

RIVERFRONT SHINES AGAIN: URBAN REGENERATION OF ZHULONG RIVER PARK

IFLA ASIA-PAC LA Awards 2023
Award Category- Built: Cultural and Urban Landscape

PROJECT STATEMENT

The regeneration of Zhulong Riverfront Park has brought new life to a 7-kilometer-long urban waterfront corridor, serving as a beacon of hope for the revitalization of precious but previously underutilized blue-green spaces.

Despite its prime location within the city's urban development, the Zhulong River had long been overlooked as a valuable blue-green corridor. With a careful integration of the surrounding city blocks' characteristics and needs, the riverfront park's renewal design has greatly improved the accessibility of the slow travel system. It has reconnected the city's buildings, infrastructure, and residents with the river, breathing new life into the area. The park offers a vibrant community space that can be enjoyed fairly and openly by people of all generations. It encourages residents to return to the riverside and share in an ideal lifestyle that embraces both human and nature. This project has freed up high-quality green spaces in the old downtown, where space resources are scarce, and created a more appealing leisure destination for future high-density development projects in the new urban area. Thanks to the flexibility of the river, Zhulong Riverfront Park has dredged the veins of the city and injected endless vitality into the urban development process of Zibo's "renewal of the old city and expansion of new districts."

PROJECT NARRATIVE

Zhulong River: A Potential Blue-green Corridor Connecting Old and New Towns

Zibo City in Shandong Province is a bustling industrial hub in transition. The city's rapid growth and urbanization have put increasing pressure on open spaces, limiting its potential for development. The central city, with a permanent population of nearly 800,000, suffers from extremely high urban density and a shortage of public open spaces, rendering existing urban parks insufficient to meet residents' needs. Meanwhile, the northern part of the city is undergoing rapid construction, poised to become a new population center. However, the area still lacks crucial public service facilities, including green spaces, limiting its appeal to potential residents. To achieve the "renewal of the old city and expansion of the new city" development plan, it's crucial to optimize the open space structure that connects the central city to the new city.

The Zhulong River is the only natural waterway that flows through Zibo's central urban area, linking it to the high-tech development zone and carrying the city's "connecting northward" development strategy. Running through important urban spaces such as the high-end commercial area, central park, high-tech business district, and northern industrial park, the river also connects with over 20 residential areas, directly serving around 200,000 urban residents. Despite its significance, the rapid development of the city has largely ignored the river, with the old city pattern spreading northwards, and fragmented park facilities failing to interact with the surrounding urban interface, resulting in limited accessibility and exclusion of the residents' living experience.

In 2021, Zibo's urban renewal plan aims to renovate the 7-kilometer-long riverfront space of the Zhulong River, stretching from the old city center to the high-tech zone. The master plan envisions a beautiful blue-green connection that links the old and new towns, creating a spatial sequence that stimulates community vitality.

The General Regeneration Strategy Based on Heterogeneity of Urban Block Interface

As landscape architects, we have developed a general regeneration strategy for the Zhulong River based on the heterogeneity of the adjacent urban blocks. Our approach aims to meet the diverse needs of residents and promote sustainable urban development. To achieve this, we have positioned the riverfront space facing the new urban area in the north as an open space to serve the large-scale population of the new area in the future. The design emphasizes ecological restoration of existing wetlands and riverbanks, preserving permeable vegetation cover, and incorporating low-impact activity sites in the natural countryside. The middle section of the design area is adjacent to the commercial center of the new city, where we have opened up the interface of the commercial district to the river and placed an urban landmark to form a new outdoor gathering place. As the river penetrates into densely populated residential areas, we aim to create

a fair, open, and vibrant public space for the community. Our design includes a multi-layered slow travel system as a framework, small activity spaces, and preservation of community gathering places with cultural significance. The renewal will be carried out in a low-carbon footprint, using an acupuncture-style approach to minimize disruption to the existing urban fabric.

Enhancing the Slow Travel System

We implemented a robust and updated slow travel system that would promote the health and well-being of the residents. The strategy included updating the existing trail fragments, building a new 6.8 km trail, and creating a greenway system that runs through the riverfront space. We ensured continuous walkways on both sides of the river and direct connections to adjacent community entrances and exits, and added two new pedestrian bridges to enhance the connection between the two sides of the river. In addition, we established a two-layer trail system in sections that meet the width conditions to achieve the separation of slow walking and fast movement. The optimized greenway system fills the missing sections of the city's north-south slow travel route, and it creates an open connection with the urban greenway that crosses the river in the east-west direction, providing expanded accessibility and service scope of the riverfront space. The Zhulong River's riverfront greenway is more than a corridor for life commuting. As we have observed, more and more residents are using the riverfront greenway instead of the sidewalk attached to the highway. The greenway also serves as a round-the-clock tree-shade sports venue where residents can find an active green lifestyle. The optimized slow travel system, therefore, promotes the health benefits for residents, encouraging them to engage in physical activities and leading to a healthier lifestyle.

Reconnecting People, City, and River

The project utilized a range of strategies to re-establish a positive connection between the river space and the urban interface, demonstrating a flexible approach. By reopening the riverfront interface adjacent to the commercial space and constructing the "Window of the City," we were able to extend the façade of the commercial buildings along the river and establish a new landmark in the business district. Overcoming a significant obstacle to pedestrian-friendliness, we designed a distinctive trestle bridge that guides pedestrians to the lower part of the riverbank, gradually reducing the elevation of the trail and enabling people to pass through the space under the elevated road. Additionally, in the riverfront space parallel to the urban viaduct, slender corridors were introduced to create a seamless transition between the soft-canopy-covered riverfront greenway and the hard road facilities. These well-designed facilities seamlessly integrate the park into a complex system of large buildings and infrastructure in the city, promoting interaction between the river space and the urban interface. Furthermore, by transforming the gray infrastructure into green infrastructure, we successfully created a space that residents are happy to be close to.

A Place of Natural Perception for All

The riverfront park has been meticulously designed to provide a diverse range of activity spaces that blend in with the abundant native plant environment, creating a place of natural perception that is fair and open to all. The project incorporates various nature education functions, including trestle bridges that extend deep into the wetland, providing valuable spaces for visitors to understand the river's ecology. The outdoor reading spaces located under the shade of native plants serve as a classroom extension for the surrounding campus, and are also used for local public welfare nature education activities. These spaces have revitalized the vitality of the community, providing fishing spots along the river, a fitness plaza, a Go square, and local culture exhibition areas that offer meeting places for people with different interests and abilities. The children's activity spaces, closely integrated with the community, provide the best destination for family entertainment activities and enhance the experience of children and adolescents playing and learning in nature. In the afternoons and on weekends, dozens of families from the surrounding community gather on the banks of the Zhulong River. The riverfront park incorporates different generations of living experiences and becomes a home for nurturing shared memories.

Sustainability and Resilience throughout the Life Cycle

The Riverfront Park project places a strong emphasis on all-round sustainability and resilience throughout the entire design, construction, and maintenance process. The project team prioritized the preservation of existing trees and wetland vegetation, and added native tree species with higher carbon sink capacity such as *Koelreuteria paniculate*, *Fraxinus chinensis*, *Ulmus pumila*, *Liriodendron chinense*. The biomass analysis before and after construction showed that the expected vegetation carbon density of the project will increase from 67.36 t/ha to 75.25 t/ha, indicating a significant improvement in carbon sequestration. Furthermore, the project implemented several initiatives to reduce the carbon footprint, such as reusing demolished waste paving to fill retaining walls, and replacing traditional high-carbon materials like granite with artificial stone. Through the whole life cycle carbon footprint assessment, all carbon emissions generated during the construction phase can be offset within 20 years,

making a positive contribution to the city's carbon neutrality goals. The project demonstrates a commitment to environmental sustainability and resilience, ensuring a better future for generations to come.

Following two years of meticulous planning, construction, and continuous upkeep, the neglected section of Zhulong River has been skillfully transformed into the most expansive and connected open space, linking the old and new towns. The revitalized riverfront park reflects its ecological, social, and symbolic significance through its excellence in design. This lush and lively green space is integrated harmoniously with the surrounding city blocks, meticulously considering the community's characteristics and needs, and substantially enhancing the accessibility of the slow travel system. It reconnects the residents, city's infrastructure, buildings, and the river, creating a vibrant gathering place for all generations to use equitably and freely. This project has freed up high-quality green spaces in the old city center, which is crucial in the face of scarce space resources, while also providing a more appealing leisure destination for upcoming high-density development projects in the new urban area. Leveraging the river's flexibility, the Zhulong Riverside Park has breathed new life into the city's urban development process, rejuvenating the area's "renewal of the old city and expansion of new districts" initiative.



BUILT IN 1990
RESIDENTIAL AREA IN
OLD URBAN DISTRICT

BUILT IN 2010
BUSINESS AREA IN
NEW URBAN DISTRICT

BUILT IN 2020
RESIDENTIAL AREA IN
NEW URBAN DISTRICT

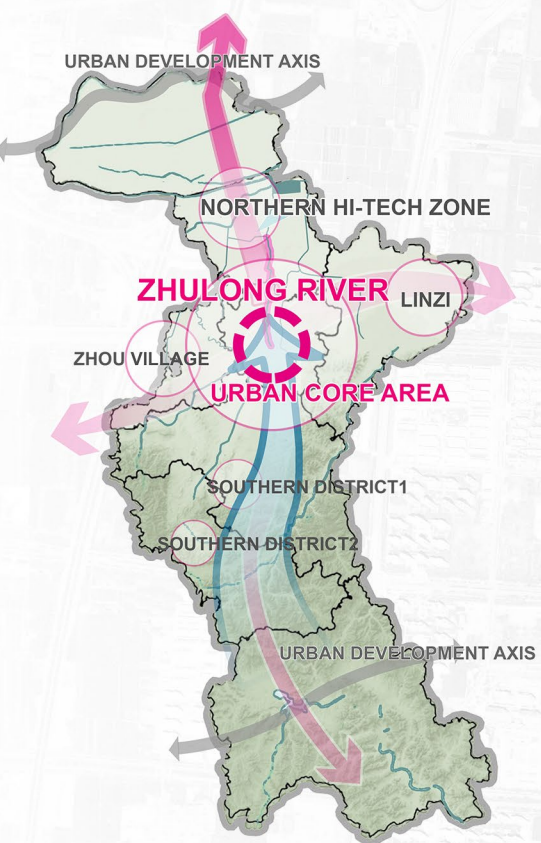
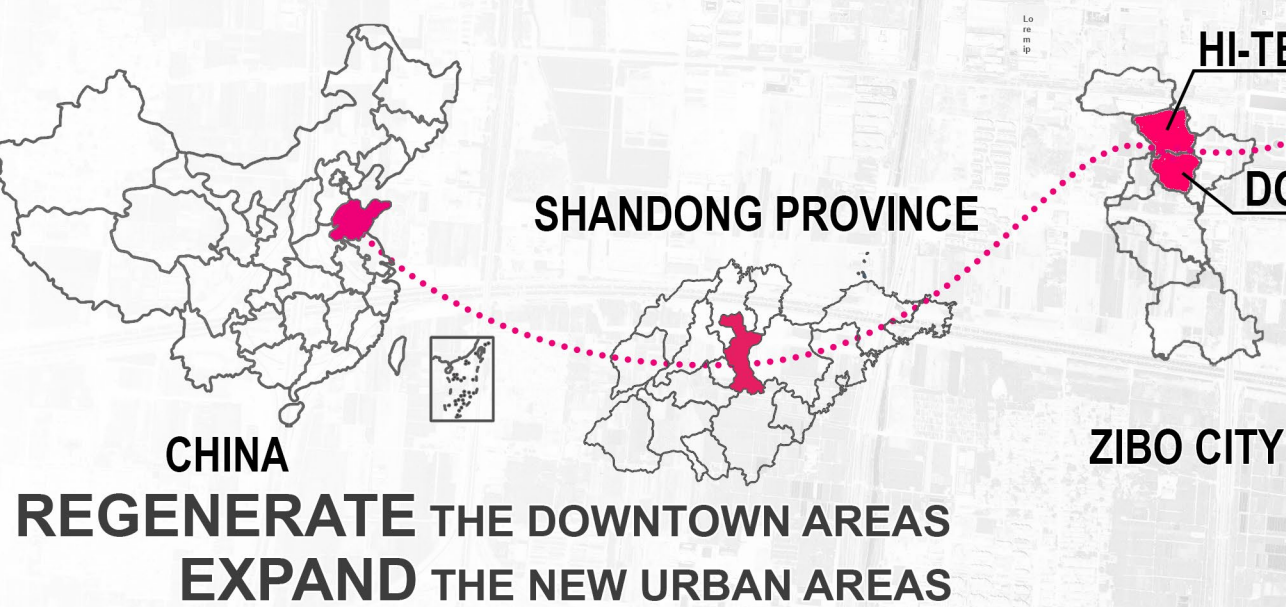
JINAN-QINGDAO EXPRESSWAY

WEST 5TH ROAD

**ZHULONG RIVERFRONT PARK
AFTER REGENERATION**

The regeneration of Zhulong Riverfront Park has brought new life to a 7-kilometer-long urban waterfront corridor, serving as a beacon of hope for the revitalization of precious but previously underutilized blue-green spaces.

A POTENTIAL BLUE-GREEN CORRIDOR FOR URBAN RENEWAL AND EXPANSION



15 COMMUNITIES
15 RESIDENTIAL AREAS ALONG THE RIVER

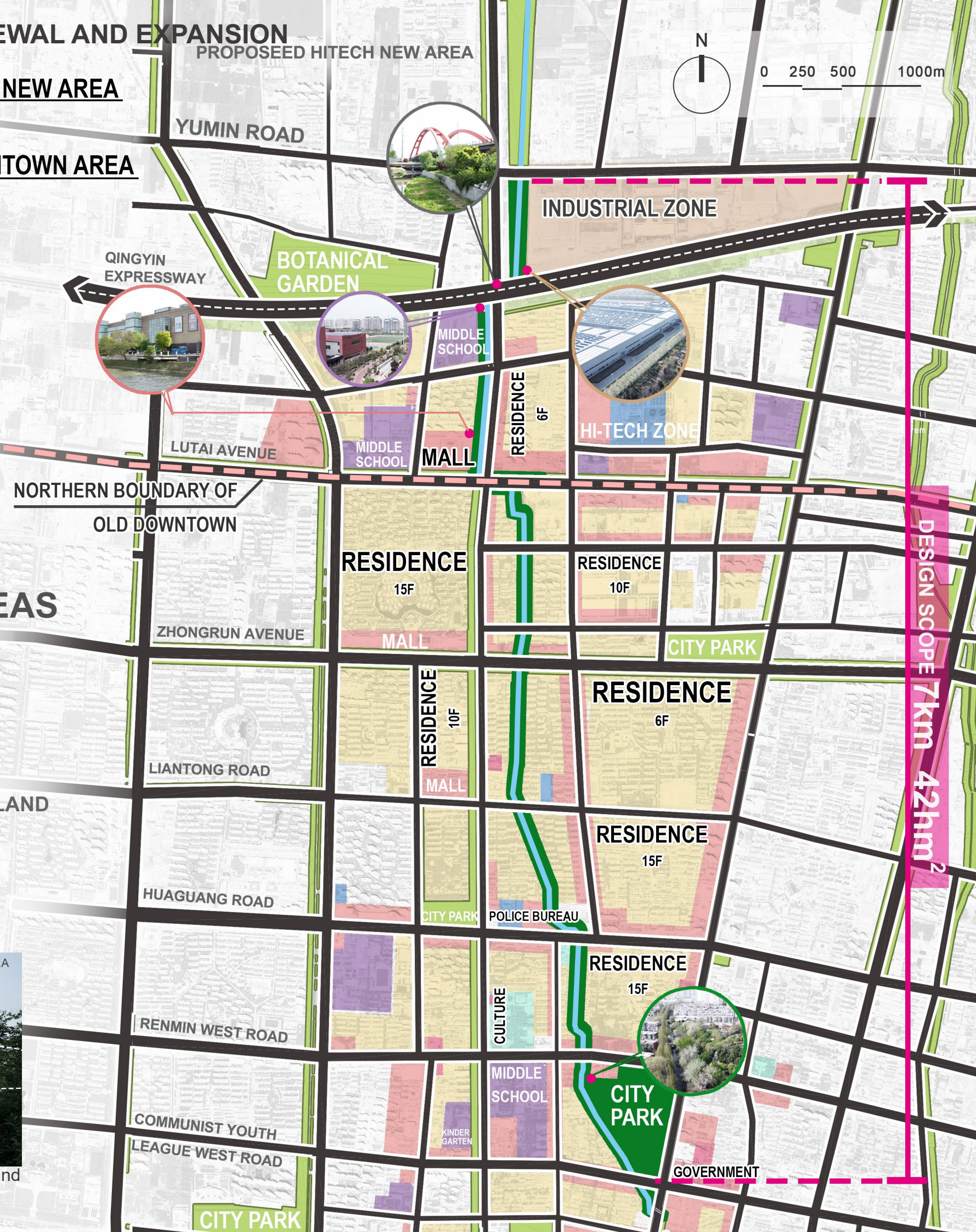
1.28 MILLION
RESIDENT POPULATION

10 COMMERCIAL AREAS

13 SCHOOLS

LEGEND

MALL	ZHULONG RIVER
RESIDENCE	GREEN SPACE
SCHOOL	PUBLIC FACILITY LAND
INDUSTRIAL LAND	GOVERNMENT
URBAN ROAD	



ZHULONG RIVER: A POTENTIAL CORRIDOR HIDDEN IN URBAN TEXTURE



The rapid development of the city has largely ignored the river, resulting in limited accessibility and exclusion of the residents' living experience.

A REGENERATION PROPOSAL BASED ON URBAN HETEROGENITY



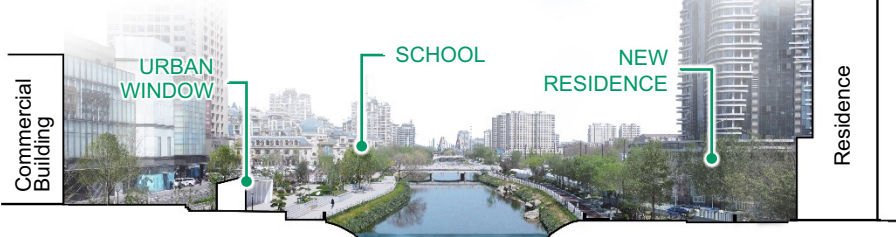
- 01 INDUSTRIAL GARDEN
- 02 LUMINOUS FOREST
- 03 EXPLORATION TRESTLE
- 04 UNDERGROUND PASSAGE
- 05 VIADUCT PLAYGROUND
- 06 FLOWER TRAIL
- 01 SHARED READING PAVILION I
- 02 WAVE SQUARE
- 03 URBAN WINDOW
- 01 SHARED READING PAVILION II
- 02 MALUS BLOSSOMS PLAYGROUND
- 03 TREE FORMATION SQUARE
- 04 LOTUS WATER GALLERY
- 01 MELODY SQUARE
- 02 NEIGHBORHOOD BAZAAR
- 03 REED SPACE
- 04 JIANG ZIYA SQUARE
- 05 CUJU PLAYGROUND
- 06 RIVER BAY SQUARE
- 01 COLOURED GLAZE WALL
- 02 FITNESS PLAZA
- 03 SCULPTURE SQUARE
- 04 WATER MIRROR SQUARE
- 05 COMMUNITY PLAYGROUND



A-A ECOLOGICAL EDUCATION SECTION



B-B COMMERCIAL SECTION

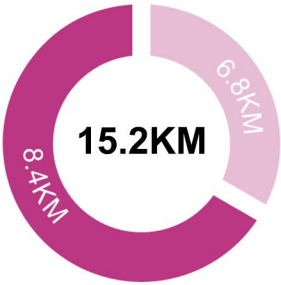


C-C CULTURAL NEIGHBORHOOD SECTION

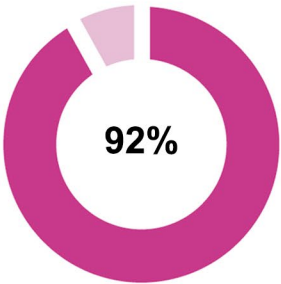


The master plan envisions a beautiful blue-green connection that links the old and new towns, creating a spatial sequence that stimulates community vitality. A general regeneration strategy for the Zhulong River has been developed based on the heterogeneity of the adjacent urban blocks.

ENHANCING THE SLOW TRAVEL SYSTEM



The project utilizes the current 8.4km greenway resources and adds 6.8km new greenway.

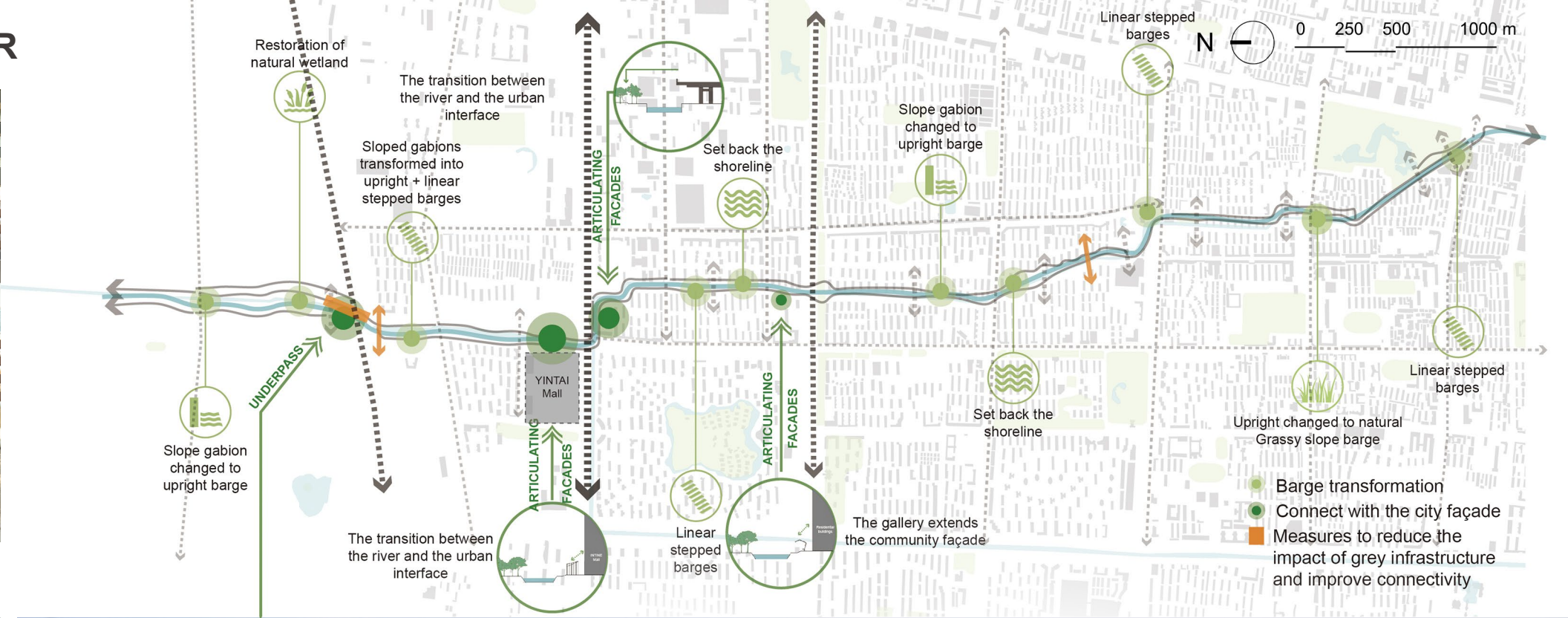


Percentage of visitors using the park for aerobic exercise (walking, jogging, running, bicycling, jumping rope)



An advanced slow travel system was established to enhance the health and well-being of the residents. The Zhulong River's greenway offers more than just a commuting path, it's also a 24-hour tree-shaded sports area that encourages an active and healthy lifestyle.

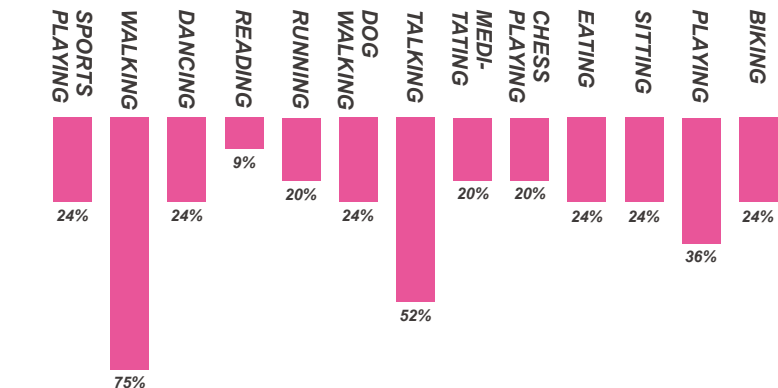
RECONNECTING PEOPLE, CITY, AND RIVER



The park was seamlessly integrated into the city's complex system of buildings and infrastructure, promoting interaction between the river and urban interface. A space that residents enjoy being near was created by transforming gray infrastructure into green infrastructure.

A PLACE OF NATURAL PERCEPTION FOR ALL

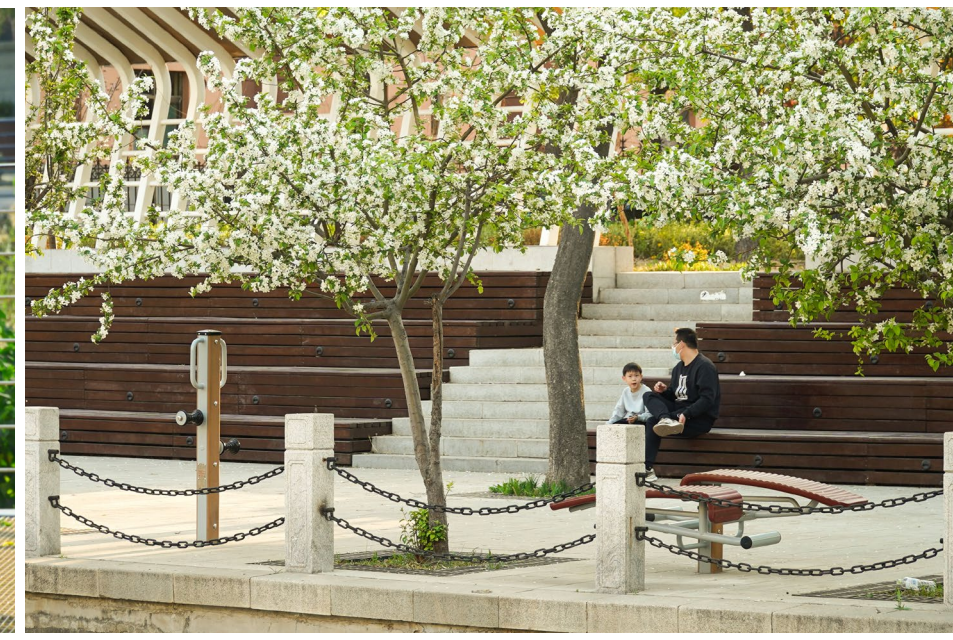
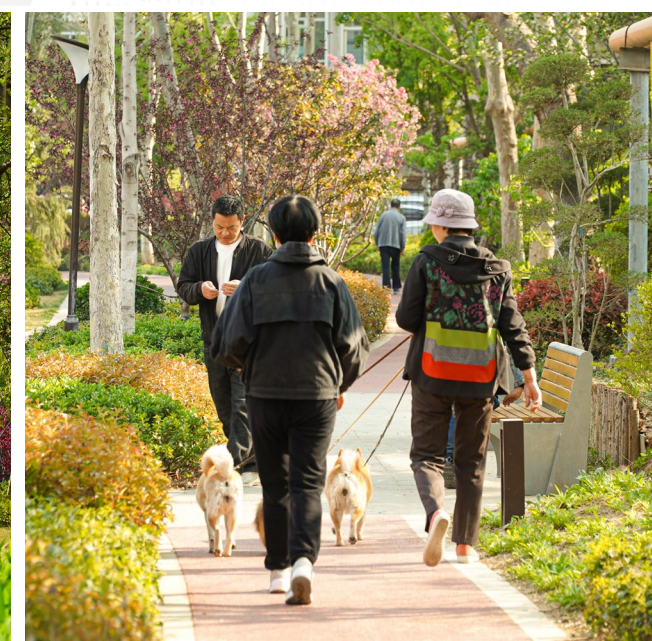
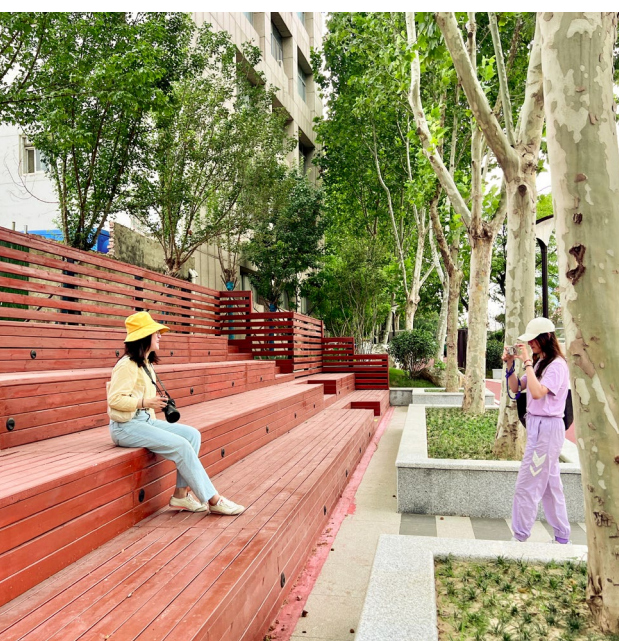
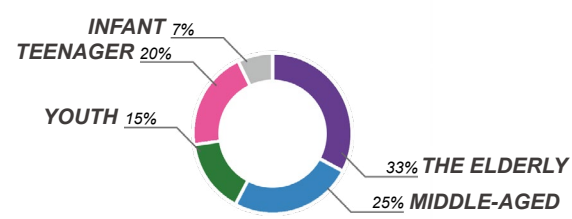
PARK USERS BY ACTIVITY



PARK USERS BY TIME OF THE DAY



PARK USERS BY GENERATIONS



The riverfront park has been meticulously designed to provide a diverse range of activity spaces that blend in with the abundant native plant environment, creating a place of natural perception that is fair and open to all.



OPEN SPACE FOR THE NEW TOWNS

The riverfront space facing north has been positioned as a future open space for the new urban area. The wetlands and riverbanks have been restored, vegetation cover has been preserved, and low-impact activity sites have been integrated into the natural countryside for ecological benefits.



WETLAND RESTORATION

The conservation of existing trees and wetland vegetation was accorded utmost priority by the project team. Additionally, a diverse range of vegetation with abundant seasonal variations and high carbon sequestration potential was thoughtfully incorporated to enhance the park's ecological benefits.



RIVERFRONT WITH SEASONAL VEGETATIONS

The protected reeds retain their autumn-winter hues, flowing with the new spring's sprouting willows, creating a scenic landscape. The trestle bridge allows for an intimate experience of this picturesque view.



A PATHWAY TO NATURE

The riverfront park's leisurely pathway is seamlessly integrated with a waterfront platform, offering visitors an intimate experience with nature during their stroll.



A PATHWAY FOR RESIDENT HEALTH

By integrating various slow travel options and promoting active transportation, our optimized slow travel system not only supports sustainable transportation but also helps to improve residents' physical and mental health by encouraging them to engage in regular physical activity.



RIVERFRONT FOR DIVERSE USE

The meticulously designed riverfront space offers diverse and adaptable usage options, and the health-conscious residents who inhabit the area coalesce with the river to create a dynamic and lively landscape.



REVITALIZING DYNAMIC RIVERFRONT LIFE

The riverfront pathway is increasingly preferred by residents over the sidewalks adjoining the urban roads. The integration of pedestrian paths and recreational areas within the riverfront space provides a more comfortable and leisurely outdoor experience.



SPACES FOR PLAY AND GATHERINGS IN NATURE

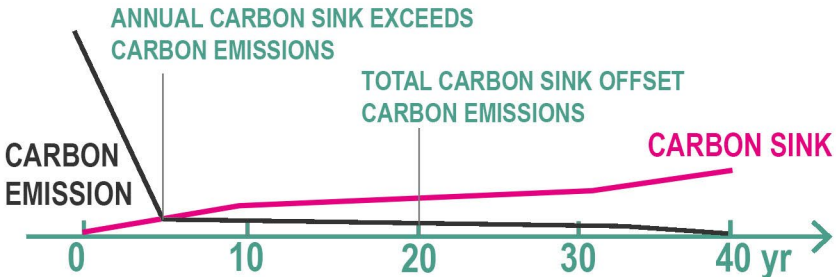
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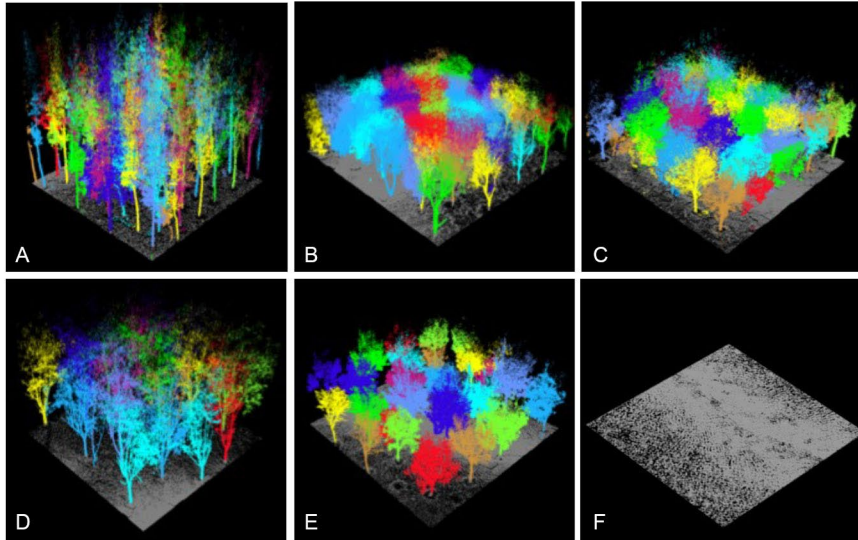
COMMON GROUND FOR SHARED MEMORIES

With its inclusive design, the riverfront park caters to a diverse range of ages and fosters a sense of community, creating a space where cherished memories can be made and shared by all.

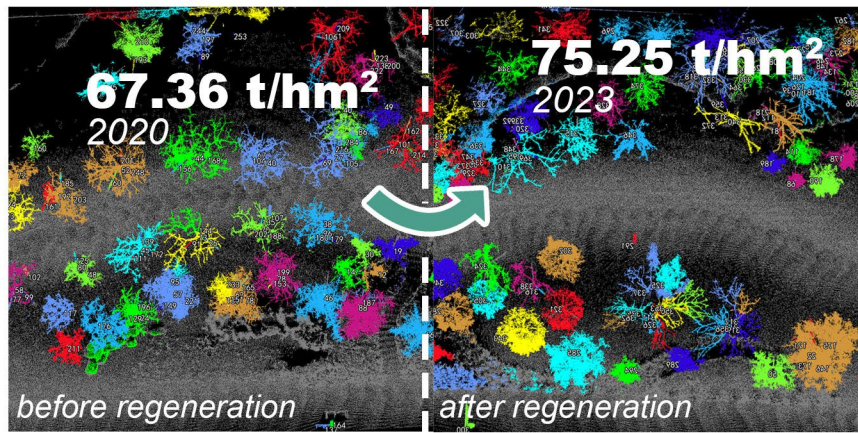
LIFE-CYCLE CARBON FOOTPRINT ASSESSMENT



Backpack lidar was used to model the point cloud of community samples and estimate carbon storage of the project.

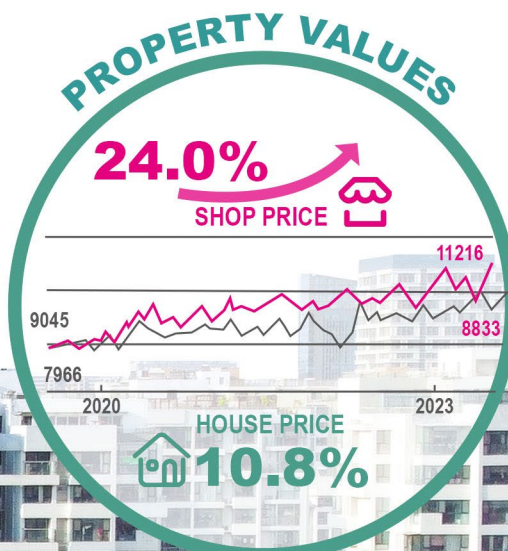
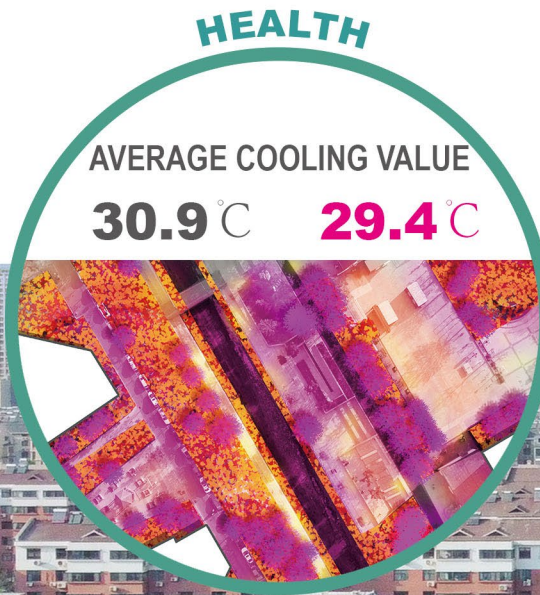


Community sample point cloud models



IMPROVED VEGETATION CARBON DENSITY

The lidar-based biomass analysis before and after construction showed that the expected vegetation carbon density of the project will increase from 67.36 t/ha to 75.25 t/ha, indicating a significant improvement in carbon sequestration.



A NARROW RIVERFRONT WITH WIDE IMPACTS

The neglected section of Zhulong River has been skillfully transformed into the most expansive and connected open space, linking the old and new towns. The revitalized riverfront park reflects its ecological, social, and symbolic significance through its excellence in design.