Urban trees are continuously exposed to several stress situations like air pollution, soil compaction, damage of tree trunks, etc. For the responsible authorities, it is important to anticipate possible accidents (e.g. tree fall) and to manage the forest heritage. So, the Brussels Capital Region charged EUROSENSE to develop an analysis of the health status of trees along regional roads. Each year, an airplane of EUROSENSE acquires imagery (IR) over one third of all the Brussels lane trees. These datas are, after being processed and corrected, interpreted and combined with a visual check on the field and a global index on the tree vitality is created. Finally, EUROSENSE inserts the results in a database which can be visualized by a map indicating the health status with a colour code.

**Scope of Services:**

- Acquisition of imagery: Flight planning and execution in summer by means of a EUROSENSE airplane equipped with the digital camera Vexcel UltraCamX; The infrared imagery allows a physiological analysis.
- Field analysis during the autumn. It allows to make a tree by tree diagnosis; this is a mechanical analysis.
- Each year, one third of all the lane trees are analysed. The tree inventory includes a tree species identification, height, trunk circumference measurements and spatial localization.
- The two sources of information are combined to create a global index of vitality which is divided into 5 classes.
- Analysis tools have been developed to monitor the evolution of the health status over time.

**Technical description:**

Each flight has been executed on a summer day covering one third of all trees of the Brussels Capital Region (+/- 10000 trees) with a resolution of 10 cm. The Near Infrared (NIR) channel is included in the data. In this part of spectrum of the light, vegetation reflects much more and can hence be better analysed than in the case of the visible channel; a healthy tree has not the same reflection as an unhealthy tree in the NIR-channel.

The analysis of infrared imagery is executed with a special software that permits viewing every tree in 3 dimensions in order to have a good idea of the crown of each tree. The final product is usable in ArcGIS-software (esri) and applied in ATM (website developed by ALIWEN).