SZENT ISTVÁN UNIVERSITY
FACULTY OF LANDSCAPE ARCHITECTURE AND URBANISM – BUDAPEST
Department of Garden and Open Space Design

GREEN CITY MEETING AND CONFERENCE

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STRATEGIES FOR SUSTAINABLE URBAN WATER MANAGEMENT IN THE EXAMPLE OF BUDAPEST

BACKGROUND

Changing urban climate

Extreme weather events

- Heavy rainfall
- Floods and droughts

Traditional urban structure

- Old infrastructure
- Dense urban structure

- Overloaded treatment plants
- Flood protection & damages: extra costs, medical risk
- No possibility for rainwater reuse

CLIMATE CHANGE

BACKGROUND

SUSTAINABLE URBAN WATER MANAGEMENT (SUWM)

- onsite rain- and stormwater treatment
- infiltration, harvesting, retention, vaporization

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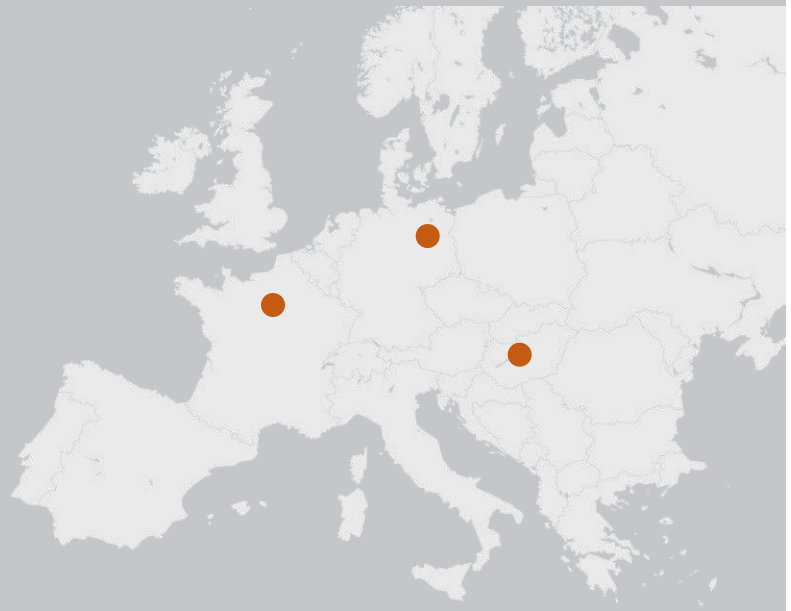
Restoration of the river Emscher (1992-2020)

- Transitioning more than 100 ha brownfield into a healthy and liveable environment
- 1994-98: 500 small pilot projects in rainwater management
- Goal: disconnecting from sewage system (15%)

kuras

KONZEPTE FÜR URBANE REGENWASSERBEWIRTSCHAFTUNG UND ABWASSERSYSTEMEN
CONCEPTS FOR URBAN RAINWATER MANAGEMENT, DRAINAGE AND SEWAGE SYSTEMS

BEST PRACTICE IN EUROPE



AIMS OF RESEARCH

- Collecting methods and measures of sustainable urban stormwater management
- Finding the suitable SUWM measures for features of Budapest

METHODS

- Comparison of three old european metropolises (Paris, Berlin, Budapest)
- Studying solutions through development plans, climate and water strategies and case studies
- Spatial analysis of Budapest: defining categories for SUWM

BUT HOW…?

HARVESTING----INFILTRATION----RETENTION----VAPORIZATION----CLEANING

New green areas

Green roof

Green wall

Street trees

Rain garden

Swales

Ponds and lakes

Permeable paving

Adaptable plant use



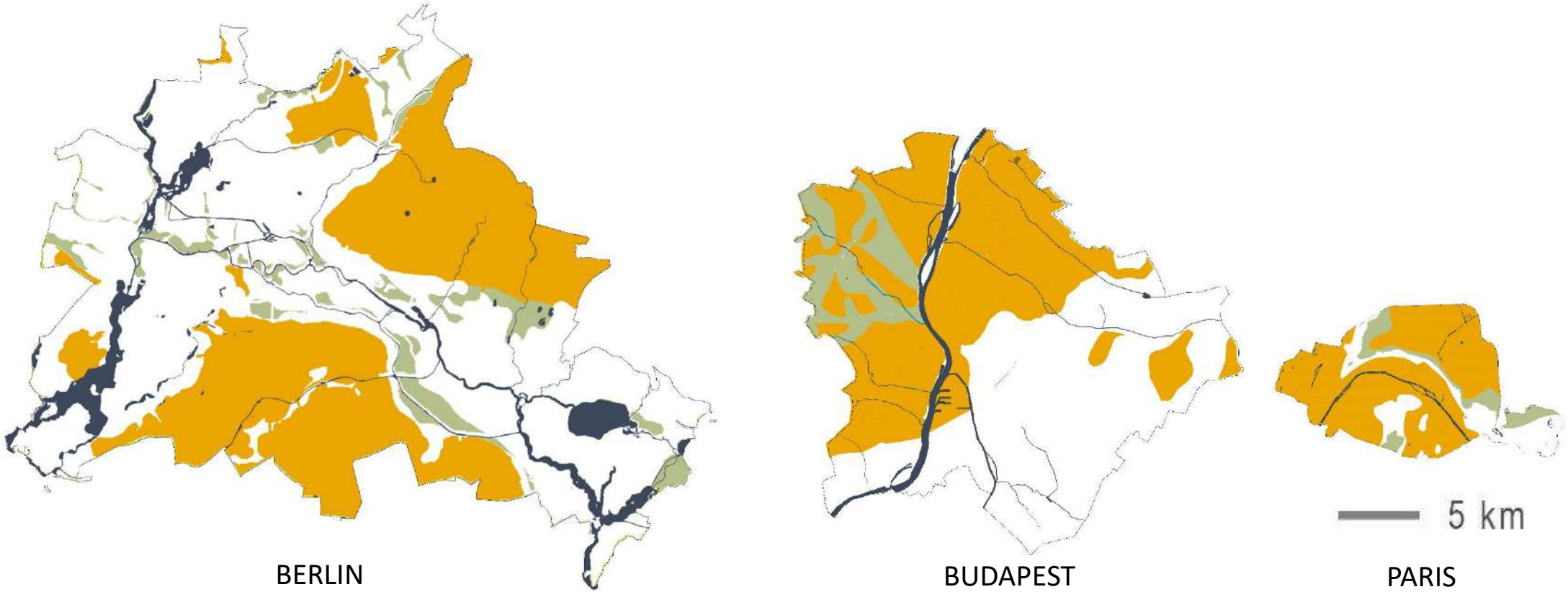






NATURAL SETTINGS & URBAN STRUCTURE

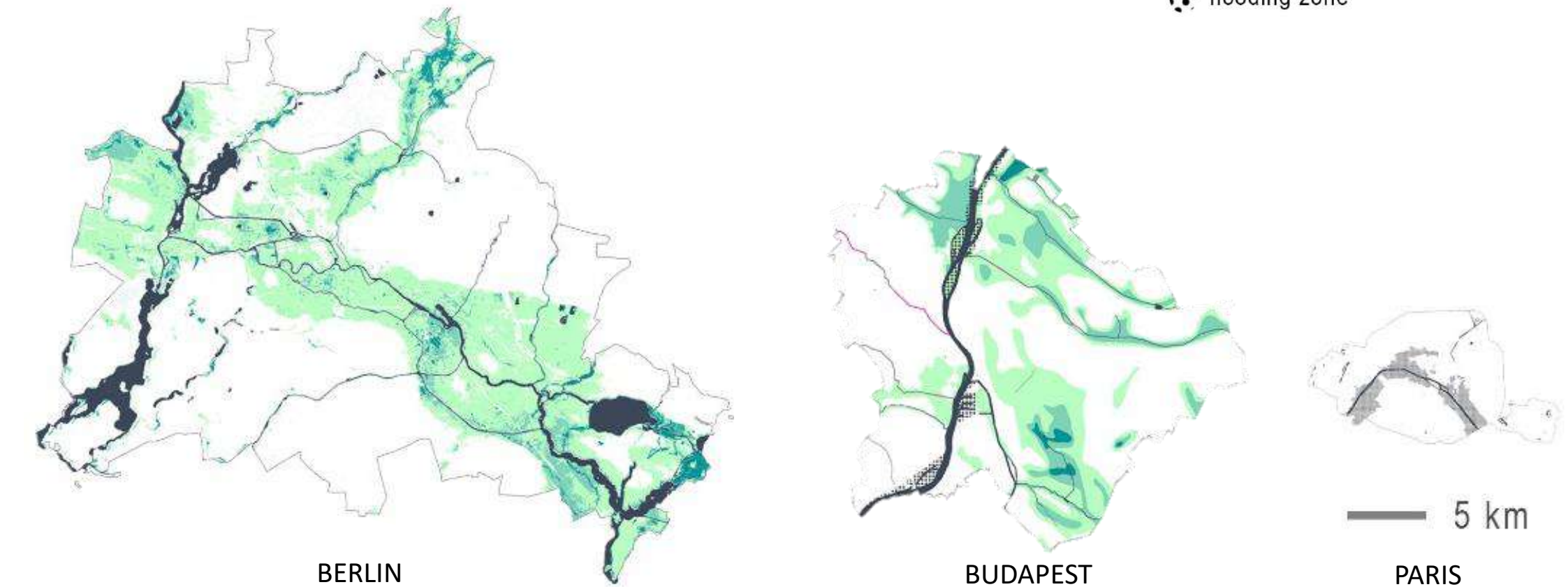
GEOLOGY



BERLIN BUDAPEST PARIS

NATURAL SETTINGS & URBAN STRUCTURE

HYDROLOGY



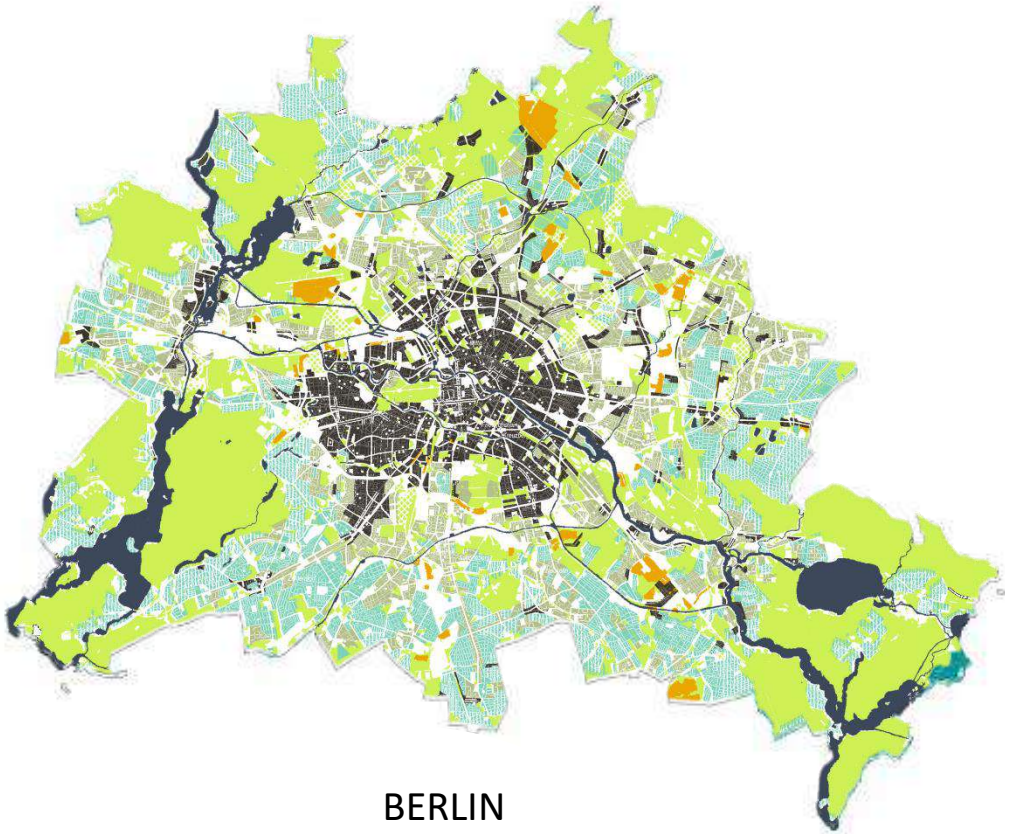
BERLIN

BUDAPEST

PARIS

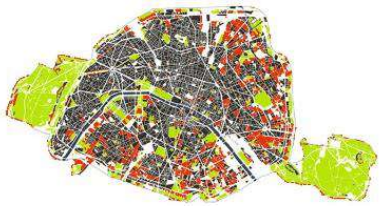
NATURAL SETTINGS & URBAN STRUCTURE

LAND USE



BERLIN

BUDAPEST



PARIS

- closed urban blocks (builded around 1900)
- public housing*
- brownfields
- detached housing
- green areas

*housing from 20-30ies and prefabricated buildings from 60-80ies with large green spaces between buildings

5 km

BEST PRACTICE PARIS

RISKS

- Flood risk on Seine
- Dense tenement housing -> less infiltration, heat island effect

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MEASURES

- city gardens
- small green areas (swales and planters)
- green roofs
- the lake “Lac Inférieur”

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- Quai opened for public use

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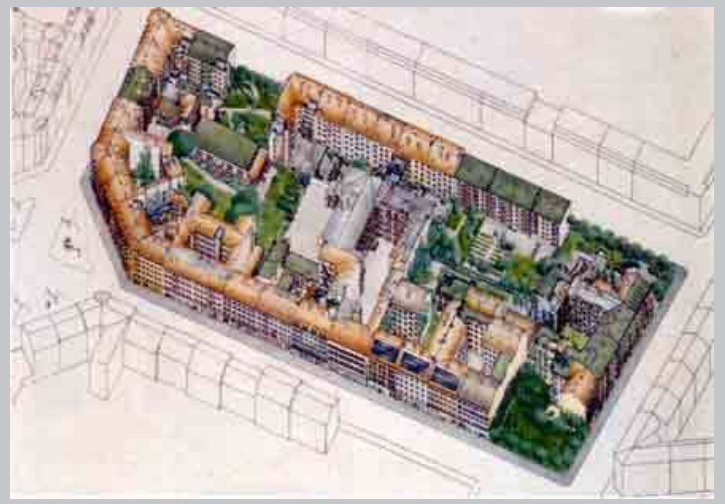


RISKS

- Dense city centre -> heat island effect
- Watercourses (water quality, riverside areas)
- Green areas

MEASURES

City centre

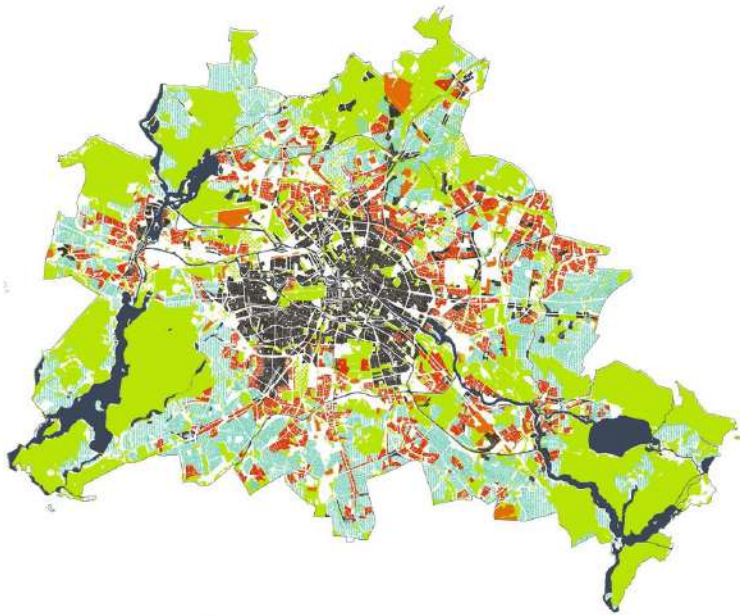
- Permeable paving
- Street trees
- green roofs and green walls

Watercourses

- River restorations (Flussbad Berlin)

Green areas

- adaptive plant species



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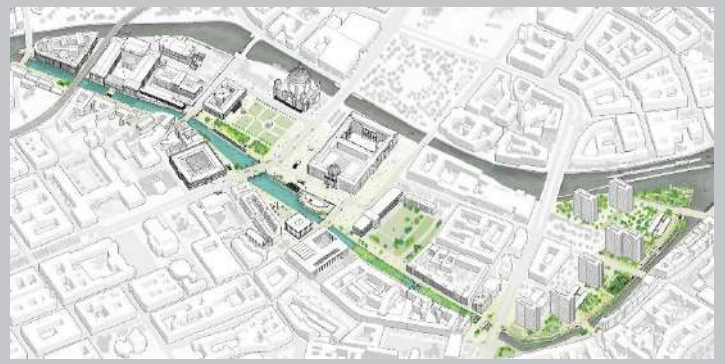

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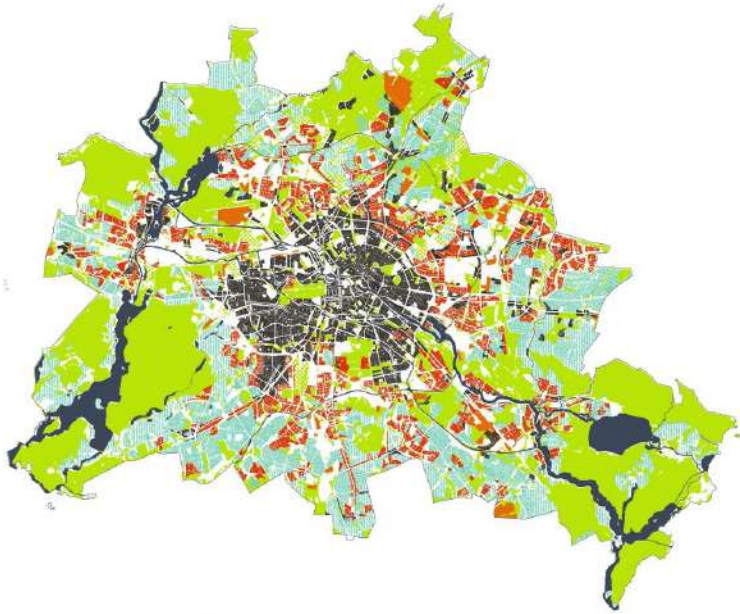
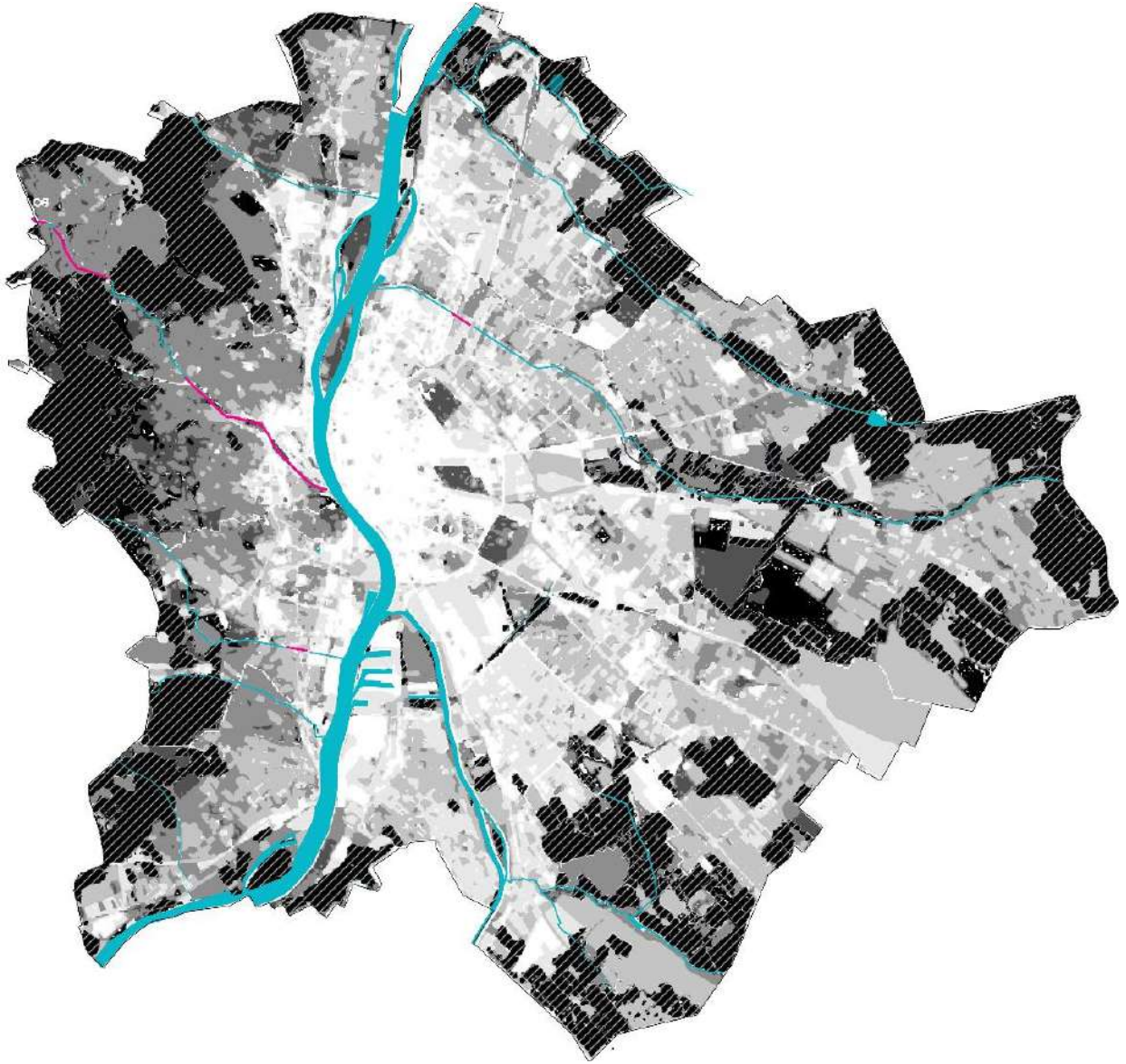
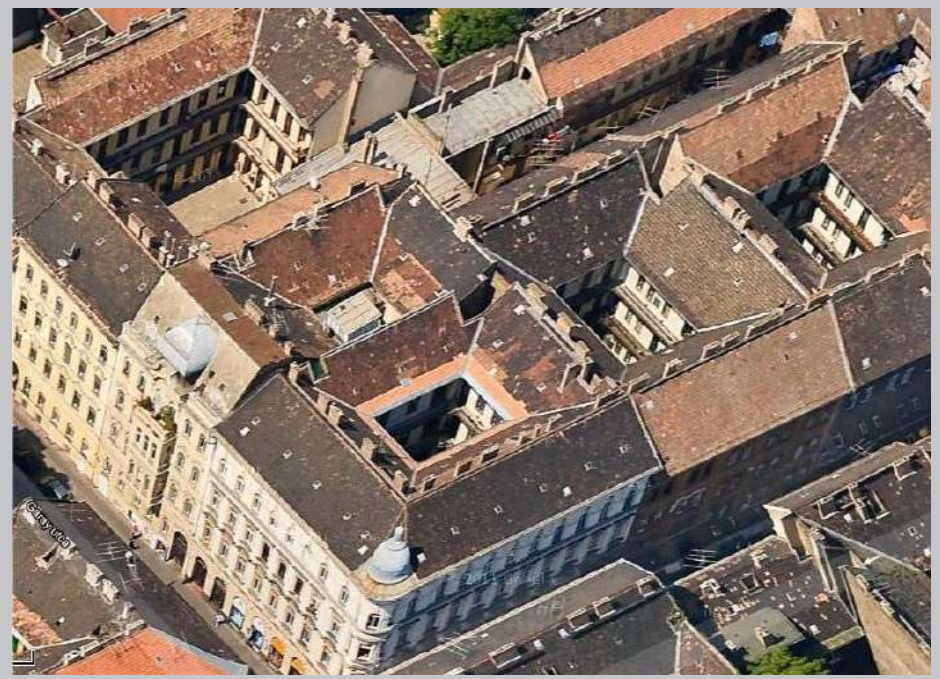


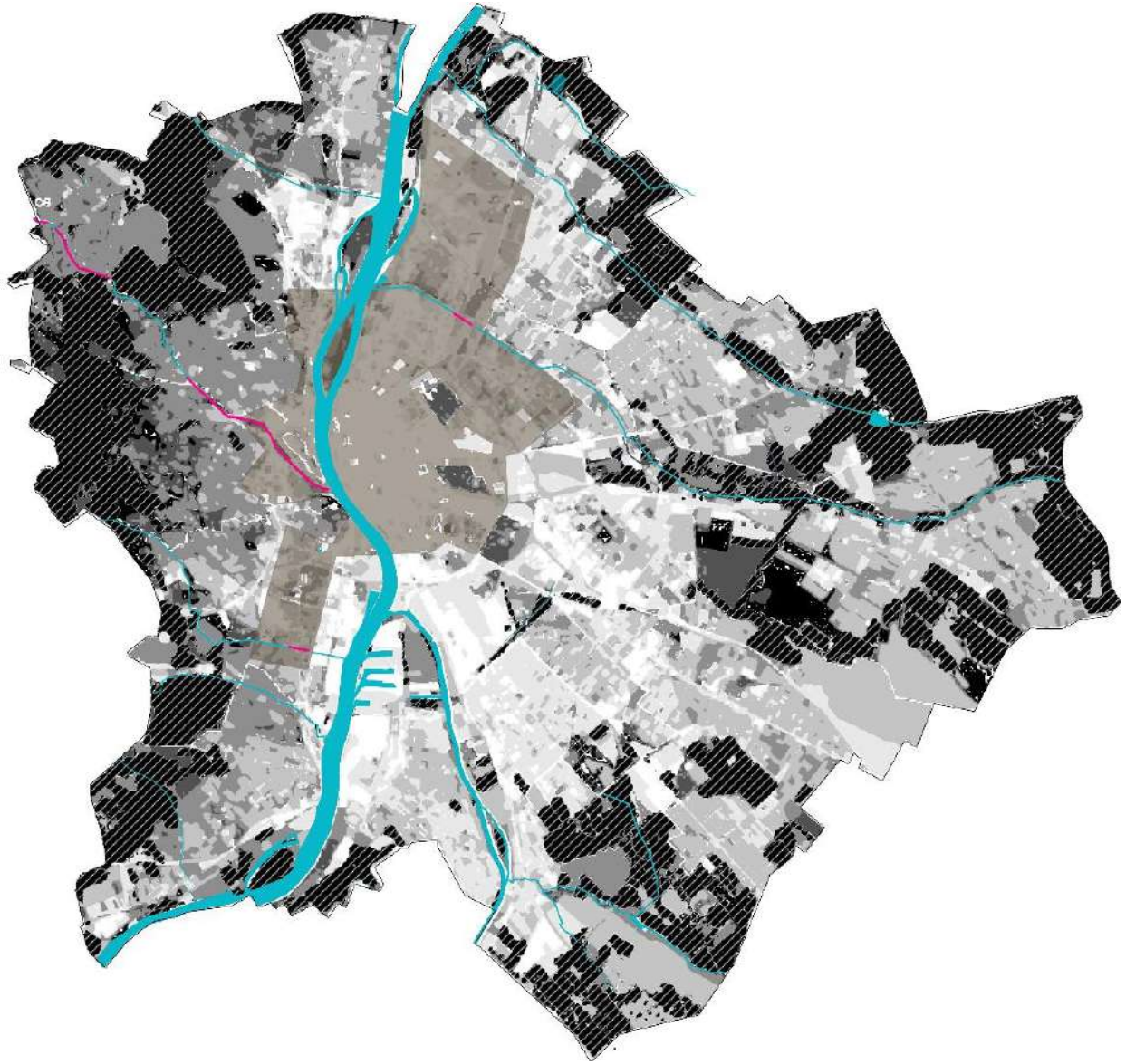
BUDAPEST IN FOCUS



BUDAPEST IN FOCUS

CLOSED URBAN BLOCKS





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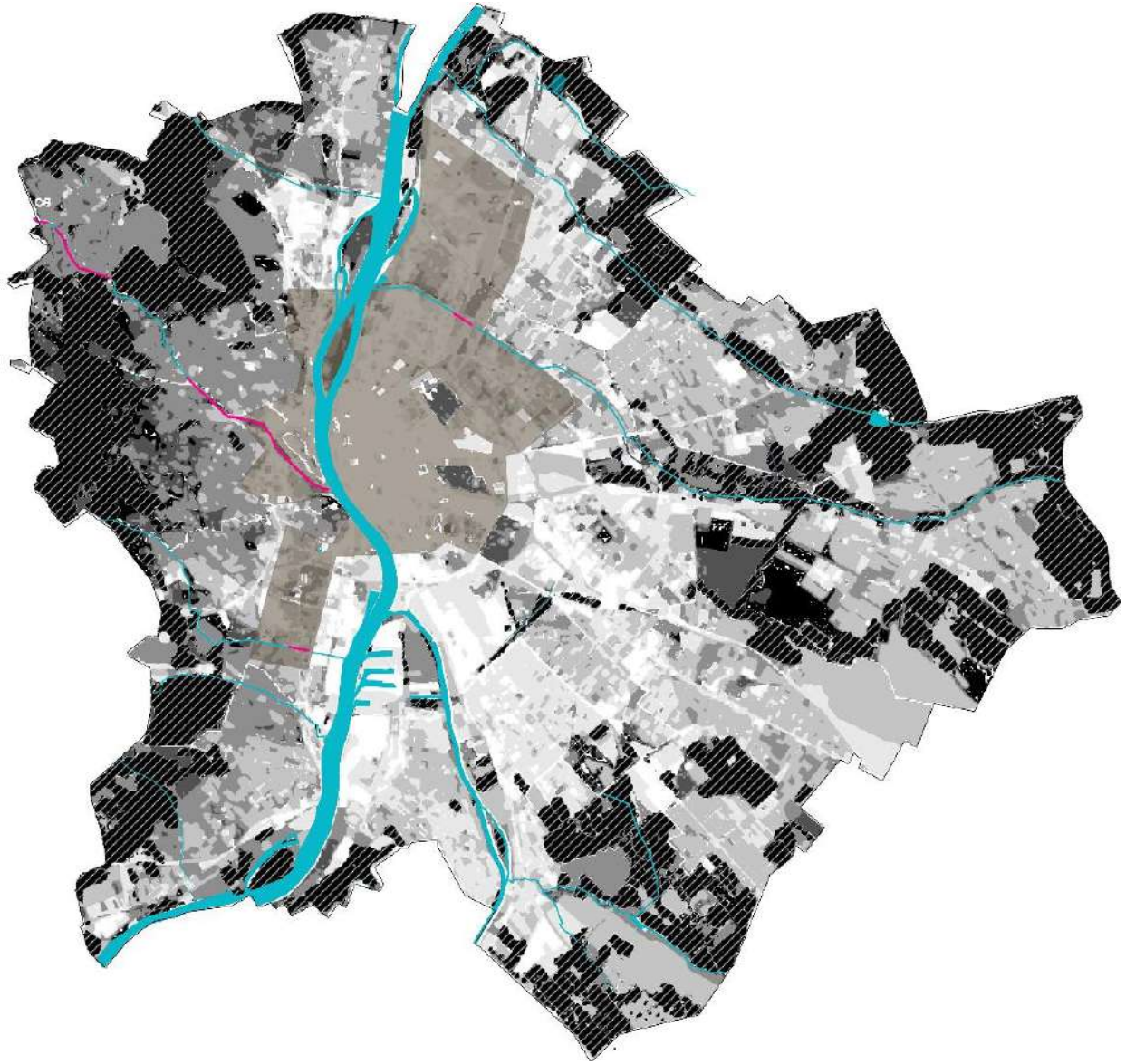
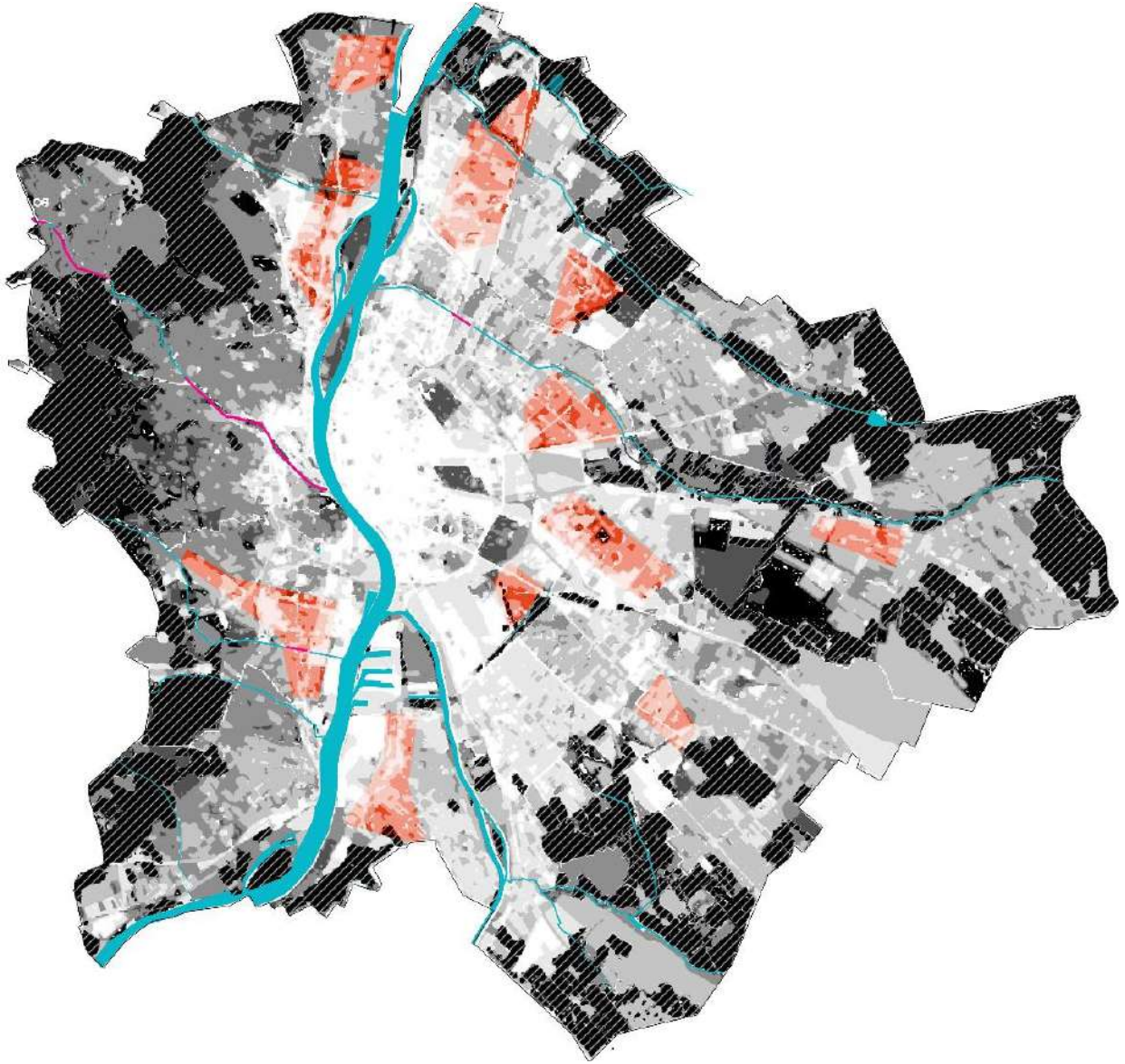


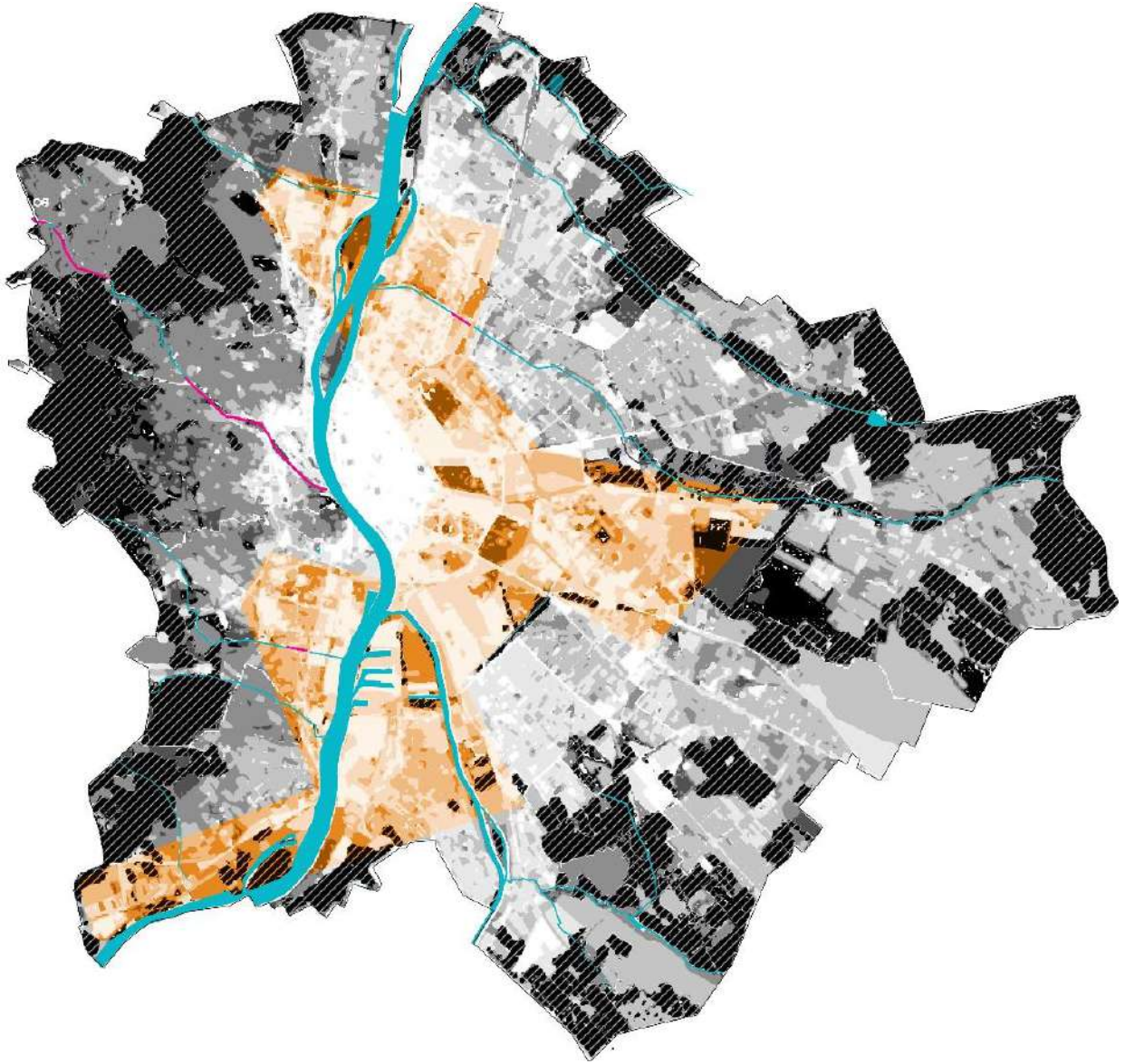
BUDAPEST IN FOCUS

PUBLIC HOUSING



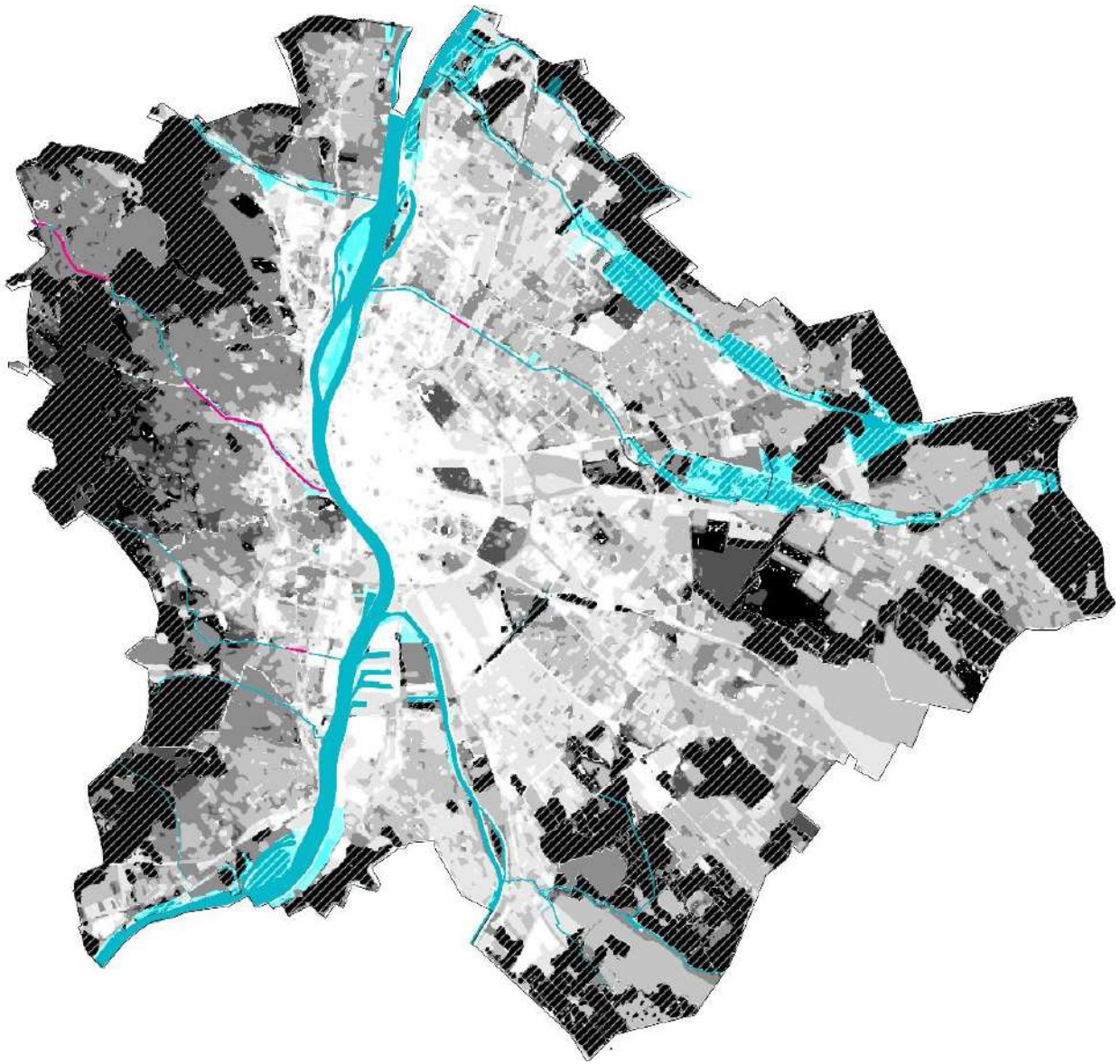
BUDAPEST IN FOCUS

BROWNFIELDS



BUDAPEST IN FOCUS

RIVERSIDE AREAS



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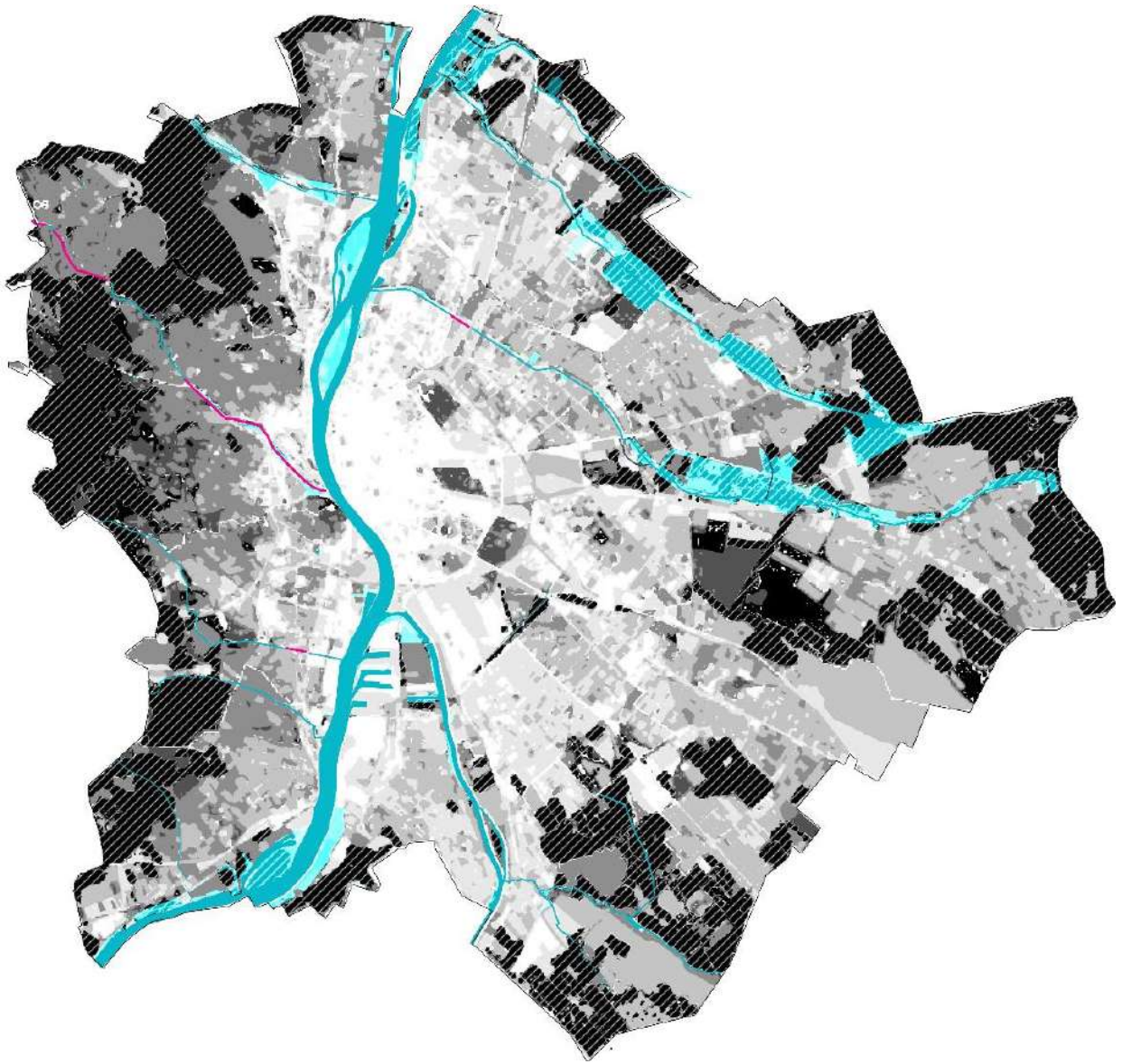
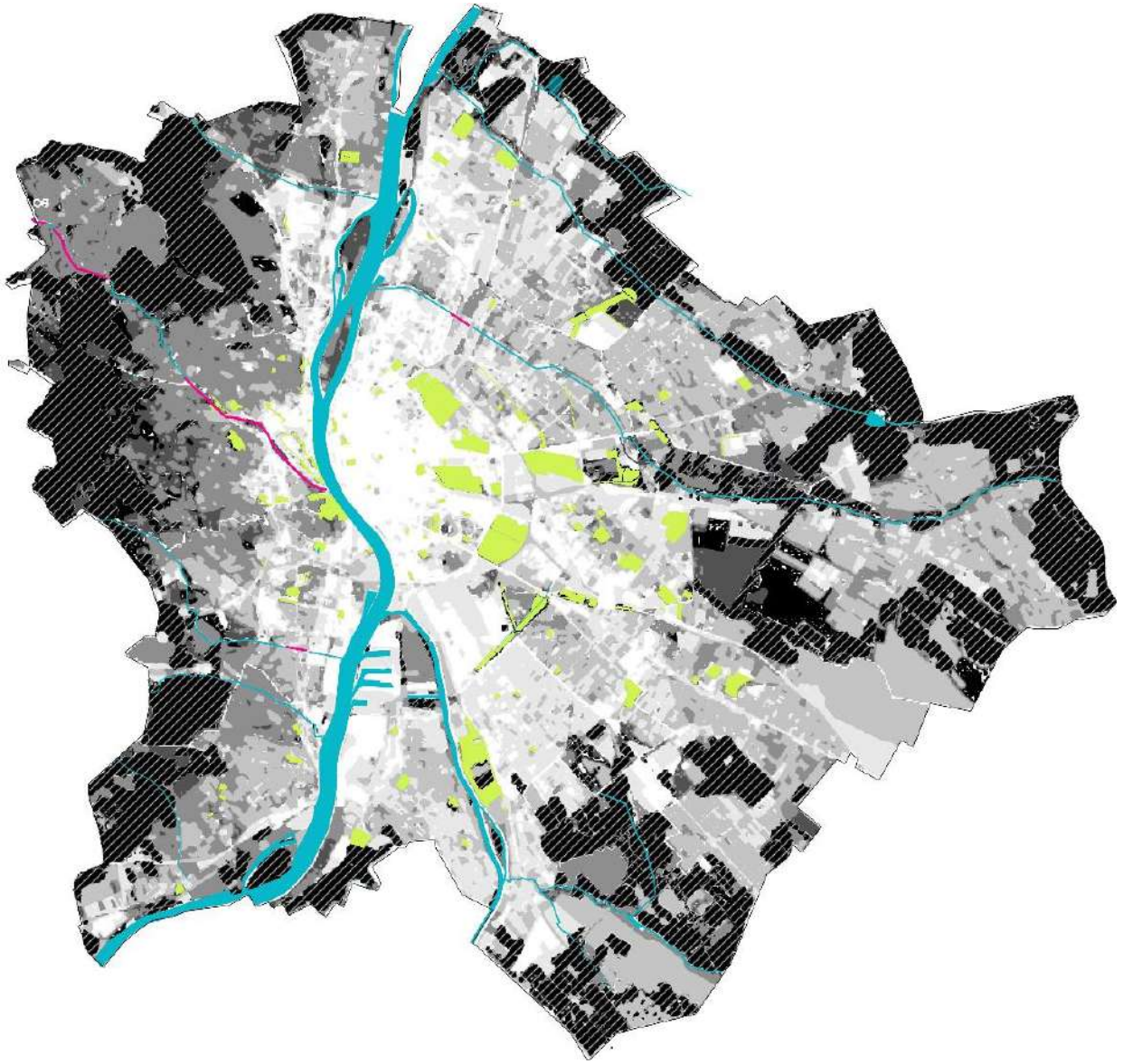


BUDAPEST IN FOCUS

GREEN AREAS



ACCESIBILITY OF SUWM MEASURES

- CLOSED URBAN BLOCKS
- PUBLIC HOUSING
- BROWNFIELDS
- RIVERSIDE AREAS
- GREEN AREAS

BUILT-IN AREAS

OPEN SPACES

Building type analysis of the Intensive urban development between 1870-1990

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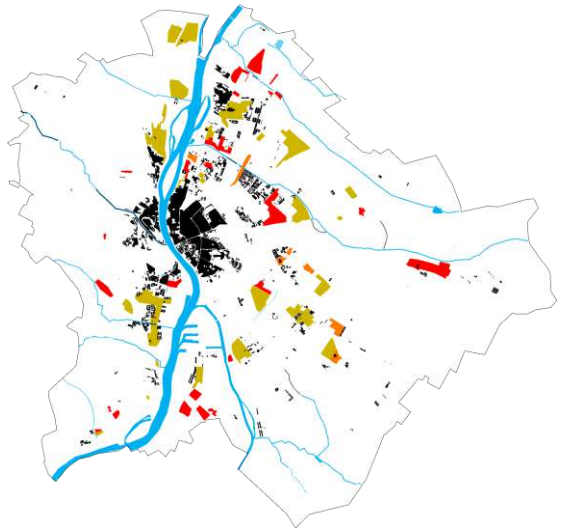
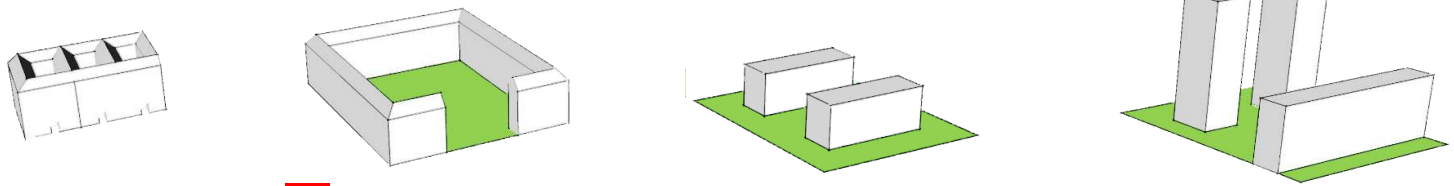
OPEN SPACES

Building type analysis of the Intensive urban development between 1870-1990

- Planning principials of the age
- Examination of application of SUWM measures (KURAS Project)

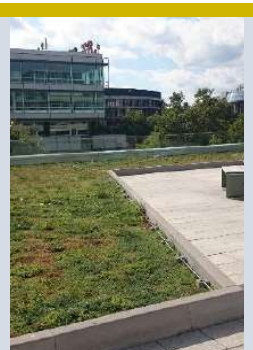




CLOSED URBAN BLOCK | FRAMED BLOCK | LOW FREE STANDING BLOCKS | HIGH FREE STANDING BLOCKS

ACCESIBILITY OF SUWM MEASURES

	New green areas	Green roof	Green wall	Street trees	Rain garden	Swales	Ponds and lakes	Permeable paving	Adaptable plant use
CLOSED URBAN BLOCK	●●	●	●	●●	●●	○	○	●●	●●
FRAMED BLOCKS	○	○	●	○	●●	●●	●	●	●
LOW FREE STANDING BLOCKS	○	●●	●●	●	●●	●●	●	●	●
HIGH FREE STANDING BLOCKS	○	●	●●	●●	●●	●●	●●	●●	●●



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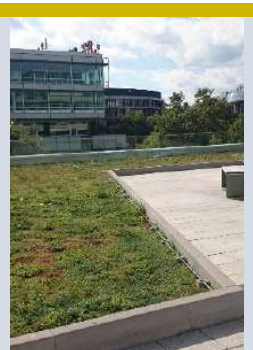






CONCLUSION

- Riverside revitalisations and new green area establishment provide social, ecological and economical benefits
- Old European cities struggle with the same challenges → sharing „best practice”
- Transitioning of existent housing needs individual solutions