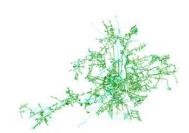# Fine-scale rainfall measurement and prediction to enhance urban pluvial flood control

Pilot location: LEUVEN (BE)

A full hydrodynamic sewer model has been built using InfoWorks CS

- The sewer system and the main water courses are modelled in 1-dimension (1D) in InfoWorks CS : the model consists of around 10500 nodes and around the same number of pipes. There are about 25 pumping stations and more than 100 combined sewer overflows (CSOs).
- The rainfall runoff process is modelled in InfoWorks CS using conceptual runoff models (initial and continuous losses + linear reservoir routing) in combination with geographically defined subcatchments per node.
- In the current model flood calculations are done in a simplified way using conceptual flood cones. During the project, the model will be extended with a full 2D surface grid to allow much more accurate calculation of the flood depths and flows. Alternative approaches using 1D overland trajectories will also be considered to optimise calculation times.

Spatial datasets

Digital Elevation Model

The Flemish GIS Agency (AGIV) has produced a first DEM in 2004, based on Lidar technology. The real height of buildings is not represented in the DEM. The DEM is an irregular cloud of points with an average density of 1 point per 20 m . The density can be higher in areas with a more variable relief.

In 2012 work has started to produce a completely new DEM using latest Lidar techniques, and expecting to result in an average density of around 10 points/m , including full indications of elevations of buildings etc. The first data of this new DEM will be available in 2013, and it is hoped that the Leuven area will be one of the first areas covered.

Rainfall
Rain gauges.
- 8 tipping bucket raingauges with realtime data retrieval, spread over the drainage area (0.2 mm resolution, 1-2 minute interval)
- various other raingauges with varying resolution and data availability
- 3 RMI raingauges (daily totals);

Radar:

Specifications	Marine X-band technology (Furuno)
Location	Province House, Leuven
Frequency	9.41 GHz
Polarization	single polarization
Spatial resolution	125 x 125 m
Temporal resolution	1 min
Beam opening	$4°$ hor – 20° vert.
Elevations	1 elevation only

Water level sensors
In the northern part of the area the following monitoring equipment is installed :
- 10 level gauges (most of which at CSOs)
- 3 flow gauges
- pump recordings at 3 major pumping stations

Most of these data are collected daily by a telemetry system. Flow recordings are collected manually on a weekly basis.