

# INFOBLAD

## Positioning of people in road and rail tunnels in the event of fire

**If there are people left in a road or railway tunnel where a fire has broken out and where they in that case are located are likely factors that can be expected to influence on how the rescue operation develops, and on the rescue service's ability to assist the evacuation. A system for locating people evacuating is therefore considered to be a technical installation that can largely contribute to increasing both the possibilities for evacuating in the event of a fire and to more efficient rescue interventions.**

**One such localization system using the Wi-Fi function of smart mobile phones, has been tested under realistic conditions in a road tunnel. The motive was to investigate what conditions the system must function in order to locate people in a road tunnel and primarily to investigate how close a wifi-predicted position is to a real position. Another interesting aspect was to investigate whether there are possibilities to determine in which direction the person is moving. The work has been characterized by the practical application of the system and how it can be used as a basis for decisions partly by traffic or operations control centers and partly by the rescue services during an intervention.**

### Methods and implementation

Försöken genomfördes i oktober 2021 i Sicklatunneln i Stockholm and a total of 39 tests were conducted. Several variables were changed between the tests, such as the route chosen by the research subjects in the tunnel, the number of people moving at the same time, how the mobile phone is kept (in the hand or in the pocket), the presence of obstacles in the tunnel and the way the mobile phone communicates with the access points present (active or passive communication). The actual positions of the research subjects were documented using video cameras.

### Resultat

The results of the tests show a relatively large deviation between a mobile phone's (actually the used mobile devices that were used as a replacement) real position in the tunnel and the position predicted by the Wi-Fi system. The deviation was in the order of 20 meters and the deviation's variation is also relatively large. There was no major variation in the deviation depending on the conditions of the experiments.

Despite the deviation between real position and predicted position, the system can still be seen as useful for locating people in a tunnel. It also seems to be possible to identify in which direction a person or a group is moving. The trials should be seen as part of an initial work to map the technology's possibilities and additional work need to be done for example to investigate the effect of smoke in the tunnel.

### RESEARCH TEAM



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