Sensing Models and Sensor Network Architectures for Transport Infrastructure Monitoring in Smart Cities

Ingo Simonis

OGC, Kriftel, Germany (isimonis@opengeospatial.org)

Transport infrastructure monitoring and analysis is one of the focus areas in the context of smart cities. With the growing number of people moving into densely populated urban metro areas, precise tracking of moving people and goods is the basis for profound decision-making and future planning. With the goal of defining optimal extensions and modifications to existing transport infrastructures, multi-modal transport has to be monitored and analysed. This process is performed on the basis of sensor networks that combine a variety of sensor models, types, and deployments within the area of interest. Multi-generation networks, consisting of a number of sensor types and versions, are causing further challenges for the integration and processing of sensor observations. These challenges are not getting any smaller with the development of the Internet of Things, which brings promising opportunities, but is currently stuck in a type of protocol war between big industry players from both the hardware and network infrastructure domain.

In this paper, we will highlight how the OGC suite of standards, with the Sensor Web standards developed by the Sensor Web Enablement Initiative together with the latest developments by the Sensor Web for Internet of Things community can be applied to the monitoring and improvement of transport infrastructures. Sensor Web standards have been applied in the past to pure technical domains, but need to be broadened now in order to meet new challenges. Only cross domain approaches will allow to develop satisfying transport infrastructure approaches that take into account requirements coming form a variety of sectors such as tourism, administration, transport industry, emergency services, or private people. The goal is the development of interoperable components that can be easily integrated within data infrastructures and follow well defined information models to allow robust processing.