## Eindhoven (NL)

### *Setting/Problem*

The City of Eindhoven (~215,000 inhabitants and ~2,500 inh/km$^2$) is the main city of the Eindhoven metropolitan area (~750,000 inhabitants), and is situated at the confluence of various small rivers and streams. The Eindhoven metropolitan area and city have grown fast since industrial companies, like Philips, settled here in the 1920s.

The urban water system did not keep track with this growth, causing problems for water quality and quantity:

- Water on streets after heavy rainfall due to insufficient urban drainage capacity.
- Combined sewer outlets polluting vulnerable surface waters with higher ecological functions and values.
- Malfunctioning of the remaining surface waters due to closing of former streams or connecting these to combined sewer systems.
- A large waste water treatment plant, serving 750,000 inhabitants, discharging effluent on a small surface water area, with insufficient biological treatment capacity in periods of large sewage supply.
- Groundwater entering basements of houses due to building in former wetlands, combined with reductions in groundwater extractions.

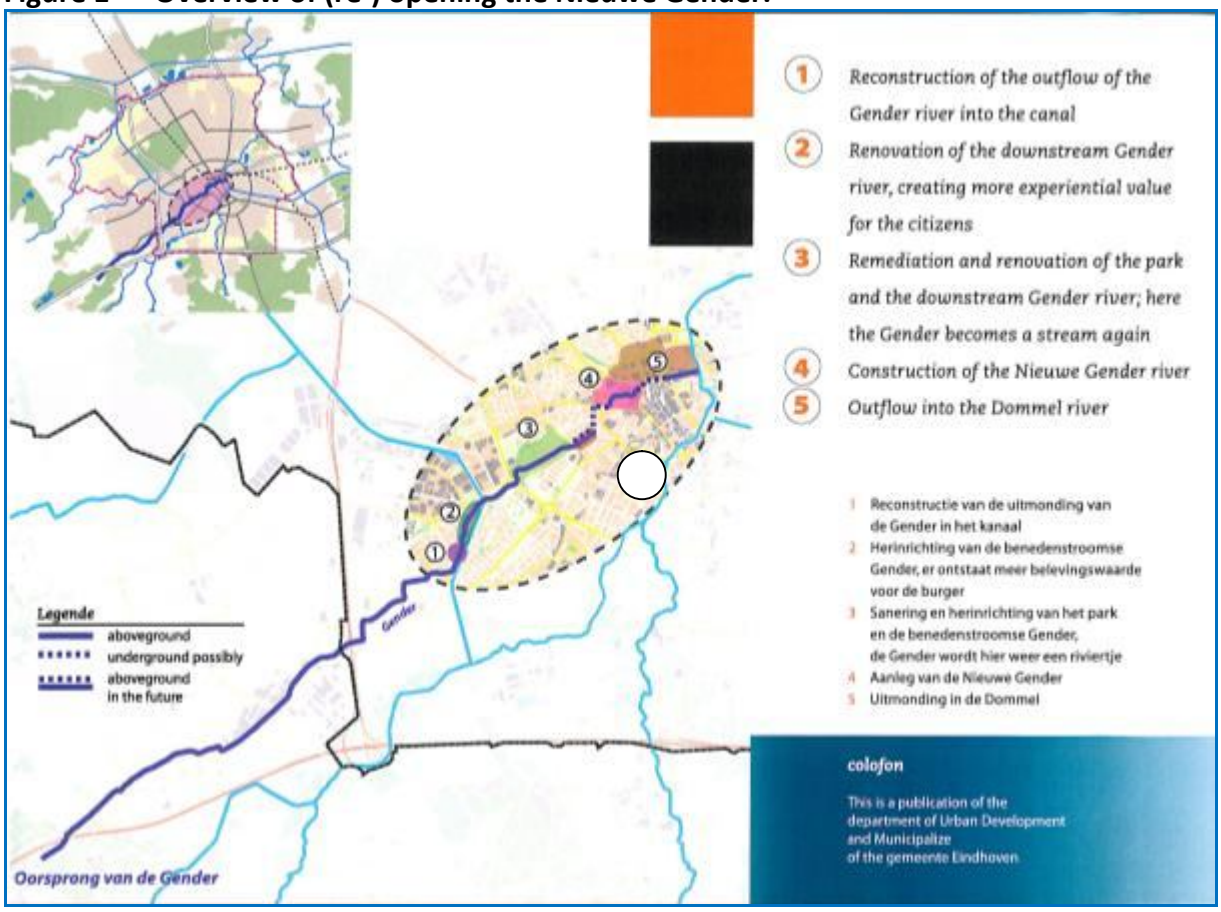
A long term programme has been developed to tackle these problems, including all water issues and linking it with the planning of other activities in the public space. These measures include: i) decoupling by changing the sewer system from combined to separate sewers, discharging rainwater from roads and roofs via a new drainage system on surface water, and ii) (re)opening a number of watercourses throughout the city. Most measures are executed until 2015, by then the abovementioned problems will have been reduced significantly. Recently, also climate change adaptation has been included in the development of future measures and in a research program.

### *Objective*

One of the measures is the (re)opening of a watercourse, called the Gender, that has been closed down in the 1950s, and is planned to be reopened through the city centre. The reopening of the “Nieuwe Gender” aims to:

- Give a technical optimal contribution to the water goals, including space for maximum storage and discharge capacity (see Figure 1).
- Add maximum value to the public space (e.g. recreation and visibility).

**Figure 1 Overview of (re-) opening the Nieuwe Gender.**




The section of the watercourse to be studied includes de last 3 kilometres of the Nieuwe Gender, before it discharges into the Dommel river. Within this section, there are four interesting parts to be studied in more detail (see Figure 1):

- Section 3 – Gendervijver. Here the Gender is a pond in a park. Renovation of park and pond is planned. Two scenarios are studied: restoration to a more natural watercourse or maintaining the present configuration. Also a flexible weir system including water retention is planned here, to store rainwater and control discharge. This has consequences for the land use of the park.
- Section 3B – De Frederika van Pruisenweg. Some years ago the inhabitants of this street were asked to approve re-opening the watercourse in their street. A majority of citizens voted in favour, but for political reasons the plan was cancelled (in relation to expected complaints). There is a group of citizens asking to reopen the watercourse here, especially when there is a good perspective for the other sections to be reopened. The case study will investigate if reopening here adds value.
- Section 4 – Emmasingelkwadrant. This is a former industrial area to be redeveloped to housing, shopping and leisure functions. Three scenarios are possible here: an underground connection, a watercourse with a minimum of (functional) space to discharge water, and a watercourse in a spatial green setting.
- Section 5 – Stationsweg. The watercourse will be reopened and end in the Dommel river.

### *Outputs*

Expected spatially explicit outputs using the DST will be:

- Information on the added value of the Nieuwe Gender for the various sections and for various scenarios.
- Information to provide, together with other case studies in the project, outcome and output that can serve wider and more general use.
- The (added) value of the various scenarios in terms of household welfare ('quality of life') and the (added) land value.
- Cost-benefit analysis of scenarios (e.g. based on the investment and maintenance costs of the scenarios and the added land value).
- Comparison of (added) value of the different scenarios for (re-) introducing green/blue space versus (added) value of built space, including scenarios of greening the urban areas and the added value of (different) green/blue qualities for citizens.