



## DHI CASE STORY

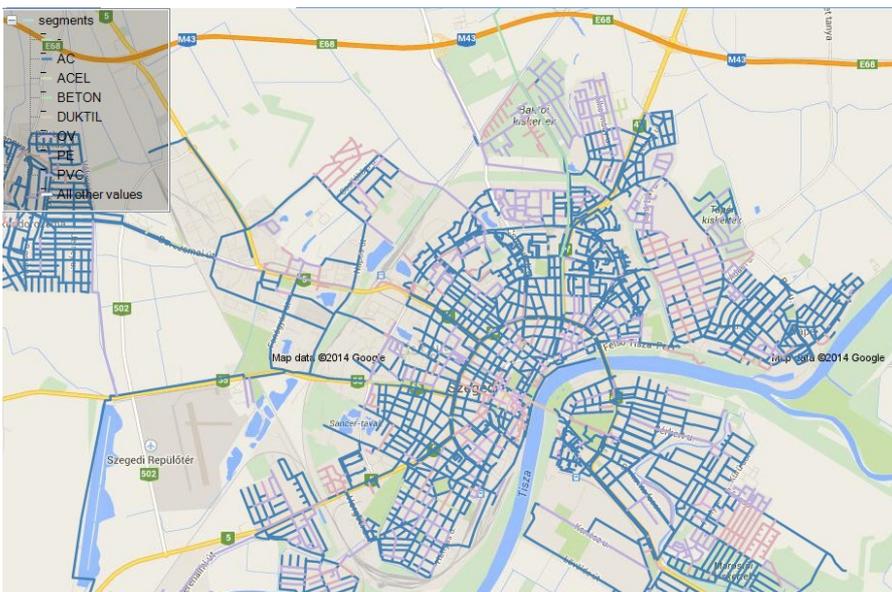
# IMPROVING THE WATER SUPPLY NETWORK FOR THE CITY OF SZEGED

A flexible system in planning and reconstructing a sustainable water network

The city of Szeged, located in the south-east of Hungary, has around 160,000 inhabitants and spreads over 280 km<sup>2</sup>. The city has a densely populated downtown surrounded by newer neighbourhoods. Apart from the obvious disparity in how the buildings look from the outside, the difference of the main city zones also lies in the age and material of the pipes within its water network. A large network of older pipes are in dire need of replacement to avoid leakage problems. We were tasked with designing a network reconstruction plan to help Szeged Water Utility improve its water supply system within the city.

## SZEGED'S NEED FOR IMMEDIATE PIPE REPLACEMENT

The main challenge for the reconstruction planning are that the pipes constructed during the 1960s and 1970s were mainly made from asbestos cement. These pipes—which cover a wide network in the downtown areas—are more susceptible to failures and leakages than pipes made of steel or polyvinyl chloride (PVC), for example. Due to wear and tear, a large number of them are now in a critical state and need to be replaced as soon as possible.



Material of pipes in Szeged's water supply network. © DHI

## SUMMARY

### CLIENT

Szeged-Algyő, Drinking Water Quality Improving Municipal Association

### CHALLENGE

- Improving the city's water supply network performance while working within financial limits
- Bringing non-revenue water (NRW) level to under 20%
- Analysing the water supply network based on varying multi-criteria input

### SOLUTION

MIKE CUSTOMISED—a complete tool for sustainable network evaluation and reconstruction planning.

### VALUE

- Helping the city improve the process of reconstructing its water supply network
- Ability to create multiple network reconstruction scenarios and assess financial impact
- Capability to combine all available input into the MIKE CUSTOMISED solution

### LOCATION / COUNTRY

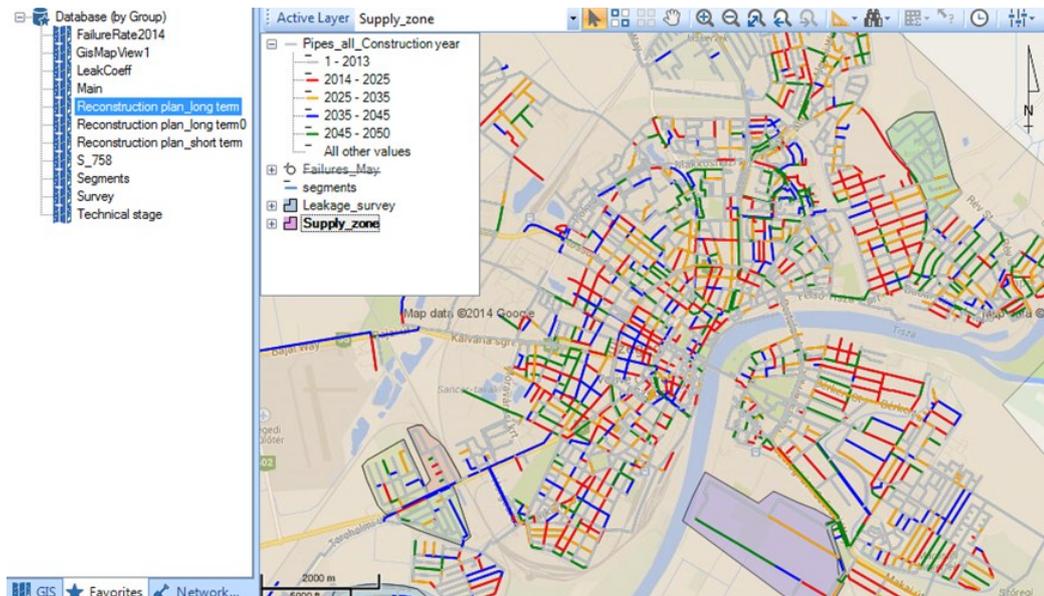
Szeged-Algyő, Hungary

In order to avoid serious leakages which could impede the entire water supply system, our client had to make immediate plans to improve the performance of their water supply network. We facilitated a network reconstruction plan while working within financial limits of the city. The main aim of this project is to define the most optimal reconstruction strategy focusing on critical pipe segments, eventually bringing the NRW level to below 20%. Aiming to create a customer-oriented solution, we are helping Szeged achieve the best economical results in the shortest time possible.

### MIKE CUSTOMISED- A COMPLETE TOOL FOR SUSTAINABLE NETWORK EVALUATION AND RECONSTRUCTION PLANNING

The network reconstruction tool implemented in MIKE CUSTOMISED collects information about Szeged's current network performance, in terms of pipe material and age, failure rates, leakage and other pipe properties. With this information, the tool can identify the most critical pipelines to reconstruct with highest priority.

We used MIKE CUSTOMISED to assess the NRW components, highlight key factors influencing the NRW level and evaluate the data inputs to establish the most optimal reconstruction planning method. This method was then implemented in the reconstruction planning tool in the same MIKE CUSTOMISED platform. The reconstruction strategy can be tested directly in the tool, taking into account many technical and financial outputs. Throughout the implementation process, we provided full support and training to our client in order for them to manage the network reconstruction tool independently.



Screenshot of reconstruction planning software. © DHI

### FLEXIBLE MULTI-CRITERIA NETWORK ANALYSIS

The main strengths of the network reconstruction tool are the availability of a multi-criteria analysis and an appropriate use of the available technical parameters such as the age, material, failure rate and water loss of the pipes. The flexibility of the software enables our client to change the criteria definition at any moment to create a new planning scenario. They are also able to add new criteria and parameters when new information becomes available (measurement campaigns and hydraulic model results, for example).

An important highlight of the ongoing reconstruction planning is that our client has the option to coordinate the network reconstruction plan with other investments in the area while working within the needs of network development. They also have the flexibility to manually mark the pipe segments that are to be reconstructed without taking into account the simulation results. In the first year of simulation, Szeged went ahead to use this flexible method even when the investment has been already prepared independently based on simulation results. The reconstruction types and costs are defined in terms of material and pipe diameter, but many other conditions can be taken in account, including the setting of individual cost for each pipe. The cost is then input into the software, and this figure is the main parameter used in the calculation of the necessary investments per year.

With MIKE CUSTOMISED, the city of Szeged enjoys an easier process of reconstructing its water supply network. The ability to create multiple network reconstruction scenarios while assessing financial impact, and the flexibility of our solution greatly helped our client in planning and reconstructing a sustainable water network.

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For more information visit: [www.dhigroup.com](http://www.dhigroup.com)