City of Helsinki Storm Water Management Program: Lessons learnt and key conclusions

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Helsinki

iWater

Interreg
Central Baltic

EUROPEAN UNION
European Regional Development Fund

FLAGSHIP

Structure of presentation

1. ”Basic” storm water management in Helsinki

2. iWater work:

- *Needs & aims*
- *Preparation process*
- *New measures*

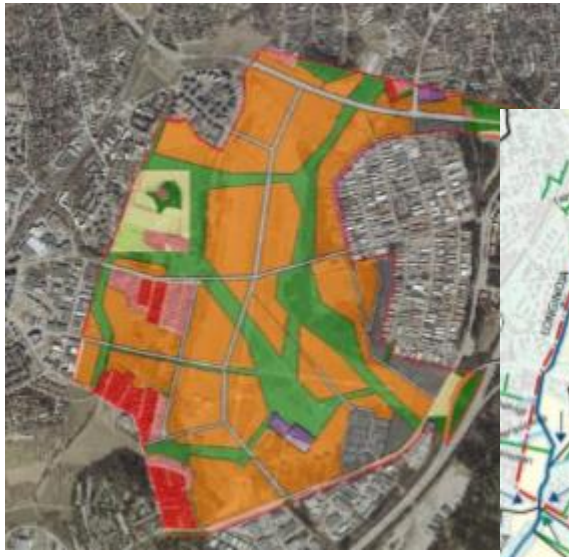
3. Lessons learnt & key conclusions

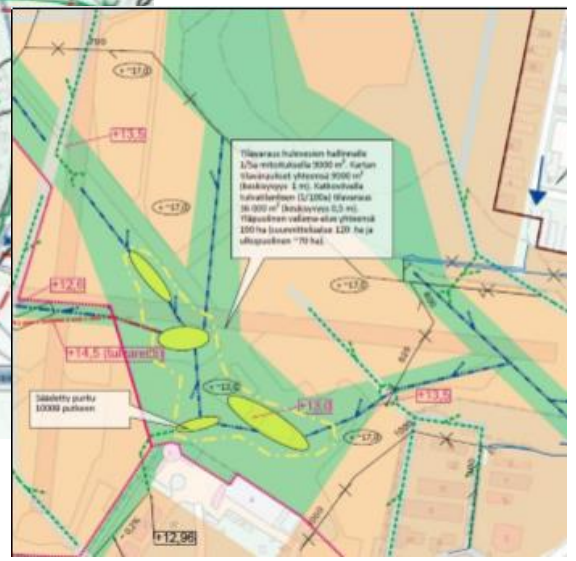
1. ”Baisic” storm water management in city

NEW AREAS

Master plan/ partial master plan

Strategic urban planning service → a general storm water plan for the master plan (large scale sw handling)





- *Description of status quo*
- *Impacts of land use change*
- *Aims and principals for sw management (e.g. watershed oriented approach, sw quality impacts, infiltration on site)*
- *Flow directions for sw and flooding routes*
- *Space reservations*

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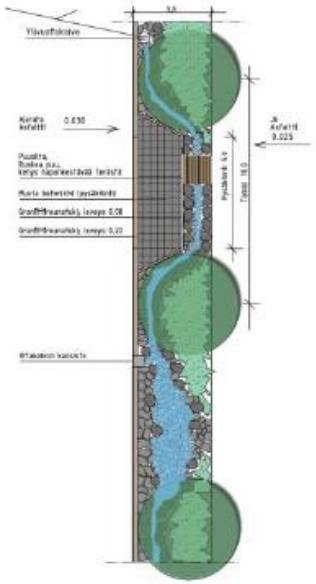
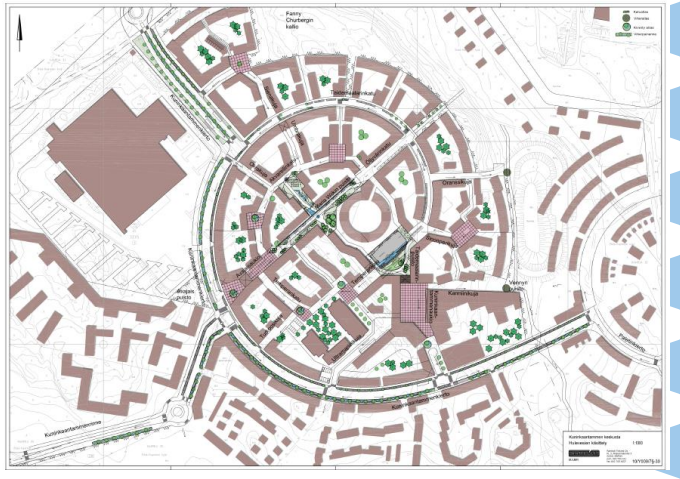
NEW AREAS

Detailed plan

Detailed planning service → a general storm water plan and written plan regulations (eg. green roofs, wetlands)





Example: Kuninkaantammi area, a pilot district for sustainable storm water management. Reservations for handling storm water on site and eg. 0,5 m3 retention/100m2 impermeable surface as requirement in written plan regulations

-> Link between watershed approach and detailed planning needs improvment.
Promotion of SUDS on site needed – role of building supervision!

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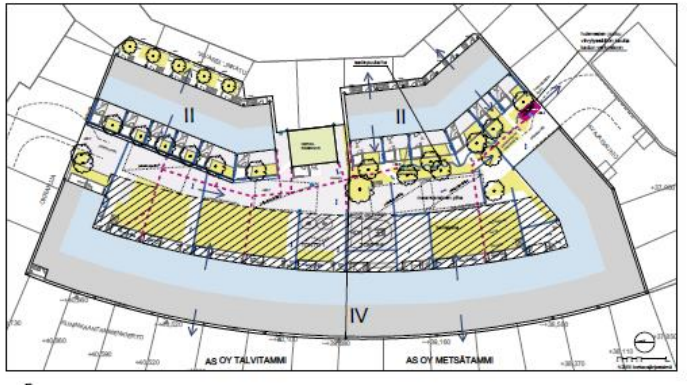
NEW AREAS

Planning of implementation & construction

- Public areas: Traffic, street and park planning (storm waters need to be considered and utlized better!)

- Private areas, role of building control services
  - SW plans for lots as a pre-requisite for the building permit
  - Demand for using the Green Area Factor planning tool for lot assignment and land use agreements – *increased through iWater!*



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Development of ”old” areas

ALREADY CONSTRUCTED AREAS

1. Development plans for ”old” residential areas (consideration and utlisation of storm waters need to be improved)

2. Flood risk assessment (updating 2018, climate adaptation needs to be considered)

3. Watershed based storm water plans for individual brooks in Helsinki (”suitability for storm water use”, also negative effects of storm waters need to be considered)

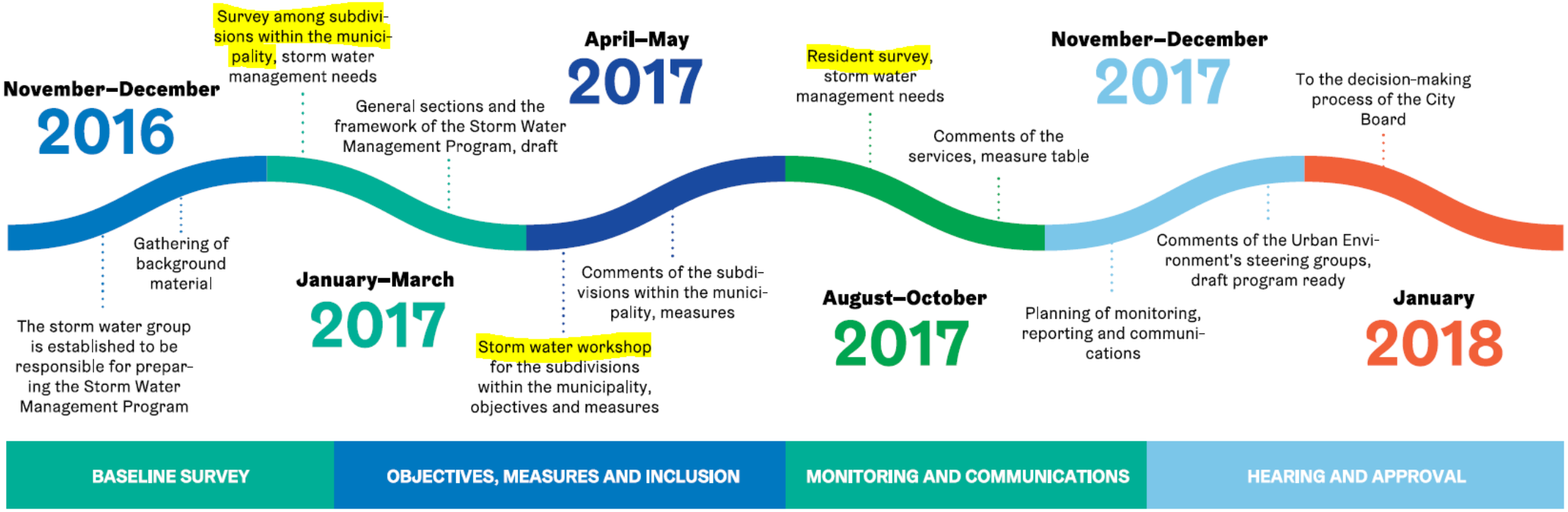
2. iWater: New storm water managment program

New Storm Water Program

City board 2008

Urban Environment Committee 2/2018, City board 15.5.2018!

Preparation process of the new SWM program



Challenges in the old program -> Needs for a new progam

- From problem to **resource**
- New master plan (2016) aims for a **densifying city**
- **Increased need of adaptation** to climate change
- Focus on improving **sw quality**
- Implementation of **new sw legislation** (2015, the municipality has the responsibility of sw handling)
- Clear definitions of **responsibilities within the city organisation**
- **Monitoring of sw expences**

Objectives

Storm water has been utilised for increasing the attractiveness of the environment, maintaining biodiversity and promoting a good condition of surface and groundwater.

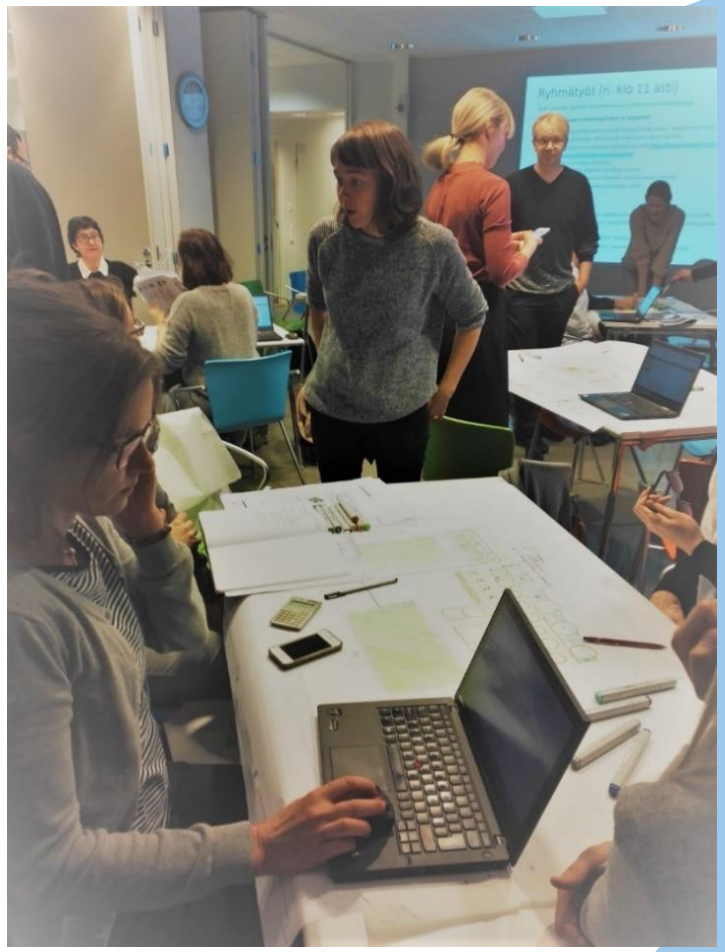
Regional and local drainage has been ensured while taking the impacts of climate change into account.

The disadvantages caused by storm water have been prevented and eliminated in changing conditions and densifying city structure.

Storm water flow rates are under control and storm water quality is improved.

Conveying storm water into wastewater sewer has been reduced.

Cooperation and procedure models supporting systematic overall management of storm water are in use, and sufficient competence and resources have been secured.



How should sw be handled in practice?

Priority order

Storm water management will be planned and storm water will be treated and conveyed in accordance with the following priority order:

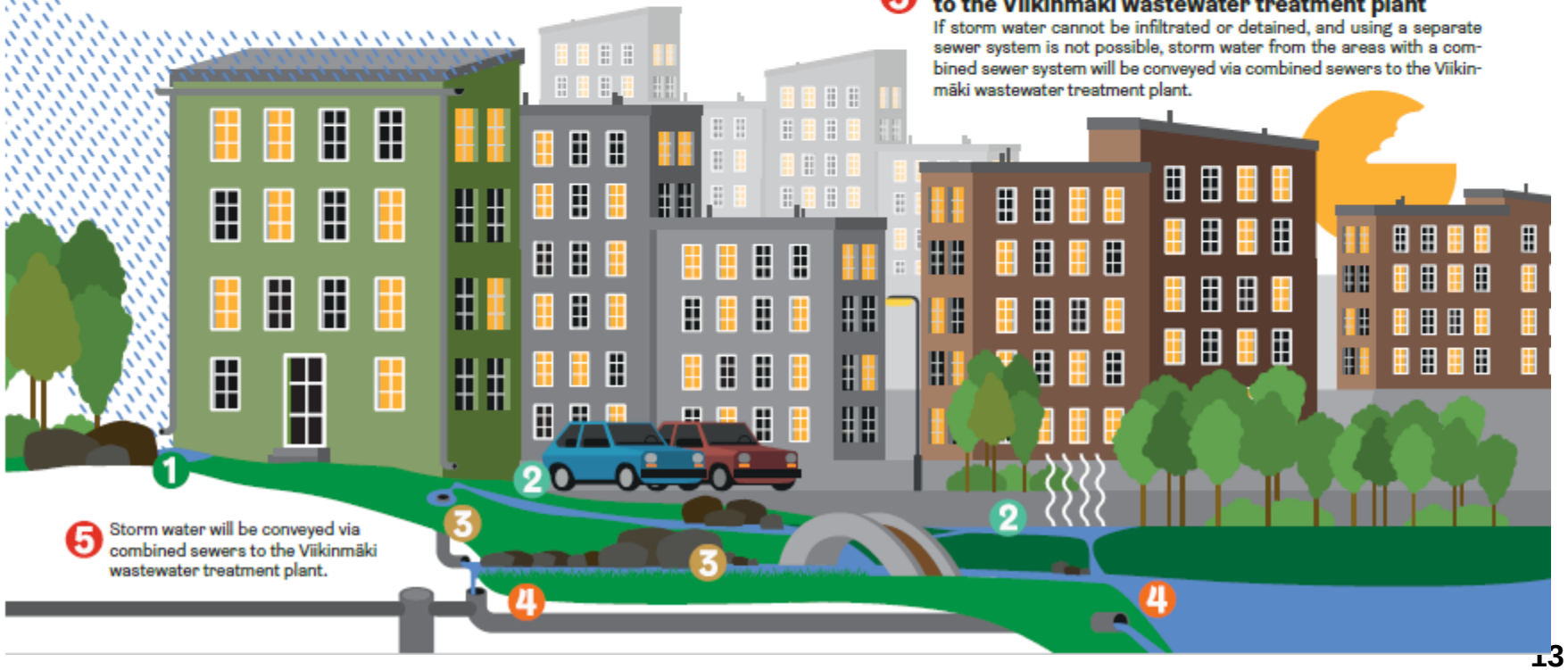
1 Primarily, storm water will be treated and utilised at the source.
If the soil quality and other conditions allow, storm water will be infiltrated on the lots and public areas where storm water is generated. If storm water cannot be infiltrated, it will – whenever possible – be retained or detained on the lot/public area before it is conveyed away.

2 Storm water will be conveyed away from the source with a system that retains and detains the water.
If storm water cannot be infiltrated or detained at the source and therefore the water must be conveyed away from the lots/public areas, it is carried out by retaining and detaining the water in surface systems via ditches, meandering brooks and swales, in which water can infiltrate into the ground, be retained by vegetation and evaporate into the atmosphere.

3 Storm water will be conveyed away from the source in a storm water sewer to retention and detention areas located on public areas before conveying the water to a water body (brook).
If storm water cannot be infiltrated or conveyed away from the lots/public areas with a retaining and detaining surface system, the water is conveyed away in a pipe. However, storm water will be treated with a retaining and detaining system before the water is finally conveyed to an urban brook. If storm water is conveyed from the lots/public areas directly to the sea or to Vantaanjoki/Keravanjoki river, retaining and detaining is required only if the quality of storm water is poor.

4 Storm water will be conveyed in a storm water sewer directly to the recipient water body.
If storm water cannot be infiltrated or detained on lots or public areas before the recipient water body, the water is conveyed directly to the water body in a pipe.

5 Storm water will be conveyed in a combined sewer to the Viikinmäki wastewater treatment plant
If storm water cannot be infiltrated or detained, and using a separate sewer system is not possible, storm water from the areas with a combined sewer system will be conveyed via combined sewers to the Viikinmäki wastewater treatment plant.



38 measures in the SWM program –

integrated management

Land Use and City Structure /
Measures under the responsibility of the Traffic and Street Planning Services

19.	Reserves sufficient space for storm water management structures and storm water detention and infiltration solutions in traffic and street plans.	**Planning Unit,** in cooperation with the required parties	Continuous	Budget (consultant)	
20.	Increases the use of pervious materials in street construction where applicable.	**Planning Unit,** in cooperation with the required parties	Continuous	Budget (consultant)	
21.	Conducts a survey on the conditions to construct a street without a storm water sewer and makes it a pilot project.	**Planning Unit,** in cooperation with the Urban Space and Landscape Planning Services	Assessment in 2020	Budget (consultant)	
22.	Separates the storm water costs from the street and park construction costs to a separate cost centre in investment programming and monitoring.	**Resource Planning Unit,** in cooperation with the required parties	Continuous	Budget	

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24.	Uses an ecosystem service-based blue green network planning tool in planning public areas and develops the tool.	**Area Planning Unit** in cooperation with other units of the Urban Space and Landscape Planning Services and other required parties.	Continuous	Budget (consultant)	
25.	Promotes the construction of storm water surface systems, restoration of small watercourses and utilisation of green areas for storm water management in planning the renovation of public areas, especially in areas with a combined sewer system.	**Urban Space and Landscape Planning Services** in cooperation with the Traffic and Street Planning Services, Buildings and Public Areas Segment and HSY	Continuous	Budget (HSY)	
26.	Participates, in connection with various projects, in the planning, piloting and implementation of new storm water management methods that are suitable for built environment.	**Park and Green Area Planning Unit** in cooperation with the Area Planning Unit, Environmental Services and other required parties	Continuous	Budget, project funding, partners, EU funding	
27.	Updates the small watercourse program.	**Urban Space and Networks Unit,** in cooperation with the required parties	2020	Budget (consultant)	

Buildings and Public Areas /
Measures under the responsibility of the Maintenance Services

	Measure	Responsible unit/ in cooperation with	Schedule	Financing	Promotes the objective (page 11)
28.	Develops the competence, tools and methods for the maintenance of storm water management.	**Municipal Engineering Unit** and **Public Areas Unit,** in cooperation with the required parties	Continuous	Budget, project funding, partners, EU funding	
29.	Prepares the maintenance instructions for the storm water solutions and storm water flooding routes in streets and green areas.	**Public Areas Unit,** in cooperation with HSY	2019-2020	Budget (consultant)	
30.	Separates the storm water costs and income from the maintenance costs and income in budgeting and control.	**Public Areas Unit**	Continuous	Budget	

Services and Permits /
Measures under the responsibility of the Environmental Services

	Measure	Responsible unit/ in cooperation with	Schedule	Financing	Promotes the objective (page 11)
34.	Unifies and develops the permit and notification practices concerning storm water	**Environmental Protection Unit,** in cooperation with the Building Control Services and the Land Use Unit of the Urban Environment Resident and Business Services	Continuous	Budget	
35.	Updates the instructions on drainage waters from construction sites and monitors its implementation.	**Environmental Protection Unit,** in cooperation with the required parties	Continuous	Budget	
36.	Regulates storm water management/issues in environmental permits when necessary.	**Environmental Protection Unit**	Continuous	Budget	

Examples of measures

Storm water group

1. Prepares and develops a clear and smooth **procedure model for the overall management of storm water for the city organisation**

2. Gathers **the indicators with which the services monitor the implementation of the measures** of the program

3. Promotes the establishment of the **user-oriented information platform**

7. **Organises tailored trainings for various actors**, decision-makers and resident promoting the overall managment of storm water

Examples of measures

Detailed planning

15. Uses Helsinki's green factor as a tool in detailed planning

17. Prepares planning principles taking storm water into account in urban infill, roof top court yards and street areas by increasing the amount of green areas

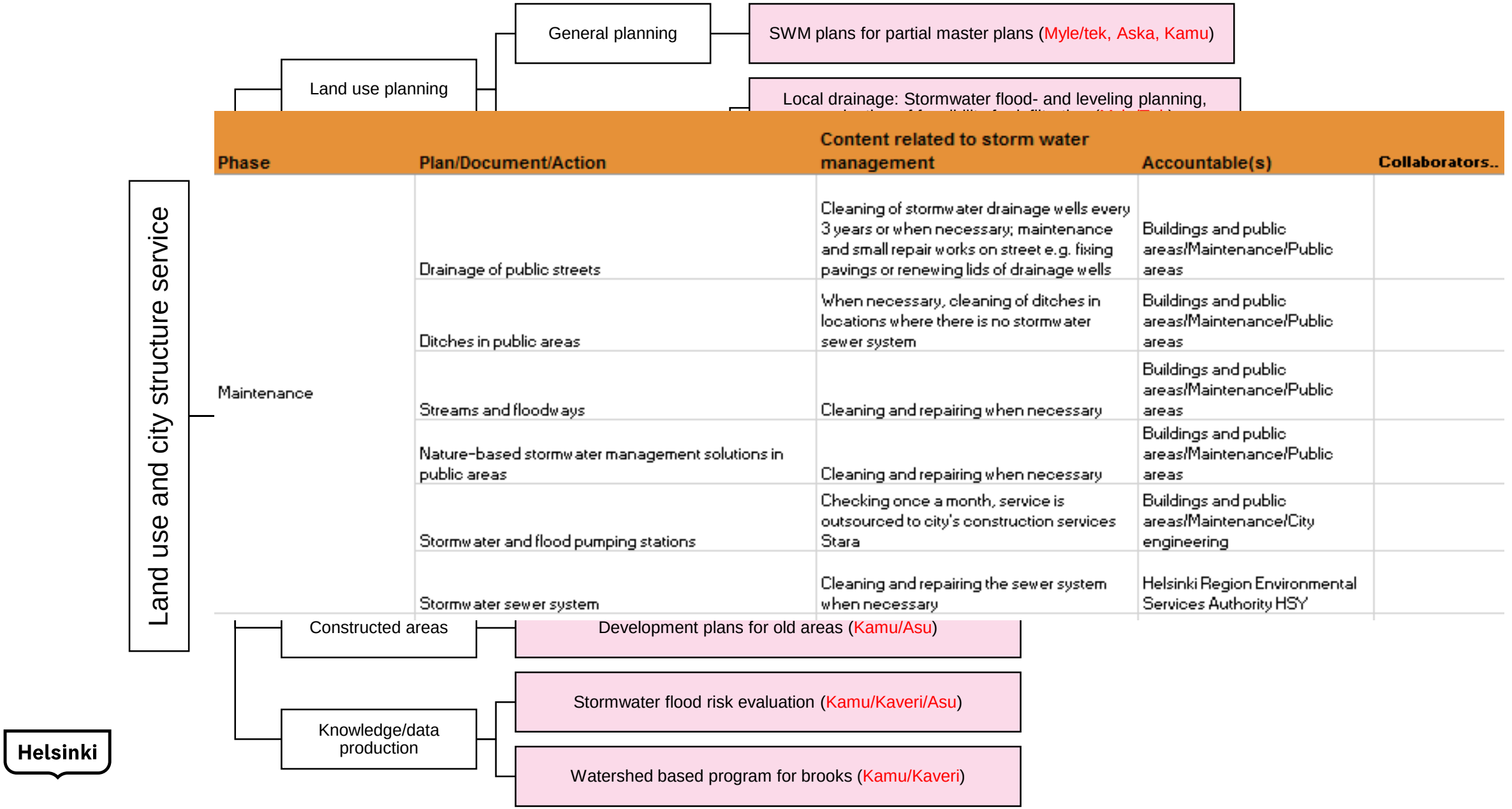
Traffic and street planning services

19. Reserves sufficient space for storm water managmeent strucutres and storm water detention and infiltration solutions in traffic and street plans

Environment services

38. Prepares a storm water quality monitoring program

Storm water group: 1. Develops a clear and smooth procedure model for the overall management of storm water for the city organisation



Phase	Plan/Document/Action	Content related to storm water management	Accountable(s)	Collaborators..
Maintenance	Drainage of public streets	Cleaning of stormwater drainage wells every 3 years or when necessary; maintenance and small repair works on street e.g. fixing pavings or renewing lids of drainage wells	Buildings and public areas/Maintenance/Public areas	
	Ditches in public areas	When necessary, cleaning of ditches in locations where there is no stormwater sewer system	Buildings and public areas/Maintenance/Public areas	
	Streams and floodways	Cleaning and repairing when necessary	Buildings and public areas/Maintenance/Public areas	
	Nature-based stormwater management solutions in public areas	Cleaning and repairing when necessary	Buildings and public areas/Maintenance/Public areas	
	Stormwater and flood pumping stations	Checking once a month, service is outsourced to city's construction services Stara	Buildings and public areas/Maintenance/City engineering	
	Stormwater sewer system	Cleaning and repairing the sewer system when necessary	Helsinki Region Environmental Services Authority HSY	

Lessons learned and conclusions

- **The process** is as important as the result
- **In the beginning even more stakeholder involvement and more time for discussions** and finding the baseline
- The **process model is imortant to make responsibilities visible**
- **SUDS and watershed approach changes procedures**
  - Role of landscape and yard planning
  - Need for several specialised experts working together
  - Lack of knowledge during breaking-point: experinces on functionality are scarce -> need for monitoring is underlined, resources are small
- **Increasing interest for developing sustainable storm water handling!**

Thank you!

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