney, once repurposed as a giant thermometer during the Expo, now stands as a landmark symbol of industrial heritage and art. Positioned on the *Huangpu River*'s edge, it serves as the visual anchor and a testament to the *"Power of Art,"* underscoring the symbolic significance of industrial structures.The *Power Station of Art*'s establishment aligns with the ongoing transformation of the *Huangpu River*'s southwest industrial belt. Beyond its individual redevelopment, it represents the broader shift of Shanghai's old urban and riverfront industrial zones into multifunctional public spaces and open areas. Over the past decade, this transformation has redefined the *Huangpu Riverfront*, turning former industrial sites into integrated riverside public buildings and open space systems.

Figure 5.2-1, Maps and Photos of Power Station of Art.

1, Nanshi Electric Plant in 1935. 2, Nanshi Electric Plant in 1985. 3, Power Station of Art. 4, Location of Huangpu River's industrial belt and Art & Musuem Cluster. 5, Master plan of the Art & Musuem area.

Source: 1, 2 and 3, Website of PSA, https://www.powerstationofart.com/about-psa. 4, drawn by author, based on OSM. 5, Tang Z and Jin X, From Expo Pavilions to the Model of the Urban Transformation[J], *Shanghai Urban Planning Review*, 2012(01):77-82.

5.2.2.2 Hangzhou, Arts and Crafts Museums Group

The Hangzhou *Arts and Crafts Museums Group* is a cultural tourism project that combines a cluster of cultural buildings with industrial heritage. The complex includes four museums: the Hangzhou *Arts and Crafts Museum*, the *China Knives, Scissors, and Swords Museum*, the *China Umbrella Museum*, and the *China Fan Museum*. Located near the *Gongshu* segment of the *Grand Canal*, these museums are part of Hangzhou's *Grand Canal Museum Cluster*.

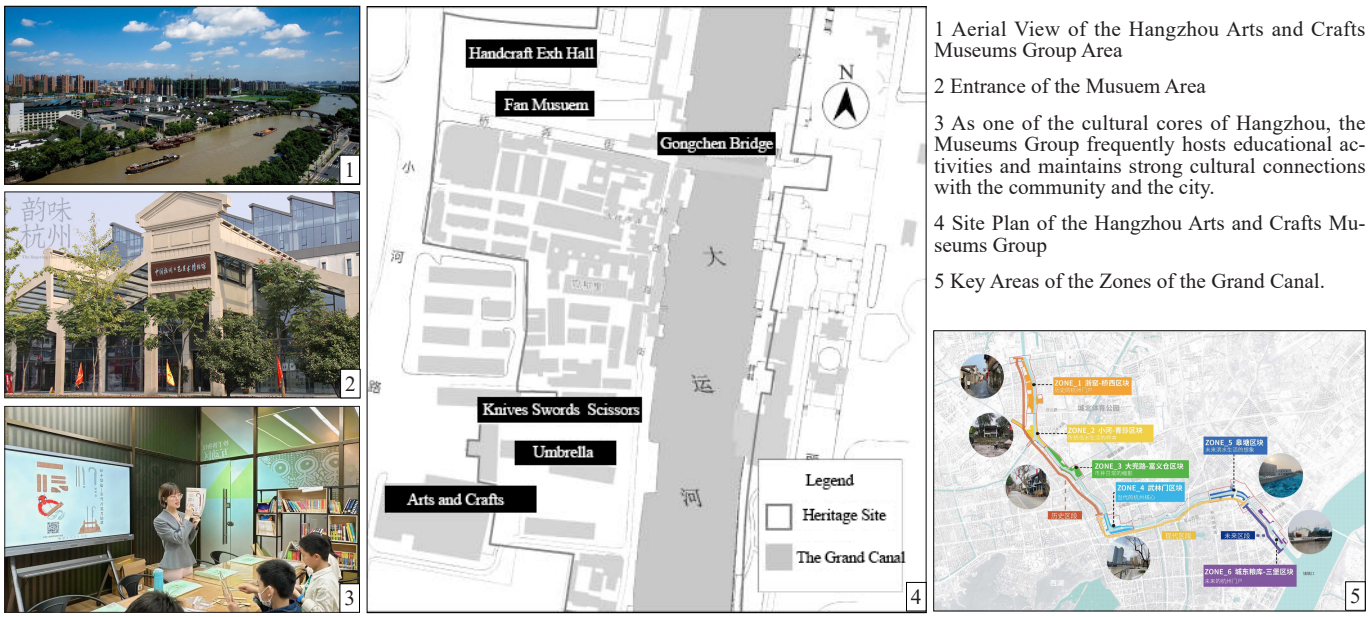
Each museum is housed in repurposed industrial spaces: the *China Fan Museum* occupies the former factory of Hangzhou *No.1 Cotton Mill*, the *China Knives, Scissors, and Swords Museum*, and the *China Umbrella Museum* are located in the former Zhejiang *Native Products Warehouse*, and the Hangzhou *Arts and Crafts Museum* occupies the former *Honglei Silk Weaving Factory*. These museums celebrate and preserve traditional craftsmanship such as making scissors, fans, and umbrellas, which have deep roots in Hangzhou's industrial and artisanal history. By showcasing these crafts, the museums connect traditional handcrafting techniques with modern industrial heritage, fulfilling both preservation and public exhibition purposes.

The *Gongshu* segment along the *Grand Canal*, once an important industrial zone on the suburban of Hangzhou, was home to numerous state-owned enterprises like the *Hangzhou Dahang Shipyard*, *Honglei Silk Weaving Factory*, Hangzhou *No.1 Cotton Mill*, Zhejiang *Hemp Textile Mill*, and *Changzheng Chemical Plant*. These enterprises not only shaped Hangzhou's industrial history but also bore witness to the development of modern canal-based industries. With the city expanding and industries shifting focus, Hangzhou's government has prioritized the ecological restoration of the canal and the transformation of surrounding industrial areas under the "retreating secondary industries and advancing tertiary industries" policy. This shift has left behind industrial buildings with significant historical value, creating a focal point for the *Grand Canal*'s comprehensive regeneration (Zhang, Shen and Wu, 2015).

By preserving and reusing industrial heritage, *Arts and Crafts Museums* use Hangzhou's artisanal traditions to showcase its craft-making legacy. The project bridges historical industrial spaces and cultural exhibition spaces, filling the gap for a national-level canal industry museum while preserving and showcasing the industrial and historical significance of the *Grand Canal*. It provides a concentrated, multifaceted view of Hangzhou's evolution as a city of crafts.

The city's government planning documents—*Hangzhou General Plan*, *Historical and Cultural City Protection Plan*, *Relocation Plan for Industrial Enterprises in Hangzhou's Main Urban Area*, *Reuse Plan for Industrial Buildings Along Hangzhou's Grand Canal*, and *Gongshu District Development Strategy*—reflect the city's layered objectives in this area. Short-term goals focus on integrating traditional canal culture with nearby museums and historical streets, supporting Hangzhou's efforts for the *Grand Canal*'s World Heritage designation. Mid-term goals aim to combine cultural spaces with the cultural tourism industry to strengthen Hangzhou's branding as a tourist destination. Long-term goals emphasize enhancing *Gongshu* District's waterfront public spaces, revitalizing old industrial areas, and fostering sustainable urban renewal (Ye, 2008).

This project demonstrates a holistic approach to industrial heritage preservation, integrating history, culture, and tourism in the broader spatial transformation of Hangzhou.



1 Aerial View of the Hangzhou Arts and Crafts Museums Group Area

2 Entrance of the Musuem Area

3 As one of the cultural cores of Hangzhou, the Museums Group frequently hosts educational activities and maintains strong cultural connections with the community and the city.

4 Site Plan of the Hangzhou Arts and Crafts Museums Group

5 Key Areas of the Zones of the Grand Canal.

Figure 5.2-2, Maps and Photos of Hangzhou Arts and Crafts Museums Group. Source: 1,2 and 3, Official Website of the Arts and Crafts Museums Group, https://www.hzacm.cn/. 4, 5, base map from Atelier Liu Yuyang Architects, edited by author.

5.2.2.3 Chongqing, Industrial Culture Expo Park and Museum

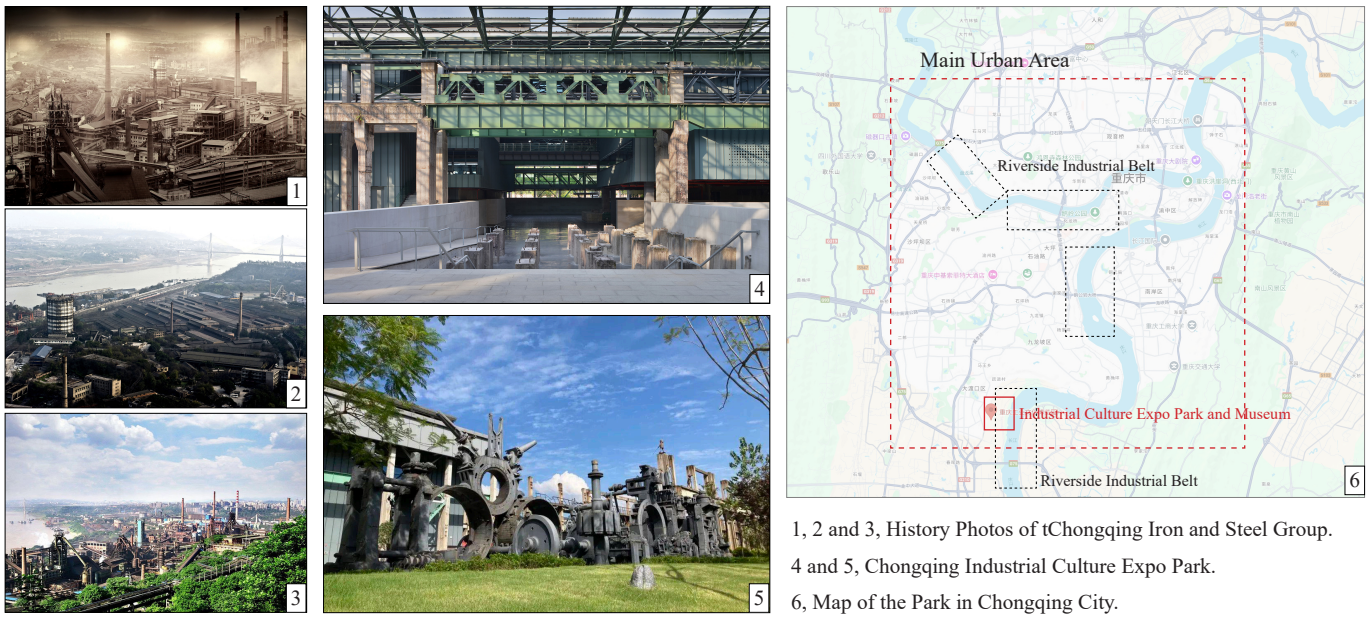
The *Chongqing Industrial Culture Expo Park* is a cultural and tourism area themed industrial heritage. Located in Chongqing's *Dadukou* District, the park occupies the former main factory site of the *Chongqing Iron and Steel Group*. Its origins trace back to 1938 during the Anti-Japanese War, when *Hanyang Steel Plant* and *Shanghai Steel Works* were relocated to suburban of Chongqing (then *Ba* County, Sichuan Province). These factories played a pivotal role in China's wartime steel and military industries. In 2007, responding to Chongqing's call to improve the urban environment, the *Chongqing Iron and Steel Group* relocated to a new eco-friendly plant in *Changshou* District (Xu, 2012).

In 2010, leveraging the relocation of the steel factory, the Chongqing Municipal Government initiated the development of the *Industrial Culture Expo Park*, aiming to preserve industrial heritage and enrich the city's cultural identity.

Chongqing, as a representative industrial city, has made significant contributions to China's industrialization. The *Industrial Culture Expo Park*, as a key project in the city's industrial transformation, encapsulates over a century of Chongqing's industrial history since the city's opening as a treaty port in 1891. It celebrates Chongqing's rich steel industry legacy and its associated social and industrial history.

At the heart of the park is the *Industrial Culture Museum*, repurposed from existing factory structures. Iconic industrial elements such as smokestacks, blast furnaces, and workshops have been preserved, showcasing treasures like an 8,000-horsepower steam engine and large forging equipment. Exhibits also include motorcycles, automobiles, and military equipment produced in Chongqing since the founding of the PRC. The park features creatively adapted outdoor spaces, including an industrial relic park and a railway plaza, with industrial equipment transformed into sculptures and landscapes. The project also includes themed hotels highlighting industrial cultural elements (Liu and Yang, 2014).

In 2023, the *Chongqing Industrial Culture Expo Park* was designated a National Industrial Tourism Demonstration Base by China's Ministry of Culture and Tourism, highlighting its role as a model for industrial tourism.



1, 2 and 3, History Photos of tChongqing Iron and Steel Group.
4 and 5, Chongqing Industrial Culture Expo Park.
6, Map of the Park in Chongqing City.

Figure 5.2-3, Map and Photos of Industrial Culture Expo Park and Museum. Source: 1, 2, 3, 4 and 5, WallaceLiu and Etienne Clement. 6, drawn by author.

Unlike projects such as Shanghai *Power Station of Art*, which integrate new cultural elements, the *Chongqing Industrial Culture Expo Park* focuses on preserving and celebrating industrial memory. It allows visitors to reflect on over 130 years of Chongqing's industrial development, highlighting the perseverance and resilience of the working class. Beyond serving as a museum, urban park, and tourist destination, the park fulfills an educational role, reinforcing historical awareness and cultural pride.

5.2.3 Strategies for Spaces

The strategies for spaces in the three preceding cases illustrate different approaches, shaped not only by their unique cultural positioning but also by the spatial characteristics and constraints of the historical industrial spaces themselves.

In the Shanghai case, the focus is on transforming the industrial site into a landmark urban public cultural and art center. This strategy prioritizes the centrality and symbolism of individual buildings over holistic preservation. While heritage protection typically aims for comprehensive planning to retain authenticity—incorporating docks, auxiliary offices, and storage spaces into the broader landscape design—Shanghai's strategy emphasized the iconic status of the main power plant building and its chimneys (Tang and Jin, 2012). Other ancillary spaces and structures were cleared to reinforce the primary structure's centrality. At the urban level, the area's spatial design was oriented around this cultural landmark. Guidelines such as controlling building heights, fragmenting block arrangements, reorienting spatial axes, continuous open spaces, and central plazas of the park, all focus on the *Power Station of Art*'s role as the area's focal point (Huang, 2018).

Conversely, the Hangzhou case adopts a decentralized, clustered spatial strategy despite the larger number of museums and a more extensive range of exhibits. The *Gongchen Bridge West* area, representing a blend of industrial, local commercial, and vernacular culture, features historical industrial spaces interwoven into the dense urban fabric. This dispersed, smaller-scale layout ensures integration into the historical street network and continuity of the urban landscape. Additionally, smaller cultural facilities embedded in the historic district may hinder the "landmark" quality of individual museums but allow for more distinct

functional themes (Huang, 2018). The preserved historical industrial spaces, such as the *Tongyi Cotton Mill*, *Honglei Silk Weaving Factory*, and warehouses, have modest scales, making it easier to craft diverse public activity spaces along the waterfront, reinforcing the collective identity of Hangzhou's urban spaces along the canal.

In the *Chongqing Industrial Culture Expo Park* case, the transformation centers on an industrial culture museum, built around the steel plant's remaining buildings and structures. The museum project is part of a broader renewal plan for the old steel plant, which preserves most of the original industrial structures. The steel plant, once a key heavy industry site, was initially located far from Chongqing's urban core, though urban expansion has since reached the area. The site maintains strong spatial cohesiveness due to the rigorous and complex production flows inherent in steel industry. After renovation, the area functions as an "industrial theme park," integrating culture, tourism, and commerce (Han and Yan, 2021). This approach revitalizes the district by leveraging cultural tourism to stimulate commercial growth, breathing new life into the space. Such a cohesive strategy unveils the mystique of the steel plant to residents and visitors alike, establishing the site as a distinctive industrial tourism destination.

The Shanghai case demonstrates a centralized spatial layout, aligning with the original characteristics of its historical industrial buildings. The grand scale and efficient spatial organization are well-suited for the requirements of museum exhibitions. However, this approach has a notable drawback: its large-scale spaces struggle to foster a sense of livability. In contrast, the *Hangzhou Arts and Crafts Museums* utilized the dispersed nature of historical industrial buildings, selectively expanding certain structures while preserving the original community fabric. The integration of elevated walkways and open management significantly enhances the accessibility of the dispersed museum units. This strategy not only caters to external visitors but also provides local residents with abundant outdoor spaces for daily leisure. Additionally, small-scale commercial spaces along the streets fulfill the day-to-day functional needs of cultural facilities (Huang, 2018). In comparison, the *Chongqing Industrial Culture Expo Par*k operates as a large-scale "industrial culture theme park," where its self-contained design alleviates concerns about its connection to the broader urban fabric.

It is important to note that iconic large-scale historical industrial buildings often derive their significance from their monumental size, location, and ornamentation. However, with uneven urban development, not all large-scale industrial buildings receive the opportunity for revitalization. In many Chinese cities, particularly in inland or smaller industrial cities, these buildings are often repurposed for their "land economic" value rather than for their cultural heritage. Conversely, smaller, dispersed industrial buildings have shown more potential for adaptive reuse, as exemplified by the Hangzhou case.

In the *Hangzhou Arts and Crafts Museums*, the dispersed buildings were consolidated into a cohesive complex. Although the warehouses varied in construction era, materials, methods, and scale, selective architectural interventions connected these spaces. This approach is particularly instructive for numerous historical industrial spaces across China, especially in medium and small industrial cities. Here, the "layered chronology" of industrial buildings is often prominent. Covering and integrating these diverse elements emerges as a practical and effective strategy to create a cohesive and iconic spatial identity.

5.2.4 Fostering Urban Cultural Regeneration

For the majority of China's historical industrial spaces, urban spatial transformation is a gradual process that cannot be accomplished overnight. It requires the successful transformation of individual micro-spaces as foundational elements. Among these, leveraging the construction of cultural facilities to establish new identities for industrial spaces and reshape local identity is a critical step. Particularly for urban industrial zones undergoing transformation, the role and significance of public cultural facilities in driving this change are undeniable.

As demonstrated in the case studies, this approach is typically government-led, with regional development serving as the primary driver, and guided by an overarching cultural strategy. While all three cases represent public cultural facilities, each emphasizes a distinct cultural orientation tailored to its regional cultural goals. From these examples, three cultural approaches can be identified: **additive**, **traditional**, and **continuative**, corresponding respectively to the *Shanghai Power Station of Art*, the *Hangzhou Arts and Crafts Museums*, and the *Chongqing Industrial Culture Expo Park*.

In the case of Shanghai, the *Power Station of Art*, situated in the *Urban Best Practices Area*, transitioned from its World Expo exhibition role into a cultural-creative district. This area now integrates multiple objectives, including fostering creative industries, preserving Expo cultural heritage, and promoting low-carbon ecological development. Within this transformation, the *Power Station of Art* has become the public core of this creative cluster and the cultural "heart" of the district, driving its cultural renewal (Tang and Jin, 2012).

For Hangzhou case, the *Arts and Crafts Museums* are anchored in the overarching objective of the *Grand Canal*'s UNESCO World Heritage inscription. The cultural displays focus on showcasing traditional craftsmanship related to the canal's history, such as Hangzhou's renowned traditional brands: *Zhang Xiaoquan Scissors*, *Wang Xingji Fans*, and *West Lake Silk Umbrellas*. Unlike the original industrial identity tied to the textile mills, this approach highlights traditional craftsmanship and integrates these displays with the preservation and development of nearby historic neighborhoods. The museums are tightly interwoven with *Gongshu* District's cultural tourism strategy, enhancing the canal's cultural functions (Zhang, 2015).

In Chongqing case, the focus is on the city's modern historical industrial spaces, particularly steel and defense industries. The transformation of the *Chongqing Steel Plant* into the *Industrial Culture Expo Park* prioritizes preserving and showcasing Chongqing's industrial culture. Unlike the previous cases, this approach emphasizes the site's original industrial character, narrating the rich history of steel production and its societal impacts. By doing so, it preserves a cultural symbol deeply embedded in local memory—an indelible mark for older generations and a bridge to future generations. This initiative keeps the city's cultural identity and provides a tangible narrative of Chongqing's development, illustrating human ingenuity and resilience in shaping history.

These examples highlight diverse strategies for integrating historical industrial spaces into cultural regeneration, ensuring their continued relevance while adapting to contemporary needs. Each approach underscores the role of historical industrial spaces in fostering urban identity, cultural pride, and collective memory.

5.2.5 Implications for Medium-Small Industrial Cities

It is important to note that before analysis, similar to the "Urban Event Opportunity and Marketing" model, the transformation of historical industrial spaces into cultural facilities requires substantial government funding, robust execution, and strong project management capabilities. Unfortunately, these are resources and capacities that many medium-small industrial cities in China lack. Based on statistics gathered from China's commonly used architectural and urban design case websites, as well as publicly available government documents, it can be observed that nearly 95% of successful and outstanding "Transformation into Cultural Facilities" cases come from China's first-tier cities, such as Beijing, Shanghai, Shenzhen and Hangzhou. Among these, projects from Beijing and Shanghai alone account for over 70%.

This type of large-scale transformation of historical industrial spaces remains a challenging endeavor for medium-small industrial cities in China, which have a long way to go in replicating such practices. Nevertheless, this model can still provide valuable insights and lessons for these cities, offering potential strategies for smaller-scale or context-specific adaptations of this approach.

We have observed three distinct approaches to repurposing industrial buildings into cultural facilities: the Shanghai case, which enhances the creative appeal of cultural sites by repurposing industrial buildings; the Hangzhou case, which enriches the cultural memory of the space by reinterpreting historical industrial spaces; and the Chongqing case, which preserves the historical industrial spaces to keep its cultural significance. Ultimately, all three cases illustrate that through top-down government leadership, accurate evaluation of historical industrial spaces value, effective functional replacement, and appropriately designed new spatial identities, cultural facilities can significantly enhance regional recognition (Huang, 2018).

These efforts effectively reverse the negative public perception of old industrial zones, stimulate the development of surrounding areas, and interact positively with existing high-growth urban sectors. As representations of urban identity and collective recognition, these approaches provide valuable lessons for China's medium-small industrial cities. Specifically, they offer practical insights into addressing the "negativity and trauma" associated with industrial memory and culture in these cities' current phase of transformation.

	Shanghai, Power Station of Art	Hangzhou, Arts and Crafts Museums Group	Chongqing, Industrial Culture Expo Park and Museum
Industrial Use	Power Plant for City	Light Industry and Warehouse	Large-Scale Steel Plant
Type of Facility	Contemporary Art Museum	Traditional Culture Museum	Industrial History Exhibition
Year of Construction	1893, Late Qing Dynasty	1950s, First Five-Year Plan	1938, Anti-Japanese War in WWII
Renovation Timeline	First Time 2009, Second Time 2012	2009-2013	2010-2023
Ownership	State-Owned Enterprise	State-Owned Enterprise	State-Owned Enterprise
Land Use Type	Industrial Land Use to Cultural Land Use	Industrial Land Use to Cultural Land Use	Industrial Land Use to Cultural Land Use
Original Location Type	Urban Edge, Riverfront Industrial Belt	Urban Edge, Riverfront Industrial Belt	Suburban Industrial Zone, Large-Scale Complex
Current Location Type	Inner City, Former Riverfront Industrial Belt	Inner City, World Heritage Area Former Riverfront Industrial Belt,	Urban Edge, Large-Scale Complex
Context	World Expo, Core of Urban Exhibition Zone	Grand World Heritage Application	Eco-Friendly Relocation
Goals	As Shanghai's First Public Contemporary Art Museum, Expanding Artistic Influence	National-Level Museum, to Exhibiting the Cultural Heritage of the Grand Canal	Industrial History, a City-Level Cultural Tourism and Educational Destination
Spatial Characteristics	Focused on Individual Building	Decentralized, Forming a Building Group Through Small Individual Spaces	Large-Scale Thematic Industrial Park

Figure 5.2-4, Comparison Table of Shanghai, Hangzhou and Chongqing Cases. Source: Created by author.

5.3 Policy-Driven, Government-Funded: Ecological Restoration and Green Infrastructure

Compared to the other 5 methods for transforming urban historical industrial spaces, this approach focuses less on economic factors and more on environmental concerns. It is a common strategy used by many medium-small industrial cities, especially resource-based cities. After decades or even a century of resource extraction and industrial activities, these cities often face serious pollution and damage to their land. This makes environmental restoration a major challenge during urban transformation.

For many of these cities, protecting and restoring the environment is a more urgent issue than promoting culture or the economy. This urgency has increased since China adopted the slogan *"Lucid waters and lush mountains are invaluable assets"* and began implementing stronger environmental protection policies. As a result, restoring the ecological balance of former industrial sites has become a key direction. Pingdingshan is an example of this, as will be shown in later case studies. At the same time, many cities have used this approach to build urban parks. These parks not only restore the environment but also create post-industrial landscapes that serve as "green infrastructure and public service." The following sections will introduce and explore this unique strategy in more detail.

5.3.1 "Park City" as Green Infrastructure and Public Service

For many cities that have faced severe environmental pollution during their industrialization past—especially resource-based medium-small sized industrial cities—environmental protection and restoration are far more urgent than promoting culture or economic growth in recent years. Since China introduced the concept of *"Lucid waters and lush mountains are invaluable assets"* (Xi, 2017) and the *"Park City"* and implemented stricter environmental protection policies, this urgency has translated into mandatory actions at the policy level. Restoring the ecological balance of former industrial sites has thus become a key focus. Alongside ecological restoration, many cities have taken the opportunity to construct urban parks. These parks not only repair the environment but also create post-industrial landscapes in these cities, functioning as "green infrastructure and public service."

In 2018, the Chinese central government proposed the concept of a *"Park City,"* This concept places high demands on ecological protection, urban development, industrial transformation, and living environments. The aim is to create a green and healthy lifestyle where people live "within parks," promoting a low-carbon, environmentally friendly, and modern ecological production model. This approach seeks to achieve harmony between cities and nature, fulfilling the public's aspirations for a better life (Xi, 2017). The concept emphasizes using natural frameworks as the foundation, prioritizing the protection and restoration of ecological elements such as damaged mountains, wetlands, and water sources affected by industrial development (Zhu, Yang, and Xu, 2022). Through integrated measures combining the preservation of *"mountains, waters, forests, farmland, lakes, grasslands, and human habitats"* (2018), this strategy strengthens ecological safety barriers, optimizes ecological functionality, and addresses legacy ecological problems. It anchors the environmental foundation of park cities, promotes the conversion of ecological values into tangible benefits, and builds a new model of sustainable urban development.

The strategy of "building cities within parks" aims to integrate green spaces with urban development. Industrial cities often face challenges such as insufficient green spaces, low environmental quality, and limited recreational diversity. To address these, cities are establishing multi-type, multi-level park and

greenway systems. These systems connect various urban zones, peripheral areas, and functional nodes through regional ecological corridors and interconnected greenways. By strategically planning accessible and engaging recreational green spaces, these systems fulfill the public's need for high-quality living environments and diverse green services (Xu et al., 2023).

5.3.2 Case Studies

5.3.2.1 Zhoukou, Shahewan Power Plant Wetland Park

Located in Zhoukou City, Henan Province, *Shahewan Wetland Park* spans 45 hectares along the *Shaying River* basin. Formerly a thermal power plant ash pit abandoned in 2010, the site suffered from severe soil and groundwater pollution due to decades of coal ash deposition. This issue is representative of the challenges faced in Henan Province, where coal-fired power plants dominate energy production. As a demonstration project for ecological restoration in Central China, the park plays a crucial role in regional environmental management.

The site faced significant challenges: extensive pollution, degraded vegetation, and a lack of urban vitality and public spaces. The ash pits, covering half the site, were remediated through isolation, phytoremediation, and industrial material reuse, while water quality was improved with filtration and bioremediation systems. Vegetation restoration introduced adaptive species to enhance biodiversity and stabilize the ecosystem, replacing the sparse and imbalanced original flora.

Situated on the city's suburban area, the site lacked connectivity and public infrastructure. The project aimed to integrate the park into urban life by creating accessible public spaces, transforming it into a dynamic urban asset. Sponge city principles were employed to manage stormwater, while industrial structures were repurposed for public services and ecological education. Materials such as coal ash and rubble were reused to support low-impact development.

The park design retained native vegetation and introduced adaptive plant corridors to improve ecological health and support wildlife habitats. Scattered ash pits were connected to form natural filtration ponds, while the central lake was enhanced with diverse landscape features. Shoreline treatments balanced ecological sustainability with human access, creating rich waterside experiences while protecting the ecosystem.

Through thoughtful urban integration, *Shahewan Wetland Park* has become a vibrant public space, revitalizing the surrounding area. The park encourages public engagement through interactive and educational activities, fostering ecological awareness and promoting sustainable urban living. Its transformation exemplifies how industrial sites can be rethought as ecological and cultural assets.

5.3.2.2 Zibo, Boshan District Comprehensive Park City

Located in Zibo City, Shandong Province, Boshan District has a modern industrial history of over a century, making it a significant industrial hub in the region. Positioned at the ecological transition between mountainous and plain terrains, Boshan has diverse natural elements and abundant resources. Classified as a national key ecological function area, it serves as a vital ecological region in southwestern Zibo. However, as a former center for coal, ceramics, and glass industries, Boshan faces numerous challenges stemming from its industrial legacy, including a fragile ecosystem, heavy reliance on outdated industries, low development levels, poor environmental quality, and limited living standards.

Unlike the Zhoukou case which focuses on a single industrial site, Boshan takes a district-wide approach to address these issues. Its integrated plan incorporates parks, green spaces, and greenways to drive ecological restoration, urban development, industrial transformation, and improved living environments (Lin and Sun, 2023). The *Zibo Comprehensive Park City Construction Plan* establishes a spatial framework of *"Two Mountains, Two Waters, One City, One Belt, Five Pathways, and Multiple Parks"*, supported by a measurable indicator system with 30 metrics (2021). These include mine restoration, water quality, wetland preservation, forest coverage, urban green space ratio, industrial transformation, and public services, ensuring a comprehensive and actionable approach to building a park city.

The plan emphasizes the restoration of natural habitats, focusing on the rehabilitation of industrial wastelands, abandoned mines, and coalfields, while optimizing water quality, ecological corridors, and urban wetland areas to enhance resilience. A robust park and greenway network integrates urban and natural spaces, achieving the goal of *"five minutes to green spaces, ten minutes to a park"*, and *"15 minutes park life cycle"* (Sun, 2022), thereby embedding ecological benefits into residents' daily lives. Through this integration, green spaces become functional and accessible parts of daily urban life.

In addition to ecological restoration, the plan seeks to develop a sustainable economy and establish a new cultural identity for Boshan by leveraging green public services and industrial transformation. By protecting its historical industrial spaces, Boshan connects its historical industries, such as ceramics and glass artistry, with repurposed industrial spaces. These spaces are adapted for public, cultural, and ecological uses, enhancing the district's cultural identity and promoting local craftsmanship. This approach weaves together Boshan's industrial legacy with its urban and ecological renewal, creating a model for sustainable development and cultural revitalization.

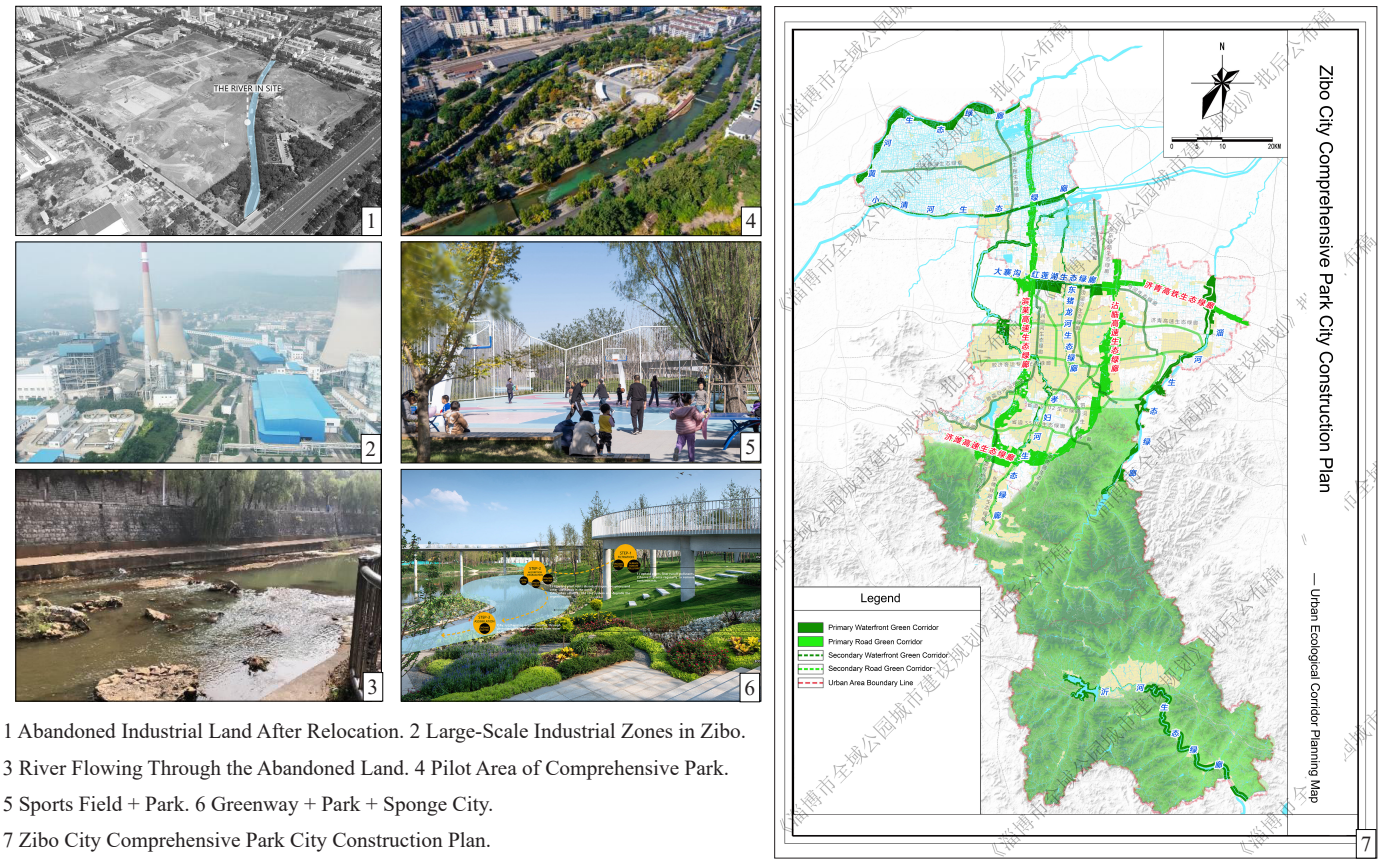
1 The abandoned hermal power plant ash pit before the restoration.

2, 3 The new built wetland park.

4 The location of the park in Zhoukou.

5 Master Plan of the park, showing the ecological restoration strategy for the entire area.

Figure 5.3-1, Maps and Photos of Zhoukou Shahewan Power Plant Wetland Park. Source: Beijing Sunshine Landscape Co.,Ltd, edited by author.



1 Abandoned Industrial Land After Relocation. 2 Large-Scale Industrial Zones in Zibo.
3 River Flowing Through the Abandoned Land. 4 Pilot Area of Comprehensive Park.
5 Sports Field + Park. 6 Greenway + Park + Sponge City.
7 Zibo City Comprehensive Park City Construction Plan.

Figure 5.3-2, Map and Photos of Zibo Comprehensive Park City. Source: 1-6, GVL Design Group. 7, *Zibo City Comprehensive Park City Construction Plan*.

5.3.3 Strategies and Cultural Impacts

5.3.3.1 Strategies for Spaces

Land and ecosystem restoration has become a critical concern in urban renewal processes (Lei et al., 2018). Building green urban spaces helps form sustainable networks and reshapes urban appeal (Zhen, Qyu, and Chen, 2023). Former industrial sites, often situated in ecologically sensitive suburban areas, offer unique opportunities for restoration and community engagement. The repurposing of these sites is both a vital method for land reclamation and a key space for fostering human-city interactions.

These industrial spaces, often with minimal structures but diverse topographies—such as ravines, slopes, and subsidence zones—are transformed through strategic landscaping. The terrain's natural characteristics are retained and integrated into the design, creating cohesive networks of industrial history and cultural narratives. Artificial lakes, waterfalls, and rainwater-collection systems can be introduced in low-lying areas, helping to manage urban water drainage. Selective preservation of industrial remnants, such as waste rock heaps or lime kilns, maintains a connection to the site's industrial past. Displaying past industrial materials alongside modern green landscapes extends the memory of the industrial era while fostering a simpler, ecological urban aesthetic (Chen, Yan and Li, 2024).

5.3.3.2 Cultural Impact and Urban Memory

These spaces serve not only as repositories of human history but also as vital platforms for promoting and celebrating urban cultural heritage. By integrating "culture and green spaces," cities can preserve and highlight their industrial legacies. This approach seeks to reframe post-industrial urban culture, transforming "functional cities" into "cultural cities" underpinned by ecological principles (Chen, Yan and Li, 2024). In doing so, cities create new identities and cultural landmarks.

From a cultural perspective, this method highlights the transition of abandoned industrial spaces, once symbols of decline and pain, into sustainable and green landscapes. It mitigates the stark, desolate imagery associated with industrial decline and reshapes the narrative of industrial cities from polluted, environmentally degraded spaces to sustainable, opportunity-filled environments. By layering sustainability and ecological progress onto industrial memories of hardship, cities can instill hope and confidence among residents—especially the working class—while reinforcing their belief in the possibility of better urban living.

5.3.4 Implications for Medium-Small Industrial Cites

This approach, after being promoted in cities like Shanghai and Hangzhou, is now widely adopted by medium-small industrial cities in China. This is not only due to policy mandates requiring cities to improve their environmental and ecological conditions but also because these cities have recognized the tangible benefits of such initiatives. These benefits include visible improvements in urban image, enhanced resident happiness and satisfaction, and the creation of new landmarks for urban tourism, all of which increase the value of surrounding areas.

For resource-based industrial cities, this approach holds particular significance for reshaping urban industrial culture, identity, and memory. Transforming industrial wastelands, often associated with pain, pollution, and a "grey" image, into lush green urban parks with "clear waters and flourishing greenery" has proven to shift negative memories into positive ones. Moreover, the successful transformation of industrial wastelands into urban parks can serve as a model, offering inspiration and confidence for the redevelopment of other historical industrial spaces and abandoned sites. Such ecological transformations align closely with the goals of high-quality and sustainable development required for the transition of resource-based cities.

Furthermore, the momentum of this planning and practice is evident in ongoing projects. For example, the long-established *No.7 Coal Mine Egret Island City Wetland Park* in Pingdingshan has not only been a success but has also provided confidence to the city's government and residents. This confidence is reflected in the *General Spatial Plan for Pingdingshan City (2021–2035)*, which includes the creation of a new *"Mining Ecological Park"* as part of the *"Three Horizontal, Six Vertical" Green Corridors*. These plans aim to integrate this new park with existing riverside and lakeside parks, forming a "green belt" or even a "green network." This approach is undoubtedly a promising and practical strategy worthy of serious consideration and implementation.

5.4 Government-Guided, Market-Funded: Introduction of Creative and Innovative Industries

The creative industries-oriented renewal model is a significant type of urban historical industrial spaces transformation. This approach emerges amid the waves of transitioning cities from secondary industries to tertiary industries and upgrading urban industrial structures. In this context, historical industrial buildings are repurposed from their original production-oriented layouts into spaces for urban-centric industries, such as design, internet-based industries, and other knowledge-intensive sectors.

This transformation establishes a mutually beneficial interaction between the characteristics of historical industrial buildings and the nature of creative industries. Historical industrial spaces provide a physical foundation for the growth of creative industries, offering new spaces, diverse creative atmospheres, and unique cultural settings. In turn, the development of creative industries injects new vitality and momentum into the revitalization of these spaces (Huang, 2018).

This synergy goes beyond generating new industry formats, economic value, and employment opportunities. It also creates a fusion of local urban heritage with new cultural landscapes, resulting in the evolution of place-based urban narratives (Tang and Kunzmann, 2013).

5.4.1 Market-Driven, Integration of Industrial Spaces and Creative and Innovative Industries

Creative industries have experienced rapid growth in recent years, particularly in Chinese cities focusing on “innovation economy” and “creative economy” as core drivers of development, such as Shanghai, Shenzhen, Guangzhou, and Hangzhou. In these cities, creative production spaces that integrate creative industries and environments have become mainstream in urban historical areas dominated by large industrial buildings. Historical industrial spaces, undergoing a transition from traditional industrial economies to creative economies, have found renewed purpose, evolving into a new type of metropolitan space.

The essence of metropolitan creative industry spaces lies in their comprehensive functionality, centered on developing creative industries, attracting creative communities, fostering a creative atmosphere, and constructing creative networks (Yu, 2013). In this process, historical industrial spaces do not passively undergo physical updates. Instead, their inherent characteristics, combined with guidance from city governments, and market choices, enable these spaces to actively participate in their transformation into creative spaces. This unique compatibility explains why historical industrial spaces surpass other urban spaces and even new urban spaces in attracting creative industries .

Existing studies (Huang, 2018) highlight several reasons for the strong interaction between creative industries and historical industrial spaces:

1. Economic Feasibility: Creative enterprises are often emerging, innovation-driven small and medium-sized businesses with limited budgets and high sensitivity to rent costs. Historical industrial buildings offer lower rents, fewer renovation restrictions, and flexible spaces with development potential, making them more attractive than traditional office buildings in established urban areas (Yu, 2020).

2. Good Urban Locations: Historical industrial buildings in metropolitan inner-city areas benefit from excellent urban, transportation, and talent networks. These spaces are typically not in central business districts (CBDs) nor suburban, but located in other urban sub-cores where former industrial lands have become integrated into inner-city due to urban expansion. These areas support creative industries

and core elements such as innovation, collaboration and competitive networks through suitable rents, transportation and community atmosphere for practitioners.

3. Cultural Symbolism: The cultural landscapes of historical industrial spaces can be "symbolized" through innovative transformations, creating unique "productive cultural landscapes." This differentiates them from "cultural landscapes" found in traditional historical districts and caters to the consumption preferences of urban creative communities.

4. Community Interaction: Vibrant creative spaces require close interaction between social networks, communities and urban neighborhoods. Historical industrial spaces' pre-existing connections with urban community networks, which based on former *Danwei* system, enable them to meet the multifunctional needs of creative industry professionals, offering work, leisure, and social spaces, while also supporting interpersonal exchanges beyond work.

On one hand, creative activities within historical industrial spaces reshape their physical forms and production environments. The diverse and dynamic economic activities further enrich these spaces, producing new social relationships and culture that strengthen the link between creativity and historical industrial spaces. On the other hand, inner-city historical industrial buildings provide important conditions for creative industries. This mutually beneficial relationship promotes creative economic activities and enhances daily life for creative communities, fostering deep interactions with the urban environment and giving rise to new urban space types and cultures (Ma, 2011).

5.4.2 Case Studies

5.4.2.1 Shanghai, Cotton Mills at No.670 Yangtszepoo Road

The site at *No.670 Yangtszepoo Road*, formerly the *Ewo Cotton Mills*, was established in 1896 by *Jardine Matheson & Co.* as the first foreign-owned textile mill in Shanghai. It played a pivotal role in Shanghai's industrial history and labor's revolution. Today, it is a key part of the *Yangpu* Riverside industrial heritage, showing Shanghai's modern industrial and history of revolution. The site contains six historical buildings, including factory, workshops, warehouses, and garden residences. Before restoration, some buildings were used for temporary offices or experimental facilities, while others remained vacant and abandoned. It has been recognized as an outstanding historical building and listed as a protected immovable cultural relic (Shanghai, 1999, 2004). In 2021, the front of the *Ewo Cotton Mills* was announced as a revolution heritage

The *Yangpu* Riverside, known as Shanghai's "Eastern Gateway," epitomizes the city's industrial heritage, stretching 15.5 kilometers along the *Huangpu* River. This area was historically significant, hosting numerous industrial milestones since its development began in the late 19th century. By 1937, it housed 57 foreign factories and 301 domestic ones, marking its importance in China's early industrialization. The *Ewo Cotton Mills* transitioned through multiple phases of ownership and function, reflecting China's tumultuous history, including wartime destruction in WWII and China's War of Liberation, post-war recovery, and eventual integration into public enterprises (Qin, 1985). By the 1990s, the mill ceased operations, and in 2021, the site underwent comprehensive restoration as part of the *Yangpu* Riverside redevelopment initiative.

As a key node in the redevelopment plan for the *Huangpu Riverside Industrial Belt* in Shanghai's *Yangpu* District, this site mirrors other projects in the area by repurposing its main factory buildings into

spaces for creative, design, research, and software development enterprises. Of the six historical buildings on the site, five large industrial structures have been transformed into spacious, multifunctional office spaces. These are complemented by amenities catering to creative industry professionals, such as cafés and casual dining restaurants. The former air compression station has been converted into an indoor sports facility and gym, while the original owner's residence has been adapted for office use. Shanghai's vision for these transformations, alongside the integration of creative industries, is to breathe new life into historical industrial spaces. This initiative aims to partially address the shortage of office and residential space in the city's inner districts, particularly in nearby commercial residential zones, while providing a sustainable economic growth point for the revitalized industrial areas.

Cultural and historical layers were carefully preserved, including remnants from the 1950 bombing by Nationalist forces and subsequent 1950s repairs, which utilized blue bricks to reconstruct damaged walls. These features were conserved to illustrate the multi-layered history of the site (Liao, 2024). Additionally, slogans *"People Unite"* from the 1970s, discovered in underground spaces, were integrated into the design with protection by setting up a glass cover combined with lighting design for display to narrate the site's historical stories. The project also designed industrial elements such as lamp posts, outdoor staircases, and canopies, which complement the historical industrial aesthetic. The historical facades and structures were meticulously restored, preserving industrial architectural elements while accommodating new uses. Notable features include the intentional display of restored red brick walls and informational plaques explaining the repair process. This effort promotes public understanding of heritage preservation and highlights the craftsmanship involved.

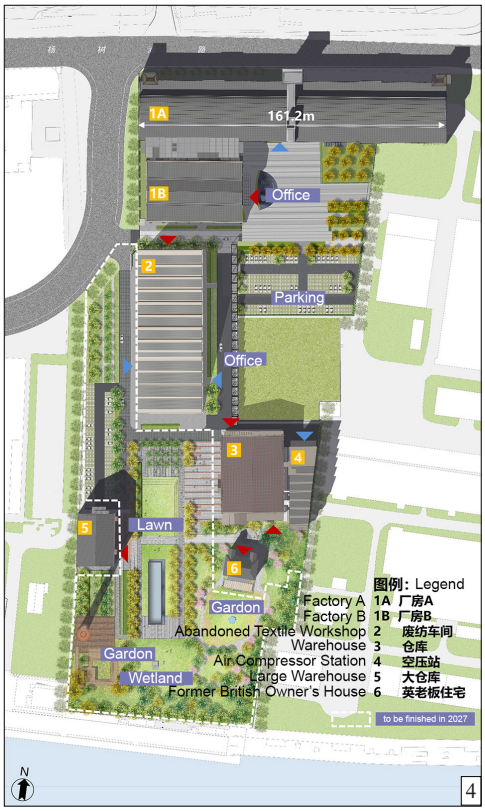
Importantly, the site serves as an educational and cultural platform, showing Shanghai's industrial heritage, labor movements, and post-liberation constructions. Through signage and restored features, it narrates the architectural and cultural significance of *Ewo Cotton Mills*, preserving its industrial and revolutionary legacy for future generations.

1 Aerial View Before and After Renovation.

2 Factory Photos: from Qing Dynasty and Renovated Office Space.

3 A 1970s Component Inscribed with "People Unite," Reflecting the Industrial Memory of the Era, Showing China's Revolutionary Ideology at the Time.

4 Location of the site in industrial belt.



5 Master Plan, Showing That Most of the Space Is Used for Offices and Green Areas.

Figure 5.4-1, Maps and Photos of Shanghai Cotton Mills at No. 670 Yangtszepoo Road. Source: Historical drawings and *History of the Workers' Movement at Shanghai No. 5 Wool Textile Factory* from Shanghai Urban Construction Archives, and East China Architectural Design & Research Institute, edited by author.

5.4.2.2 Hangzhou, Xizi Wisdom Industrial Park

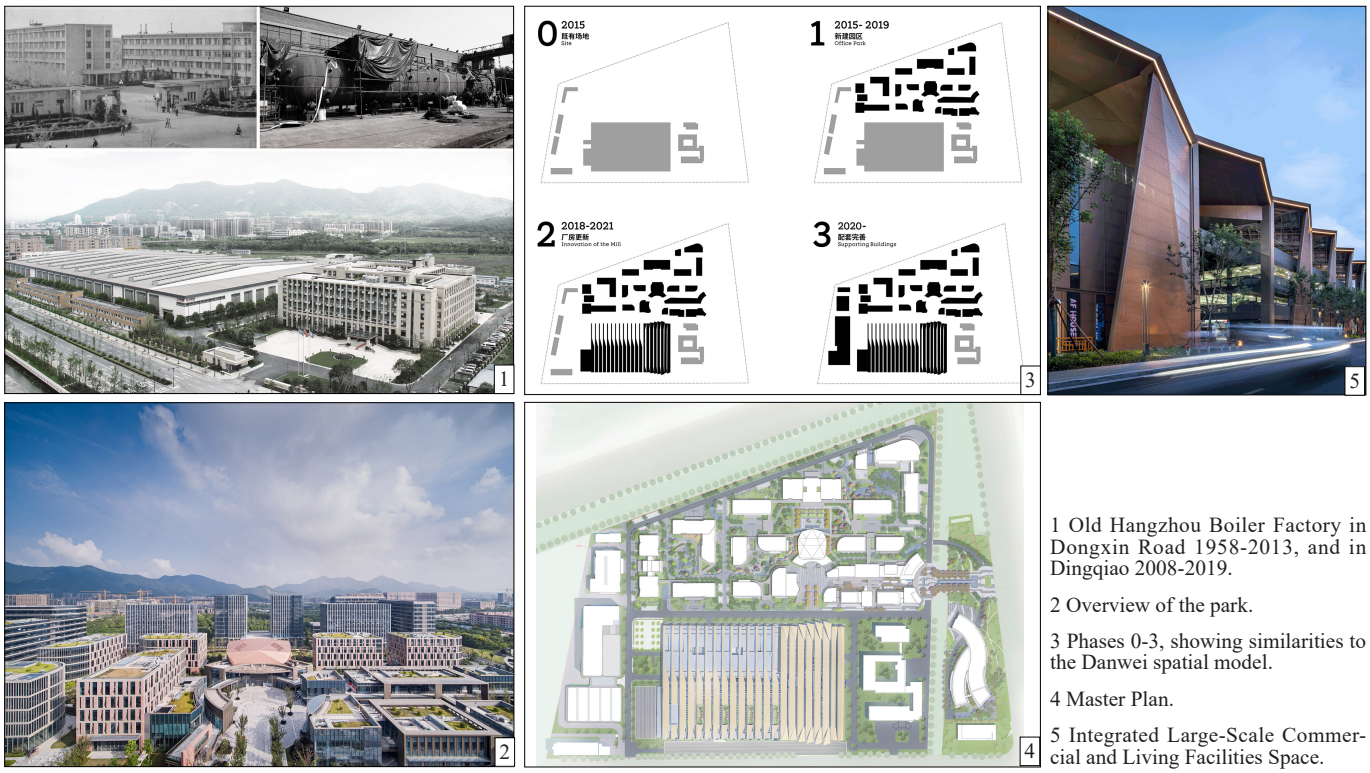
Xizi Wisdom Industrial Park is a large-scale creative and intelligent industrial park that emerged as part of the industrial relocation in Hangzhou. In 2008, *Hangzhou Boiler Group*, a representative of the northern industrial cluster in Hangzhou, relocated from its urban factory site, where it had operated for nearly 60 years, to *Dingqiao* Town, then a suburban area. However, following the rapid urbanization in China after 2008, farmland and factory areas in *Dingqiao* were gradually replaced by large-scale residential developments. The extensive land occupied by the *Hangzhou Boiler Group* was no longer suitable for the area's development and residents' needs. Starting in 2015, the factory and its surrounding 21.5-hectare site, including public services, underwent redevelopment to achieve spatial and industrial transformation, while the factory and its workers' housing were relocated to a newly established high-tech industrial park at the urban periphery. The old factory buildings, however, were left as historical industrial spaces. It is worth noting that these buildings are relatively recent, having been built as late as around 2008.

The old factory buildings and surrounding land were repurposed into a *"Wisdom industrial park"* to host creative, design, software development, and research enterprises, becoming an important part of the planned *Dingqiao Wisdom Town*. The designers aimed to avoid the homogeneity and monotony of traditional industrial parks while extending the cultural memory of Hangzhou's historical industrial spaces.

The design reflects the characteristics of the *danwei* compound from the planned economy era. Previously, such "compounds" integrated production and urban life, providing residential and living facilities for factory workers and nearby residents. This integrated mode of production and urban living offers valuable insights for today. The project seeks to go beyond merely providing an industrial container, instead creating a multifunctional community blending production, commerce, and living. The entire 21.5-hectare site is being developed in three phases, with diverse functions: the northern section of the old factory (Phase 1) houses an intelligent manufacturing center, research and development center, creative offices, and an arts center; the redevelopment of the old factory itself (Phase 2) accommodates a warehouse-style supermarket, centralized commercial spaces, and parking facilities; the western section of the factory (Phase 3) includes modern pilot workshops and mixed-use facilities.

The renovation of the *Hangzhou Boiler Group* factory is a highlight of the park's development. The original factory, covering approximately 42,000 square meters, was a steel-frame industrial structure with less than 10 years of use before abandonment. While the structure itself has limited historical value, the industrial memory associated with the *Hangzhou Boiler Group* and its industrial symbolism warranted preservation and utilization. The design leverages the structural and stylistic features of the industrial buildings, boldly embracing innovation in form, façade, and interior space. This approach is in stark contrast to the historically faithful restoration seen in the *Shanghai Ewo Cotton Mills* case, showcasing diverse and modern designs with strong visual impact.

Xizi Wisdom Industrial Park is significant to this discussion as it addresses how suburban industrial parks can align more closely with "urbanity." Reflecting on lessons from the *danwei* system's integrated production-living spaces, it demonstrates how to create a balanced industrial park combining creative industries, ancillary commerce, and residential needs. By incorporating groundbreaking functional and design innovations in historical industrial spaces, the project provides a cultural perspective that contrasts sharply with the Shanghai case, showcasing how old industrial memories can nurture new cultural growth.



1 Old Hangzhou Boiler Factory in Dongxin Road 1958-2013, and in Dingqiao 2008-2019.

2 Overview of the park.

3 Phases 0-3, showing similarities to the Danwei spatial model.

4 Master Plan.

5 Integrated Large-Scale Commercial and Living Facilities Space.

Figure 5.4-2, Maps and Photos of Hangzhou Xizi Wisdom Industrial Park. Source: GOA Design, shiromio studio, edited by author.

5.4.3 Spatial Strategies Creativity, Symbolization, and Public Engagement

In market-driven "creative parks", as exemplified by the Hangzhou case, spatial integration is emphasized to enhance vibrancy and serve as a catalyst for cultural and creative industries. This integration is reflected in the blending of production and consumption spaces, where open layouts promote dynamic interactions. Numerous designs combine creative workspaces and retail outlets, often featuring semi-open façades, glass display windows, and designated spaces for internet-driven businesses. The rise of remote and flexible working trends has led to the repurposing of centrally located large-span factory spaces, aligning perfectly with the requirements for differentiation and adaptability (Chai, 2014).

Many "creative parks" integrate ground-floor retail spaces with restaurants, tea houses, and cafes that cater to office workers during the day and attract local residents in the evenings. Public facilities such as gyms, basketball courts, and badminton halls operate around the clock, fostering interaction between office users and nearby communities. On weekends and holidays, public spaces within these parks frequently host art exhibitions, creative markets, and other events, further enhancing weekend vitality. These activities dissolve traditional boundaries of working space and other, creating a lifestyle that integrates production, consumption, and everyday interactions, as described in Section 5.6, but with more focus on the daytime creative work.

5.4.4 Cultural Features and Impacts

The design of creative parks aims to foster an innovative atmosphere that attracts and facilitates interaction among creative individuals. This atmosphere relies on a combination of repurposing historical elements, creating dynamic public landscapes, and employing strong visual systems. However, these spaces often emphasize the symbolic use of design language and cultural representation (Tang and Kunzmann, 2013).

	Shanghai, Cotton Mills at No.670 Yangtszepoo Road	Hangzhou, Xizi Wisdom Industrial Park
Industrial Use	Textile Mill	Boiler Factory
Type of Facility	Contemporary Art Museum	Traditional Culture Museum
Year of Construction	1896, Late Qing Dynasty	1960s
Renovation Timeline	Start from 2021	Start from 2015
Ownership	Foreign-Owned to State-Owned Enterprise	State-Owned Enterprise
Land Use Type	Mixed-Use (Office, Commercial)	Mixed-Use (Office, Commercial, Residential)
Original Location Type	Urban Edge, Riverfront Industrial Belt	Urban Edge, Multiple Relocations to the New Edge
Current Location Type	Inner City, Former Riverfront Industrial Belt	Urban Edge
Goals	Preservation and Adaptive Reuse, Commemorating Industrial Histori	Creating New Industries and Communities
Spatial Characteristics	Factory Building Complex	Community Using the Former Danwei Model
Cultural Characteristics	Layers of Historical Context, From Late Qing, then WWII, to Revolutionary Period	Fucos on New Function in Urban Edge

Figure 5.4-3, Comparison Table of Shanghai and Hangzhou Cases. Source: Created by author.

A key characteristic is the coexistence of buildings from different eras, with historical elements creatively adapted by cultural enterprises. While the original industrial spaces often lack significant heritage value, new architectural strategies are employed to enhance the parks' "creative identity" . Features such as sawtooth roofs and silos, with their distinct industrial aesthetics, are prominently utilized in creative transformations to strengthen spatial and cultural significance (Chai, 2014). These elements highlight the unique scale and functional characteristics of industrial architecture.

Another notable feature is the removal of boundaries, particularly the walls that traditionally enclosed industrial compounds. Open spaces, aerial corridors, large public-facing structures, and terraced landscapes foster greater interaction among users. These spaces not only encourage engagement within the parks but also integrate with surrounding communities, blending modern needs for entertainment, leisure, and socialization with economic and cultural activities.

This integration extends beyond the park itself (Huang, 2018), leveraging urban public services and neighboring facilities to enhance connectivity with the city. Creative parks often introduce new cultural dynamics to surrounding areas, driven by younger creative or knowledge workers who leave their cultural imprint on both the parks and adjacent communities. This interaction strengthens the relationship between creative environments and local culture, ensuring that economic activity and cultural expression evolve together.

Importantly, this new culture does not "overwrite" or "erase" the old historical industrial spaces but builds upon it, advancing the narrative of industrial culture. These changes reflect the inevitable cultural evolution that accompanies industrial and economic transformation, blending legacy with innovation in a way that redefines urban identity.

5.4.5 Implications for Medium-Small Industrial Cities

Like the development of green ecological spaces, introducing cultural and creative and innovative industries offers useful lessons for medium-small industrial cities, especially as they work toward industrial transformation and seek new innovation-driven economic opportunities. However, this model has some challenges for medium-small industrial cities. Unlike larger cities, they often lack the natural appeal and clustering effect that attract creative businesses and professionals. It can be difficult for these cities to rely on market-driven forces to bring cultural and creative industries into their historical industrial spaces.

That said, medium-small industrial cities have their own advantages. As these cities shift toward new industries, they will need flexible spaces to support this transformation. Historical industrial spaces can provide large, adaptable environments for new industries. For example, in Pingdingshan, the *General Spatial Plan for Pingdingshan City (2021–2035)* highlights plans to develop creative industries. Surrounding counties like *Baofeng* and *Ruzhou* are especially relevant for their traditional crafts. *Ruzhou*, for instance, is famous for *Ru porcelain*, which is considered the top of China's top five porcelains. Historically, the *"kilns and furnaces lining both banks of the Ru River"* symbolized the area's prosperity, but this has long disappeared with the growth of industry. Today, while *Ru* porcelain production still follows traditional styles, many designers and artists are working on modern reinterpretations. This could help integrate creative industries into the local economy while revitalizing the city's cultural identity and making Pingdingshan's urban memory richer and more diverse.

Beyond arts and design, the unique characteristics of historical industrial spaces also make them well-suited for research-driven industries and other innovative sectors. As cities explore their transformation potential, these spaces can be repurposed to support various industries. For example, in Pingdingshan, as the city transitions toward industrial manufacturing and technology, these spaces can provide flexible, large-scale environments for engineers and researchers, catering to the diverse needs of emerging industries. Specifically, Pingdingshan has numerous coal mining *danwei* spaces located in the eastern and western worker towns. These *danwei* residential areas hold potential for housing, living facilities, and public services while integrating seamlessly with industrial buildings. These spaces present significant opportunities for innovative industries and align with Pingdingshan's plan to develop new industrial clusters on the city's eastern side.

By repurposing historical industrial spaces effectively, medium-small industrial cities can achieve both economic growth and cultural development, combining innovation with tradition to strengthen their identity and new urban memory.

5.5 Market-Led:

This approach transforms urban historical industrial spaces into distinctive consumer-oriented spaces, driven by differentiated consumption. Through symbolic reinterpretation, industrial spaces are rethought as urban consumption areas. While the spatial forms and characteristics vary widely, “industrial space and industrial culture” play a key role in shaping and redefining these spaces. However, their transition into consumer-oriented urban landscapes often follows a “homogenized” process, facing the challenge of losing the uniqueness of industrial culture.

5.5.1 “Industrial Culture” as a Symbol of Urban Identity and Consumption

The transformation of historical industrial buildings into consumer-oriented landmarks in cities often involves layers of complexity, such as class restructuring, interest redistribution, and land transactions, alongside internal spatial reconfigurations and reproduction (Huang, 2018). While industrial enterprises may hold the rights to use and manage historical industrial buildings, their lack of technical capacity often limits these buildings to being mere production assets. To unlock their potential, industrial enterprises frequently transfer these spaces to commercial developers, using their expertise in cultural packaging and access to policy and financial resources. This process reinterprets industrial spaces into commercially viable assets imbued with “differentiated symbolism.” The original industrial enterprises benefit from rental income, while developers gain from cultural value appreciation, collectively sharing the added value generated by the transformation (Chen, 2013). Simultaneously, industrial culture itself becomes a consumer symbol, integrating into urban identity and fostering new layers of collective recognition.

Unlike traditional commercialized historic districts, historical industrial spaces are often preferred for their unique combination of characteristics:

Historical Symbolism as Cultural Capital: Industrial buildings inherently possess historical value, which can be reinterpreted and emphasized through heritage preservation initiatives during redevelopment. Their structural integrity and relatively low protection under heritage laws provide developers with significant freedom for creative reinterpretation.

Symbolic Adaptation for Cultural Capital: Industrial spaces lent themselves to creative reinterpretations, making them ideal for showcasing adaptive reuse. This flexibility allows for the reinvention of their historical elements into bold, contemporary cultural expressions.

Dynamic Appeal for Modern Consumers: Compared to traditional commercial historic districts, industrial spaces abandon refined, quaint middle-class imagery in favor of vibrant, dynamic, and striking cultural aesthetics. This approach resonates strongly with younger, fast-paced urban consumers (Huang, 2018).

In this model, historical industrial spaces serve a dual role as both “platforms for consumer behavior” and “consumable spaces.” As Lefebvre observed, “landscape consumption mediated by capital is one process of spatial reproduction by capital” (Jiang, Chen, and Ma, 2011). Utilizing the vast spatial capacity of industrial building clusters, these redevelopments integrate urban transportation, public activities, leisure, commerce, offices, residences, hotels, exhibitions, dining, conferences, and entertainment to generate intensive commercial activity. They create open urban spaces that promote a blend of living, recreation, social interaction, work, and consumption.

Moreover, this adaptive reuse is often closely tied to creating iconic commercial landmarks and developing urban tourism. The scope of such transformations ranges from single industrial buildings to clusters and even entire industrial districts, showcasing their adaptability across various spatial scales.

5.5.2 Case Studies

5.5.2.1 Shanghai, The 17th Cotton Textile Factory

The Shanghai International Fashion Center stands on the historic site of the *17th Cotton Textile Factory*, located in the *Yangshupu Riverside Industrial Zone*, a traditional cluster of Shanghai's industrial heritage.

The factory, originally established in 1921 by the *Japanese-owned Osaka Toyo Spinning Corporation*, expanded with additional plants in 1924, 1930, and 1932. Over the decades, it underwent significant historical changes, including government control during the Republican era, military administration post-liberation, nationalization, and restructuring during the 1990s. Despite these transformations, many high-quality architectural structures, such as sawtooth-roofed factory buildings, beamless warehouses, and well-preserved residences, remained intact. Early recognition of their heritage value led to the site's designation as part of Shanghai's third batch of *Excellent Historical Buildings* in 1999 and as a district-level protected site in 2004. These designations greatly influenced subsequent redevelopment efforts.

After ceasing operations in 2005, relocating production facilities, and restructuring its workforce, the parent company, *Shanghai Textile Group*, established *Shanghai 17th Investment Development Co., Ltd.* in 2009 to oversee the site's redevelopment.

The factory's location in the *Yangshupu Riverside Industrial Heritage Zone* (as referenced in 5.4.2.1) is significant, as it was the first site in the area to complete a commercial transformation. This early success is closely tied to the background of its corporate owner. Since the 1990s, Shanghai's traditional textile industry faced economic decline, prompting the *Shanghai Textile Group* to adopt a strategic transition combining technology and fashion. The group leveraged its experience from developing other industrial heritage projects, such as *M50* on *Moganshan Road*, *Shang Street LOFT*, and *Xinqiao* in the western suburbs, to spearhead the redevelopment of the *17th Cotton Textile Factory* with district government support.

A unified development approach enabled a coherent integration of preservation and modern functionality. The transformation of the 90,000-square-meter southern area into a 143,000-square-meter mixed-use commercial hub showcases a seamless blend of old and new. This area now houses fashion clubs, multifunctional show venues, retail spaces, dining options, entertainment facilities, and hotels. Historical brick-and-timber structures were reinforced and restored, harmoniously combining traditional and contemporary elements. Meanwhile, the northern section was converted from industrial to commercial and office use and released to the real estate market.

Functionally, the site is positioned as a comprehensive commercial district emphasizing fashion culture. It integrates retail, dining, creative offices, conferences, fashion shows, and apartments with the cultural significance of its historic buildings. Public exhibition halls along the street create an open atmosphere, while fashion show venues and other facilities maintain a more controlled access.

As one of China's earliest (started in 2007) large-scale transformations of industrial heritage into consumer-oriented commercial space, this project offers valuable lessons and serves as a reference for similar endeavors today.

1 and 2, Photo in 1920s, 1980s.

3-6 Renovated Photos: Transformed into a Fashion Show Venue and Shopping Center next to the river.

7 Location in the industrial belt.

8 Aerial View, Showing the Retention of the Original Factory Structure and Form.

Figure 5.5-1, Map and Photos of Shanghai Fashion Center. Source: 1-6 and 8, website of the SFC, https://www.in-sfc.com/. 7, drawn by author.

5.5.2.2 Xi'an, Dahua 1935 (The 11th) Cotton Textile Factory

Dahua 1935 is located on the historical site of *Xi'an Dahua Cotton Textile Factory*, once the largest modern cotton textile enterprise in the region. It reflects the city's industrial evolution, from its early development to its transformation in the modern era. The factory's origins date back to 1919, when *Wuhan's "Textile King," Xu Rongting*, founded *Yuhua Cotton Mill*. Following the *Mukden Incident* in 1931, the National Government of the Republic sought to develop the northwest China as a key industrial base. *Dahua Cotton Mill* began construction in 1935 and started production in 1936, marking a pivotal moment in Xi'an's early industrialization. After the establishment of the People's Republic of China, the factory underwent socialist reform in 1954 and was nationalized. Renamed *Shaanxi 11th Cotton Textile Factory* in 1966, it became central to the province's prominence as a major national cotton textile hub. However, like many state-owned enterprises, the factory struggled during China's market economy transition. In 2008, the parent company *Shaanxi Tanghua Group* declared bankruptcy under state policies (Gao, Cai and Huang, 2020). By 2013, the site completed its transformation into a commercialized urban space.

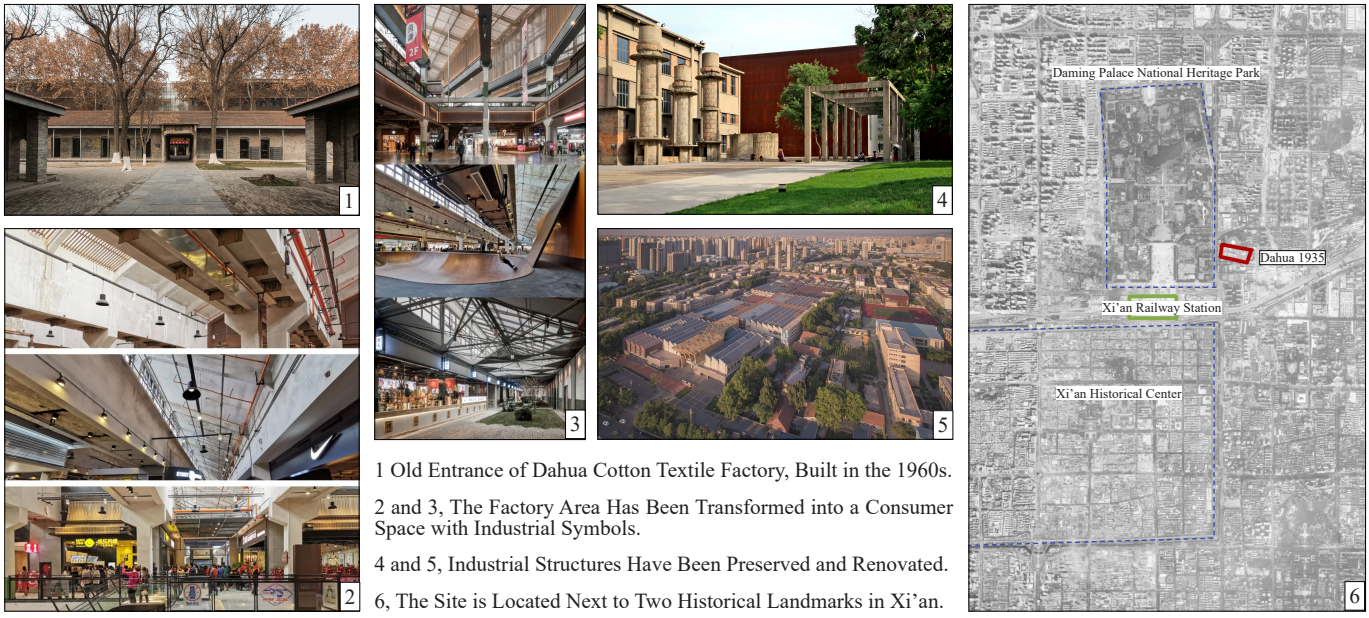
The factory's evolution parallels critical moments in Chinese history, encompassing the Republican era, the war of resistance against Japan, post-liberation industrialization, and reform. Its preservation highlights its status as a symbol of Xi'an's modern industrial heritage and as a pioneer in western China's textile industry.

Despite its historical significance, the site's redevelopment into a "24-hour consumption center" was influenced by its strategic location near the *Daming Palace National Heritage Park*, a UNESCO World Heritage site. Adjacent to this 3.2-square-kilometer cultural landmark, *Dahua Cotton Mill* had to adapt to the shifting urban landscape and align its functions, forms, and identity with the grandeur of the neighboring heritage (Gao, Cai and Huang, 2020). The southern section was designated as a dining district, with small-scale historical buildings minimally modified to create a cohesive restaurant space. The central area became a specialty shopping zone, where the iconic textile factory buildings retained their basic structures but were adjusted to reduce density, creating atriums typical of modern commercial spaces.

In addition to its commercial focus, *Dahua 1935* incorporates a cultural arts district. Running north to south, the area features a series of small theaters, a textile industry museum, and a cultural arts center.

This arrangement ensures a balanced blend of retail, leisure, and cultural experiences.

Dahua 1935 represents a multifaceted approach to industrial heritage renewal, combining commercial development, heritage conservation, and integration into the surrounding cultural tourism framework. While primarily a commercial complex, its commitment to public services such as heritage preservation and local community improvement adds significant social value. However, its reliance on long-term cultural cultivation raises concerns about avoiding the pitfalls of gentrification, a challenge highlighted by scholars Yang and Zhao (2012).



1 Old Entrance of Dahua Cotton Textile Factory, Built in the 1960s.

2 and 3, The Factory Area Has Been Transformed into a Consumer Space with Industrial Symbols.

4 and 5, Industrial Structures Have Been Preserved and Renovated.

6, The Site is Located Next to Two Historical Landmarks in Xi'an.

Figure 5.5-2, Map and Photos of Xi'an Dahua 1935. Source: 1-5, China Architecture Design Group Land-based Rationalism D.R.C. 6, drawn by author.

5.5.3 Industrial Spaces Blurring Consumption, Space and Culture

Unlike high-end commercial centers in central urban areas, the cases are located on the urban fringe or subcenters. Their redevelopment leverages the distinct characteristics of industrial sites, blending historical industrial elements with traditional commercial models to create differentiated consumer experiences and higher returns. Large-span, single-story industrial buildings, such as saw-tooth roofed workshops, are particularly well-suited for malls or large-scale retail spaces due to their ample size and adaptability (Huang, 2018).

Each project's commercial functions and design choices reflect the identity of the developer. For instance, the *Shanghai Fashion Center*, developed by *Shanghai Textile Group* (the parent company of the *17th Cotton Textile Factory*), emphasizes its textile industry heritage by incorporating fashion shows, designer exhibitions, and premium clothing stores. In contrast, the *Dahua 1935* in Xi'an, led by the *Qujiang Daming Palace Investment Group*, integrates significant cultural elements, reflecting its experience in cultural tourism and its commitment to preserving the *Daming Palace* heritage zone. Cultural functions, including museums, small theaters, and art salons, occupy approximately 21,000 square meters—27.2% of the total area—making it a mixed-use space that blends heritage preservation, cultural tourism, and commercial real estate (Jing and Yuan, 2015). This development inertia actually means that, in most cases, such industrial transformation into consumer space will largely reflect the industrial culture of the original industrial enterprises (Qiao et al, 2022).

A core focus in redeveloping industrial heritage for commercial use lies in creating unique experiences through thematic spatial reorganization (Huang, 2018). For example, large-scale, rigid industrial spaces are restructured to align with consumer-oriented movement patterns and thematic sequences. Existing outdoor spaces are often repurposed as organizing nodes, while modifications maintain the integrity of the industrial site's layout. Enhancements include semi-open courtyards and connections between buildings to improve flow, break down the inward-facing nature of factory layouts, and foster a sense of openness. Scale adaptation is key in transforming these expansive industrial spaces into human-centered environments for consumption (Qiao et al, 2022). This involves dividing large factory buildings into varied functions, such as retail, exhibitions, creative offices, dining, and entertainment. Smaller attached buildings are often repurposed for high-traffic functions like cafés, bars, or bakeries, ensuring continuous activity across the site. The low-density nature of industrial spaces provides opportunities for integrating social interaction. By reshaping large spaces into layered commercial zones and breaking rigid indoor-outdoor boundaries, these projects blend seamlessly with surrounding urban areas. Landscape improvements and pedestrian-friendly designs encourage interaction, making the sites appealing to both consumers and nearby residents.

Event programming also plays an increasingly significant role in enhancing these spaces. Activities such as photography exhibitions, fashion shows, film festivals, art fairs, and cultural lectures serve as tools for promoting the site. Externally, they elevate brand recognition, while internally, they create vibrant spaces that maximize operational efficiency and profitability.

These redevelopments often require integration with broader urban design frameworks to align new functions, transportation networks, and scales with surrounding urban clusters. This alignment helps dissolve the disconnect between former industrial sites and their urban contexts, repairing spatial cohesion and fostering synergy with adjacent city areas. Consequently, while these projects are primarily market-driven, government policy and urban planning support remain important for their success (Zhang and Wei, 2002).

5.5.4 Positive and Negative Impacts on Urban Culture and Memory

This method is fundamentally driven by the interplay of government and capital, transforming industrial spaces into high-yield consumer environments that replace outdated industries while advancing urban spatial evolution. Through intentional design, "industrial elements" are repackaged into high-end, aesthetically pleasing symbols of post-industrial culture, satisfying societal demands for cultural and spatial consumption. This process reshapes the spatial hierarchy within the city, and integrates post-industrial culture into commercial development. However, at its core, this transformation is bound to the logic of capital circulation, where the artistic and cultural values of historic spaces are ultimately subsumed into market mechanisms (Huang, 2018).

As researchers Zhang and Deng point out, industrial culture and memory, under this framework, become tools for generating consumer demand. Their intrinsic meanings and authenticity are abstracted, commodified, and woven into consumer-oriented spaces. Industrial culture serves as both a spatial driver and a marketable product, creating consumption spaces that simultaneously forge new cultural narratives (Zhang and Deng, 2009). However, this new cultural identity often stands in stark contrast to the working-class values historically represented by industrial spaces. While modern consumption narratives dominate, this shift may undermine the collective memory and cultural identity of communities closely tied to historical industrial spaces.

Despite these tensions, the approach has its strengths. By assigning cultural significance to "historic industrial buildings," once considered burdens or symbols of urban decline, these spaces are rethought as iconic commercial assets. Unlike traditional heritage sites, which encourage humility before history, rethought industrial spaces often present curated or even idealized historical narratives that serve contemporary consumption needs. This dynamic enriches the consumer experience while increasing the economic value of historical industrial spaces.

However, the process of gentrification within industrial spaces is a notable concern. Post-industrial culture and aesthetics-driven consumption spaces effectively transform former industrial areas but often exacerbate social inequalities. By targeting specific consumer demographics, these developments can deepen cultural and social divides, displacing local communities and severing the spatial and cultural ties between historical industrial spaces and their surroundings. As these areas are redeveloped for middle-class consumption, they risk alienating adjacent communities, leading to a broader fragmentation of urban cultural and social cohesion.

5.5.5 Implications for Medium-Small Industrial Cities

As previously discussed, this approach requires market leadership and substantial capital investment. For medium-small industrial cities, the feasibility of adopting such a method depends on their ability to attract investment and commercial interest. Unfortunately, resource-based cities—often the majority of medium-small industrial cities—generally lack the potential and capacity to draw the necessary investments. In some cases, these cities have attempted to create opportunities through government-driven initiatives, such as urban planning and industrial space preparation, paired with investment promotion efforts. However, their commercial appeal remains far below that of larger metropolitan areas, limiting the success of such endeavors. Given these challenges, it is important to consider whether this approach could work for medium-small industrial cities in the future if they become more capable of attracting investment.

While it could be a viable option, it must be approached with caution. As highlighted earlier, the consumer culture this method promotes often clashes with the deeply rooted worker-centric cultural identity and collective memory of these cities. Unlike in larger cities with more diverse social structures and cultural dynamics, medium-small industrial cities typically emphasize their proud historical industrial spaces and working-class ethos. Introducing a consumption-driven culture risks overshadowing these traditional values and creating further disconnection within the community (Zhang and Deng, 2009).

However, as urban development continues to diversify after 2010s, these cities may eventually encounter a growing demand for novel, "symbolic" consumption experiences, as described earlier. This emerging trend could provide an opportunity to cautiously experiment with this approach. If adopted, it is crucial to balance the introduction of new consumer-driven cultural elements with the preservation of the city's historical industrial spaces and traditional identity. Ensuring that new developments complement rather than overshadow the existing cultural fabric is vital to maintaining cohesion in cities where industrial culture remains a key component of urban identity.

5.6 Government-Market Collaboration: Integrating of Living and Other Functions

5.6.1 Integration of Living, Public, Production, and Culture

Since the late 1990s, following China's 1998 housing market reform, commercial housing replaced the *danwei* system's public housing as the primary housing supply. This shift commodified former worker housing and their associated land, while many industrial production spaces ceased their original functions. Alongside rapid urbanization and policies like *"Transition from Secondary to Tertiary Industries,"* large amounts of state-owned industrial land were gradually repurposed for residential development (Huang and Cao, 2011). During the early phases of this process, driven by rigid demand and the pressure for rapid capital turnover, old factory and residential areas were often demolished and replaced with commercial housing. This became the mainstream model for early industrial land redevelopment.

In recent years, as the housing market matured and commercial housing growth slowed, historical industrial spaces have found new opportunities to integrate into residential areas as public service spaces, limited production areas, or multifunctional community spaces. Many redeveloped sites have preserved and adapted industrial historical buildings while combining them with residential housing and public spaces, resulting in both positive market feedback and public recognition.

One approach involves separating residential and industrial functions spatially. This model is common in suburban or edge areas of cities, originally dominated by large-scale industrial sites—*danwei*'s factories and living areas—that have since been absorbed into the urban area due to city expansion. In such areas, where land costs are relatively low, industrial sites often face demolition pressures both from developers seeking returns and from city governments advancing broader urban planning goals (Huang and Cao, 2011). Or, in some inner-city locations, particularly in early-industrialized cities like Shanghai, smaller industrial sites are preserved. In these cases, historical industrial spaces coexist with residential developments, with the preserved structures serving as public amenities or cultural landmarks. Developers and city governments use the cultural symbolism of these spaces to serve as public spaces, enhance nearby residential environments, echoing the "production plus living" model of the work-unit era in a contemporary, market-driven format (Li and Zhu, 2014).

Another approach involves the spatial integration of residential and industrial functions, where preserved industrial structures are incorporated directly into new residential developments, often for cost-efficiency. This approach is more commonly seen in government-led public rental housing projects. Here, residential functions take priority, with a strong focus on practicality. As a result, historical industrial spaces are utilized primarily for their structural capacity rather than as cultural or symbolic assets (Huang, 2018). However, because most Chinese cities have abundant land and are moving away from aggressive land-revenue models, such practices remain relatively rare, and successful examples are primarily focused on innovative spatial adaptation techniques rather than cultural preservation.

5.6.2 Case Studies

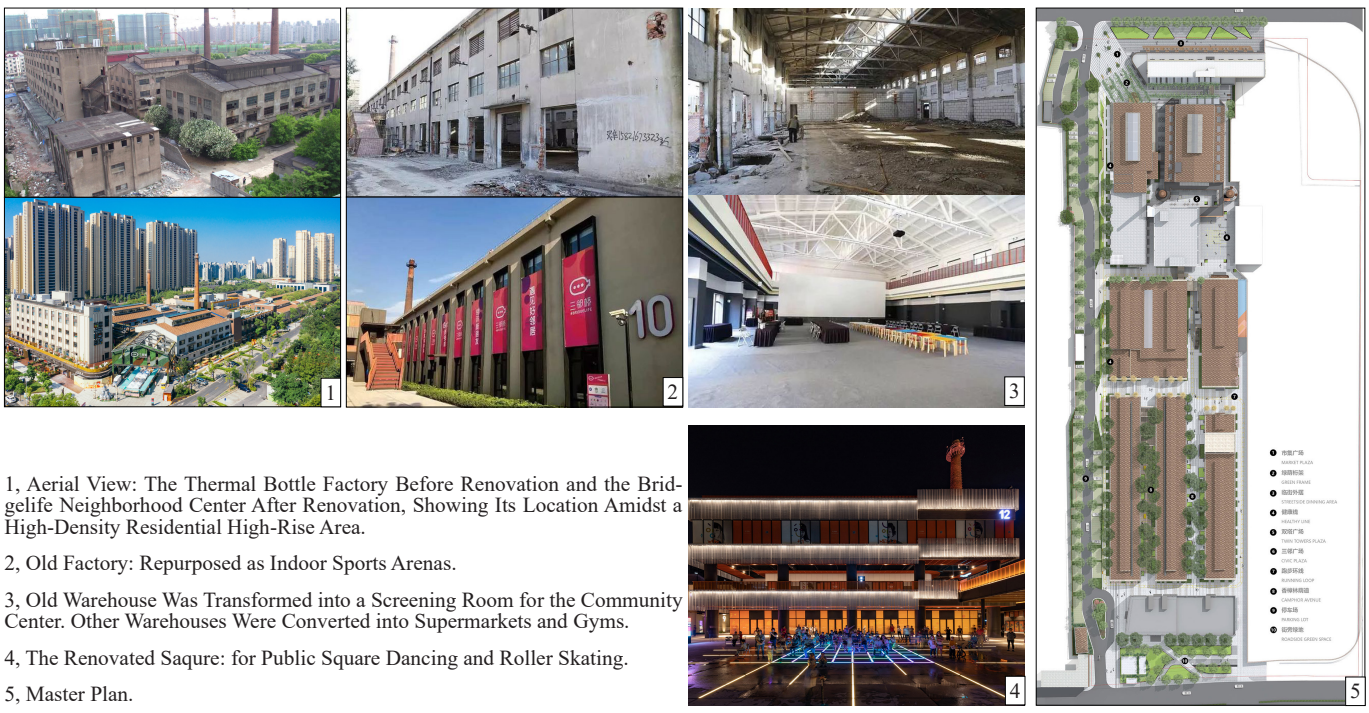
5.6.2.1 Shanghai, Thermal Bottle Factory Bridgelife Neighborhood Center

The *Bridgelife Neighborhood* is a vibrant public space amenity at the junction of three districts, namely *Baoshan*, *Hongkou* and *Yangpu* District in Shanghai. It was an abandoned Japanese thermal bottle factory named *Nissho* with more than 20 years of history. The once-popular and extraordinary fac-tory site has become quiet and abnormal, showing signs of decline.

Designer retrofit a great number of community features and variable urban space into the venue. The landscape function of the *Bridgelife* is not singular, but an adaptable place that can be transformed according to changes in users and time. The key idea is to protect this historical heritage with minimized renewal but make it to a park that offers distinct, multi-dimensional experiences. It aims to create a new community center that integrates commercial, cultural, creative, and sports uses through the transforma-tion of old industrial plants.

Due to the limitation of the original factory layout, only leftover narrow corridors could be used for the public. The *Health Line* with the setting of the boulevard is built for residents. Designer use a 600-me-ters long night runway to connect different areas and deepen the potential of each venue. Community functions and variable urban spaces are injected into the site. The updated *Bridgelife* is more than just a vibrant neighborhood in a tandem community, but also a more valuable urban living room. Within *Brid-gelife Neighborhood*, the old memories of the residents are still there, and the new future continues.

Around the site are commercial high-rise residential buildings developed about five years ago. This area is a high-density residential area, and people have a demand for public space and community service. In addition, due to the requirements of Shanghai's "15-minute living circle", there must be supermarkets, affordable restaurants, gyms, indoor and outdoor sports activity venues for children and the elderly, and a large number of public service spaces in this community. By the fall of 2024, *Bridgelife Neighborhood Center* will be fully equipped with these spaces.



1, Aerial View: The Thermal Bottle Factory Before Renovation and the Brid-gelife Neighborhood Center After Renovation, Showing Its Location Amidst a High-Density Residential High-Rise Area.

2, Old Factory: Repurposed as Indoor Sports Arenas.

3, Old Warehouse Was Transformed into a Screening Room for the Community Center. Other Warehouses Were Converted into Supermarkets and Gyms.

4, The Renovated Saqure: for Public Square Dancing and Roller Skating.

5, Master Plan.

Figure 5.6-1, Map and Photos of Shanghai Bridgelife Neighborhood Center. Source: Lab D+H, LuBing, edited by author.

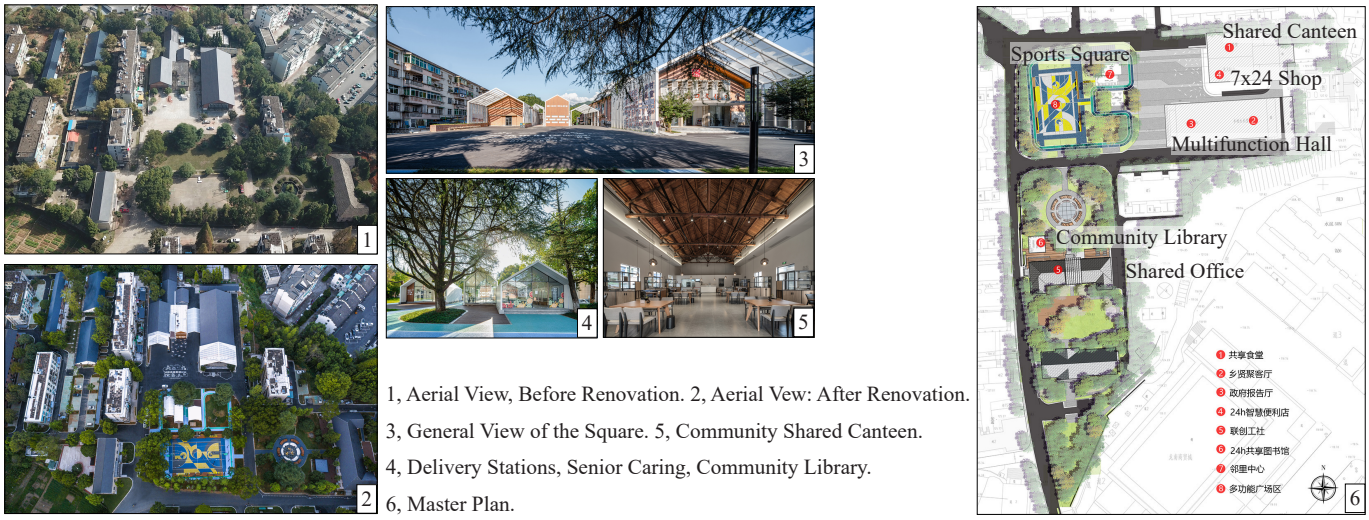
5.6.2.2 Quzhou, Xikou Pyrite Mine Future Community

On September 18, 2020, Quzhou City officially released the *Quzhou Rural Future Community Index System and Construction Guide*. Alongside this announcement, the launch ceremony for the *Xikou Rural Future Community* pilot area in *Longyou* County took place, marking the opening of the first rural future community in Quzhou. The project site, *Huangnishan* Residential Area, was originally established in 1959 as a residential community for workers of the *Xikou Pyrite Mine*. By 2020, the residential community had housed over 500 households and more than 1,000 residents. Combined with adjacent residential zones and disused mine-related facilities like warehouses and service buildings, the site embodies the common spatial legacy of *Danwei* compounds in medium-small industrial cities, largely untouched by large-scale commercialization.

The design draws on the local characteristics of the *Xikou Pyrite Mine*'s worker residential area, emphasizing the retention of historical building features while incorporating modern design elements. It aims to *"remember nostalgia, see development,"* and create a dialogue between the site's historical significance and its modern functionality.

The site features an array of low-rise industrial-style buildings, including a hospital, a dance hall, a workers' children's school, and a grand auditorium. These structures have been repurposed into key public service spaces in alignment with city policy. Notable transformations include: A shared dining hall, offering meals for both public gatherings and elderly residents from the *Huangnishan* community. A rural auditorium, converted from the former *Danwei* cinema, now serves as a multi-functional venue for events such as grassroots elections, medical outreach, flea markets, and periodic free film screenings. These screenings evoke memories of the industrial era for long-time residents. Convenience facilities, adapted from small warehouses, now host services such as parcel delivery stations, senior care centers, and automated vending and medicine dispensers. Additional features include a community library designed to cater to lifelong learning needs, following policy directives to promote education across all age groups. The library encourages community engagement and foster a reading culture. A community sports field, developed from the former *Danwei* sqaure, provides a revitalized space for recreation and interaction.

By reactivating nearly forgotten *Danwei* spaces on the urban periphery, this project exemplifies how the legacy of industrial residential areas can be rethought to serve contemporary community needs while preserving historical and cultural connections.



1, Aerial View, Before Renovation. 2, Aerial Vew: After Renovation.
3, General View of the Square. 5, Community Shared Canteen.
4, Delivery Stations, Senior Caring, Community Library.
6, Master Plan.

Figure 5.6-2, Map and Photos of Quzhou Xikou Pyrite Mine Future Community. Source: Zhushengxuan Studio, e.lit light and shadow space, edited by author.

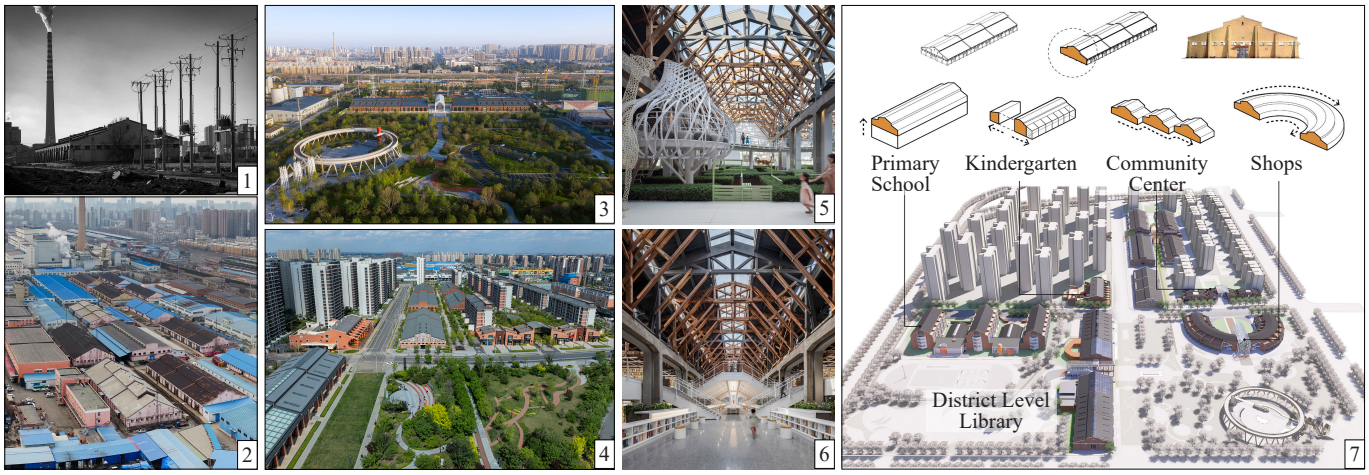
5.6.2.3 Shenyang, Dongmaoku Warehouse Community of CR Times City

The *Dongmaoku No.2 Warehouse Community*, completed in 2022, is part of *CR Land's Times City* development, designed to integrate seven preserved warehouses into a new residential environment near *Shenyang East Railway Station*. *Dongmaoku Warehouse*, built in the 1950s as one of China's earliest and largest logistics area, represents a significant example of civic warehouse architecture. However, its cultural value was largely overlooked until its inclusion in a historic buildings list. The government retained ownership of the warehouses while mandating their preservation and reuse, with the surrounding land allocated for commercial real estate.

The project centers on two parallel warehouses, No.2 and No.4, situated within the future city park. Each warehouse consists of three 30m x 30m units. Due to their spatial and functional limitations, they were designated for community cultural activities rather than serving *CR Land*'s commercial goals. A standout feature is the glass connector between the two warehouses, inspired by the original truss structures. This modern addition reinterprets the warehouses' charm and was proposed as a potential marriage registration office and wedding venue to enhance its public functionality. Another unique element is the inclusion of a greenhouse, designed to provide a green, inviting space for the cold northeastern climate. This feature contributes to fostering community connections and serves as a year-round gathering point for residents.

Warehouse No.1 hosts a wedding hall, the *Dadong Industrial District Urban Exhibition Center*, and *CR Land*'s marketing center. Its transformation has made it a focal point for local residents, highlighting the lack of accessible public facilities in older neighborhoods. This project exemplifies how government and state-owned developers collaborate to allocate high-quality public resources to improve underserved communities. Warehouse No.2 has been repurposed as a branch of the *Dadong District Library*, funded by the government. It includes the proposed greenhouse garden, a plant education space, and free reading areas. To ensure accessibility and encourage frequent use, the library avoids an overly formal or exclusive design, incorporating simple seating, a tea room, and a café, allowing visitors to bring their own devices for work or leisure.

As a non-profit public space, the library aims to be a hub for community cultural development. It serves as an inclusive, barrier-free platform where residents can interact, fostering a sense of belonging and strengthening neighborhood ties.



1, 2, Dongmaoku Warehouse Before Renovation. 3, 4, Arial View of the Library, Kindergarten and Community Center.

5, Gardon in Community Center. 6, Library. 7, Diagram of the Project and Surroundings.

Figure 5.6-3, Map and Photos of Dongmaoku Warehouse Community of CR Times City. Source: URBANUS, Shenyang Jianzhu University HA+STUDIO.

5.6.3 From Danwei Compounds to Contemporary Community Space

The three cases discussed above represent different approaches to transforming *danwei* system spaces, each reflecting different models of development. This is highly relevant to contemporary medium-small industrial cities. These spatial frameworks were mainly built around the *danwei* system and are now undergoing diverse stages of redevelopment and transformation. Despite their differences, the three cases share commonalities. They are all situated within the remnants of the *danwei* spaces, with varying degrees of preservation and transformation. This shows the state of many medium-small industrial cities, where spaces built during the *Danwei* era are at different stages of renewal.

5.6.3.1 Ownership and Operational Models

The ownership and operational models significantly across the three cases. The first, *Shanghai Bridge-life Neighborhood Center*, is a government-selected historical industrial spaces. The industrial land was initially held by a state-owned enterprise. The resulting project primarily provides shared public spaces and community services for nearby commercial residential areas. These residential areas were completed about five years earlier. After allocating sufficient public service areas, the state-owned enterprise handed over commercial operations to private, and guided by the government.

The second case, *Quzhou Xikou Pyrite Mine Future Community*, is totally located on state-owned *danwei* land, and managed by state-owned enterprises, including surrounding residential areas that retain the original *danwei* system layout. Situated at the urban fringe, it has not been subjected to commercial real estate development. Under governmental policy's guidance, the state-owned enterprise improved the living environment for residents in the original *Danwei* residential area, transforming it into a wholly public-service-oriented project without profit motives.

The third case, *Shenyang Dongmao No.2 Warehouse Community of CR Times City*, represents yet another model. Here, both the historical industrial spaces and surrounding residential zones are owned by CR Land, a single private real estate developer. Under government policy requiring public spaces, the developer repurposed historical industrial spaces elements to create small-scale landmarks, integrating them into the broader residential and community context.

	Shanghai, Bridgelife Neighborhood Center	Quzhou, Xikou Pyrite Mine Future Community	Shenyang, Dongmaoku Warehouse Community of CR Times City
Industrial Use	Thermal Bottle Factory	Light Industry and Warehouse	Large-Scale Steel Plant
Type of Facility	Commercial Community Center	Non-Profit Community Center and Life Facilities	Public Facilities
Year of Built	1990s	1959, First Five-Year Plan	1950s, First Five-Year Plan
Renovation Time	Complated in 2024	Started in 2020	2019-2022
Ownership	State-Owned Enterprise	State-and- Collective-Owned Danwei	State-Owned Warehouse to Private-Owned Land
Land Use Type	Commercial and Public Service Land Use	Public Service Land Use	Commercial and Public Service Land Use
Original Location Type	Inner City, Next to Urban Edge	Suburban Industrial Area, Mining Area	Urban Edge, Large-Scale Complex
Current Location Type	Inner City, Surronded by High-Rise Residence	Urban Edge	Inner City, Surronded by High-Rise Residence
Spatial Context	Surround Residence Require Life Facilities	Policies to Improve the Living Quality of Old Danwei Residential Areas	Public Supporting Facilities for Commercial Real Estate Development
Function	Supermarket, Gym, Restaurants, Public Squre, etc.	Non-Profit Library, Shard Canteen, Parcel Station, Sports Field, Health Care, Community Center	School, Kindergarten, Library, Park Green Space, Supermarket & Grocery Stores, etc.

Figure 5.6-4, Comparison Table of Shanghai, Quzhou and Shenyang cases. Source: Created by author.

5.6.3.2 Spatial Approach

In the *CR Times City* project in Shenyang, the site was initially located at the urban edge, near newly built high-rise residential developments. Although the original site featured a wealth of historical industrial spaces and structures in terms of both quantity and scale, the development plan opted to demolish most of these buildings, retaining only a few based on specific needs. The site was transformed into shared community services, small businesses, and green spaces. This approach reflects a strategy where new residential space planning aligns with the original industrial layout, balancing the developer's profit motives with the preservation and adaptive reuse of historical elements.

In S*hanghai's Bridgelife Neighborhood Center* project, the surrounding area had already undergone significant development, characterized by densely populated high-rise residential buildings. With established urban public amenities and considerable commercial potential, the developers adopted some consumption- and symbol-oriented approach. Guided by Shanghai's "15-minute living circle" policy, the project combines public services with new commercial functions, using industrial historical spatial elements. Notably, the industrial structures were fully preserved, ensuring their integration into the surrounding residential and community spaces.

In contrast, the *Quzhou Xikou Pyrite Mine Future Community* project, situated on entirely public (state-owned) land. This project has preserved the original layout of the *danwei* space to the greatest extent, maintaining the traditional *danwei* model by repurposing abandoned industrial buildings and residential facilities into upgraded public service and social welfare spaces. It represents a modern version of the *danwei* system, where the providers of services have shifted from large state-owned enterprises to government, private businesses, and social organizations. The project focuses on public service rather than commercialization, offering a space dedicated to meeting the needs of nearby residents without pursuing profit returns.

5.6.4 Impacts on Urban Culture and Memory

The three cases illustrate differing attitudes toward historical industrial spaces and its cultural impact. These strategies have shaped new spaces that integrate with surrounding residential areas, creating distinct cultural significance.

In the Shanghai and Shenyang projects, the surrounding residential areas are largely commercialized, reflecting the broader trend of urban industrial zones transformation in contemporary Chinese cities. Both cases combine this approach with the "Consumption, and Symbolism" approach discussed in Section 5.5. By symbolizing industrial imagery to enhance commercial value, these projects promote consumption and increase the value of surrounding residential areas, to get benefits in government finance or private interest. Such methods are facing the complexities of a new generation of urban residents—more diverse and no longer limited to the original *Danwei* communities of retired workers and their descendants. These projects preserve historical industrial spaces to some extent, symbolizing it and embedding it into contemporary community life of the People's City Policy. This approach provides new cultural and historical connections to industrial spaces for younger generations, while respecting the worker culture and industrial memory cherished by older residents. These integrations foster a new, everyday urban culture and memory deeply embedded in daily life.

In contrast, the *Quzhou Xikou Pyrite Mine Future Community* remains in a non-commercial *Danwei* worker residential area, where most residents are retired factory workers and their descendants. Guided by the *Quzhou Rural Future Community Index System and Construction Guide*, the project emphasizes modernizing public spaces while preserving nostalgia and memory. The spatial design draws from the local characteristics of the *Xikou Pyrite Mine* residential area, adhering to policies that aim to the slogan *"Make nostalgia remembered and development visible"* (Xi, 2013). By creating a dialogue between history and the future, the project fulfills residents' aspirations for a better life. It integrates high-tech modern services with the old spatial characteristics, maintaining the *Danwei*-era living mode and memory while allowing residents to enjoy the conveniences of modern governance and technological advancements. This approach updates the community's historical industrial culture and memory, ensuring its relevance for the present and future.

5.6.5 Implications for Medium-Small Industrial Cites

The transformation of historical industrial spaces into mixed-use communities, combining residential, public, and production-related functions, provides valuable lessons for medium-small industrial cities undergoing urban renewal. These cities, shaped predominantly by the *Danwei* system, share common characteristics with the cases discussed, making such approaches particularly relevant.

Medium-small industrial cities often face challenges such as limited capacity to attract large-scale development projects and substandard urban infrastructure. They also typically lack high-quality public spaces and adequate public services. Many of these cities possess historical industrial spaces surrounded by varying levels of developed residential areas—remnants of the former *Danwei* system, which once provided rich public services. These inherited spaces and modes present an opportunity to transform historical industrial sites into community-centered developments that address modern needs while preserving industrial culture.

The Quzhou project highlights the potential for government-led that modernize public spaces while preserving historical and cultural ties. This approach caters to retired workers and long-term residents by blending nostalgia with advanced services, making it ideal for areas with intact *Danwei*-based layouts and minimal commercial development.

The Shanghai and Shenyang cases demonstrate how industrial spaces can integrate public services and light commerce to enhance residential areas. Aligned with policies like the "15-minute living circle," these projects combine public amenities and light commercial functions, improving urban quality while generating revenue. Medium-small cities can adapt similar strategies, focusing on selective preservation and practical reuse to create cultural and economic value.

For cities like Pingdingshan, revitalizing historical industrial spaces aligns with their *Danwei*-based history. By balancing government planning, public participation, and market investment, such projects can preserve cultural identity, foster pride, and support sustainable urban development.

Chapter 6:
Proposed Solutions for Pingdingshan City, and Implications for All Medium-Small Industrial Cities

This chapter builds upon the discussions, analyses, and case studies presented in the previous five chapters to propose macro and meso-level solutions for Pingdingshan City. These solutions aim to address the challenges of transforming historical industrial spaces, while preserving and reinterpreting the city's cultural identity and collective memory. Grounded in the framework of China's urban planning system, the chapter aligns with the spatial development trajectory and current conditions of medium-small industrial cities like Pingdingshan.

The proposed solutions are structured on two levels: **Policy Frameworks and General Planning:** Recommendations to guide the overall approach and urban planning policies. **Applicable Strategies and Methods:** Identifying suitable strategies from the six commonly used approaches in China, as discussed in Chapter 5, and providing detailed guidance on their implementation in Pingdingshan.

By integrating these strategies with existing and future plans, this chapter seeks to offer practical pathways for Pingdingshan to navigate its industrial transformation while preserving and reinterpreting its cultural identity and collective memory.

6.1 Policy Frameworks and General Planning

Policy frameworks and general planning offer opportunities to refine and enhance Pingdingshan's *General Spatial Plan for Pingdingshan City (2021–2035)*. As this plan remains active and adaptable over its implementation period (2021–2035), there is enough room to adjust and expand it in response to the city's ongoing development. The primary focus of this study is on the preservation and transformation of Pingdingshan's industrial culture and collective memory. Using the *General Spatial Plan* as a foundation, specific suggestions can be made to deepen and refine its proposals.

First, the overall general policies should put the maintenance and protection of the city's industrial culture identity and collective memory in an important position, focusing on transforming their negative aspects into positive ones. This process requires not only the preservation of physical spaces and historical industrial spaces but also improvements in elements linked to industrial culture, such as workers' living standards and the environmental quality of industrial zones. Additionally, comprehensive evaluations of the various coal mining heritage spaces are necessary to develop tailored strategies for each site.

Building on these principles, the plan already emphasizes cultural development and recognizes the value of traditional heritage, with a focus on preserving the Ru Porcelain craftsmanship as an intangible cultural asset. This heritage could be integrated with industrial culture to create synergies, as discussed later in this study. Pingdingshan's ancient historical heritage and traditional craftsmanship provide potential for adopting a government-led approach to developing cultural facilities.

The plan's objective of *"optimizing the layout of the central urban area and enhancing urban quality"* aligns with the proposed *"One Core, Two Wings"* spatial structure. This framework includes the core city area and two industrial development wings in the east and west. Within the eastern wing—comprising the high-tech and nylon industrial zones—there are numerous former *danwei* spaces with varying levels of commercialization and transformation, offering spatial potential for new industrial development. The *"one core,"* representing the old city center, also contains smaller, scattered historical industrial spaces whose proper transformation could bring significant benefits to the area. Policies should encourage the adaptive reuse of these historical industrial spaces, particularly in connection with the development of new innovative industries, to achieve both economic and cultural benefits.

The city's plan for a *"networked ecological space"* and its "*Three Horizontal, Six Vertical"* ecological green network underscores Pingdingshan's commitment to prioritizing urban ecology and environmental construction over the next decade. This provides a stable foundation of policy and financial support for adopting strategies related to ecological restoration and green infrastructure, which rely heavily on government backing. However, there is room to further strengthen these policies. For instance, greater emphasis could be placed on the ecological restoration of abandoned coal mining sites, integrating them more closely with residents' daily lives. It is crucial to identify additional historical industrial spaces suitable for ecological transformation and actively explore innovative approaches to their repurposing. For example, disused railway lines could be used to connect large-scale historical industrial spaces, they could be converted into green spaces or ecological corridors, enhancing urban green connectivity and creating a more cohesive ecological network.

It is also crucial to align the city's specific policies with China's *"People's City Built by the People, People's City for the People"* initiative. Efforts should focus on genuinely improving the quality of life for residents within and around historical industrial spaces, particularly those in former *danwei* areas. These residents, primarily the older generation of workers and their descendants, have made significant contributions to the city's construction and development. By combining the strategies mentioned above, urban planning must truly serve the people and ensure that the city's transformation is driven by the needs and well-being of its residents. Across all these policies, economic, spatial, and ecological factors must be balanced with the cultural and mnemonic aspects of the city. The focus should not be only on economic growth but also on the "invisible" values of culture and memory. These intangible assets are critical for the sense of identity and community, ensuring that Pingdingshan's industrial culture and memory continues to play a meaningful role in its future development.

6.2 Applicable Strategies and Methods

Pingdingshan's coal mining sites present diverse opportunities for transformation, with varying conditions across location, timing of closure, space layout, and economic potential. In the *General Spatial Plan for Pingdingshan City (2021–2035)* and some surveys, several mines are expected to cease operations around 2035. This includes No.5 Mine and *Xiangshan* Mine in 10 years, and later, No.2, No.4, No.6, No.9 and No.12 Mine in 20 years. No.3 Mine and No.7 Mine had already stopped thier production for some years (Xie, 2019). Together with smaller related industrial spaces such as warehouses, railway yards, coal washing plants, and Pingdingshan Coking Plant, these areas provide numerous possibilities for adaptive reuse.

To plan this transformation in advance, it is necessary to assess strategies based on their compatibility with Pingdingshan's unique context. By analyzing the six strategies widely used in China, discussed in Chapter 5, they can be categorized into three levels of suitability.

First, **cultural facilities (5.2)**, **ecological restoration and green infrastructure (5.3)**, and **integrating residential and other functions (5.6)** are the most viable strategies for Pingdingshan. These approaches align with the city's strengths in government-led initiatives and its need to enhance public services and urban infrastructure, directly improving residents' quality of life while positively reframing industrial culture and memory.

Second, **symbolism and consumption (5.5)** and **introduction of creative and innovative industries (5.4)** are less suitable due to the city's limited socio-economic capacity to attract significant commercial or cultural tourism. These strategies may work only in specific, favorable conditions, such as targeted industry policies or improved economic appeal.

Finally, **urban event and marketing (5.1)** strategies are largely impractical for Pingdingshan, given its current limitations in hosting large-scale events or establishing itself as a cultural hub. However, this strategy could remain a long-term aspiration as the city develops further.

The following sections explore these categorizations in detail, offering tailored recommendations for the transformation of Pingdingshan's historical industrial spaces.

	Policy Support	Gov-Finance	Commercial Investment	Construction Duration	Long-term Operation Needs	Long-Term Economic Returns	Long-Term Cultural Impacts	Suitability
Urban Event and Marketing	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆	☆☆	☆☆☆☆☆	☆☆☆	New, ☆☆☆☆	Unsuitable
Cultural Facilities	☆☆☆	☆☆☆☆	☆☆	☆☆☆	☆☆☆☆	☆☆	Neutral, ☆☆☆☆☆	Suitable
Ecological Restoration and Green Infrastructure	☆☆☆	☆☆☆☆☆	☆	☆☆☆☆☆	☆☆☆☆	☆	New, ☆☆☆	Suitable
Introduction of Creative and Innovative Industries	☆☆☆☆	☆☆☆☆	☆☆☆☆	☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	New, ☆☆☆	Neutral
Consumption and Symbolism	☆☆	☆☆	☆☆☆☆☆	☆☆	☆☆	☆☆☆☆	New, ☆	Neutral
Integrating of Living and Other Functions	☆☆☆	☆☆☆	☆	☆☆	☆☆☆☆☆	☆	Old, ☆☆☆☆	Suitable

Figure 6.2-1, Comparison Table of Six Strategies. Source: Created by author.

Plase note: This is the author's subjective evaluation based on research. *Policy Support*, *Gov-Finance*, *Commercial Investment* and *Long-Term Operation Needs*: The number of stars represents the level of necessity, with 1 star meaning very low and 5 stars meaning very high. *Construction Duration*: The number of stars represents the length of time required, with 1 star meaning very short and 5 stars meaning very long. *Long-Term Cultural Impacts*: New: Represents the creation of new cultural influences; Old: Maintains the industrial culture originally carried by the space; Neutral: Indicates that both aspects are possible.

6.2.1 Recommended Strategies: Culture, Ecology, and Integrated Community Functions

Cultural facilities, ecological restoration and green infrastructure, and integrating residential and other functions (in 5.2, 5.3 and 5.6) are the most suitable strategies for Medium-small industrial cities like Pingdingshan. These approaches align well with the strengths of the city, where government leadership often plays a more dominant role compared to market and commercial investments. This allows for the effective implementation of environmental improvement policies and the development of cultural potential inherent to the city. Additionally, the city's urban infrastructure in old industrial areas, especially public services and welfare spaces in former *Danwei* areas, requires enhancement and optimization. By directly improving residents' quality of life, these strategies can transform the negative associations tied to industrial culture and memory into positive ones, offering a more direct and tangible impact on the city's cultural identity.

6.2.1.1 Adopting the Cultural Facilities in Pingdingshan

The cultural facilities model offers Pingdingshan a path to preserve and celebrate its coal mining space, while attracting residents and visitors in meaningful ways. This approach centers on creating cultural and educational spaces, such as museums and memorials, to promote historical industrial space awareness and highlight the resilience and contributions of the city's coal mining communities (Zhang et al, 2024).

One potential initiative is establishing a Coal Mining Culture Museum, like *Industrial Culture Expo Park and Museum in Chongqing*. It could be set at a representative site, such as Mine No.1 or Mine No.2, which were the earliest developed mines in Pingdingshan. It shows industrial history, conducting cultural education, and hosting tourism activities. Integrated with ecological restoration projects like the wetland park at Mine No.7, this museum could serve as a large-scale cultural and recreational hub. It would not only attract visitors but also provide nearby residents with a space for leisure, socializing, and participation in regular events. While the cultural benefits of such a project would outweigh its economic returns, it would require significant government investment.

Moreover, this approach is not limited to coal mining industrial spaces (No. 1–12 Coal Mines) but can also be applied to other industrial spaces within the city. Examples include the Coking plant, former coal freight Train Repair Yard, former coal freight Train Parking Sation, and Coal Preparation Plant. While the Coking plant and Coal Preparation Plant are likely to remain operational until all coal mines cease production—meaning they will not be abandoned in the foreseeable future—the Train Repair Yard and Train Parking Sation have been abandoned for years. The Train Repair Yard, in particular, is located in the central urban area, currently sealed off by walls and iron gates, but passersby can still see old steam locomotives and train carriages inside. This site is a symbol of Pingdingshan's industry, as the city once had one of the busiest and most intricate coal mining railway networks in China. There were some rare locomotives could be seen. Now, these locomotives sit silently in the abandoned Train Repair Yard. These spaces could be repurposed into cultural facilities related to mining railways and trains, serving as a record and preservation spaces for the city's railway and train culture. Such a transformation would hold significant cultural, historical, and educational value.

In addition, Pingdingshan should preserve and maintain existing mining cultural landmarks such as the *Workers' Cultural Palace*, the *Miner's Monument*, and the *Li Eryin Memorial Hall*, located within the *danwei* space of Mine No.2. These sites, recognized in 2023 as part of *Henan Province's industrial her-*

itage list, embody the perseverance and spirit of Pingdingshan's mining culture (Zhang et al, 2024). Restoring and highlighting these landmarks would not only honor the city's industrial legacy but also trigger collective memories among former miners and their families, many of whom still reside in nearby mining related *danwei* communities.

From the perspective of urban memory, the development of a mining cultural museum or exhibition park centered around these spaces fosters a connection between past and present. For older generations, these sites evoke memories of collective entrepreneurship, struggle and resilience. For younger residents and new urban communities, they serve as educational space that introduce the values and identity of Pingdingshan's mining culture. This role of preserving history and instilling a sense of identity bridges generational divides, promoting a shared cultural understanding and emotional connection to historical industrial spaces (Zhang, 2020).

A larger, more ambitious option would be transforming the entire industrial historical area surrounding Mine No.2 into an *Industrial Culture Exhibition Park*. This could include existing production spaces, the *Workers' Cultural Palace*, the *Miner's Monument*, and other scattered elements within the former *danwei* space. Such an integrated, "Point-to-Surface" cultural park would serve as a comprehensive narrative of Pingdingshan's industrial history, impacting both local residents within the *danwei* area and establishing a prominent cultural landmark for the city as a whole.

Additionally, the city could leverage its broader cultural assets, such as its *Ru Porcelain* and other historical traditions, to create small-scale museums or cultural facilities within former industrial sites. This aligns perfectly with Pingdingshan's general plan, which emphasizes the protection and promotion of its historical culture and traditional crafts. Furthermore, *Pingdingshan University* has one of the top three procelain programs in China, focusing on both the art of porcelain production and theoretical research. These historical industrial spaces hold significant potential to connect with the university's academic and practical activities. These facilities could host interactive experiences to blend industrial space with cultural traditions. In this way, they provide Pingdingshan with opportunities to develop its creative industries. Such initiatives would not only preserve and repurpose industrial spaces but also promote Pingdingshan's rich cultural diversity, creating a win-win scenario for industrial and cultural heritage conservation.

It is worth noting that, smaller cultural facilities, or even cultural installations and structures, can also be categorized within this approach. This method is cost-effective and offers high feasibility. From the perspective of reviving coal mining heritage and memory, some of Pingdingshan's current practices are worth continuing (Zhang et al, 2024). For instance, the pedestrian street on Heping Road, near the Pingdingshan Workers' Cultural Palace, features a series of cultural symbols, such as statues of miners at work and models of mining trains. These small-scale symbolic cultural facilities recreate the imagery of hardworking miners and the authentic scenes of coal mining areas, which most young residents of Pingdingshan have never witnessed. Using small-scale cultural symbols to trigger memory (Smith, 2006) is an effective approach, as it provides tangible and direct representations. However, its impact is limited due to its small scale. Therefore, it should be used in conjunction with the landmark cultural facilities mentioned earlier to create a more comprehensive effect.

In conclusion, the strategy of transforming industrial spaces into cultural facilities provides a highly direct and effective method to preserve and promote Pingdingshan's urban culture, whether it pertains to coal mining historical industrial spaces or traditional crafts and history. This approach is straightforward and yields clear results. However, these spaces require meticulous planning and design, as well as careful management and operation by the government after the transformation is completed. This presents

challenges for Pingdingshan, as the fiscal resources of a medium-small industrial city are often limited. Nonetheless, this strategy remains highly applicable and effective, capable of quickly evoking a sense of cultural identity and pride (Wang and Liu, 2021). Additionally, it can serve as a visible cultural landmark, influencing urban space and contributing directly to the city's culture and memory in the long term.

6.2.1.2 Continuing Ecological Restoration and Green Infrastructure

The ecological restoration and green infrastructure model is well suited for large industrial sites within urban areas, particularly those with coal mining subsidence zones or waste rock areas (gangue hills) (Jiang, 2007). This approach not only rehabilitates the environment but also integrates mining heritage into urban green spaces, offering ecological, cultural, and recreational benefits. A notable example is the transformation of the subsidence zone at Mine No.7 into the *Egret Island City Wetland Park*. This project combined the subsidence area with artificial lakes, creating a harmonious integration of the former mining site with its surrounding environment.

Such projects require considerable time to materialize. For instance, the *Mine No.7 Egret Island City Wetland Park* project began in 2005 and was completed in 2009, and achieving an ideal ecological balance has taken even longer. These long timelines highlight the importance of early planning and implementation to ensure that decommissioned coal mining sites would show less environmental risks. The *General Spatial Plan for Pingdingshan City (2021–2035)* reflects this awareness, with proposals for

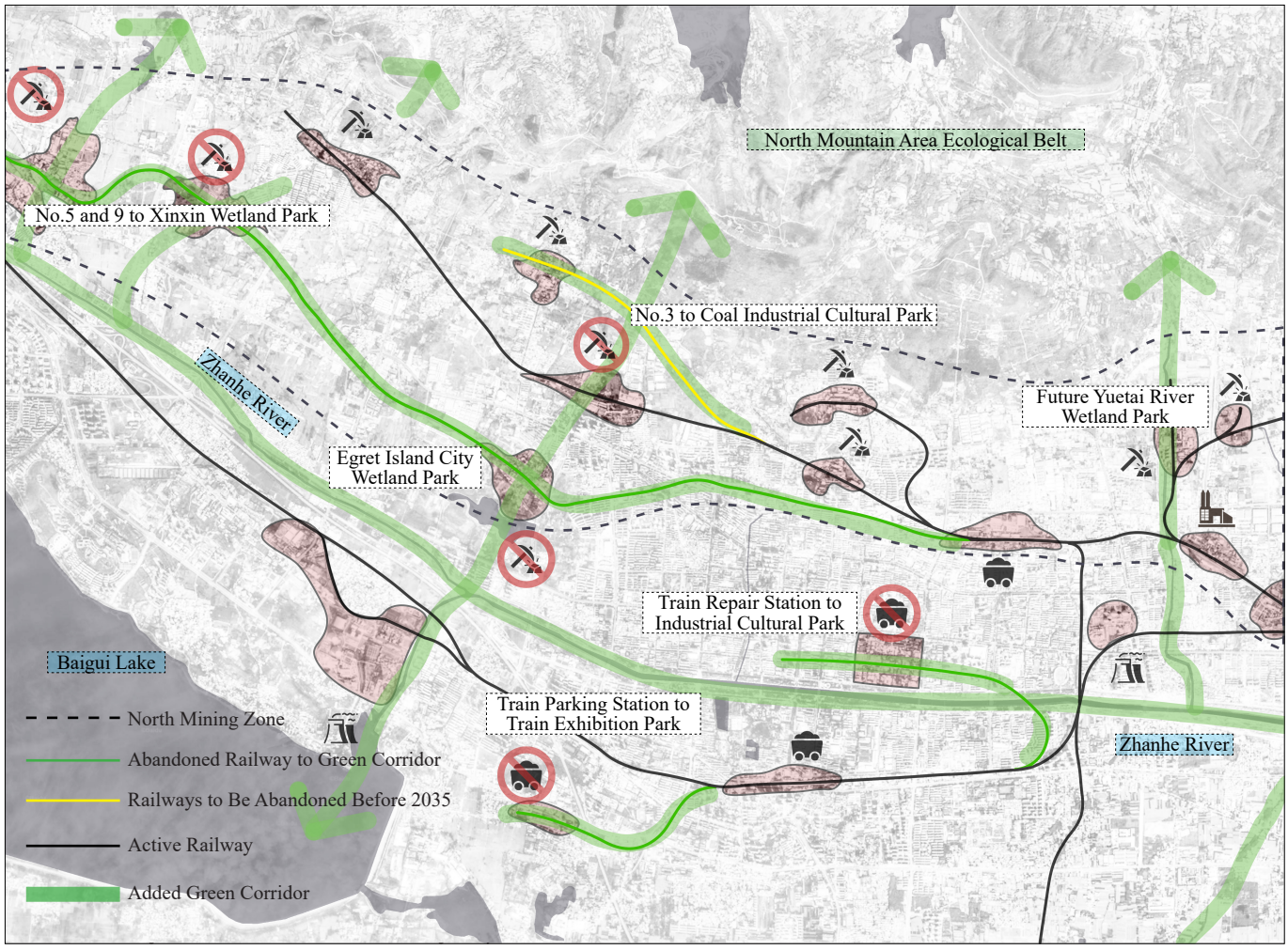


Figure 6.2-2, Map and Dragram of Idea on Pingdingshan's Advanced Green Network. Source: Drawn by author, based on *General Spatial Plan for Pingdingshan City (2021–2035)*.

several ecological restoration projects. These include converting the subsidence areas at Mine No.9 and the gangue hills near Mine No.10 into *Yuetai River Wetland Park* along the *Yuetai River*. Together with the existing *Mine No.7 Wetland Park*, these projects could link with the *Zhanhe River* and its greenbelt, as well as the northern mountain range, to form a cohesive urban green ecological network.In addition to large-scale projects, smaller ecological restorations are also feasible. Examples from the *General Spatial Plan* include converting the outlying areas of Mine No.8 into the *City's Suburban Park* and transforming the area near the small lake by Mine No.12 into *Donghu Park*. Both demonstrate how smaller mining sites can be integrated into the city's green infrastructure.

Pingdingshan's planning proposals and urban policies place significant emphasis on ecological restoration, particularly the concept of a "green ecological network" aimed at connecting different parts of the city through green infrastructure. Therefore, it is important to further refine the existing plans. Future strategies could involve repurposing the railways that connect these mining sites. Previously, these railways divided the city and restricted spatial flow, but they could be transformed into green corridors linking various ecological areas, thereby enhancing Pingdingshan's urban ecological network (Zhang, 2020). As of 2024, the old railway connecting Mine No.9 and Mine No.7, along with the abandoned train repairing station in the city's core, has already been decommissioned. While these railways currently fragment the urban space, they hold significant potential to become part of the city's green infrastructure

The juxtaposition of preserved industrial structures against restored natural environments creates a visual and emotional connection. These kinds of spaces evoke memories of the city's coal mining history while offering residents a modern, serene recreational experience. Walking through these parks, visitors can reflect on the evolution of Pingdingshan, intertwining past and present. Beyond cultural resonance, these green spaces significantly improve urban environmental quality, contributing to higher living standards and greater happiness for the city's residents.

6.2.1.3 Integrating Living and Other Functions

The industrial *Danwei* community is a significant site of collective memory, where workers lived and worked together in close communities, forming strong social bonds (Ma, 2022). These spaces included residential facilities—housing units with utilities such as water, electricity, and heating—as well as public services and amenities such as canteens, shops, schools, kindergartens, parks, cinemas, and hospitals. However, after China's 1998 housing market-oriented reform, commercial housing replaced the *Danwei* system's public housing as the primary supply (Huang, 2018). This shift prioritized profitability and overlooked the preservation of public service and welfare spaces to some extent. As a result, many former *Danwei* facilities, public spaces, industrial elements and symbols were replaced by higher-density residential developments, leading to reduced public spaces, lower living quality, and the loss of industrial culture and memory (Liu, 2021).

Learning from *Danwei*'s model is not a historical regression, it could prove effective in reactivating small-scale historical industrial spaces within residential neighborhoods. For instance, projects like Shanghai's Bridgelife Neighborhood Center and Quzhou's Pyrite Mine Future Community provide inspiration. In areas where commercial development is already substantial or where original *Danwei* structures remain, such as many Pingdingshan's industrial neighborhoods, such as an abandoned warehouse in the

area of Coking Plant, small-scale industrial spaces could be repurposed into public service facilities and mixed-use areas. These spaces could integrate historical industrial spaces with daily life, offering residents improved amenities. And what would be important that, it can turn negative perceptions of industrial historic spaces into positive ones, so as to inherit and continue the industrial culture, identity and memory that the city once prided itself on.

This approach can follow two main strategies. First, smaller industrial sites can be transformed into public spaces serving the surrounding worker's neighborhoods. Second, existing industrial structures can be adapted and integrated with residential and public services. Many mines in Pingdingshan, such as Mine No.8 and Mine No.2, have partially abandoned areas suitable for such adaptations. Similarly, smaller warehouses and factory buildings near residential areas could be repurposed to meet specific local needs. By aligning these transformations with the characteristics of each neighborhood, it is possible to address residents' demands while maintaining harmony with historical industrial spaces. This method is especially important given the aging population in former *Danwei* communities. Socially oriented and publicly beneficial redevelopment can meet the needs of elderly residents, and ensuring the broader community benefits from enhanced public spaces.

Public engagement is also crucial in this process. Traditional historical industrial spaces projects often prioritize government and developer input, overlooking the role of residents. This can lead to a loss of focus on what residents actually care about, weaken the connection between physical space and collective memory. Encouraging residents to participate in the redevelopment process fosters a sense of ownership and strengthens community ties, and also implements China's concept and slogan of "people's city".

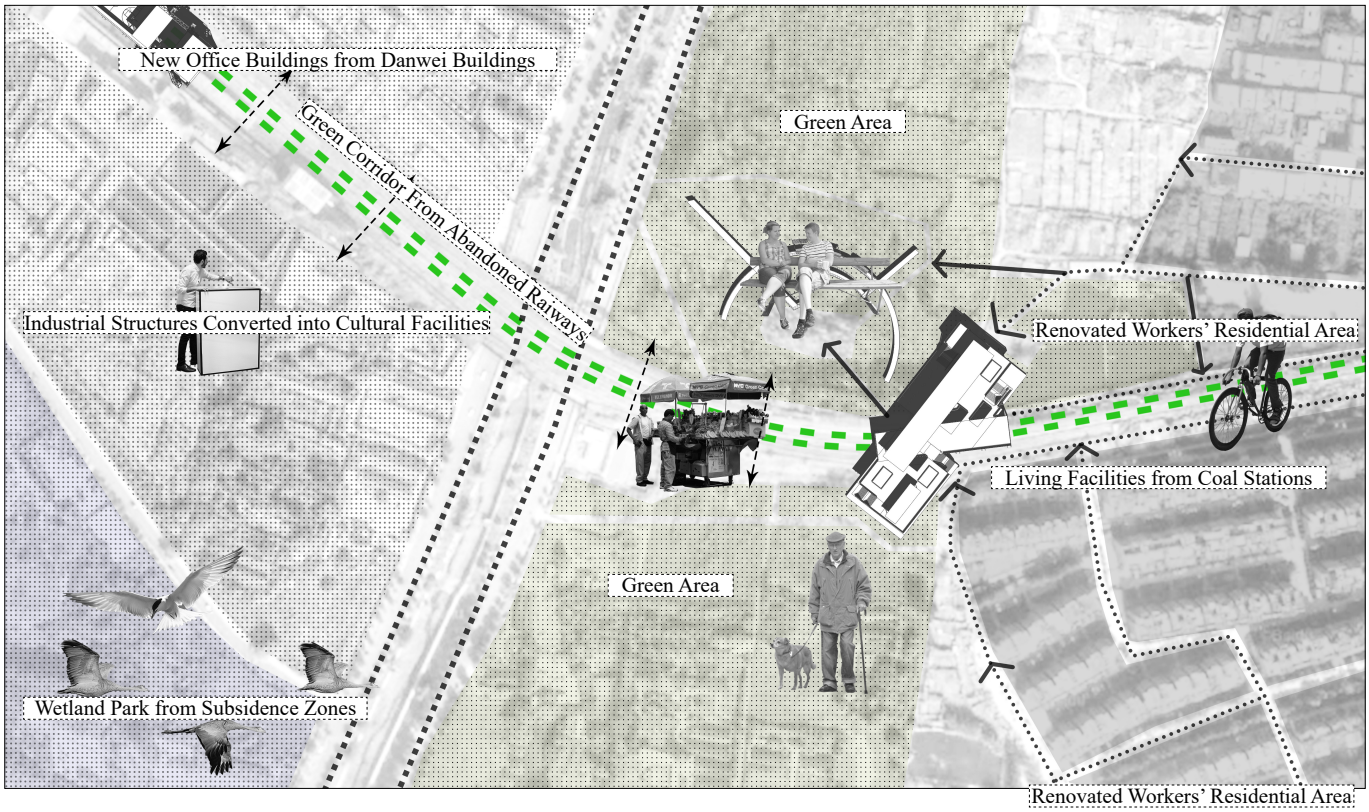


Figure 6.2-3, Concept Diagram of Integrating. Pingdingshan's Typical Coal Mining Industrial Historical Spaces with Cultural Facilities, Living Facilities, Ecological Restoration, and Green Infrastructure, based on No.3 Mine. Source: Drawn by author.

6.2.2 Partially Suitable Strategies: Consumption, and Creative Industry

The strategies of creative industries and symbolism and consumption (in 5.4 and 5.5) are partially suitable due to the city's current socio-economic conditions and limited capacity to attract substantial commercial or cultural tourism. These approaches may only prove effective in specific cases under favorable conditions. For instance, introducing creative industries could improve industrial and cultural transformation, but this would require the existing industries, at least planning, and policies, alongside the ability to attract the necessary talent and investment. Similarly, transforming industrial spaces into large-scale commercial and consumption center would depend on enhancing of the city's appeal and raised residents' incomes, creating opportunities for deeper exploration of industrial culture and memory.

6.2.2.1 Economic and Commercial Limitations for the Symbolism and Consumption

For medium-small industrial cities like Pingdingshan, the Symbolism and Consumption model described in Section 5.5, which relies on market-driven commercial and consumer activities, is not currently suitable, or not completely suitable. This approach demands strong economic vitality and a ability to attract commercial investment. Historical industrial spaces under this model are redesigned as commercial and consumer symbols, adding cultural value to the market (Huang, 2018). However, Pingdingshan's current focus remains on improving residents' quality of life. Projects such as *Shanghai's 17th Cotton Textile Factory* and *Xi'an's Dahua 1935* were successful only because they were supported by the economic and commercial appeal of their cities, which are first level cities in China. Even so, the well-designed *Dahua 1935* project in Xi'an is highly regarded in academia and design circles, but faces commercial risks, underscoring the risks inherent in such strategies. Therefore, the city must have a number of middle-class residents or tourists who are willing to pay for the added value of industrial culture, which is exactly what Pingdingshan City lacks.

As analyzed in Section 5.5, the Symbolism and Consumption model represents a reinterpretation of industrial culture for commercial use (Chen, 2013). In many ways, it departs from the original spirit of industrial culture rooted in the working class's entrepreneurship, which is memorialized in the city's largest sculpture in the center of the city. And instead, it aligns with consumerist values prevalent in cities dominated by the middle and petty bourgeoisie, which is also a source of the workers' "pain culture" (Wang, 2006). Although, it is difficult to clearly discuss whether its impact on industrial culture and memory is positive or negative, it still a strategy worth exploring for cities with a large amount of historical industrial spaces.

In the foreseeable future, as incomes in Pingdingshan and similar medium-small industrial cities continue to rise, there may be growing demand for consumer experiences rooted in industrial culture and symbolism. Currently, smaller cities often use historical or cultural themes (usually from ancient history and culture) as symbols to create commercial spaces like cultural streets, night markets, food courts, bars, and shopping centers. In this context, industrial culture could serve as a similar symbolic and economic asset for Pingdingshan. For instance, integrating historical industrial spaces into small-scale commercial districts in central urban areas could combine cultural and economic benefits. Pingdingshan has already begun experimenting with small-scale commercial projects such as "movable cultural street markets." Utilizing historical industrial spaces for these projects could have two benefits—providing functional spaces for small markets, while preserving industrial culture and memory in a way that avoids the full commercialized transformation seen in larger-scale projects. This approach offers a balanced path to blend industrial culture with contemporary urban life.

6.2.2.2 Opportunities for New Industries

For medium-small industrial cities like Pingdingshan, creative industries, such as architecture, art design, software design and development, are often concentrated in major metropolitan areas like Shanghai and Shenzhen, where scale and clustering attract talent and investment. However, this does not mean that Pingdingshan cannot try a similar model. By focusing on innovative industries such as high-end manufacturing design, research and development, and technological industries, the city can align its industrial transformation goals with the reuse of its historical industrial spaces.

As discussed in Section 4.3, Pingdingshan is actively promoting economic diversification to reduce its reliance on coal mining. The city aims to build a more sustainable and resilient industrial structure by developing of high-end manufacturing and new material industries. Pingdingshan's 2035 master plan shows this goal with proposals such as a *High-Tech Industrial Development Zone*, *Nylon New Material Development Zone*, *Modern Service Industry Development Zone*, and a *High-Tech Comprehensive Service Park* in the eastern part of the city. These zones are strategically located near the planned *Yuetai River Wetland Park* (formerly Mine No.10), *East Lake Park* (Mine No.12), and the *Suburban Park* (Mine No.8). Notably, Mines No.10 and 12 are expected to cease operations around 2035, providing an opportunity for redevelopment.

These emerging industries provide an opportunity to reuse the historical industrial spaces as office and research facilities. The proximity of these sites to the *Danwei* residential communities, such as *West Worker Town*, which is the residential area for Mine No.8, No.10 and No.12, due to deindustrialization, many vacancies have been created, further supports this strategy. By integrating innovative industries with reused industrial spaces and the new urban parks mentioned earlier, Pingdingshan's eastern urban area has the opportunity to transform its industry in a more cost-effective way and, as we said, protect, inherit and renovate the city's industrial culture and memory.

Culturally, this approach could redefine the city's industrial legacy, not only physical spaces, but also industrial culture and memory. Transforming the coal mining heritage into spaces for innovation provides functional reuse, as well as reshapes the city's collective memory. The entrepreneurial spirit of coal workers could find continuity in new industries, turning what might otherwise be a narrative of decline into one of reinvention and optimism. This would foster a dynamic and evolving urban identity, enabling residents to view the industrial past as a foundation for the city's future growth and vitality.

6.2.3 Unsuitable Strategy: The Limitations of Urban Event and Marketing

The urban event and marketing (in 5.1) strategy is unsuitable for medium-small industrial cities like Pingdingshan at their current stage of development and position in the region, as these cities are not the core cities of the region, especially in terms of culture. These cities lack the capacity to host large-scale events or establish itself as a major cultural destination. This approach is better suited to regional cultural or economic hubs with stronger resources and infrastructure (Huang, 2018). While currently impractical for Pingdingshan, it could serve as a long-term aspiration. Other forms of this strategy may be adopted in the future, or there may be an opportunity to find a new cultural positioning for the city to achieve it.

6.3 Implications for Medium-Small Industrial Cities

The case of Pingdingshan provides valuable insights for other medium-small industrial cities facing similar challenges. These cities often share characteristics such as a history of heavy industry, diverse industrial spaces, and the need to balance economic development with cultural preservation. This chapter outlines how the strategies discussed in Chapter 5 and 6 can guide the transformation of historical industrial spaces in these cities, ensuring sustainable development while honoring their unique identities.

6.3.1 Policy Framework, Strategic Adaptation and Practical Considerations

Medium-small industrial cities should adopt policies that integrate historical industrial spaces into their urban planning. General spatial plans must emphasize preserving industrial culture and collective memory. These plans should not only protect physical spaces but also improve the living conditions of communities tied to historical industrial spaces. For example, policies should prioritize enhancing worker housing areas and rehabilitating degraded industrial environments to provide the basement for positive cultures. Also, clear assessments of different industrial sites can help in selecting the right strategies for their transformation. Additionally, cities should combine industrial culture with local traditions to strengthen their cultural identity. This approach not only preserves historical industrial spaces but also broadens the city's cultural appeal.

These cities can benefit most from strategies like cultural facilities, ecological restoration, and integrated living and working spaces. These approaches improve residents' quality of life and positively transform industrial culture and memory. Projects such as industrial museums, ecological parks, and upgraded worker housing provide practical examples that directly benefit communities while preserving the cultural identity of former industrial areas.

Partially suitable strategies, including symbolism and consumption and creative industries, require careful adaptation to align with a city's socio-economic conditions. Cities with developing economic bases may difficult to attract high-level cultural tourism or creative enterprises, but smaller-scale implementations are feasible. For example, local innovation industries, such as high-tech manufacturing and design, could utilize industrial spaces for offices or research labs. Similarly, themed markets or food streets rooted in industrial culture could support economic growth while preserving historical significance.

Urban event and marketing strategies are generally impractical for medium-small cities due to limited resources and infrastructure. While these strategies are better suited to larger cultural hubs, smaller cities could explore localized events, such as regional fairs or festivals, to incrementally enhance their cultural profile. These efforts can serve as stepping stones for future aspirations, preparing the city for larger-scale cultural initiatives as it develops.

6.3.2 Culture, Collective Memory, Collaboration, and Future Identity

Similar to Pingdingshan, most medium-small industrial cities in China are resource-based and currently face economic challenges during their transformation. They also confront issues related to culture, collective memory, and identity. Topics connected to *Danwei* compounds and historical industrial spaces are crucial for the development of industrial cities, especially in North China. However, existing redevelopment practices have often failed to adequately protect and adapt these sites of memory, with their cultural value remaining underrecognized, leading to a potential "crisis of amnesia" (Zhang, 2021). While the overall environment of industrial cities is gradually improving, ecological conditions near industrial *Danwei* areas remain uneven. Many such spaces, like those in Pingdingshan, continue to suffer from poor living conditions and low quality of life. These economic and social challenges often contribute to negative perceptions and a decline in cultural and memory-based identity.

As with Pingdingshan, the industrial culture and collective memory of these cities urgently require preservation.Preserving collective memory is critical to meaningful industrial transformation. Industrial spaces are more than physical structures; they represent the struggles and achievements of past generations (Ma, 2022). Redevelopment projects should involve local communities to ensure these memories are honored and passed down to younger generations. Educational spaces and interactive cultural initiatives can bridge generational gaps, fostering a shared identity rooted in Historical industrial spaces.

Collaboration between governments, communities, and the private sector is crucial. Governments can lead planning efforts, protect Historical industrial spaces, and encourage private investment to support adaptive reuse projects. In China's political context, governments play a central role in overseeing the entire process, maintaining respect for industrial culture, workers' collective memory, and their identity. They can provide stronger policy and financial support to ensure these values are preserved. Community involvement ensures redevelopment meets local needs and priorities. Through participation by residents, social organizations, and community initiatives, it is possible to enhance public engagement, emphasizing the meaning behind the slogan "A city built by the people, for the people." This approach fosters a sense of ownership and pride among residents, ensuring redevelopment aligns with their expectations and aspirations.

Ultimately, the core of preserving and continuing the industrial culture, collective memory, and identity of medium-small industrial cities lies in transforming negative perceptions into positive ones. This should always be a primary consideration. By transforming Historical industrial spaces into cultural and functional assets, cities can foster unity and promote sustainable growth. Healthy, sustainable, and positive industrial spaces must replace abandoned, negative, and polluted ones. This transformation in nature is central to the redevelopment of historical industrial spaces.

Pingdingshan's case demonstrates how balancing economic, social, and cultural objectives can revitalize medium-small industrial cities, providing a model for similar urban areas to honor their past while building a resilient future. Such an approach allows negative cultural and historical memories to evolve into positive ones, creating a solid foundation for their preservation, continuity, and potential future exploration.

Conclusion

This thesis studies the transformation of historical industrial spaces in China's medium-small industrial cities and focuses on Pingdingshan as a case study. It explores how these transformations affect urban culture, collective memory, and identity, while also identifying the challenges they entail. The thesis emphasizes the need for strategies that balance economic, spatial, ecological, and cultural demands, with a particular focus on preserving urban culture—a crucial aspect that has often been overlooked in the planning policies of medium-small cities. The results highlight that transforming industrial spaces in cities like Pingdingshan involves not only physical and economic changes, but also the preservation of cultural characteristics and collective memory. A key focus is on reversing the shift from pride to negativity surrounding industrial culture and memory, and ultimately restoring a positive and forward-looking identity.

1. Summary of Contents and Research Framework

The study is structured around the core topic of how medium-small industrial cities in China can balance economic revitalization and cultural memory preservation in the spatial transformation of historical industrial spaces. To achieve this, the research follows a progressive framework that connects institutional and historical context analysis, cultural and spatial reinterpretation, case verification, strategy evaluation, and practice-oriented suggestions. This methodological framework ensures that the research findings are not only theoretically reasonable but also applicable to real-world urban transformation.

1.1 Three Interconnected Dimensions as Theoretical Foundation

The theoretical foundation of this research is built upon three interconnected dimensions:

Institutional Dimension (Chapter 1): The study begins by examining China's urban planning system, administrative hierarchy, and classification standards, establishing medium-small industrial cities as a distinct research category. This provides a legal framework for analyzing Pingdingshan's planning constraints in Chapter 4 and reveals structural conflicts between land finance dependency and historical industrial space conservation.

Administrative level → Explain Pingdingshan's planning authority as a prefecture-level city;

Urban planning tools → Preface to Chapter 4: Analysis of the Pingdingshan General Spatial Plan;

City classification → Defining the "medium-small industrial cities", the scope of the research, connecting to the historical analysis in Chapter 2.

Historical Dimension (Chapter 2): The research reviews the evolution of industrial cities from the planned economy era (how they developed initially, *danwei* system) to the market-driven urban transformation from 1980s, and the urban challenges of today. This historical perspective uncovers the root cause of the challenges, shows the common structural problems of resource depletion, spatial decay, and cultural disconnection. The context discussed in this chapter directly inform the strategy evaluation in Chapter 5

and 6, particularly in distinguishing if these strategies are suitable for the transformation paths of medium-small industrial cities.

First Five-Year Plan to Third Front Construction → Explain the spatial form of the "Urban edge industrial belt" of medium-small industrial cities (Chapter 4 Distribution of Pingdingshan Mining Area);

Reform and Opening-Up Land System Changes → Connecting the institutional motivations for the dissolution of the *danwei* system in Chapter 3;

Common issues such as resource depletion → Provide historical context and support for the necessity of the Chapter 5 strategy;

Cultural and Spatial Dimension (Chapter 3): The study introduces the concept of "*danwei* spaces as memory carriers", analyzing how the spatial and social structures of industrial communities shaped collective memory and identity. The research further studies how the disintegration of *danwei*-based communities led to a crisis of cultural identity. These outcomes directly guide the strategies which focus on the integration of historical industrial spaces with community life functions, proposed in Chapter 6, ensuring that spatial renewal continues the community living functions and social structure of the urban space previously constructed by the *danwei* system and space.

Enclosure of danwei space → Explaining the status of spatial segregation in the industrial and mining communities of Pingdingshan in Chapter 4;

Collective memory carrier → Theoretical basis for the strategy of "cultural facilities" in Chapter 5, and the core topic of the entire thesis on cultural needs;

De-danweization of the identity crisis → Showing one of the reasons absence of culture and memory, responding to the social objectives of the strategy "Integration of Community Functions" in Chapter 6;

1.2 Case Synthesis: Pingdingshan's Challenges & Practical Strategies Evaluation

Introduction of specific cases (Chapter 4): uses Pingdingshan as a case to concentrate the theoretical topics of the previous three chapters: the north mining area and railway network confirms the spatial heritage of the "Urban edge industrial belt" in Chapter 2, the current situation of workers' community isolation reflects the cultural consequences of the disintegration of the *danwei* system in Chapter 3, and the 2035 General Plan exposes the cultural blind spots of the master planning tool described in Chapter 1.

Development stage → Reflects Chapter 2 theory of common issues such as resource depletion and more spatial problems;

Danwei distribution in the mining area → Physical preservation of the danwei spatial heritage and the transforamtion of urban space in Chapter 3;

Challenges and The General 2035 Planning Cons and Pros→ Leading to the practical needs for

various strategy evaluations in Chapter 5;

Practical Strategy, Comparison of Six Strategies (Chapter 5): attempts to build a qualitative "culture-economy-space-environment" evaluation standard by introducing and comparing cases of different cities with six strategies. The evaluation are from the theories in the first three chapters and the focus of Chapter 4, including the cultural impacts of strategies (memory carrier in Chapter 3) and the adaptability of medium-small industiral cities (administrative and economic resource limitation in Chapter 1 and historical context in Chapter 2).

Focus on Cultural Impacts → Direct response to the needs of memory carrier protection in Chapter 3;

Various Case City Tier → Compare and contrast the small and medium-small industiral city attributes of Pingdingshan in Chapter 4;

Economic and Policy Feasibility → Provide criteria for the choosing of strategies in Chapter 6;

1.3 From Theoretical Review and Case Studies to Practical Suggestions

In the practical suggestions (Chapter 6), the solution is based on the context and analysis summary of the previous chapters. The policy level is reflected in incorporating cultural impact assessment into the General Planning (responding to the limitations of General Planning in Chapters 1 and 5), and the spatial level is based on the *former* danwei system living circle to design middle-scale community space (continuing the cultural and spatial logic of Chapter 3), and then integrating multiple dimensions such as economy, environment, and culture (responding the common problems in Chapter 2 and the strategy comparison in Chapter 5). The final "Pingdingshan Model" has both case specificity and type universality.

General Planning and Policy Framework Suggestions → Respond to the requirements and specifications of urban planning systems, tools and stakeholders in Chapter 1.

Three Optimal Strategies → Based on the evaluation results of the strategies in Chapter 5 and the current situation and challenges of Pingdingshan in Chapter 4;

The Universality of Medium-small Industrial Cities → Based on the main objective, the "common problems" of these cities in Chapter 2, and the spatial and cultural mechanisms in Chapter 3.

2 Main Research Outcomes

2.1 Common Problems and Challenges in Chinese Medium-Small Industrial Cities

China's medium-small industrial cities like Pingdingshan are facing the structural challenges—single economic path, cultural blind spots in urban planning, identity crisis.

Economic Path Dependency: Most of these cities are trapped in a single industrial path established during the planned economy era. Pingdingshan's challenge lies in the coexistence of exhausted coal mines and large areas of abandoned industrial land. This phenomenon shows the "deindustrialization trap" in resource-dependent cities. The overreliance on a single industry, especially the resource industry, decreases economic diversification, leaving municipalities unprepared for post-industrial transitions.

Cultural Blind Spots in Urban Planning: Current urban planning systems prioritize new high-end industry, physical infrastructure and ecological restoration over cultural aspects. The *General Spatial Plan*

for Pingdingshan City (2021–2035), while ambitious in these targets, lacks concrete measures to protect and reuse historical industrial spaces and their culture. In the absence of policy tools like cultural impact assessments in urban planning, urban renewal frequently erases memorial spaces.

Identity Crisis: The dissolution of *danwei* has impacted the social fabric of industrial neighborhoods. While older generations still remain fading collective memories of *danwei* life, younger generations show growing indifference to industrial culture—as evidenced by the deserted Pingdingshan Workers' Cultural Palace and the outflow of miners' descendants. This intergenerational disconnection threatens to disconnect cities from their pasts.

2.2 Practical Recommendations and Significance

This thesis provides insights into how medium-small industrial cities in China, like Pingdingshan, can transform their industrial spaces while keeping their history and culture alive. The findings show that economic development and urban renewal shouldn't lead to lost of industrial culture and collective memory. Instead, cities should balance economic growth, urban development, and cultural preservation. The conclusions of this research offer both policy frameworks for general urban planning and practical strategies that can help similar cities plan their future.

2.2.1 Integrating Cultural and Memorial Aspects into Urban Planning

One of the key conclusions of this study is that general urban planning should include industrial culture and memory as an important part of urban development. Currently, most urban plans focus mainly on economic and physical changes, often ignoring the cultural aspects of transformation. This leads to the destruction and neglect of historical industrial spaces, making it more difficult for communities to maintain a sense of identity. General spatial plans must emphasize preserving industrial culture and collective memory. These plans should not only protect physical spaces but also improve the living conditions of communities tied to historical industrial spaces. For example, policies should prioritize enhancing worker housing areas and rehabilitating degraded industrial environments to provide the foundation for positive cultures. For Pingdingshan City, it is crucial to set clear rules in the *General Spatial Plan (2021–2035)* to protect key historical industrial spaces, such as *Mine No.2* and the *Workers' Cultural Palace*.

Also, clear assessments of different industrial sites can help to select the right strategies for their transformation. Additionally, cities should combine industrial culture with local traditions to strengthen their cultural identity. This approach not only preserves historical industrial spaces but also broadens the city's cultural appeal. To achieve this, urban planning policies should consider the following: historical industrial spaces should be assessed for cultural value before redevelopment. Former worker and industrial communities should be improved rather than removed. Environmental conditions in industrial areas should be restored to improve residents' quality of life.

2.2.2 Six Transformation Strategies for Industrial Historical Spaces

This study evaluates six different strategies for transforming industrial spaces. Three of these strategies are highly suitable for medium-small industrial cities, two have both strengths and weaknesses, and one is not suitable for cities like Pingdingshan.

The most suitable strategies are **cultural facilities, ecological restoration and green infrastruc-**

ture, and mixed-use development. (1) **Converting old industrial areas into cultural facilities**, such as museums and cultural centers help preserve industrial history, educate the public, and attract cultural tourism. This approach ensures that historical industrial spaces remain a meaningful part of urban identity rather than being lost to redevelopment. (2) **Ecological restoration and green infrastructure** provide another viable solution, especially for industrial areas suffering from pollution and poor environmental conditions. Transforming these spaces into parks, green zones, and public recreation areas improves urban livability while supporting sustainability efforts. (3) **Mixed-use development**, where former industrial sites are adapted for dailylife-related functions, such as residential and public purposes, allows these areas to stay relevant in modern urban life while maintaining their industrial character. Instead of isolating historical industrial spaces, this strategy integrates them into everyday urban functions.

Two strategies—**symbolism and consumption, and creative and innovative industries**—offer potential benefits but also face challenges. (4) Some cities use industrial symbols for branding and themed commercial areas, attracting tourists and investment. While effective in larger cities, this approach is harder to sustain in smaller cities due to weaker market demand and the risk of over-commercialization, which can make historical industrial spaces lose authenticity. (5) Similarly, repurposing industrial sites for creative and innovative industries, such as technology hubs or design districts, can be an engine for economic diversification. However, many medium-small industrial cities lack the talent, infrastructure, and financial investment needed to support this transformation, making it difficult to implement in the short term.

The least suitable strategy is **urban event and marketing-based revitalization**. (6) These events require significant financial and infrastructural investment, which medium-small industrial cities often lack. Instead, smaller, locally focused cultural events, such as historical industrial spaces festivals or community exhibitions, may offer a more sustainable way to gradually build cultural identity and civic engagement, which should relate to the cultural facilities strategy.

2.2.3 Universal Value and Cultural Impact

The outcomes of this thesis highlight the universal value of historical industrial spaces as both cultural assets and tools for urban regeneration. Beyond Pingdingshan, medium-small industrial cities across China can use their industrial past to rebuild local identity and foster civic pride, rather than viewing it as an obstacle to modernization. Historical industrial spaces have cultural meaning, representing generations of workers, resilience, and collective memory. By integrating historical industrial spaces into urban planning through these solutions, cities can ensure that these spaces remain active and meaningful, rather than fading into neglect. Protecting local identity while adapting to new economic realities allows industrial cities to preserve their cultural roots as they embrace a more sustainable and inclusive future.

3 Critical Discussions, Limitations and Further Research Suggestions

3.1 Critical Discussions and Limitations

While this study provides valuable insights into the transformation of industrial spaces in medium-small industrial cities, it also has limitations. One key constraint is case selection bias—the six transformation strategies analyzed were primarily chosen from economically developed cities, where financial resources, policy support, and market conditions are much better than those of smaller industrial cities. Medium-small cities often face budget constraints, weaker institutional frameworks, and lower investor

interest, making it uncertain whether these strategies can be implemented effectively without adaptations.

Another key challenge is the capacity limitation of medium-small cities and the inertia of existing policies and urban development models. While local governments in China have shifted their focus from economic growth to more balanced development, including environmental and cultural preservation, the ability of medium-small cities to implement the conservation is constrained by financial limitations, administrative capacity, and urban planning inertia. Many of these cities lack the high-quality experience and professional expertise needed to effectively integrate the strategies into urban plans. Furthermore, most proposed strategies rely heavily on public funding, which places additional financial pressure on local governments already managing multiple urban development priorities.

Additionally, this thesis primarily relies on qualitative analysis, using Pingdingshan as a representative case to infer broader trends in medium-small industrial cities. While selecting Pingdingshan has a high applicability due to its shared characteristics with other similar cities, the study still has a general exploration of common issues rather than an evaluation of conditions of other cities. One limitation of this approach is the lack of a quantitative evaluation framework that could be used to assess transformation strategies across different urban contexts. Without such tools, it is difficult to develop transformation models that suitable for the specific strengths and constraints of each city.

3.2 Future Research Directions

To address these limitations, future research can expand in several key directions. First, more empirical cases should be collected from a wider range of medium-small industrial cities, particularly those with smaller urban areas, single-industry economies, and weaker financial capacity. Cities like Zhoukou and Quzhou are useful case studies in the thesis, but also need long-term tracking. In particular, cities that have recently begun their transformation efforts will be important for understanding the effectiveness of different strategies over time. Since transformation in these cities typically progresses more slowly than in larger metropolitan areas, long-term observations are needed to get the impacts and effects.

Second, future research should integrate qualitative analysis with quantitative evaluation. Currently, most empirical research relies on descriptive and comparative studies, provide valuable insights but lacks a standardized method for assessing success across different contexts. Developing systematic evaluation tools could help measure key factors such as the percentage of original structures, the integration of community functions, and the economic viability. Combining urban economic and environmental data into these assessments would provide a more objective way to evaluate if specific strategies are suitable for different cities.

Since China's urban planning operates on long timelines, monitoring the efforts until 2035 will help improve policy suggestions and ensure the adaptability of the strategies. Lastly, international comparisons are also needed, which focus on seeking more adaptable strategies, considering China's unique governance and urban development context. Future research could provide a more comprehensive and practical framework for cultural aspects of urban space transformation in Chinese medium-small industrial cities.

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