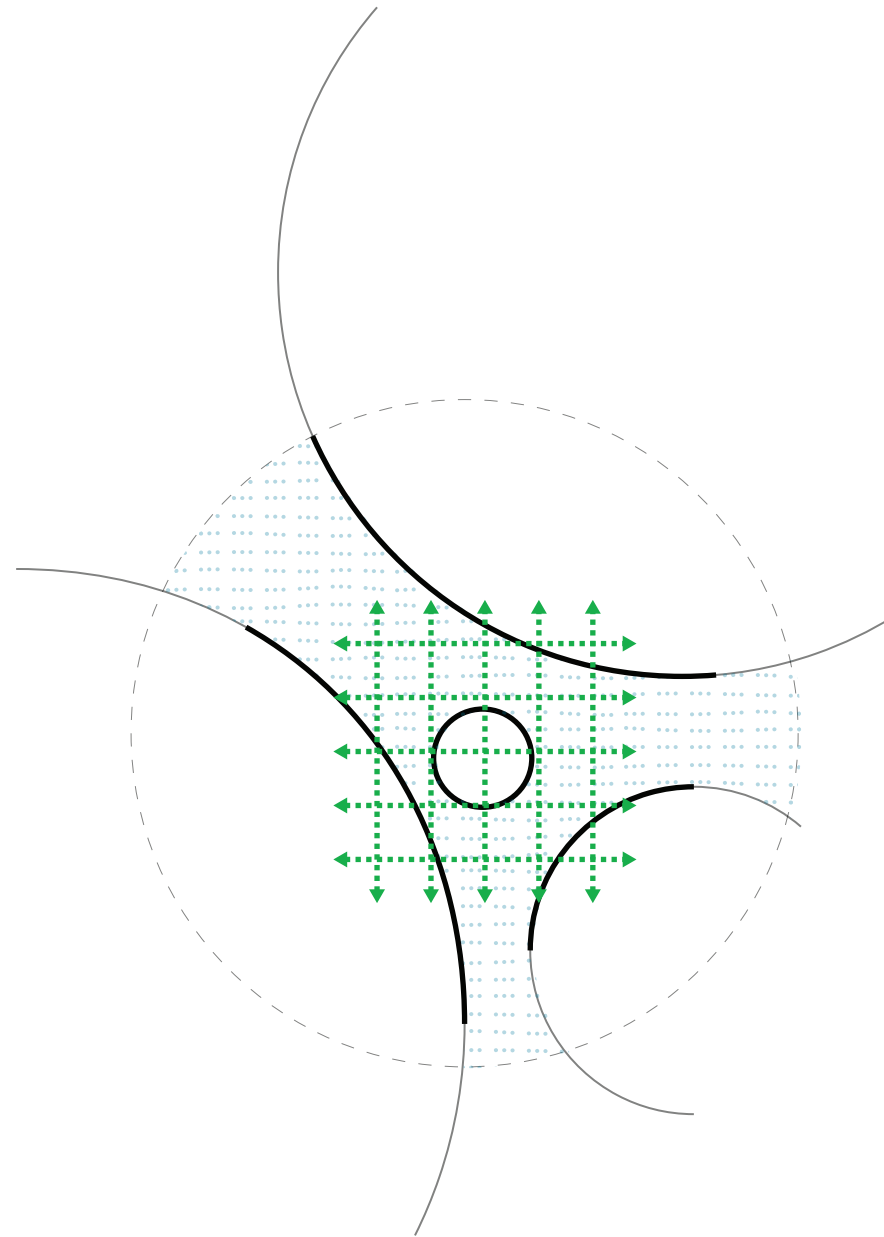


' FLOW NETWORK '

-- Design of the Great War Island and waterfront of Danube River, Belgrade



P2

Lei Wei

4256085

Flowscape Studio

First mentor: Inge Bobbink

Second mentor: Maurice Harteveld

Landscape Architecture

TU Delft

2014.1.23

1	Fascination of project	01
2	Site choosing &visiting	02
3	Context analysis	03
4	Problem statement	05
5	Reserch Question	07
6	Case study	08
7	Design the site	10
8	Regional plan	40
9	Developing phases	41
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11	Time plan	43

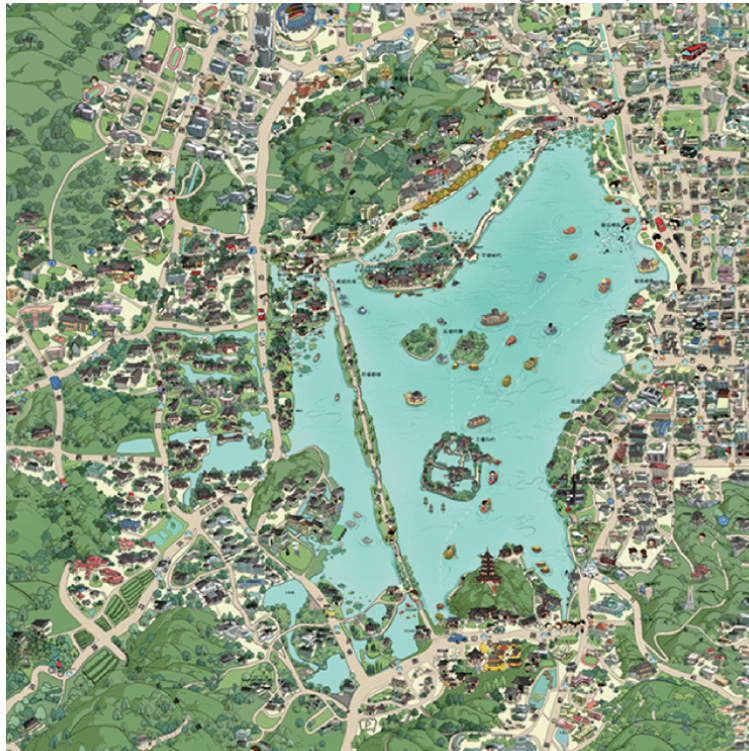
Landscape architecture in Foshan , CHINA



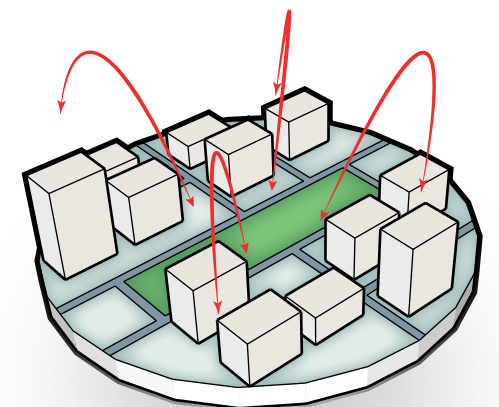
There are two kinds of landscape in China, One just offers the citizen beautiful scenery, this kind of landscape is very common in China. However, the other one not only offers beautiful scenery, but also works as a element which can integrate the space, economy, ecology and society for the city. Like Westlake for Hangzhou.

VS.

Landscape architecture in Hangzhou, CHINA



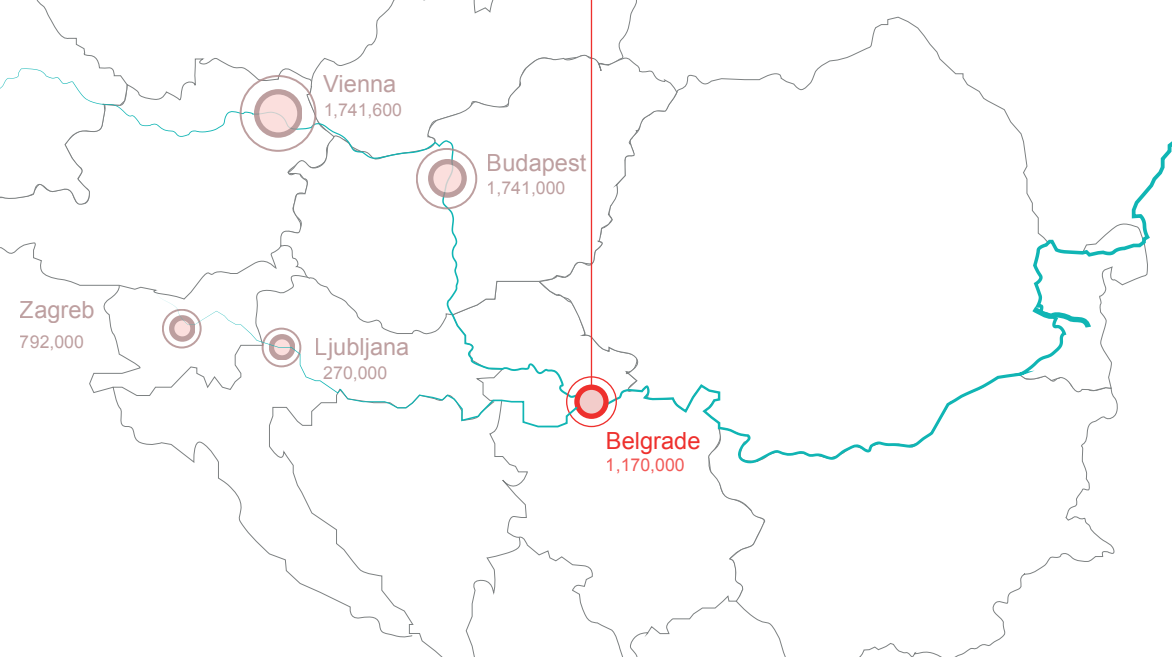
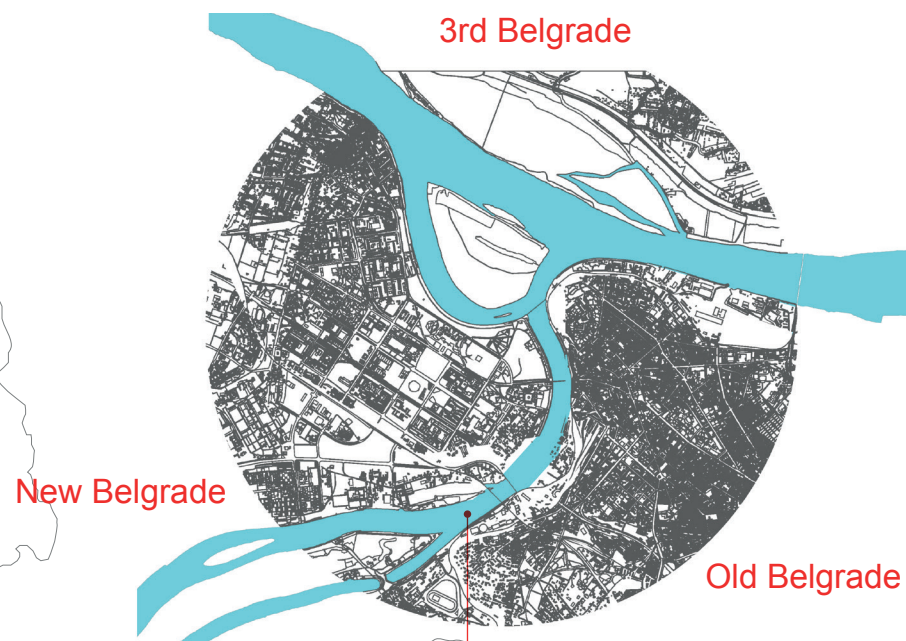
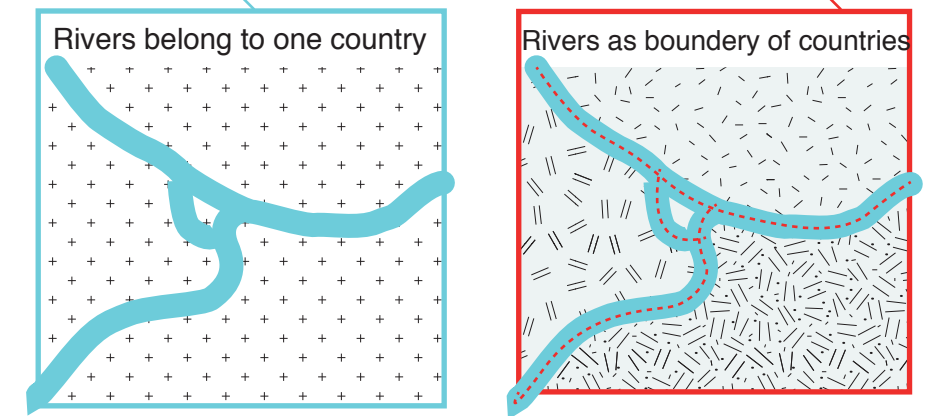
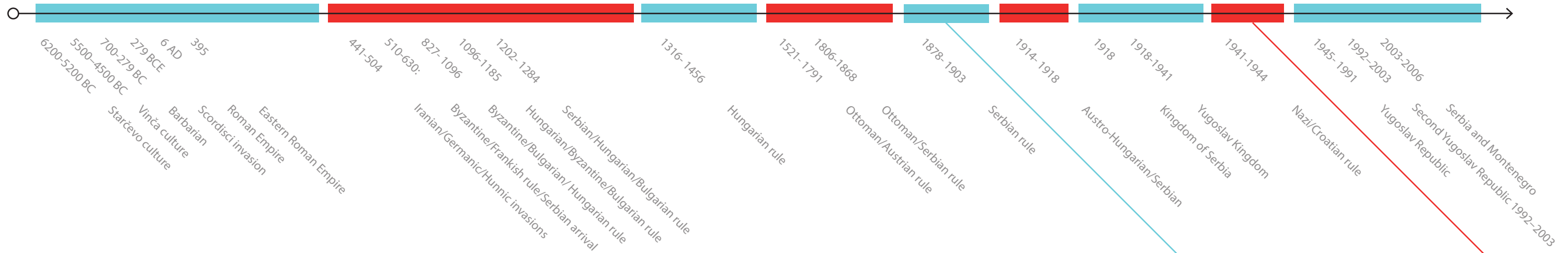
Therefore, I have a fascination about my graduate project:



Landscape Architecture can not only just works as recreational area for the city,

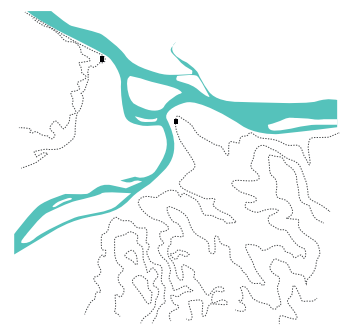
but also works as a element which integrate the space, economy, ecology and society.

Time line of Belgrade

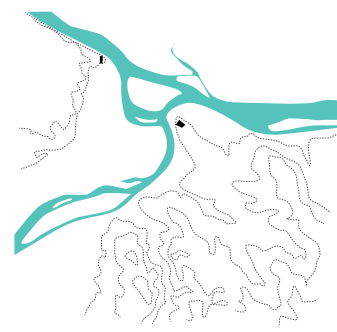


Belgrade is the capital city of Serbia, located in the junction of two international rivers, Sava and Danube. And because the rivers the city is divided in 3 parts.

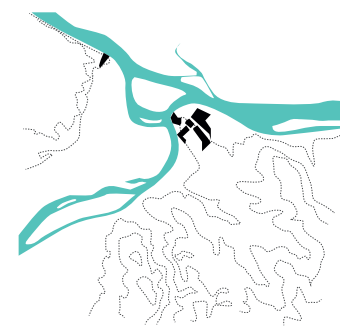
Why I choose Belgrade as my site, because the rivers worked as the national boundaries in history. The 3 parts of Belgrade belonged to different countries in history, and now they belong to one government. The whole city may face with the problem of integration.



The Nolithic



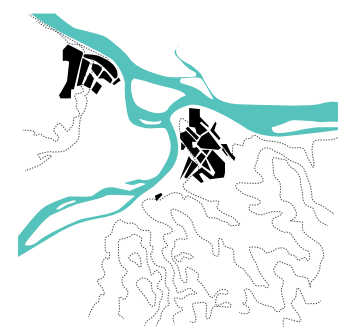
4-7th Great Migration



16-17th century



1830



1884



1934



After 2nd World War

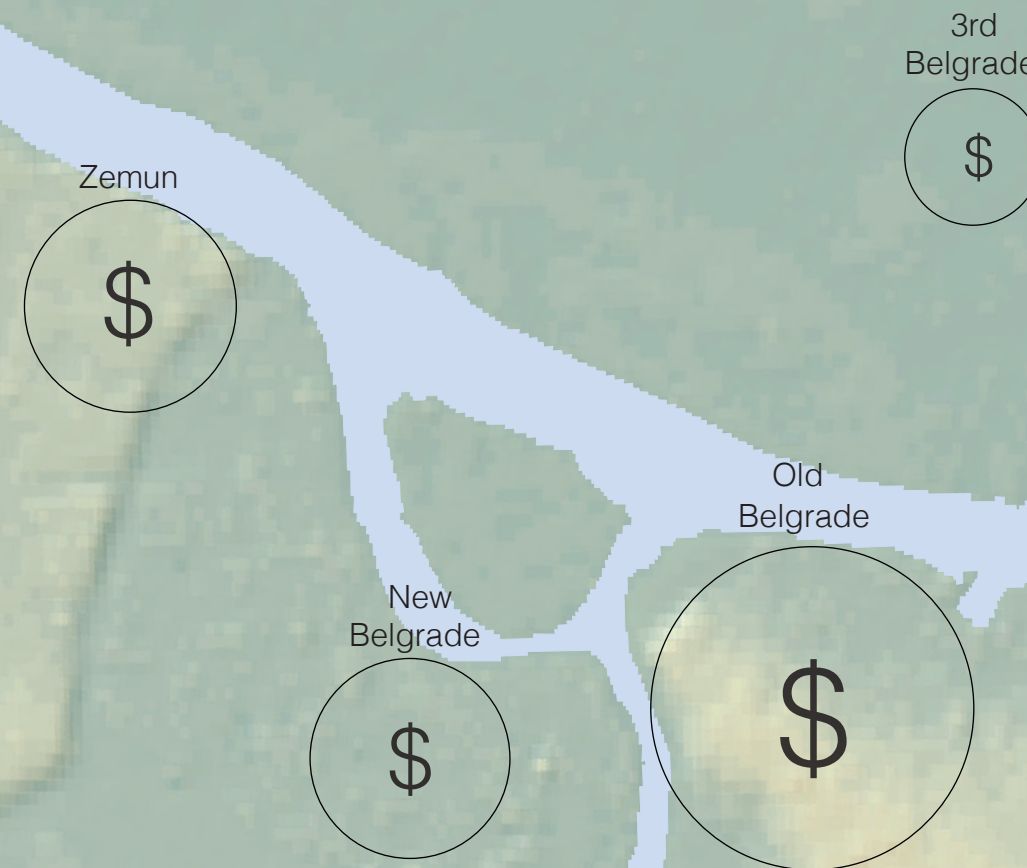


1950



2021

Looking back to the history of Belgrade city, we can know that whole city developed around the junction of two rivers, and a green island - Great War Island left as a nature reserve now. In the future, the government want to built a system of ring road to unify and integrate the city.

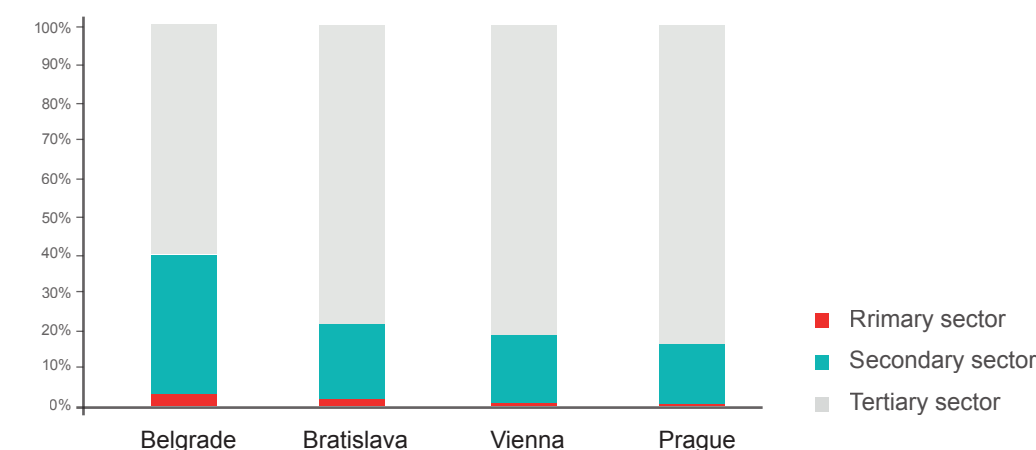


However, three parts of Belgrade have different kinds of landscape, and different financial background.

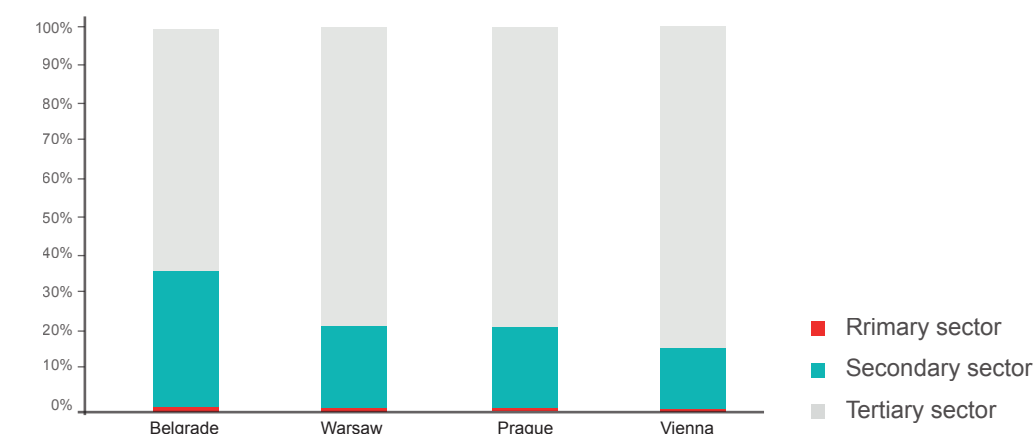
	Beograd	Budapest	Prague	Wien	Bratislava
Capital city	Serbia	Hungary	Czech Republic	Austria	Slovakia
Area of the city (km2)	359	525	496	414	367
Population	1.639.121	1.733.685	1.258.106	1.714.142	425,533
GDP	E 11,938 (2010) National statistics, estimation	E 24,900 (2006), national statistics, PPS method	E 42,800 (2007) Eurostat PPS method	E 40,600 (2007) Eurostat, PPS	E 39,900 (2007) Eurostat PPS method
Main characteristics and the economic structure	Service oriented. From the end of nineties trying to establish transportation hub on three EU corridors; City of leisure, tourism and sports	Service oriented. From the early nineties particularly boosted finance, consulting and retail. IT sector, and investments in building and construction, and also arts and education	Expansion the new city-wide Centre, International airport at Ruzyně, an important administrative and commercial center within Central Europe; Inner and the Outer Ring Roads	Very good supply of public services (public transport, water, social services, and healthcare). long tradition of social housing ; high quality of life.	Developments located near the main bus (Twin city), railway station and the North-Western area of Bory; A strong development along the Danube River
Vision	2020 EU Capital of Culture, Science oriented, Innovation and environment	Danube Region metropolis; Aiming a more balanced distribution of economic functions in the metropolitan area	'Knowledge' culture	Mixture securing European competitiveness and attractiveness for residents; Definition of the city within the Danube Region	Research and development clusters.
Challenges	The economic environment , EU relations and the political stability. Decentralization, Polycentricism and sustainable and integrated development within the region	Changing the capital city's dominance in a mono-centric metropolitan area	Cooperation on a regional level; Overcoming inherited institutional barriers to cooperation; specifically between the city and the regional level.	Institutionally and transport-related integrated urban region; Allocation of metropolitan functions in the region.	The Danube region potential; Strengthen the metropolitan competitiveness; Permanent exchange of information.

Table 8 – Data from the UPI research and the Executive summary of the project POLYCE Metropolisation and Polycentric Development in Central Europe, 2010-2012

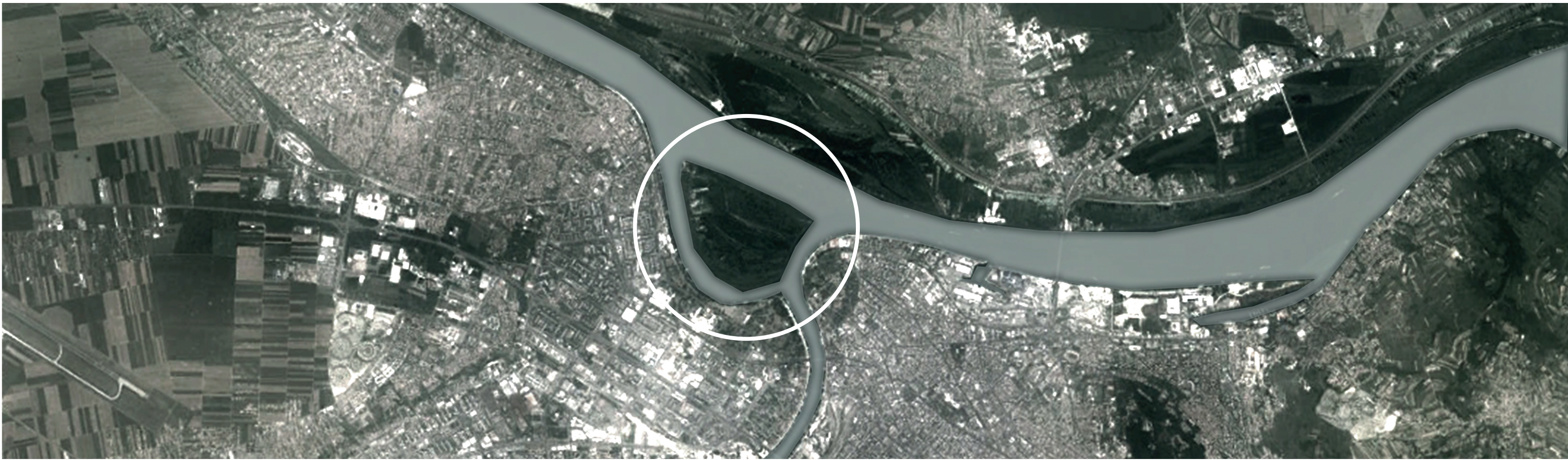
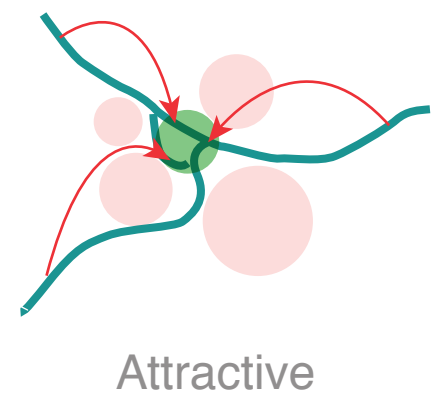
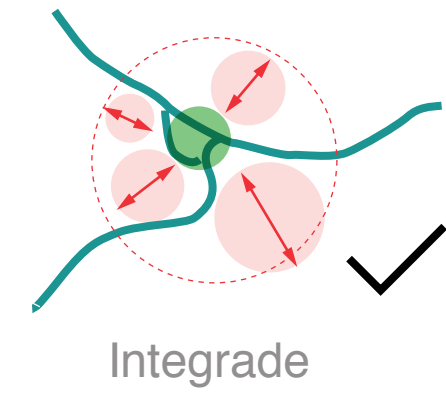
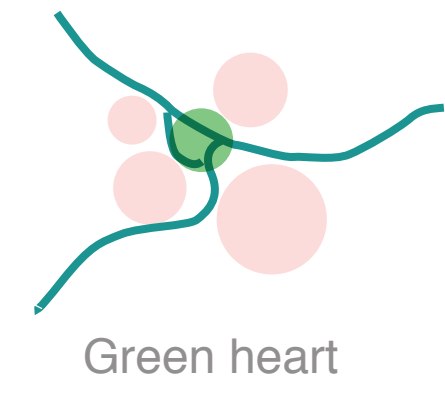
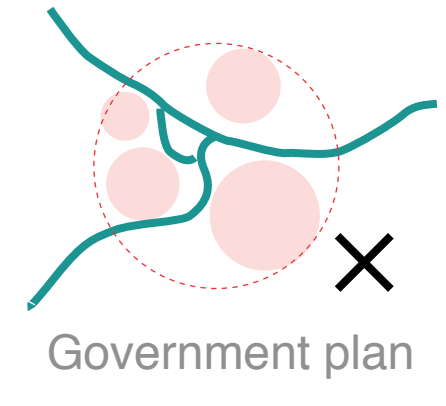
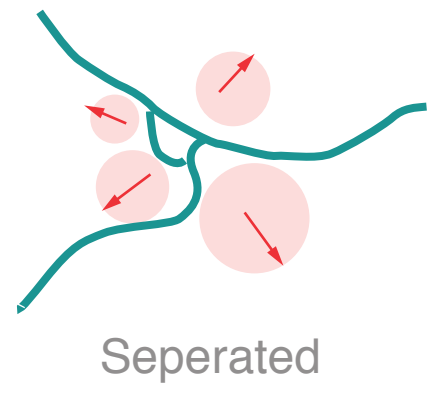
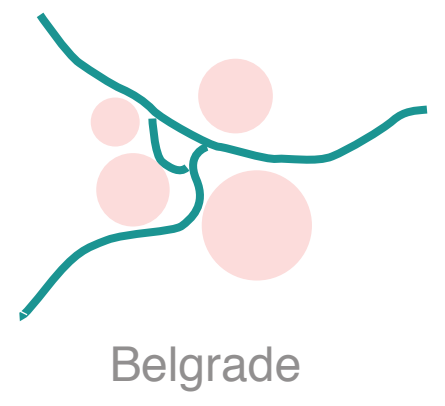
STRUCTURE OF EMPLOYEES BY SECTORS OF ACTIVITIES, 2003



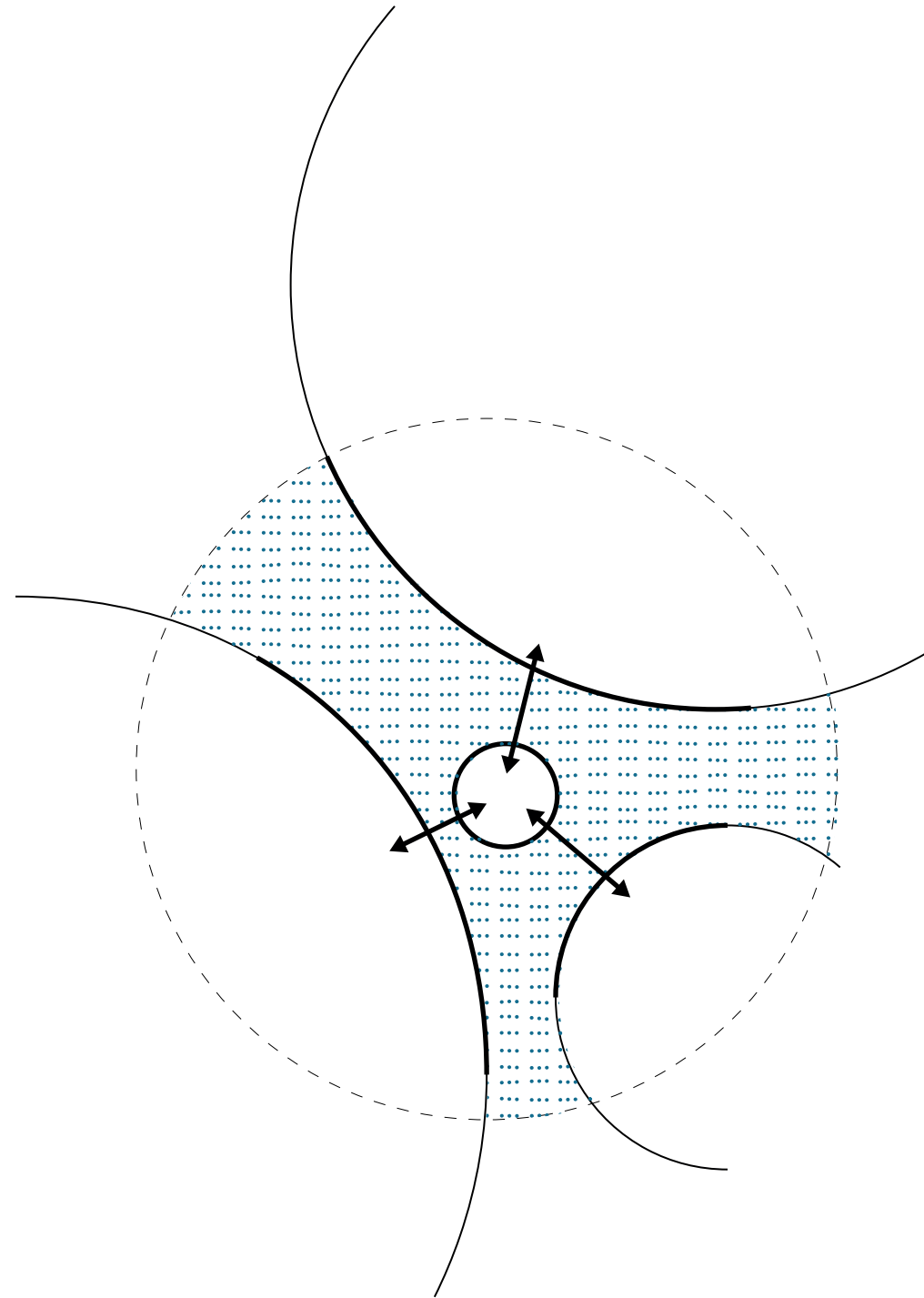
STRUCTURE OF GDP BY SECTORS OF ACTIVITIES, 2004



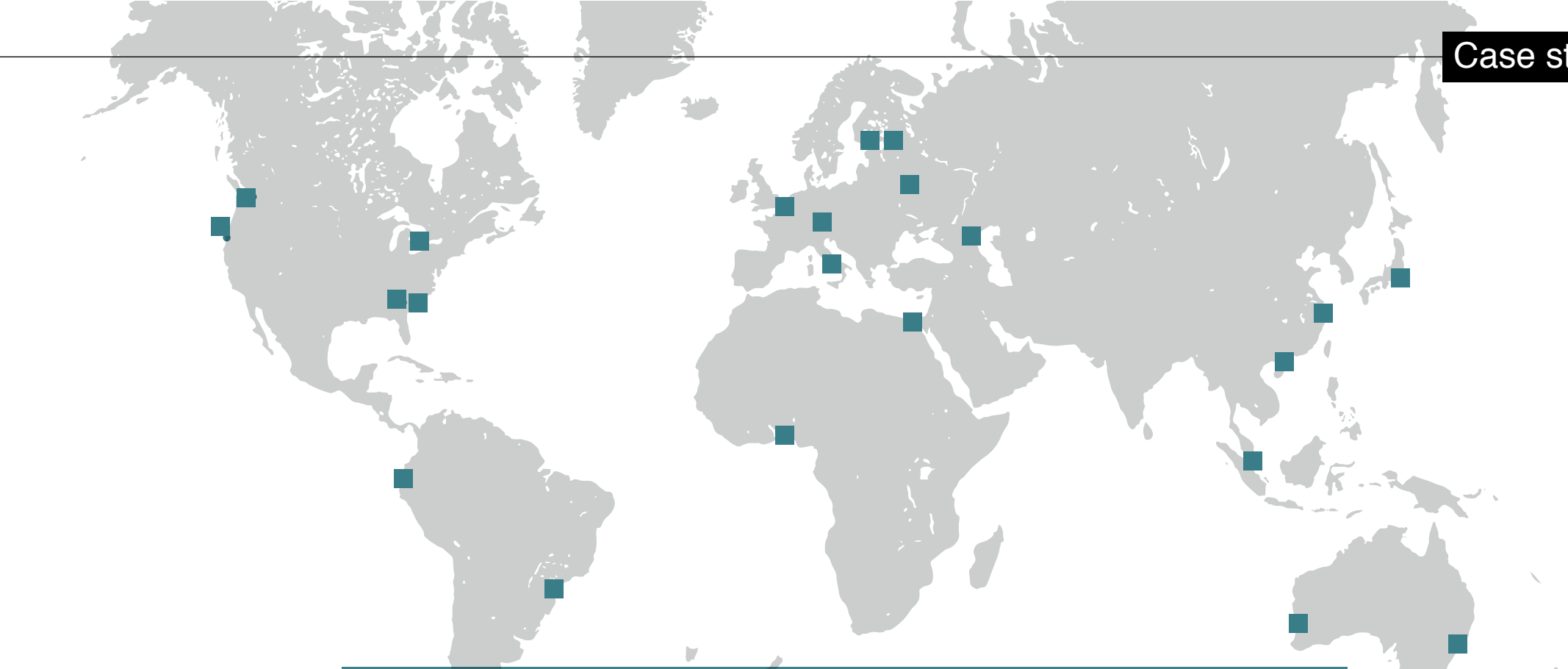
Compared with other capital cities in Europe, Belgrade needs to develop Tertiary sector.



Belgrade is a seperated city, the government want to use a system of ring road to unify the city, However, such a simplest way will not integrate the city. I think, the nature reserve located in the middle of Belgrade, the Great War Island, can be a opportunity to integrate the city, and att-ract people by flow of two international rivers.



How to use the Great War Island and the waterfront of Danube River as an opportunity to integrate the city of Belgrade from both physical and social aspect ?



Study with various islands located in cities to know how can island connect to the land.

Annacis Island
British Columbia
industry



North Island
Rotterdam
Residential



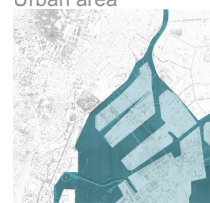
Lagos Island
Lagos
Urban area



Gorodskoy Island
Astrakhan
Natural reserve



Tsukishima Island
Tokyo
Urban area



Bairro do Recife
Recife
Urban area



Governor's Island
New York
Park



Gezira Island
Cairo
Urban area



Tiber Island
Rome
Heritage, Residential



Isla Baltichug
Moscow
Urban area



Sentosa Island
Singapore
Tourism



Santay Island
Guayas
Natural reserve



Theodore Roosevelt Island
Washington, D.C.
Monumental



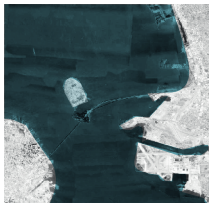
Prater Island
Munich
Heritage



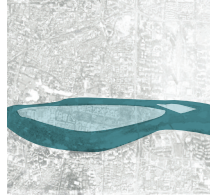
Zayachy island
Saint Petersburg
Heritage



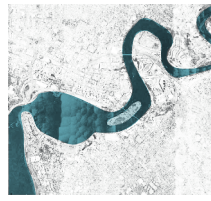
Treasure Island
San Francisco
Residential



Ersha Island
Guangzhou
Urban area



Harrison Island
Perth
Park



Belle Isle Park
Detroit
Park



Ile de la Cite
Paris
Heritage, Recidental



Rabbit Island
Istanbul
Nature



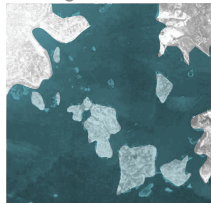
Fuxingdao island
Shanghai
Urban area



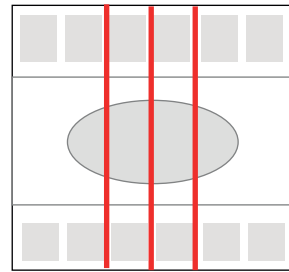
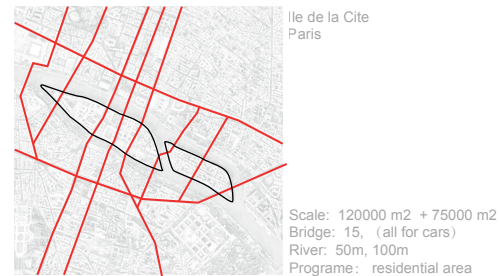
Goat Island
Sydney
Park



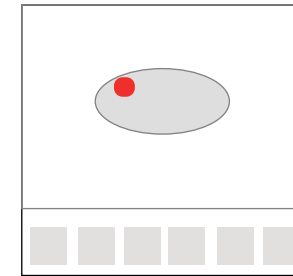
Suomenlinna Sea Fortress
Helsinki
Heritage



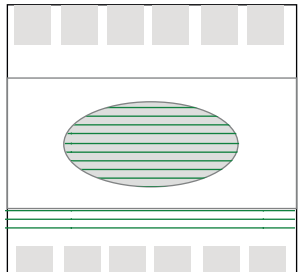
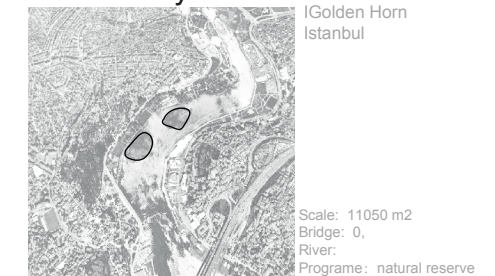
Physical link



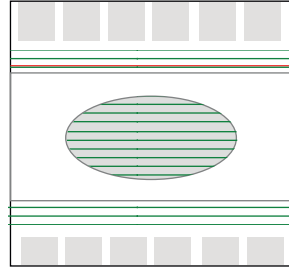
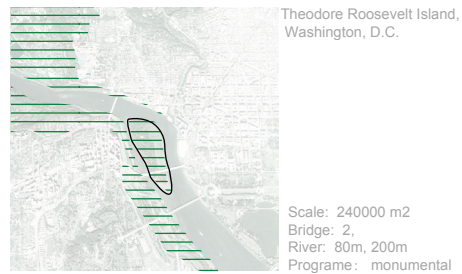
Heritage link



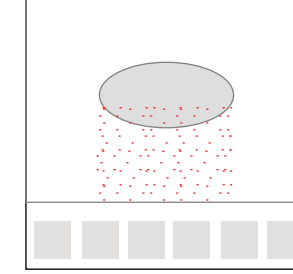
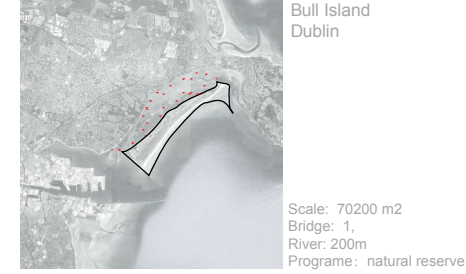
Visual-unity link



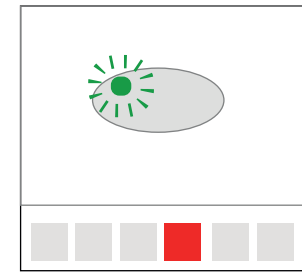
ECO link



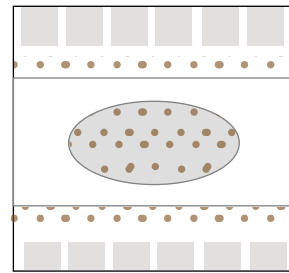
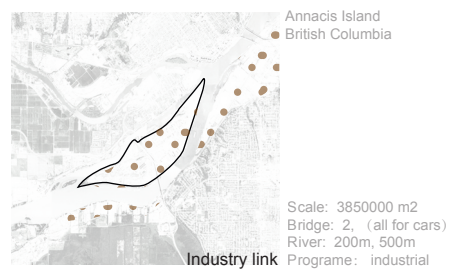
Sediment link



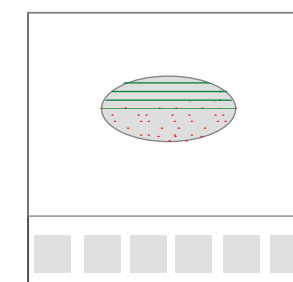
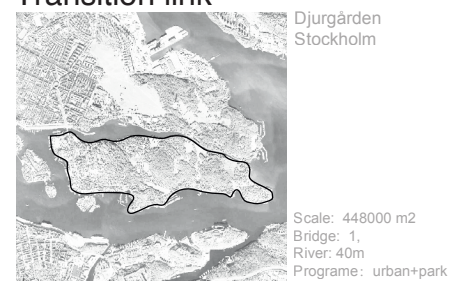
Visual link



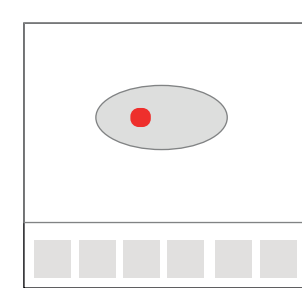
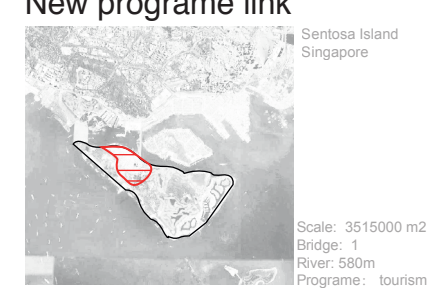
Function link



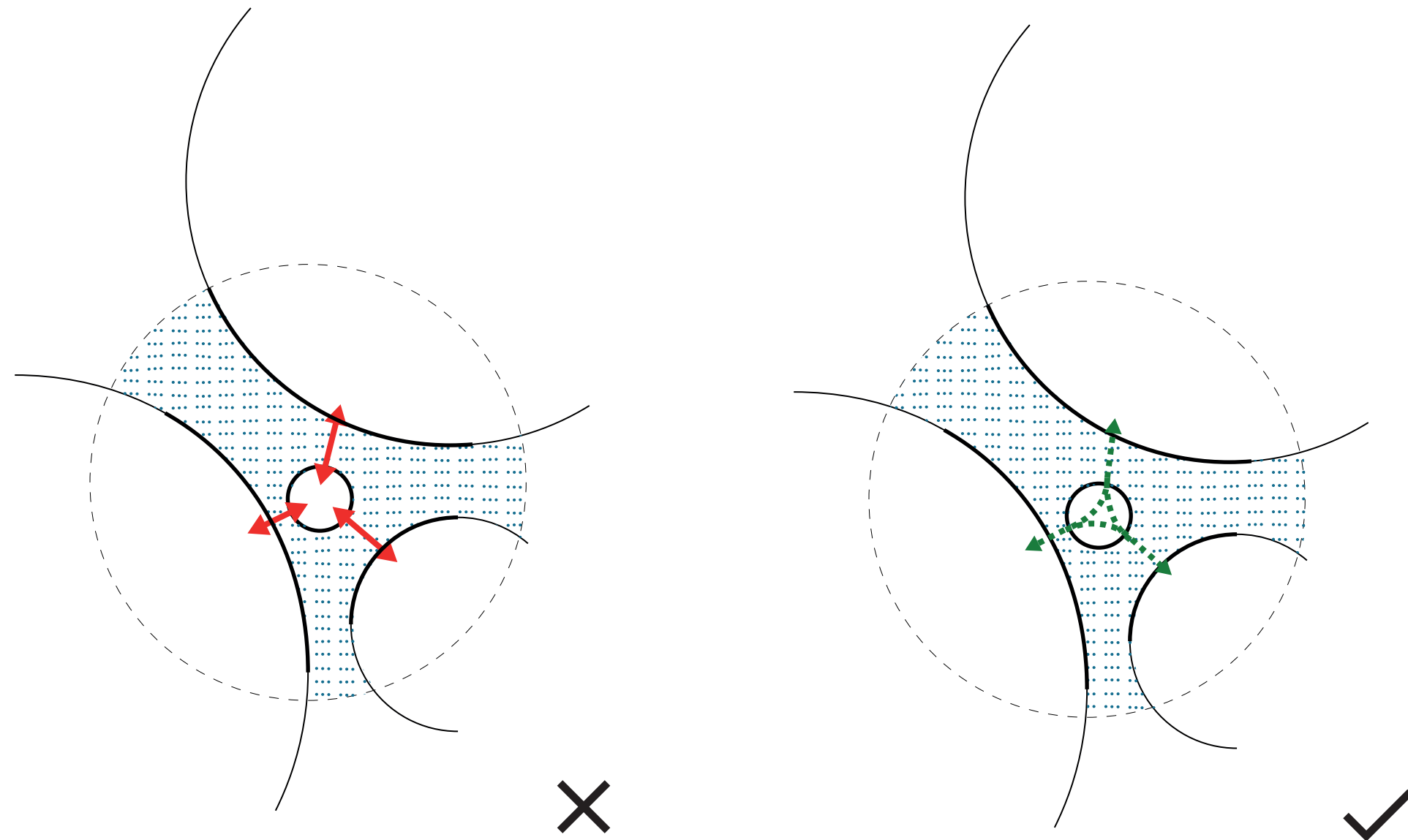
Transition link



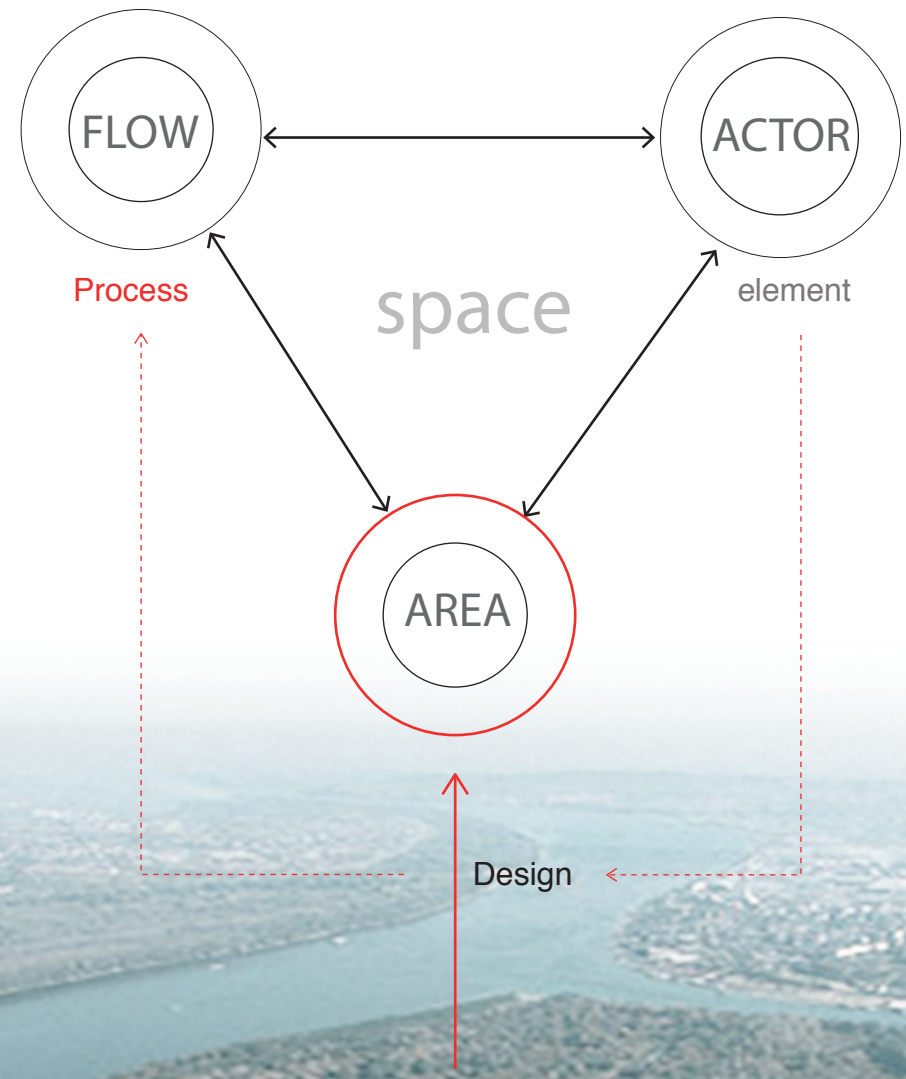
New programme link



From the cases study of islands, I can summarize many design principles for connecting the Island with the land.



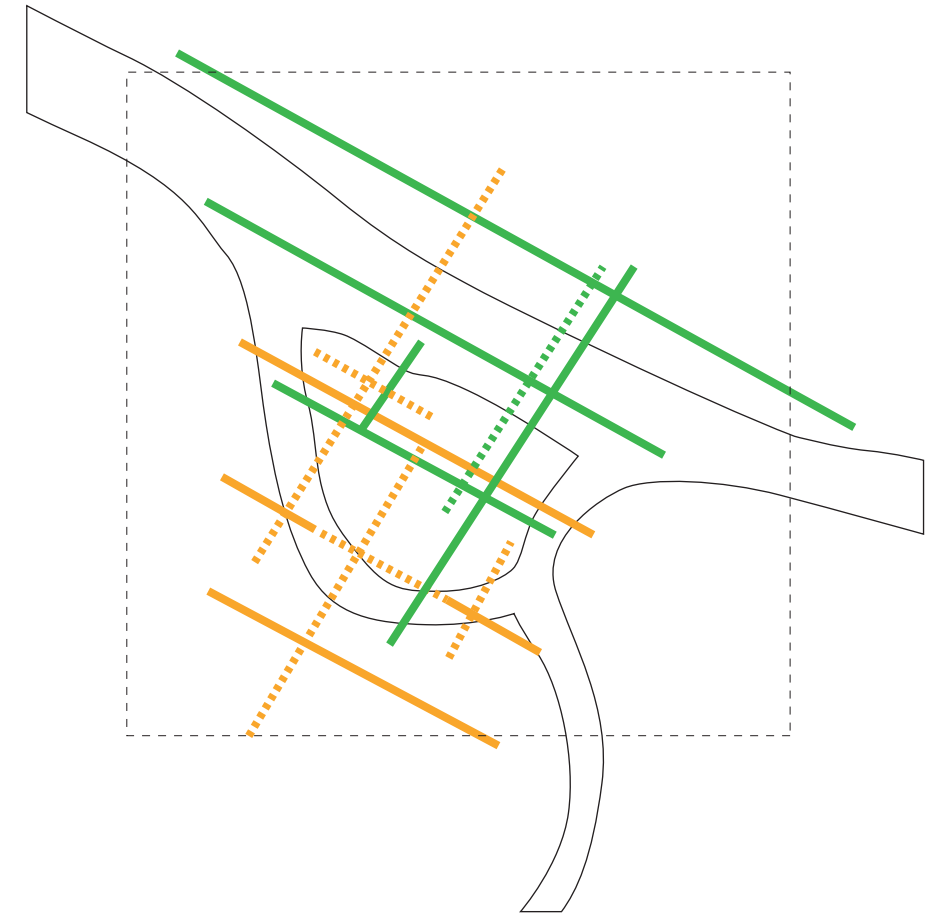
There are many ways to connect the island with the land. However, which kind of connection is more flexible and durable?
As a landscape architect, I think designing the 'connection' as a process but not a object maybe a good way.



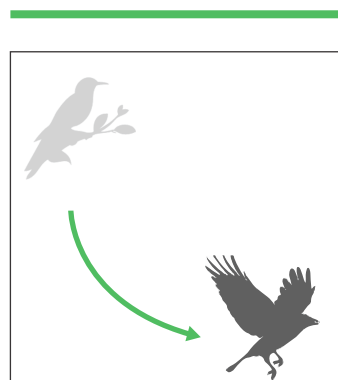
As a landscape architect, design with the flow can be more flexible and durable. 'design with the flow' means landscape design the area by considering the actor and their behavior(flow).



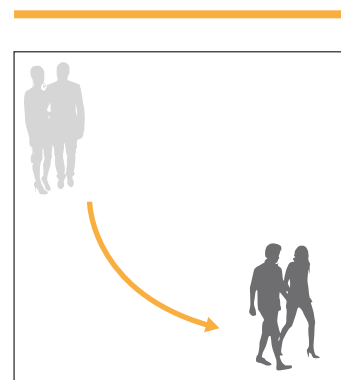
What can landscape architect do ?



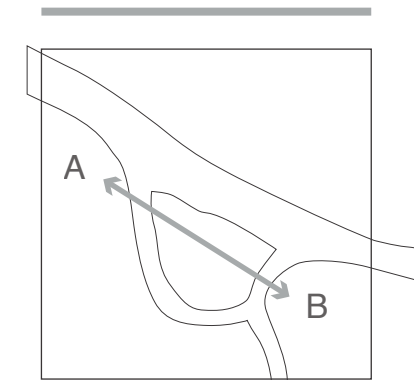
As the site is located between natural and urban environment, I can use the nature and urban flow to organize a network to integrate the city. therefore, my concept is "Flow network", which can make separation turn into integration



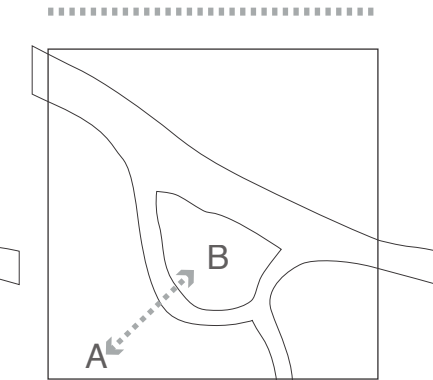
Nature flow



Urban flow



Passing-by flow



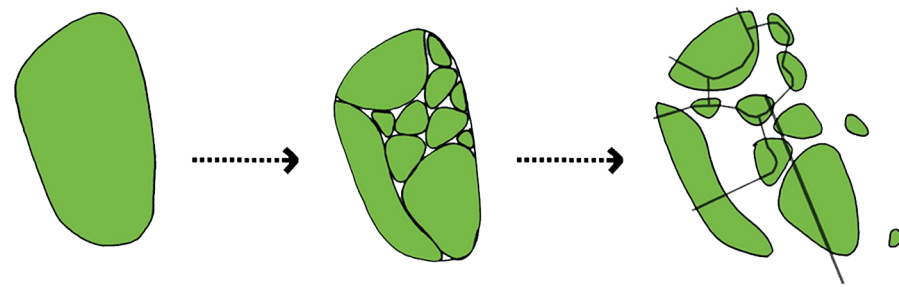
Destination flow

The Framwork of Design

- 1 Design a flexible base for the 'Flow Network'
- 2 Design the 'Flow Network' for integrating the seperated city
- 3 Design the traffic road fit with my 'Flow Network' (by Space Syntax)
- 4 Design the developing phase of the site

1 Design a flexible base for the 'Flow Network'

International Garden Show Park Xia men, China



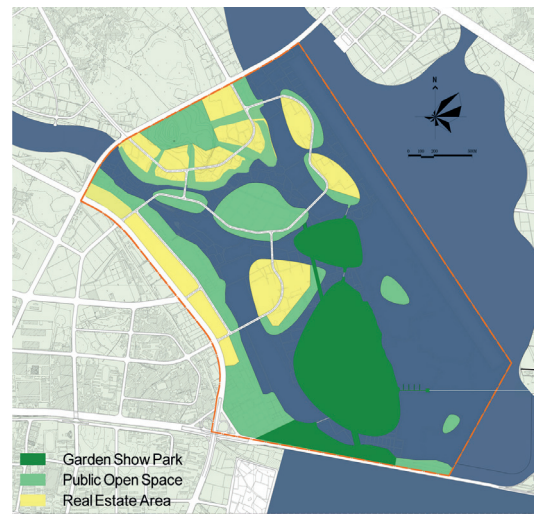
Seperate huge island into small islands



dynamic watersystem



diversity of ecosystem



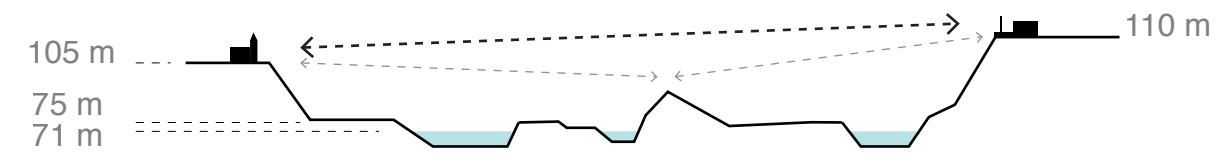
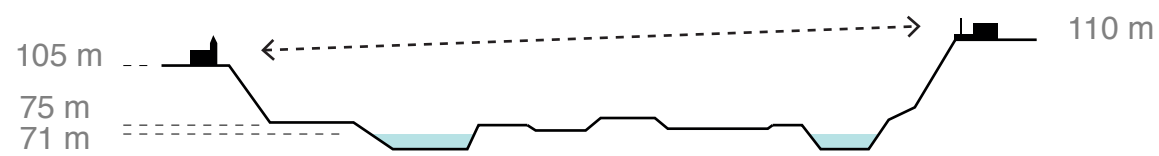
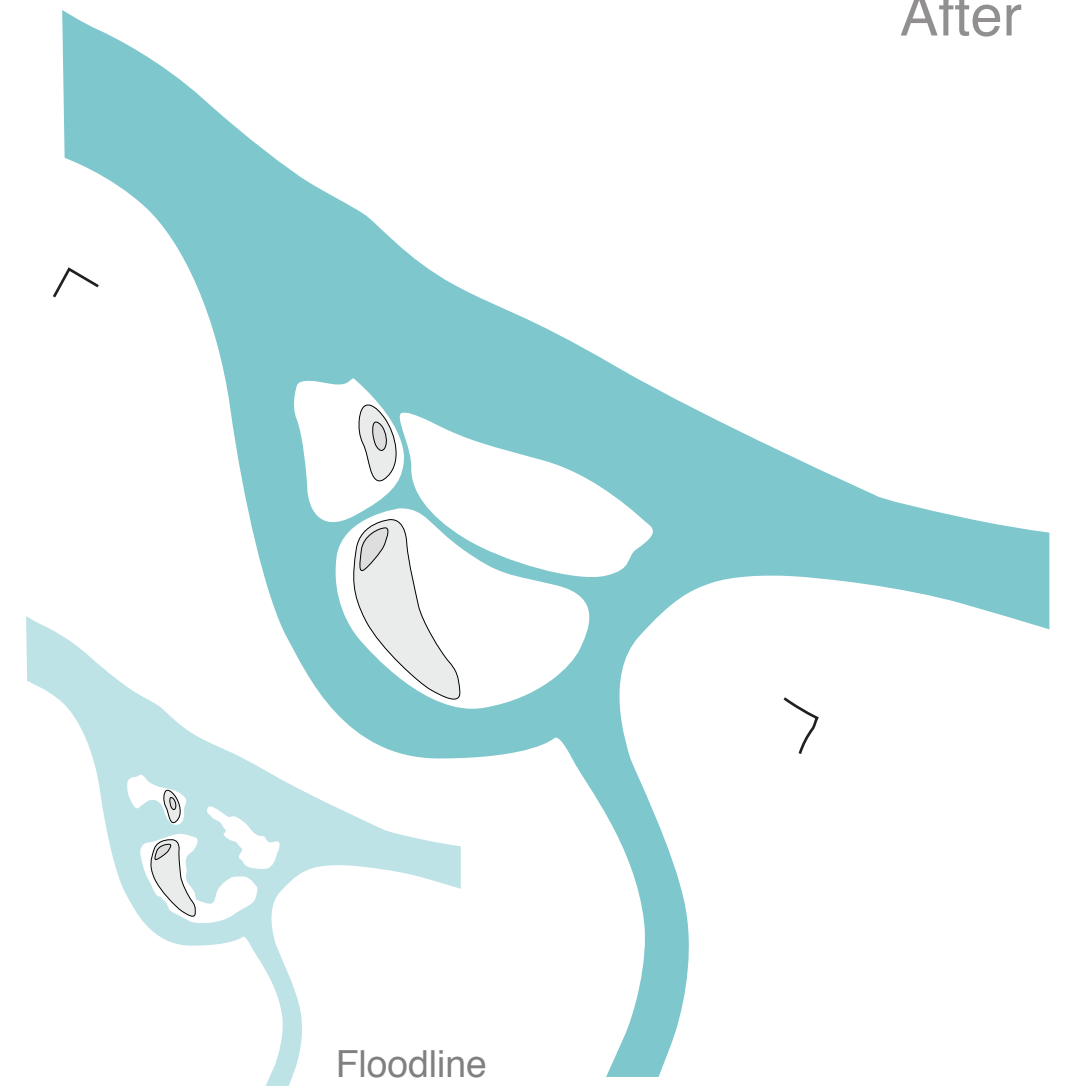
Unify islands with program and bridges

1 Design a flexible base for the 'Flow Network'

Before



After



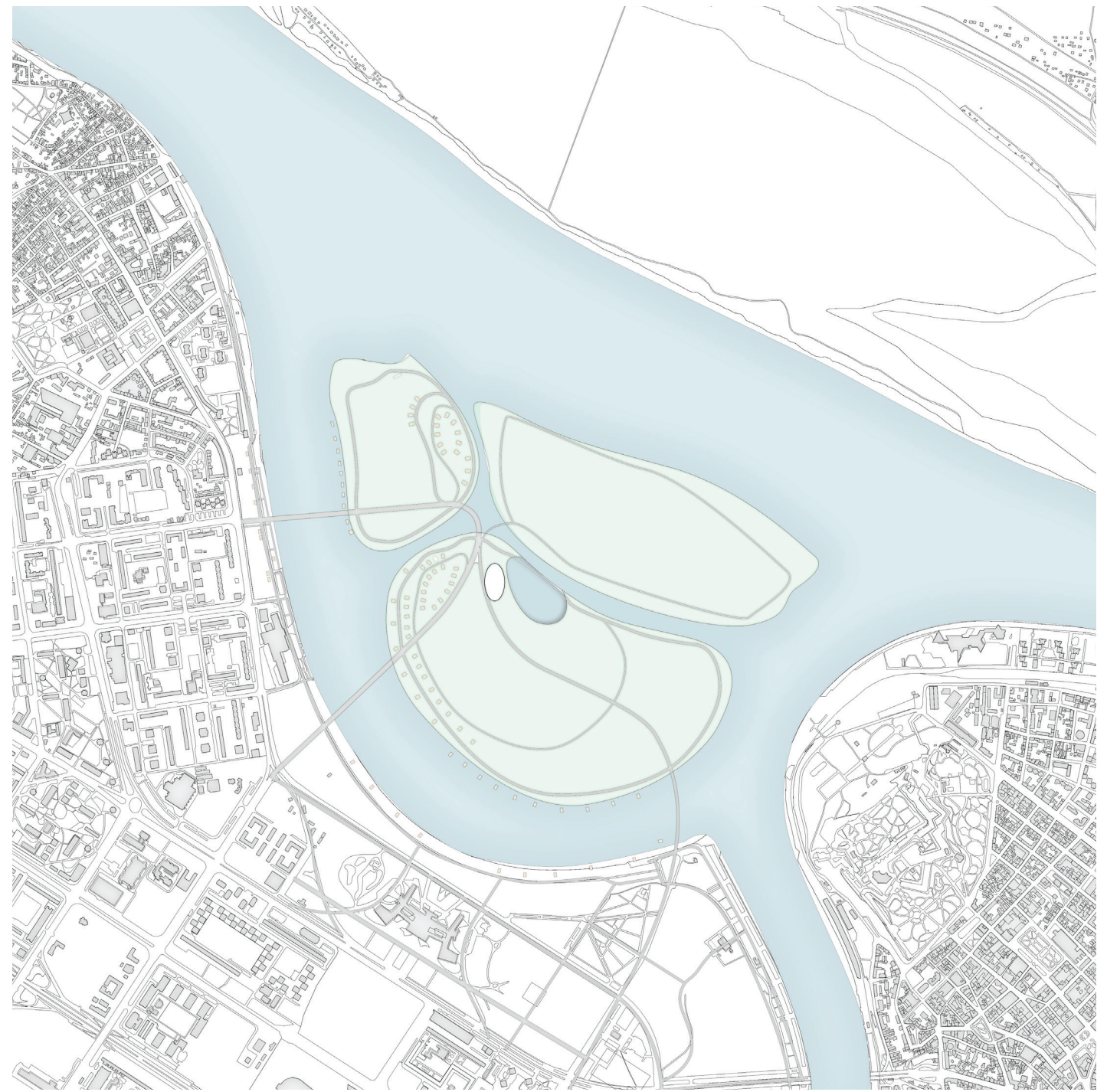
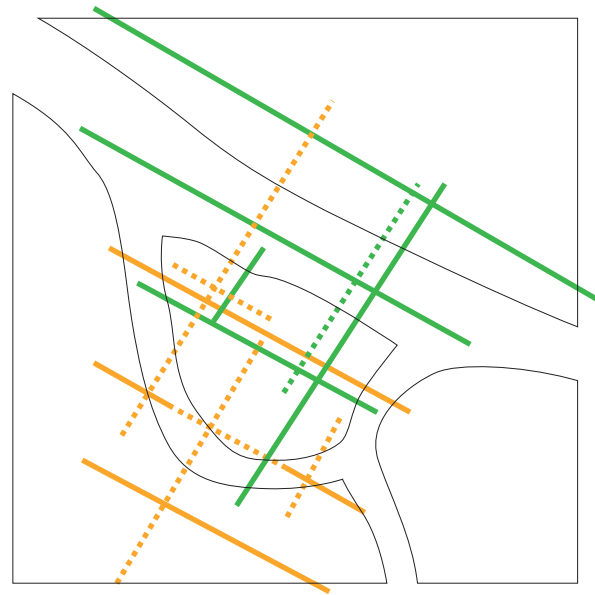
Considering the existing structure, floodline and the high-value heritage view in the site, then separate the Island and use the earth to built new landform, to ensure the new floodline and protection of heritage view.

2 Design the 'Flow Network' for integrating the seperated city

According existing situation, I designed 9 kinds of flow in my site to integrate seperated city.

Including 4 kinds of nature flow,
5 kinds of urban flow.

Overlay these flows, I can have my master plan.



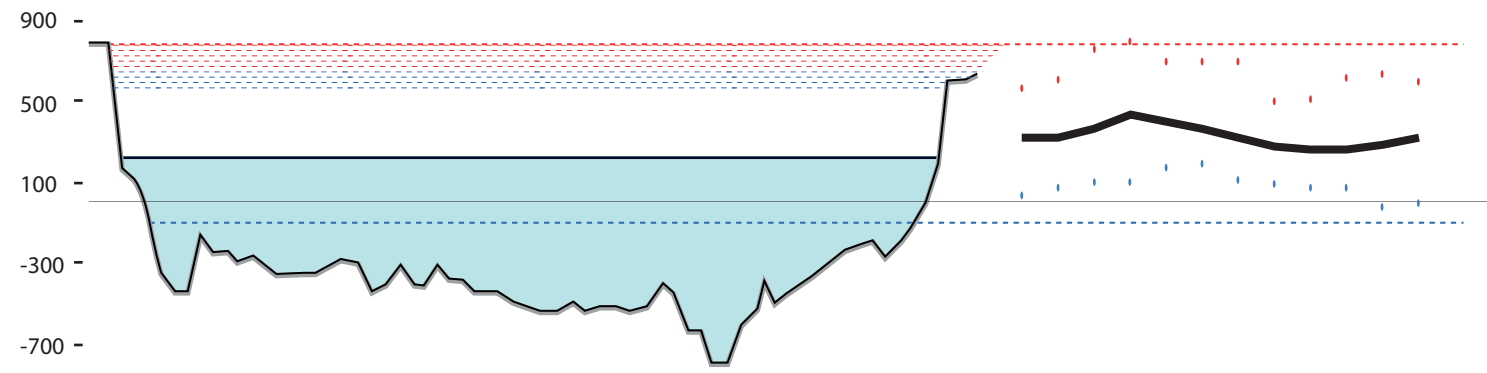
Nature Flow

Urban Flow

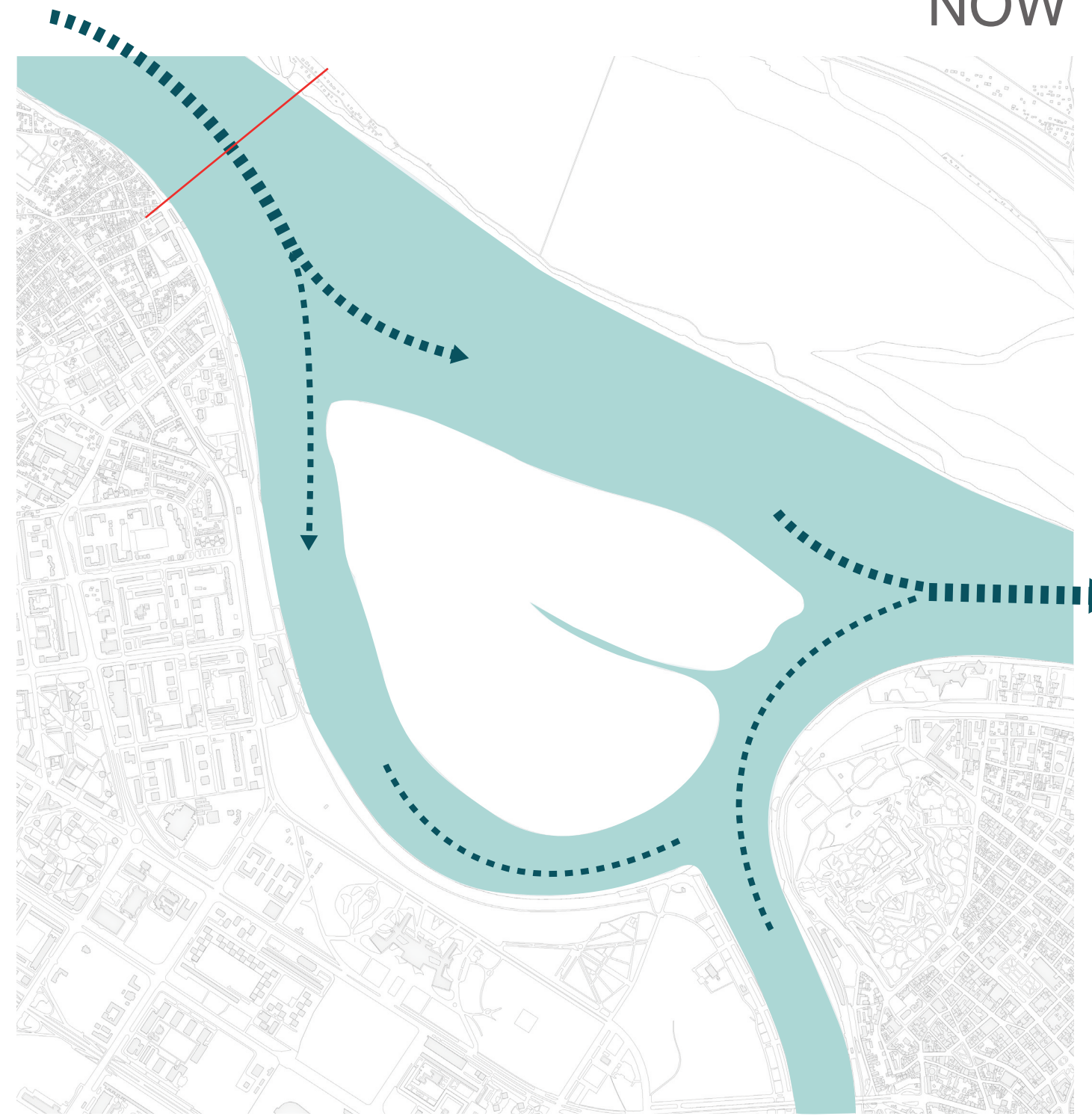
Water flow	Sediment flow	Plant flow	Bird flow	Heritage flow	Nightlife flow	Residential flow	Art flow	Modern life flow

2 Design the 'Flow Network' for integrating the seperated city

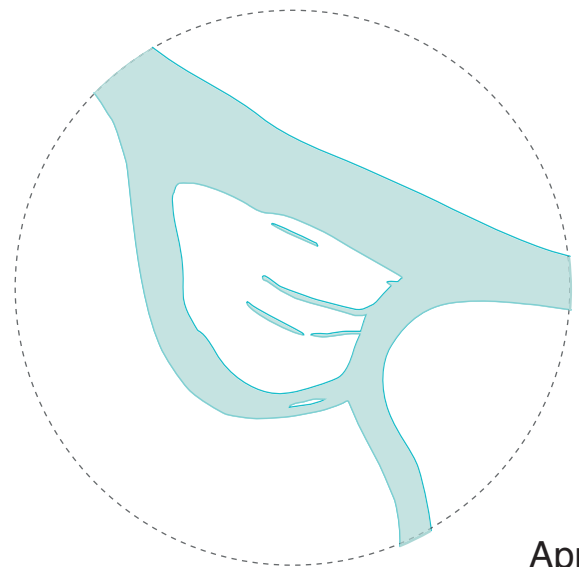
Water flow
NOW



The Water level of Danube is seasonal changing, which will be highest point at April, lowest point at September. The difference between highest and lowest waterlevel is about 2m. And flooding problem is not so serious in Belgrade.



September

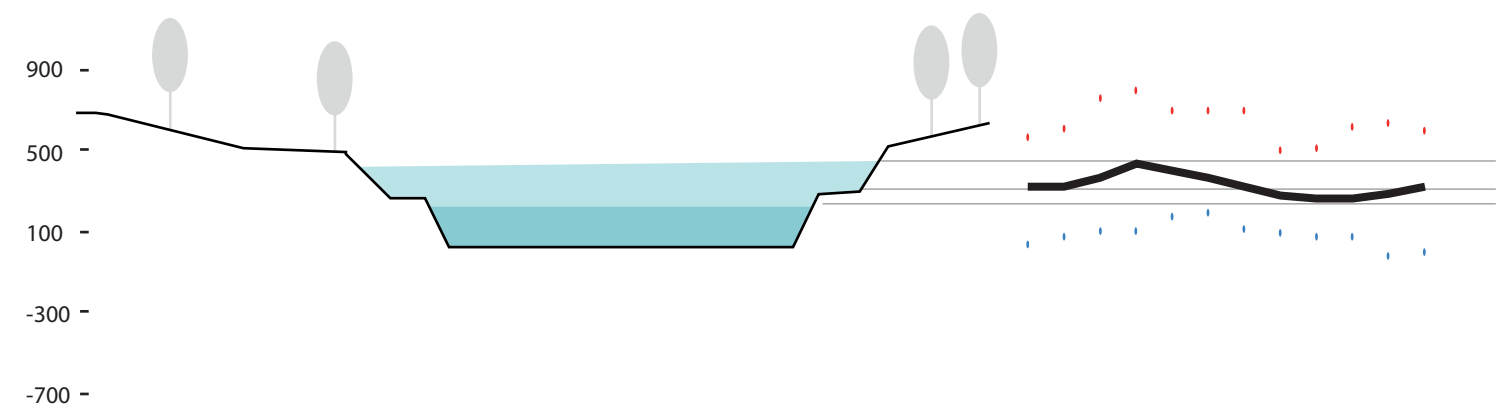


April



2 Design the 'Flow Network' for integrating the seperated city

Water flow Design



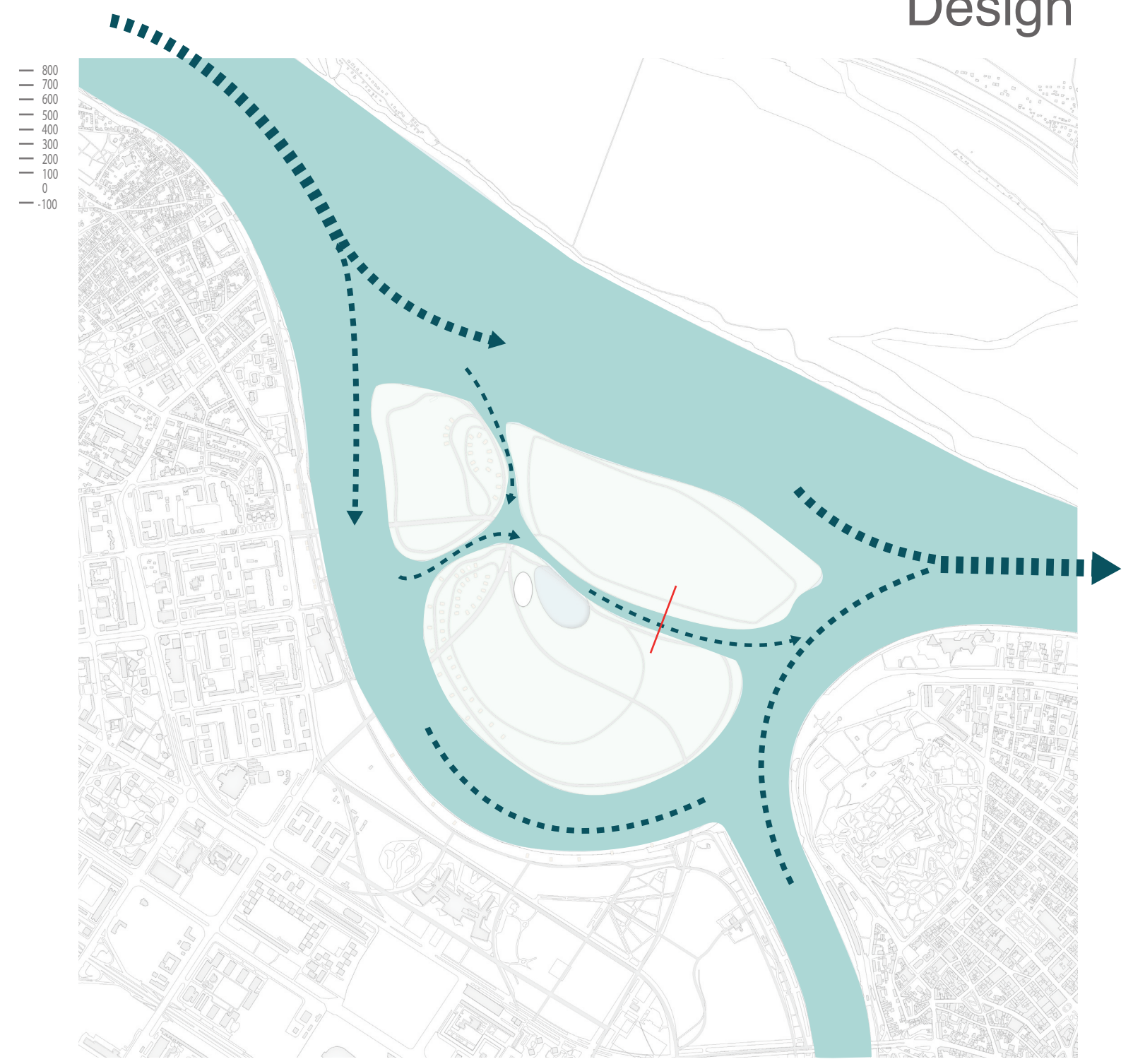
Design a flexible waterfront in new cannal to fit with the seasonal change water level.



September

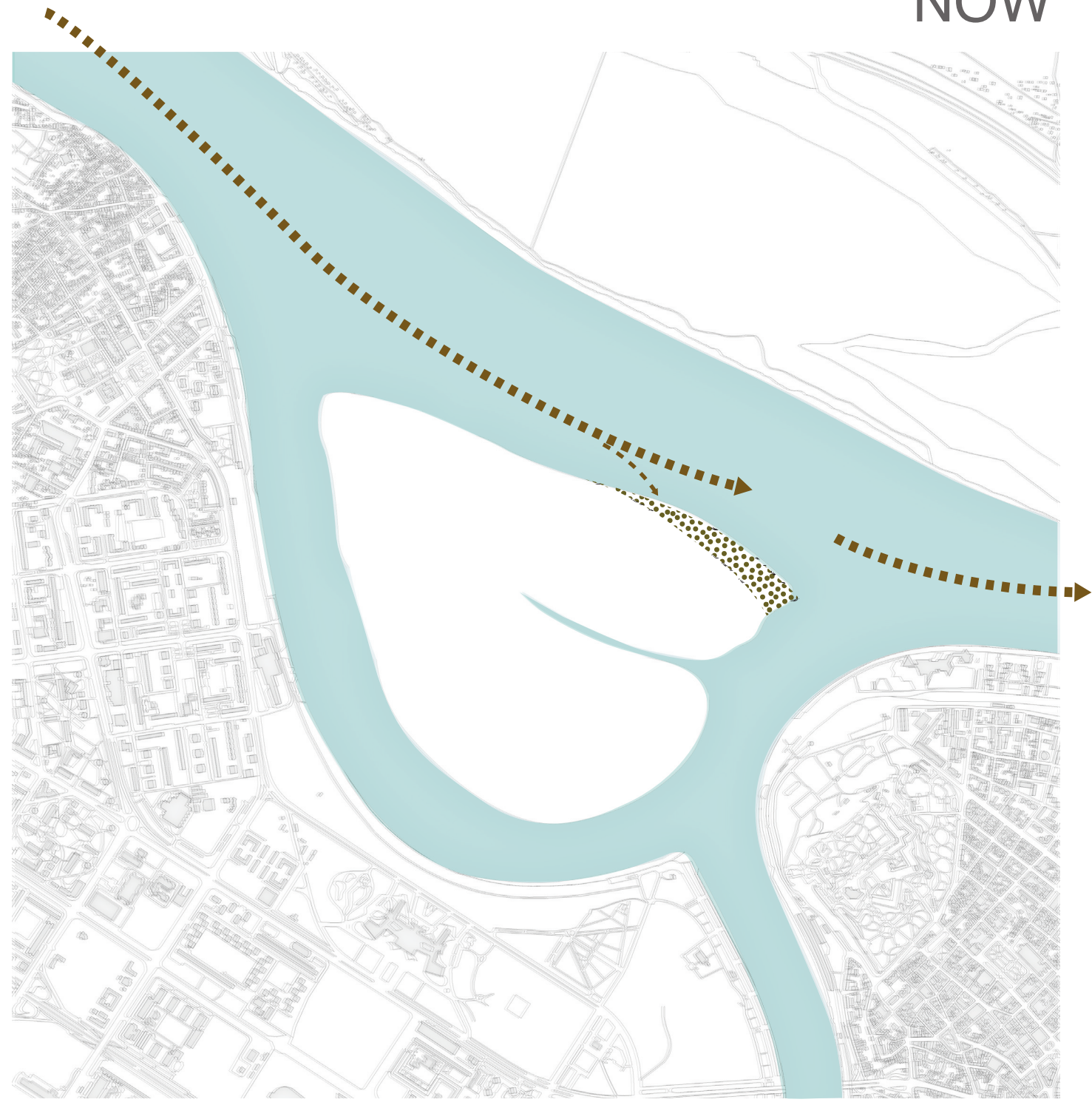
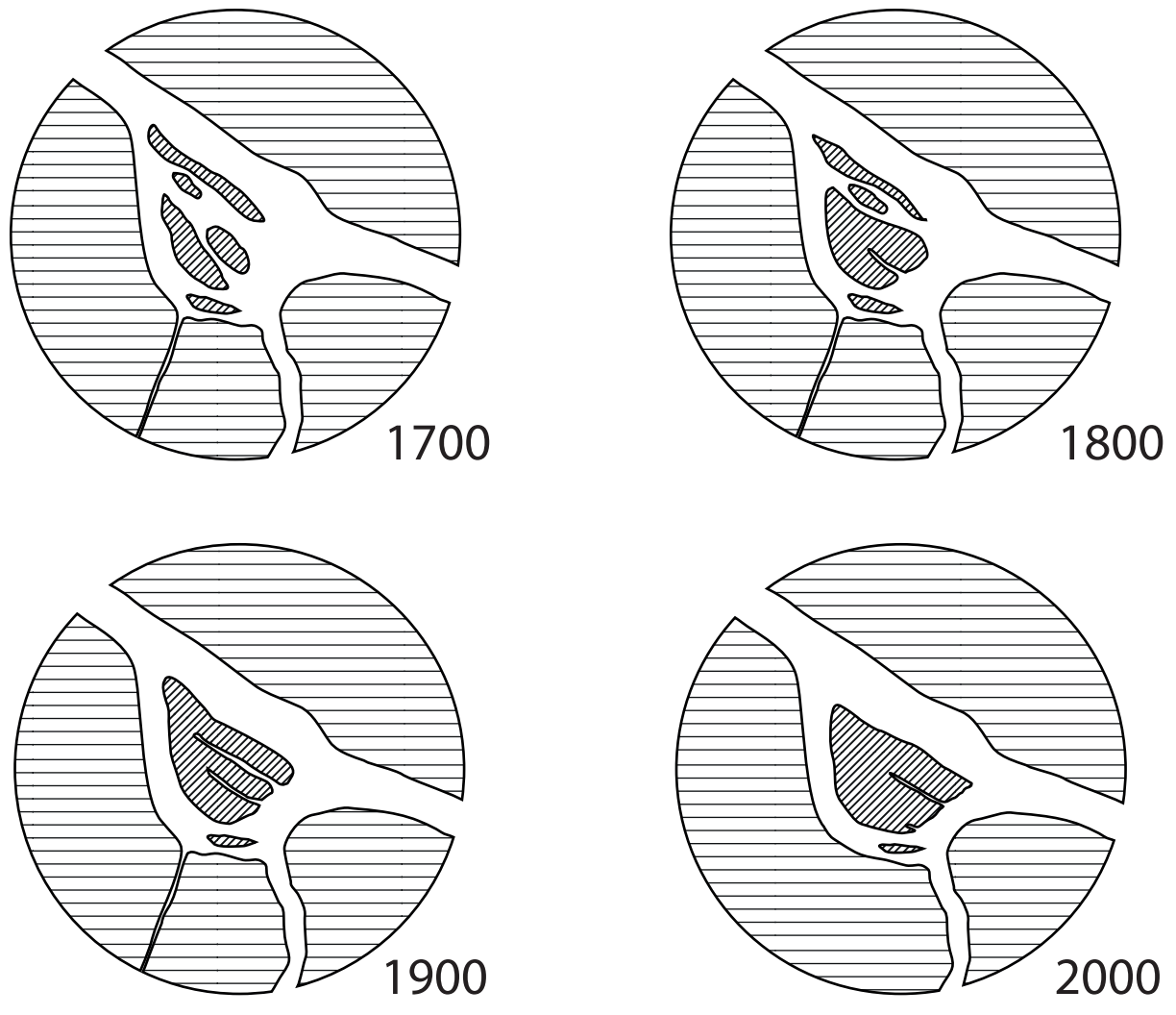


April



2 Design the 'Flow Network' for integrating the seperated city

Sediment flow
NOW



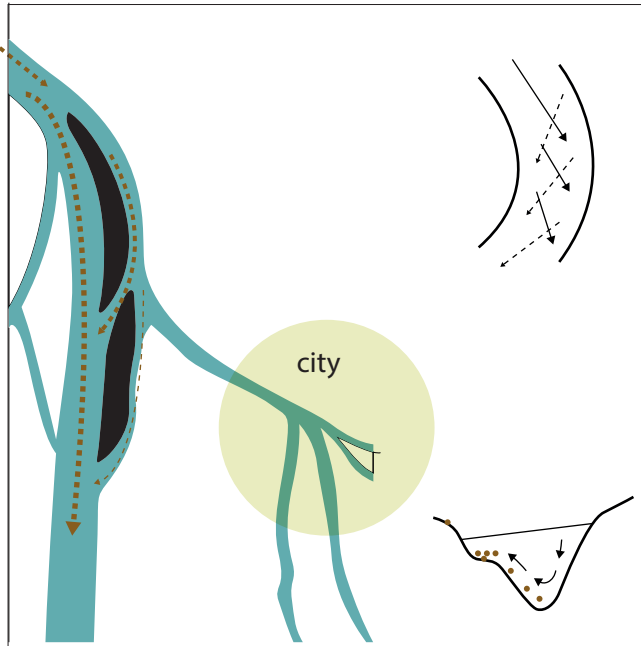
The island was generated by the sediment flow. In history, many islands became into a big one also caused by the sediment.



Sediment flow
DESIGN

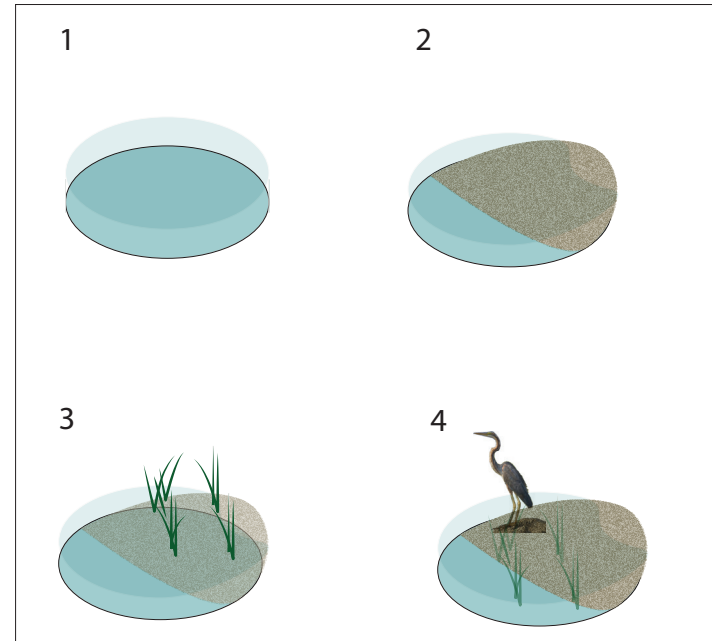
2 Design the 'Flow Network' for integrating the separated city

1 Du jiang yan in China

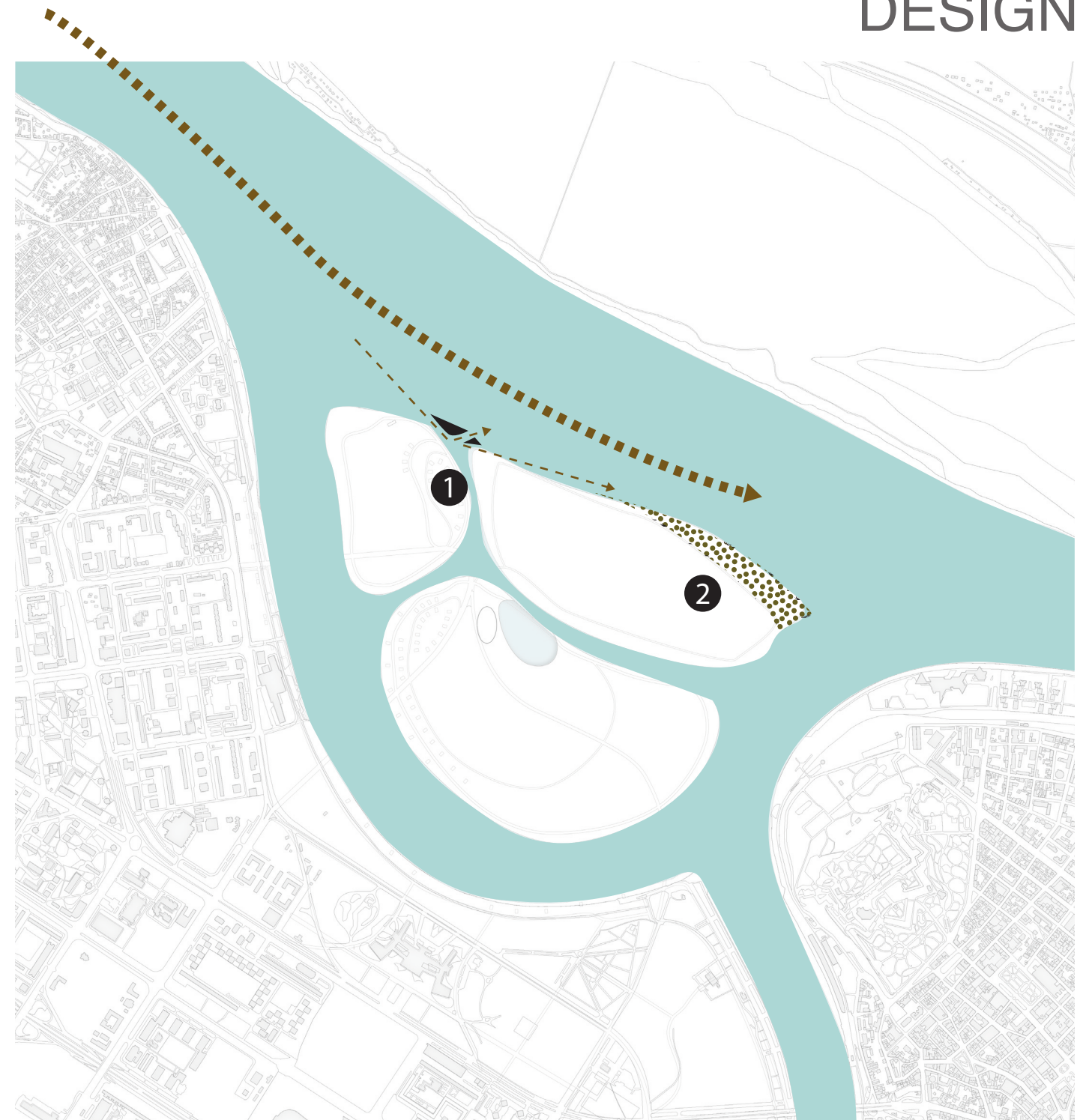


Using the same hydraulic structure in Dujiangyan city, China. To avoid the sediment closing the canal again.

2 Evolution of wetland



The sediment at north-east part of island can design as a area with educational function to show the evolution of wetland.

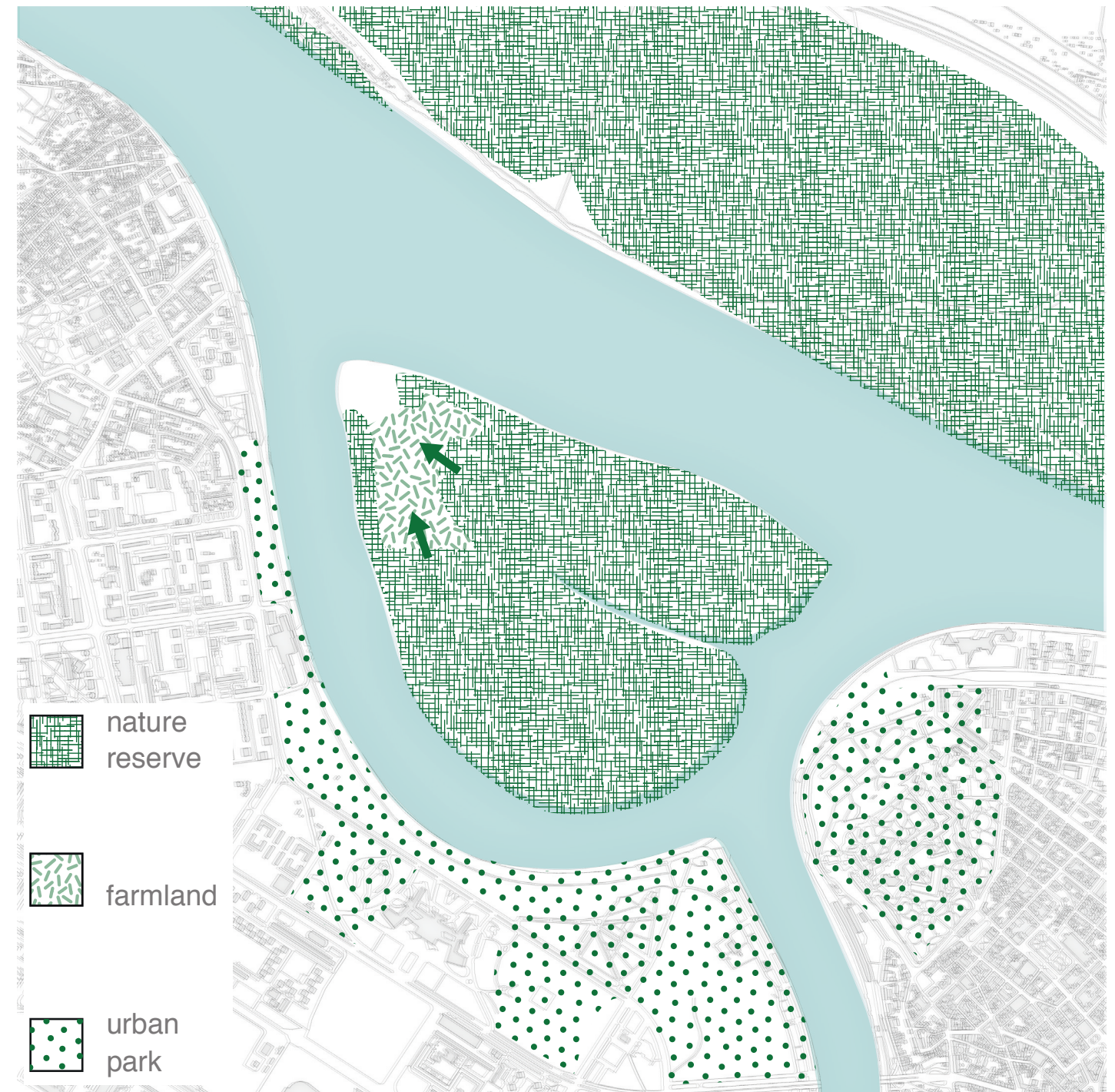
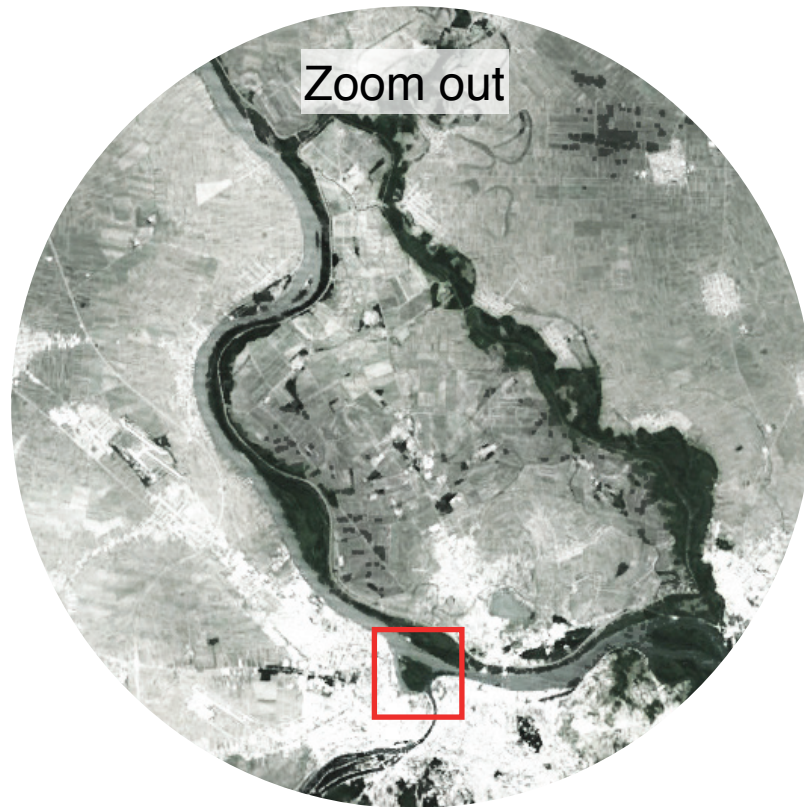


2 Design the 'Flow Network' for integrating the seperated city

Plant flow
NOW

Plant List of
the Great War Island

- Salix alba L.
- Populus alba L.
- Populus nigra L.
- Fraxinus angustifolia Vahl.
- Quercus robur L.
- Fraxinus pennsylvanica Marsh.
- Amorpha fruticosa L.
- Acer negundo L.
- Vitis riparia Michx.
- etc.












The plant species of the island are common. Therefore, the left side of Danube has more eco-valuable as a green corridor.



2 Design the 'Flow Network' for integrating the seperated city

Birds flow
NOW

- 1  *Aythya nyroca* (VU)
- 2  *Oriolus oriolus* (LC)
- 3  *Perdix perdix* (VU)
- 4  *Milvus migrans* (VU)
- 5  *Ardea purpurea* (LC)
- 6  *Gavia arctica* (VU)
- 7  *Vanellus vanellus* (VU)
- 8  *Tachybaptus ruficollis* (LC)
- 9  *Egretta garzetta* (LC)

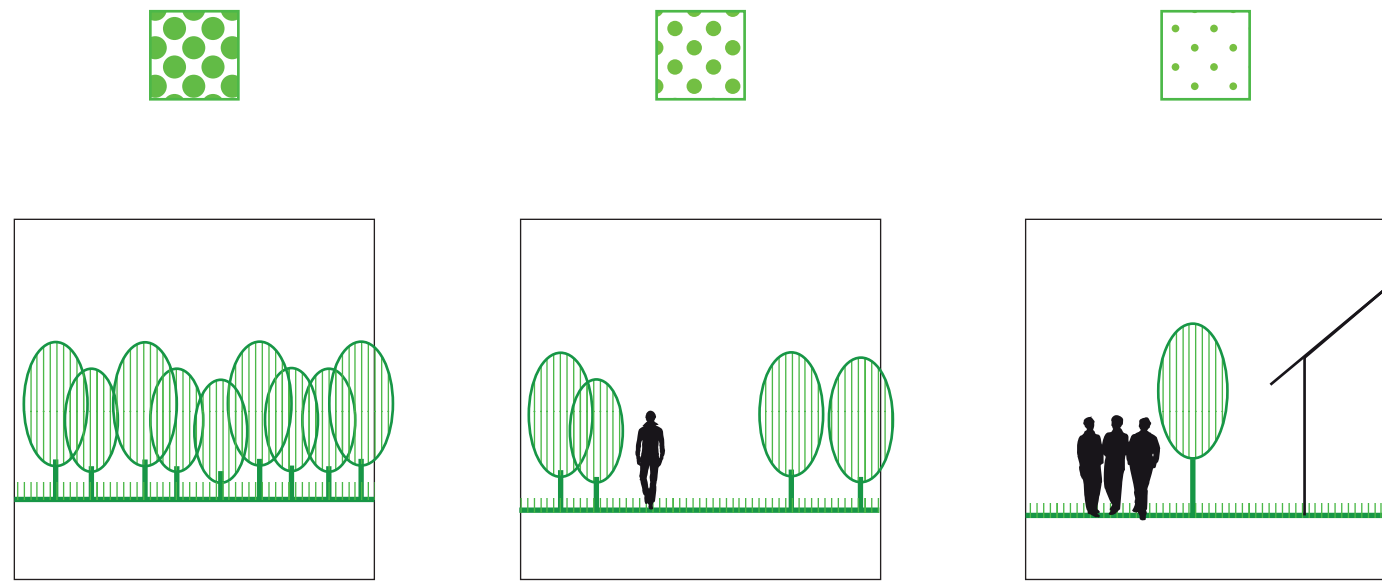


The endanger species in the nature reserve are birds. Different types of ecosystem offer the birds shelter.

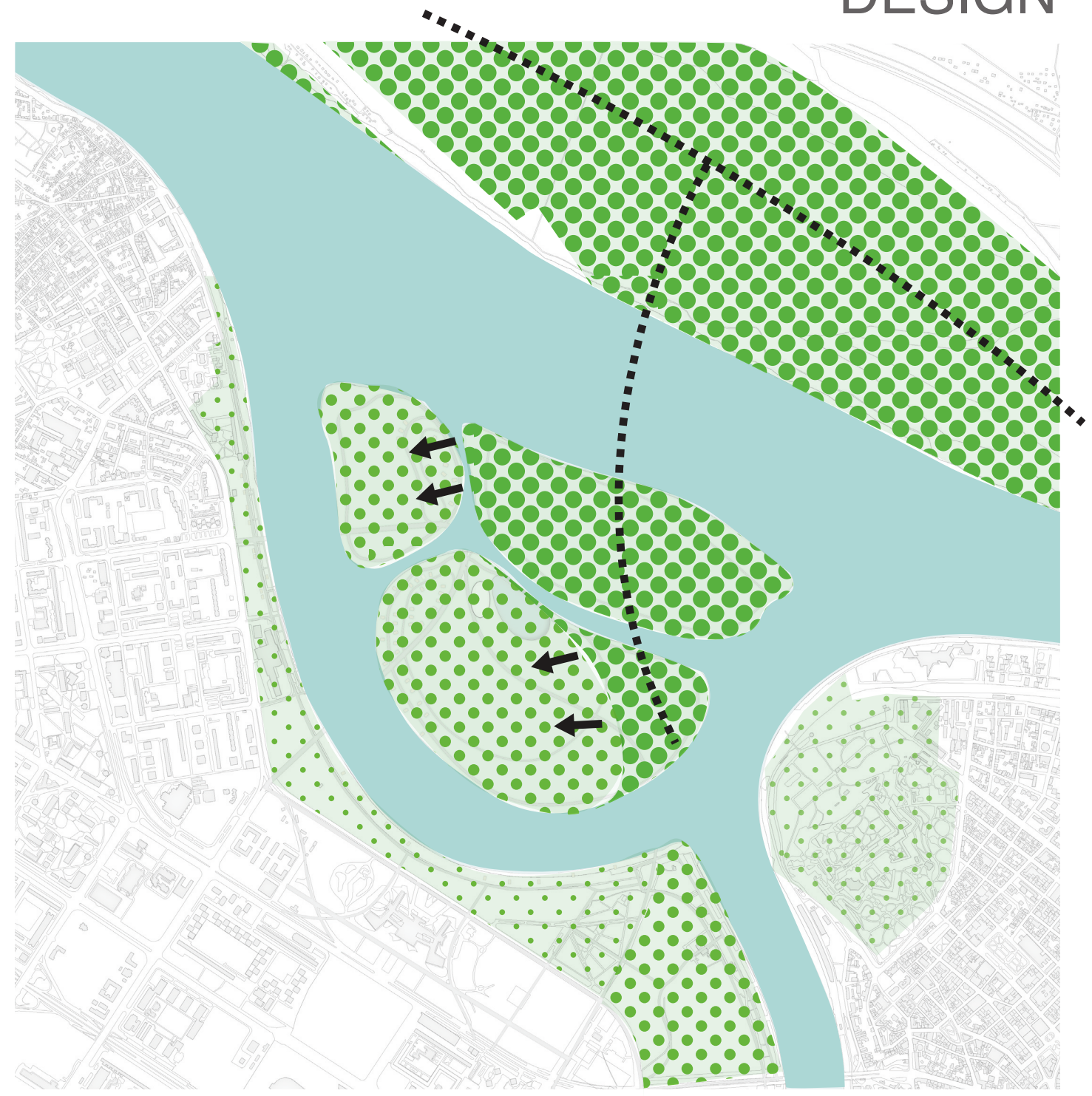


Plant flow DESIGN

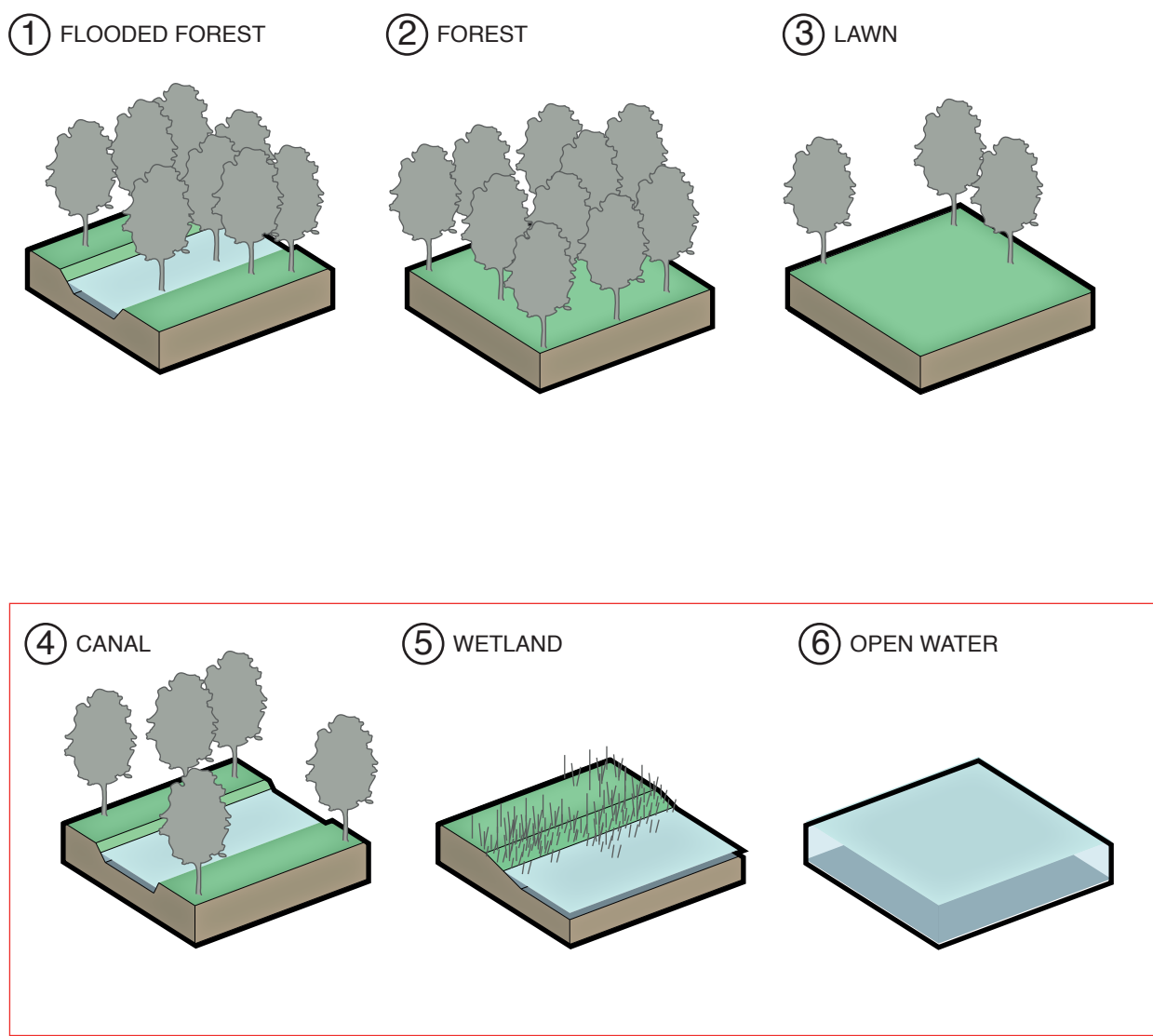
2 Design the 'Flow Network' for integrating the seperated city



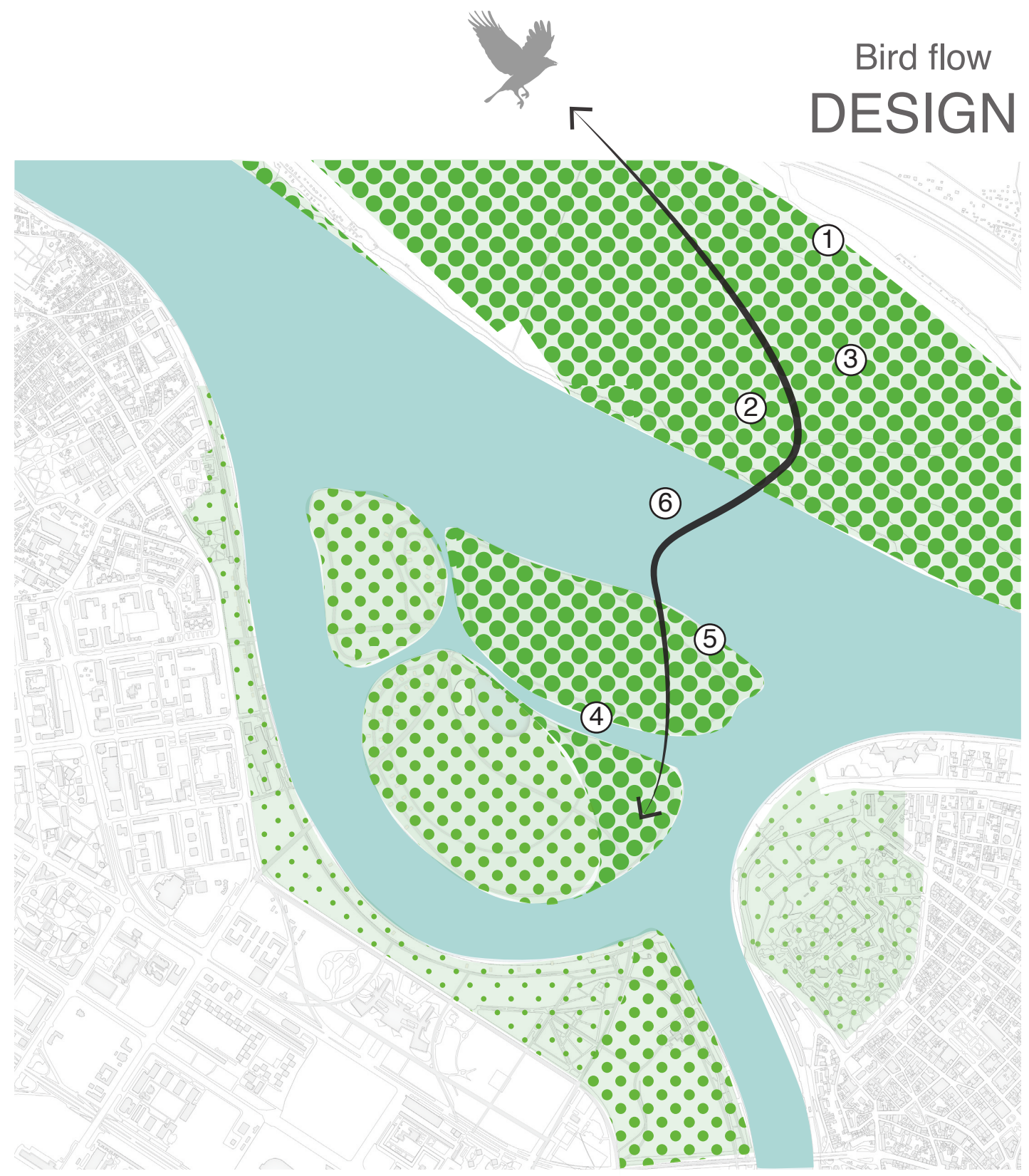
The plant species of the island are common. Therefore, the left side of Danube has more eco-value as a green corridor.



2 Design the 'Flow Network' for integrating the seperated city



By design the northeast part as nature reserve, it can offer 3 more ecosystem to attract birds.



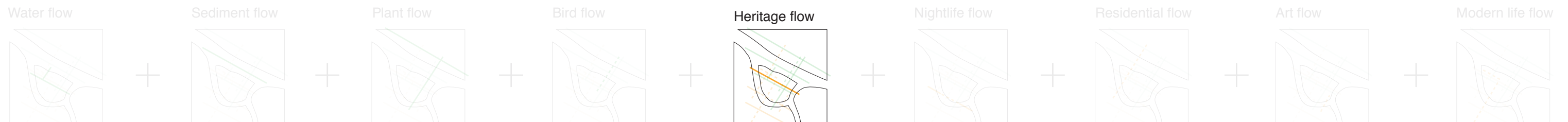
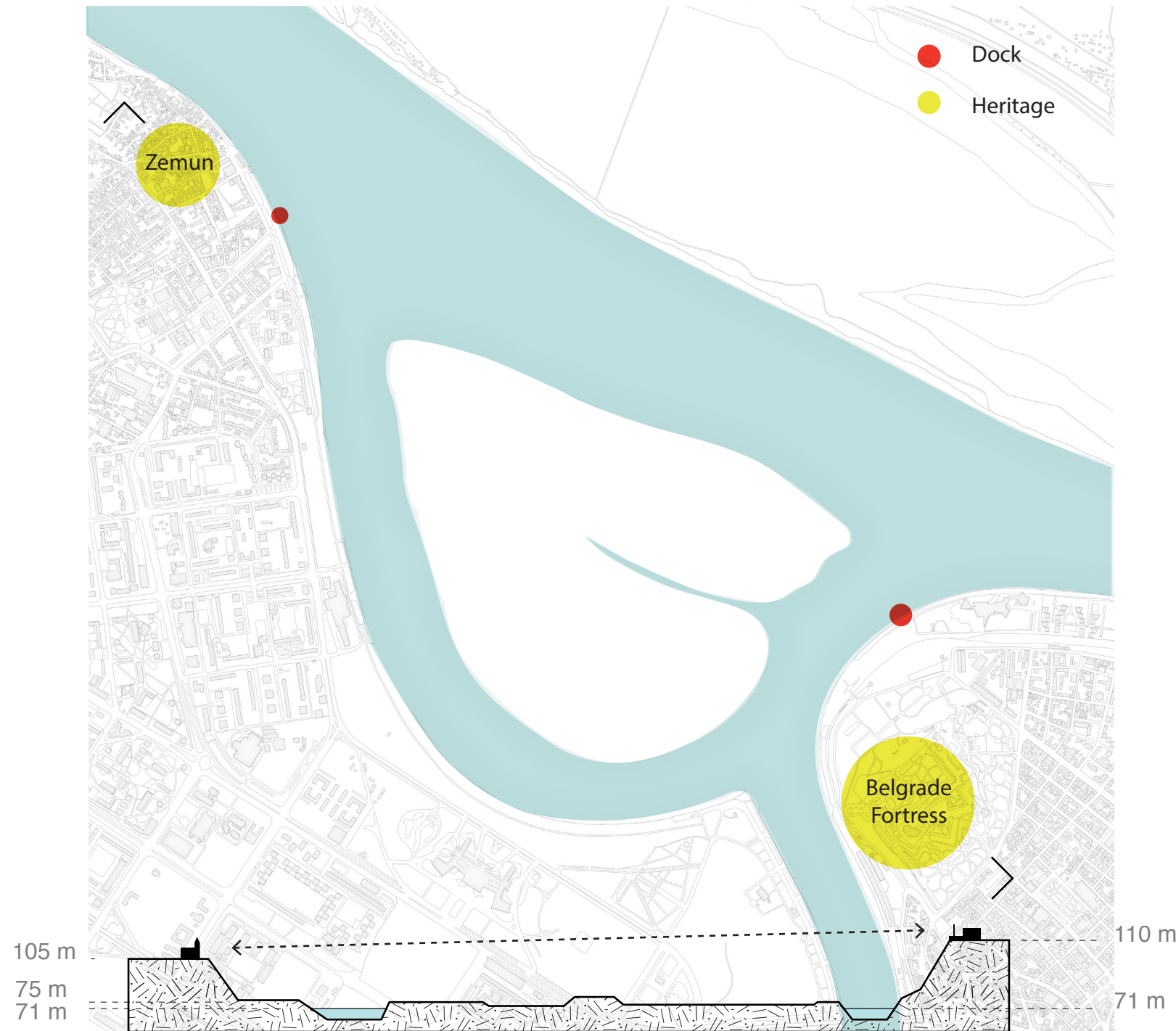
2 Design the 'Flow Network' for integrating the seperated city



The history image of Belgrade in 1780

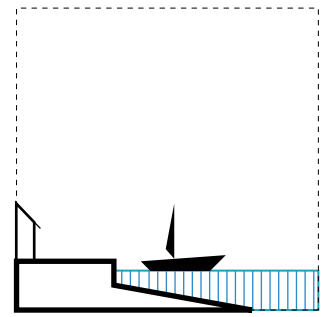
The visual relationship between two old twons is very important for the site, and the history of Belgrade is a history of wars.

Heritage flow NOW

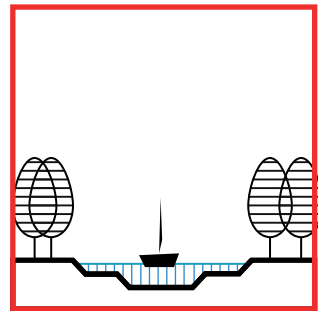
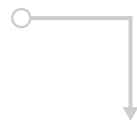


Heritage flow DESIGN

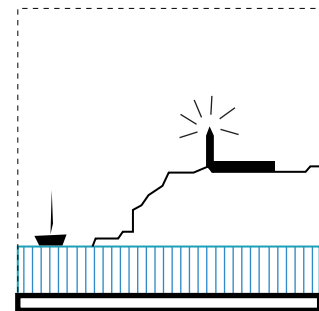
2 Design the 'Flow Network' for integrating the seperated city



The dock at Zemen

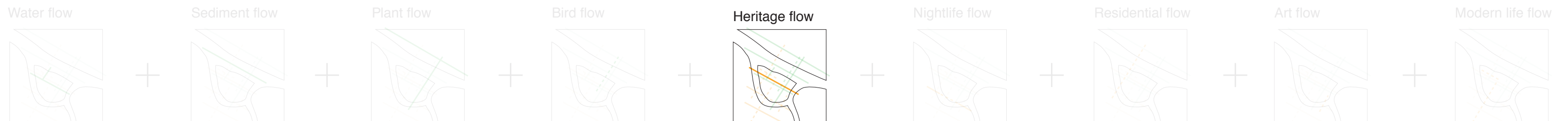
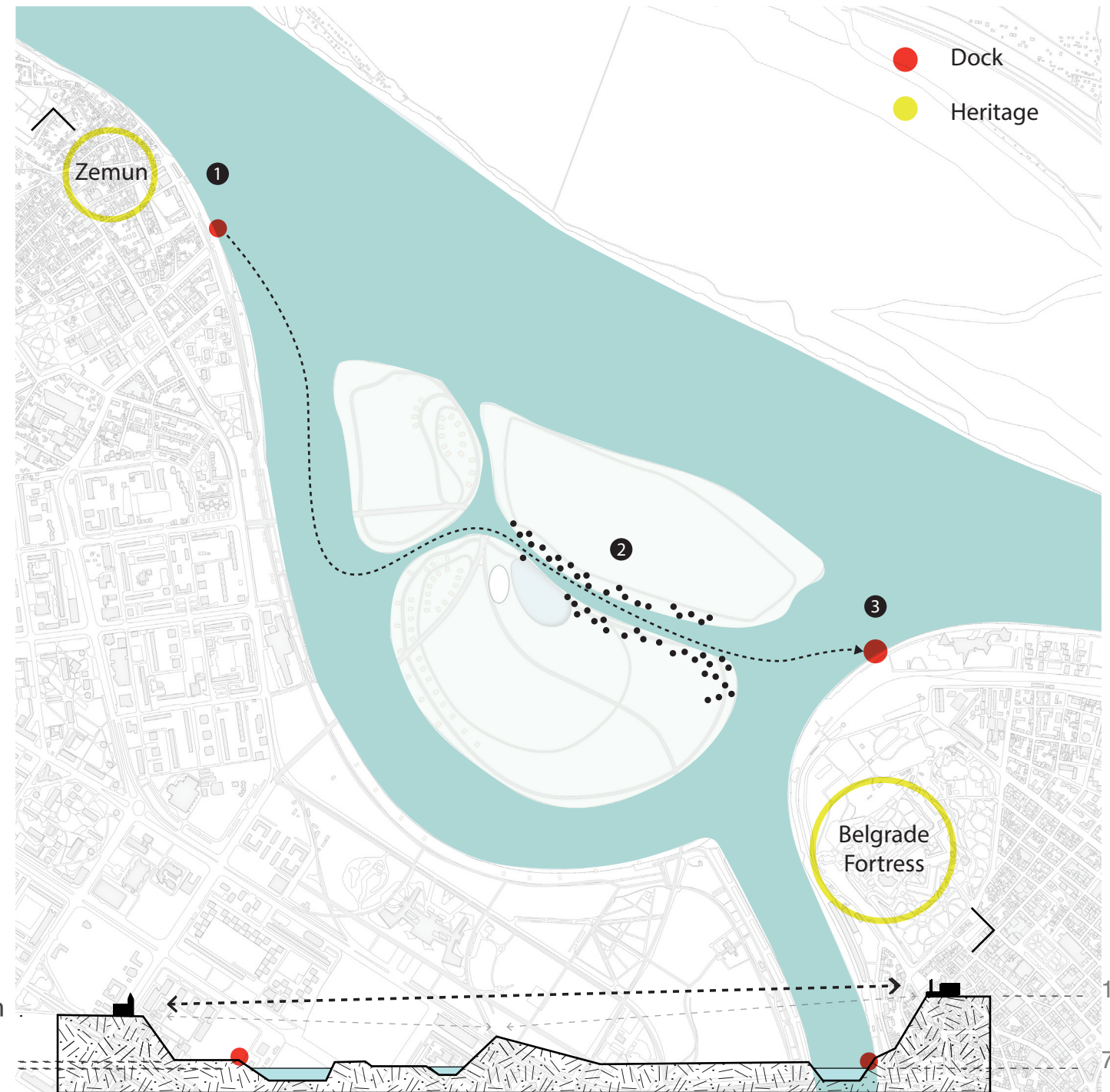


The forest at island

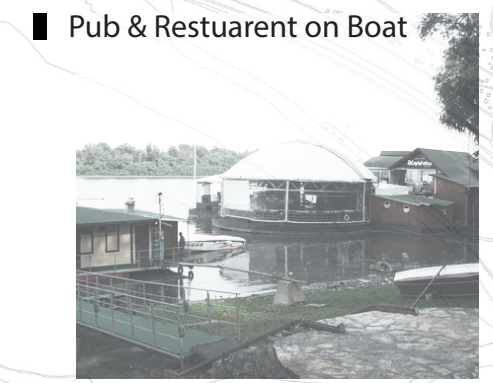


The dock at Fortress

Design a spatial experience sequence by adding forest on island to let visitors to resee historical experience.



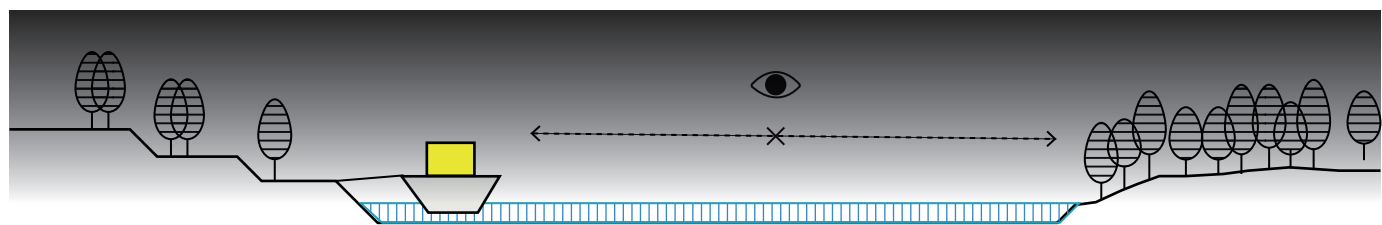
Night life flow NOW



2 Design the 'Flow Network' for integrating the seperated city



'Belgrade is the city with the best nightlife.'
-----Lonely Planet

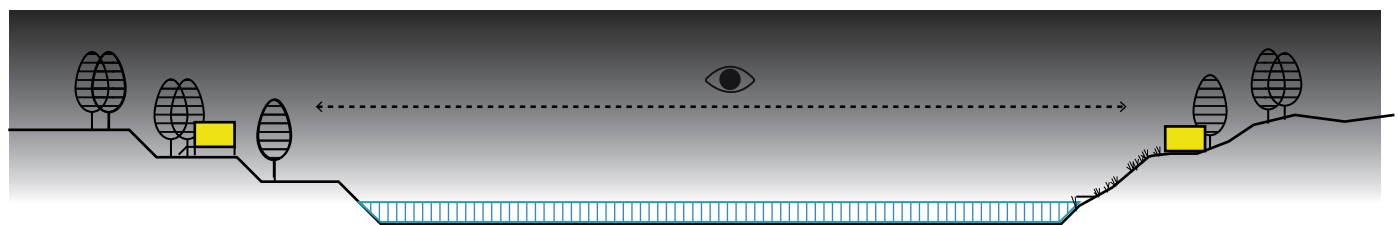
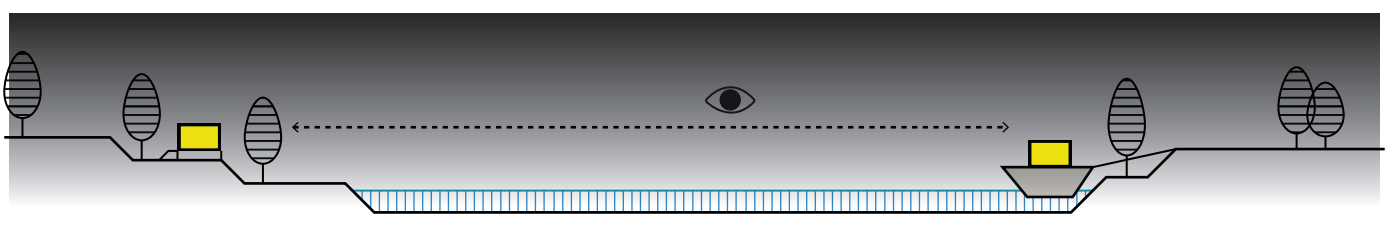
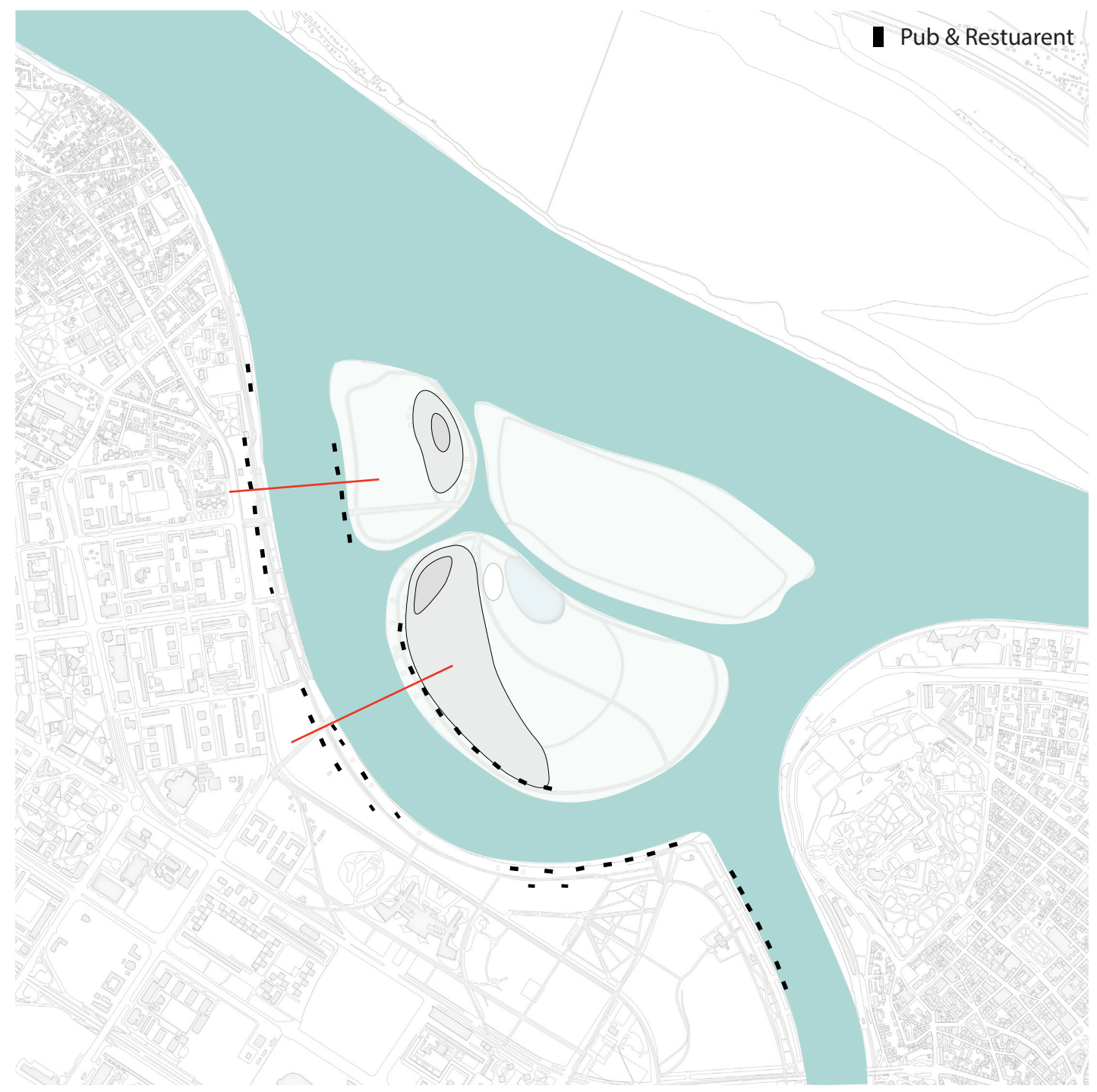


Night life is very important activity in Belgrade. However, the Pubs and Clubs along the Danube offer bad spatial experience.



Night life flow DESIGN

■ Pub & Restuarent



Design a new waterfront for offering a better spatial experience.



Residential flow
NOW

2 Design the 'Flow Network' for integrating the seperated city

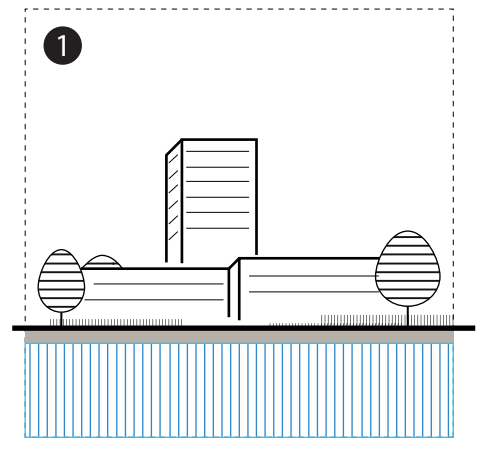


Hotel Jugoslavija is one of important buidings builded in socialism period. However, because bad management, it partly closed, partly uesd as luxry restaurant.

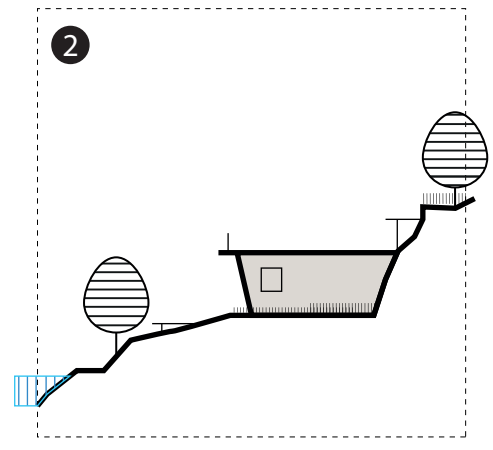


Residential flow DESIGN

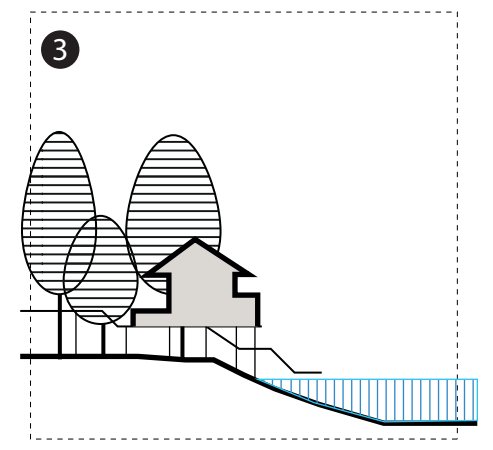
2 Design the 'Flow Network' for integrating the seperated city



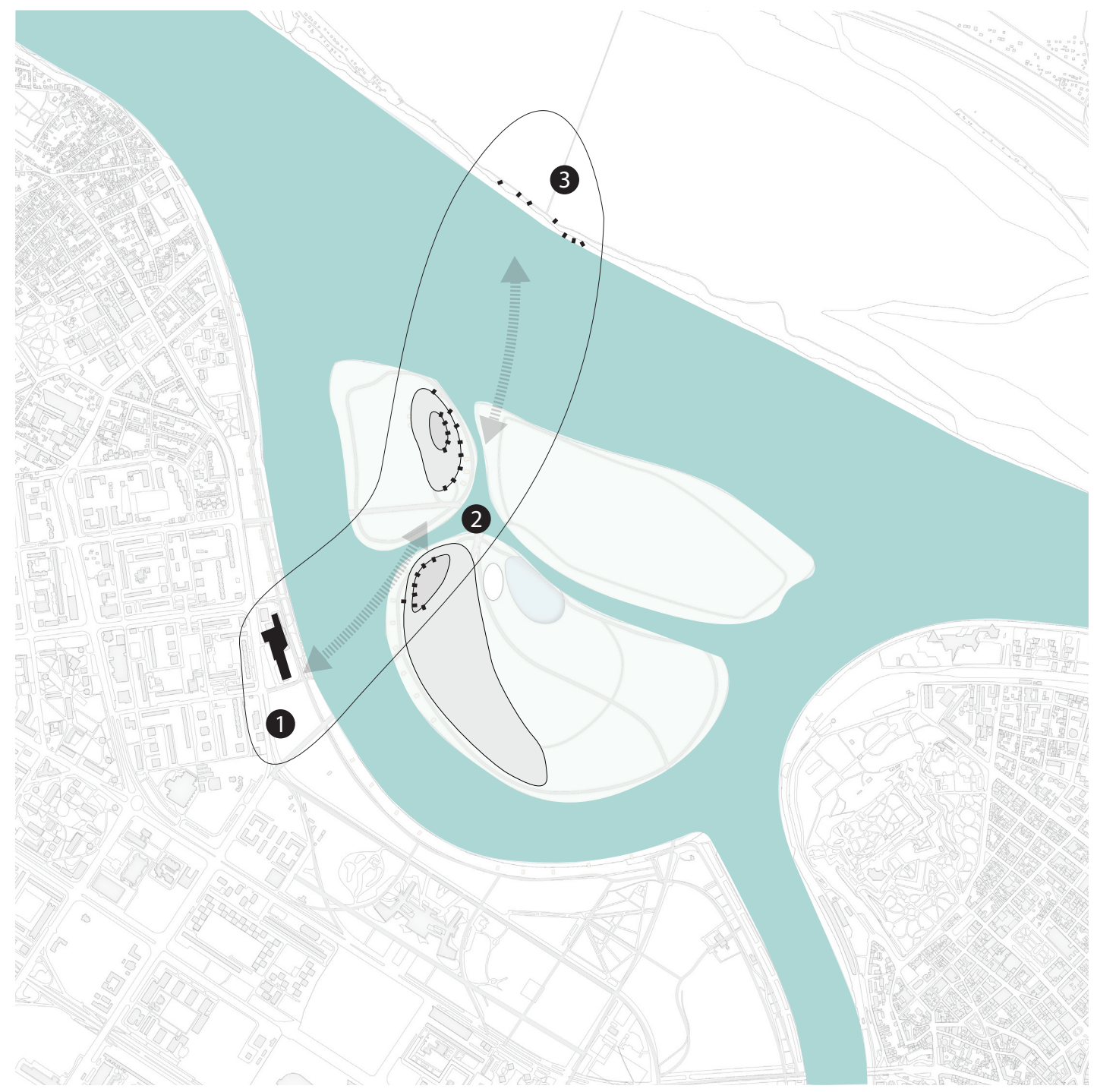
1 Revival existing hotel



2 Villas on hill



3 Villas in forest



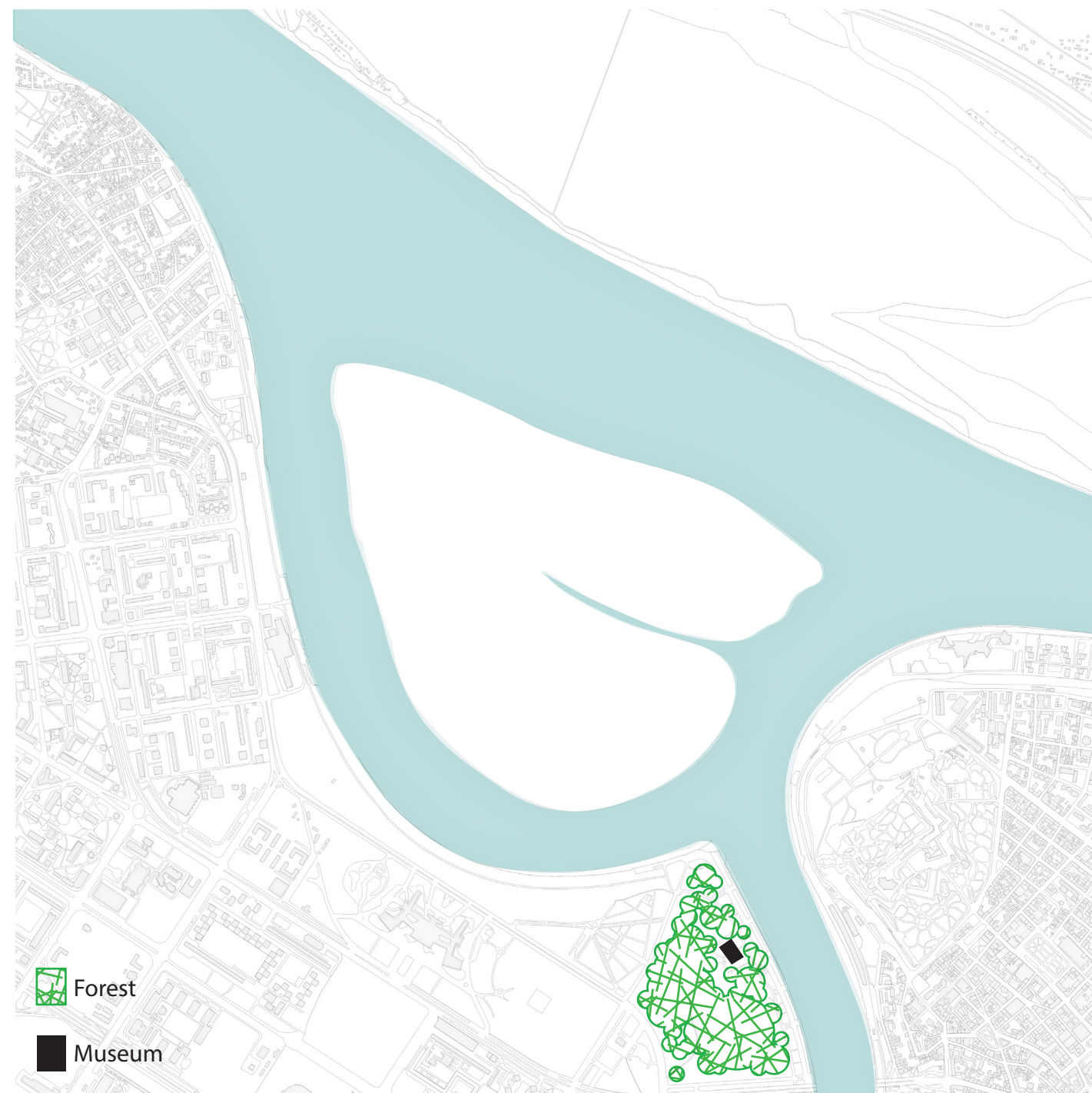
Adding new types of villas in the site to developing a new residential resort to attract tourist.



2 Design the 'Flow Network' for integrating the seperated city



ART flow
NOW

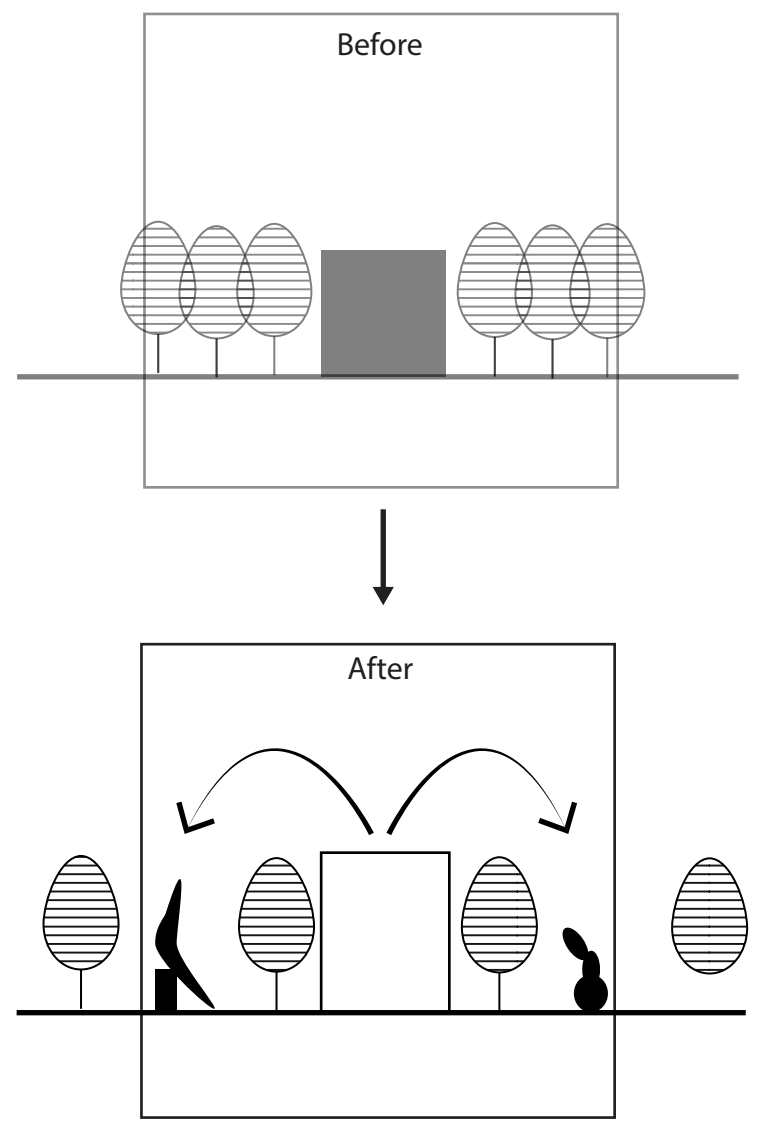


Museum of Contemporary Art is one of important buidings builded in socialism period. However, it works as a box hidid in forest and less people go there.



ART flow DESIGN

2 Design the 'Flow Network' for integrating the seperated city



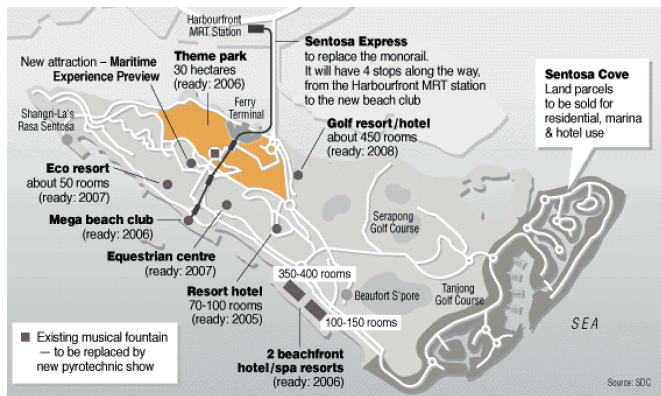
Open the museum to make indoor exhibition change into outdoor exhibition to attract more visitors.



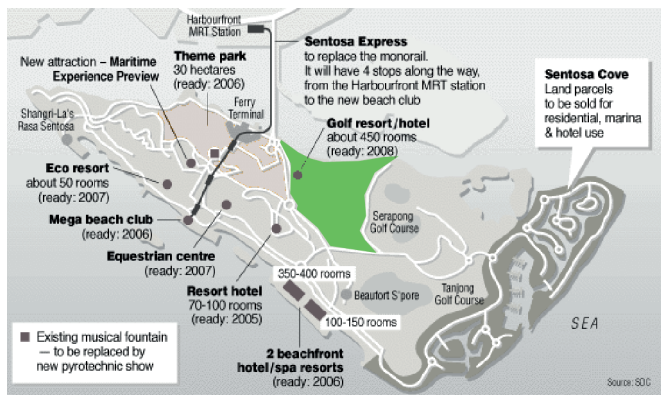
Modern life flow
CASE
 Sentosa Island
 Singapore

2 Design the 'Flow Network' for integrating the seperated city

Using the existing structure to design new Flow connection is not enough, therefore, I need to adding new program into island to ensure the island have strong identity, like Sentosa Island in Singapore city.



Theme park



golf course



The Sentosa island in singapore used to be a abandoned military zone, after adding new programs in the island and now developing to be one of most famous tourist attractions.



Modern life flow
NOW

2 Design the 'Flow Network' for integrating the seperated city



Summer

EXIT Festival is a summer music festival Hold in Novi Sad, Serbia, which only have 10 years history, but become one of the best music festival in europe.



Winter

Ice skating is one of the most popular winter outdoor activities in Belgrade. It offer the fun for the entire family, or for a hangout with a group of friends in outdoor activity.



Considering the possible citizen activites in Belgrade.



Modern life flow NOW

2 Design the 'Flow Network' for integrating the seperated city



1 Lido Beach

It is a very popular outdoor beach which open to public only in summer on the Great War Island.



2 Palace of Belgrade

It used to be the seat of the Council of the Republic of Serbia. Since 2006, the state authorities are looking at new possibilities to use the building.



3 Belgrade Arena

It is an indoor arena and designed as a universal hall for all sports events and concert.



4 View point at Belgrade Fortress

It is a important tourist attraction in Belgrade Fortress, where can overlook the Great War Island.



Considering existing public life around the island in Belgrade.



Modern life flow DESIGN

2 Design the 'Flow Network' for integrating the seperated city



intention figure

outdoor stage



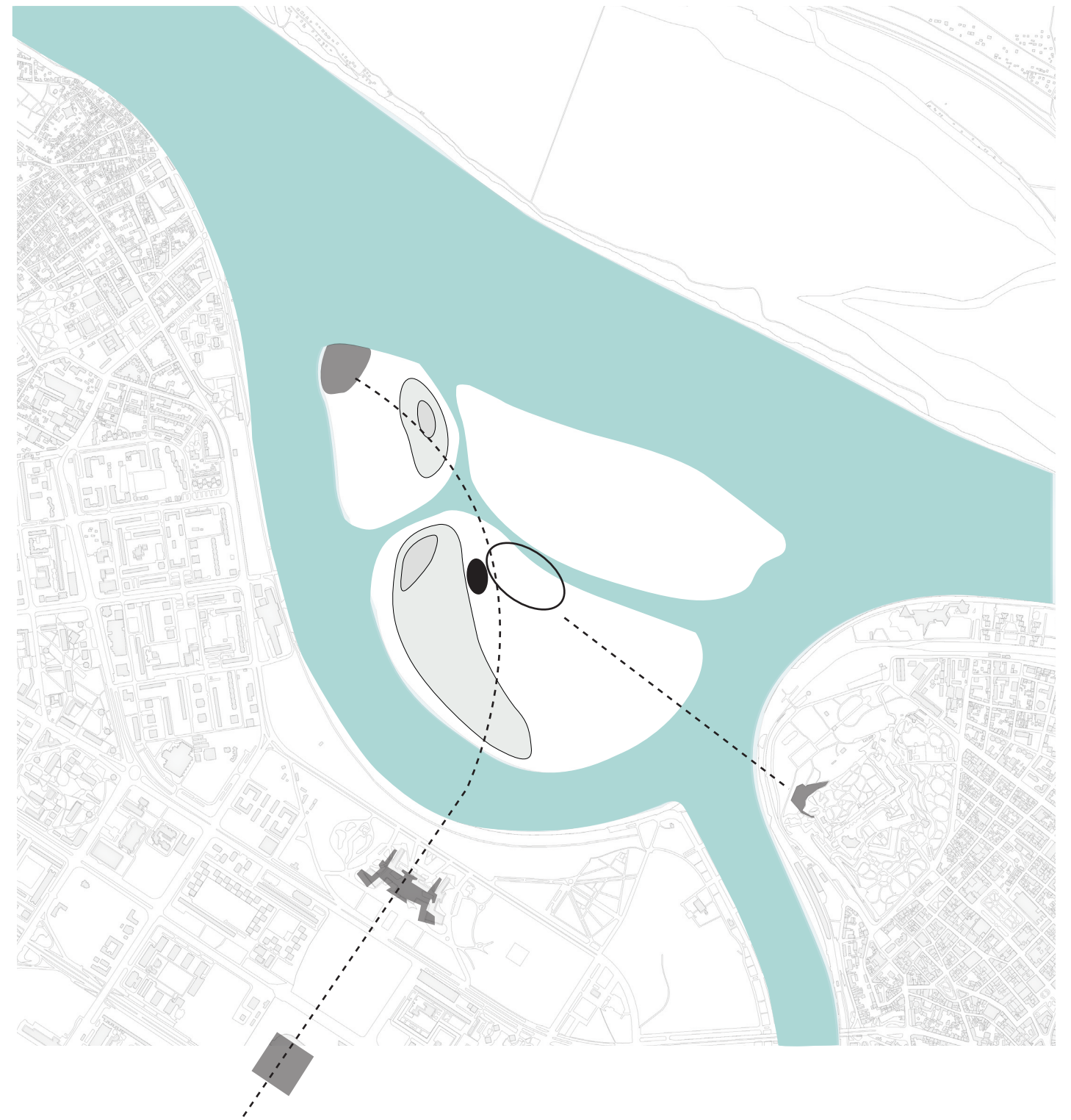
intention figure

artificial lake



new activity center

Considering existing citizen activities and the new landformin to decide the location of outdoor stage and artificial lake.

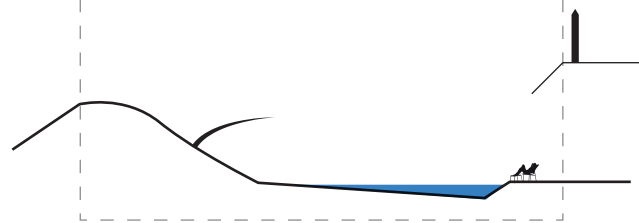


Modern life flow DESIGN

2 Design the 'Flow Network' for integrating the seperated city

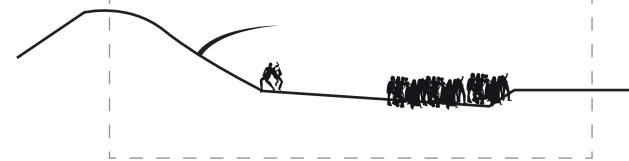
Spring

April
water level: 450 mm
temperature: 12.9 °C
activity: sun bath



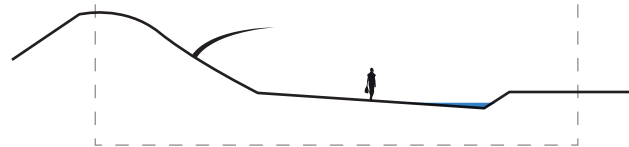
Summer

August
water level: 250 mm
temperature: 22.7 °C
activity: music festival



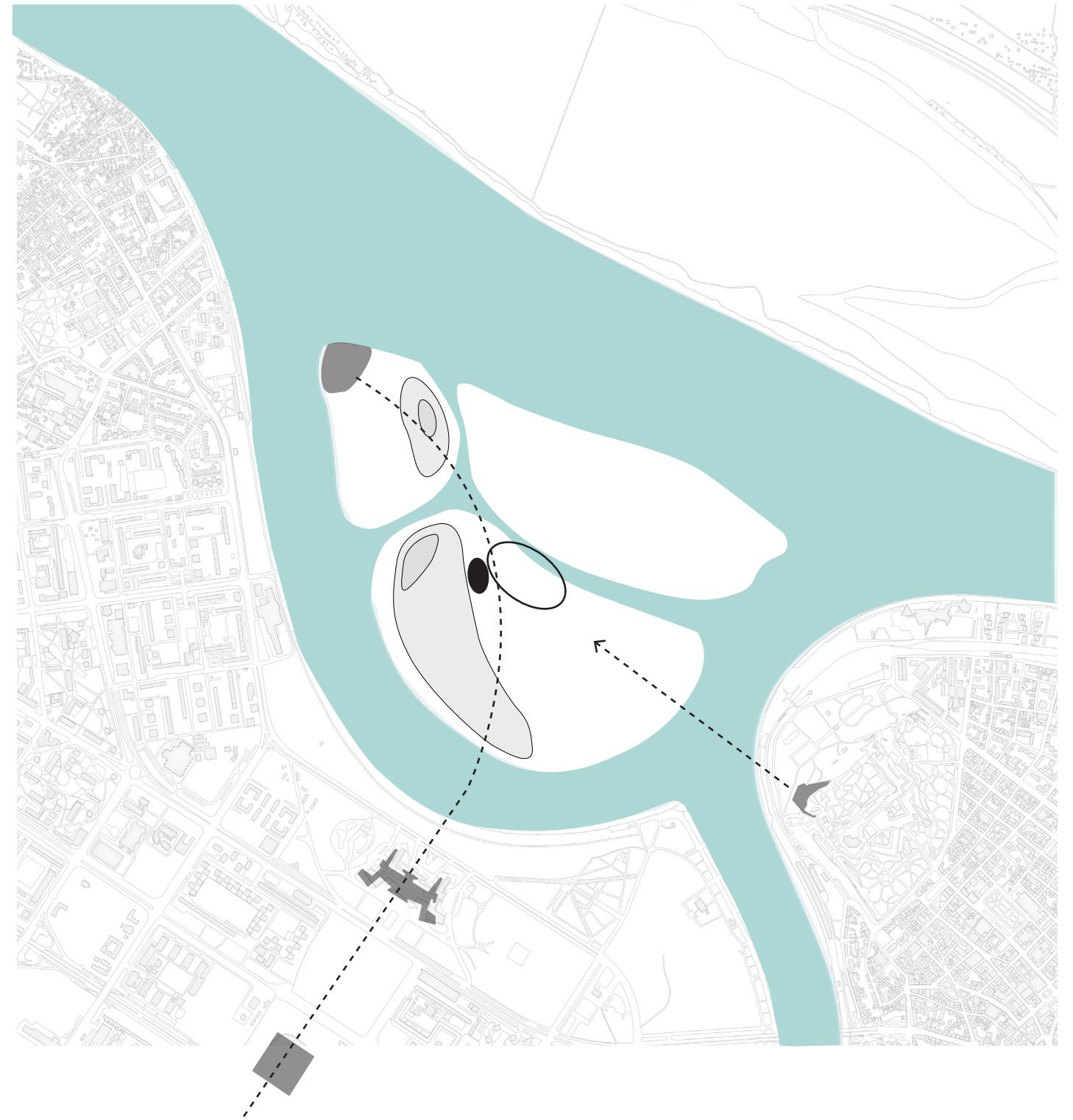
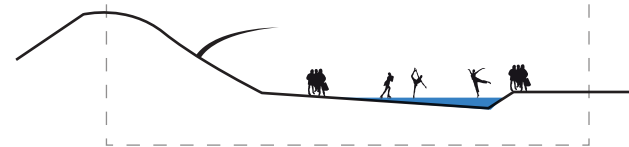
Autumn

October
water level: 300 mm
temperature: 12.9 °C
activity: walk



Winter

January
water level: 330 mm
temperature: 1.4 °C
activity: skating

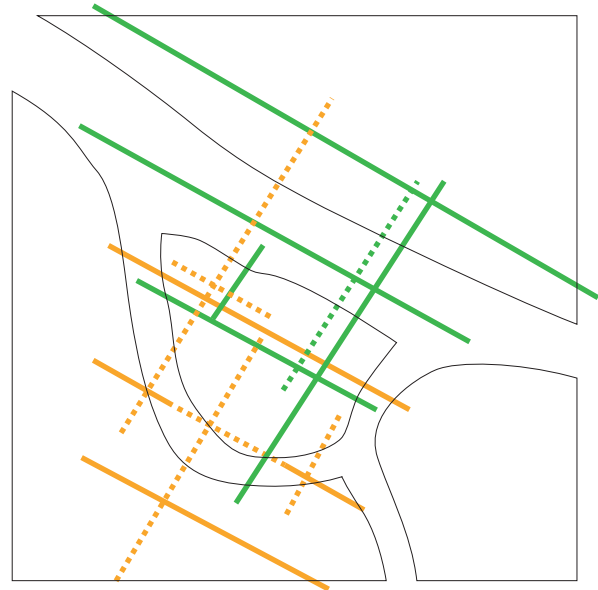


Considering the seasonal water level change and the activity in the design of stage and lake.



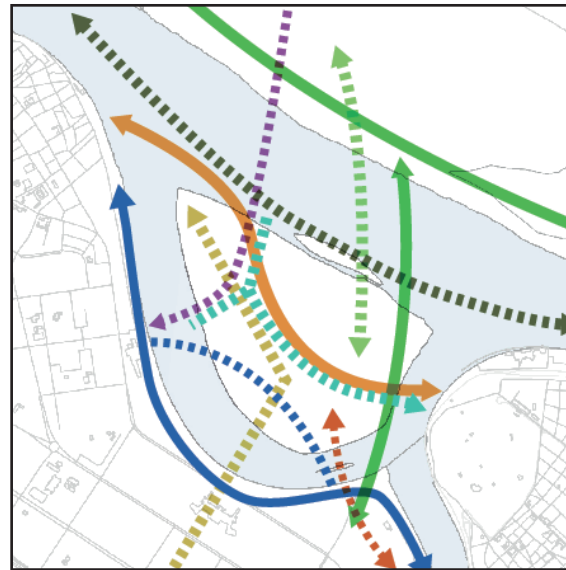
3 Design the traffic road fit with my 'Flow Network'

CONCEPT



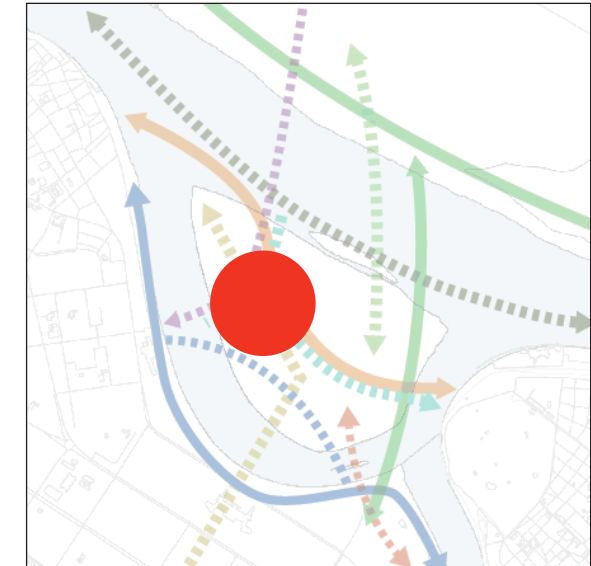
FLOW NETWORK

DESIGN



DESIGN THE FOW IN THE SITE

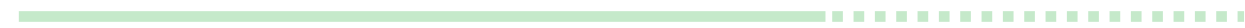
ACTIVITY CENTER



HUMEN ACTIVITY CENTER

According the flow system, find out the activity center of design.

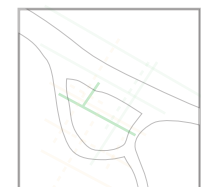
Nature Flow



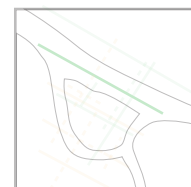
Urban Flow



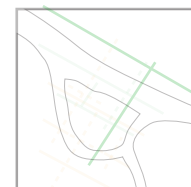
Water flow



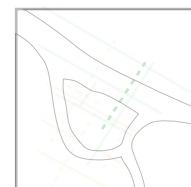
Sediment flow



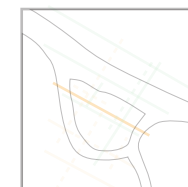
Plant flow



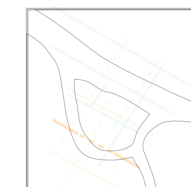
Bird flow



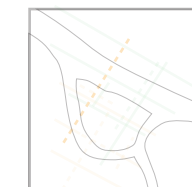
Heritage flow



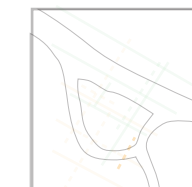
Nightlife flow



Residential flow



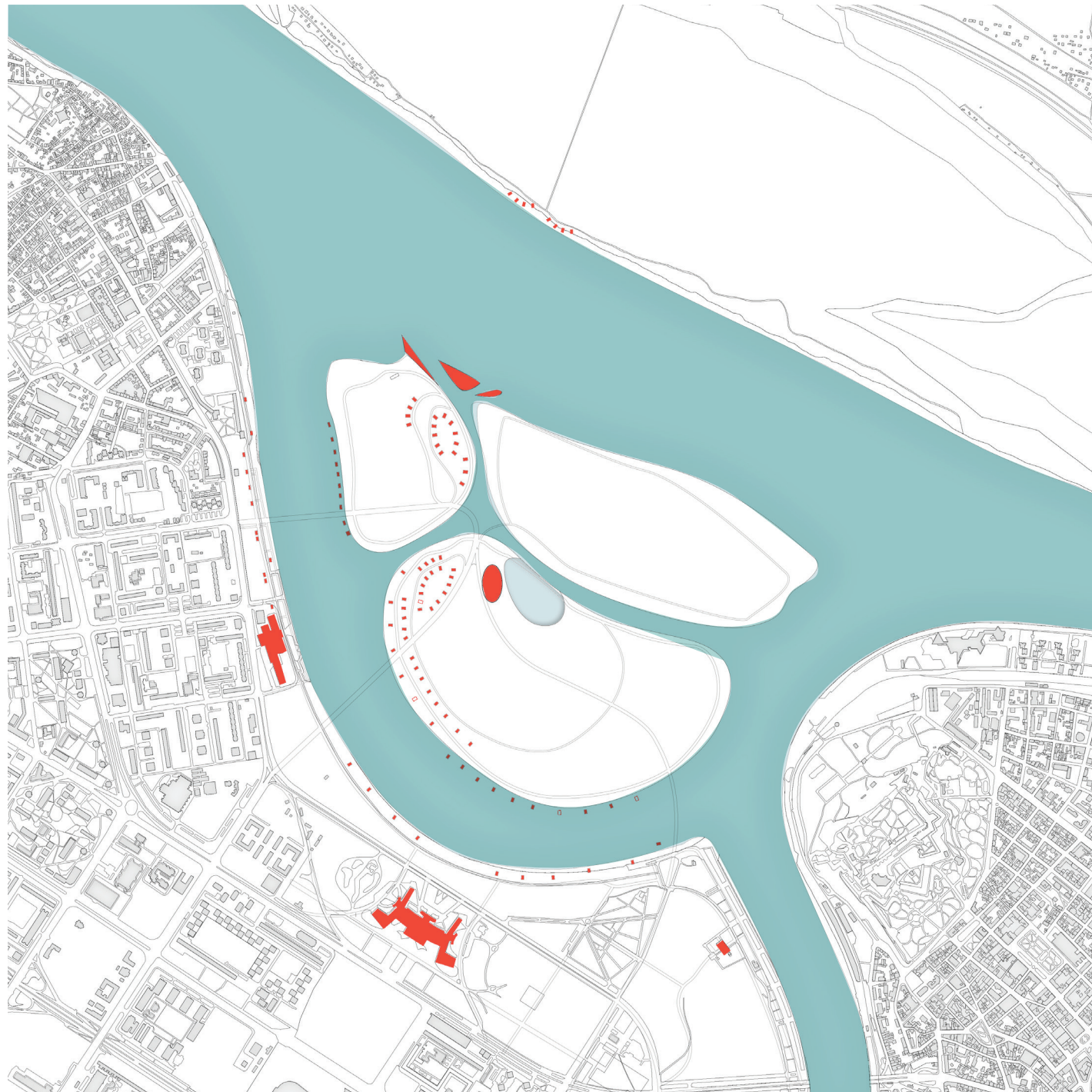
Art flow



Modern life flow



3 Design the traffic road fit with my 'Flow Network'



Using space syntax software to test the possibility connection. And choose the best one Adding the traffic road to the program map.

Nature Flow

Urban Flow

Water flow

Sediment flow

Plant flow

Bird flow

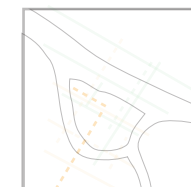
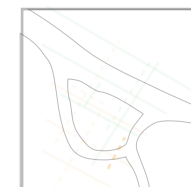
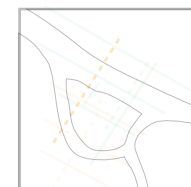
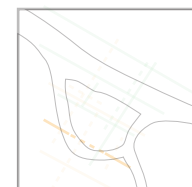
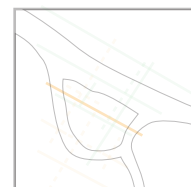
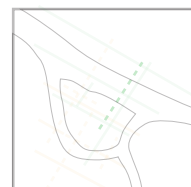
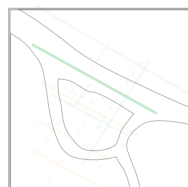
Heritage flow

Nightlife flow

Residential flow

Art flow

Modern life flow



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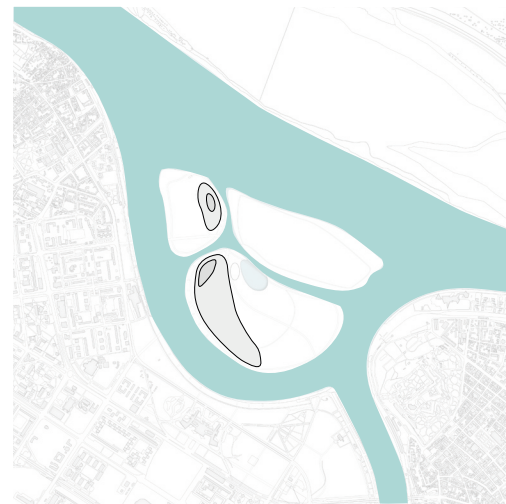
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4 Design the developing phase of the site



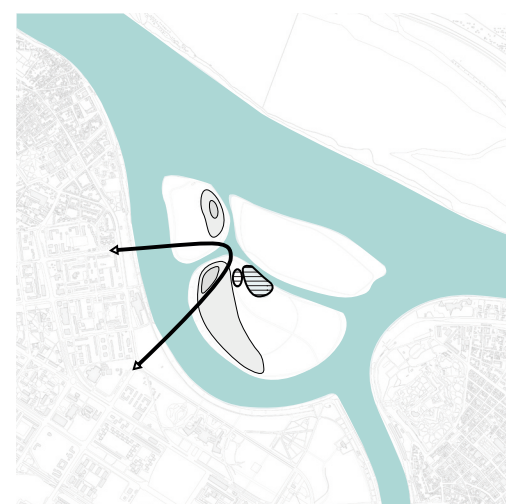
PHASE 0

The existing map of the Great War Island.



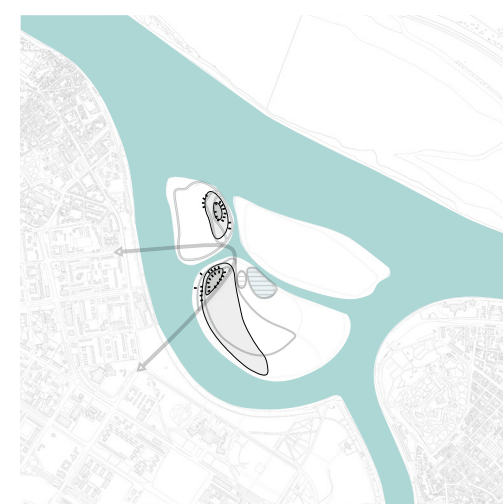
PHASE 1

Open the canal and reshape the island's form.



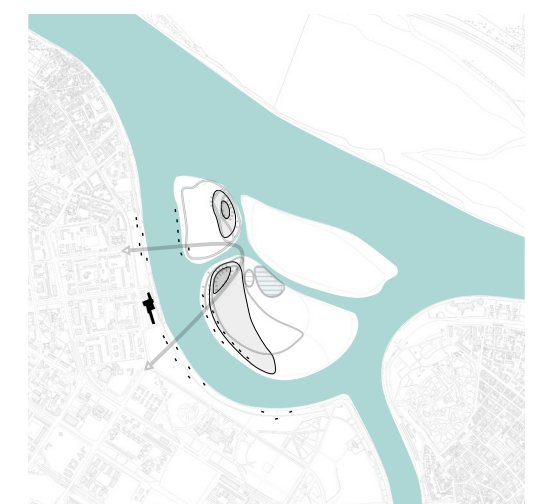
PHASE 1

Adding new program (outdoor stage and lake) and 2 bridges.



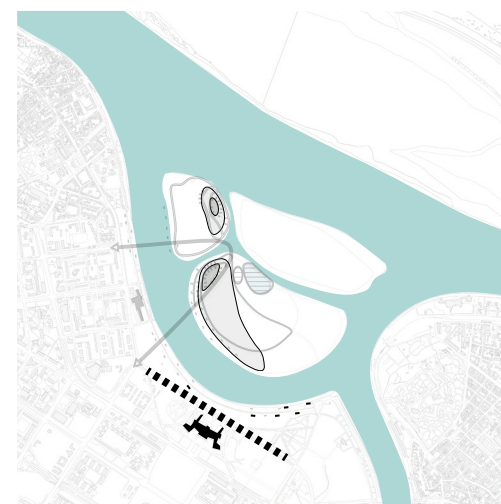
PHASE 3

As the modern life activity (beach, music festival and skating) the resort area (villa) can develop.



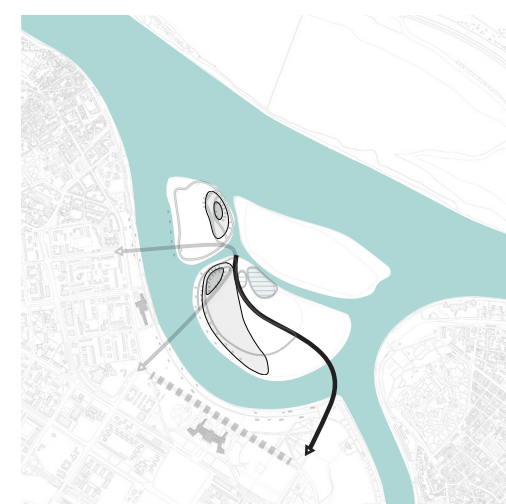
PHASE 4

As the resort area developed and the flow of tourism, the night life area can develop. Also the abandoned hotel can be revived.



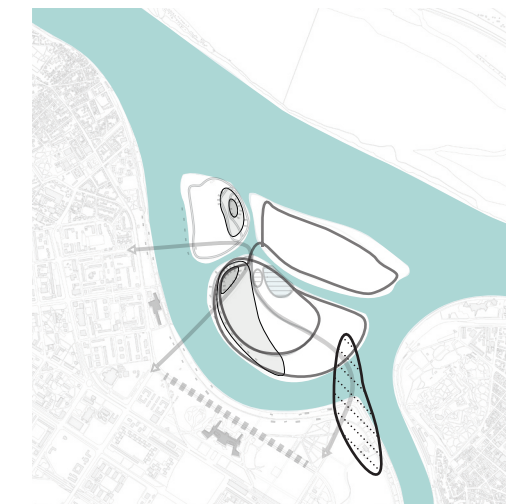
PHASE 5

When the night life area developed, the Palace of Belgrade and the urban space nearby can be redeveloped.



PHASE 6

When the urban space around the Palace of Belgrade is redeveloped into a tourist attraction, the third bridge can be built.



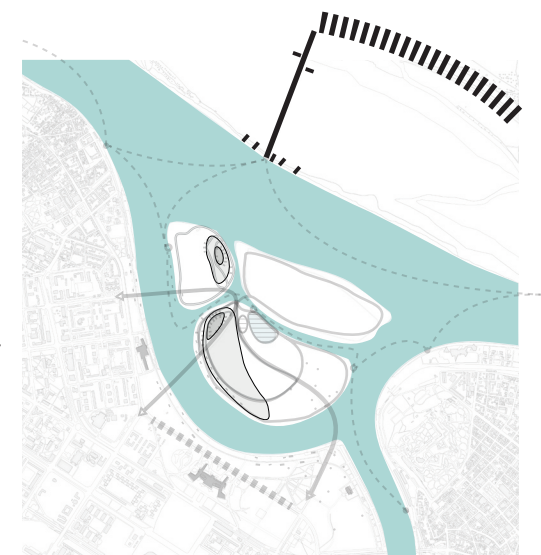
PHASE 7

When the third bridge is built, the art field can be built and the routing system on the island can be completed.



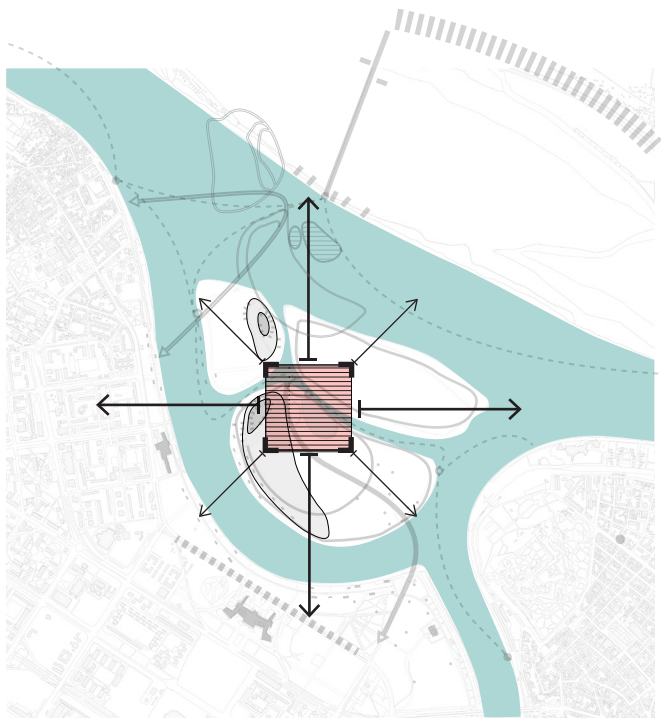
PHASE 8

After the routing system of the island is completed, develop the water traffic system by adding 3 new docks on the island.



PHASE 9

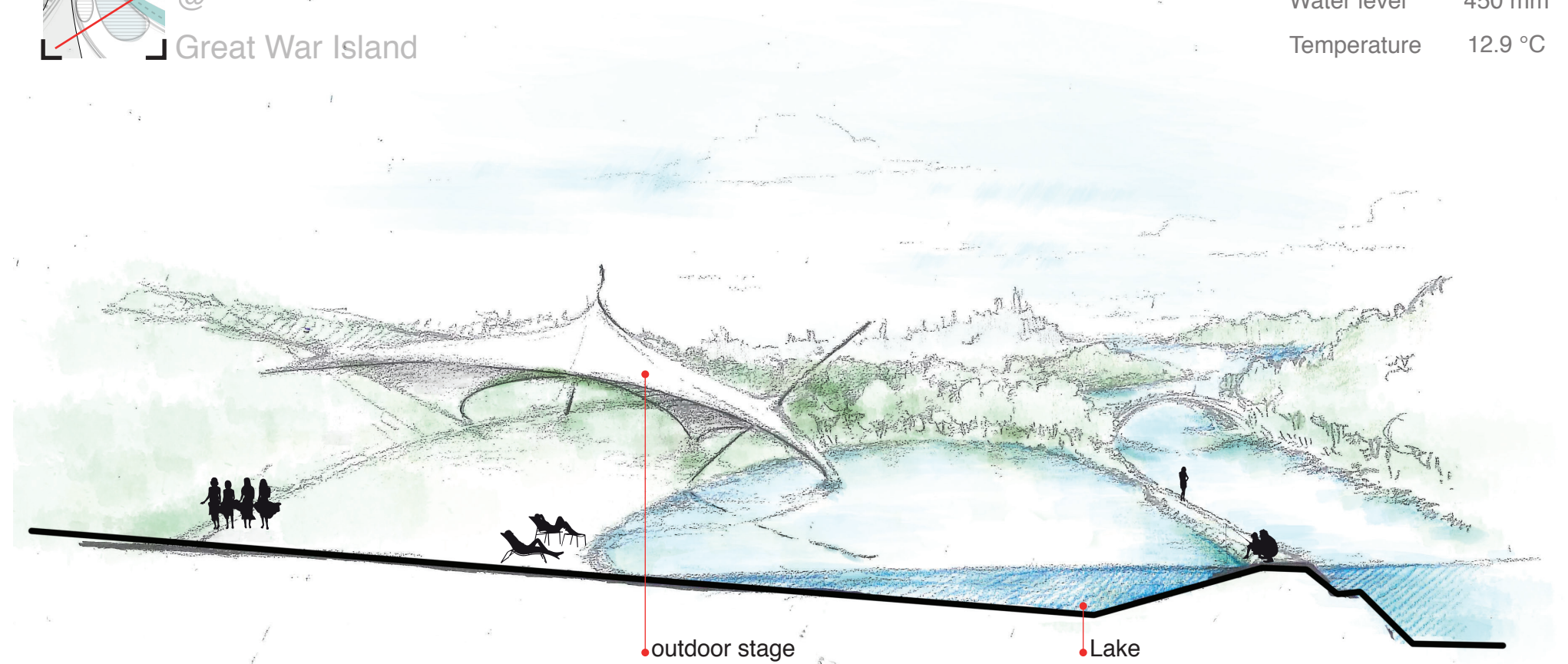
After the whole island is developed, it might influence the other side of the Danube and influence the 3rd Belgrade.



'The heart of Design'

SPRING
@
Great War Island

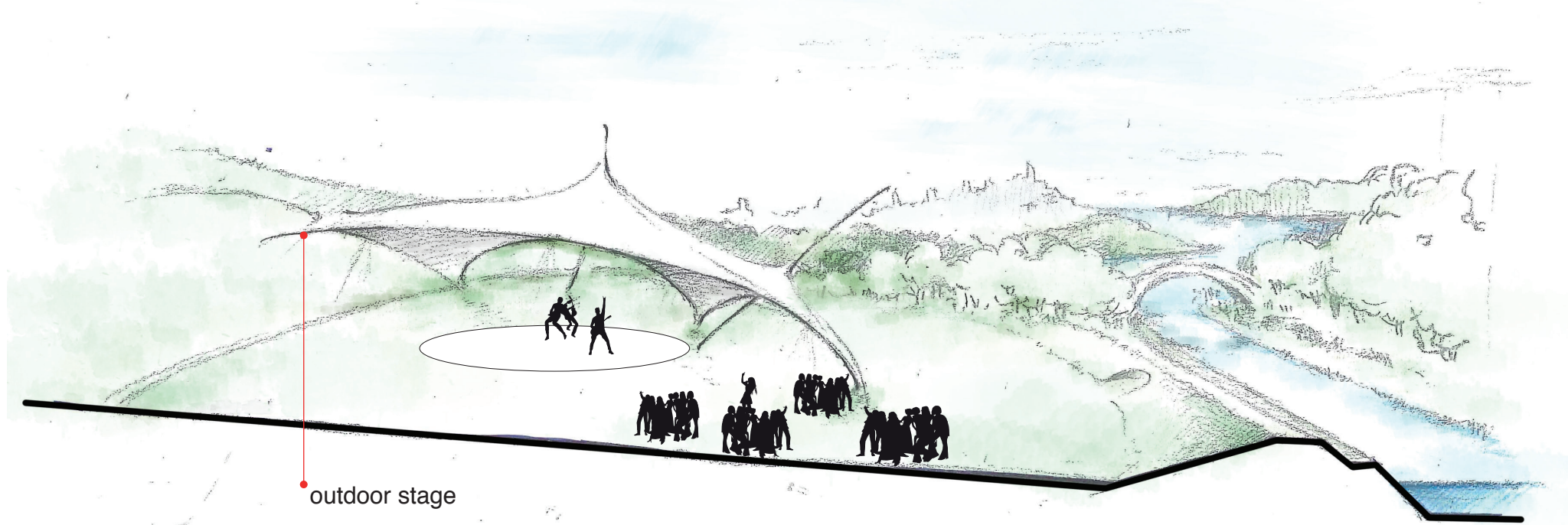
Time	April
Water level	450 mm
Temperature	12.9 °C



outdoor stage Lake

SUMMER
@
Great War Island

Time	August
Water level	250 mm
Temperature	22.7 °C



outdoor stage

// To be continued.....

P1

P2

P3

P4

P5

Fascination of project

Site choosing & visiting

Context analysis

Problem statement

Reserch Question

Case study

Design the site

Regional plan

Developing phases

Zoom in

Design the site

Mater plan

detail design

Material design

Plant choosing

Physical model

Rendering

Advanced presentation



Design the site

Mater plan

detail design

Material design

Plant choosing

Physical model

Rendering

Advanced presentation