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Exploring the potential of the Grand Canal as a backbone for adaptive and resilient urban development in Tongzhou

REDEFINE THE BORDER OF WATER

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Past







Past 5









Door to the canal

The role of the Grand Canal in history

Soc	Transportation line Production Landscape entertainment
Ecolo	Flood control and drainage Irrigation









Now 8















Water context in Liao Dynasty

Map of Tongzhou district in 916-1125 CE Photo taken by author in "SANMIAOYITA" Museum in Tongzhou district



1 Confluence of two waters 二水汇流



5 Willow shade and dragon boat 柳荫龙舟



2 Savanna and the peak 平野孤峰



6 Bridge and the moon reflection 长桥映月



3 High platform and the grove 高台树丛



4 Water wave and the diversion marsh 波分凤沼



7 Pagoda volley above the clouds 古塔凌云



8 Ferries run neck and neck 万船骈集

Eight scenic spots in Tongzhou

Source from Wechat account "Beiyuntongzhou"





Canal mostly used as water container











REDEFINE THE BORDER OF WATER



Exploring the potential of the Grand Canal as a backbone for adaptive and resilient urban development in Tongzhou How to use Grand Canal as a backbone for adaptive and resilient urban development by social and ecological connectivity principles in Tongzhou district ? How does the Grand Canal function as **an operative landscape structure**?

How to transform the canal to a **landscape infrastructure**(principles and strategies) ?

How to use the **water source** in Tongzhou as **part of the urban infrastructure**?

Is there **room left** for **unexpected**?



SCALE

L (Regional scale)

M (Neighborhood scale)

S (Human scale)



Inspired by: Kondolf, G., & Pinto, P. (2017). The social connectivity of urban rivers.



-Diagnosis











B Luxury community





Lateral connection

C City park



D Forest park











Vertical connection 24











Rain and evaporation 26



Challenge 27

Challenge Lost of identity Social Longitudinal - Saperate public system - Space is a line instead of a zone Lateral - Weak connection to the community Vertical - Boundary in the boarder of water

Ecological

No coherent green-blue system to benefit an adaptive and resilient city

The role of the Grand Canal now



What if we learn from the history?

Tongzhou





simple and very few social space



Urban development restricted by urban road system



Only hard embankment for urban development



Building turn its back to the water

Ecological





Urban water hard to flow away



nature reserve region



Fixed bridge and road system cut the coherent habitat

Technical





Saperate drainage system and urban green space

Poor cross-strait connectivity



front space



doned









Social







development



Bridges increase cross-strait connectivity

Potential framwork

History

Ecological







Soft embankment for natural development



Water space

Technical



Water storage



Coherent drainage system





Bridges increase cross-strait connectivity







Urban natural and rural space



Water space





-Regional strategy



Development strategy

RURAL RESIDENTIAL AREA 32

Purification

Reuse

Discharge

Community government Community Community Community Community Community water structure City park Sports center Central bussiness Public green 1 center 1 11 Public green Forest park Community water front, 1 Waterfront Community Wetland pa Community Commercial Community Community Longitudinal: Space under the bridge Lateral: Spce under the bridge Connect the two sides Connection between people and water Vertical:







Ecological network

35

Natural park Wetland Urban park Public open green Plaza Green khastructu



Natural area

-

Wetland


Hydrological network







Embankment



Spatial network 41





Dock



This layer shows the spatialvisual experience along the Grand Canal flows from urban to natural, from concrete to soft by applying different forms of embankments and interactive infrastructures.



-Local implementation



neighbourhood









Spatial aspect-Transfer

Activate a resilient neighbourhood connection between the two sides of water

Activate a resilient neighbourhood

connection to the community and water retention

Activate a resilient neighbourhood

Stadium

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Community

Lack of lateral and vertical connection

Social network

Hydrological network

Ecological network

Spatial network

Staturated

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3

Open soil

4

Water tank

Floating garden

Social connectivity and seasonal change

Bike lane&pedestrain

Waterfront view point

Dry

Performing stage

Bike lane&pedestrain

For gathering

Swimming pool/ Sunken plaza

Waterfront deck

Floating deck

Frozen

Performing stage

Bike lane&pedestrain

Open soil

Skating rink

Waterfront deck

Floating deck

Planting plan

Plant list

Planting plan 58

2030

2050

2060

Vertical connection

soft embankment and social interaction

Rain season

65

Developing process

Vertical connection

Ecological succession

Longitudinal connection

space under the bridge

Longitudinal connection space under the bridge

68

河的前世中:

京建铁路通车,南北 赤朝末期到解放前期 沿岸河道淤积, 闸坝 一片没落。

业运河水系进行了重 通用河,北运河(大 官都重要的排水系统 向景色,运河风光成 景结。

Discussion

Social

Ecological

Technical

Spatial

Research and design

- clarify the objective of this project

- idea of the main focus of the design
- limit the scope of the analysis

Design across scales

- the design is not completed gradually from large to small scale
- design concepts of different scales will be tested at the same time
- the final design will be formed through repeated considerations

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