Adaptible Wireless Sensor Network for Urban Crisis Management

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AWSN project (2010-2013) aims to develop wireless sensor system which can be easily applied for different crises situations, such as monitoring of snow load on the roofs, water floods, etc.

2010 Phase I

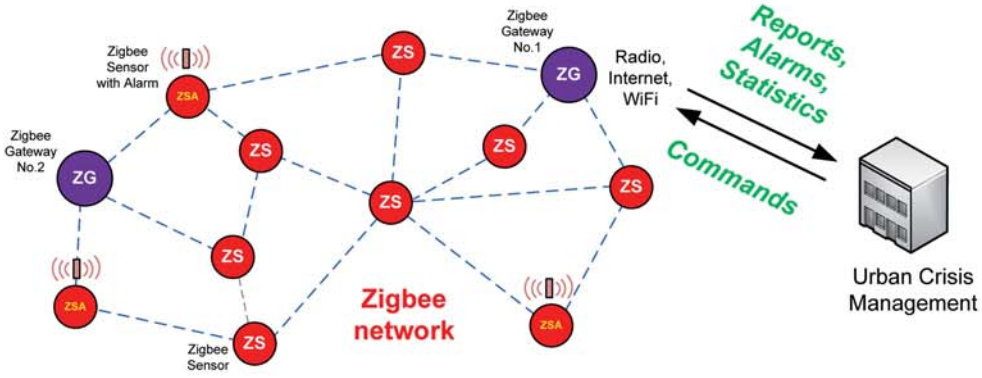
Testing of enviromental sensors suitable for AWSN project. We have already designed a new snow sensor, it is under the patenting submission process. The snow sensor sends information about level of snow and its quality, the weight of snow is calculated remotely in crises managemement center

Water flow sensor testing

Snow sensor testing

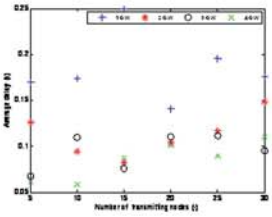
2010 Phase II

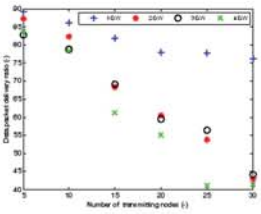
Proposal of network architecture. Designed a new network architecture that is based on Zigbee. AWSN system consists of Zigbee Sensor, Zigbee Sensor with Alarm (e.g. display, siren, beacon) and Zigbee gateway equipped with external communication module for long-haul distances. AWSN protocol specifies four message types:
Report, Alarm, Statistics, Commands



2011 Phase III

Simulations of throughput, delay and packet delivery ratio ofproposed AWSN architecture with more gateways. The results showed that more gateways increase reliability however cause also considerable delay in packets transport and higher ratio of collisions.





2011 Phase IV

Design of Zigbee Sensor unit. Wireless communication is realized through the Atmel Zigbit 868 MHz module that can be alternatively replaced by its 2,4 GHz version. Zigbee Sensor offers 3/2 x digitial input/output, 4 x analog inout, 1 x I2C, 2 x UART.

Detail of Zigee Sensor

Cased Unit ready for deployment.

Schematic diagram of internal peripheries

2012-13 Phase V-VII

Validation, testing and deployment - TBD