iWater project

Holistic, Sustainable and Cost-Effective Stormwater Management

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Turku, 29 November 2017

Urban Climate Adaptation in the Baltic Sea Region | Training Workshops

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Integrated Storm Water Management

www.integratedstormwater.eu

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Overview

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Why?


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Common challenges in the BSR

Baseline: before the implementation of the iWater

Current **Common Challenges*** in the Baltic Sea Region:

- Increased precipitation, more frequent and heavier rainfalls

  serious damages to infrastructure, hazardous substances and nutrients pollute water bodies

- Responsibilities scattered among cities' departments

  need for a cross-sectoral co-operation in the cities and between municipalities

- Good strategies – weak implementation

  ***lack of political mandate/awareness**, insufficient evaluation how existing strategies are implemented, weaknesses within updating such strategies, not all relevant city departments are involved at all necessary levels, no communication with neighbouring municipalities, citizens are not involved in decision making and implementation*

*** Stormwater Management Survey (UBC 2014)**

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Challenges in the iWater cities

Baseline: before the implementation of the iWater

Challenges in the iWater cities:

- Common trend in urban planning to densify urban areas
- Dispersed stormwater planning and management responsibilities
- Urban planning and management practices – weak in meeting these and other challenges

= a clear need for transferring stormwaters **from a problem (waste) to a resource** for urban areas

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Goals

of the iWater project

iWater project **aims** to:

- Improve urban planning

  develop integrated and multifunctional stormwater management in partner cities, develop new stormwater planning tools

- Create higher quality and more resilient urban space

  find, pilot and disseminate innovations in urban stormwater management that improve urban environment and decrease adverse environmental and climate impacts

- Decrease future costs of urban flooding

… and thus increase the overall urban sustainability

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By whom?


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Partners

of the iWater project

A consortium of **9 iWater project partners** representing all **4 Central Baltic countries**:

City of Gävle, SE

City of Turku, FI

City of Tartu, EE

City of Helsinki, FI

City of Riga, LV

City of Söderhamn, SE

Union of the Baltic Cities

City of Jelgava, LV

Aalto University, FI

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What?


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Activities I

Integrated Stormwater Management (ISWM)

Development of **Integrated Stormwater Management (ISWM)** system:

- guidelines for the ISWM system
- development and adoption of the ISWM strategies/programmes/plans in all iWater partner cities
- capacity building

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Activities I

Integrated Stormwater Management (ISWM)

What is the **Integrated Stormwater Management (ISWM)**?

- based on a holistic and an integrated approach
- applies greener, more eco-efficient urban planning principles
- promotes additional environmental benefits such as presence of multiple ecosystem services in urban environment
- promotes transition from conventional drainage to sustainable drainage; priority – Green Infrastructures vs. Gray Infrastructures (SuDS, LID, etc.)

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Activities II

Stormwater Planning Tools

Development of the **Stormwater Planning Tools** in the iWater partner cities:

- development and adjustment of stormwater planning tool in each city, that is based on the «Green factor» approach
- piloting and adapting the tool in 7 partner cities

Development of the **iWater TOOLBOX**

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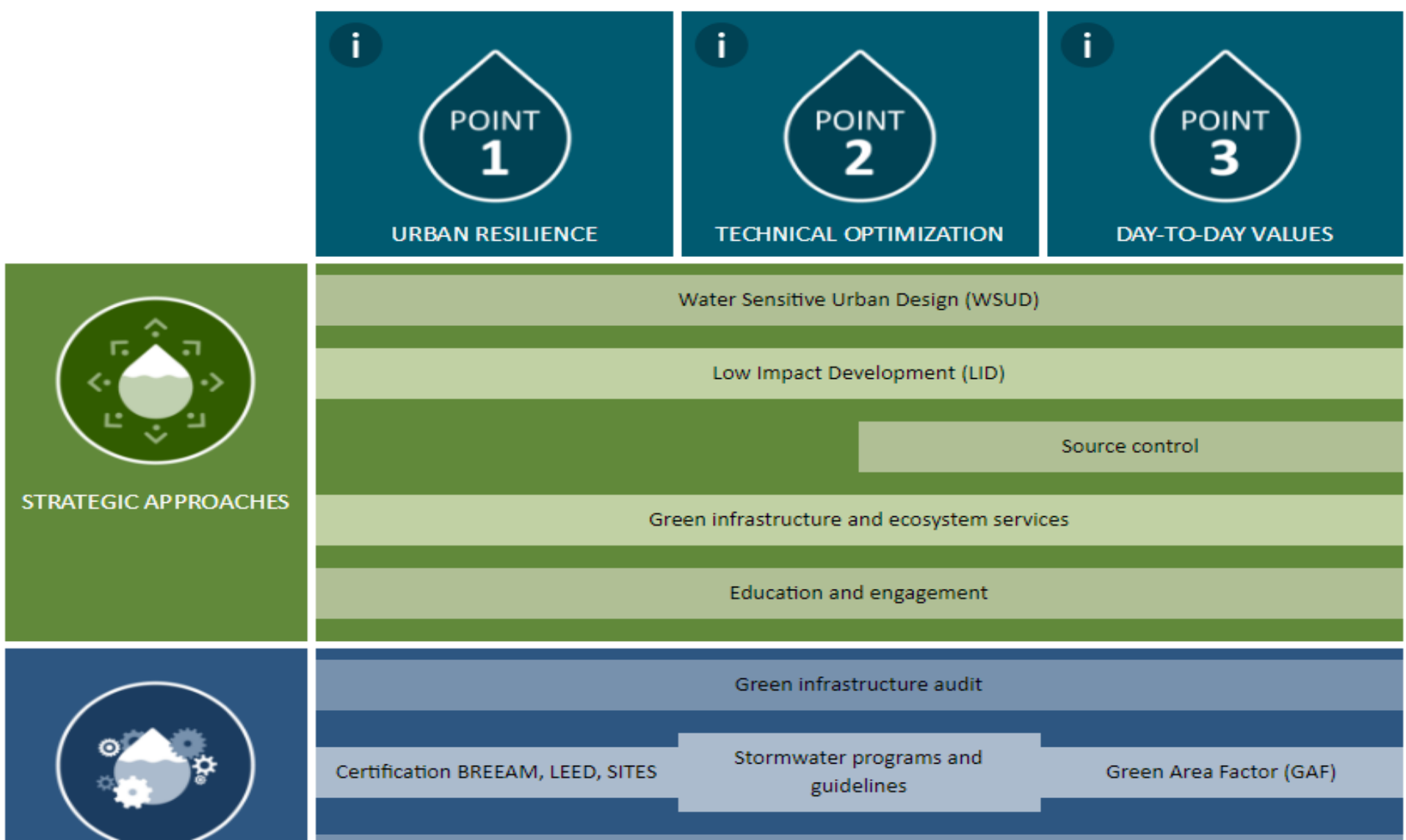
iWater TOOLBOX

Test it yourself!



PLANNING SUPPORT TOOLS AND PROGRAMS

Flood risk mapping

Watershed assesment

DESIGN / STRUCTURAL SOLUTIONS

Sustainable Urban Drainage Systems SUDS, Best Management Practices BMPS

Descriptions of sustainable stormwater management solutions

Green Streets

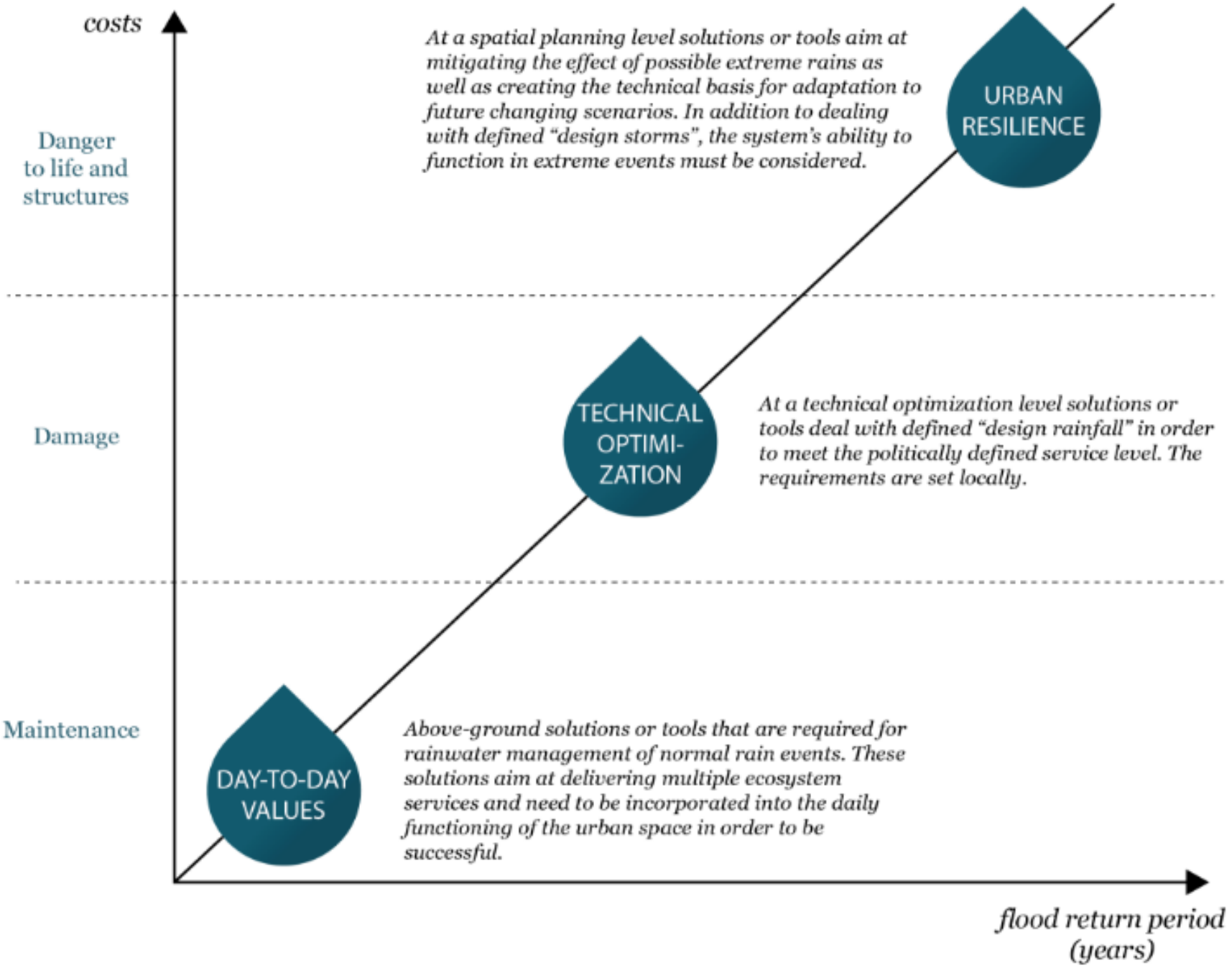
ASSESMENT

Cost-benefit analysis

ESS potential of SUDS

ESS values of SUDS

iWater assesment criteria


costs
Danger to life and structures
Damage
Maintenance
At a spatial planning level solutions or tools aim at mitigating the effect of possible extreme rains as well as creating the technical basis for adaptation to future changing scenarios. In addition to dealing with defined "design storms", the system's ability to function in extreme events must be considered.
URBAN RESILIENCE
TECHNICAL OPTIMI-ZATION
At a technical optimization level solutions or tools deal with defined "design rainfall" in order to meet the politically defined service level. The requirements are set locally.
DAY-TO-DAY VALUES
Above-ground solutions or tools that are required for rainwater management of normal rain events. These solutions aim at delivering multiple ecosystem services and need to be incorporated into the daily functioning of the urban space in order to be successful.
flood return period (years)

Activities III

Piloting Innovative and Multifunctional Stormwater Solution

Development of a **concept** for local innovative & multifunctional **stormwater solution**, based on Green Infrastructure:

- Based on a multivalued stormwater solution developed by students within the iWater Summer Schools, in pilot sites provided by each partner city

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…our response to the challenges…

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From a waste to a resource

iWater activities

- In the iWater 7 Central Baltic cities **benefit from collaboration** within the preparation of stormwater programmes in their cities
- iWater creates a **high quality, clean and safe urban environment** through stormwater management that protects and mimics the natural water cycle
- iWater promotes the usage of **green infrastructure** to deal with stormwater in urban environment

#iWatercooperation

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iWater Case Study:

The city of Riga

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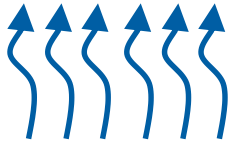
Baseline Review

Specific Geographical Conditions

130%



100%

precipitation > evaporation

1-11m above sea level

0.3 – 1.5 m

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Baseline Review

Major Concerns → Opportunities

- Yearly **damage** from the consequences of flooding ~ 1 mln. EUR
- **Decrease in value of the real estate** due to flooding ~ 150 mln. EUR
- **Losses from water pollution** – considerable, not yet quantified
- **Potential for real estate value growth** from applying green infrastructure solutions ~ 200 – 500 mln. EUR
- Stormwater in Riga is not a big problem. It is a **BIG OPPORTUNITY!**

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Driving Factors

…key conclusions from the Needs Analysis

- **Climate change** (heavier and more frequent rainfalls in the city, spring floods, storm surges, etc.)
- **Increased knowledge and awareness** (participation of the city of Riga in the EU projects, development of regulatory framework on climate change adoption in Latvia)
- **Need for new approaches to stormwater management**: studies carried out and sectorial planning documents elaborated… all leading to a key conclusion that technical solutions to stormwater management issues for our city are **EXPENSIVE**

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Coordination

Composition of the Stormwater Management Group and its responsibilities

OUR STORMWATER GROUP:

- 20 members representing 7 city institutions (6 city departments + 1 municipal enterprise)
- Currently responsibilities are limited to «support to implementation of the iWater project activities»
- Regular meetings & participation in project activities and local/international events

MEMBERS:

City Development Department of the Riga City Council

- iWater project experts (Spatial planning expert, Strategic planning expert, Amelioration – Stormwater expert, etc.)

Riga City Construction Board

- Land use architect, Building & Architecture engineer, Building control specialist

Riga Water & Sewage Utility (PSIA «Rīgas ūdens»)

- Board Member, Chief Engineer

Traffic Department of the Riga City Council

- Specialist for Transport Infrastructure Building & Maintenance

Environment & Housing Department of the Riga City Council

- Environment protection specialist

Property Department of the Riga City Council

- Municipal property accounting specialist

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Target Setting

Role of the Stormwater Management Group

Stormwater Management Group – meets once per 2 months:

- Collaborative institutional SWOT analysis
- Stakeholders' analysis
- Proposals for and approval of stormwater management principles and criteria for (institutional) stormwater management model
- Evaluation of various (institutional) stormwater management models and selection of the preferred option
- **Capacity building activities and knowledge transfer at every meeting!**

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So – our targets are…

… to be continued

1. **Clear responsibilities** for stormwater management & infrastructure development under **clear legislative framework**
2. Flood protection & prevention
3. «Stormwater – the urban resource» – stormwaters used to create more **attractive urban space**
4. «Improved state of urban waters» – stormwater management used to improve the overall **quality of urban waters**
5. **Cost efficiency**: «green» vs. «grey» *or* «green» + «grey»
6. Continuous awareness raising …
7. …. and much more!

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iWater Pilot Site

New development with existing masterplan

A place of **water**, **nature** and **hidden human traces** …

… to remain a green and calm neighbourhood?

… or to become a large multi-modal transport hub?

… or a combination of both?

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Photo: Andris Ločmanis


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Planned Built Environment

iWater Pilot Site

Planned Development

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- Multimodal transport hub 700 m^2;
- Regional bus terminal 12.000 m^2;
- Park & ride 13.700m^2;
- New access streets 680 m;
- Reconstruction of existing streets 1016 m;
- Technical infrastructure 3.660 m.

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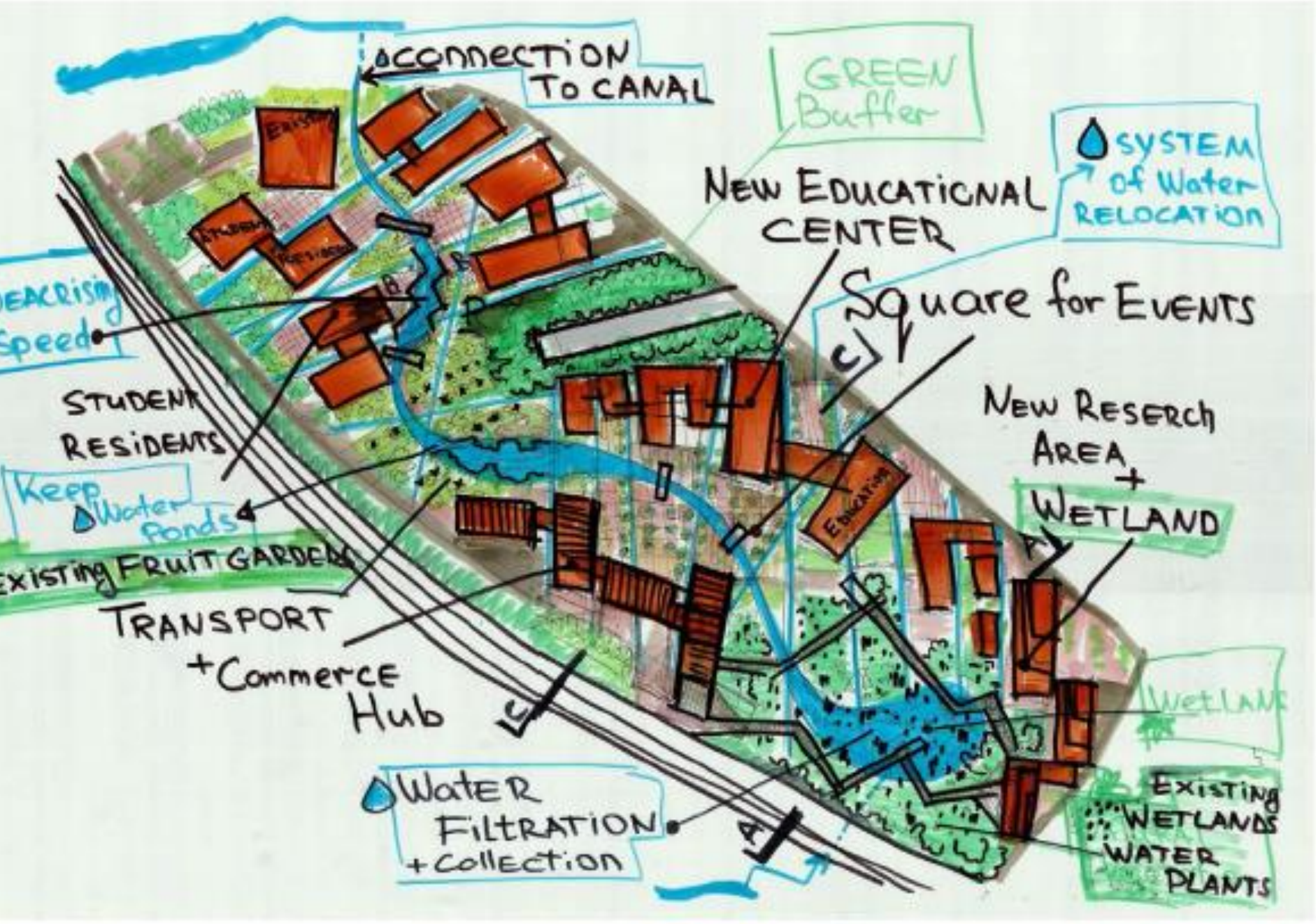
Our approach…


ANALYSIS
of MASTERPLAN
IDEAS
RECREATION AREA
SOCIAL CENTER
FOR ALL HABERMASS
PARK
MULTIFUNCTIONAL
PARKING LOT
MORE UNIFIED
AREAS
WATER AS A FRAME
FOR COMPOSITION
BLOOMING LINDEN


connection To CANAL
GREEN Buffer
SYSTEM of Water RELOCATION
NEW EDUCATIONAL CENTER
Square for EVENTS
STUDENT RESIDENTS
NEW RESERCH AREA + WETLAND
Keep Water ponds
EXISTING FRUIT GARDENS
TRANSPORT + Commerce Hub
WATER FILTRATION + COLLECTION
EXISTING WETLANDS WATER PLANTS

Results

Proposals for the iWater Pilot Site

Proposed **General Strategies & Principles** for urban stormwater management :

- Maximize stormwater interception, infiltration, retention and disconnection of impervious elements in all the scales and levels of the stormwater chain
- Consider any urban element or system as a contributor in the stormwater chain

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Results

Proposals for the iWater Pilot Site

In the **Planning & Design** phases the city should ensure:

- Early integration of the stormwater management issues in the planning and design processes
- Development of urban plans in multidisciplinary teams
- Expansion of the palette of urban solutions for stormwater management (SUDS, LID, …)

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Results

Proposals for the iWater Pilot Site

Integration of **Ecosystem Services**:

- Use the stormwater as the key element to maximize the provision of ecosystem services in the cities
- Connect and integrate the natural or artificial water features into a multifunctional green-blue network

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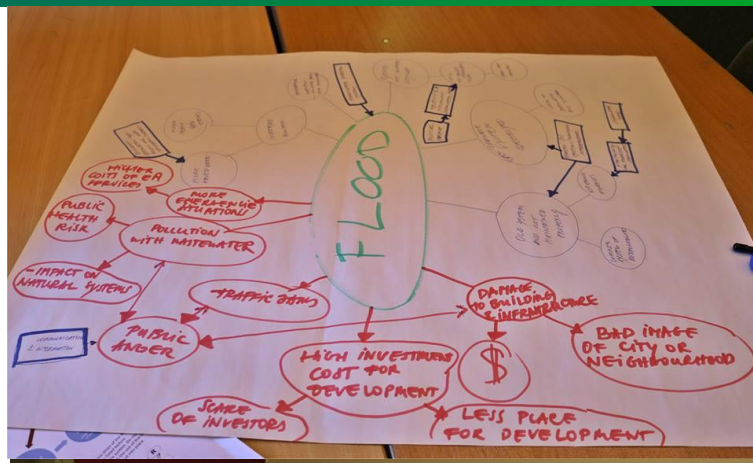
Learn from us…

Learn from the iWater

iWater project will **train the other BSR cities** to use the stormwater planning tools and Integrated Stormwater Management (ISWM) method:

- Participate to national training events in iWater countries in your own language – **in Helsinki and Tallinn on 16-17 May 2018**!
- Get to know the methods and tools online: visit www.integratedstormwater.eu



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Thank you!

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