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Supporting First Responders by Terrestrial Bluetooth-based Traffic Monitoring in Case of Large Scale Events

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In the present paper we describe the application of terrestrial Bluetooth-based sensors for the purpose of traffic and person monitoring during large scale events. By the example of a worldwide renowned music festival, a case study was carried out during actual operating business of the event. The aim of this case study was, on the one hand, to automatically collect anonymised data of the current traffic situation along the arrival roads, and on the other hand, data according to the local number of persons at specific points of interest on the event area throughout the entire duration of the festival.

The results of the case study are presented and evaluated within the paper. It turned out that the usage of locally deployed Bluetooth-based sensors allows adequate continuous time measurement which is able to register reliable situation changes in the local concentration of people over the course of the day. The findings are accompanied by referencing results from aerial imagery which were recorded from parallel conducted flight monitoring and which support the observations made from the terrestrial monitoring.

With the results of the paper, the authors want to contribute to the research on safety concepts for large scale event. Therefore, we aim to demonstrate that with relatively little effort and low costs an ad-hoc sensor network can be installed and operated, which allocates reliable information on the current situation for the event organizer and, thus provides an adequate data base for professional responders in order to efficiently initiate and execute evacuation measures in case of potential risks.