MINISTRY OF CULTURE OF UKRAINE
KHARKIV STATE ACADEMY OF DESIGN AND ARTS

Study on Reconstruction of Digital Media Empowered Industrial Heritage under Urban Renewal

—— (Taking Changzhou Canal No.5 as an example)

通过设计活化工业遗产研究技术

—— ——以常州第五毛纺织厂为例

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•01

Research Background and Significance

Urban Renewal • Industrial Heritage • Digital Media

1.1 Research Background

①

Urban Renewal Shifts to Stock Optimization

Urban renewal is shifting from outward expansion to optimization of existing urban space. Old factory areas are no longer merely targets for demolition, but are redefined as public cultural resources carrying city memory and local identity, requiring careful preservation and creative transformation.

②

Industrial Heritage Needs Cultural Interpretation

The tangible remains—architecture, equipment, production processes—and intangible workers' memories are often scattered and fragmented. They need to be organized into an understandable and engaging narrative system through professional design to resonate with the public.

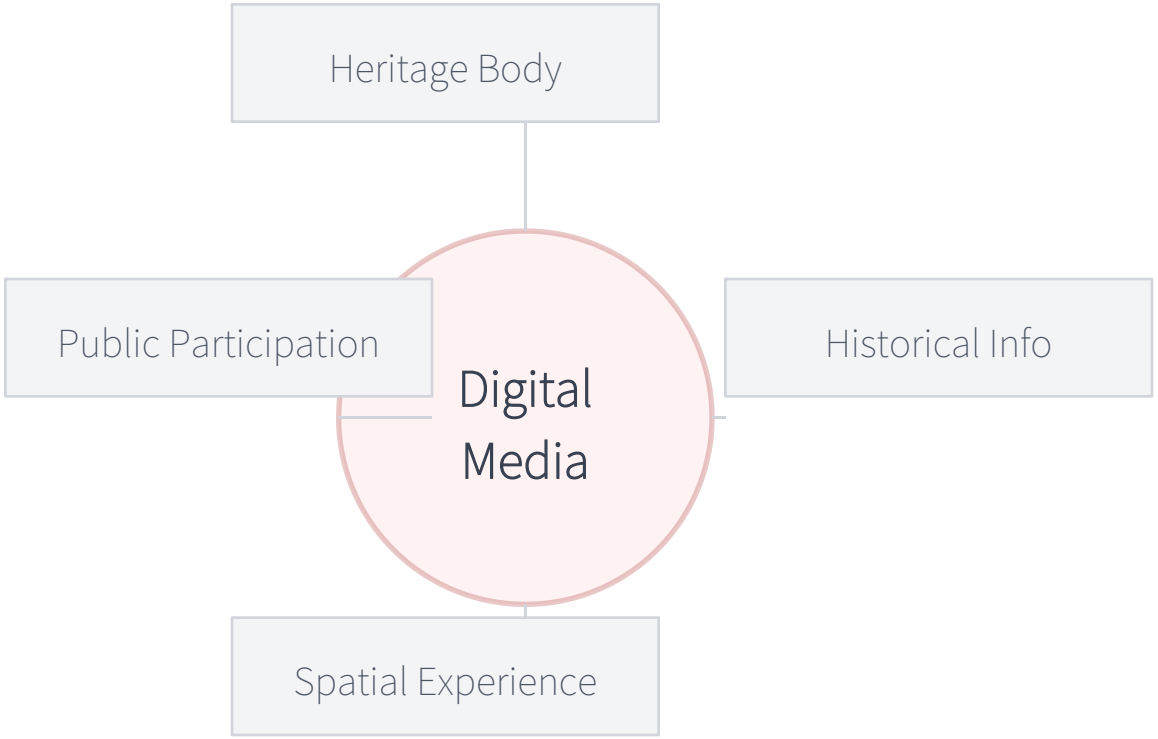
③

Digital Media Provides a New Interface

Digital imaging, AR/VR, interactive projection, sound maps, and smart guides can bring dormant historical information back to the original site, creating immersive, interactive experiences that bridge the gap between the past and present visitors.

The renewal of industrial heritage is evolving from "space reuse" to "experience reproduction"

1.2 Research Significance



On the basis of protecting the authenticity of existing factories, equipment, and historical environments:

- Establish a systematic media framework that interweaves heritage preservation, historical narrative, spatial perception, and public engagement into a cohesive whole.
- Bridge the disciplinary gap between traditional industrial heritage conservation and modern digital media spatial design, fostering interdisciplinary innovation.
- Transform static industrial relics into dynamic, interactive public cultural spaces, revitalizing their social and cultural value in the contemporary context.

Digital media should serve as an integrative layer — not decorative technology

1.3 Research Object & Purpose

Research Object

Focus: Changzhou No.5 Wool Textile Factory & Canal No.5 Creative District (Jiangsu, China)

01 Physical Heritage

Preserved old factory buildings, iconic saw-toothed roofs, red brick walls, industrial chimneys, and original textile machinery as core physical carriers.

02 Spatial Environment

Interwoven streets, alleys, inner courtyards, the factory entrance, and the unique waterfront landscape along the ancient canal.

03 Info & Experience

Intangible textile industry history, collective memories of workers, digital navigation systems, immersive exhibitions, and interactive visitor engagement.

Research Purpose

To explore the synergistic relationship between urban renewal, industrial heritage conservation, and digital media design. This study examines how digital technologies can innovatively support spatial regeneration, enhance cultural expression, and maintain the authentic historical features of industrial heritage sites for sustainable development.

→ Fragmentation of Info

Disconnected historical narratives and scattered archival data hinder the formation of a coherent heritage context.

→ Static Exhibition Gap

Traditional static displays create a disconnect between visitors and dynamic historical space, lacking depth.

→ Youth Engagement Deficit

Insufficient interactive elements fail to attract younger generations to engage with industrial heritage.

1.4 Research Objectives & Methods

Five Research Objectives

1. Construct a robust theoretical basis for digital media interventions in industrial heritage renewal, integrating heritage conservation theories with media technology.
2. Identify and define the core heritage values (cultural, historical, aesthetic) and diagnose the existing spatial, functional, and operational challenges of the research site.
3. Analyze the interactive relationship between digital media applications and industrial heritage spaces through cross-cultural case studies and comparative analysis.
4. Develop a systematic design framework for digital-media-empowered reconstruction, outlining key principles, implementation strategies, and evaluation metrics.
5. Validate the framework's validity and feasibility through a practical design intervention project at Changzhou No.5 Wool Textile Factory.

Research Methods

01 Theoretical Level

- Literature review: Systematic analysis of heritage studies and media theories.
- Case study: Comparative analysis of global digital heritage practices.
- Logical synthesis: Inductive reasoning to form theoretical constructs.

02 Practical Level

- Empirical research: On-site investigation and spatial mapping.
- User-centric: Behavioral observation and stakeholder interviews.
- Design practice: Visual documentation and prototype implementation.

Object of research



Renovation of industrial relics left over from the city

Starting from the new paths provided by digital media, with features such as "immersive experience", "dynamic interaction", and "data-driven", it can solve the problem of industrial heritage revitalization and achieve "dynamic reconstruction".

城市遗留工业遗迹的翻新

从数字媒体提供的新途径出发，借助“沉浸式体验”、“动态互动”和“数据驱动”等特点，可以解决工业遗产的振兴问题，实现“动态重建”。

Chronological boundaries of the research

Focusing on the construction practices of industrial heritage in China in recent years, the latest research findings on industrial heritage are based on the policies issued by the government at present.

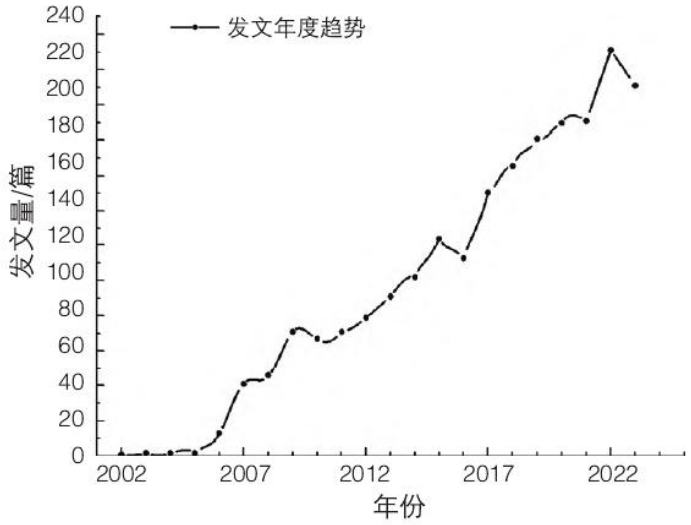


图3　2002—2023年工业遗产改造期刊发文年度趋势



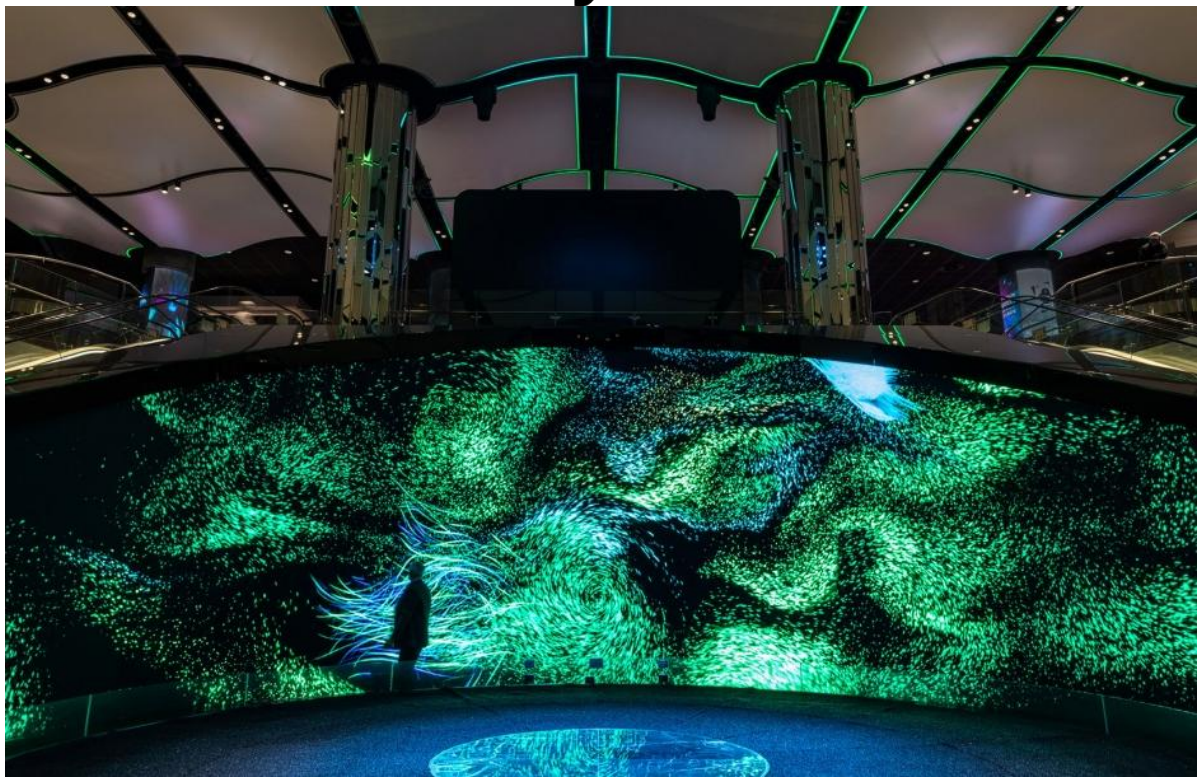


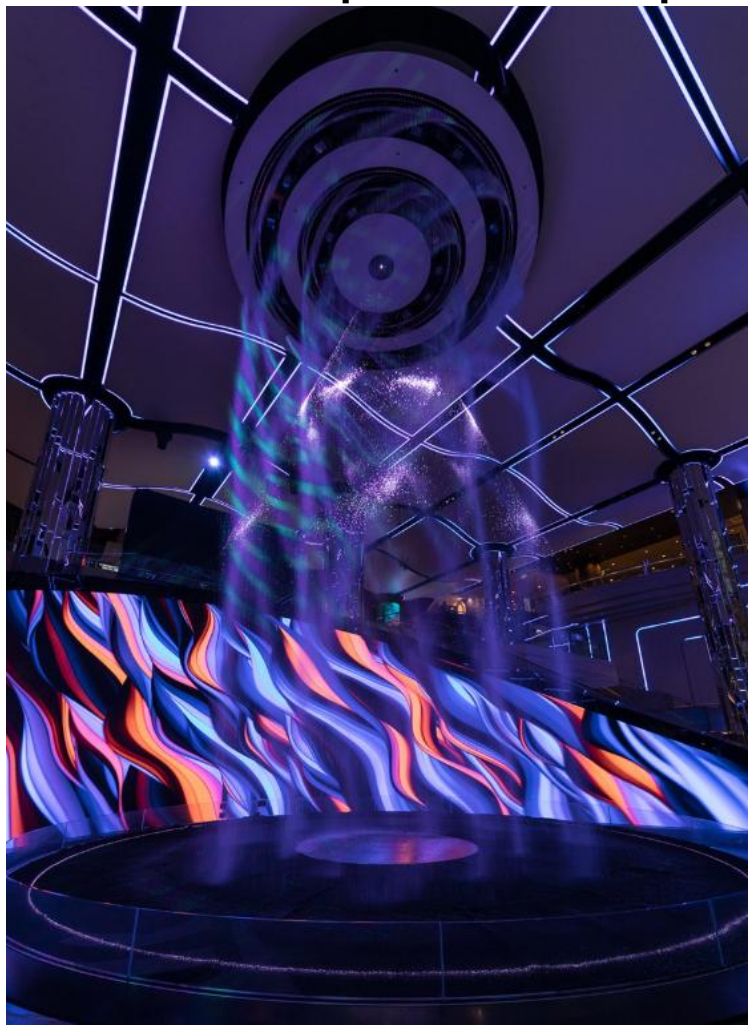
02

Example from practice

Case Study

The Star Immersive Experience Space





This innovative platform transports art out of the gallery context and into the public realm. As meditative as it is spectacular, visitors are welcomed into an immersive moment that surrounds and envelops,

Case Study

The Star Immersive Experience Space



The immersive experience stems from a 25m, 8k resolution, interactive digital canvas at the centre. Curated to the human rhythm, the canvas expresses Sydney's light and movement through the digital artworks of local and international artists, animators and cinematographers.

Case Study

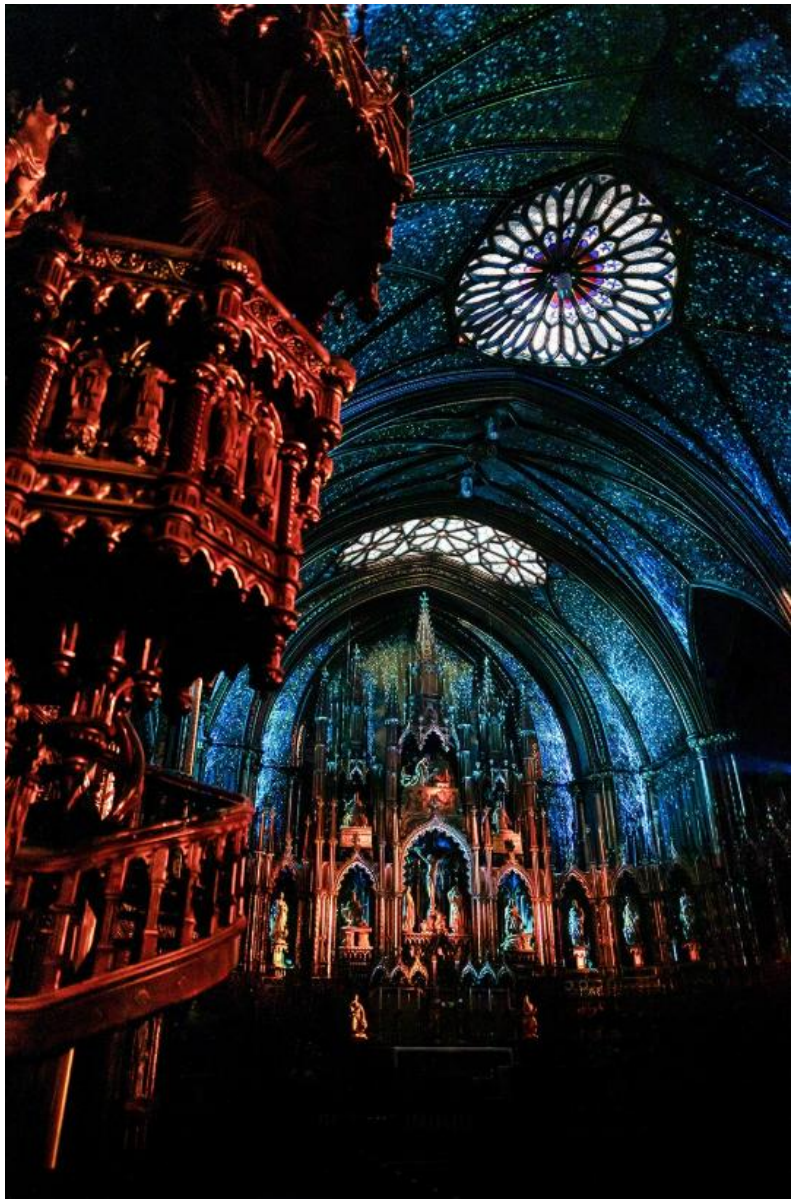
Montreal

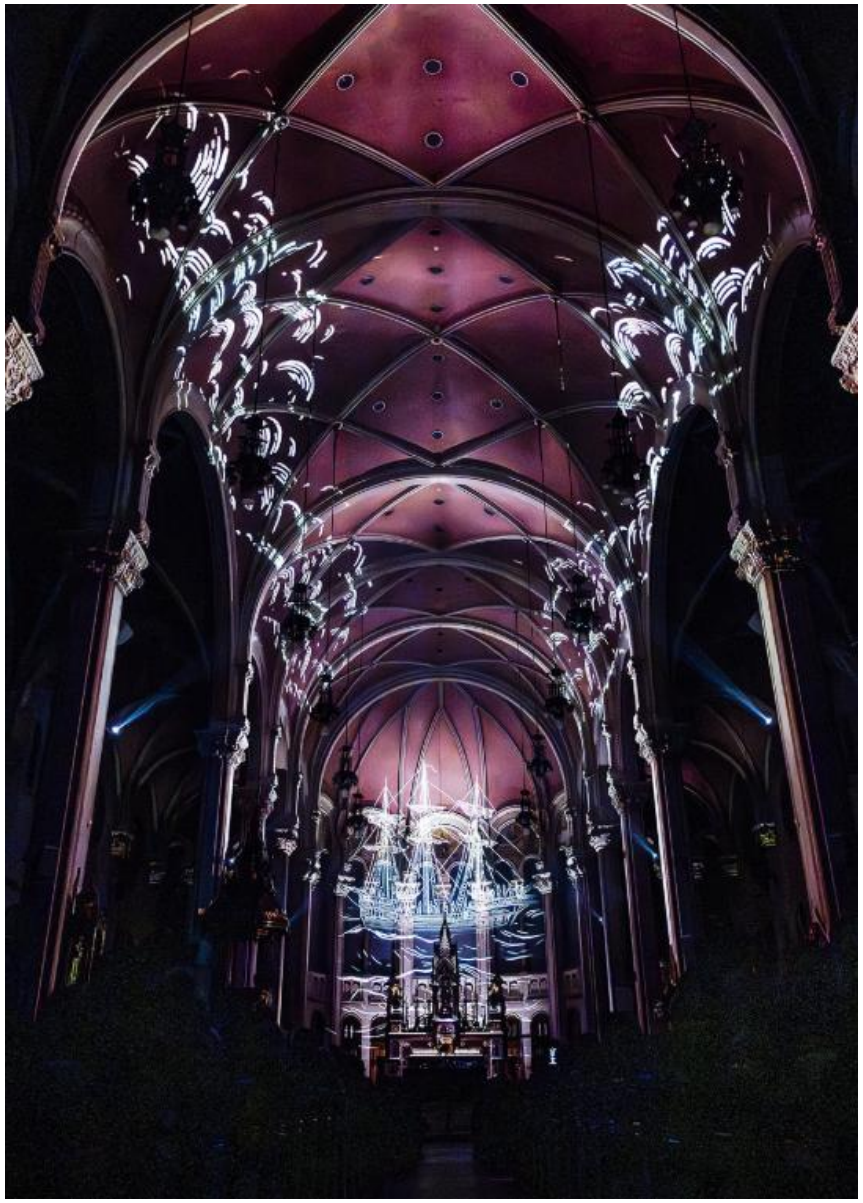




These immersive experiences breathe new life into heritage sites after dark, transforming their indoor spaces by illuminating centuries of tradition, artistry, and craftsmanship in new and unexpected ways.

Fusion of historic ornament and digital imagery







03

View the project

Problems in the surrounding area

01 Degradation of building performance

02 Lack of barrier-free facilities

03 Mixed traffic in the neighborhood

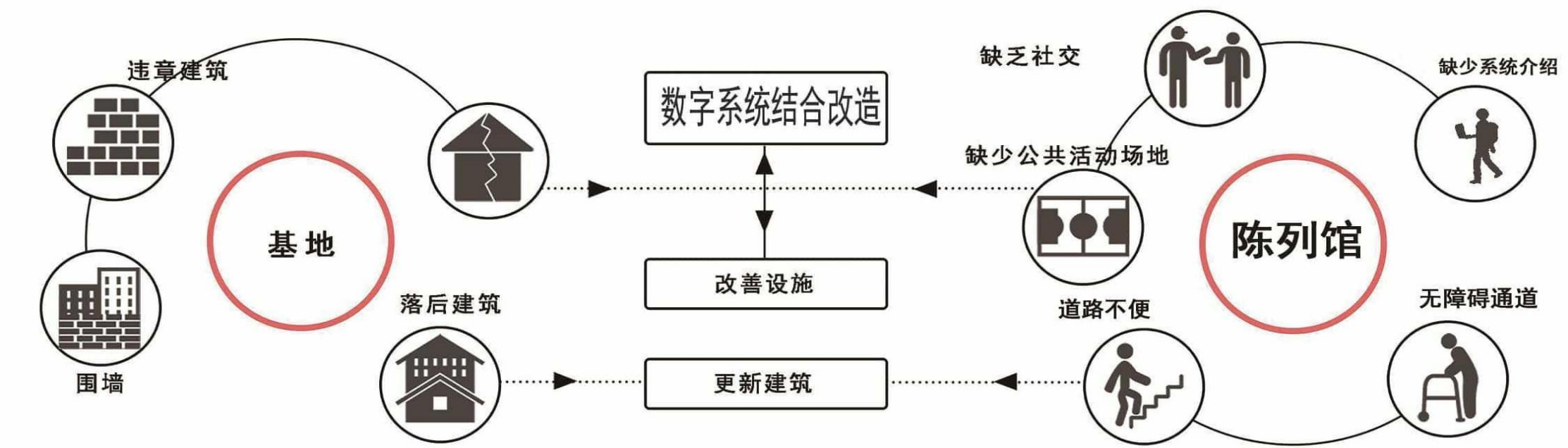
04 Spatial chaos and scarcity

05 The safety management is worrying

06 Loss of community culture



transformation strategy



Improve the service system

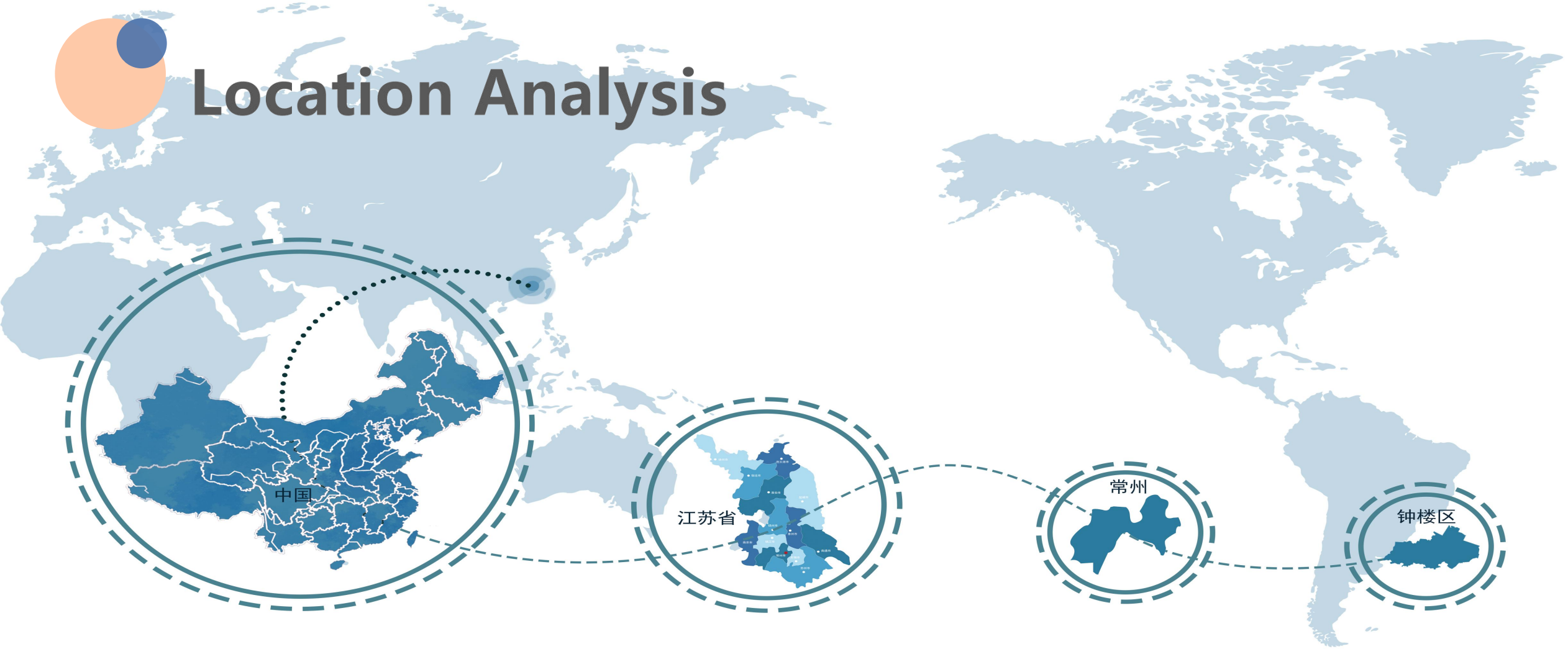
Route planning and layout

Introduce advanced intelligent systems

Strengthen overall planning and construction

Integrate local characteristics

Location Analysis



Canal No.5 Creative District is located on Sanbao Street in Changzhou City, on the south bank of the Beijing-Hangzhou Grand Canal. It serves as a crucial node in Changzhou's implementation of the "Central Area Improvement" strategy and the construction of the "Canal Historical and Cultural Industrial Belt".

current situation overview





scene

Conduct research on the Changzhou Hengyuanchang and its surrounding areas











景观分析 / Landscape Analysis

常州市 · 城市景观结构与生态空间研究 / CHANGZHOU · URBAN LANDSCAPE STRUCTURE AND ECOLOGICAL SPACE STUDY

景观格局 | 水绿交织 | 生态廊道 | 开放空间

LANDSCAPE PATTERN | WATER-GREEN NETWORK | ECOLOGICAL CORRIDOR | OPEN SPACE



图例 / Legend

水体 Water Body

绿地 Green Space

建成区 Built-up Area

开放空间 Open Space

生态廊道 Ecological Corridor

研究范围（示意） Study Area (Approx.)

N

0 0.5 1.0 2.0 km

水绿相依 · 景观共生

INTERWOVEN ECOLOGY · LIVABLE LANDSCAPE

节点分区分析 / Node Zoning Analysis

常州市·城市关键节点结构与空间层级研究 / CHANGZHOU · URBAN NODE STRUCTURE AND SPATIAL HIERARHY STUDY

节点层级 | 枢纽联系 | 滨水活力 | 空间引导

NODE HIERARCHY | HUB CONNECTIONS | WATERFRONT VITALITY | SPATIAL GUIDANCE



图例 / Legend

综合核心节点 Core Mixed-use Node

桥头交通节点 Bridgehead Transit Node

社区服务节点 Community Service Node

滨水活力节点 Waterfront Vitality Node

产业转型节点 Industrial Transition Node

生态开放节点 Ecological Open-space Node

水体 Water Body

道路 Road Network

研究范围（示意） Study Area (Approx.)

N

0 0.5 1.0 2.0 km

节点联动·空间协同

CONNECTED NODES · COORDINATED SPACE

城市肌理分析 / Urban Texture Analysis

常州市 · 城市空间与建成环境研究 / CHANGZHOU · URBAN SPACE AND BUILT ENVIRONMENT STUDY

城市肌理 | 水城格局 | 生态纽带 | 宜居生活

URBAN TEXTURE | WATER CITY PATTERN | ECOLOGICAL NETWORK | LIVABLE CITY



图例 / Legend

- 建筑实体 Building Mass
- 水系 / 河道 Water Body
- 道路 / 开放空间 Road / Open Space
- 绿地 / 公共空间 Green Space
- 研究范围（示意） Study Area (Approx.)

N

0 0.5 1.0 2.0 km

水网交织 · 城市共生

INTERTWINED WATERS · A MORE LIVABLE CHANGZHOU

道路系统分析 / Road Network Analysis

常州市 · 城市道路结构与通达性研究 / CHANGZHOU · URBAN ROAD STRUCTURE AND CONNECTIVITY STUDY

道路等级 | 交通骨架 | 桥梁联系 | 滨水界面

ROAD HIERARCHY | MOBILITY FRAMEWORK | BRIDGE CONNECTIONS | WATERFRONT EDGES



快速路 / Expressway　主干路 / Primary Arterial　次干路 / Secondary Road　支路 / Local Street　水系 / Water Body

N

0　0.5　1.0　2.0 km

路网组织 · 水城联动

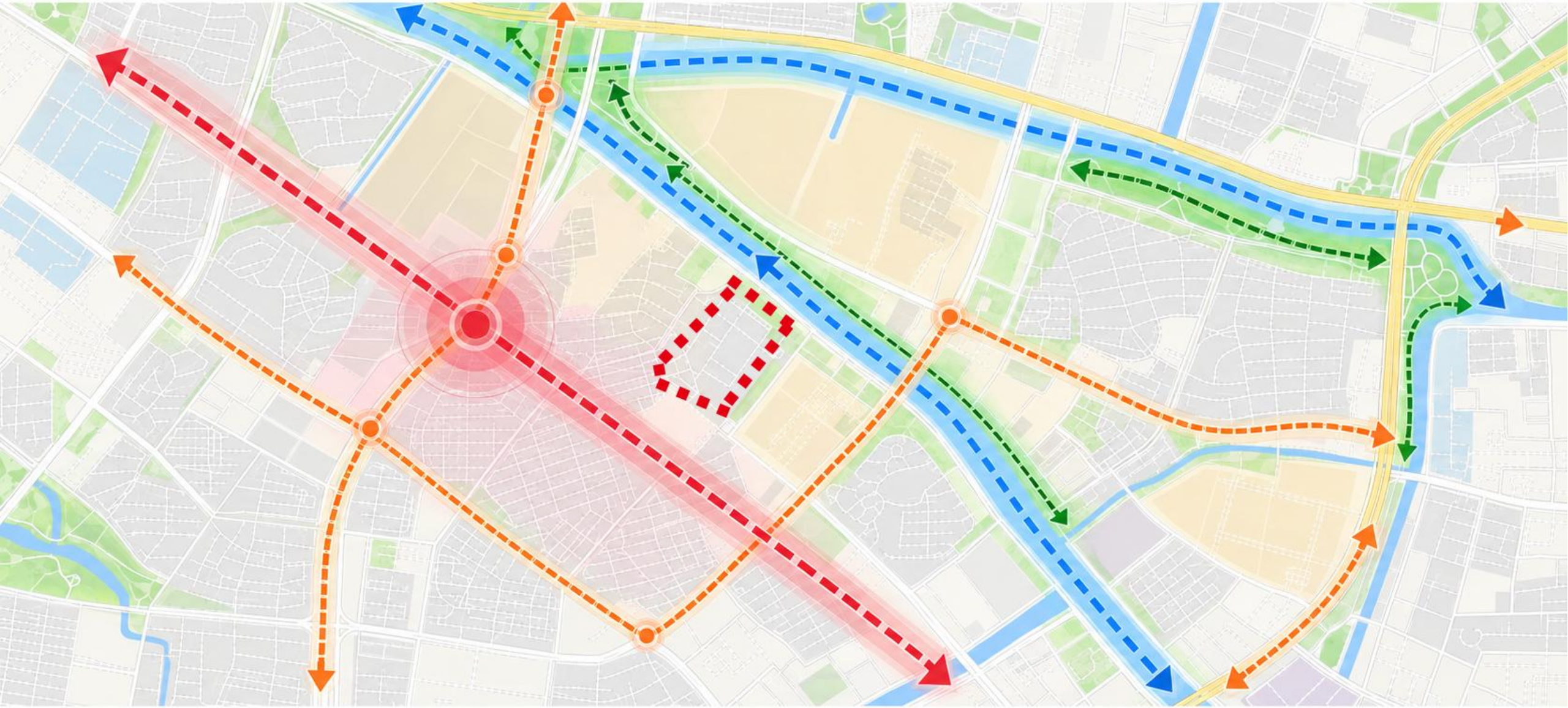
CONNECTED STREETS · WATER-ORIENTED CITY

轴线分析 / Axis Analysis

常州市 · 城市空间轴线结构与发展引导研究 / CHANGZHOU · URBAN AXIS STRUCTURE AND DEVELOPMENT GUIDANCE STUDY

空间轴线 | 滨水引导 | 功能联动 | 结构整合

SPATIAL AXIS | WATERFRONT GUIDANCE | FUNCTIONAL LINKAGE | STRUCTURAL INTEGRATION



图例 / Legend

主发展轴 Primary Development Axis

次级轴线 Secondary Axis

滨水轴线 Waterfront Axis

生态开放轴 Ecological Open-space Axis

核心协同区 Core Coordination Zone

发展引导区 Development Guidance Zone

水体 Water Body

绿地开放空间 Green / Open Space

N

0 0.5 1.0 2.0 km

轴线引导 · 空间整合

AXIS-LED STRUCTURE · INTEGRATED SPACE




常州运河五号工业遗产更新
CHANGZHOU CANAL NO.5
INDUSTRIAL HERITAGE RENEWAL
历史在此生长 · 未来与此相遇
WHERE HISTORY LIVES
WHERE THE FUTURE MEETS
2020
城市更新
URBAN RENEWAL
1980
产业发展
INDUSTRIAL GROWTH
1958
建成投产
COMPLETION
CANAL NO.5
INDUSTRIAL
CULTURE
CREATIVE
LIFE
HERITAGE
PEOPLE
CITY
FUTURE
INDUSTRY
CULTURE
PEOPLE
A NEW LIFE
五号烟囱
NO.5 CHIMNEY
— 1958
1958
见证运河工业的时代印记
A WITNESS TO THE INDUSTRIAL ERA OF THE CANAL
运河五号
CANAL NO.5
AR 导览
AR GUIDE
五号烟囱
历史展厅
文创步集
运河步道
展览馆
EXHIBITION
文创市集
CULTURAL MARKET
运河步道
CANAL PROMENADE






INDUSTRY CREATES A BRIGHTER TOMORROW
工业记忆
城市新生
1950
1980
2000
2020
PEOPLE
INDUSTRY
CITY
FUTURE
INDUSTRIAL HERITAGE REIMAGINED
让历史
继续发光
MORE THAN A PAST
A BRIGHTER TOMORROW
ART
MUSIC
IDEAS
COMMUNITY


起源
ORIGIN
1953
常州第五棉纺织厂成立
The establishment of
Changzhou No.5 Textile Factory
常州市第五棉纺织厂
建设
DEVELOPMENT
1958–1978
机器轰鸣
织就城市的工业脉络
The roar of machines
wove the industrial pulse
of the city.
运河五号
纺织厂
CANAL NO.5
TEXTILE FACTORY
CHANGZHOU
一座纺织厂
一座城市的记忆
A TEXTILE FACTORY
A CITY'S MEMORY
辉煌
PROSPERITY
1978–1990
产品远销海内外
成为城市的骄傲
Products were exported
at home and abroad,
becoming the pride
of the city.
转型
TRANSFORMATION
1990–2005
从生产到城市更新
From production
to urban renewal.
新生
REBIRTH
2005–至今
工业遗产焕发新生
融入城市生活
Industrial heritage
finds new life
and integrates
into urban life.
运河五号
INDUSTRY
PEOPLE
CITY
HERITAGE
FUTURE
机器与人
MACHINES
AND PEOPLE
城市与生活
CITY
AND LIFE


平凡的劳动者。
构筑了不平凡的时代。
Ordinary workers
built an extraordinary era.
工人
记忆区
WORKERS'
MEMORY
让记忆，成为工业的延续。
Let memory
be the continuation
of industry.
他们，
是这座城市的
建造者。
也是它的记忆。
They are
the builders of this city.
And also its memory.
"工业不仅创造了物质，
也留下了无数人的人生。"
Industry creates not only material wealth,
but also countless lives.
口述史
ORAL HISTORY
声音档案
SOUND ARCHIVES
记忆提交
SHARE YOUR MEMORY