FLUX WATERSCAPES
The transformation of South Bratislava as part of the waterscape of the Danube

Landscape Graduation Studio: Flowscapes
FEI CHEN

First Mentor: Inge Bobbink
Second Mentor: Anne loes Nillesen
Wasserburg am Inn is a town in Rosenheim district in Upper Bavaria, Germany. The historic centre is a peninsula formed by the meandering Inn River. Many Medieval structures remain intact, giving the city a unique air.

The meandering river formed the city and the city remembered.
Balkans submerged by historic floods threatening thousands.

Balkans, Serbia

Balkans submerged by historic floods threatening thousands.
The Danube is neither the largest nor the longest river in Europe, but it is the river that most effectively defines and integrates Europe. The Danube collects waters from the territories of eighteen nations and forms the international boundaries for eight of them. The gentle mountains of the Schwarzwald, Germany’s Black Forest, are credited with being the headwaters of the Danube. From the headwaters the river drops approximately 680 meters vertically to its mouth in the Black Sea.
In the year of 1969, a huge residential area was built on the right bank of River Danube. It was structured by separate community neighborhoods which are introverted and public services centralized.
In the year of 1969, a huge residential area were built on the right bank of River Danube. It structured by separated community neighborhood which is introverted and public services centralized.
Introverted Neighborhood
Centralized basic public services

Petržalka
Neighborhood school and kindergarten

No central cultural services for whole city
No functional central public spaces

Residential area
Commercial area
Green area
Industrial area

SITE LOCATION
PROBLEM STATEMENT
RESEARCH QUESTION
DESIGN THEORY
RIVERFRONT DESIGN
REGIONAL PLAN
REFLECTION

8/101
A quarter of Whole city’s residents live in Petrzalka.
RESEARCH QUESTION

How to create a flexible and sustainable river landscape which gives a new spatial identity to the right bank of Danube River in Bratislava, enhancing the connection between human and water landscape?
Research Design Goals

The goal of this research design is to satisfy the urgent needs of a flexible, accessible and dynamic riverfront which can adapt to the water changes. In addition, in the long run, it’s to create a new water landscape at the south part of Bratislava that can protect the city from flood risks.
DESIGN THEORY & PRINCIPLE
Flux means a continuous change. Flux waterscapes means a flexible waterscapes that can adapt to the changes of water flow and social needs. By creating a flexible water landscape basement, then adding dynamic programs to waterfront of Bratislava that can satisfy the public requirements.
How to mitigate flood risks of Bratislava?

How to improve low quality of living environment?
How to mitigate flood risks of Bratislava?

How to improve low quality of living environment?

From regional scale

Reference: Delta work 2.0, by RAAAF/Rietveld-Architecture

BLUE river bypass

From local scale

Waterfront transformation and improvement

Reference: New Envision of the city center of Christchurch

GREEN river bypass
1. Danube River bank transformation
2. Inside south city waterscapes improvement
3B. City suburbs blue river bypass construction
3G. City suburbs green river bypass construction
1 Danube River bank transformation
2 Inside south city waterscapes improvement
3B City suburbs blue river bypass construction
3G City suburbs green river bypass construction
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2. Inside south city waterscapes improvement
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3G. City suburbs green river bypass construction
1. Danube River bank transformation
2. Inside south city waterscapes improvement
FLOOD WATER DISCHARGE

Q_{\text{average}} = 2057 \text{ m}^3/\text{s}
Q_{\text{seasonal}} = 5000 \text{ m}^3/\text{s}
Q_{\text{5years}} = 6000 \text{ m}^3/\text{s}
Q_{\text{10years}} = 8287 \text{ m}^3/\text{s}
Q_{\text{20years}} = 9262 \text{ m}^3/\text{s}
Q_{\text{50years}} = 10532 \text{ m}^3/\text{s}
Q_{\text{100years}} = 11494 \text{ m}^3/\text{s}
Q_{\text{1000years}} = 14803 \text{ m}^3/\text{s}

3B City suburbs blue river bypass construction
3G City suburbs green river bypass construction

Danube River bank transformation
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City suburbs blue river bypass construction
City suburbs green river bypass construction

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SITE LOCATION

PROBLEM STATEMENT

RESEARCH QUESTION

DESIGN THEORY

RIVERFRONT DESIGN

REGIONAL PLAN

REFLECTION

HERITAGE

1 Danube River bank transformation

2 Inside south city waterscapes improvement

3B City suburbs blue river bypass construction

3G City suburbs green river bypass construction
RIVER BYPASS

Blue River Bypass
$Q = 4000-8000 \text{ M}^3/\text{S}$

Green River Bypass
$Q = 8000-14000 \text{ M}^3/\text{S}$

Reference: Delta work 2.0, by RAAAF/Rietveld-Architecture

3B City surburbs blue river bypass construction
3G City surburbs green river bypass construction
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BLUE RIVER BYPASS

Social needs potential

Mitigate floods

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RESEARCH QUESTION
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RIVERFRONT DESIGN
REGIONAL PLAN
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3G City suburbs green river bypass construction
Schedule of waterscape transformation of Bratislava

- Main Danube river bank transformation
- City suburbs blue river bypass construction
- Inside new city waterscape improvement

Year 2015 2018 2020 2023 2028 2030 2030 2040

1 Main Danube river bank transformation
3B City suburbs blue river bypass construction
Main Danube river bank transformation
Inside new city waterscape improvement
City suburbs blue river bypass construction
City suburbs green river bypass construction

Schedule of waterscape transformation of Bratislava

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Schedule of waterscape transformation of Bratislava

- Year 2015
- Year 2018
- Year 2020
- Year 2023
- Year 2028
- Year 2030
- Year 2030
- Year 2040
Petržalka
City center of Bratislava
The riverfront of right bank is an important connection for city of both sides.

City center of Bratislava

Petržalka

The riverfront of right bank is an important connection for city of both sides.
No central cultural services for whole city
No functional central public spaces
Low quality of right bank environment
The right bank is endangered in flood risk
Low accessibility from city to riverfront
Petržalka
Right bank of River Danube
No central cultural services for whole city
No functional central public spaces
Low quality of right bank environment
The right bank is endangered in flood risk
The city on the right bank of River Danube has an urgent need of a flexible, accessible and dynamic riverfront which can satisfy the public requirements and also can adapt to the water changes.
FLUX WATERSCAPES
The transformation of Bratislava as part of the waterscape of Danube

Design Framework

LANDSCAPE

Creating a flexible and dynamic riverfront landscape

PROGRAM

Reserving existing valuable program and invent new programs for waterfront

ACCESSIBILITY

Improving and strength the accessibility from right and left bank to the waterfront

1. LANDSCAPE
Creating a flexible water landscape basement which can adapting to water changes and recall the collective memory.

Flexible Landscape Basement

2. PROGRAM
Then adding dynamic programs to waterfront of Bratislava that can satisfy the public requirements.

Dynamic recreational program

3. ACCESSIBILITY
Adding routing system
Creating a flexible water landscape basement which can adapting to water changes and recall the collective memory.

Flexible Landscape Basement
The south bratislava is an alluvial plain formed by Danube river. The shape of river bank was meandering.
Right meandering river bank is an old water landscape identity of Danube River in Bratislava. It forms part of the collective memory of Bratislava.
Meandering river bank creates dynamic water landscape that has high ecological value.
LANDSCAPE / WATER FLOW & WATER LEVEL
1 LANDSCAPE / SEASONAL CHANGES
Creating a flexible water landscape basement which can adapting to water changes and recall the collective memory.

Then adding dynamic programs to waterfront of Bratislava that can satisfy the public requirements.
2 PROGRAM / EXISTING SITUATION

- Right bank waterfront
- Beach Music Festival
- View point for New year's firework
- Stadium
- Old forest park
- Bridge

PROGRAM / EXISTING SITUATION

- Music festival
- Fire work
- Beach

SITE LOCATION

PROBLEM STATEMENT

RESEARCH QUESTION

DESIGN THEORY

RIVERFRONT DESIGN

REGIONAL PLAN

REFLECTION
2 PROGRAM / VIEW POTENTIAL

Right bank waterfront
Beach
Music Festival
View point for New year's firework

SITE LOCATION PROBLEM STATEMENT RESEARCH QUESTION DESIGN THEORY RIVERFRONT DESIGN REGIONAL PLAN REFLECTION
Right bank waterfront
Beach Music Festival
View point for New year’s firework
Stadium
Old forest park
Bridge

Offices
Shopping mall
Residential Area

Waterfront Theater
Swimming Pool

Circus & Playground
Tennis field

PROGRAM / NEW PROGRAM
2 PROGRAM / EXISTING SITUATION

- City linear green space
- Residential Area
- Old forest park
- Right bank waterfront
- Beach
- Music Festival
- View point for New year's firework
- Stadium
- Football field
- Tennis field
- Office
- Shopping mall
2 PROGRAM / CITY CENTRALIZED POINTS
Flexible Landscape Basement Dynamic recreational program

Creating a flexible water landscape basement which can adapting to water changes and recall the collective memory.

Then adding dynamic programs to waterfront of Bratislava that can satisfy the public requirements.
ACCESSIBILITY / TRAFFIC-CAR
3 ACCESSIBILITY / TRAFFIC-BICYCLE&PEDESTRIAN

15 mins walking
10 mins walking
8 mins walking
8 mins walking
15 mins walking

SITE LOCATION
PROBLEM STATEMENT
RESEARCH QUESTION
DESIGN THEORY
RIVERFRONT DESIGN
REGIONAL PLAN
REFLECTION
CITY CENTRALIZED POINTS

- Old city center
- Old Castle
- Left bank waterfront boulevard
- Right bank waterfront
- Old bridge
- Beach
- Slovak national theater
- Football field
- Tennis field
- Shopping mall
- Residential Area
- City linear green space
- Old forest park
- Office
- Viewpoint for New Year’s firework
- City centralized point

Site Location: Old city center

Problem Statement: The centralization of points is crucial for the accessibility and connectivity of the city.

Research Question: How can we improve the centralization of points in the city to enhance pedestrian movement?

Design Theory: The integration of green spaces and linear pathways can enhance the pedestrian experience.

Riverfront Design: The design should focus on creating a seamless transition between land and water, promoting recreation and leisure activities.

Regional Plan: A holistic approach to planning should be taken to ensure the sustainability and livability of the city.

Reflection: The centralization of points plays a vital role in the city's development, and continuous improvement is essential.
3 MAIN AXIS

Old Castle
Old city center
Slovak national theater
Shopping and residential area
Left bank waterfront park
Left bank waterfront boulevard
Old Bridge

City linear green space

SITE LOCATION
PROBLEM STATEMENT
RESEARCH QUESTION
DESIGN THEORY
RIVERFRONT DESIGN
REGIONAL PLAN
REFLECTION
CONNECTION TO MAIN AXIS

SITE LOCATION

PROBLEM STATEMENT

RESEARCH QUESTION

DESIGN THEORY

RIVERFRONT DESIGN

REGIONAL PLAN

REFLECTION
CONNECTING MAIN AXIS - EXTEND THE GREEN FIELD CROSSING THE MOTORWAY
3 CONNECTING MAIN AXIS - CONNECTING WITH RETAIL STORES
CONNECTING MAIN AXIS

SITE LOCATION
PROBLEM STATEMENT
RESEARCH QUESTION
DESIGN THEORY
RIVERFRONT DESIGN
REGIONAL PLAN
REFLECTION
3 CONNECTING MAIN AXIS

![Diagram showing the Connecting Main Axis with Old Bridge, Old Creek, Petržalka city creek green spaces, Commercial street, Flood plain, forest, Wetland, Waterfront, Low water level, and High water level. The diagram also includes the Main Axis and Motorway.]
3 CONNECTING MAIN AXIS

SITE LOCATION
PROBLEM STATEMENT
RESEARCH QUESTION
DESIGN THEORY
RIVERFRONT DESIGN
REGIONAL PLAN
REFLECTION

CONNECTING MAIN AXIS

Old Bridge
Old Creek
Petržalka city creek green spaces
Commercial street
Flood plain forest
Wetland
Waterfront
Low water level
High water level

Old Bridge
Left bank
Right bank
Old creek
Main Axis
Motorway

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PROBLEM STATEMENT
RESEARCH QUESTION
DESIGN THEORY
RIVERFRONT DESIGN
REGIONAL PLAN
REFLECTION

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PROBLEM STATEMENT
RESEARCH QUESTION
DESIGN THEORY
RIVERFRONT DESIGN
REGIONAL PLAN
REFLECTION

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RESEARCH QUESTION
DESIGN THEORY
RIVERFRONT DESIGN
REGIONAL PLAN
REFLECTION

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RESEARCH QUESTION
DESIGN THEORY
RIVERFRONT DESIGN
REGIONAL PLAN
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PROBLEM STATEMENT
RESEARCH QUESTION
DESIGN THEORY
RIVERFRONT DESIGN
REGIONAL PLAN
REFLECTION

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DESIGN THEORY
RIVERFRONT DESIGN
REGIONAL PLAN
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DESIGN THEORY
RIVERFRONT DESIGN
REGIONAL PLAN
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RESEARCH QUESTION
DESIGN THEORY
RIVERFRONT DESIGN
REGIONAL PLAN
REFLECTION

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RESEARCH QUESTION
DESIGN THEORY
RIVERFRONT DESIGN
REGIONAL PLAN
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RESEARCH QUESTION
DESIGN THEORY
RIVERFRONT DESIGN
REGIONAL PLAN
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RESEARCH QUESTION
DESIGN THEORY
RIVERFRONT DESIGN
REGIONAL PLAN
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RIVERFRONT DESIGN
REGIONAL PLAN
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RESEARCH QUESTION
DESIGN THEORY
RIVERFRONT DESIGN
REGIONAL PLAN
REFLECTION

CONNECTING MAIN AXIS

Old Bridge
Old Creek
Petržalka city creek green spaces
Commercial street
Flood plain forest
Wetland
Waterfront
Low water level
High water level

Old Bridge
Left bank
Right bank
Old creek
Main Axis
Motorway

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Old City Center
Right bank of Danube
Old City Center
Old Bridge
Commercial street
Flood plain forest
Wetland
Waterfront
Low water level
High water level
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Existing forest
Wetland & Swamp
Flood plain
Forest/shrub/meadow

City linear green space
Old city center
Slovak national theater
Old Castle
Left bank waterfront park
Shopping and residential area
Left bank waterfront boulevard

Old Bridge
Shopping mall

Open Theater
Circus & Playground
Stadium
Tennis field
Beach & Swimming pool/Open Theater

Old Forest Park
Floodplain Forest & Wetland

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DESIGN PROPOSAL

Open Theater
Circus & Playground
Stadium
Tennis field
Beach & Swimming pool
Square & Ferry Dock
Old Forest Park
Floodplain Forest & Wetland
City linear green space
Shopping mall
Design Route
Existing Route
Main Route
Second Route

SITE LOCATION  PROBLEM STATEMENT  RESEARCH QUESTION  DESIGN THEORY  RIVERFRONT DESIGN  REGIONAL PLAN  REFLECTION
Main axis and important program
MAIN AXIS

View and connection to the old steel bridge
MAIN AXIS

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MAIN AXIS
MAIN AXIS

SITE LOCATION  PROBLEM STATEMENT  RESEARCH QUESTION  DESIGN THEORY  RIVERFRONT DESIGN  REGIONAL PLAN  REFLECTION
MAIN AXIS
View to the left bank old city center riverfront

View to the old castle and Apollo bridge

Temporary riverfront use potential
WATERFRONT OPEN THEATER

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REGIONAL PLAN

REFLECTION
WATERFRONT OPEN THEATER
WATERFRONT OPEN THEATER
WATERFRONT OPEN THEATER
Different water levels
winter 1793 400cm
summer 2295 508cm
Q.MIN:1000 292CM
Q3: 3500 563CM
Q5:7000 788CM
Q10:7800 830CM
Q20:8700 874CM
WATERFRONT PROMENADE
The transformation of South Bratislava as part of the waterscape of the Danube
Main Danube river bank transformation

Decreasing the seasonal overmuch water discharge risks of each banks;
Increasing the connection between city center and new city;
Improving the recreational function of right bank of Danube River;
Flood risks warning.
Main Danube river bank transformation
Inside new city waterscape improvement
City suburbs blue river bypass construction
City suburbs green river bypass construction

Year 2015 2020 2023 2018 2028 2030 2035 2040

30-100 years extra safety flood risks protections;
Agricultural production (Grazing and grass production);
Improving Agricultural education and recreational function

30-50 years floods mitigation;
Providing suburbs waterscapes adventure activities opportunities.

Improving the environmental liveability of new city;
Increasing the accessibility from the inside city to the waterfront of Danube River;
Improving the recreational function of existing water channel;
Rainfall collection and underground water supplement.

Decreasing the seasonal overmuch water discharge risks of each banks;
Increasing the connection between city center and new city;
Improving the recreational function of right bank of Danube River;
Flood risks warning.
Thank you!