

## **URBAN GEOMatics for Bulk Information Generation, Data Assessment and Technology Awareness**

Nowadays about the 54% of world population lives in urban areas and, according to the 2014 UN-ESA report, this percentage is expected to increase up to 66% by 2050. We are clearly facing a rapid and global trend, that will affect daily life in the next few decades. It is therefore crucial to manage this social and cultural change in a much more sustainable way, compared to what was done in the past.

Within this framework, the collection, integration and sharing of reliable and open spatial information is a key factor, benefiting both of different space (Earth Observation (EO) satellites and Global Navigation Satellite Systems (GNSS)) and ground (low-cost devices networked in the Internet of Things (IoT), 50 billion are expected within 2020) technologies.

Therefore, the growth of urban areas, from one side, represents a key problem, but from the other one it is an unprecedented chance to collect spatial data to address and solve the problem itself, provided these data are managed, analyzed and shared properly, in order to turn them into knowledge.

In this respect, information derived from EO can be exploited for long-term monitoring, understanding and possibly addressing the urban processes; EO data are growing in volume and variety at fast rate and spatial Agencies are starting to provide a significant part of them as open and free products, as NASA and USGS did with the Landsat and ESA is doing with Sentinels.

Moreover, thanks to the IoT devices and the Web 2.0 revolution, the availability of new and real-time data sources is rapidly increasing: we can just think on passive geo-crowdsourced data (geolocated social media content, telephone calls, SMSs, Internet connections details, etc.) or user-generated contents obtained through Volunteered Geographic Information (VGI) and citizen science and cyberscience initiatives (GNSS tracks, a variety of low-cost sensors data, etc.).

The objective of the project is the exploitation of the so-called Big Data concept (volume, variety, velocity and veracity) for

- developing new advances in studying and monitoring processes related to the urban environment
- supporting (real-time and off-line) decision processes of (huge) numbers of concurrent users

Considering the different research units involved in the project, 5 cities have been selected as test areas: Milan, Naples, Padua, Rome and Turin.

Dealing with a very different variety of data, the first step of the work will be focused on the definition of a standardized and unified geodata model. The geodatabase will be published and shared by means of free and open source tools, which will also provide multi-dimensional visualization and data processing functionalities.

It represents the starting point for different investigations connected to the urban environment. Within the project, the attention will be focused on the development of new replicable methodologies related to soil consumption and mobility.